Colwyn Bay Waterfront Phase 2

Environmental Appraisal

September 2015

Conwy County Borough Council

Mott MacDonald

Colwyn Bay Waterfront Phase 2

Environmental Appraisal

September 2015

Conwy County Borough Council

Bodlondeb, Conwy,
North Wales, LL32 8DU.

Mott MacDonald, Mott MacDonald House, 5 Woodland Road West, Colwyn Bay LL29 7DH, United Kingdom
Tŷ Mott MacDonald, 5 Ffordd Coetir Orllewinol, Bae Colwyn LL29 7DH, Y Deyrnas Unedig
T +44 (0)1492 534601 **W** www.mottmac.com

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	September 2015	A Wratten V Deakin J Bates N Jones I Scott	H Jenkins M Reid	A Lawrance	First Issue

Information class: Standard

Contents

Executive summary

Mott MacDonald Ltd has been commissioned by Conwy County Borough Council to undertake an Environmental Appraisal report for the first part of the Colwyn Bay Waterfront Project Phase 2 (Phase 2 VVP). This involves the regeneration of two areas of coastline between Victoria Pier and Cayley Embankment, with additional improvements to coastal defences in the area.

The works will comprise raising and widening of the promenade through construction of three headlands, to enhance the recreational opportunities in the area. The scheme also includes wider public realm improvements in line with the Phase 1 development which is now complete. Phase 2 forms part of the wider Colwyn Bay Waterfront Project, which aims to improve coastal defences along 3.5km of coastline between Rhos Jetty and Old Colwyn.

A request for an Environmental Impact Assessment Screening Opinion was submitted to Conwy County Borough Council in August 2015, accompanied by an Environmental Appraisal Scoping report. It was concluded that there would be no significant adverse effects likely from the proposed development, therefore statutory Environmental Impact Assessment is not applicable and the production of an Environmental Statement is not required.

Potential impacts requiring further study are assessed in detail in this Environmental Appraisal. A technical assessment of the following topics has been undertaken:

- coastal processes;
- marine ecology;
- landscape and visual; and
- socio-economic effects.

The Environmental Appraisal identifies environmental and social impacts from the scheme and associated mitigation measures. It has been produced to accompany a full planning application which will be submitted to Conwy County Borough Council for Phase 2 VVP of the Colwyn Bay Waterfront Project.

It is concluded that the main potential effects of the proposed scheme without mitigation are as follows:

- possible loss of protected habitats (dense blue mussel aggregations);
- temporary water quality impacts due to beach re-profiling;
- temporary landscape, townscape and seascape impacts as a result of construction equipment and processes;
- visual impacts on sensitive receptors along the waterfront;

Full implementation of the recommended mitigation measures will ensure that residual adverse impacts will not be significant. The main residual effects include:

- temporary disturbance to birds and foraging habitat;
- loss of low value biotopes;
- temporary sediment transport to lower foreshore;
- temporary visual impacts on landscape, townscape, seascape and receptors along the waterfront;

Residual beneficial effects are predicted, as the improved interface between the promenade and the beach will reduce the risk of erosion, flooding and scouring to protect nearby properties and infrastructure.

Abbreviations

AOD	above Ordnance Datum
BARS	biodiversity action reporting system
BGS	British Geological Survey
BS	British Standard
CCBC	Conwy County Borough Council
CCW	Countryside Council for Wales (now Natural Resources Wales)
CEMP	Construction Environmental Management Plan
EIA	environmental impact assessment
ES	environmental statement
HGV	heavy goods vehicle(s)
HPI	habitat of principal importance
IAQM	Institute of Air Quality Management
IEEM	Institute of Ecology and Environmental Management
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
MAGIC	Multi-Agency Geographic Information for the Countryside
NRW	Natural Resources Wales
NSR	noise sensitive receptors
SAC	special area of conservation
SPA	special protection area
SSSI	site of special scientific interest
TAN	Technical Advice Note
T&C EIA Regulations	Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999
VER	valued ecological resources
VVP	Vibrant and Viable Places regeneration scheme
ZoI	Zone of Influence

1 Introduction

1.1 Purpose of document

Mott MacDonald Ltd has been commissioned by Conwy County Borough Council (CCBC) to undertake an Environmental Appraisal report for the first part of the Colwyn Bay Waterfront Project Phase 2 (Phase 2 VVP).

The Waterfront Project aims to improve the coastal defences along a 3.5km stretch of coastline between Rhos Jetty and Old Colwyn, and contribute to the wider regeneration of the region. Phase 1 of the project (now complete) comprised promenade enhancement, construction of a groyne, beach recharge and wider recreational improvements. Phase 2 VVP has now secured funding and is anticipated to begin in 2016.

This Environmental Appraisal has been produced to accompany a full planning application which will be submitted to CCBC for Phase 2 VVP of the Colwyn Bay Waterfront Project, hereafter referred to as the Proposed Development. The report aims to identify environmental and social impacts from the scheme and associated mitigation measures.

The key objectives of this Environmental Appraisal report are to:
- provide an outline description of the Proposed Development;
- state the legislative requirements of the Environmental Impact Assessment (EIA) process;
- detail potential environmental impacts (both positive and negative) which may arise from the scheme;
- identify appropriate mitigation techniques to prevent significant impacts; and
- collate consultation responses from key stakeholders.

1.2 Legislative requirements

The Environmental Impact Assessment (EIA) Directive 97/11/EC (as amended) requires an EIA to be carried out in support of an application for development consent for certain projects listed in Annexes I and II of the Directive. For schemes included within Annex I, EIA is mandatory, while within Annex II, an EIA is required if the development is likely to have significant effects on the environment. Harbour works, marinas, land reclamation and certain coastal defence works fall within Annex II.

The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) apply the EIA Directive so that suitable EIAs are carried out prior to granting permission for the deposit of substances or articles within UK waters or UK controlled waters, either in the sea or under the sea bed, from various structures, vessels, containers or structures on land, or anywhere in the sea. The Marine Works EIA Regulations provide for the necessary steps to be taken in addition to those required under existing legislation, namely Part IV of the Marine and Coastal Access Act 2009:
- Part IV of the Marine and Coastal Access Act 2009 requires a licence to be obtained for the deposit of any substance or object, in the sea or on or under the sea bed, from any structure on land constructed wholly or mainly for the purpose of depositing solids in the sea.

As the Proposed Development at Colwyn Bay includes a significant landward element that requires consent under the Town and Country Planning Act, the Town and Country Planning (EIA) (England and Wales) Regulations 1999 (the T&C EIA Regulations) have to be considered.

The proposed scheme does not fall within Annex 1 of the EIA Directive (Schedule 1 of the T&C EIA Regulations), within which EIA would be mandatory. However, it does fall within Annex 2 (Schedule 2):

"10. Infrastructure projects: coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works."

As the proposed works are not considered to represent 'maintenance' and are not limited to 'reconstruction', the proposed coastal protection works in Area A fall under Annex 2 of the EIA Directive (Schedule 2 of the T&C EIA Regulations). Furthermore the proposed works exceed the indicative threshold (1 ha) identified in Welsh Office Circular 11/99 EIA, suggesting that significant effects are more likely. Therefore, the need for an EIA must be considered. A description of alternatives considered and justification for chosen options is detailed in the Phase 1 Environmental Statement (ES) (October 2010) and addendums.

The site is not located within a sensitive area, as defined in Regulation 2 of both the Marine Works EIA Regulations and T&C EIA Regulations, although it is located within the North Wales Coast Important Bird Area and adjacent to the Liverpool Bay Special Protection Area (SPA) designated for the protection of certain bird species. The need for EIA at this site is therefore based on the significance of the potential effects of the development on the surrounding environment.

A request for an Environmental Screening Opinion was submitted to CCBC in August 2015, accompanied by an Environmental Appraisal Scoping report. It was concluded that there would be no significant adverse effects from the Proposed Development, therefore statutory EIA is not applicable and the production of an ES is not required. The potential impacts identified in the scoping document are assessed further in this Environmental Appraisal. A formal response to the screening letter was received on 26th August 2015, confirming that the proposed scheme is not EIA development and therefore does not require the production of an ES.

1.2.1 Environmental Appraisal

This Environmental Appraisal is a non-statutory report to be submitted alongside the planning application for the Proposed Development. The scope of the document has been determined by the outcome of the Environmental Appraisal Scoping report and the guidance within the EIA screening response, which identified a need for assessment of potential environmental impacts from the scheme on the following categories:

- coastal processes;
- marine ecology;
- landscape and visual; and

- socio-economic effects.

The aims of the Environmental Appraisal Scoping report were to:
- provide an outline description of the Proposed Development;
- initiate consultation with key stakeholders;
- describe the legislative requirements of the EIA process; and
- identify potential environmental and social impacts (both positive and negative) which may arise, along with potential mitigation measures where known.

The Environmental Appraisal Scoping report provided an initial assessment of the issues to determine which require further examination, and those topics that do not require further consideration. Environmental topics which are not anticipated to have significant adverse impacts from the scheme, and do not require detailed studies, are considered to be “scoped out” and do not require further investigation or assessment. The EIA screening letter and Environmental Appraisal Scoping report are included in Appendix A. The formal response to the screening letter is found in Appendix B.

1.3 Methodology

This report has been informed by:
- desk top studies and site visits;
- work undertaken to date, including the Environmental Appraisal Scoping report;
- consultation with key consultees;
- a review of relevant websites;
- a review of documents including planning policy and EIA assessment guidance; and
- experience of other large regeneration and coastal defence projects.

1.3.1 Baseline data

Baseline data has been obtained from a variety of sources throughout the environmental assessment process. Baseline data is included in each specialist chapter and within the appendices. The data gathered to date is considered to be sufficient to allow design development to proceed to the planning application stage and to allow the production of a robust and comprehensive Environmental Appraisal. Baseline and assessment years are defined within each chapter as relevant to each specialist topic.

1.3.2 Assessment of impacts

This assessment is based on the proposals as described in chapter 2. Direct and indirect effects, any secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects have been identified as resulting from the following categories:
- the existence of the development;
- the use of natural resources; and/or
- the emission of pollutants.

Impacts identified have taken into account visual, noise and emissions effects on human beings, buildings and man-made features.

The assessment of whether the proposed scheme is likely to have significant impacts on the environment is undertaken through the following methods, where applicable:

- assessment based on professional judgement and published guidance criteria;
- assessment of both temporary and permanent effects;
- assessment of reversibility of effects;
- assessment against local, regional and national planning policy objectives; and
- consultation with relevant consultees.

The assessment of impacts has taken into account:

- effects on human beings, buildings and man-made features;
- visual effects on the surrounding area and landscape;
- levels and effects of noise and emissions;
- effects of the development on buildings, the architectural and historic heritage, archaeological features, and other human artefacts;
- effects on flora, fauna and geology;
- effects on land and waters;
- effects on air and climate; and
- other indirect and secondary effects associated with the project.

1.3.3 Significance criteria

Significance criteria are based on the type of potential consequence, the probability of the consequence occurring, and the magnitude of the consequence. The actual criteria used are set out in each individual technical chapter, and are dependent on the guidance, legislation and best practice applicable to each topic. The nature of significance criteria are set as ranging from major adverse through to negligible, to major beneficial.

Where possible, the following significance categories are used to ensure consistency in assessment:

- major adverse;
- moderate adverse;
- minor adverse;
- not significant / insignificant;
- minor beneficial;
- moderate beneficial; and
- major beneficial.

For the landscape and visual appraisal significance criteria were not assigned, because a full Landscape and Visual Impact Assessment was not considered necessary. This is due to the non-statutory nature of the report, and supporting information and evidence available including the Townscape Assessment (July 2015).

1.3.4 Mitigation measures

Where negative impacts are identified, the assessment highlights measures which could be employed to mitigate the impact, practical means to achieve this and any issues which will not be resolved through these mitigation measures. Consideration is given to the extent and significance of any residual impacts that may remain after the mitigation measures are taken into account. Compensation and enhancement measures are also addressed where applicable.

The mitigation process can be defined as working to lessen a risk, either by lowering the likelihood of occurrence or by reducing the potential impact. Throughout the project, risks have been identified and mitigation measures either included in the design, or proposed for the construction and operation processes. Mitigation measures can include:

- avoiding the impact by not taking an action or modifying an action;
- reducing impacts by limiting the magnitude of the action;
- rectifying the impact by repairing, rehabilitating or restoring the impacted environment;
- reducing or eliminating the impact over time through preservation and maintenance operations; and
- compensating for the impact by replacing or substituting these environments.

A summary table showing the main mitigation measures and recommendations for Phase 2 of the Colwyn Bay Waterfront Project is included in chapter 8 of this report.

1.3.5 Supporting documentation

In addition to this Environmental Appraisal, the following documents will form part of the planning application submission and should be read in conjunction with this Environmental Appraisal:

- Flood Consequences Assessment (June 2015);
- Biosecurity Risk Assessment (September 2015);
- Construction Stage Traffic Assessment (September 2015); and
- Habitats Regulations Test of Significance (September 2015).

1.4 Consultation

Consultation undertaken for Phase 1 of the Waterfront Project, including public consultation, is detailed in the Phase 1 ES (October 2010) and associated addendums (2012; 2013). Further consultation undertaken for Phase 2 has included both statutory (required by law) and non-statutory consultees, with the aim of collating all comments and concerns regarding the Proposed Development. Where appropriate, the views are incorporated into the design process. Consultees contacted included (but were not limited to) the following organisations, with consultation responses received included in Appendix C.

- Conwy County Borough Council;
- Clwyd Powys Archaeological Trust;
- Natural Resources Wales (NRW); and
- Cadw.

2 Scheme overview

2.1 Scheme description

Colwyn Bay Waterfront Project is a joint regeneration and coastal defence scheme covering approximately 3.5km of coastline, centred at grid reference SH 852 791. The Project divides the waterfront area into 'zones' with zone-specific improvements to be made dependent on the proposed end use of that particular section of the waterfront, comprising water sports, traditional beach use and nature conservation zones. The works have been divided into three phases, the first of which (Phase 1) is now complete. Appendix C shows the location of the three phases of work.

2.1.1 Scheme objectives

The principal objectives of the scheme are as follows:

- to safeguard the integrity of the existing defences while providing improved coastal defence measures within Colwyn Bay;
- to allow the construction of improved defences that are proportional to the risk of flooding and erosion to:
  - the local population;
  - residential properties;
  - local and national infrastructure including the A55 trunk road, Chester to Holyhead mainline railway, railway station and coast road;
- to maintain the availability of the waterfront area as an amenity area for both residents and visitors;
- to allow the progression of other regeneration and environmental improvement initiatives associated with the waterfront and town centre; and
- to realise the next phase of the Colwyn Bay Waterfront Project.

The scheme receives funding from the Welsh Government through the Vibrant and Viable Places (VVP) regeneration scheme.

2.1.2 Site location

Colwyn Bay (Bae Colwyn) is a seaside town in Conwy County Borough on the North Wales coastline. Principal settlements comprise Rhôs-on-Sea to the west, the town of Colwyn Bay in the centre and Old Colwyn to the east. The A55 trunk road passes through the town, running parallel to the North Wales mainline railway, both of which separate Old Colwyn and Colwyn Bay town from the waterfront.

A long promenade and associated cycle track follow the waterfront from Rhôs-on-Sea past a Victorian pier in the centre of the bay and round to Old Colwyn. Kiosks are situated along the promenade and there are slipways located at regular intervals for beach access. The beach comprises sand with some shingle at the landward edge.

2.1.3 Phase 1

Phase 1 of the scheme was carried out in three stages covering approximately 35,000m^2. The site was located within the central section of the frontage either side of Victoria Pier from the section of seafront in the vicinity of Marine Road to the west, to the section of seafront parallel to the J22 eastbound slip road of the A55 to the east.

Phase 1a of the scheme encompassed engineering works and environmental improvements. The engineering works were completed in March 2012, comprising a 150m rock groyne structure perpendicular to the shore line, with a short length of linear rock revetment to the east of the groyne, along with the construction of a sheet pile wall. A short section of concrete stepped revetment was also constructed along the western edge of the promenade. Existing slipway access at this location was raised and extended to follow the design of the new structures. The environmental works were completed in April 2013 and comprised the construction of Porth Eirias, a new multi-use water sports building, and landscaping works.

Phase 1b of the scheme consisted of coastal defence works and promenade enhancement. The coastal defence works were completed in May 2013 and primarily comprised beach recharge to the west of Porth Eirias, to bring beach levels up to the level of the existing promenade (approximately 5.0mAOD) but below the existing sea wall crest (at approximately 6.15mAOD). Beach recharge was also undertaken between Cayley Promenade and Eirias Park, sourced from Liverpool Bay. Promenade enhancement was carried out to the west of the completed Porth Eirias Phase 1a works up to the pier area and extending below the Network Rail over-bridge as far as the interface with the train station. This was completed between March and October 2014.

Improvements to the promenade consisted of:

- stepped revetment structures along the frontage to allow direct access from the promenade onto the beach;
- three ‘headland’ structures within the existing beach;
- a new access ramp, cycle ramp and car parking;
- raising the existing promenade level and provision of new finishes;
- construction of a new secondary sea defence wall; and
- new street lighting and street furniture.

Works to enhance the town centre link area were also carried out, encompassing new surfacing, underpass maintenance, street lighting and furniture, planting works at the existing railway embankment and new signage.

Phase 1c was a coastal defence scheme. This primarily consisted of beach recharge (totalling 220,000m^3 dredged beach material) and associated infrastructure works, including extending surface water outfalls, repairs to the existing seawall and removal and replacement of rock armour. Works were completed in parallel with the Phase 1b promenade enhancements, between March and October 2014.

2.1.4 Phase 2

The first part of the Waterfront Project Phase 2 (Phase 2 VVP) involves regeneration of two areas of coastline (Areas A and B) located between Victoria Pier and Cayley Embankment. This is the Proposed Development which is being assessed in this report.

The second future phase of the Phase 2 works (Phase 2b) is anticipated to be undertaken along the coastline to Rhos on Sea (see Appendix C for details of the phasing plan).

Area A

Area A extends approximately 430m westwards from Victoria Pier to Princess Court apartments (see Appendix D). The area backs onto a railway embankment and ground levels vary from 5.0mAOD in the east to 7.8mAOD in the west. The proposed scheme consists of improved recreational opportunities and enhanced coastal defences across the site. This will involve widening and raising the existing promenade and highway by constructing a new seawall approximately 7m seaward of the existing seawall, with three new headlands distributed across Area A.

Details of the proposed works are as follows:

- construction of sheet pile and wave walls (height variable);
- raising and widening the existing promenade and highway (surfacing designed to match Phase 1b);
- construction of a new event space headland (1) proximal to Victoria Pier, including a steel/bronze sculptural tree and concrete ‘chaise longues’;
- construction of a new headland (2) in the centre of the site, including a water play feature and bouldering wall (handholds fixed to wall);
- construction of a new headland (3) at the western extent of Area A, including the following features:
  - a permanent concessions kiosk with associated public convenience facility;
  - an outdoor café area with picnic tables and other seating;
  - raised planting with seating, arranged to match the wave seat (with associated groundcover planting);
  - a ‘light beacon’ artwork feature;
- DDA compliant access to beachfront;
- storm gates at headlands 1 and 2;
- new railings at various points along the coastline (1.1m high);
- a 'wave seat' at the eastern extent, with breaks, dips and crests to allow sea water to flow through and avoid sand traps;
- a zebra crossing to allow pedestrian access to the refurbished public convenience;
- a lay-by for services at the western extent;
- a ‘light beacon’ artwork features;
- light columns at 30m intervals;
- granite block benches;
- bollards to match Phase 1b design; and
- bins at either end of Area A.

There is also potential to re-clad the substation walls and create a picnic area with picnic tables at the existing open green space.

Area B

Area B extends approximately 420m westwards from the Princess Court apartments to Rydal boat store near Cayley Embankment (see Appendix E). This area backs onto residential properties for its entire length and ground levels are fairly consistent at around 8.0mAOD. This includes a gateway at Marine Road junction, slipway access for boat manoeuvring and a linear garden with informal seating proximal to Cayley Embankment. There will be no work conducted on the existing promenade wall in this section.

Details of the proposed works are as follows:

- improved access to the slipway area;
- DDA compliant access to beachfront;
- new car parking markings;
- new parallel parking bays at the western extent;
- granite block seats;
- planting beds with associated groundcover planting;
- vertical features;
- new railings;
- resurfacing;
- light pole beacons;
- a bespoke ‘wave seat’;
- paving artwork to Health Trail; and
- light columns at 30m intervals.

Therefore the main ‘activity’ area will be in Area A, with Area B designated as a ‘quiet’ zone to protect the adjacent residential housing from noise or visual disruption.

Full details of the Proposed Development can be found in Appendices A and B.

2.1.5 Phase 3

Proposals for Phase 3 of the project involve sea defence improvement east of Eirias Park to Old Colwyn. This is anticipated to comprise construction of rock armour revetment, improvements to the promenade and improvements to existing defences along the coastline. Due to uncertainty over future funding allocation, the proposals for this phase remain at the outline stage and are not assessed as part of this report.

2.2 Need for the project

The Colwyn Bay Waterfront Project aims to contribute to the regeneration of Colwyn Bay and to provide renewed coastal defences along the seafront between Rhôs-on-Sea and Old Colwyn. In particular, the scheme aims to protect 192 commercial and residential properties, the Chester to Holyhead railway line, the A55 trunk road and a national cycle route. The current coastal management policy to 2030 is to 'hold the line'.

Phase 2 VVP of the Waterfront Project is primarily a regeneration scheme for the town of Colwyn Bay, which has suffered from a decline in domestic tourism since the 1950s. This has inhibited recent investment in the area and affected the overall prosperity of the town. Therefore the Proposed Development aims to increase the appeal of the area to visitors in order to boost tourism and improve the local economy. In addition the scheme aims to improve coastal defence provision along the sea front. Sections of the coastline targeted in Phase 1 were most vulnerable to deterioration due to exposure to wind generated waves and a lack of shelter from Rhos Point. However improvements to coastal defences along the entire frontage are required in order to protect Colwyn Bay and the town centre.

Vertical masonry sea walls were initially constructed between Rhôs-on-Sea and Old Colwyn in the second half of the 19th century. Historical records indicate that the beach level has fallen considerably over the last century, with a historical loss of beach level across the foreshore, resulting in increased exposure and some undermining of the sea defences. To prevent beach erosion, wooden groynes were initially constructed in the early part of the 20th century. However, these are now in poor condition and are effectively redundant. Further low level boulder groynes and rock toes were subsequently constructed and maintained in the late 20th to early 21st century.

The current state of coastal defences across the Phase 2 site causes several issues. Regular overtopping of defences has a negative impact on adjacent infrastructure, the local community and the defences themselves. The railway line, railway station and the A55 are particularly at risk as these run parallel to the waterfront for a significant distance, and the coastal road is regularly closed as a result of storm damage. In addition, the ageing and deteriorating defences have an imminent risk of failure in the immediate term (0-5 years). The lowering of the beach through littoral drift (particularly severe following storms) requires on-going intervention which has associated cost implications.

Phase 2 VVP is an integral part of the overall Colwyn Bay Waterfront Project, which ensures the protection of the promenade, railway, roads, businesses, residential areas and shoreline. This is particularly crucial in Area B, where commercial and residential housing is present is close proximity to the coastline with no protection from the road or railway. Without the waterfront redevelopment significant adverse environmental, social and economic effects are predicted, including:

- loss of sections of the promenade, promenade highways access and promenade businesses (10-20 years);
- erosion of the railway embankment and subsequent railway closure (30-40 years);
- loss of the A55 (50-60 years);
- detachment of the pier from the shoreline (50 years); and

- the gradual spread of recession inland and longshore until the beach reaches equilibrium, leading to the loss of a number of properties in the centre of Colwyn Bay and across Area B in the medium to long-term (year 40 onwards).

The Waterfront Project is seen as a key driver to the town's emergence as a visitor destination. The scheme will safeguard the integrity of the present coastal defences and provide security to local residents and commercial business operators, particularly in the tourism sector.

Widening of the promenade will contribute to the regeneration need for business and to public realm creation. Area A is most suitable for this due to the proximity of Area B to residential housing, the existing redundant footway on the landward side of the road in Area A and the higher elevation of Area B. This reduces the amount of promenade widening and infrastructure work required in Area A. The existing coastal defences in Area B would also increase the cost and materials required for promenade enhancement in this area.

2.3 Construction strategy

2.3.1 Construction materials

The primary materials to be used in the works comprise:
- in-situ concrete (including reinforced concrete);
- pre-cast granite blocks;
- natural stone paving; and
- granite paving.

2.3.2 Construction practicalities

Access will be required along the promenade to carry out works and appropriate fencing and signing will be erected to demarcate this area – temporary diversion routes and/or closures of the promenade and public highway in places are likely to be required during the construction period. Access to the foreshore will be gained using existing slipways and across the foreshore.The contractor will be allowed to gain access within the footprint of the new works plus a working corridor outside the limits generally not exceeding 5m in width but incorporating areas for vehicle turning.

2.3.3 Programme

Construction works for the Proposed Development are anticipated to commence in early 2016, aiming to be fully open to the public by the 2017 summer season.

3 Coastal processes

3.1 Introduction

This chapter presents a technical assessment of the impacts of the regeneration and coastal defence improvement works within Phase 2 of the Colwyn Bay Waterfront Project on coastal processes, including hydrodynamics, geomorphology and water quality. It presents the methodology used to undertake the environmental assessment, summarises the relevant legislative and policy context, provides an overview of the baseline conditions and assesses the potential impacts of the coastal defence improvements on these issues. Appropriate mitigation measures to avoid or reduce significant impacts are also presented.

The improvement works that could have an impact on the coastal processes in Phase 2 comprise two areas. Area A will involve widening and raising the existing promenade by constructing a new seawall approximately 7m seaward of the existing seawall, and construction of three headlands extending up to 2.5m from this. Beach re-grading will also be undertaken in this area. In Area B there are no proposed works to the seaward side of the existing seawall. Therefore for this area it is considered there will be no impact on the coastal processes and will not be considered further within this section of the report.

Assessment of coastal and sedimentary processes should include:
- direct impacts on hydrodynamics and sediment dynamics; and
- indirect impacts of these on other environmental aspects.

3.2 Methodology

The methodology carried out to review and assess the impacts for each technical environmental issue is as per the previous methodology set out in the relevant technical chapter of the 2010 ES (Mott MacDonald, 2010).

3.2.1 Sources of data

Previous work has been carried out on behalf of CCBC to ascertain baseline conditions for the frontage. This has included the development of a coastal strategy and project appraisal report (draft) (CEUK, 2008) and a beach modelling report for Phase 2 (ABPmer, 2013) (see Appendix G). The baseline conditions have then been used to develop both numerical and physical models for the area in order to gain a thorough understanding of the hydrodynamics (Royal Haskoning, 2010), and the potential effect of any reconfiguration of beach control and coastal protection structures. Information from these previous reports has been used to develop the concept design for the improvement works and will be used to inform the detailed design.

Additional information has been developed for the Phase 2 works (CEUK, 2014). This report will provide an update for the works in terms of coastal processes.

3.3 Policy context

This section provides a summary of the main changes to legislation and policies which have occurred since 2010, relevant to the assessment of potential impacts of the proposed Phase 2 works on the coastal processes in Colwyn Bay.

3.3.1 Legislative framework

The Contaminated Land (Wales) Regulations 2006 have been amended by the Contaminated Land (Wales) Amendment Regulations 2012.

The Environmental Permitting (England and Wales) Regulations 2010 have also been amended.

3.3.2 Planning policy

There have been no significant changes from the planning policy outlined in the 2010 Environmental Statement.

3.4 Baseline conditions

The present coastal defence provision across the Colwyn Bay frontage has several key issues. Regular coastal defence overtopping is having negative impacts on the existing defences, adjacent infrastructure and also on the local community through the regular closure of the coastal road following storm damage. Regular overtopping has also resulted in a lack of investment in the waterfront area. The railway line, railway station and the A55 are particularly at risk given their location running parallel to the waterfront for a significant distance. Without the Waterfront Project as a whole, the ageing and deteriorating defences have an imminent risk of failure in the immediate term (0-5 years) and the lowering of the beach through littoral drift (particularly severe following storms) requires on-going intervention which has associated cost implications.

3.4.1 Geology and geomorphology

The proposed site along Colwyn Bay is bound by Victoria Pier in the east and by cliffs comprising glacial sands and gravels in the backshore. The superficial geology of the area includes glacial sands and gravels and boulder clays overlying the Elwy Formation. Sands and gravels in these deposits may provide limited supplies of uncertain quality, with the risk of saline contamination in coastal areas.

3.4.2 Sediment processes

The net littoral drift along the frontage is in a west to east direction with sediment transport to the west of the site at Rhos Point limited to fine sand and silt-sized material offshore. Inshore the beaches further west

at Penrhyn Bay have largely been denuded of fine material and the protrusion of Rhos Point limits the transport of material around the headland.

The majority of alongshore sediment transport within Colwyn Bay is thought to take place on the lower foreshore. Observations and monitoring suggests material between low and high water is moved on or offshore by wave activity and interaction with the present defences.

The current beach will be re-profiled during the works to allow for a bund to be formed in front of the promenade and headlands.

3.4.3 Hydrodynamics

Tides and tidal currents

The tidal range along this section of the frontage has an important influence on coastal processes. The spring tidal range is up to 7.14mAOD with a neap tide range of over 3.81mAOD.

Tidal currents in Liverpool Bay are generally in an easterly direction on the flood tide and westerly on the ebb tide with a residual net current from west to east.

At Colwyn Bay the tidal streams are generally in a west to east direction. The Rhôs-on-Sea breakwater has the potential to cause a reversal of currents at Colwyn Bay resulting in the formation of a localised net drift reversal to the south of Rhos Point during storms.

The tidal currents, together with the agitation of wave action are sufficiently high to induce shear stresses which exceed the critical shear stress for initiating the movement of sand on the seabed (CEUK, 2006).

Wave climate

The wave conditions at Colwyn Bay are generally generated by local wind or as a result of longer period swell waves that have propagated into the Irish Sea from the Atlantic Ocean via the St Georges Channel and Cardigan Bay to the south, or the channel between Scotland and Northern Ireland to the north.

3.4.4 Flood risk and erosion

A Flood Consequence Assessment has been undertaken to support the planning application.

Coastal protection structures

Along the frontage the foreshore is backed by masonry and concrete vertical walls dating back to the 19th century. Timber groynes previously constructed to prevent the removal of beach material have since fallen into disrepair and are no longer effective. Beach levels were observed to drop following construction of the hard defences and the failure of the timber groynes, leading to undermining and instability of the sea walls.

Coastal defences along the frontage are maintained by CCBC and Network Rail. An assessment of the condition of the existing defences in 2008 reported the residual life of the existing defences to be less than 5 years. Hard defences previously constructed include concrete and rock armour toe constructions, a 650m rock berm, long low rock groynes, an integral wave recurve wall, 800m steel sheet piling and a rock revetment.

The various coastal defences and their associated crest levels mean there is a variable level of protection against overtopping and flood prevention along the Colwyn Bay frontage. The low beach levels result in regular overtopping, damaging the promenade and road infrastructure and resulting in closure of the public highway to traffic. However this has been reduced as a result of the completion of the first phase of works.

The rock groyne structure and short section of rock revetment constructed as part of the Phase 1a works and the beach recharge carried out as Phase 1b form the first parts of new improved coastal defences along Colwyn Bay frontage and have reduced the risk of flooding and erosion across these sections of the frontage.

3.4.5 Water quality and contamination

The Colwyn Bay Environment Agency bathing water quality monitoring point is located to the east of Victoria Pier and is monitored on a weekly basis. Records indicate the quality ranges between ‘good’ and ‘excellent’, with only one ‘poor’ status recorded in 1993.

Three culverted watercourses currently drain from under the road and promenade, through the sea wall and onto the beach. The bathing water quality of Colwyn Bay indicates these watercourses are likely to be uncontaminated, although anecdotal evidence suggests that contamination incidents have previously occurred.

3.5 Assessment of impacts

Throughout this section, the impacts identified in the 2010 ES have been reviewed against the proposed Phase 2 works. Impacts have been updated specific to the Phase 2 works to take into account moving the seawall 7m seaward and the construction of three artificial headlands.

It should be noted that the Phase 2 works were considered in their entirety within the 2010 ES, inclusive of promenade enhancement works and coastal defence works. Consequently the majority of impacts are not considered to have significantly changed now that further information is available regarding the proposed methodologies for the Phase 2 works. Impacts associated with the Phase 3 works, in addition to overall impacts associated with the Colwyn Bay Waterfront Project are unchanged and are as stated in the 2010 ES.

3.5.1 Construction impacts

The proposed works may have an impact on a number of elements of the physical coastal environment including hydrodynamics, geomorphology and water quality, during construction.

Geology and geomorphology

Construction of the raised promenade, the three 'headland' structures and beach access ramp during Phase 2 will involve the excavation of materials down to the glacial till stratum to provide the seawall, headland structures and temporary beach ramp with a solid foundation.

New sheet piling and in situ / precast concrete will be installed for the headland structures and temporary beach ramp. An overall impact of minor adverse is considered against the baseline.

Vehicle movements across the foreshore for both phases of works will locally affect the geomorphology of the area. In particular the demolishing of the existing seawall, construction of the raised promenade and three headland structures, repositioning of existing material are likely to have the most impact. An impact of minor adverse is therefore considered.

Sediment processes

The construction of the three headland structures and beach re-profiling in the intertidal zone is unlikely to affect current long term sediment transport patterns.

There is the potential for additional sediment transport to the lower foreshore during beach re-profiling activities; however these will be temporary insignificant impacts.

Hydrodynamics

Impacts on the hydrodynamics during the construction of the three headlands and re-profiling operations will be limited to small scale temporary disruption. Most materials will be stored above Mean High Water and as a result the impact is considered to be temporary minor adverse.

Flood risk and erosion

During construction of the new seawall structure in Phase 2 the existing seawall will be demolished. This is likely to have a temporary minor adverse impact on the local flood and erosion risks in the promenade area prior to completion of the works. The movement of sediment during the re-profiling works could result in a temporary minor adverse impact depending on the construction timings.

Water quality and contamination

Vehicles will be used on site to distribute material for the raising of the promenade and construction of the headlands, as well as for the beach re-profiling activities. If pollution from these vehicles is not managed

correctly there is potential for contamination through spillage of fuels, oils and lubricants and a resulting moderate adverse impact on water quality of the beach is attributed to this impact.

The introduction of contaminated materials is not anticipated from the works to the promenade due to the reuse of existing material from the foundations of the existing seawall. Any material imported as part of the other works will be subject to contamination testing to confirm its suitability for use on site. Likewise any material removed from site or reused elsewhere will be subject to contamination testing.

Water quality may experience temporary adverse impacts during construction as the beach re-profiling may result in an increased turbidity. This is likely to be moderate adverse but will be only short term during construction.

3.5.2 Operational impacts

The operational impacts of the Phase 2 works on coastal processes will occur throughout the planned life of the Phase 2 defences. The purpose of the raised promenade and headland structures is to improve the existing flood defence and provide erosion protection and therefore will have an impact on physical aspects of the coastal environment. The raising of the existing promenade structure will protect against overtopping and subsequent flooding. A new secondary setback seawall defence will be constructed which will protect the town against flooding. This is expected to have a moderate beneficial impact on the coastal processes.

Phase 2 beach re-profiling will protect against overtopping and subsequent flooding and will also affect physical aspects of the coastal environment as described below. Beach recharge and on-going beach management / recycling may be required to re-profile material moved by the action of waves and tides. Maintenance will typically be performed annually and after significant storms, with impacts on the physical elements of the coastal environment likely.

Operational impacts from the Phase 2 works on coastal processes will also occur during the life of the defences. Repairs, repointing and re-facing of the sea walls will protect against erosion. Extension of the outfalls will reduce release of waste materials on the upper foreshore.

Geology and geomorphology

Works to the promenade and construction of the three headland structures in Phase 2 will have an impact on the existing geomorphology of the area. The raised promenade and headland structures will provide an improved interface between the promenade and the beach reducing the potential for scour in extreme events, resulting in a moderate beneficial impact.

Sediment processes

The new promenade structure and beach ramp are unlikely to hinder sediment transport and accumulation of beach material. The headland structures will be constructed based on a minimum allowable beach level of 5mAOD in front of the structures. The Mean High Water Spring level reaches 3.70mAOD and therefore

neither the works to the promenade or the new headlands are likely to interact with coastal processes, and particularly to sediment transport. The impact of the raised promenade and headland structures during operation of the scheme would therefore be insignificant.

As the structures are aligned in the direction of sediment transport, low frequency events such as very high tides or sudden beach draw down are unlikely to have a significant impact on sediment processes. However the structures differ from the baseline (straight seawall) therefore the impact can be summarised as minor adverse.

Hydrodynamics

The raised promenade and headland structures at the toe of the existing seawall will reduce the reflectivity of the surface and as such is expected to reduce scour, erosion and further lowering of the beach causing a moderate beneficial impact. This is unlikely to have a significant impact downdrift.

Furthermore the beach re-profiling should reduce erosion through absorption of wave energy. This is overall likely to have an insignificant impact as long as the beach levels do not reduce significantly.

Flood risk and erosion

The proposed raised promenade, the three headland structures and general works to repoint and reface the seawall will have a moderate beneficial impact, reducing the erosion risk of the frontage. The raised promenade will also support more dissipation of wave energy in contrast to the existing seawall, thereby reducing overtopping and therefore flooding risks. In addition, the secondary sea defence wall will prevent any water overtopping the seawall from propagating further inland towards the town and railway. Overall this will have a moderate beneficial impact.

Water quality and contamination

Beach recharge and re-profiling activities may be required throughout the lifetime of the works, involving the operation of machinery on the beach which may lead to localised pollution incidents from fuel or lubricant spillage. The increased use of vehicles and boats in the area by the general public due to the works may result in an increase in the number of potential sources of pollution on the beach and in the water.

3.6 Mitigation of impacts

3.6.1 Construction impacts

Importation of the material required for the proposed promenade works, headland structures and temporary beach ramp via road will enable materials to be directly delivered from the promenade onto the beach, reducing the requirement for vehicle movements directly on the foreshore. Some tracking of

vehicles on the foreshore will be necessary for the positioning of the precast units and promenade components.

Monitoring of beach levels, water turbidity and materials for contamination will be undertaken during construction to help mitigate impacts. A detailed Construction Environmental Management Plan (CEMP) shall be set up prior to commencement of construction works to minimise the likelihood of a pollution incident occurring during construction and to ensure that potential incidents are dealt with effectively.

3.6.2 Operational impacts

Only adverse operational impacts identified in section 3.5.2 which have changed significantly from the 2010 ES have been discussed in this section.

The proposed works to the promenade and three headland structures will require minimal maintenance during operation. Inspection should be carried out annually to recognise any movement or potential failure of the structure, with maintenance and repairs carried out where necessary using small tracked machinery on the beach. The construction of the promenade and headlands will allow for repair and reconfiguration if required in response to changes in physical environmental conditions.

Chemicals used for cleaning of the beach access points (stairs and slipways) must be specified to be non-hazardous to ensure that there is no adverse impact on sediment and water quality.

Water quality monitoring will continue to take place to mitigate further risks.

3.7 Summary and conclusions

The proposed raised promenade, headland structures, ramp and beach re-profiling works for Colwyn Bay will have minor effects on coastal processes after mitigation. During both the construction and operational phases it is unlikely that there will be any major adverse effects on the coastal processes with only minor residual adverse impacts on sediment transport.

There will be no residual adverse impacts on geology and geomorphology as construction impacts are limited to the short term. The re-profiling of the beach and the raised promenade and headland structures will offer beneficial impacts to the area as they will reduce the potential for erosion and scour.

Over time, some of the sediment placed is likely to be drawn offshore into the sub tidal region where it will become available for longshore transport in an easterly direction. This material will add to the littoral regime taking place so impacts may not necessarily be adverse.

The hydrodynamics of the area will be altered as the energy of waves travelling up the beach will be reduced through the profile of the beach and also by the raised promenade and headlands; however with mitigation no residual impacts are expected.

There may be temporary adverse impacts on water quality during construction as the re-profiled beach material will increase turbidity. During the works there is also the potential for contamination of the area due to pollution from imported material and the use of construction plant. However, following the above mitigation measures there will be no residual impacts affecting water quality and contamination.

The proposed works may result in impacts on coastal processes; however the scheme will provide a number of beneficial impacts during both the construction and operational phases. The mitigation measures proposed will reduce the impacts during both construction and operation.

In general, the impacts to coastal processes associated with the Phase 2 works are not considered to have significantly altered from those identified in the 2010 ES.

3.8 References

- ABPMer, 2013. *Colwyn Bay Waterfront Development Phase 2: Beach Modelling*. Hampshire: ABM Marine Environmental Research Ltd.
- Allied Exploration and Geotechnics Limited, 2010. *Colwyn Bay Waterfront Project – Phase 1 Coastal Defence – Ground Investigation Works,* (AM 26714).
- CEUK, 2008. *Colwyn Bay Preliminary Project Appraisal Report (draft)*. UK: Coastal Engineering UK.
- CEUK, 2006. *Colwyn Bay Waterfront Project Plan, Draft for Consultation.* UK: Coastal Engineering UK.
- Conwy County Borough Council, 2006. *Colwyn Bay Waterfront Project Plan: Natural Processes and Coastal Defence (Baseline Report).* UK: Coastal Engineering UK.
- HR Wallingford, 1991. *Colwyn Borough Sea Defence Review* (Report EX 2367). UK: H R Wallingford.
- HR Wallingford, 2008. *Coastal process study: Rhyl to Prestatyn* (Report EC 5690). Denbighshire: Martin Wright Associates (part of the Denbighshire County Council Report on the Development of a Waterfront Project).
- Mott MacDonald, 2010. *Colwyn Bay Waterfront Project, Phase 1 Engineering Works, Environmental Statement: Volume 1 Main Text*. Conwy: Mott MacDonald.
- Royal Haskoning, 2010a. *Detailed Modelling Studies For Colwyn Bay Coastal Defence, Scheme Physical Model Tests of New Linear Defences.* UK: Royal Haskoning.
- Royal Haskoning, 2010b. *Colwyn Bay Detailed Modelling Study for Coast Defence Scheme, Phase 1 Interim Modelling Technical Note.* UK: Royal Haskoning.
- SMP, 2009. *North West England and North Wales Shoreline Management Plan* (SMP2), Consultation Draft.

4 Marine ecology

4.1 Introduction

This chapter presents a technical assessment of the impacts of the regeneration works within Phase 2 VVP of the Colwyn Bay Waterfront Project on biodiversity and marine ecology. It presents the methodology used to undertake the ecological assessment, summarises the relevant legislative and policy context, provides an overview of the baseline conditions and assesses the potential impacts of the coastal defence improvements on these issues. Appropriate mitigation measures to avoid or reduce significant impacts are also presented.

4.2 Methodology

The assessment of ecology and nature conservation was undertaken in accordance with both the Charted Institute of Ecological and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the United Kingdom' (2006) and the CIEEM 'Guidelines for Ecological Impact Assessment in Britain and Ireland: Marine and Coastal' (2010). Additional guidance is provided in 'TAN5: Nature Conservation and Planning' (2009) and RSPB 'Planning Naturally' (2013).

The specific objectives of ecological assessments are to:

- describe the existing ecological baseline including the physical and chemical environment;
- provide an objective and transparent assessment of the ecological effects (short, medium, long-term, synergistic, cumulative and in-combination) of the project to all interested parties, including the general public;
- facilitate objective and transparent determination of the consequences of plans and projects in terms of international, national, regional and local policies relevant biodiversity and landscapes; and
- set out the steps required to meet legal requirements relating to designated sites and legally protected or controlled species, whilst taking account of their ecosystem function and the wider environment.

The construction and operational activities for a development must comply with International, European and UK legislation.

The overall approach and methodology has been to:

- define the baseline through consultations, desk study and field surveys;
- identify receptors (designated sites, habitats and species) and assess their conservation value;
- identify potential impacts on receptors taking into account the incorporated mitigation and best practice;
- assess the magnitude of impacts, the timescale and reversibility of the impacts;
- provide an overall appraisal of each impact, assess the confidence of the likelihood of the impact occurring and state the significance of the impact;
- recommend supplementary mitigation measures to reduce significant impacts; and
- evaluate any residual impacts with compensation and enhancement measures.

Zone of Influence

Operation and construction of the proposed development can have impacts on ecological features beyond the confines of the site itself. Following CIEEM guidance, all ecological features should be investigated which occur within the zone of influence (ZoI) which arises during the whole lifespan of the proposed development. The potential zone of influence is defined as:

- areas directly within the footprint of the proposed scheme; and
- areas where there is a risk from loss and alteration of habitat, burial, increase in suspended solids, noise, pollution and light during construction and/or operation.

The study area of disturbance for the development is likely to encompass a 500m radius around the boundary of the onshore working area for Phase 2 VVP. However, the desk study extends to a 1km radius around the boundary for protected coastal flora and fauna and 2km for designated sites. The desk study further extends out to 5km for one marine designated site (Y Fennai a Bae Conwy / Menai Conwy Bay Special Area of Conservation) as some of the qualifying features (i.e. marine mammals) could be present within Colwyn Bay.

Evaluation and significance criteria

An ecologically significant impact is an impact that has a negative, or positive, effect on the integrity of a site or ecosystem and/or the conservation objectives for habitats or species populations within a given geographical area. In accordance with CIEEM guidance, professional judgement was used to assess the value of ecological features (CIEEM, 2006).

The conservation value of ecological features was then assessed using the criteria stated in Table 4.1.

Table 4.1: Criteria for determining conservation value

Conservation value	Criteria	Examples
Very high	High importance and rarity, international scale and limited potential for substitution	Internationally designated sites
High	High importance and rarity, national scale, or regional scale with limited potential for substitution	Internationally important species and habitats Nationally designated sites Regionally important sites with limited potential for substitution
Medium	High or medium importance and rarity, local or regional scale, and limited potential for substitution	Regionally important sites with potential for substitution Locally designated sites Priority species of conservation concern
Low	Low or medium importance or rarity, local scale	Undesignated sites of some local biodiversity and earth heritage interest
Negligible	Very low importance and rarity, local scale	Other sites with little or no local biodiversity and earth heritage interest

Source: CIEEM, 2006

Once the conservation value of each resource was identified, the magnitude (major, moderate, minor negative or positive, Table 4.2) and the characterisation (Table 4.3) of the impact on the resource were evaluated.

Table 4.2: Criteria for determining the magnitude of impacts

Magnitude	Criteria
Major negative/positive	The proposal would affect the integrity of the site, habitat or species population, in terms of the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, the complex of habitats and/or the population levels of species of interest.
Moderate negative/positive	The proposal would not affect the integrity of the site, habitat or species, but would affect the ecological objectives for the site or species. However if, in the light of full information, it cannot be clearly demonstrated that the proposal will not have an effect on integrity, then the impact should be assessed as major.
Minor negative/positive	Some minor impact is evident with changes in the habitat or species population. However, ecological objectives for the site or species would not be affected.
Negligible	The habitats or species on the site are being affected or changed, but there is no observable impact in either direction.
No impact (neutral)	The site, habitat or species is either outside the zone of influence, or if inside the zone of influence is not in any way altered by the works.

Source: CIEEM, 2006

Table 4.3: Characterisation of impacts

Characterisation	Description
Time scale	Short-term: 12 months to 5 years; Medium-term: 5 to 10 years; or Long-term: greater than 10 years.
Scale and persistence	Localised: Damage or loss of a habitat or species which may be reversible or irreversible and having an impact on less than 5% of the local species population or 5% habitat; Reversible: Temporary damage or loss of a habitat or species in the short, medium or long-term; or Irreversible: Permanent damage or loss of a habitat or species.

Source: CIEEM, 2006

The conservation value and the magnitude of impacts were then used to provide an overall appraisal, as shown in Table 4.4 and Table 4.5.

Table 4.4: Appraisal category

Magnitude of impacts	Conservation value				
	Very high	High	Medium	Low	Negligible
Major negative	Very large adverse	Large adverse	Moderate adverse	Moderate/slight adverse	Negligible
Moderate negative	Large adverse	Large/moderate adverse	Moderate adverse	Slight adverse	Negligible
Minor negative	Moderate/slight adverse	Slight adverse	Slight adverse	Slight adverse	Negligible

Magnitude of impacts	Conservation value				
	Very high	High	Medium	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral	Neutral

Source: CIEEM, 2006

Table 4.5: Significance criteria

Magnitude of impacts	Conservation value				
	Very high	High	Medium	Low	Negligible
Major negative/positive	Significant	Significant	Significant	Significant	Not significant
Moderate negative/positive	Significant	Significant	Significant	Not significant	Not significant
Minor negative/positive	Significant	Not significant	Not significant	Not significant	Not significant
Negligible	Not significant	Not significant	Not significant	Not significant	Not significant
Neutral	Not significant	Not significant	Not significant	Not significant	Not significant

Source: CIEEM, 2006

4.2.1 Sources of data

A detailed ecological and nature conservation assessment was undertaken as part of the 2010 ES Volume 1. Ecological data was obtained from various sources including the North Wales Environmental Information Service (COFNOD), Clwyd Bird Recording Group and various online resources providing existing publications and reports. A site walkover was also undertaken. The assessment identified the potential impacts of the Colwyn Bay scheme and notable sensitive receptors. This reports lists baseline information pertinent to the Phase 2 VVP area only.

Baseline ecological data was obtained the North Wales Environmental Information Service (COFNOD) for a 2km radius around the Colwyn Bay frontage. A search was also undertaken of the following online databases:

- Natural Resources Wales;
- National Biodiversity Gateway;
- UK Post-2010 Biodiversity Framework;
- Multi-Agency Geographic Information for the Countryside (MAGIC); and
- Joint Nature Conservation Committee (JNCC).

A search was also conducted for available publications and reports relevant to the area, these included the following:

- Bae Lerpwl / Liverpool Bay SPA Standard Data Form;
- Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC Standard Data Form;

- Departmental Brief: Liverpool Bay / Bae Lerpwl Special Protection Area (Natural England and Countryside Council for Wales, 2010); and
- Recommendations for the selection of, and boundary options for, an SPA in Liverpool Bay (Webb *et al.*, 2006).

4.3 Policy context

4.3.1 Legislative framework

The main legislative framework for the assessment is set by the following Acts of Parliament and Regulations:

- Wildlife and Countryside Act 1981 (as amended);
- Environmental Protection Act 1990;
- Countryside and Rights of Way Act 2000 (CRoW Act 2000);
- Conservation (Habitats etc.) Regulations 1994 as amended 2010 (Habitats Regulations);
- Environment Act 1995; and
- Wild Mammals (Protection) Act 1996.

The following EC Directives and international conventions are also relevant, as applied in the above UK Acts and Regulations:

- Convention on Biological Diversity 1992;
- Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) 1973;
- The Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar) 1971;
- EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (Habitats Directive 1982) as amended (92/43/EEC);
- The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) (1992);
- EC Directive on the Conservation of Wild Birds (Birds Directive 1979) (79/409/EEC) as revised (Birds Directive) (2009/147/EC);
- Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979) as amended; and
- Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979) as amended.

4.3.2 Planning policy

Non-statutory guidance in the form of the ‘UK Post-2010 Biodiversity Framework’ (2012) and the ‘Environment Strategy for Wales’ (2006) will also form part of the assessment methodology.

Further guidance on ecological assessment is set out in Planning Policy Wales and ‘TAN5: Nature Conservation and Planning’ (2009). In accordance with this guidance any development, as part of the planning process, needs to take into consideration the following:

- the principles of sustainable development;

- the protection and improvement of the environment;
- the conservation and enhancement of statutorily designated areas and undeveloped coast;
- sites of international, national and local importance;
- protection of wildlife and natural features in the wider environment;
- protecting the range and population of protected species; and
- adopting a step-wise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation.

Regional guidance in the form of the Conwy Local Biodiversity Action Plan (LBAP, and the relevant policies of the Conwy Local Development Plan (NTE/3 Biodiversity) will be taken into account.

4.4 Baseline conditions

Designated sites

The following statutory designated sites were identified near to Colwyn Bay.

Bae Lerpwl / Liverpool Bay inshore Special Protection Area (SPA) with marine components

The inshore area of Colwyn Bay lies within the boundary of Bae Lerpwl / Liverpool Bay SPA. The SPA regularly supports more than 1% of the British populations of red-throated diver *Gavia stellata*, 1% of the biogeographical population of common scoter *Melanitta nigra* and more than 20,000 waterfowl during the non-breeding season. These species are discussed in more detail in the following sections.

This area is also a designated Important Bird Area.

Y Fenai a Bae Conwy / Menai Strait and Conwy Bay Special Area of Conservation (SAC)

The Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC is located over 5km from Colwyn Bay and therefore beyond the two kilometre radius usually required for inclusion in ecological assessments. However, as two mobile qualifying features, that is, the grey seal *Halichoerus grypus* and Bottlenose dolphin *Tursiops truncates* have been observed within Colwyn Bay, there is a possibility that these species form part of the same marine assemblage present within this SAC. Consequently potential impacts on these qualifying features of the SAC will be assessed. Further qualifying features that could be present in the vicinity of Colwyn Bay include:

- Sea lamprey *Petromyzon marinus*;
- River lamprey *Lampetra fluviatilis*;
- Allis shad *Alosa alosa*;
- Twaite shad *Alosa fallax*; and
- Common skate *Dipturus Batis*.

Where information is available the occurrence and frequency of these species observed along Colwyn Bay is described in more detail in the following sections.

Bryn Euryn Site of Special Scientific Interest (SSSI)

The Bryn Euryn SSSI lies approximately 1km from the proposed site. The site consists of a prominent limestone hill with a range of lime-rich habitats including limestone heath (a European dry heath), and an abundance of hoary rockrose *Helianthemum oelandicum*.

The following non- statutory designated sites were identified close to the proposed site:

- Coed Rhos Fossil Woodland Wildlife Site, designated for its geological features, and
- Royal Fishing Weir candidate Wildlife Site, containing unknown designated features.

Habitats and associated benthos

Previous baseline information indicates blue mussel *Mytilus edulis* aggregations within the site area. According to NRW online mapping there are two areas of sublittoral biogenic reef on sediment (blue mussel aggregations) within the site, with denser areas of the habitat to the west of the site, in the vicinity of Rhos Promenade. The following sections describe the habitats and the associated sessile species recorded during previous surveys.

Along the seawalls, sparse yellow and grey lichens along with sparse black tar lichen *Verrucaria maura*, gut weed *Entermorpha sp* and the spiral wrack *Fucus spiralis* were recorded (CCW, 2003). At the base of the seawalls on a mixed rock/gravel substrate, sparse blue mussel *Mytilus edulis* aggregations along with barnacles and brown seaweeds belonging to the fucoid family were found attached to the substrate (see Figure 4.1). There were also some small areas comprising barren coarse sand which usually contains some sparse fauna with a low abundance of burrowing amphipods, otherwise known as LGS.BarSnd biotope.

In the mid and lower intertidal zones, the substrate varied, but the main substrate type consisted of a LGS. AP.P (Mid shore clean coarse sand with burrowing amphipods) biotope. Survey data indicated some small discrete areas consisting of sparse mussel aggregations with many broken shells on a mixed rock and gravel substrate were also recorded. This is categorised as a SLR.MytX biotope (Eulittoral mixed substrata with *Mytilus edulis* beds) of low conservation value. Acorn barnacles *Elminius modestus* were frequently recorded along with *Chthamalus spp*, semibalanus balanoides and some limpets *Patella vulgata* were also recorded within cobbled areas (CCW, 2003).

Figure 4.1: Sparse blue mussel aggregations

Assessment of blue mussel aggregations

Mytilus edulis beds on sediment are listed as a Habitat of Principle Importance (HPI) under the Natural Environment and Rural Communities Act 2006 and included on the OSPAR (Annex V) list of threatened and declining species and habitats. However, *Mytilus edulis* is widespread around the UK coastline with dense mussel beds forming on the upper faces of tide-swept sediment dominated substrates, sometimes to almost the exclusion of other species. This species will settle and attach to areas comprising a variety of substrates (e.g. mixed boulders, cobbles and pebbles on muddy sediment). In sheltered areas infaunal beds may occur on gravel or even quite sandy areas, although it is likely that some harder substratum embedded within the more sandy areas is required. These mussel beds play an important part in the healthy functioning of the marine ecosystem, having a role in coastal sediment dynamics, acting as a food source for over-wintering waders, and providing an enhanced area of biodiversity in this sediment-dominated environment. The spaces between the mussels can provide refuges for a diverse community of organisms.

There are numerous threats to this habitat, including coastal developments resulting in physical damage and displacement of beds, bait digging activities causing the removal of mussels as fishing bait and physical damage from associated trampling.

According to the Biodiversity Action Reporting System (BARS, downloaded August 2015) *Mytilus edulis* is monitored to measure the impact of management or other activities on the total abundance. No further targets are specified in the Conwy Local Biodiversity Action Plan.

Within the footprint of the works, there are a few areas containing sparse blue mussel aggregations which are not regarded as mussel beds due to their low mussel density which form part of the UK Habitat of Principal Importance. However, these areas are still considered in this assessment as they are still ecologically important (e.g. in providing a food source for many protected coastal bird species) but have been assigned a conservation value of low rather than medium. For the larger and/or denser mussel aggregations which are regarded as beds and a UK Habitat of Principal Importance, these are categorised as having medium conservation value. These are present beyond the groynes in the Phase 2 location.

Fauna

Marine mammals

Two marine mammal species have been sighted off Colwyn Bay; the grey seal *Halichoerus grypus* and the bottlenose dolphin *Tursiops truncates*. A general description of these species and their assigned conservation value is provided below.

Grey seal

Seals (unspecified species) have been regularly sighted off Colwyn Bay between June and September 2009 (Wales Directory, 2008). As seals are known to cover large distances it is possible that the species observed off Colwyn Bay could belong to the grey seals *Halichoerus grypus* population present in the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC which is located approximately 5km away.

The grey seal is among the rarest seals in the world. The UK population represents about 40% of the world population and 95% of the EU population. Globally, there are three reproductively isolated stocks of grey seal with the East Atlantic stock extending from Iceland and northern Norway southwards to northern France, with the majority breeding around Great Britain and Ireland.

The grey seal spends most of the year at sea, and may range widely in search of prey. They come ashore in autumn to form breeding colonies on rocky shores, beaches, in caves, occasionally on sandbanks, and on small largely uninhabited islands. In such locations they may spread some distance from the shore and ascend to considerable heights.

The grey seal is listed in Appendix III of the Bern Convention and is protected by the EC Habitats Directive (Annex II), Wildlife and Countryside Act 1981 and Conservation of Seals Act (1970). It is not a UK priority species. Consequently this species is categorised as being of high conservation value.

Bottlenose dolphin

There have been numerous sightings of bottlenose dolphins, *Tursiops truncates*, near to Victoria Pier, especially during the summer (Wales Directory, 2008). According to MAGIC the maximum recorded sighting rate is 1-3 per hour.

This species is listed in Appendix II of the Bern Convention, Annex IIa of the EC Habitats Directive and protected under the Wildlife and Countryside Act 1981. It is not a UK priority species. The conservation value of this species is therefore categorised as high.

Birds

The inshore area of Colwyn Bay lies within the boundary of the Bae Lerpwl / Liverpool Bay Special Protection Area (SPA). The SPA regularly supports more than 1% of the British populations of red-throated diver *Gavia stellata*, 1% of the biogeographical population of common scoter *Melanitta nigra* and supports an assemblage of more than 55,597 waterfowl during the non-breeding season.

Red-throated diver is predominantly a coastal species outside of the breeding season, commonly frequenting shallow inshore waters between 0-20m deep (Natural England (NE) and Countryside Council for Wales (CCW) (now NRW), 2010). They feed predominantly on fish; principally cod *Gadus morhua*, herrings *Clupea harengus*, and sprats *Sprattus sprattus* (Cramp and Simmons, 2004). Red-throated diver occur in loose aggregations over extensive areas within Liverpool Bay SPA with the highest densities recorded off the Ribble Estuary, North Wales and the North Wirral foreshore (Webb *et al.,* 2006).

The conservation status of red-throated diver is primarily threatened outside of the breeding season by human disturbance, water pollution and entanglement with fishing gear (Birdlife International, 2015), although dredging and dumping impacts of prey species requires more research (NE and CCW, 2010). Developments most likely to cause concern within Liverpool Bay are those with the potential to result in increased pollution as well as the removal and disturbance of substrate resulting in an increased turbidity and subsequent difficulties in locating and catching prey. Red-throated diver is considered to be highly vulnerable to disturbance by ship traffic and generally avoid boats (Garthe and Huppop, 2004).

Common scoter are predominantly a marine species commonly frequenting waters 500m to two kilometres from land where the water depth is not more than 10–20m (Cramp and Simmons, 2004). They feed predominantly on molluscs, especially the blue mussel *Mytilus edulis* and other bivalves (Cramp and Simmons, 2004) stocks of which Liverpool Bay has in abundance (JNCC, 2015). As a result of the abundance of accessible prey, Liverpool Bay is an important over-wintering site for common scoter (54,675 individuals, 3.4% of the north west European population). The highest concentrations of birds occur in three broad areas including Great Orme's Head to the North Wirral Foreshore (NE and CCW, 2010) within which Colwyn Bay is located. Large numbers of common scoter (3700-8000 birds) were recorded on the Rhyl Flats and Colwyn Bay in November 2005, February and March 2006 and February 2007 (Driessen *et al.*, 2009).

The conservation status of common scoter is primarily threatened outside of the breeding season by human disturbance, water pollution and the degradation of food resources (Birdlife International, 2015), although dredging and dumping impacts of prey species requires more research (NE and CCW (now NRW), 2010). Developments most likely to cause concern within Liverpool Bay are those with the potential to increase pollution and substrate removal or disturbance. Common scoter is considered to be highly vulnerable to disturbance by ship traffic (Garthe and Huppop, 2004).

From the biological records a total of 33 protected or notable bird species, including those listed as birds of conservation concern (Johnstone *et al.*, 2010), are known to occur within 500m of the proposed scheme (Table 4.6). The species most likely to be impacted by the proposed scheme are those utilising the area between mean low water and the existing sea defences. Of particular note are large aggregations of turnstone *Arenaria interpres* (54-200 birds) and oystercatcher *Haematopus ostralegus* (341-420 birds) recorded at Rhôs-on-Sea. Whilst low numbers of both turnstone and oystercatcher were recorded to the east of Rhôs-on-Sea, their distribution appears clumped around the more diverse intertidal mud habitats within the ZoI at Rhôs-on-Sea.

Furthermore, there are records of large numbers of starling (1400-4792 birds) within the ZoI in winter 2008/9 and 2009/10. For at least the last few years, possibly longer, many thousands of starlings have been roosting on the pier during the winter (Ian Spence, Clwyd Bird Recording Group pers.comm. 28 August 2010). Liverpool Bay SPA has a moderate to high concentration of seabirds vulnerable to oil spills throughout the year.

Fish

A wide range of fish have been recorded within Colwyn Bay and the surrounding waters, which include sea bass, *Dicentrarchus labrax*, whiting, *Merlangius merlangus*, herring, *Clupea harengus*, mackerel, *Scomber scombrus*, and plaice, *Pleuronectes platessa* (Wirral Sea Fishing, 2015). The nearby shallow bays of Conwy and Red Dwarf support dab *Limanda limanda*, sand goby *Pomatoschistus minutes*, solenette *Buglossidium luteum* and dragonet *Callionymus lyra*. The sandbanks within these bays support skates and rays including the common skate, *Dipturus batis*, the blonde ray, *Raja brachyuran*, and the thornback ray, *Raja clavata* (Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC, 2011). The site is also within 1km of a classified bivalve mollusc harvesting area / shellfish waters.

Prior to submission of the Environmental Statement for Phase 1 there was concern that some protected fish species of medium to high conservation value to the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC could be present in Colwyn Bay, as described below.

<u>Sea lamprey</u>

The sea lamprey (*Petromyzon marinus*) is a qualifying feature of the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC (2011).

The sea lamprey occurs over much of the Atlantic coastal area of western and northern Europe, from northern Norway to the western Mediterranean, and eastern North America (Lelek, 1973). There are

several landlocked populations in North America (Maitland *et al.*, 1994). In the British Isles it is absent from many northern rivers and has become extinct in a number of southern rivers due to pollution and man-made barriers (Maitland, 1980).

P. marininus is anadromonous and in British rivers they usually spawn from April to July. Spawning is most common in late May and early June in strong-current habitats of rivers and streams, when the water temperature reaches at least 15°C (Freyhof and Kottelat, 2008). All lampreys die after spawning. After hatching the larvae leave the nest and drift downstream distributing themselves among suitable silt beds. On average, the duration of larval life is five years.

Metamorphosis to the adult stage occurs between July and September; the process takes a few weeks. The timing of the main downstream migration seems to vary from river to river (Maitland, 2003). Relatively little is known about the sea lamprey once they reach the sea, where they have been found in both shallow coastal and deep offshore waters. Adult lampreys are very sensitive to pollution, either alone or in combination with other factors (Morman *et al.,* 1980), and have disappeared from polluted rivers. The sea lamprey, *Petromyzon marinus*, is protected under the Berne Convention (Appendix III), EC Habitats Directive (Annex IIa and Va), OSPAR and is listed as a UK Habitat of Principle Importance (previously the UK Biodiversity Action Plan). This species is considered to be of least concern on the IUCN Red List (IUCN, 2015). Consequently this species is regarded as being of high conservation value.

River lamprey

The river lamprey, *Lampetra fluviatilis*, is a qualifying feature of the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC (2011).

The river lamprey is a dermersal species which is found mainly in the temperate zones of the world. In Western Europe, it has a wide distribution from southern Norway to the Western Mediterranean (JNCC, 2015). The river lamprey is definitely rare but distinctly scattered in the UK (Maitland, 1980). According to Henderson (2003), however, this species is not rare and is probably present in all rivers and their estuaries where weirs and dams do not block access to spawning grounds.

The river lamprey is a primitive fish which is normally an anadromous species; however there are a few isolated non-migratory populations in Finland, Russia and Loch Lomond in Scotland (JNCC, 2015; Bond, 2003).

In the UK, the river lamprey is intermediate in size ranging from 0.2 to 0.4 m in length (Reitti, undated; Central Fisheries Board, undated; Igoe *et al*., 2004). The majority of populations reach maturity in estuaries, spending approximately one to two years feeding parasitically on various species of marine and anadromous fish such as sprat, flounder and haddock (Kelly and King, 2001; Henderson, 2003). The adults live in coastal waters in the UK and Ireland, migrating upstream around August in order to spawn in strong-current habitats of rivers and streams (Freyhof and Kottelat, 2008). The spawning season starts when water temperature usually rises above 9°C, which depends on latitude, starting in late March in France and mid-June in Finland (Morven Barnes, 2008). Adults die after spawning. Most juveniles overwinter in freshwater and migrate to the sea in the spring (Freyhof and Kottelat, 2008).

This species requires clean well oxygenated river gravels for spawning with suitable nearby hiding places. Good water quality and slower flowing water for nursery areas of sandy silt for juveniles. As the adult stage migrates to, and feeds in, estuaries suitable estuarine conditions are needed at the mouth of the 'home' rivers, free from pollution and with suitable prey fish species. They also require a clear migration route from the estuary to the spawning grounds with suitable flows and no barriers.

The river lamprey is protected under Annex IIa and Va of the EC Habitats Directive (92/43/EC), Berne Convention (Appendix III) and is listed as a UK priority species. *L. fluviatilis* is considered to be of least concern on the IUCN Red List (IUCN, 2015). Therefore this species is regarded as being of high conservation value.

Allis shad

The allis shad is a qualifying feature of the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC (2011). The allis shad is found along the coasts of Western Europe, from southern Norway to Spain, and in the Mediterranean eastwards to northern Italy. Adults are predominantly pelagic returning upriver in May to spawn and spawning commences at a temperature of 15°C. Juveniles remain in estuaries or close to shore feeding on insect larvae until the autumn when they migrate to sea (English Nature, 2003). Allis shad require a clear migration route through estuaries from March to June (Maitland and Hatton-Ellis, 2003). The population of this fish has declined significantly throughout Europe. In the UK adult fish occur in small numbers around the coast in most years. The main threats are from fishing, pollution, reduced access to spawning sites as a result of construction and gravel extraction (IUCN, 2015). It is thought that allis shad can tolerate conditions meeting Environment Agency Water Class B or better (Maitland and Hatton-Ellis, 2003).

The allis shad is protected under Annex IIa and Va of the EC Habitats Directive (92/43/EC), the Berne Convention (Appendix III), OSPAR and is listed as a UK priority species. This species is therefore categorised as being of high conservation value.

Twaite shad

The twaite shad is a qualifying feature of the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC (2011). This species has been a victim of pollution and impoundment of large rivers throughout Europe. The current status of the species is good, with numbers increasing in the North and Baltic Seas (Freyhof and Kottelat, 2008).

This species is anadromous. At sea they are pelagic with the juveniles remaining close to the shore and estuaries. The adults congregate near estuaries in April and enter rivers when temperatures reach 10-12°C, mainly in May-June. The spawning sites usually occur in the main river often only a few kilometres above the limit of brackish water; however this has also been reported from small rivers over gravel bottom. Spawning starts when temperatures reache approximately 15°C or more, around May-June. Spent fish migrate back to sea. Most juveniles migrate back to the river mouth during first summer and move to the sea at the end of their second year, where most shads remain until they mature. However some have

been recorded living permanently in freshwaters. Individual fish are thought to return to their natal spawning site (Freyhof and Kottelat, 2008).

They require a clear migration route to the spawning grounds from March to June, with suitable river flows and no barriers. There is also a preference for the lower reaches of large unpolluted rivers (Maitland and Hatton-Ellis, 2003). This species has been recorded from depths of 10-110m with a preference for water 10-20m deep (Maitland and Hatton-Ellis, 2003). In Britain, spawning populations of twaite shad are still found in the rivers Severn, Wye, Usk and Tywi and appear to be relatively stable (Aprahamian *et al.,* 1998). There may however be remnant populations present in other rivers (Maitland and Lyle, 1995).

The twaite shad, *Alosa fallax* (Lacepede) is protected under the Berne Convention (Appendix III), EC Habitats Directive (Annexes IIa and Va), Wildlife and Countryside Act (1981) (Schedule 5) and is listed as a UK priority species. They are of least concern on the IUCN Red List (IUCN, 2010). Consequently this species is regarded as being of high conservation value.

Common skate

Common skate, *Dipturus Batis*, are known within the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC (2011). The common skate is listed on OSPAR and under the Conwy Local Biodiversity Action Plan. They have a wide range in the north-east Atlantic but tagging records show that most fish stay within a relatively small coastal area. This species is categorised as being of medium conservation value.

The 2010 ES confirmed that protected fish species are not present within Colwyn Bay and therefore these are excluded from further assessment. However, other fish assigned a low conservation value have been included as they are ecologically important in providing a source of food for other bird and sea mammal species.

Protected and invasive plant species

There are no records indicating the presence of protected and invasive plant species within the ZoI of the Colwyn Bay Waterfront Project.

Table 4.6 provides a summary of the conservation status of ecological features present in Colwyn Bay.

Table 4.6: Summary of features present

Ecological feature	Conservation value	Designation/protection status
Designated sites		
Bae Lerpwl / Liverpool Bay	Very high	SPA EC Habitats Directive
Y Fenai a Bae Conwy / Menai Strait and Conwy Bay	Very high	SAC EC Habitats Directive
Bryn Euryn	High	SSSI
Coed Rhos Fossil Woodland	Medium	Wildlife Site

Ecological feature	Conservation value	Designation/protection status
Royal Fishing Weir	Low	Candidate Wildlife Site
Protected habitats		
Blue mussel *Mytilus edulis* beds	Medium	OSPAR UK Habitat of Principal Importance
Protected species		
Grey seal	High	EC Habitats Directive (Annex IIa) Berne Convention (Appendix III) Conservation of Seals Act 1970 Wildlife and Countryside Act 1981
Bottlenose dolphin	High	EC Habitats Directive (Annnex IIa) Berne Convention (Appendix II) Wildlife and Countryside Act 1981
Black-headed gull *Chroicocepahalus ridibundus*	Medium	Wildlife and Countryside Act 1981 Red List
Common gull *Larus canus*	Medium	Wildlife and Countryside Act 1981 Amber List
Common scoter	High	EC Birds Directive (Annex II) Wildlife and Countryside Act 1981 Red List
Velvet scoter *M.fusca*	Medium	EC Birds Directive (Annex II) Wildlife and Countryside Act 1981 Amber List
Whimbrel *Numenius phaeopus*	Medium	EC Birds Directive (Annex II) Wildlife and Countryside Act 1981 Red List
Greenshank *Tringa nebularis*	Medium	EC Birds Directive (Annex II) Wildlife and Countryside Act 1981
Black Tern *Chlidonias niger*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Amber List
Roseate Tern *Sterna dougallii*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Red List
Black-tailed Godwit *Limosa limosa*	Medium	EC Birds Directive (Annex II) Wildlife and Countryside Act 1981 Red List
Purple Sandpiper *Calidris maritima*	Medium	Wildlife and Countryside Act 1981 Amber List
Cormorant *Phalacrocorax carbo*	Medium	Wildlife and Countryside Act 1981 Amber List
Great black-backed gull *Larus marinus*	Medium	Wildlife and Countryside Act 1981 Amber List

Ecological feature	Conservation value	Designation/protection status
Guillemot *Uria aalge*	Medium	Wildlife and Countryside Act 1981 Amber List
Herring gull *Larus argentatus*	Medium	Wildlife and Countryside Act 1981 Red list
House martin *Delichon urbicum*	Medium	Wildlife and Countryside Act 1981 Amber List
Leach's storm-petrel *Oceanodroma leucorhoa*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Amber List
Mediterranean gull *Larus melanocephalus*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Amber List
Oystercatcher *Haematopus ostralegus*	Medium	Wildlife and Countryside Act 1981 Amber List
Red- throated diver	High	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Amber List
Black-throated diver *G. artica*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Amber List
Great northern Diver *Gavia immer*	Medium	Wildlife and Countryside Act 1981 Amber List
Scaup *Aythya marila*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Red List
Long-tailed Duck *Clangula hyemailis*	Medium	EC Birds Directive (Annex II) Wildlife and Countryside Act 1981
Slavonian Grebe *Podiceps auritus*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Amber List
Osprey *Pandion haliaetus*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981 Amber List
Peregrine *Falco peregrinus*	Medium	EC Birds Directive (Annex I) Wildlife and Countryside Act 1981
Black Redstart *Phoenicurus ochruros*	Medium	Wildlife and Countryside Act 1981 Amber List
Song thrush *Turdus philomelos*	Medium	Wildlife and Countryside Act 1981 Red List
Starling *Sturnus vulgaris*	Medium	Wildlife and Countryside Act 1981 Red List

Ecological feature	Conservation value	Designation/protection status
Swift *Apus apus*	Medium	Wildlife and Countryside Act 1981 Amber List
Turnstone *Arenaria interpres*	Medium	Wildlife and Countryside Act 1981 Amber List
Twite *Carduelis flavirostris*	Medium	Wildlife and Countryside Act 1981 Red List
Wood warbler *Phylloscopus sibilatrix*	Medium	Wildlife and Countryside Act 1981 Red List
Allis shad	High	EC Habitats Directive (Annex II and V) Berne Convention (Appendix III) UK Priority Species OSPAR
Common skate	Medium	OSPAR LBAP
River lamprey	High	EC Habitats Directive (Annex II and V) Berne Convention (Appendix III)
Sea lamprey	High	EC Habitats Directive (Annex II and V) Berne Convention (Appendix III)
Twaite shad	High	EC Habitats Directive (Annex II and V) Berne Convention (Appendix III) Wildlife and Countryside Act 1981 (Schedule 5)
Other fish	Low	-

4.5 Assessment of impacts

Within this section, potential impacts generated during the construction and operational phases of the scheme on the valued ecological resources (VERs) are assessed. These are features considered to be of importance that could potentially experience significant and/or adverse impacts. Those of negligible or low conservation value and unlikely to be adversely impacted by the proposals are not considered further.

The key potential impacts resulting from the scheme on the valued ecological resources are summarised below.

4.5.1 Construction impacts

Construction of the proposed works would result in the following effects:

- habitat loss/alteration in the intertidal area; and
- temporary disturbance to foraging, roosting and/or loafing birds.

Impacts on marine mammals are considered to be negligible and there are not anticipated to be any impacts on the integrity of designated sites in the vicinity of the scheme.

Habitat alteration

The construction of the three headland structures will require heavy plant vehicle movements on the intertidal area, resulting in altered structures replacing the existing sea wall. The potential habitat alteration is considered to be a minor negative impact.

Birds

It is likely that the construction activities of the proposed scheme would result in negative impacts on bird species of medium conservation value from disturbance and displacement.

Disturbance (e.g. noise and visual presence of people) has been found to have a fundamental influence on the behaviour of birds (e.g. Goss-Custard and Verboven 1993; Riddington *et al.,* 1996). This not only has consequences for individual species but also impacts on the composition of bird communities. A study of wintering oystercatchers by Goss-Custard *et al.* (2006) showed that birds could be disturbed 1.0–1.5 times per hour before their energy budgets were adversely affected, such that they were more likely to die of starvation. In severe winters this disturbance rate is reduced to 0.2–0.5 times per hour. The impact of disturbance varies between species and the time of year, and the adverse effects are not universal. The zones within which the effects of noise disturbance can be measured have been calculated to cover large areas. Furthermore, the visual presence of humans can displace birds and result in the deterioration of the conservation value of a site (e.g. Hockin *et al.,* 1992; Smit and Visser, 1993). Any increase in visual disturbance resulting from construction activities has the potential to exasperate existing levels of disturbance and limit the functionality of the area.

Assuming that birds do not habituate to construction related disturbance, i.e. noise and the visual presence of people, before mitigation it is likely that disturbance will result in a significant short-term, localised impact. This is classified as a moderate negative impact.

Marine mammals

It is extremely unlikely that the proposed scheme would result in adverse impacts on marine mammals. This is because there would be no percussive works from the extension of the promenade which are known to cause adverse effects in marine mammals (e.g. behavioural changes and impairment to their auditory system).

Consequently, for the grey seal and bottlenose dolphin (of high conservation value), a negligible impact is envisaged. This results in an overall appraisal of negligible for this impact, which is not considered to be significant.

Designated sites

Bae Lerpwl / Liverpool Bay SPA

Due to the very low number of qualifying features found within the ZoI and the localised nature of impacts it is not considered that the integrity of Liverpool Bay SPA would be adversely affected by the Colwyn Bay Waterfront Project.

Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC

As the majority of the works would be undertaken within the upper intertidal zone, no impact is envisaged on the subtidal qualifying features (i.e. marine mammals) of the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC.

Bryn Euryn SSSI

The SSSI is located inland greater than 1 km away from the works, due to the distance and nature of the works; it is unlikely that the qualifying features of this SSSI will be impacted on.

Coed Rhos Fossil Woodland Wildlife Site

This site is located approximately 1 km away from the works, as such, is unlikely to be impacted on by the works.

Royal Fishing Weir candidate Wildlife Site

This site is located greater than 1 km away from the works, as such, is unlikely to be impacted on by the works.

4.5.2 Operational impacts

Operation of the scheme could result in the following effects:

- loss of coastal biotopes to the east as a result of altered sediment transport. The loss of a dense mussel bed would reduce foraging habitat and prey species for notable bird species; and
- new foraging opportunities for turnstone and potentially oystercatcher.

There are not anticipated to be any impacts on the integrity of designated sites in the vicinity of the scheme.

Habitats

Following completion of the promenade improvements there may be an alteration of sediment transport across the Colwyn Bay waterfront. This could potentially result in further erosion to the north of the scheme

(beyond Phase 2) and associated loss of some coastal biotopes and a dense blue mussel bed (foraging habitat and prey species for notable bird species). This impact is anticipated to be moderate negative.

Due to longshore transport processes a 9% loss of beach material is predicted over a 30-year simulation period (ABPMer, 2013). Without the proposed improvements to the sea defences significantly more beach recharge would be required to replace the lost material. Therefore the impacts of any future beach recharge are outside the scope of this assessment.

The creation of new rock substrate and artificial structures could provide new foraging opportunities for species such as turnstone. There is also potential for increased oystercatcher foraging if the new substrate and structures were to be colonised by suitable prey species. Therefore the creation of new rock substrate and artificial structures could have a minor positive impact.

Birds

There is potential for the operation of the proposed scheme to result in minor negative impacts on bird species of medium conservation value, caused by potential loss of biotopes and therefore prey species within the scheme footprint (as described above).

Designated sites

Bae Lerpwl / Liverpool Bay SPA

Due to the very low number of qualifying features found within the ZoI and the localised nature of the impacts it is not considered that the integrity of Liverpool Bay SPA would be adversely affected by the Colwyn Bay Waterfront Project.

Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC

As the majority of the works would be undertaken within the upper intertidal zone, no impact is envisaged on the subtidal qualifying features (i.e. marine mammals) of the Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC.

Bryn Euryn SSSI

The SSSI is located inland greater than 1 km away from the works, due to the distance and nature of the works; it is unlikely that the qualifying features of this SSSI will be impacted on.

Coed Rhos Fossil Woodland Wildlife Site

This site is located approximately 1 km away from the works, as such, is unlikely to be impacted on by the works.

Royal Fishing Weir candidate Wildlife Site

This site is located greater than 1 km away from the works, as such, is unlikely to be impacted on by the works.

The potential impacts resulting from the construction and operation of the scheme are summarised in Table 4.7.

4.6 Mitigation of impacts

Recommended mitigation measures for ecological impacts are described below.

4.6.1 Construction

Habitats and associated sessile benthos

Measures to mitigate effects on habitats and associated sessile benthos are as follows:

- if piling is required during construction, this should take place a low tide to avoid noise impacts on marine mammals and fish; and
- works should be confined to the Phase 2 footprint and not extend into the adjacent dense blue mussel beds, to the west of this location near to Rhos breakwater.

Birds

Measures to minimise noise from construction activities during the over-wintering period (November to February inclusive) will be implemented. These could be implemented through the CEMP and should include:

- timing of works to avoid disturbing high tide roosts;
- avoidance of unnecessary revving of engines and switching off equipment when not required;
- careful maintenance of plant and vehicles to meet the manufacturer noise rating levels. Any silencers or bearings which become defective should be replaced as soon as possible;
- using reverse warning systems incorporating broadband noise;
- limiting the use of particularly noisy plant or vehicles;
- plant and vehicles would be operated with noise control hoods closed;
- using enclosures for noisy plant such as pumps or generators;
- vehicles to reverse in a direction towards Old Colwyn and wherever possible manoeuvre in a circular manner to minimise the use of reversing alarms;
- location of internal haul routes to the east of the site, away from the Rhôs-on-Sea;
- keeping all haul routes well maintained to avoid unwanted rattle and “body slap” from vehicles;
- minimising drop height of materials;
- lorry tailgates would be kept closed where possible; and

- limiting personnel, contractors, sub-contractors and other site visitors on the top of the seawall and within the ZoI. Increased presence of people in this area would create additional visual disturbance to wintering birds especially at high tide.

Monitoring

Ecological surveys will be undertaken prior to, and during, construction of the scheme. Details of the timing and scope of the surveys will be confirmed with Natural Resources Wales and CCBC's Countryside section.

If construction takes place between November and February, bird surveys should be undertaken prior to construction to locate high tide roosts of over-wintering bird species within the ZoI. The results of these surveys will be used to formulate a detailed mitigation strategy to time works in order to minimise disturbance at high tide roosts. Monitoring during construction is required to ensure that mitigation measures for over-wintering birds are effective and the strategy is amended if necessary.

Following the promenade improvements, surveillance monitoring should be undertaken to test the modelling predictions.

4.6.2 Operation

No additional mitigation measures have been identified for the operational phase.

A summary of the recommended mitigation measures is found in Table 4.7.

4.7 Residual effects

It is apparent from Table 4.7 that after the implementation of the proposed mitigation measures several residual effects remain. These are as follows:

- loss of existing biotopes of predominantly low conservation value. However, it is likely that the new rock substrate would eventually be re-colonised by biotopes of a similar conservation value;
- temporary disturbance to birds; and
- temporary loss and alteration of bird foraging habitat.

There is also a residual beneficial impact from the addition of new foraging opportunities for turnstone and potentially oystercatcher.

4.8 Summary and conclusions

The purpose of this chapter was to undertake an ecological impact assessment of the proposed options. The desk based study showed that the site of the proposed scheme is located proximal to Liverpool Bay SPA and approximately 5km from Menai Strait and Conwy Bay SAC. Liverpool Bay SPA is important because it holds internationally important numbers of common scoter *Melanitta nigra* and nationally

important numbers of red-throated diver *Gavia stellata*. In Colwyn Bay there have been a number of sightings of protected marine mammals such as seals. These could be the grey seal *Halichoerus grypus* and the bottlenose dolphin *Tursiops truncates* which form part of the Menai Strait and Conwy Bay SAC.

A total of 33 protected or notable bird species, including species listed as birds of conservation concern (Johnstone *et al.*, 2010), are known to occur within 500m of the proposed scheme. Of particular interest are large aggregations of turnstone *Arenaria interpres* (54-200 birds) and oystercatcher *Haematopus ostralegus* (341-420 birds) recorded at Rhôs-on-Sea. Whilst, low numbers of both turnstone and oystercatcher were recorded to the east of Rhôs-on-Sea their distribution appears clumped around the more diverse intertidal mud habitats within the ZoI at Rhôs-on-Sea.

Impacts due to the construction and operation of the scheme were shown to have a number of effects on valued ecological resources. However, following the implementation of mitigation measures it was apparent that in general, the scheme has minimal long term impacts on ecology; although some locally significant residual impacts may arise in the shorter term. These are the loss of biotopes and therefore bird foraging habitat, which results in an overall appraisal of moderate adverse.

This assessment has highlighted the need for further investigation / surveys to effectively implement recommended mitigation measures. This consists of defining the important foraging and roosting areas for birds within and adjacent to the Phase 2 area.

A summary of impacts from the proposed scheme, associated mitigation measures and overall impact appraisal (before and after mitigation) is shown in Table 4.7 below.

Table 4.7: Summary of ecological impacts

Ecological feature	Conservation value	Potential impacts	Magnitude of impacts	Overall impact appraisal (before mitigation)	Mitigation and compensation	Overall impact appraisal (after mitigation)
Designated sites						
Bae Lerpwl / Liverpool Bay SPA (including common scoter and red-throated diver)	Very High	Increase in suspended solids in the water column from beach recharge	Neutral	Neutral	None	Neutral
Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SAC	Very High	Beach recharge resulting in potential collision impacts between marine mammals and seaborne vessel and an increase in suspended solids.	Negligible	Negligible	Ensure slow barge approach. Reduce the percentage of fine particles in the recharge beach material.	Negligible

Ecological feature	Conservation value	Potential impacts	Magnitude of impacts	Overall impact appraisal (before mitigation)	Mitigation and compensation	Overall impact appraisal (after mitigation)
Bryn Euryn SSSI	High	No impact	Neutral	Neutral	None	Neutral
Coed Rhos Fossil Woodland Wildlife Site	Medium	No impact	Neutral	Neutral	None	Neutral
Royal Fishing Weir Candidate Wildlife Site	Low	No impact	Neutral	Neutral	None	Neutral
Intertidal Habitats and associated Sessile Species						
Sparse aggregations of the blue mussel beds	Low	Works to the promenade resulting in the loss and replacement of upper intertidal biotopes	Major adverse	Slight / Moderate adverse (which is locally significant)	Reduce the percentage of fine particles in the recharge beach	Slight / Moderate adverse of local significance
Dense aggregations of blue mussel beds located outside of the main footprint.	Medium	Beach recharge resulting in the burial of intertidal bodies	Negligible	Negligible which is not significant	Reduce the percentage of fine particles in the recharge beach	Negligible
Subtidal Habitats and Associated Sessile Species						
Dense aggregations of blue mussel beds located outside of the main footprint.	Medium	Beach recharge resulting in the burial of intertidal bodies	Moderate adverse	Slight adverse which is not significant	Reduce the percentage of fine particles in the recharge beach	Negligible
Protected species						
Marine mammals (grey seal and bottlenose dolphin)	High	Percussive effects from the extension of the promenade causing adverse impacts on marine mammals	Negligible	Negligible (not significant)	If piling is required during construction, this should take place at low tide	Negligible (not significant)
Birds (see section 4.4 for details of affected species)	Medium	Reduced foraging habitat and prey species as a result of plant and new	Minor negative	Slight adverse (not significant)	Monitoring surveys prior to and following construction	Slight adverse (not significant)

Ecological feature	Conservation value	Potential impacts	Magnitude of impacts	Overall impact appraisal (before mitigation)	Mitigation and compensation	Overall impact appraisal (after mitigation)
		artificial structures				
		Temporary disturbance to foraging, roosting and/or loafing birds	Moderate negative	Moderate adverse (significant)	Minimise construction related disturbance (see section **Error! Reference source not found.** for details)	Slight adverse (not significant)
		New foraging opportunities for turnstone and potentially oystercatcher from the new structures	Minor positive	Minor positive	None	Minor positive
Fish (see section 4.4 for details of affected species)	Low	Beach recharge resulting in a potential increase in suspended solids	Minor adverse	Slight adverse which is not significant	Reduce the percentage of fine particles in the recharged beach material	Negligible

4.9 References

- ABPMer, 2013. *Colwyn Bay Waterfront Development Phase 2: Beach Modelling*. Hampshire: ABM Marine Environmental Research Ltd.
- Aprahamian, M.W., 1988. The biology of the twaite shad *Alosa fallax fallax* (Lacepede) in the Severn Estuary. *Journal of Fish Biology,* 33A, 141-152.
- BirdLife International, 2015. *Species factsheet* [online]. Available from: http://www.birdlife.org [Accessed 25 August 2015].
- Bond, L., 2003. The Endrick Water cSAC Conservation Strategy. *Conserving Natura 2000 Rivers*. English Nature, Peterborough. 56 pp.
- Central Fisheries Board, undated. *River lamprey (Lampetra fluviatilis)* [online]. Available from: http://www.cfb.iw/fisheries_research/lamprey/river.htm [Accessed 1 January 2007].
- Chartered Institute of Ecology and Environmental Management (2006), *Guidelines for Ecological Impact Assessment in the United Kingdom,* June 2006.
- Chartered Institute of Ecology and Environmental Management (2010), *Guidelines for Ecological Impact Assessment in Britain and Ireland: Marine and Coastal,* August 2010.

- Cofnod biodiversity records centre. Data obtained 04/09/15.
- Countryside Council for Wales (2003) *Phase 1 Biotope Survey.*
- Cramp, S. and Simmons, K. E. L. (eds.), 2004. *BWPi: Birds of the Western Palearctic Interactive* (DVD-ROM). BirdGuides Ltd, Sheffield.
- Driessen, J., Salazar, R. and Gill, P., 2009. 3rd FEPA Monitoring Report – Rhyl Flats, 2008- 2009, Report for Npower Renewables. ESS Ecology, Edinburgh.
- English Nature, 2003. The Humber Estuary: A comprehensive review of its nature conservation interest. *English Nature Research Reports,* Report Number 547.
- Freyhof, J. and Kottelat, M., 2008. Lampetra fluviatilis. *In*: IUCN 2010. *IUCN Red List of Threatened Species. Version 2010.2* [online] Available from: http://www.iucnredlist.org [Accessed 28 July 2010].
- Garthe, S. and Huppop, O., 2004. Scaling possible adverse effects of marine wind farms on seabirds: developing and applying a vulnerability index. *Journal of Applied Ecology* 41: 724-734.
- Goss-Custard, J.D. and Verboven, N., 1993. Disturbance and feeding shorebirds on the Exe estuary. *Wader Study Group Bull*. 68: 59-66.
- Goss-Custard, J.D., Triplet, P., Sueur, F. and West, A.D., 2006. Critical thresholds of disturbance by people and raptors in foraging wading birds. *Biological Conservation*, 127 (1): 88-97.
- Henderson, P.A, 2003. Background Information on species of shad and lamprey. *Marine Monitoring Report No. 7.* Countryside Council for Wales.
- Hockin, D., Ounsted, M., Gorman, M., Hill, D., Keller, V. and Barker, M.A., 1992. Examination of the effects of disturbance on birds with reference to its importance in ecological assessment. *Journal of Environmental Management* 36: 253-286.
- Igoe, F., Quigley, D.T.G., Marnell, F., Meskell, E., O'Connor, W. and Byrne, C., 2004. The sea lamprey Petromyzon marinus (L.), river lamprey Lampetra fluviatilis (L.) and brook lamprey Lampetra planeri (Bloch) in Ireland: general biology, ecology, distribution and status with recommendations for conservation. Biology and Environment. *Proceedings of the Royal Irish Academy, Section B*, 104B-S, 43-56.
- IUCN 2015. *The IUCN Red List of Threatened Species. Version 2015.2* [online]. Available from: www.iucnredlist.org [Accessed 24 August 2015].
- Johnstone, I.G., Thorpe, R.I. and Noble, D.G., 2010. The population status of birds in Wales 2. *The state of birds in Wales 6*. RSPB Cymru, Cardiff.
- JNCC, 2015. *Vertebrate species: Fish. 1099 River lamprey Lampetra fluviatilis* [online] Available from: http://www.jncc.gov.uk/protectedsites/sacselection/species.asp?FeatureIntCode=S1099 .1-3 [Accessed 25 August 2015].
- Kelly, F.L and King, J.J., 2001. A review of the ecology and distribution of three lamprey species, Lampetra fluviatilis (L.), Lampetra planeri (bloch) and Petromyzon marinus (L.): A context for conservation and biodiversity considerations in Ireland. *Biology and Environment: Proceedings of the Royal Irish Academy*, Vol. 101B, 3, 165-185.
- Maitland, P.S., 1980. Review of the ecology of lampreys in northern Europe. *Canadian Journal of Fisheries and Aquatic Science*s, 37, 1944-1952.
- Maitland, P.S. and Hatton-Ellis, T.W., 2003. Ecology of the Allis and Twaite Shad. *Conserving Natura 2000 Rivers Ecology Series No. 3*, English Nature, Peterborough.
- Maitland, P. S and Lyle, A. A, 1995. Shad and smelt in the Cree Estuary, SW Scotland. *Report to Scottish Natural Heritage*, Edinburgh.

- Morman, R.H., Cuddy, D.W. and Rugen, P.C., 1980. Factors influencing the distribution of sea lamprey (Petromyzon marinus) in the Great Lakes. *Canadian Journal of Fisheries and Aquatic Sciences,* 37, 1811–1826.
- Morvan Barnes, 2015. Alosa fallax. Twaite shad. *Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme* [online]. Available from: http://www.marlin.ac.uk/speciesinformation.php?speciesID=2466 [Accessed 25 August 2015].
- Natural England and Countryside Council for Wales (now Natural Resources Wales), 2010. *Departmental Brief: Liverpool Bay/ Bae Lerpwl Special Protection Area* [online]. Available from: http://www.naturalengland.org.uk [Accessed 25 August 2015].
- Planning Policies Wales (2009*), Technical Advice Note 5: Nature Conservation and Planning*, Welsh Government.
- Reitti, S., undated. River *lamprey the peculiar provincial 'fish' of Satakunta* [online]. Available from: http://wwwreitti.org/eng/ar_nahkianen.php [Accessed 20 August 2010].
- Riddington, R., Hassall, M., Lane, S. J., Turner, P. A. and Walters, R., 1996. The impact of disturbance on the behaviour and energy budgets of Brent Geese Branta b. bernicla. *Bird Study,* 43: 269-279.
- Royal Society for the Protection of Birds (2013), *Planning Naturally, spatial planning with nature in mind: in the UK and beyond,* July 2013.
- Smit, C.J. and Visser, G.J.M., 1993. Effects of disturbance on shorebirds: a summary of existing knowledge from the Duch Wadden Sea and Delta area. *Wader Study Group Bull*. 68: 6-19.
- Wales Directory, 2008. *Colwyn Bay Beach* [online]. Available from: http://www.walesdirectory.co.uk/Beaches/Colwyn_Bay_Beach.htm [Accessed 25 August 2015].
- Webb, A., McSorley, C.A., Dean, B.J. and Reid, J.B., 2006. *Recommendations for the selection of, and boundary options for, an SPA in Liverpool Bay*. JNCC Report 388.
- Wirral Sea Fishing, 2015. *Colwyn Bay* [online]. Available from: http://www.wirralseafishing.co.uk/cs/reports/report.php?ven=Colwyn%20Bay [Accessed 25 August 2015].
- Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay, 2011. *Standard Data Form* [online]. Available from: http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0030202.pdf [Accessed 25 August 2015].

4.10 Appendices

The following can be found in Appendix C.2:

- Ecology consultation response from CCBC

5 Landscape and visual

5.1 Introduction

This chapter presents a landscape appraisal of the impacts of the regeneration works within Phase 2 of the Colwyn Bay Waterfront Project on the landscape resource and visual amenity.

The Phase 2 works include regeneration of two areas of coastline between Victoria Pier and Cayley Embankment, to enhance existing coastal defences and contribute to the wider regeneration of the area. The works will comprise raising and widening of the promenade alongside the construction of three headlands which will enhance the recreational opportunities within the area. The scheme also includes wider public realm improvements, in line with the Phase 1 development which is now complete. Phase 2 forms part of the wider Colwyn Bay Waterfront Project, which aims to improve coastal defences along 3.5km of coastline between Rhos Jetty and Old Colwyn.

This chapter presents the methodology used to undertake the landscape appraisal, summarises the relevant legislative and policy context, provides an overview of the baseline conditions and appraises the potential impacts of the coastal defence improvements on landscape and visual amenity. Appropriate mitigation measures to avoid or reduce impacts are also presented.

A further appraisal of the landscape and visual elements was recommended in the Environmental Scoping Report (August 2015) as it was considered that due to the likely scale of the landscape and visual impacts in the short to mid-term, this would necessitate further consideration of the possible mitigation proposals. By further appraisal of the baseline townscape and local landscape character, this chapter will seek to consider the potential landscape and visual amenity issues resulting from the design proposals.

This appraisal forms part of a non-statutory Environmental Appraisal. The fieldwork undertaken for and subsequent involvement on Phase 1 was used as the baseline for this appraisal and undertaken by the same Chartered Landscape Architect, alongside supporting reports and evidence.

5.2 Methodology

5.2.1 Sources of data

The landscape and visual appraisal for this project has been undertaken based on the overarching principles set out in the ‘Guidelines for Landscape and Visual Impact Assessment’, third edition (2013) (GLVIA3) published by the Landscape Institute and the Institute of Environmental Management and Assessment. The landscape character appraisal has also drawn on the guidance provided in the Countryside Agency’s ‘Landscape Character Assessment: Guidance for England and Scotland (2002). Both landscape and visual studies have used additional best practice guidance on seascape assessment by the Countryside Council for Wales (now Natural Resources Wales) (2001).

5.2.2 Resources and methods

The landscape and visual impact appraisal process involved a desk study to establish the existing baseline condition, landscape character, classification and quality assessments, and any potential landscape mitigation measures that should be incorporated in to the project, followed by a summary of the overall landscape and visual impact.

The study area is based on the extent of the landscape character areas likely to be significantly affected either directly or indirectly as defined in the guidelines (GLVIA3). This appraisal is based on the Visual Envelope as defined in the Phase 1 ES and also taking into account the essential links and corridors which connect the site and its immediate context to Colwyn Bay.

Desk based reviews were carried out of available publications, including LANDMAP information from Natural Resources Wales and the Conwy County Borough Council Local Development Plan 2007-2022 (Adopted 2013).

Field studies were undertaken by a Chartered Member of the Landscape Institute during the Phase 1 assessments in 2010. As such a further site visit for this report was not considered to be required as the original survey information combined with available publications and digital imagery were considered adequate for this level of appraisal. In particular the Townscape Assessment (dated July 2015) which was undertaken by a Chartered Member of the Landscape Institute in accordance with guidelines published jointly by Landscape Institute and Institute of Environmental Management & Assessment 'Guidelines for Landscape and Visual Impact Assessment' (Third Edition) provided a detailed assessment of the current baseline, incorporating all Phase 1 changes.

5.2.3 Scope of appraisal

The landscape appraisal considers three different aspects:
- elements;
- characteristics; and
- character.

Visual amenity relates to the changes that arise in the composition of available views and to people's responses to the changes. They include the visual amenity of residents and members of the public passing through the area. These are usually recorded as views from roads and other Rights of Way, but in this case this includes views from the coast and sea as well.

In addition, the settings of conservation areas and listed buildings and structures are also considered.

The appraisal has been carried out to address issues:
- during construction; and
- during the operational stage immediately following completion of the works.

5.3 Policy context

5.3.1 Legislative framework

There are no landscape designations within the site area. The nearest landscape designated site being a National Park which is approximately 7 km to the west and south of Colwyn Bay.

There are however, other designated areas in the vicinity of the site and this includes the Creuddyn peninsula of which much of this headland is designated as a Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) and as a Heritage Coast. This important coast line begins approximately 2 km to the west of Rhos Point and covers the coast from Little Ormes head to the Great Orme.

Within the towns of Colwyn Bay and Rhôs-on-Sea are designated Conservation Areas and Listed Buildings. The conservation area of Colwyn Bay was designated in 1998 and covers the central area of the town. The Rhôs-on-Sea conservation area was designated in 1991 and includes much of the frontage of Rhôs-on-Sea and the village centre.

The Colwyn Bay Conservation Area was designated because of the quality of design and use of materials of late 19th and early 20th century developments that give it a unique ‘sense of place’.

Despite a gradual deterioration in the quality of appearance and general well-being of the town, the urban townscape has retained some of its character.

The conservation area of Rhôs-on-Sea includes the frontage that faces out onto the promenade and contains several important views. These include views over the promenade and sea front, encompassing the whole of the bay.

The listed buildings include the Victorian pier and pavilion at Colwyn Bay which were constructed in 1899.

5.3.2 Planning policy

Within the Conwy County Borough Council Local Development Plan 2007-2022 (Adopted 2013), the site area is classified as Coastal and Serviced Accommodation zones.

5.4 Baseline conditions

5.4.1 Existing landscape character

Landscape character describes what makes an area distinctive, what gives it a sense of place and what makes it different from another landscape. The Visual Envelope is the area defined in the Phase 1 ES. It is restricted to the south by the landform and built environment, however there are open and unobstructed

views to the north. The visual envelope is defined as a maximum distance of 1 km to the seaward side as views further than this distance are not considered significant. The landscape character includes:

- landscape character – description of the seafront landscape;
- seascape character – the seascape within the Visual Envelope; and
- townscape character – the townscapes of Colwyn Bay and Rhôs-on-Sea.

National and regional landscape character

The site is covered at national level by the Natural Resources for Wales (NRW) landscape character mapping initiative (LANDMAP). This evaluates the landscape in terms of its visual and sensory aspect and also its cultural landscape. The visual and sensory character region of Colwyn Bay study area is described as 'a settlement that consists of a series towns joined in conurbation including Colwyn Bay, Old Colwyn and Rhôs-on-Sea. It is a major coastal resort on the north Wales coast with a promenade and some elegant Victorian built form in its core. The settlement is orientated towards the bay with its beach, promenade and pier, but for much of its frontage to the core and east, the town is separated from the beach by the major A55 road and railway line. This disrupts the relationship and reduces tranquillity'.

The value of the landscape is classified as being of 'moderate' value in terms of its visual and sensory evaluation (as defined in LANDMAP). The promenade is described as allowing positive views of the bay and the built form of the core is pleasing in its composition. The promenade and core has the strong integrity with coherent form. The core has the strong character of a Victorian seaside resort with fine buildings.

Local landscape character

The landscape character of Colwyn Bay can be described as unique with its sweeping open promenade and elevated backdrop with seascape views. This seaside character has gradually however, been undermined by the declining tourist infrastructure and subsequent commercial viability. Structural disrepair is visually evident along the promenade as ad hoc repairs to the concrete defence walling have taken place since the early 1900's adding to the dilapidated and chaotic character of the urban structure.

Recently however, the public realm has improved with the raising of the beach level, coastal defence and promenade improvements to the central section of the frontage either side of Victoria Pier. This has sympathetically improved the landscape character with an enhanced promenade and more publicly accessible beachfront. The area of promenade between Victoria Pier and Cayley Embankment however is still of low landscape character quality.

The Phase 1 works to the east of Victoria pier included a 150m rock groyne structure and concrete stepped revetment, a new multi-use water-sports building and landscaping works on the new raised promenade (1a). Coastal defence works and beach recharge and promenade improvements including new street lighting and street furniture (1b) have improved the local landscape character in this area.

To the west of Victoria pier, the local landscape character is 'hard' and engineered in character, consisting of the original paved surfaces failing visibly towards the promenade edge. The railway embankment is a

distinctive element by the Colwyn Bay station, retained by the prominent limestone walls. The shoreline in this section comprises a slightly sloping sandy beach controlled by numerous vertical timber groynes. The existing level of beach in comparison to the promenade greatly limits any physical or visual connection for the pedestrians with the foreshore.

West of Marine Road the character is urban, with the mature housing on the inland side providing a prominent built elevation along the promenade. The frontages of Colwyn Bay and Rhôs-on-Sea overlooking the bay consist predominately of residential and commercial properties. These are a diverse range of properties with many architectural styles.

Along the promenade are structures and furniture that retains a traditional style of seaside architecture. These include a food kiosk, open sided seating shelters and benches. However, there are no areas of vegetation within the site extents, serving to reinforce the hard urban character of the promenade with no features to break up the vast areas of hard landscaping.

The main transport corridors closely follow the sea front for much of Colwyn Bay, which with the recent construction of the A55 expressway reinforces the physical barrier between the town centre and the waterfront. This currently detracts from the sense of place of an otherwise traditional sea front character with its long promenade, pier and retail units. The A55 also creates light spill impacts on the current site due to the roadside lighting.

The length of the promenade and relatively unobstructed views seawards provide Colwyn Bay's unique character however, it is now widely recognised that the area is in need of regeneration both socially and physically. Urban regeneration, if undertaken sensitively, could revitalise and improve the character of this section integrating with the improvements completed in Phase 1. This could be achieved with the introduction of landscape elements to integrate the seascape with the townscape and therefore improve the overall seaside character.

Seascape character

The North Wales coastal area is rich in landscape, cultural and heritage features, with a natural and wild coastline interspersed with seaside resorts.

This study has drawn upon guidance of the CCW (now NRW) 'Guide to Best Practice in Seascape Assessment' (March 2001) and also the 'Guidance for Coastal Defence in relation to their Landscape and Visual Impacts' (2003), to assist with the identification of elements that contribute to the local character and quality of the coast.

The seascape is defined as including views from sea to land and views along the coastline. Seascape assessment is an extension of landscape character assessment and assesses the integration of the sea, coastline and land components together.

Important amenity resources relevant to the seascape include: the promenade, coastal footpath, beach and Porth Eirias water sports centre. The water-based leisure activities depend on the character and

quality of the seascape for their user's enjoyment, and also affect the appearance of the coast. The Phase 1 site extent has modern surfacing and features along the promenade.

The coastline is open to the north, with a number of off shore features which can be seen from Colwyn Bay. These includes the production platform of the Douglas and Hamilton oil and gas field located approximately 11 miles off shore and the wind turbines of the Rhyl Flats and North Hoyle wind farms which can also be seen closer on the horizon.

The foreshore consists of a large, gently shelving, and predominately sandy beach.

Townscape character

The towns of Colwyn Bay and Rhôs-on-Sea are relatively recent towns, dating back to Victorian times of the latter part of the 19th century and the early part of the twentieth century. These have now largely reached their limits due to the proximity of the hills which have constrained development. Until the middle of the century, the area was an important holiday destination that was easily accessed by the main Holyhead to London railway line, but recent changes in the holiday market have a marked effect and impact on the town.

The architecture and urban fabric still retains much of its quality in its design and use of materials of the period. This provides a diversity of architectural styles that contributes to the towns' sense of place and distinctiveness. Buildings along the front and within the towns typically range from 2- 4 storeys and their mass is skilfully broken down by the introduction of several design features and elements such as the use of bay windows, plain and decorative fenestration, gabled and dormer roofs and Dutch gables. The visual appearance of the street scene is further varied by use of different materials and textures such as red and yellow brick, stone render and black and white mock Tudor work.

Eirias Park situated on the east of the town centre comprises 40 acres of rolling open park land and formal gardens close to the sea front.

The original settlement of Old Colwyn was a small fishing and farming community that grew up around the river Colwyn and rises dramatically up the surrounding hills.

Rhôs-on-Sea is a more prosperous sea side town lying on the western side of Colwyn Bay and has a small harbour providing moorings for small boats. There is a broad sweeping promenade part of which is backed by a grassy embankment known as Cayley Promenade.

The pier stands between Rhôs-on-Sea and Old Colwyn and was constructed in 1900. Over the years it has been damaged and re-built with its present structure in neglect.

The transport corridors and topography of the area have influenced the development of the town of Colwyn Bay, as it has expanded outwards in easterly and westerly directions. The railway line pre-dates the town having been built in 1847.

Landscape quality and sensitivity

The quality of the landscape incorporating the local landscape, townscape and seascape elements is variable. Even though individual elements of the landscape have suffered decline and are in a poor state of repair, the landscape in the wider context still retains its scenic quality and sense of place. There is also still potential for further enhancement and scope for restoring the typical seaside character of the area.

5.4.2 Visual baseline analysis

Due to the location and landform of the area around the site, there are a large number of potential viewpoints of the site.

The Visual Envelope is restricted to the south by the landform and built environment. There are open and unobstructed views to the north, however, the visual envelope is displayed as a maximum distance of 1 km to the seaward side as views further than this distance are not considered significant.

Public rights of way in the vicinity of the site include the Long Distance Footpath 'North Wales Path' which follows the coastline before heading inland at Beach Road, Old Colwyn. This forms the promenade for the length of the Phase 2 section of works and is an important visual baseline for pedestrians and cyclists.

The nature of the topography, particularly the steep vegetated cliff to the south and also the location and spread of the built environment and transport corridors tends to limit views other than those in close proximity of the seafront. The locations where public views will be most notably affected are:

- views from the frontage properties including residential and commercial;
- views from the shore immediately north of the site;
- views from inshore waters north of the site;
- views from the promenade for all recreational and commercial users; and
- views from the adjacent A55 and railway.

The site is partially visible from some more distant views from within the built environment where the nature of the rising topography allows views over the bay. Due to the urban scale and massing however, these views are generally obstructed by intervening buildings.

The listed Victorian pier and pavilion occupies a prominent position along the eastern section of the site however, this is currently closed to the public due to its unsafe condition.

The Phase 1 regeneration works are now complete and the new water sports facility, beach replenishment and promenade works now occupy a large part of the frontage for approximately 3.5 km. Views from the promenade have changed dramatically since the Phase 1 works have been completed with a more visually and physically accessible beach and prominent landmarks. These works have improved the visual amenity and encouraged more activity with recreational users such as day-trippers and water based recreational users.

Views from the shoreline and water, to the north of the site, encompass recreational and commercial users of the beach and water. These range from day-trippers, dog walkers and water activity based recreational users to commercial fishing and sailing activities.

Views from properties are mostly restricted to frontage properties. These frontage properties are predominately residential or commercial properties of hotels and bed and breakfast establishments. Shop premises and public houses are more evident near the town of Rhôs-on-Sea and are within the Conservation Area designation.

Views from the widely used promenade include recreational users of walkers and cyclists as well as patrons of the many refreshment kiosks situated along the promenade. At Rhôs-on-Sea there are small retail units serving the typical recreational activities of the area such as fishing equipment and kayaking and fishing charter operations. These units are located at Rhos Point and Rhos Jetty. At Rhos Jetty there is also a restaurant and tea shop within a prominent position overlooking the bay.

Views from the A55 and railway include key elevated views over the bay. For travellers on the A55 westbound, the Colwyn Bay section is the first where the road reaches the open sea coastline. This allows viewers to appreciate the large scale and dramatic nature of the coast.

5.4.3 Topography

The topography rises from the beach gradually increasing in gradient to the southern fringes of Colwyn Bay. This then rises steeply up a series of hills bordering the south of the town towards the extensive woodlands to the south. These woods occupy steeply rising ground and form a pleasing and attractive backcloth to the town as well as providing an important valuable amenity.

The sloping and undulating nature of the terrain and its changing levels contribute to the character of the town and provides potential for a variety of enclosed and open views.

5.5 Assessment of impacts

This section addresses the appraisal of the potential landscape, townscape and seascape character issues associated with the scheme and its potential impact on visual amenity during construction (temporary effects) and operation (longer term effects).

5.5.1 Construction impacts

Landscape, townscape and seaside impacts

Temporary adverse landscape, townscape and seascape impacts are likely during the construction period, resulting from the works to the promenade and construction of new headlands. This will result in impacts on the natural environment of the foreshore during this construction period. There should not be adverse impacts on Victoria pier, a Grade II listed building, as this is currently closed to the public.

Large scale construction equipment would be required to carry out the works to the promenade and construct the new headlands. The construction management plan is to be provided by the contractor and is not available at this stage. However, the delivery of materials and construction traffic would have temporary adverse impacts on the area.

Visual impact assessment

Due to the nature of the site and its location there will be potential for impacts to sensitive receptors particularly along the waterfront. These sensitive receptors will include public and commercial properties directly overlooking the site, which some effects on members of the public using public rights of way and undertaking other outdoor recreational activities.

The Long Distance Footpath 'North Wales Path' is an important Public Right of Way that follows the promenade for the length of the Phase 2 section of works. This will form a very sensitive receptor to members of the public due to their proximity to the works and the temporary loss of this public space. During the works sections of the promenade are likely to be closed to the public with temporary diversion routes available.

Key sensitive receptors will be occupiers of residential and commercial properties within prominent positions overlooking the bay. To the western section of the scheme, the commercial property lined frontages such as cafes and pubs overlook the waterfront providing potential for visual impacts.

The A55 provides a visual barrier to the majority of Colwyn Bay to the eastern and central sections of the scheme. These receptors would have a lower sensitivity than residential or recreational receptors.

Views from residential and commercial areas will be from the frontage properties in the vicinity of Area B. Receptors will experience changes in their sea views during the construction period due to construction activity and are considered as high sensitive receptors.

During the construction stage it is considered that views from commercial and residential properties will be adversely altered. The works will be temporary in nature and no cranes or large plant will be present close to these receptors (Area B). Some plant and large construction equipment may be visible, however, as this will be required in Area A. Views from the road and railway are considered less sensitive, though recreational users of the site may be temporarily affected due to temporary closure of the footpath.

5.5.2 Operational impacts

Landscape, townscape and seaside impacts

There would be some positive change in experiential characteristics for users of the beach, because the foreshore would be changed by the removal of damaged existing sea defence structures and the re-profiling of the beach.

The ongoing management of the proposed sea defence structures, promenade and foreshore levels will have an effect on the tranquillity of the area but, this is not expected to be adverse. Any further regeneration activities linked to this scheme will be expected to be beneficial on the urban character. The works to the promenade will improve the character in line with the Phase 1 development. Overall the proposed works will be beneficial during operation in terms of landscape and visual effects.

Visual impact assessment

There will generally be visual benefits arising from the scheme due to the improved appearance of the promenade and sea defence wall. This will benefit receptors using the promenade and resident's views from frontage properties. The improvements will be viewed in conjunction with the existing sea control structures along the foreshore and as an extension of the recently regenerated promenade in Phase 1.

The Long Distance Footpath 'North Wales Path' is an important Public Right of Way that follows the promenade for the length of the Phase 2 section of works. This will form a very sensitive receptor to members of the public due to their proximity to the works and the temporary loss of this public space. During the works sections of the promenade are likely to be closed to the public with temporary diversion routes available.

When the works are completed there will be ongoing maintenance and management operations taking place. This may include topping up of beach levels and regular maintenance to the seawall structure.

The scheme would not cause an appreciable change in the existing situation. The changes in elevation of the promenade may have negative impacts on the panorama of the landscape viewed from for the road and foreshore, however this change is very minor and in line with the existing Phase 1 development.

Overall, it is considered that changes to visual amenity will be minimal during operation and beneficial due to the improvement to the public realm.

5.6 Mitigation of impacts

The following measures should be implemented as far as possible:

- the existing stone and predominantly new locally sourced stone will be used in the construction of the proposed sea wall to integrate it with the overall scheme;
- promenade finishes will be maintain the high quality finish to integrate with the recently completed promenade works;
- the proposed concrete wave return wall will be constructed as low as possible while still providing the necessary level of overtopping performance, to reduce the visual impact; and
- additional design proposals of the scheme components, surfacing and edgings should be in keeping with the local character as far as practicable and integrate with the Phase 1 works as far as practical.

The Phase 2 proposals are widely viewed as providing a catalyst for further regeneration works to the area. Planned planting and soft landscaping features provide an opportunity to soften and break up the

visual dominance of the sea wall structure in elevation. Additional landscape elements such as public art pieces could greatly enhance the visual aspect of the area. There is a separate public art project being developed alongside the Waterfront Project which will comprise four or five major pieces of commissioned public art installed along the Waterfront.

5.7 Summary and conclusions

The scheme as proposed will provide a positive landscape and visual benefit to the area in the long term. This will be in character with the existing situation retaining and improving upon the characteristics of the area that currently provide its 'sense of place'.

There will be a number of visual receptors influenced by the scheme due its prominent location. These will be predominately receptors of a high sensitive nature as the scheme is viewed in close proximity by commercial and residential properties in Area B. This scheme will generate additional construction traffic and directly affect the public's use of the promenade through temporary closure of the footpath. However, the works will be temporary in nature and any cranes or large plant will be limited to Area A, which is not in the vicinity of any commercial or residential properties.

As the proposed sea defence structures will be generally in character with the existing structures, there will be no adverse impacts anticipated during the operational stage. The improved appearance of the promenade and sea wall and connectivity for the public to the foreshore are likely to be beneficial.

Providing sensitive design and material selection is carried out, the proposals and any future enhancements of the area are unlikely to have significant impacts during construction. In the long term the scheme will be beneficial to the overall area and should improve the sea side character of waterfront. There are opportunities to incorporate improvement works to the public realm areas of the seafront and improve the connectivity for future public access.

5.8 References

- Countryside Agency, 2002. *Landscape Character Assessment Guidance for England and Scotland*. UK: Countryside Agency.
- Countryside Council for Wales 2001. *Guide to Best Practice in Seascape Assessment, The Marine Institute*. Wales: Countryside Council for Wales.
- Landscape Institute, 2013. *Guidelines for the Assessment of Landscape and Visual Impacts* (3rd edition). UK: The Landscape Institute.
- Conwy County Borough Council, adopted 2013. *Local Development Plan 2007-2022*. Conwy: CCBC.

6 Socio-economic

6.1 Introduction

This chapter presents a technical assessment of the socio-economic impact of the coastal defence improvement works within Phase 2 of the Colwyn Bay Waterfront Project. It presents the methodology used to undertake the environmental assessment, summarises the relevant policy context, provides an overview of the baseline conditions and assesses the potential impacts of the coastal defence improvements on these issues. Appropriate mitigation measures to avoid or reduce significant adverse impacts are also presented.

6.2 Methodology

6.2.1 Overview

The socio-economic impacts associated with the Colwyn Bay Waterfront Project were reported in the Environmental Statement published in October 2010. The impacts assessed in that Environmental Statement included an assessment of those impacts likely to arise during Phase 2, though the scope and extent of this phase has now changed. Therefore the methodology used for this assessment is consistent with that used in the assessment undertaken in 2010 and many of the potential impacts previously assessed remain.

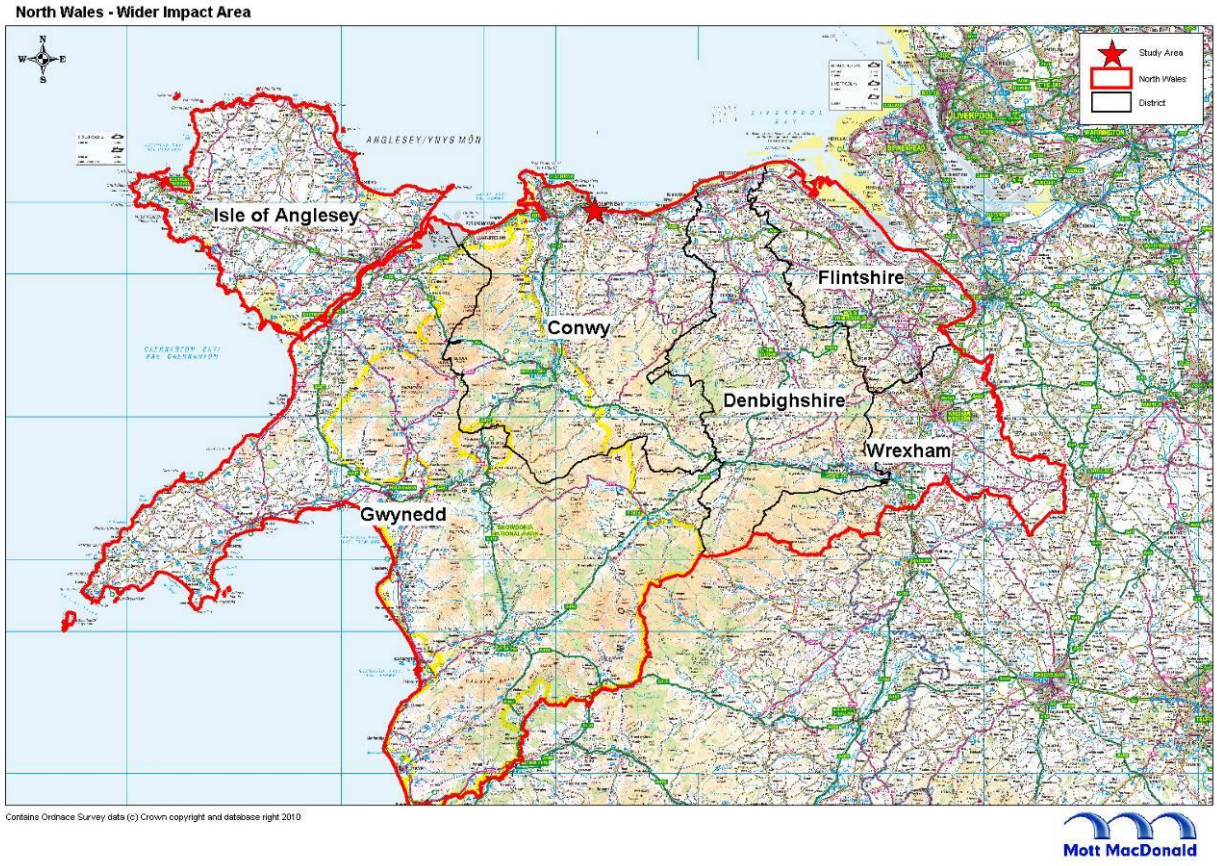
6.2.2 Spatial scope

The potential socio-economic effects will be considered at two scales:

- the immediate impact area – the three parishes of: Rhôs-on Sea; Colwyn Bay; and Old Colwyn. This is the primary area of focus for the assessment and has been selected as the Colwyn Bay Waterfront Project spans these three parishes; and
- the wider impact area – which is defined as North Wales. This is the area in which Conwy County sits and is important to consider due to regional strategies. See Figure 6.1.

The influence of tourism, for example, may be experienced at much larger geographical scale. However, the defined impact areas are considered appropriate to capture the potential significant effects associated with the project.

Figure 6.1: Wider impact area



6.2.3 Assessment criteria

The significance of the socio-economic impacts associated with Phase 2 of the Colwyn Bay Waterfront Project will be assessed using the following approach.

The magnitude of each impact identified will be assessed taking into consideration whether the impact is:

- positive or negative; temporary or permanent; long or short term; direct or indirect; and
- whether impacts will be felt in the immediate or wider impact area or both.

The sensitivity of the receptor (resource, organisation, residents, businesses) experiencing the impact will be considered, assessing their ability to absorb changes.

Taking the magnitude and sensitivity into consideration, the significance of each effect (pre-mitigation) will be classified as follows:

- major adverse; moderate adverse; minor adverse;
- insignificant; or
- minor beneficial; moderate beneficial; major beneficial.

Those effects that are rated as moderate or major (adverse or beneficial) are considered to be significant effects. Residual impacts, following the application of mitigation measures, will also be identified.

6.2.4 Assumptions and limitations

The following assumptions and limitations should be considered when reading this socio-economic assessment.

Assumptions

- the construction process will not render local properties unusable and there will be no displacement of local residents;
- the construction process may cause some disruption but will not result in any temporary business closures;
- the number of construction workers is unknown but likely to be similar to the numbers used for Phase 1; and
- levels of public service provision will not alter as a result of the scheme; health, education and community provision will remain unchanged.

Limitations

- no formal consultation or primary research was undertaken in the production of this report;
- qualitative assessments of the impacts to businesses and residents (i.e. in terms of disruption, access and quality of life) have been based upon professional judgement.

6.3 Policy context

There are a number of strategic documents that relate to identifying and delivering socio-economic objectives in the wider impact area. The most relevant documents are identified below.

6.3.1 Adopted Local Development Plan

The Conwy Local Development Plan (LDP) was adopted in October 2013 and forms the development plan that covers the immediate impact area and much of the wider impact area of this study. The LDP informs decisions on land use planning. The LDP contains two particular components relevant to this assessment.

Economic Strategy Statement

The economic strategy policies seek to address a number of employment related challenges and aspirations including:

- meeting the employment needs of the predicted population;
- promoting and developing new higher value employment opportunities;
- supporting business and technology clusters;
- supporting the growth of existing business, entrepreneurs and business start-ups;
- developing a skills and knowledge based economy which optimises the value of the area's natural resources, environment and cultural heritage; and
- utilising the County's strategic road and rail position.

Tourism Strategy Statement

The role of tourism's contribution to the economy is recognised and that year-round tourist attractions are essential to the prosperity of the local economy and the well being of local communities. This focus on well being is reflected in the development plan which includes policies to ensure that activities such as cycling, walking and environmental and heritage tourism are promoted and supported.

6.3.2 Community strategies

One Conwy: Working Together for a Better Future 2015-2025

This document sets out the vision for the future of Conwy County Borough, focusing on the role of Public Service agencies. The document merges a number of existing strategies, including the Community Strategy, to set a vision to achieve eight outcomes.

Figure 6.2: One Conwy 2012-2025: Outcomes

Outcome 1	People in Conwy are educated and skilled
Outcome 2	People in Conwy are safe and feel safe
Outcome 3	People in Conwy live in safe and appropriate housing
Outcome 4	People in Conwy are healthy and independent
Outcome 5	People in Conwy live in a county which has a thriving economy
Outcome 6	People in Conwy live in a sustainable environment
Outcome 7	People in Conwy live in a county where heritage, culture and the Welsh language thrive
Outcome 8	People in Conwy are informed, included and listened to

Source: Conwy County Borough Council

Bay Life Programme

Conwy County Borough Council is leading the Bay Life Programme. This is a community focused initiative and follows on from the work undertaken as part of the Welsh Government's designation of the North Wales Coast as a Strategic Regeneration Area. The Bay Life Programme involves CCBC working with partner organisations and over 30 community groups and 200 businesses to deliver physical regeneration and to "improve and bring together all the things that make up a community". The Programme is funded through the Welsh Government's Vibrant and Viable Places regeneration scheme.

6.4 Baseline conditions

The Environmental Statement published in October 2010 set out the demographic baseline for the immediate impact area and the wider impact area.

In 2010, spending from spending associated UK domestic tourist trips to Wales equated to £1,450 million. It is estimated that visits to the coast accounted for 41% of all overnight trips, much higher proportion than in England and Scotland (20% and 13% respectively). Over the past 15 years visitors are taking fewer trips to the seaside and the seaside share of the UK holiday market in Wales has fallen.

The table below sets out the sectors covered by businesses located in Conwy. This shows that approximately 11% of the businesses operate in Tourism, with another 10% operating in accommodation and entertainment and another 15% in retail.

Table 6.1: Business sectors

Sector of business	Number	Percentage
Accommodation and food services	17	7.6%
Agriculture, forestry and fishing	1	0.4%
Arts, entertainment	6	2.7%
Construction	20	9.0%
Education and training	7	3.1%
Financial and insurance	9	4.0%
Health and social care	13	5.8%
IT services	10	4.9%
Manufacturing and processing	6	2.7%
Other	59	26.4%
Retail	33	14.8%
Scientific and technical	2	0.9%
Tourism	26	11.7%
Transport	9	4.0%
Wholesale trade	3	1.3%
Did not say	2	0.9%
Total	**223**	

Source: Conwy business survey, 2013

Businesses operating in the study area draw the majority of their customers from the North Wales area; the table below shows over 73% of customers are situated in the local region.

Table 6.2: Location of customers

Customer base	Number	Percentage
Local (within 5 miles	48	21.5%
North Wales	115	51.6%
Across the UK	81	36.3%
Europe	12	5.4%
Across the world	27	12.1%

Source: Conwy business survey 2013

There is a range of visitor accommodation within Colwyn Bay, predominantly within serviced facilities such as hotels and guest houses, with further accommodation available in campsites and self-catering residences.

In considering the local economy, the table below shows the numbers and proportions of people that are economically active and inactive. This shows that the overall demography of Conwy has fewer people of traditional working age. The table also shows that Conwy has fewer people who are economically active than the national and Great Britain averages.

Table 6.3: Labour supply – working age population and economic activity (residence based)

	Conwy CB		Wales	Great Britain
	No.	%	%	%
All people aged 16-64 (mid 2014)	66,900	57.5	62.2	63.5
Economic activity (Apr 2014-Mar 2015)				
Economically active	48,800	73.8	74.4	77.4
In employment	46,400	70.2	69.3	72.7
Employees	38,800	58.7	59.3	62.2
Self employed	7,100	10.7	9.2	10.1
Economically inactive	17,300	26.2	25.6	22.6

Source: ONS mid year population estimates; ONS annual population survey, (NOMIS)

The number of people who are economically inactive includes those who are not seeking work. Therefore data on Job Seekers Allowance (JSA) claimants is presented below which provides a better indication of unemployment and worklessness. The table below shows that the JSA rate in Conwy has been falling since June 2012 and is now at its lowest rate since June 2008. In June 2015, the JSA rate in Conwy was slightly below the average rate of Wales, but slightly above the Great Britain average.

Table 6.4: Comparative annual Job Seekers' Allowance unemployment figures

	Conwy CB		Wales		Great Britain	
	Number	Rate	Number	Rate	Number	Rate
June 2015	1,272	1.9	43,136	2.2	691,481	1.7
June 2014	1,850	2.8	55,669	2.9	967,398	2.4
June 2013	2,448	3.6	72,469	3.8	1,378,001	3.5
June 2012	2,458	3.7	76,857	4.0	1,502,357	3.8
June 2011	2,402	3.5	71,594	3.7	1,434,373	3.6
June 2010	2,318	3.4	68,962	3.6	1,388,761	3.5
June 2009	2,427	3.6	76,980	4.0	1,504,117	3.8
June 2008	1,473	2.2	40,586	2.1	809,957	2.1

Source: ONS JSA count (NOMIS)

Unemployment in Conwy County Borough is generally seasonal; at its highest in the winter months, usually peaking around February.

6.5 Assessment of impacts

The need for the project is set out in Section 2.1.1 where the consequences of not enhancing the coastal defences include the loss of the promenade, loss of the A55 and loss of properties in the centre of Colwyn Bay. This situation would have obvious negative impacts on people, the community and the local economy. The Scoping Report identified a number of potential socio-economic impacts and these are assessed here.

6.5.1 Construction impacts

Employment

The exact number of workers required to construct Phase 2 of the Waterfront Project is not yet known. However, it is anticipated that the numbers will be similar to those used for Phase 1 engineering works; a peak workforce of about 50 site staff with average employees on site of between 35 and 40 for the seven month duration of the construction period.

Although the generation of employment is relatively short-term, this is a direct impact that can bring a large benefit to those individuals involved, extending into the wider impact area. Therefore this is a moderate beneficial impact and is significant.

Local business

There are a small number of businesses located along this stretch of the Waterfront and there are not anticipated to be any direct impacts on these businesses (e.g. there is no requirement for land or for these businesses to close). Access to these businesses will be maintained during the construction phase. However, there may be some temporary disruption as some of the pedestrian and cycle routes will be

temporarily closed. Temporary alterations to parking facilities may also have some impact on staff, suppliers and customers.

There is expected to be some minor disruption in the waterfront area but this is unlikely to affect the ability of businesses to function. Therefore this impact is relevant to the immediate impact area and is rated as a minor adverse and is not significant.

6.5.2 Operational impacts

Employment

Once the works are complete they will require regular maintenance to ensure the defences remain effective. It is unlikely that a new and dedicated workforce resource would be employed by CCBC for the sole purpose of maintaining the new infrastructure; the work would be divided as additional tasks for existing council services. Those services however may require a small number of additional employees to accommodate the increased workload, or may make greater use of local Contractors to undertake the additional work.

Therefore this impact is likely to be very small and have no discernible effect on the local employment situation. The impact is rated as neutral and is not significant.

Regeneration

As reported in the Environmental Statement in 2010, informal consultation revealed that local businesses considered that the coastal defences would prevent the disruption caused by road closures resulting from flooding events. The consultation also revealed businesses' perceptions that insurance premiums would decrease.

The works that form Phase 2 include physical regeneration components creating a more attractive promenade area. This enhanced attractiveness of the area is expected to result in a modest increase in tourism and visitor spend in Colwyn Bay, i.e. benefitting businesses in the town, not just those located near the waterfront.

Retaining business in the area and attracting new businesses are key facilitators in delivering regeneration and economic development objectives. The new waterfront provides opportunities for businesses in the retail sector (particularly the new headland 3 in Area A) and recreation sector; the newly constructed nearby Port Eirias watersports centre is a good example of such opportunities.

The regeneration benefits of Phase 2 are difficult to separate from the benefits associated with the combined waterfront improvements. Taken alongside the other phases, the impact on regeneration is considered to affect the wider impact area and be moderate beneficial and is therefore significant.

Local amenity

The works undertaken as part of Phase 2 will directly improve the amenity of the waterfront area, particularly with the enhancements to the public realm and community art installations. The enhanced pedestrian and cycle environment helps to facilitate healthy lifestyles (particularly links to the Health Trail in Area B). The themes assigned to the three new headlands in Area A (event space and concessions, play, and concessions and outdoor café culture) are aimed at improving the public realm and local amenity and will make a positive contribution to social inclusion goals and delivering the outcomes set out in the 'One Conwy' vision for the area.

The impact of the project on local amenity affects the immediate impact area and is therefore considered to be a moderate beneficial impact and is a significant.

6.6 Mitigation of impacts

Mitigation measures aim to reduce any predicted adverse impacts on local receptors.

6.6.1 Construction impacts

To reduce the predicted impacts on local businesses, the Contractor will be required to develop a construction management plan to minimise disruption to promenade access for customers, deliveries and staff. This should include measures to manage traffic and access for the duration of the works and that this is well advertised throughout the immediate impact area. These measures are predicted to ameliorate some of the predicted impacts, but this does not change the rating of minor adverse impact on local businesses.

6.6.2 Operational impacts

The impacts identified during the operational phase are beneficial and therefore no mitigation is proposed.

6.7 Summary and conclusions

The construction of the Phase 2 of the Waterfront Project is predicted to have a significant positive impact as a result of generation of additional employment during the construction stage. However, there is predicted to be some disruption to local businesses during the seven month construction, but this is not considered to result in a significant impact.

Once completed, Phase 2 of the Waterfront Project is predicted to have significant positive impacts on economic regeneration of Colwyn Bay, with direct and indirect benefits on local businesses – retaining and attracting jobs. The local community is also predicted to benefit through the physical improvements to the public realm. These are significant beneficial impacts.

6.8 References

- CBCC, 2015. *Monitoring the economy. (*Research bulletin). Corporate Research and Information Unit.
- CBBC, 2013. *Conwy business survey 2013*. Corporate Research and Information Unit.
- CBBC, 2013. *Adopted Local Development Plan*. Conwy: CCBC.
- CBBC, 2012. *One Conwy: Working Together for a Better Future 2015-2025*. Conwy: CCBC.

7 Other environmental topics

7.1 Background

Several environmental topics have not been included as separate chapters in this Environmental Appraisal, because they were scoped out of further assessment by the Environmental Appraisal Scoping report or through consultation with relevant stakeholders.

The environmental topics not previously covered in this report are summarised in this chapter.

7.2 Air quality

This section provides a preliminary assessment of baseline conditions, a description of potential construction phase effects, a description of potential operational effects and any requirements for further assessment.

7.2.1 Baseline

Table 7.1 presents recent monitoring data from Conwy County Borough Council in Colwyn Bay, considered to be most representative for the purpose of this assessment.

Table 7.1: Colwyn Bay roadside and background representative monitoring

Site ID	Site name	Site type	Pollutant	Monitoring type	NO2 annual mean concentrations (µg/m3)			
					2011 [a]	2012 [b]	2013 [c]	2014 [d]
DTCC BC3	Grove Park, Colwyn Bay	Urban background	NO2	Diffusion tube	9.3	10.3	10.6	8.8
DTCC BC5	Kingsway, Colwyn Bay	Urban roadside	NO2	Diffusion tube	18.7	20.3	19.6	18.1
DTCC BC13	Beach Avenue, Old Colwyn	Urban roadside	NO2	Diffusion tube	17.6	18.7	17.1*	16.8
CCBC PM10/ 3	Heol Dewi, Pensarn	Roadside	PM10	Automatic analyser	-	-	12.5*	N/A

Note: National bias adjustment 2011: 0.84
National bias adjustment 2012: 0.79
National bias adjustment 2013: 0.8
National bias adjustment 2014: 0.81
* Indicates data has been annualised to provide a reasonable estimate of the annual mean using the methodology described in Local air quality management – technical guidance, 2009 (LAQM – TG (09))
NO_2 – Nitrogen Dioxide
PM_{10} – Particulate Matter
The Pensarn automatic analyser commissioned July 2013, 2014 not currently available

Previous reviews and assessments carried out by Conwy County Borough Council have concluded that all air quality objectives are being met across the jurisdiction and there has been no requirement to declare an Air Quality Management Area. The latest data, available for 2014, confirmed this conclusion and results from Table 7.1 indicate that concentrations are well below the objective.

7.2.2 Summary of potential effects

The Waterfront Project Phase 2 has the potential to cause air quality effects during the construction and operation phases. The key pollutants for consideration within the assessment of air quality effects are:

- dust particles (defined as particulate matter in the size range 1-75 microns in diameter);
- nitrogen oxides (NO_X), particularly nitrogen dioxide (NO_2); and
- fine particles (defined as particulate matter less than 10 and 2.5 microns in diameter; PM10 and PM2.5 respectively).

No assessment is considered necessary for emissions of any pollutants other than those identified above, as no potentially significant emission sources of these pollutants are introduced or affected by the Waterfront Project Phase 2 and concentrations are expected to be well below air quality objectives within the study area.

The main potential impacts identified are the following:

- temporary effects from dust; and
- effects of plant emissions on local air quality.

'Dust' is a generic term which usually refers to particulate matter in the size range 1-75 microns in diameter; the most common impacts from dust emissions are soiling and increased ambient PM_{10} concentrations (Building Research Establishment, 2003). Given the local and temporary nature of site plant, and in accordance with guidance from the Institute of Air Quality Management (IAQM), effects of plant emissions on local air quality are considered to be of negligible significance.

Construction and operational traffic

At this stage, information related to traffic generated off-site during construction is limited. Environmental Protection UK and IAQM guidance (2015) indicates that assessment of construction traffic emissions is only likely to be required for large, long-term construction sites that would generate Heavy Goods Vehicle (HGV) flows of over 100 movements per day (one way past a given point) over a period of a year or more. Due to the nature of the proposed works, it is not anticipated that movements of over 100 HGVs would occur.

During operation, changes in traffic flows are anticipated to be minor and there will be no significant increase in emissions. Therefore there is no potential for operational air quality impacts.

No further issues were identified through consultation.

7.2.3 Recommendations

The preliminary air quality impacts for the Phase 2 works are considered to relate to the construction phase.

Appropriate mitigation measures to reduce dust and the effect of site plant on local air quality will therefore be identified in the Construction Environmental Management Plan (CEMP). See section 7.8 for more details.

7.3 Noise and Vibration

The following legislation, standards and guidelines are relevant to the proposed development:

- Sections 60 and 61 of the Control of Pollution Act 1974;
- The Environmental Protection Act 1990;
- Technical Advice Note (TAN) 11: Noise (1997);
- British Standard (BS) 5228 Code of practice for noise and vibration control on construction and open sites - Part 1: Noise 2009, amended 2014;
- BS5228 'Code of construction practice for noise and vibration control on construction and open sites - Part 2: Vibration' 2009;
- Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 7 "Noise and Vibration" (HD213/11);
- Calculation of Road Traffic Noise (CRTN) 1988; and
- The World Health Organisation's "Guidelines for Community Noise" 2000.

7.3.1 Baseline

Existing noise sources

Local baseline noise conditions are likely to be dominated by the adjacent A55 trunk road. Speed limits along the section of the A55 passing through Colwyn Bay are restricted to 50mph. The adjacent North Wales Coast Railway which runs through Colwyn Bay is the main link between Holyhead and Chester which will also contribute to baseline noise levels.

Potential receptors

In Area A, residential housing is separated from the beach by the A55. In Area B there are a number of commercial and residential properties including Princess Court Apartments and Staford House proximal to the promenade, which constitute noise sensitive receptors (NSR) of high value. Toad Hall Inn, a public house is also located to the west of the promenade. There are a number of NSR in the wider area, including schools, government offices and a public library.

7.3.2 Summary of potential impacts

Temporary impacts from construction

The main works which will generate noise and vibration are those associated with Area A, where works to upgrade sea defences have the potential to produce high levels of noise and vibration in the local area. With the exception of the western extent of Area A, which is close to Princess Court Apartments, Area A is

separated from NSR by the railway and the A55 trunk road and associated embankments and structures. Baseline noise levels will be relatively high and there is no line of sight between NSR and the works. Significant noise impacts are not considered likely. In the case of Princess Court Apartments, it is anticipated that specific measures to control noise and vibration impacts from Area A works will be agreed with the Local Authority in advance of works commencing, and that these measures will involve the application of Best Practicable Means to control noise and vibration. Assessment of temporary noise and vibration impacts and effects due to works at Area A will therefore not require further assessment in the Environmental Appraisal.

Works associated with Area B are limited in nature and generally comprise improvements to the public realm which will be completed during normal day-time construction hours agreed with the Local Authority. There are no works to sea defences. Significant noise impacts are not considered likely. Assessment of temporary noise and vibration impacts and effects due to works at Area B will therefore not require further assessment in the Environmental Appraisal.

Permanent impacts from operation

Increases in traffic flows on residential streets of 25% or more would be needed to result in adverse noise impacts. Such increases in traffic flow are not anticipated due to implementation of the scheme. Assessment of permanent noise and vibration impacts and effects due to operation of the scheme will therefore not require further assessment in the Environmental Appraisal.

7.3.3 Recommendations

Appropriate mitigation measures to reduce noise and vibration will therefore be identified in the Construction Environmental Management Plan (CEMP), in accordance with the views of relevant consultees. Working hours will be agreed prior to the start of the works. See section 7.8 for more details. No further assessment of noise and vibration impacts is required.

7.4 Transport/traffic and access

An assessment of traffic and transport impacts is usually required if a proposal is likely to result in changes to traffic flows which could have a significant impact on the operation of the local network or community. Assessment will be required if changes to road layouts or networks are required.

7.4.1 Baseline

Existing infrastructure and access

The project area is split into two separate project areas located between the Victoria Pier and the Rydal Boast Store. The promenade is serviced by a single carriageway road. There is a pedestrian route along the seafront and also a Sustrans cycle route. Existing vehicular access to the promenade is via three main underpasses, which cross to the promenade from the town to the south, under the A55 Expressway and

railway line and along the coast road from the west. Spaced along the bay there are several slipways and steps which lead from parking areas to the beach itself.

Public transport

The railway station is located immediately to the south of the beach in the vicinity of the Victoria Pier and the railway embankment runs along the landward side of the coast road. The station is served by both local and national train services. Colwyn Bay is served by a comprehensive network of local bus services and four coach services to local and national destinations.

Beach usage

As part of the previous works phase, a survey of the local area was undertaken to determine the number of people and vehicles present at peak times. The usage survey undertaken in May 2010 monitored the beach and promenade usage in the areas to the east and west of Victoria Pier. The survey recorded a peak of 390 people on the beach, 735 people on the promenade and around 1000 cars parked along the promenade. These numbers were recorded on a hot Sunday afternoon.

7.4.2 Summary of potential impacts

Under the 'do-nothing' scenario there would be no significant impacts on short term daily activities, and the beach would continue to be used as existing. In the longer term, the lack of an adequate coastal defence system may result in the damage or loss of the local road network, rail line and A55 trunk road.

During the construction phase, the transport of materials to the site will have an environmental impact from the numbers of heavy goods vehicles using the road network. Locally the impact will be relatively low with direct access from the A55 (Junction 24) to the promenade, and this should mitigate possible impacts and disruption to the surrounding area i.e. avoiding travel through the town centre and/or residential areas. The temporary closure of pedestrian and cycle routes would have an impact on users. Temporary alterations to parking facilities could also have a local impact during the construction phase.

The main operational phase impacts of the project are expected to relate to changes in traffic flows due to increased vehicle movements from both the increased usage of the waterfront area for business and leisure usage, and the increased number of business and leisure visitors to the town centre. Changes to parking layouts could also have a local impact.

7.4.3 Recommendations

In accordance with the views of relevant consultees, an updated Construction Stage Traffic Assessment (September 2015) has been undertaken for submission alongside the planning application. This addresses the following:

- haulage routes for contractors' vehicles and other traffic;
- anticipated frequency and nature of traffic movements;

- location of contractors' compounds;
- working hours, including delivery times;
- an indication of the type and number of heavy plant to be used;
- whether any other works (e.g. access, drainage works, hardstandings are proposed); and
- a method statement for the reinstatement of the land.

Impacts associated with traffic, transport and access will be mitigated in the CEMP (see section 7.8 for more details).

7.5 Water, Flooding and Hydrogeology

7.5.1 Baseline

Hydrogeology

The Elwy Group bedrock is a Secondary B aquifer. These are "*predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers*". The site does not lie within an Environment Agency designated groundwater source protection zone.

Due to the low topography of the site (1mAOD to 2mAOD), groundwater is expected to be encountered across the site, both within the beach sands and within the granular fill of the promenade.

Flooding

Tidal water levels are recorded to the west of the proposed site, with a typical tidal range of approximately 5m. The highest astronomical tide level recorded is 4.74mAOD.

The area of interest lies within or close to 'TAN15: Development Advice Maps (DAM)' Zone C2; this is described as an area "without significant flood defence infrastructure" (shown in Figure 7.1 below). This zone is based on the Environment Agency's extreme flood outline, which is greater than or equal to a 0.1% Annual Exceedance Probability (AEP) event.

Figure 7.1: Colwyn Bay Development Advice Map

Source: Welsh Government Development Advice Maps, 2015

There are three fluvial watercourses in the vicinity of the site; the Nany Y Groes and the Llwar Pentre to the east and the Afon Ganol to the west. All three rivers are classified as ‘main rivers’. None of the watercourses are a flood risk impact on the site.

Both the Nant y Groes and the Llwar Pentre are currently classified as having ‘moderate’ ecological status. The Afon Ganol is classified as having ‘good’ ecological status.

The Environment Agency’s ‘Risk of Flooding from Surface Water’ online maps shows that there is some surface water risk in the area of interest, particularly at Marine Road, which shows a ‘Medium Risk’ of surface water flooding.

Seawater/bathing water quality

There is one Natural Resources Wales bathing water sampling location at Colwyn Bay, located to the west of the area of interest. Natural Resources Wales carries out inspections with the Local Authority and the water company, which are carried out pre-season and mid-season (if required). Natural Resources Wales undertakes detailed bacterial sampling around the catchment and a transect of the beach.

Results from the investigations show that the water quality in the area of interest for 2014 was projected as excellent by Natural Resources Wales.

7.5.2 Summary of potential impacts

There may be temporary adverse impacts on water quality during the construction phase with the disturbance of sediment (and potential release of contaminants to seawaters) due to the general construction process, however this can be mitigated through use of best practice construction methods and by having a Construction Environmental Management Plan (CEMP) in place to minimise the risk of accidental spillage.

A temporary adverse impact may also be experienced on bathing water quality from sediment disturbance leading to the release of bacteria through the water column. This would be at its most significant for any works undertaken in May through to September (peak months for sea bathing).

In general, the operational impacts of the scheme are anticipated to have little impact. The promenade area is outwith any flood zones and the proposed scheme will not impact this. There are no fluvial streams discharging into the area, therefore these will not be impacted.

7.5.3 Recommendations

A Flood Consequence Assessment has been undertaken and will be submitted with the planning application. Relevant consultation has confirmed that all other impacts on hydrology and hydrogeology can be mitigated through the CEMP (see section 7.8 for more details). Water quality impacts are further considered in the coastal processes chapter of this report (see chapter 3).

7.6 Geology and soils

Former activities on the site and the existing ground conditions (both geological and chemical) may impose constraints on the development requiring positive measures to be taken to mitigate design risks. Ground conditions may also present health and safety risks that will require management.

The proposals could have an impact on land quality, and contamination impacts may potentially arise during the construction and operational phases of the development.

7.6.1 Baseline

Underlying strata

British Geological Survey (BGS) published maps and historic exploratory hole records have been used to determine the underlying geology. Environment Agency data and maps have been used to determine aquifer classifications.

Local exploratory borehole records indicate the presence of made ground underlying the site.

In areas of tidal influence at the site the superficial deposits comprise marine beach deposits – sand, described as “shingle, sand, silt and clay; may be bedded or chaotic”. Underlying the promenade are glaciofluvial deposits – sand and gravel overlying till (Diamicton).

The site is underlain by Elwy Formation bedrock – mudstone, siltstone and sandstone, described as “disturbed beds, striped silty mudstones and subordinate sandstones with lateral facies changes”. The bedrock geology is classified as a Secondary B aquifer.

Cranfield Soil and Agrifood Institute Soilscapes mapping classifies the soils underlying the site as “slightly acid loamy and clayey soils with impeded drainage”. The soils drain to stream networks.

Mining

The BGS GeoIndex data and mapping indicates that the site is within an area of mining for superficial sand and gravel resources, sourced from the glaciofluvial deposits underlying the site.

Historic mapping indicates quarrying proximal to the site.

Contaminated land

The following potentially contaminative historical land uses have been identified for the site:

- 1875: railway line and station present to the south of the site; a gravel pit is present just south of the present day Victoria Pier and a brick works is present to the south of the western extent of the site. Mapping indicates that some excavation / quarrying occurred across the site;
- 1879: the brick works has been replaced by explosive works;
- 1900: residential and commercial development has occurred at the site and to the south of the site; a station has been developed in association with the railway line;
- 1913: the gravel pit at the east of the site is now labelled as a goods yard; Victoria Pier has been constructed and groynes have been developed along the coastline; and
- subsequent to 1913 there is little change to land use, although there is further commercial and residential development at the site and in the surrounding area.

Environment Agency environmental maps and data have been used to identify contaminative activities, including the presence of landfills and pollution incidents. No records have been identified at or proximal to the site.

Designated sites

Magic interactive mapping has indicated that there are no designated sites present in the area of the site.

7.6.2 Summary of potential effects

As the scheme involves raising and widening an existing structure, required excavation will be minor. As a result it is unlikely that contaminated land will be encountered and the risk to construction workers is low.

Underlying aquifers are not considered at significant risk as the proposed excavation depth will not exceed -10mAOD.

Potential impacts relating to geology, soils and contaminated land for the proposed works include:
- generation of waste materials from localised excavation during construction; and
- importation of a small quantity of materials for promenade enhancement.

No further issues were identified through consultation.

7.6.3 Recommendations

Preliminary impacts associated with geology for the Phase 2 works are considered to relate to the construction phase.

In accordance with the waste hierarchy, impacts associated with waste generation and material usage will be mitigated through waste management measures identified in the CEMP. See section 7.8 for more details.

7.7 Archaeology and cultural heritage

Cultural heritage assets comprise buildings, areas (e.g. landscapes, archaeological complexes) and sites (e.g. ancient monuments), and may include both above ground and buried features. The significance of heritage features depends largely upon their importance (e.g. statutory designations such as Scheduled Ancient Monuments or Listed Building status, identified archaeological sites which are not protected and other designations such as World Heritage Sites), reasons for importance, and the inter-relationships between heritage features.

7.7.1 Baseline

Historical land use

The town of Colwyn Bay developed following the construction of the railway around 1845. By 1878, Colwyn Bay was described as a seaside resort comprising numerous residential properties and hotels. Development of the town continued during the early part of the 20th century with the opening of Victoria Pier in around 1900, construction of the promenade along the seafront between 1898 and 1911, continued residential development and the extension of the railway. The A55 highway was constructed by 1987.

Vertical masonry sea walls were initially constructed between Rhôs-on-Sea and Old Colwyn in the later part of the 19th century. Historical records indicate that the beach level has fallen considerably over the last century, with a historical loss of beach level across the foreshore of approximately 10-20mm per year, resulting in increased exposure and in some areas undermining of the sea defences. To prevent beach erosion, wooden groynes were initially constructed in the early part of the 20th century, with further boulder groynes constructed in the 1990s.

Archaeological features

The Victoria Pier and pavilion at the eastern extent of the site is a Grade II listed building. Although not a listed building, Colwyn Bay Railway Station is a historic building of archaeological importance. Ridge Cottage, a Grade II listed building, is within 50m of the promenade in Area B. and the Head Post Office adjacent to the A55 is also a Grade II listed building. Several other Grade II listed buildings are located in the surrounding area, including a cinema (Princess Bingo and Social Club), Penrhyn Buildings, Colwyn House and the Methodist Church of Saint John.

There are not believed to be any Scheduled Ancient Monuments directly impacted by the scheme. However there are several marine archaeological features of note in the vicinity of the site, including:

- A number of historic shipwrecks, such as the Mary Catherine Shipwreck;
- Submerged forests along the bay; and
- Rhos Fynach Weir, a medieval to post-medieval fishing weir.

7.7.2 Summary of potential impacts

Victoria Pier is beyond the boundary of the site therefore is unlikely to be impacted by the scheme. The majority of any significant impacts are anticipated to be positive, as general improvements to the waterfront will increase opportunities for the pier in the future.

The proposed coastal defences will protect the railway embankment and the historic railway station, along with the railway bridges and listed buildings within the town. The sea walls are not understood to be archaeologically protected structures, however they currently suffer annual storm damage and overtopping therefore the scheme would increase protection of the defences.

In general, the scheme will have beneficial impacts on cultural heritage and contribute to the economic regeneration of the waterfront area by attracting visitors and protecting historic features.

7.7.3 Recommendations

Consultation with Cadw and Clwyd Powys Archaeological Trust confirmed that no further assessment of impacts on archaeology and cultural heritage is required.

7.8 Construction Environmental Management Plan

7.8.1 Purpose

It is recommended that general construction impacts are managed through the implementation of a Construction Environmental Management Plan (CEMP). The purpose of a CEMP is to set out the precautionary and reasonable steps that the contractor will take to prevent adverse environmental impacts occurring, using Best Practicable Means.

The contractor shall provide the CEMP for the acceptance of the supervising authority prior to the commencement of works on-site.

The CEMP shall be project-specific and provide:

- details of the contractor's organisational framework, in particular the designation of a senior manager to take overall responsibility and an engineer nominated as the 'environmental monitor', to manage environmental control facilities on a day-to-day basis and liaise with the supervising authority;
- details of the principal pollution control facilities proposed, including procedures for the mitigation, collection and disposal of wastes, and of contingency plans in the event of failure of these facilities, including emergency procedures where appropriate;
- details of the contractor's proposed environmental monitoring procedures, to ensure the construction sites are operating satisfactorily and that problems are being dealt with promptly;
- the format of a monthly report to the supervising authority, comprising a checklist of environmental issues at each worksite, and covering the specific problems of the works;
- forms to be used by the contractor to demonstrate compliance with the environmental requirements of the contract and to identify any problems;
- details of any other records to be kept to allow the contractor to demonstrate compliance with the CEMP;
- details of the contractor's environmental awareness training programme proposed for the workforce;
- a requirement that all method statements include a section on environmental impacts and mitigation; and
- a formalised mechanism to audit the effectiveness of the CEMP.

7.8.2 Scope

The CEMP shall, as a minimum, address the following issues:

- noise and vibration;
- construction working hours;
- water pollution, including measures to minimise the risk of accidental spillage;
- waste and materials management;
- impacts on flora/fauna;
- visual impact;
- air pollution, including odour, dust, fumes and on-site plant;
- storage and handling of hazardous materials;
- good housekeeping and vermin control;
- contaminated land;
- archaeology and heritage issues;
- impacts on the local community; and
- impacts of any temporary works including location of site office etc.

7.8.3 Compliance with the CEMP

The supervising authority shall have the right to audit the contractor's management of the CEMP. Such audits will include a review of the contractor's internal audit records including identified non-conformities and the effectiveness of the corrective action. The contractor shall be provided with ten working days' notice prior to an audit being carried out.

On a day-to-day basis, the contractor shall afford reasonable availability of staff and documentation for the supervising authority to assess implementation of the CEMP.

8 Impact summary

Environmental topic	Principal impacts identified	Recommended mitigation and compensation measures
COASTAL PROCESSES		
Construction	Excavation and importation of materials for construction works and associated vehicle movements	All materials should be imported via road to reduce vehicle movements on the foreshore Monitoring of materials for contamination should be undertaken during construction
	Temporary sediment transport to lower foreshore during beach re-profiling	Monitoring of beach levels should be undertaken during beach re-profiling
	Temporary disruption to hydrodynamics	Materials should be stored above Mean High Water level
	Temporary minor impact on flood risk and erosion prior to completion of the works	The new sea wall should be built prior to the remainder of the construction works
	Temporary water quality impacts due to increased turbidity from beach re-profiling	Monitoring of water turbidity will be undertaken to mitigate impacts
Operation	Improved interface between promenade and beach reducing the risk of flooding, erosion and scour in extreme events. This will reduce the risk of overtopping	Promenade and headland design to allow for repair and reconfiguration if required
	Impacts on sediment transport and accumulation of material	Water quality monitoring
	Reduced reflectivity resulting in reduced erosion and scour	N/A

Environmental topic	Principal impacts identified	Recommended mitigation and compensation measures
	Reduced erosion through absorption of wave energy as a result of beach re-profiling	N/A
	Increased risk of pollution incidents from maintenance and public use of the site	Annual inspections of structures Maintenance and repairs should be carried out using small tracked machinery on the beach Chemicals used for cleaning beach access points must be non-hazardous
MARINE ECOLOGY		
Construction	Loss and replacement of upper intertidal biotopes such as sparse blue mussel aggregations	Construction works to be confined to Phase 2 footprint and not extend to adjacent mussel beds
	Percussive effects on marine mammals	If piling is required during construction, this should take place at low tide
	Temporary disturbance to foraging, roosting and/or loafing birds	Minimise construction related disturbance (see section 4.6.1 for details)
Operation	Reduced foraging habitat and prey species as a result of plant and new artificial structures	Monitoring surveys prior to and following construction
	New foraging opportunities for turnstone and potentially oystercatcher from the new structures	N/A
LANDSCAPE AND VISUAL		
Construction	Temporary adverse landscape, townscape and seascape impacts as a result of construction equipment and materials delivery / construction traffic	Existing stone and locally sourced stone to be used as far as possible

Environmental topic	Principal impacts identified	Recommended mitigation and compensation measures
	Impacts on sensitive receptors along the waterfront, particularly residential and commercial properties overlooking the bay	Promenade finishes to be designed to give a high quality and integrated finish Proposed wall to be constructed as low as possible to reduce visual impact Design should be in keeping with local character and integrate with the Phase 1 works as far as practical
Operation	Increased pedestrian activity on the promenade	N/A
	Removal of existing damaged sea defence structures	N/A
	Impact on tranquillity of the area as a result of ongoing management of the structures	N/A
	Improved views from frontage properties	Potential to integrate more soft landscaping and public art pieces to soften the visual dominance of the sea wall structure
SOCIO-ECONOMIC		
Construction	Moderate benefit in employment; it is envisaged there will be about 50 site staff during peak workforce, with average number of employees on site between 35 and 40 for the seven month duration of the construction period.	N/A
	Temporary minor disruptions to local businesses on the Waterfront as some of the pedestrian and cycle routes will be temporarily closed. Temporary alterations to parking facilities may also have some impact on staff, suppliers and customers.	Contractor to develop a construction management plan to minimise disruption to promenade access for customers, deliveries and staff. This will include measures to manage traffic and access for the duration of the works and that this is well advertised throughout the immediate impact area

Operation	Regular maintenance will be required to ensure the defences remain effective, this may require a small number of additional employees to accommodate the increased workload. However, this impact is likely to be very small and have no discernible effect on the local employment situation	N/A
	Physical regeneration components creating a more attractive promenade area. This enhanced attractiveness of the area is expected to result in a modest increase in tourism and visitor spend	N/A
	opportunities for businesses in the retail sector (particularly the new headland 3 in Area A) and recreation sector	N/A
	moderate beneficial impact from the improvement of the local amenity of the waterfront area	N/A

Appendices

Appendix A. EIA screening letter and Scoping Report

Appendix B. EIA screening response

Appendix C. Consultation responses

C.1 Cadw

C.2 CCBC Ecology

C.3 CCBC Noise

From: Roper, Rog G
Sent: 28 August 2015 14:36
To: Huw Robat Williams
Cc: Reid, Melanie H
Subject: RE: Colwyn Bay Phase 2 Environmental Appraisal

Huw

Thanks for the prompt response. We will proceed on that basis.

Thanks again

Roger

From: Huw Robat Williams [mailto:Huw.Williams@conwy.gov.uk]
Sent: 27 August 2015 17:51
To: Roper, Rog G
Subject: RE: Colwyn Bay Phase 2 Environmental Appraisal

Roger,

I'm not in now until Wednesday of next week, hopefully this email will assist you.

I've had a cursory look at the Environmental Appraisal Scoping Report.

The mitigating measures you will put in place to deal with dust, noise etc should contained in your Construction Method Statement, having regard to the documents you mention in 5.2 and should give you best practicable means for undertaking the works.

I don't think that there will be any need for you to undertake a noise assessment regarding these works, I would suggest something along the following lines be included in your Method Statement, which is the standard response we recommend to planning.

"Work (including deliveries etc) will only take place between 08:00 and 18:00 Monday to Friday, 08:00 and 13:00 on Saturday and no work on Sundays or Bank Holidays."

Are the proposed works to build the 3 "headlands" tide dependent? As an environmental health section, recognise (as has happened in the past) these work are essential and, due to the tides can occur outside the time frames mentioned above, I can only suggest that your CMS

1 states that this will occur

2 be kept to a minimum duration
3 that all local residents that may be affected are advised in advance of these proposed works (eg letter drops, social media, information board close to the sites, resident drop in sessions etc etc)
4 there is a named individual associated with the construction company that they can phone to discuss or complain.

Just one minor point, 5.2.1 mentions the Rothesay Hotel as a receptor for noise – it was demolished about 4 weeks ago (but a block of flats will be constructed in the void) these will (if completed prior to works starting) be subjected to possible noise and dust issues.

I am able to read work emails at home so if there is something specific you want an answer to, please email me, I will try and responded before next Wednesday

Regards

Huw

From: Roper, Rog G [mailto:Rog.Roper@mottmac.com]
Sent: 27 August 2015 17:01
To: Huw Robat Williams <Huw.Williams@conwy.gov.uk>
Cc: Reid, Melanie H <melanie.reid@mottmac.com>
Subject: Colwyn Bay Phase 2 Environmental Appraisal

Hi Huw

Thanks for calling me back today. I am sorry I was not here to take your call at the time.

In case you haven't seen these, attached are our scoping report and the Conwy Council's response for the Colwyn Bay Phase 2 works. Hopefully we will catch up with each other on Friday 28th to discuss the scope for any noise assessment required.

I will give you a call tomorrow.

Regards

Roger Roper

Principal Acoustic Engineer

Appendix D. Waterfront Project phasing plan

Appendix E. Area A site plan

Appendix F. Area B Site Plan

Appendix G. Beach Modelling Report