Shetland Islands Council
Interim Planning Policy:
Wind Energy Development

SEA Environmental Report

February 2010

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ENVIRONMENTAL REPORT

Shetland Islands Council

Strategic Environmental Assessment (SEA): Environmental Report for Shetland Islands Council Interim Planning Policy: Wind Energy Development

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ENVIRONMENTAL REPORT

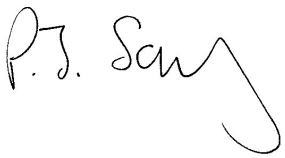
Shetland Islands Council

Strategic Environmental Assessment (SEA): Environmental Report for Shetland Islands Council Interim Planning Policy: Wind Energy Development

For and on behalf of Natural Capital Ltd

Approved by: Dr Phil Say

Signed:



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SHETLAND ISLANDS COUNCIL WIND ENERGY DEVELOPMENT INTERIM PLANNING POLICY

SEA ENVIRONMENTAL REPORT
NON-TECHNICAL SUMMARY

1 INTRODUCTION

1.1 STATUTORY CONTEXT FOR THE SEA

The Environmental Assessment (Scotland) Act 2005 (the Scottish SEA Act) is the statutory mechanism by which the requirements of the European Directive 2001/42/EC – "On the assessment of the effects of certain plans and programmes on the environment" (known as the Strategic Environmental Assessment or SEA Directive) are delivered in Scotland. The purpose of the SEA Directive is twofold. Firstly it aims to provide for a high level of protection of the environment and secondly ensure that environmental considerations are taken into account in the preparation and adoption of plans. This should promote sustainable development as part of the planning process.

Current guidance (specifically the Scottish Executive's[1] September 2006 Strategic Environmental Assessment Tool Kit) confirms that SEA will be required for all plans and strategies that are likely to have a significant affect on the environment.

Shetland Islands Council recognises that the delivery of its Interim Planning Policy: Wind Energy Development (Wind Energy IPP) Policies could, if not managed sustainably, result in significant impacts on the environment. It is therefore appropriate that a plan of this nature should be subject to SEA and appraised fully so that any possible negative effects can be mitigated against and the positive effects strengthened as far as is possible.

1.2 PURPOSE OF THE ENVIRONMENTAL REPORT

The purpose of this Environmental Report (ER) is to set out the findings of an environmental assessment of Shetland Islands Council Wind Energy IPP. In accordance with Part 2 of the Environmental Assessment (Scotland) Act 2005, the ER identifies, describes and evaluates the likely significant effects on the environment of implementing the Wind Energy Development IPP and the reasonable alternatives that have been assessed.

The report is intended to provide this information for the Consultation Authorities and the general public during public consultation on the Wind Energy Development IPP.

[1] Now known as Scottish Government

2 THE WIND ENERGY DEVELOPMENT PLAN AND ITS CONTEXT

2.1 KEY INFORMATION

Box NTS 1 Summarises the key information about the Wind Energy IPP.

Box NTS 1 Summary of Key Facts relating to the Wind Energy IPP

Name of Responsible Authority: Shetland Islands Council
Title of Plan/Programme: Interim Planning Policy: Wind Energy Development
What prompted the Plan: The Shetland Islands Council Corporate Plan (2008) seeks to support the development of a large wind farm on Shetland, which will contribute to the national target of energy generated from renewable sources, increase the local skills base, and provide a security of income in the face of a declining oil industry. The SIC Corporate Plan also sets a target of reducing Shetland's CO2 emissions by 30% by 2020.
Plan Subject: Sets the framework by which wind energy projects on Shetland will be developed
Period covered by Plan: The current Local Plan was adopted 2004-2012. However, as the review of current policy is underway it is envisaged that all IPP's will become Supplementary Guidance alongside the new Local Development Plan in 2012
Frequency of Updates: A review of LDP policies will occur every 5 years
Plan Area: All areas of Shetland Islands Council activities
Plan Purpose/Objectives: To provide location, design and policy for Wind Energy Development within Shetland
Contact Point: Hannah Nelson, Planning Officer, Development Plans, Shetland Islands Council

2.2 OUTLINE AND OBJECTIVES OF THE WIND ENERGY IPP

The Spatial Policies, Development Management Policy and Criteria and Broad Areas of Search of the Wind Energy IPP are listed in Tables NTS 1, NTS 2 and NTS 3 below. These Policies, Criteria and Broad Areas of Search are the drivers behind the Wind Energy IPP and will shape the development of the plan. The Environmental Report focuses on an assessment of these key features.

Table NTS 1: Spatial Policies

Policy LDP WED SP1	Off-Shore Wind Energy Development
Policy LDP WED SP2	The Areas to be Afforded Significant Protection
Policy LDP WED SP3	All Other Areas

Table NTS 2: Development Management Policy and Criteria

WED DM1	Development Management Policy
1	Biodiversity
2	Geodiversity
3	Landscape and Visual Impact
4	Historical and Archaeological Environment
5	Impact on Water Resources
6	Impact on Quality of Life and Amenity
7	Availability of Grid Connection
8	Peat and Soil Disturbance
9	Aviation

Table NTS 3: Broad Areas of Search

Map 1	Landscape Sensitivity
Map 2	Areas to be Afforded Significant Protection
Map 3	Areas of Likely Significant Constraint
Map 4	Broad Area of Search
Map 5	Spatial Distribution of Other Constraints

3 THE SEA PROCESS

3.1 INTRODUCTION

The approach to the SEA has followed a series of defined stages:

- review of relevant plans and programmes which both underpin the Wind Energy IPP and which provide direction for the SEA of the Wind Energy IPP ;
- identification and review of relevant aspects of the current state of the environment that relate to sustainable construction and design and that could be influenced by the implementation of the Wind Energy IPP;
- identification of existing and potential future environmental issues which may influence or be influenced by the Wind Energy IPP;
- identification of SEA objectives to guide the Wind Energy IPP appraisal taking account of the objectives in other plans and programmes, the identified issues and the current baseline;
- scoping of environmental issues to be appraised in the SEA;
- environmental assessment of the policies within the Wind Energy IPP; and
- establishing any appropriate mitigation and proposals for monitoring the implementation of the Wind Energy IPP.

3.2 SEA OBJECTIVES

A set of SEA objectives have been defined based on:

- the environmental topics of Schedule 3 of the Scottish Act ;
- the Policies within the Wind Energy IPP;
- objectives from other relevant plans and programmes;
- environmental issues and problems identified as part of the baseline analysis during the scoping stage.

The objectives have been developed to provide a consistent and clear basis for the appraisal of the Minerals IPP.

4 ENVIRONMENTAL ASSESSMENT OF THE WIND ENERGY DEVELOPMENT IPP

4.1 ALTERNATIVES AND DEVELOPMENT OF THE PLAN

The SEA Directive and the Scottish SEA Act require the Environmental Report to consider the impacts of alternatives to the proposed plan as part of the SEA. There have not been any literal “alternatives” to the Wind Energy IPP and its suite of policies since SIC has sought an integrated and balanced approach to policy development right from the start. Rather than developing alternative policies SIC has evolved its policy document in an iterative way making use of the SEA process during this “evolution” to remove any undesirable environmental effects, should they exist, and to make sure that environmental sustainability elements within the policies were strengthened where possible.

As a result, therefore, of this iterative assessment and consultation process some of the supporting text and objectives within the Wind Energy IPP have been refined. The following summarises the overall impact that the SEA process has had in the evolution of the Wind Energy IPP and the key changes made:

- widening of the understanding of the impact that developments can have through interactions with consultees;
- consideration of flood risks associated with future developments;
- recognition of the need to consider embodied energy and carbon associated with the manufacturing and construction of plant and equipment used in wind energy developments.

4.2 FUTURE OF THE ENVIRONMENT IN THE ABSENCE OF THE WIND ENERGY IPP

Given that the objective of developing a large wind farm on Shetland is asserted in the Shetland Islands Council Corporate Plan (2008), the absence of up to date wind energy development policies (which the Wind Energy IPP presents) would mean that such development would either fail to be realised or would proceed without full consideration of the social, economic and environmental impacts such a project could have.

Existing Local Plan and Structure Plan policies (Local Plan policy ENG 6 and ENG 7 and Structure Plan policies ENG 3 and ENG 4), along with the Shetland Energy Plan do provide a framework for the development of renewable energy in general but do not focus specifically on wind energy and, being some years old, are likely to be less in touch with best practice and less in tune with changing legislation. It is difficult to predict the likely evolution of some environmental aspects without the Wind Energy IPP. However assumptions have allowed some trends to be assessed and these are reported in the Environmental Report.

A cable connecting Shetland to the mainland would be required for any major development in renewable energy in Shetland and this could facilitate further opportunities in development of marine renewable energy in the future.

4.3 ENVIRONMENTAL BASELINE

Details of the current state of the environment in the study area and how this might change in the future in the absence of the Wind Energy Development IPP and the environmental characteristics of the area likely to be affected by the plan were identified and are described in the Environmental Report.

Key environmental issues highlighted by the baseline data included biodiversity (flora and fauna), climate change, health, hydrology and flooding, material assets and waste management, landscape and visual effects and cultural heritage.

Environmental baseline data were taken into account when assessing the Wind Energy IPP policies including existing landscape, ecological, cultural heritage, and water features and statutory and local designations. This helped ensure that environmental considerations played a key role in ensuring that all policies exist within a framework which has taken full account of relevant environmental considerations.

Schedule 2 of the Scottish Act requires that the Environmental Report includes a description of existing environmental problems, especially those relating to any areas of particular environmental importance. The purpose of this section of the Environmental Report is to explore the key environmental issues that are relevant to SIC and whether the Wind Energy IPP is likely to have an effect either positively or negatively on these issues. This review of environmental problems, issues and opportunities across Shetland, both strategically and in the context of the Wind Energy IPP, has been undertaken by the environmental assessment team.

4.4 ENVIRONMENTAL IMPLICATIONS

Building on the assessment that was undertaken for the individual policies of the Wind Energy IPP, the Wind Energy IPP has been considered as a whole in the context of the SEA Topics. The Environmental Report outlines the environmental effects that are predicted to arise as a result of the adoption of the draft Wind Energy IPP and are summarised. In reaching the conclusions included in the Environmental Report, professional judgement has also been exercised in considering the likelihood of secondary, cumulative, indirect and synergistic effects arising from the adoption of the proposed Wind Energy IPP.

Overall, the assessment finds that the adoption of the plan will result in an improvement on the potential environmental consequences of adopting the "do minimum" approach.

Where appropriate, mitigation that is contained within the Plan is outlined and further suggestions for strengthening this are made.

4.5 POSITIVE IMPLICATIONS

In general terms the Wind Energy IPP does not generate any strongly negative environmental effects and puts into place a suite of Development Management Criteria that will mitigate against inappropriate and environmentally damaging wind energy development. Overall the Wind Energy IPP is likely to deliver a positive contribution to the broad environmental trends for Shetland. In the absence of the policies and Development Management Criteria the evolution of the SEA topic areas in general would be likely to show an adverse trend.

Overall, in environmental terms, the Wind Energy IPP aims to:

- facilitate the creation of more sustainable forms of energy generation (from renewables) in line with the SIC Corporate Plan (2008);
- identify spatially, those geographical areas of Shetland least able to support wind energy because of their environmental, social, historical or visual sensitivity;
- outline the specific criteria planning applications for wind energy development must meet, in order to minimise the potential environmental impacts of wind energy development (e.g. air quality, water quality, visual etc);
- emphasise the importance of the protection of the natural and cultural heritage designations;
- ensure that new developments are environmentally sustainable.

The suite of policies attempt to address:

Climatic Factors

Through:

- outlining the circumstances under which wind energy development can take place in order to optimise the carbon saving potential of this form of renewable energy while ensuring Shetland's environment and unique character are protected;
- seeking to encourage the application of sustainable development principles (that will include addressing the use of fossil fuels, energy efficiency, the role

of renewables and climate change issues) through the requirements built into key overarching policies.

Use of Natural resources and Material Assets

Through:

- ensuring that waste is minimised and that reused or recycled materials are used wherever possible in wind energy development;
- directing development of wind energy away from inappropriate land (such as locally protected areas).

Population and Health

Through:

- seeking to encourage the application of best practice principles, that will include: addressing emissions of noise, shadow flicker from aerogenerators and other nuisances that can affect public health and well-being, addressing traffic and transport issues, addressing the need to maintain visual amenity, ensuring that water supply and quality is not affected by developments and through the requirements built into key overarching policies and development criteria;
- ensuring that the cumulative impact of numerous wind energy developments and their associated infrastructure is taken into consideration when assessing the impacts of a single wind energy development application.

Air

Through:

- facilitating the growth of renewable energy in place of existing energy production, which relies on fossil fuels (e.g. oil or solid fuel such as peat);
- ensuring that nuisances caused by construction (noise, dust, etc) are minimised.

Soils and Geology

Through:

- outlining a requirement for wind energy development to minimise disturbance of soil and peat in order to protect against peat slip and carbon emissions;
- protecting sites designated for their geological importance (including Sites of Special Scientific Interest and the newly designated Shetland Geopark).

Water

Through:

- seeking to encourage the application of best practice principles (that will include surface water drainage and management, groundwater/hydrogeological survey and management, site- specific measures to minimise pollution etc) through the requirements built into specific Development Management Criteria.

Landscape, Biodiversity and Cultural Heritage

Through:

- seeking to encourage the application of sustainable development principles (that include recognising the importance of biodiversity, landscape and cultural heritage and the implementation of measures such as assessing the landscape and ecological value of development proposals, assessing archaeological remains and historic features and implementing measures for their preservation and recording, etc) through the requirements built into specific Development Management Criteria;
- identifying spatially, those geographical areas of Shetland least able to support wind energy because of their environmental, social, historical or visual sensitivity;
- encouraging the adoption of environmental management systems and environmental performance standards to address the effects of developments on biodiversity, landscape and seascape, the historic environment and cultural heritage.

4.6 INDIRECT ENVIRONMENTAL IMPLICATIONS

Notwithstanding the above positive elements it is likely that there will be some environmental implications arising from any new wind energy developments that ultimately will come on stream as a consequence of this Wind Energy IPP. Some issues are almost inevitable, and would arise as a result of any new type of development and these include:

- emissions of greenhouse gases from energy use and traffic both during construction and operational activities;
- embodied energy and carbon in plant and equipment used in wind energy developments;
- an increased burden on air quality from emissions generated by plant and equipment as well as traffic associated with any developments;
- threats to the water and soil environment from construction activities and changes to on-site drainage as a result of the development.

Other issues are highly dependant on the nature, scale and location of particular developments. It is not inconceivable that some future developments might have implications for biodiversity (for example damage to habitats, disturbance of species and loss or damage to particular flora and fauna), landscape and historic character (including visual impact, effects on landscape and historic features) and wider transport impacts during construction, operation and maintenance.

Although SIC can and does influence developers to adopt sustainable development principles and best practice in avoiding and/or mitigating any of these effects it has no direct control over the operation of individual developments. It is assumed that some of the above implications would be picked up more specifically by controls exerted by other agencies such as Scottish Natural Heritage, Scottish Environment Protection Agency (SEPA) and Historic Scotland.

4.7 POSSIBLE CUMULATIVE EFFECTS ASSOCIATED WITH THE WIND ENERGY IPP

A summary of the assessment of the possible cumulative effects is given in the Environmental Report. Clearly to deal with some of the effects there will need to be supporting action at the Government or Agency level, for example to help deal with:

- **energy** supply and **CO_2** emissions;
- reliance on **fossil fuels**;
- **embodied energy** and **carbon**;
- **traffic** and transportation alternatives;
- **waste** management and disposal;
- **wate**r supply and treatment; and
- wider **biodiversity and geodiversity conservation** issues.

However the Wind Energy IPP has a significant role to play in contributing to the management and mitigation of those effects associated with the role of SIC as the Planning Authority. In particular the Wind Energy IPP policies and Development Management Criteria can:

- steer new wind energy developments away from sites of nature conservation, landscape and seascape, historic and cultural heritage importance;
- address the contribution of the renewable energy development sector in Shetland to more global level issues (e.g. climate change, use of fossil fuels and energy, waste generation, loss of biodiversity) through influencing action at the local (Shetland) level;
- address resource use and material asset issues through encouraging more sustainable design and construction within new wind farm developments (e.g. effective waste minimisation, use of low embodied carbon materials in manufacture, fabrication and construction of turbines and associated infrastructure, sustainable sourcing of materials etc); and
- create the right development policy framework and approach to site design, location and construction that will help to provide proactive solutions to these problems.

4.8 PROPOSED MITIGATION

The precise effects of some of the Wind Energy Development IPP overarching policies and Development Management Criteria are clearly going to be difficult to predict at a very local level. The effects, whether positive, negative or cumulative will depend on:

- how policies are implemented on the ground;
- the precise nature of any proposed wind energy developments that are taken forward;
- the environmental characteristics of the potential locations.

Mitigation has been developed within the wording of policies and in particular the Development Management Criteria and there were no cases where any of these were found to generate an overall negative environmental impact or clear, strong negative impacts on any of the SEA objectives. It is of course important to recognise that the policies and criteria must be simultaneously applied and not considered in isolation. Details of the proposed mitigation are described in full in the Environmental Report.

4.9 MONITORING

Monitoring of the effects of implementing the plan will be based on the performance of a set of key indicators. Monitoring will be undertaken by regimes currently in place for local authority infrastructure maintenance and also delivered by the environmental regulators.

Monitoring will rely on the continued day-to-day management and site knowledge of those managing land for which they have responsibility, and the ongoing activities of the environmental regulators.

5 NEXT STEPS

The following stages in the development of the Wind Energy Development IPP and its environmental assessment are envisaged:

- The Environmental Report, which reports the findings of the SEA of the Wind Energy Development IPP will be published for consultation alongside the IPP. This is programmed for March 2010, and the consultation period is scheduled to last for 8 weeks.
- Following consultation on the IPP and the Environmental Report, the Wind Energy Development IPP will be revised and updated where necessary taking account of the comments received.
- Following revision of the IPP, an SEA Statement will be prepared and made available to the Consultation Authorities and the public, setting out how the findings of consultation and the environmental assessment have been incorporated into the development of the Wind Energy Development IPP.

It is intended to finalise the IPP and associated documents by June 2010 and it is anticipated that the Wind Energy Development IPP will be adopted in July 2010.

6 COMMENTS

Any queries on the SEA of the Shetland Wind Energy Development IPP should be addressed to:

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Infrastructure Services
Shetland Islands Council
Grantfield
Lerwick
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Email: development.plans@shetland.gov.uk

Telephone: 01595 744843

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ANNEXES

1 INTRODUCTION

1.1 CONTEXT OF THE INTERIM PLANNING POLICY: WIND ENERGY DEVELOPMENT

1.1.1 Statutory Context for the SEA

The Environmental Assessment (Scotland) Act 2005 (the Scottish SEA Act) is the statutory mechanism by which the requirements of the European Directive 2001/42/EC – "On the assessment of the effects of certain plans and programmes on the environment" (known as the Strategic Environmental Assessment or SEA Directive) are now delivered in Scotland. The purpose of the SEA Directive is twofold. Firstly it aims to provide for a high level of protection of the environment and secondly ensure that environmental considerations are taken into account in the preparation and adoption of plans. This should promote sustainable development as part of the planning process (see Section 1.4).

Current guidance (specifically the Scottish Executive's[1] September 2006 Strategic Environmental Assessment Tool Kit) confirms that SEA will be required for all plans and strategies that are likely to have a significant affect on the environment (see Section 2.2 below).

The Council recognises that the delivery of its Interim Planning Policy: Wind Energy Development (Wind Energy IPP) Policies (see Section 3.2) could, if not managed sustainably, result in significant impacts on the environment. It is therefore appropriate that a plan of this nature should be subject to SEA and appraised fully so that any possible negative effects can be mitigated against and the positive effects strengthened as far as is possible.

1.1.2 Purpose of the Environmental Report

The purpose of this Environmental Report is to set out the findings of an environmental assessment of Shetland Islands Council Interim Planning Policy: Wind Energy Development (Wind Energy IPP). In accordance with Part 2 of the Scottish SEA Act, the Environmental Report identifies, describes and evaluates the likely significant effects on the environment of implementing the Wind Energy IPP and the reasonable alternatives that have been assessed.

The report is intended to provide this information for the Consultation Authorities[2] and the general public during public consultation on the Wind Energy IPP. Further information on consultation for the Wind Energy IPP and SEA is presented in Sections 1.5 and 2.7 and in Annex C.

1.1.3 Sustainable Development

In March 2005 Scotland signed up to a new UK shared framework for sustainable development, One future – different paths[3] which set out a common goal for sustainable development across the UK:

- "to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life for future generations"

This framework set out five shared principles of sustainable development:

[1] Now known as Scottish Government
[2] Scottish Natural Heritage, Scottish Environment Protection Agency and Historic Scotland
[3] DEFRA (2005) *One future – different paths* – UK Shared Framework for Sustainable Development

- Living within Environmental Limits
- Ensuring a Strong, Healthy and Just Society
- Achieving a Sustainable Economy
- Promoting Good Governance
- Using Sound Science Responsibly

Scottish Ministers set out their aims for sustainable development in 'Choosing our Future – Scotland's Sustainable Development Strategy'[4]. The main thrust of the strategy is enshrined in four key goals:

- The well being of Scotland's people
- Supporting thriving communities
- Scotland's global contribution
- Protecting Scotland's natural heritage and resources

The Scottish Government in 2007 further developed these into five policies:

- **Strategic Objective 1:** Wealthier and Fairer - Enable businesses and people to increase their wealth and more people to share fairly in that wealth.
- **Strategic Objective 2:** Healthier - Help people to sustain and improve their health, especially in disadvantaged communities, ensuring better, local and faster access to health care.
- **Strategic Objective 3:** Safer and Stronger - Help local communities to flourish, becoming stronger, safer place to live, offering improved opportunities and a better quality of life.
- **Strategic Objective 4:** Expand opportunities for Scots to succeed from nurture through to life long learning ensuring higher and more widely shared achievements.
- **Strategic Objective 5:** Improve Scotland's natural and built environment and the sustainable use and enjoyment of it.

There is a strong environmental strand running through the above goals and policies particularly Strategic Objective 5, so testing Shetland Islands Council's Wind Energy IPP against the requirements of the SEA Act in Scotland will make sure that the Council's approach to development planning for construction and design is effective in protecting the environment whilst at the same time contributing to sustainable development.

1.1.4 SEA Activities to Date

The Environmental Report brings the results of all of these activities together and then goes on to describe:

- an assessment of the Wind Energy IPP Policies against the SEA Objectives, as laid out in the SEA Scoping Report (see Annex A);
- an assessment of the Wind Energy IPP as a whole, including alternatives and cumulative effects (see Chapter 5); and
- the proposals for any mitigation measures, and monitoring of the implementation of the Wind Energy IPP (see Sections 5.6 and 5.7).

[4] The Scottish Executive (2005) *Choosing our Future* – Scotland's Sustainable Development Strategy

The next steps for the SEA, including those for public consultation and finalisation and adoption of the Wind Energy IPP are set out in Chapter 6. Box 1 summarises the key facts relating to the Wind Energy IPP.

Box 1 Summary of Key Facts relating to the Wind Energy IPP

Name of Responsible Authority: Shetland Islands Council

Title of Plan/Programme: Interim Planning Policy: Wind Energy Development
What prompted the Plan: The Shetland Islands Council Corporate Plan (2008) seeks to support the development of a large wind farm on Shetland, which will contribute to the national target of energy generated from renewable sources, increase the local skills base, and provide a security of income in the face of a declining oil industry. The SIC Corporate Plan also sets a target of reducing Shetland's CO2 emissions by 30% by 2020.
Plan Subject: Sets the framework by which wind energy projects on Shetland will be developed
Period covered by Plan: The current Local Plan was adopted 2004-2012. However, as the review of current policy is underway it is envisaged that all IPP's will become Supplementary Guidance alongside the new Local Development Plan in 2012
Frequency of Updates: A review of LDP policies will occur every 5 years
Plan Area: All areas of Shetland Islands Council activities
Plan Purpose/Objectives: To provide location, design and policy for Wind Energy Development within Shetland

Contact Point: Hannah Nelson, Planning Officer, Development Plans, Shetland Islands Council

1.2 LAYOUT OF THE REPORT

The remainder of the document is structured as follows:

- Chapter 2: sets out the appraisal methodology including SEA guidance and the response to the statutory consultation;
- Chapter 3: describes the Wind Energy IPP and its context together with the links with other relevant plans and programmes;
- Chapter 4: describes the environmental baseline and key environmental issues and discusses the future of the environment without the implementation of the Wind Energy IPP;
- Chapter 5: presents the results of the environmental assessment including the assessment of alternatives, the proposed mitigation and proposals for monitoring; and
- Chapter 6: describes the next steps including the proposed stages and key milestones.

The main text is supported by the following annexes:

- Annex A: SEA Appraisal of Wind Energy IPP Policies
- Annex B: Review of Relevant Plans, Programmes and Strategies
- Annex C: Summary of Statutory Consultee Responses
- Annex D: SEA Scoping Report
- Annex E: Assessment of Cumulative Effects
- Annex F: Bibliography
- Annex G: SIC SEA Workshop Report

2 APPRAISAL METHODOLOGY

2.1 INTRODUCTION

This section presents a summary of the methods used to carry out the environmental assessment of the Wind Energy IPP. The approach to SEA is described first followed by the guidance that has been used to shape the development of the Environmental Report. This is then followed by a summary of the SEA objectives to be used in the assessment followed by a summary of the scoping process carried out by the Council. The assessment methods are set out in Section 2.6 and the chapter is concluded with a description of the response to the statutory consultation on the Scoping Report.

2.2 OVERALL APPROACH TO SEA

The approach to the SEA has followed a series of defined stages:

- review of relevant plans and programmes which both underpin the Wind Energy IPP and which provide direction for the SEA of the Wind Energy IPP (see Chapter 3, Table 3.2 and Annex B);
- identification and review of relevant aspects of the current state of the environment that relate to sustainable construction and design and that could be influenced by the implementation of the Wind Energy IPP (see Section 4.2);
- identification of existing and potential future environmental issues which may influence or be influenced by the Wind Energy IPP (see Section 4.3);
- identification of SEA objectives to guide the Wind Energy IPP appraisal taking account of the objectives in other plans and programmes, the identified issues and the current baseline (see Section 2.4);
- scoping of environmental issues to be appraised in the SEA (see Section 2.5);
- environmental assessment of the policies within the Wind Energy IPP (see Section 5.3 and Annex A); and
- establishing any appropriate mitigation and proposals for monitoring the implementation of the Wind Energy IPP (see Section 5.6 and 5.7).

2.3 SEA GUIDANCE

This Environmental Report has been prepared with reference to the following SEA legislation and guidance:

- The SEA Directive;
- The Scottish SEA Act;
- Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive;
- Scottish Executive (2003) Environmental Assessment of Development Plans, Interim Planning Advice;
- Scottish Executive (2006) SEA Toolkit;
- Guidance on the SEA Directive produced by the Office of the Deputy Prime Minister, which identifies a series of requirements for the SEA.

The main requirements set out in the SEA Directive are summarised in Table 2.1 along with a comment as to their status in the SEA of the Wind Energy IPP.

Table 2.1 SEA Directive Guidance

Requirements		Response within SEA of Wind Energy IPP
a)	Outline of the contents, main objectives of the plan and relationship with other relevant plans	Addressed within Sections 3.2 and 3.3 of this Environmental Report
b)	Relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan	Addressed within Table 4.19 of this Environmental Report
c)	Environmental characteristics of areas likely to be significantly affected	Addressed within Section 4 of this Environmental Report
d)	Existing environmental problems which are relevant to the plan	Addressed within Section 4.3 of this Environmental Report
e)	Environmental protection objectives established at international, Community or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation	Addressed within Section 2.4 and Table 2.2 of this Environmental Report
f)	Likely significant effects on the environment	Addressed within Section 5.4 and Annex E of this Environmental Report
g)	Measures envisaged to prevent, reduce and as fully as possible offset significant adverse effects on the environment of implementing the plan	Addressed within Section 5.6 and Annex E of this Environmental Report
h)	Outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties	Addressed within Section 5.2 of this Environmental Report
i)	Description of measures envisaged concerning monitoring in accordance with Article 10	Addressed within Section 5.7 of this Environmental Report
j)	Non-technical summary of the information provided under the above headings	A non-technical summary of this Environmental Report appears at the beginning of this document

A full list of plans and programmes reviewed as part of the SEA work undertaken to date is included in Annex B and sources of reference for the environmental baseline are included in Annex F.

2.4 SEA OBJECTIVES

The Scottish SEA Act does not require the generation of SEA objectives by Shetland Islands Council to appraise the potential effects of the Wind Energy IPP. However, environmental protection objectives from other policies, plans and programmes should be taken into consideration where they are appropriate. The development of specific SEA objectives and indicators is a recognised way in which environmental effects can be described, analysed and compared. SEA objectives will describe the intent and desired direction of environmental change, whilst indicators will measure the performance of the Wind Energy IPP against these objectives (for indicators see later in Section 5.7 and in Table 5.4).

To fulfil the requirements of the SEA Directive and Schedule 3 of the Scottish SEA Act the SEA objectives should cover:

- '…. biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape and the interrelationships between them.'

Table 2.2 summarises SEA objectives for the Wind Energy IPP. The objectives have been developed by the Council during the scoping stage and are designed to consolidate:

- the environmental topics of Schedule 3 of the Scottish Act ;
- the Policies within the Wind Energy IPP;
- objectives from other relevant plans and programmes;
- environmental issues and problems identified as part of the baseline analysis during the scoping stage.

Table 2.2 SEA Objectives for the Wind Energy IPP

SEA Topic	SEA Objectives
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity
Population	2. To improve the quality of life for people and communities across Shetland
Human Health	3. To improve the quality of health in Shetland
Soils and Geology	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner
Water	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably
Air	7. To protect Shetland's air quality
Climatic Factors	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target[5] 9. To adapt to the predicted effects of climate change
Material Assets	10. To promote the sustainable use of Shetland's natural resources
Cultural Heritage	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded

2.5 SCOPING THE APPRAISAL

In accordance with the Scottish SEA Act, the Council considered whether the environmental effects (positive and negative) of the Wind Energy IPP were likely to be significant. This initial scoping assessment was based on preliminary information about the scope of objectives and nature of the developments likely to feature in the emerging Wind Energy IPP, the known environmental baseline likely to be affected by the plan and the likely environmental issues[6].

[5] The Climate Change (Scotland) Act 2009 received Royal Assent on August 5, 2009 and has introduced a statutory target to reduce Scotland's greenhouse gas emissions by at least 80 per cent by 2050
[6] Shetland Islands Council (2009) Interim Planning Policy: Wind Energy Development SEA Scoping Report

The scoping process concluded that no SEA issues should be scoped out and so all the SEA objectives will be taken forward for assessment against the policies of the Wind Energy IPP.

2.6 ASSESSMENT METHODS

The Wind Energy IPP currently contains thirty three policies, seven of which will sit within the Local Development Plan (LDP) – when published – and twenty six of which will comprise a Supplementary Planning Guidance (SPG) document. In order to assess the potential effects of these policies, and in doing so evaluate the effects of the Wind Energy IPP, a framework approach was used. The SEA framework (see Table 2.3) was developed following the work undertaken during the scoping stage. It was based on the SEA objectives presented in Section 2.4 and Table 2.2 above. A set of appraisal criteria was developed, drawn from the literature, the study team's own experience and feedback from the Council. These criteria have been used to focus the appraisal of the twenty five Policies against the SEA objectives.

Table 2.3 SEA Appraisal Framework

SEA Topic	SEA Objectives	SEA Questions
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity	• Does the policy impact on plants and animals? • Does the policy conserve and protect biodiversity? • Does the policy contribute to the aims of the Local Biodiversity Action Plan? • Does the policy contribute to public awareness and understanding about biodiversity?
Population	2. To improve the quality of life for people and communities across Shetland	• Does the policy contribute towards improving quality of life for people and communities across Shetland
Human Health	3. To improve the quality of health in Shetland	• Does the policy contribute towards improving the quality of health associated with the environment (Air quality, water quality, noise and vibration)? • Does the policy contribute to the goal of creating active, healthy lifestyles for Shetland islanders? • Does the policy contribute towards improving access to health and care services for all Shetland islanders?
Soil	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	• Does the policy protect Shetland's peat, soil and geological resources? • Does the policy encourage the use of them only in a sustainable manner?
Water	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably	• Does the policy protect and enhance freshwater and marine water quality? • Does the policy ensure that Shetland's water resources are used effectively and sustainably? • Does the policy protect the integrity of the physical aspect of the water environment? • Does the policy promote a sustainable drainage infrastructure?
Air	7. To protect Shetland's air quality	• Does the policy pose any risks to air quality? • Does the policy encourage activities that could contribute to lowering air quality?

SEA Topic	SEA Objectives	SEA Questions
Climatic Factors	8. To reduce greenhouse gas emissions and to contribute to Scotland's 80% CO_2 reduction target 9. To adapt to the predicted effects of climate change	• Does the policy help in reducing greenhouse gas emissions? • Does the policy take account of the predicted effects of climate change, and adapt appropriately? • Is the risk or likelihood of flooding of any property, planned or existing, increased? • Will the policy put other assets at risk from flooding? • Will the policy ensure that people and property are protected from flooding?
Material Assets	10. To promote the sustainable use of Shetland's natural resources	• Does the plan or programme encourage the sutainable use of natural resources? • Will the policy lead to a reduction in the use of natural resources? • Does the policy encourage the use of local or imported materials? • Will the policy promote or enable greater use of recycling?
Cultural Heritage	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage	• Does the policy impact on the historic environment? • Does the policy conserve and protect the historic environment? • Does the policy help in raising public awareness and understanding of cultural heritage and how the public influence the continuing development of cultural heritage? • Does the policy conserve and enhance cherished aspects of local cultural heritage? • Does the policy contribute to local character, customs and traditions? • Will the policy affect the setting of any listed buildings, historic sites or culturally important sites?
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded	• Does the policy consider all landscape and seascape implications? • Does the policy contribute to landscape and seascape protection? • Does the policy enhance degraded landscapes and seascapes?

The SEA framework was used to predict the potential effects of individual interventions and the vision of the plan as a whole. Best practice guidance on evaluation was followed and the effects were considered in terms of their scale, the sensitivity of the resource, whether the effects were temporary or permanent, positive or negative, direct or indirect and whether there was the potential for effects to build up. Wherever the potential for significant environmental effects was identified the potential for mitigation was considered.

A simple scoring system was used to assess the Wind Energy IPP Policies against the SEA framework, as set out in Table 2.4.

Table 2.4 SEA Framework Scoring System

Clear contribution to the objective, very positive	✓✓
Broadly supportive	✓
Neutral, no discernible effect	0
Negative effect, incompatible	×
Very negative effect	××
Uncertain effect	?
Positive and negative effects	×✓

The findings of each assessment are set out in a matrix table based on the one in Table 2.5 and the full assessment is contained within Annex A. Each assessment is supported by text as appropriate to ensure that the summaries in the tables are auditable and the methods of assessment transparent. The text indicates where qualitative appraisal only has been possible and what information has been used to inform the findings and recommendations.

In undertaking the final appraisals of residual effects, the scale and nature of the effects was taken into account. The potential for cumulative environmental effects of the Wind Energy IPP has been evaluated in the light of the evolution of the environment without the plan (see Section 4.4).

Table 2.5 Example Matrix for Documenting the Assessment of Wind Energy IPP Policies

IPP Policy	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
Policy: XXX														
	To cover for example: - Likelihood/certainty of effect occurring - Geographical scale of effect - Whether temporary or permanent - Frequency of effects and potential for reversibility - Assumptions made in assessment - Future opportunities for mitigation - Potential for indirect effects - Potential for secondary effects - Potential for synergistic effects - Potential for cumulative effects - Requirements for consultation - Identification of any partners to deliver mitigation etc - Any recommendations for issues to be considered at different stages of the planning process - Recommendations for data collation **- etc**													
Policy: XXX														

2.7 RESPONSE TO STATUTORY CONSULTATION

2.7.1 Introduction

The responses of the three statutory consultees – the Scottish Environment Protection Agency, Scottish Natural Heritage and Historic Scotland to the consultation process on the Scoping Report are summarised in Annex C. A brief summary of the responses is given below.

2.7.2 Historic Scotland

Some constructive comments were provided with regard to the context of the historic environment together with recommendations for the inclusion of recent changes in policy background. These have now been included. Data were provided on the number of listed buildings, gardens and designed landscapes and this information was used to update the relevant section of the environmental baseline. There were also some helpful comments with regard to the possible impact on historic sites from wind developments and the need to fully document the process of considering alternative objectives and policies. These points have been taken up and reflected in the environmental report.

2.7.3 Scottish Environment Protection Agency (SEPA)

Highlighted the issue of waste materials generation, specifically waste peat and overburden associated with wind developments and related to this suggested the need for inclusion of deep peat location in the baseline. The baseline was amended to reflect this comment and the point was further brought out in the assessment, signposting this information and highlighting the requirement for potential developers to take account of it. The point was made that the assessment matrix should be edited to reflect the identification of likely significant effects and then identification of mitigation methods to overcome these effects. The appraisal matrix was adjusted in accordance with this comment. The useful recommendation was made that the Environmental Report should clarify how the assessment impacted on the policies being consulted upon, this approach has been incorporated in the Environmental Report.

2.7.4 Scottish Natural Heritage (SNH)

Constructive comments were provided on some additional plans and programmes that should be included for review and these have now been reviewed. Various comments were made on the natural heritage present in Shetland and these have been incorporated to the environmental baseline section of the Environmental Report. SNH noted a number of inaccuracies within the tables listing the designated features of the SACs and SPAs of Shetland, these have been amended in this report. SNH also made further corrections to the tables listing protected sites (SSSIs, NNRs etc) and details of RSPB reserves. Useful comments on protected species and habitats of Shetland were made and these were incorporated into the baseline information. The relevance of a number of 'Current Environmental Issues' to the IPP was questioned and SNH made suggestions for additional issues that should be included so the text was edited accordingly. Finally a suggestion for a biodiversity indicator was given which has been incorporated.

3 PLAN CONTEXT

3.1 INTRODUCTION

The Shetland Islands Council Corporate Plan (2008) seeks to support the development of a large wind farm on Shetland, which will contribute to the national target of energy generated from renewable sources, increase the local skills base, and provide a security of income in the face of a declining oil industry. The Wind Energy IPP is therefore needed in order to steer wind energy development towards the most suitable locations in terms of sustainability, economic, social and environmental parameters.

This section provides a brief summary of the Wind Energy IPP together with its key objectives. The links to other relevant plans, programmes and strategies (PPS) are then described setting out the main environmental objectives of these PPS and the corresponding implications for the Wind Energy IPP. A more extensive list with implications for the Wind Energy IPP is provided in Annex B.

3.2 OUTLINE AND OBJECTIVES OF THE WIND ENERGY IPP

The Spatial Policies, Development Management Policy and Criteria and Broad Areas of Search of the Wind Energy IPP are listed in Tables 3.1, 3.2 and 3.3 below.

Table 3.1: Spatial Policies

Policy LDP WED SP1	Off-Shore Wind Energy Development
Policy LDP WED SP2	The Areas to be Afforded Significant Protection
Policy LDP WED SP3	All Other Areas

Table 3.2: Development Management Policy and Criteria

WED DM1	Development Management Policy
1	Biodiversity
2	Geodiversity
3	Landscape and Visual Impact
4	Historical and Archaeological Environment
5	Impact on Water Resources
6	Impact on Quality of Life and Amenity
7	Availability of Grid Connection
8	Peat and Soil Disturbance
9	Aviation

Table 3.3: Broad Areas of Search

Map 1	Landscape Sensitivity
Map 2	Areas to be Afforded Significant Protection
Map 3	Areas of Likely Significant Constraint
Map 4	Broad Area of Search
Map 5	Spatial Distribution of Other Constraints

These Policies, Criteria and Broad Areas of Search are the drivers behind the Wind Energy IPP and will shape the development of the plan. The Environmental Report focuses on an assessment of these key features (see Section 5 and Annex A).

3.3 LINKS TO OTHER RELEVANT POLICIES, PLANS AND PROGRAMMES

An understanding of the relevance of other legislation, policy and plans to the Wind Energy IPP is an essential step in understanding the context for the Wind Energy IPP and in deriving the necessary baseline for the assessment. A summary list of the policies, plans and programmes together with their environmental objectives relevant to the Wind Energy IPP are presented in Table 3.4 below. These were used to help shape the SEA objectives in Table 2.2. Other plans and programmes, together with more details on the key environmental messages used to shape the SEA objectives and how these have been taken into account within the SEA, are given in Annex B.

Table 3.4 Summary of Representative Plans, Programmes and Strategies (PPS) relevant to the Wind Energy IPP (see Annex B for more details)

Policy, Plan or Programme	Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP
National	
Scottish Planning Policy: October 2008	Protection and enhancement of the national and built environment – key policy direction
Biodiversity: The UK Action Plan (1994)	The plan assesses the current status of the UK's habitats and species and sets out a strategy for their future conservation and enhancement
Scottish Biodiversity Strategy: Scotland's Biodiversity, Its in Your Hands (2004)	To conserve Scotland's biodiversity for future generations
Nature Conservation (Scotland) Act (2004)	This Act puts in place legal measures for the conservation of biodiversity .The Act places a "Biodiversity Duty" on Shetland Islands Council
The UK Strategy for Sustainable Development "Securing the Future" (2005)	To ensure the effective protection of the environment, maintenance of economic growth, employment and prudent use of natural resources
UK Climate Change Programme (2006)	To reduce greenhouse gas emissions. The UK target is to cut emissions by 12.5% below 1990 levels by 2008-2012
"Choosing Our Future": Scotland's Sustainable Development Strategy (2005)	Details the Scottish Government's strategy for tackling issues such as climate change, biodiversity, resource use and pollution
"Changing Our Ways" Scotland's Climate Change Programme (2006)	To make an equitable contribution to the UK commitment on climate change and enable Scotland to make the transition to a low carbon economy
Climate Change (Scotland) Bill (2009)	Sets a CO_2 reduction target for the year 2050, an interim target for the year 2020, and makes provisions for annual targets, for the reduction of greenhouse gas emissions; confers power on Ministers to impose climate change duties on public bodies and to make further provision with regard to mitigation of and adaptation to climate change
Water Environment and Water Services (Scotland) Act 2003	Ensures that all human activity that can have a harmful impact on water is controlled
Environment Protection Act 1990	This Act relates to the control of pollution and protection of the natural environment
Water Environment (Controlled Activities) (Scotland) Regulations 2005	Requires authorisation over point source discharges, abstractions, impoundments and engineering activities
The Air Quality Limit Values (Scotland) Regulations 2005	Limits values of relevant pollutants in ambient air which must be complied with
SPP6 : Renewable Energy (2007)	Delivery of renewable energy targets Need for spatial plans for large windfarms (>20 megawatts) Support for renewable energy developments must be

Policy, Plan or Programme	Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP
	compatible with protecting and enhancing the natural and historic environment
PAN 45 Annex : Planning for Micro-Renewables (2006)	Micro-renewables which can be integrated into new developments in the design stage
PAN 68 : Design Statements (2003)	Ensuring design principles and therefore environmental quality are at the centre of a proposed development
PAN 83 : Masterplanning (2008)	Key message – masterplanning ensures developments are designed successfully and in a sustainable manner, minimising impact on the environment
PAN 84 : Reducing Carbon Emissions in New Development (2008)	Good practice guidance and technical calculations to deliver low and zero carbon developments
Designing Places : A Policy Statement for Scotland (2001)	Ensure sensitive siting and design of all development making the most of its setting in the landscape
Scottish Planning Policy 23: Planning and the Historic Environment (SPP 23)	This SPP supercedes and consolidates National Planning Policy Guidelines – NPPG 18: Planning and the Historic Environment and NPPG 5: Archaeology and Planning. It sets out the national planning policy for the historic environment and indicates how the planning system will contribute towards the delivery of Scottish Ministers' policies as set out in the current Scottish Historic Environment Policy
Scottish Historic Environment Policy (SHEP)	This outlines Scottish Minister's policies on the Historic Environment and is produced by Historic Scotland. The key environmental protection objective of the legislation and policy framework is 'to protect and, where appropriate, enhance the historic environment'.
SPP1 The Planning System (2002)	To ensure that future planning contributes towards sustainable development
The Wildlife and Countryside Act (1981)	The Wildlife and Countryside Act 1981 is the principal legislation dealing with nature conservation in Britain. The SIC Construction and Design IPP should aim to promote the maintenance and enhancement of the UK's biodiversity.
Local and Regional	
Living Shetland Project: Local Biodiversity Action Plan (199)	Aims to engage with local communities to promote the conservation and restoration of local habitats and species
'Seas the Opportunity' A Strategy for the Long Term Sustainability of Scotland's Coasts and Seas (2005)	Strategy sets out aims to enhance and conserve the overall quality of Scotland's coasts and seas, their natural processes and their biodiversity
Shetland Regional Transport Strategy (2008)	Sets out strategy for development of an efficient and reliable transport system for Shetland
Orkney and Shetland Area Waste Plan (2003)	Sets out a waste management strategy for Orkney and Shetland. The Wind Energy Development IPP should develop measures aimed at controlling and reducing waste generation and associated environmental impacts
Shetland Islands Council Structure Plan (2000)	The Shetland Structure Plan 2000 sets out the general development strategy for the Shetland Islands and gives detailed guidance on all development including commercial and housing development. The Wind Energy Development IPP will be used to update the policies within the structure plan and so will be closely related to this document
Shetland Local Plan (2004)	Presents policies and recommendations for the development and use of land throughout Shetland Sets out policies in relation to all potential

Policy, Plan or Programme	Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP
	developments As above, the WED IPP will be used to update the policies within the local plan and so will be closely related to this document
Shetland Island Council Corporate Plan (2008)	Sets out measures aimed at achieving a range of 'Targets and Priorities' developed by the Community Planning Board
Shetland Islands Council Priorities & Targets (2007)	Conserve and where possible improve the quality of life and the environment
Shetland Island Council Sustainable Development Implementation Plan (2008)	Sets out priorities and actions which contribute to the achievement of sustainable development in Shetland
Shetland Islands Council Draft Interim Planning Policy: Towards Sustainable Construction and Better Design (2009)	Provides location, design and amenity guidance and policy for Housing and Other Development within Shetland
Shetland Islands Council Draft Interim Planning Policy: Minerals	Provides sound and comprehensive policies for minerals development leading into the next decade, based on up-to-date information and legislation.
Shetland Islands Council Draft Interim Planning Policy: Energy	Provides policies for the provision of energy and energy infrastructure leading into the next decade, based on up-to-date information and legislation.
Shetland Amenity Trust: The Shetland Woodland Strategy (2002)	Guide to the conservation of Shetland's native trees and woodland planting may also be relevant under local strategies

4 ENVIRONMENTAL BASELINE

4.1 INTRODUCTION

Part 2, Schedule 3 of the Scottish SEA Act requires the Environmental Report to include a description of "the relevant aspects of the current state of the environment and the likely evolution thereof without the implementation of the plan or programme."

This section of the Environmental Report describes:

- the current state of the environment in the study area and the environmental characteristics of the area likely to be significantly affected by the Wind Energy IPP; and
- the existing environmental issues which are relevant to the Wind Energy IPP including those relating to areas of particular environmental importance;
- the evolution of the Shetland environment without the Wind Energy IPP (Table 4.19).

4.2 CURRENT ENVIRONMENTAL BASELINE

4.2.1 Biodiversity, Flora and Fauna

Many areas of Shetland are designated under international or national legislation or by SIC. This section describes these areas and highlights their respective level of protection. Information about species which are protected under European or national legislation is also provided, together with further information on priority species and habitats.

Designated Areas

Special Protection Areas (SPAs)

SPAs are protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC), also known as the Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I of the Birds Directive, and for regularly occurring migratory species. Shetland is home to 12 SPAs the full list of which is given in Table 4.1 and displayed in Figure 4.1.

Table 4.1 Special Protection Areas in Shetland

Site	Description
Noss	High cliffs supporting internationally important breeding populations of migratory seabirds including fulmar (*Fulmarus glacialis*), gannet (*Morus bassanus*), great skua (*Catharacta skua*), guillemot (*Uria aalge*), kittiwake (*Rissa tridactyla*) and puffin (*Fratercula arctica*) The site also qualifies for protection due to the internationally important assemblage of seabirds
Fetlar	Heathlands, marshes, cliffs and rocky shores important for breeding birds and waders including internationally important populations of arctic skua (*Stercorarius parasiticus*), arctic tern (*Sterna paradisea*) , dunlin (*Calidris alpina schinzii*) , fulmar (*Fulmarus glacialis*), great skua (*Stercorarius skua*),red-necked phalarope (*Phalaropus lobatus*) ,whimbrel (*Numenius phaeopus*) The site also qualifies for protection due to the internationally important assemblage of seabirds

Site	Description
Hermaness, Saxa Vord and Valla Field	The SPA supports a breeding population of European importance of the Annex I species red-throated diver (*Gavia stellata)*. The site also qualifies under Article 4.2 for its internationally important breeding populations of three migratory seabird species. These are gannet (*Morus bassana)*, great skua (*Catharacta skua)* and puffin (*Fratercula arctica)*
Fair Isle	Fair Isle supports the entire world population (33 territorial males) of the endemic Fair Isle subspecies of wren *(Troglodytes troglodytes fridariensis)*, and by supporting an internationally important breeding population of arctic tern *(Sterna paradisaea)* Fair Isle also qualifies for protection by regularly supporting internationally important breeding populations of migratory seabirds: including of fulmar *(Fulmarus glacialis)*, shag (*Phalocrocorax aristotelis*) arctic skua (*Stercorarius parasiticus)*, great skua (*Stercorarius skua*), kittiwake (*Rissa tridactyla*), guillemot (*Uria aalge*), razorbill (*Alca torda)* puffins (Fratercula arctica)
Foula	Rocky coastline and large areas of moor, supporting internationally important breeding populations of seabirds Foula qualifies for protection by regularly supporting a nationally important population of arctic tern (*Sterna paradisaea*) and a colony of leach's petrel (*Oceanodroma leucorhoa*) though the current status of this population is uncertain. Foula also qualifies by regularly supporting internationally important breeding populations of great skua (*Catharacta skua*), guillemot (*Uria aalge*) and puffin (*Fratercula arctica)*
Mousa	Low grassy island with internationally important breeding colonies of storm petrel (*Hydrobates pelagicus*), and arctic tern (*Sterna paradisaea)*
Ramna Stacks and Gruney	Group of small rocky islets with internationally important colony of leach's petrel (*Oceanodroma leucorhoa*)
Sumburgh Head	Sumburgh Head Special Protection Area consists of cliffs and boulder beaches and qualifies for protection by supporting a nationally important breeding population of arctic tern (*Sterna paradisaea*). The site also qualifies for protection by supporting over 20,000 individual breeding seabirds with approximately 35,000 individuals of eight species, including kittiwake, regularly using the site. The site is also notable for supporting a nationally important population of guillemot (*Uria aalge*)
Ronas Hill, North Roe and Tingon	Areas of blanket bog supporting a nationally important breeding population of red-throated diver (*Gavia stellata)*. The SPA also qualifies for protection by supporting an internationally important breeding population of great skua (*Catharacta skua)*. The assemblage of breeding seabirds within the SPA comprises 12 species including nationally important populations of arctic skua (*Stercorarius parasiticus*) and black guillemot (*Cepphus grylle*)
Lochs of Spiggie and Brow	Eutrophic 'machair type' loch regularly supporting nationally important wintering population of Icelandic whooper swans
Papa Stour	Heathland and cliffs supporting a large population of the arctic tern (*Sterna paradisaea*). Papa Stour is one of the few British sites that regularly supports large numbers of this species. Papa Stour SPA also qualifies for protection by regularly supporting a large population of ringed plover (*Charadrius hiaticula*). This is the highest density breeding population in Britain and is one of the highest density populations in Europe
Otterwick and Graveland	Comprises two areas of open moorland with numerous pools and lochans on Yell. Inland areas are dominated by blanket bog, with some stretches of dry heather moorland. A band of maritime

Site	Description
	grassland extends along the coastal stretch to the Graveland peninsula. Breeding population of European importance species red-throated diver

Source: Scottish Natural Heritage Information service. http://www.snh.org.uk/snhi/ (accessed 4/03/09)

Special Areas of Conservation (SACs)

SACs are designated under the EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, known as the Habitats Directive. In the UK, sites are protected under The Conservation (Natural Habitats, &c.) Regulations 1994, due to the presence of one or more habitats or species listed in the Directive and management plans are written to ensure 'favourable conservation status.' The 12 SACs in Shetland are listed and described in Table 4.2 and displayed in Figure 4.1.

Table 4.2 Special Areas of Conservation in Shetland

Site	Description
Hascosay	Active blanket bog with an intact pool system displaying a range of shallow mud-bottom hollows with typical Shetland blanket bog vegetation and a diverse range of *sphagnum* species
Keen of Hamar	Vegetated calaminarian grassland area and dry heathland on serpentine bedrock and (base-rich) scree areas that support a unique community of plants including a number of rare northern species and one sub-species Edmondston's chickweed (*Cerastium edmonstonium*) found only in Unst
Tingon	An extensive area of active blanket bog dominated by *sphagnum* bog moss in the hollows, undisturbed heather and hare's tail cotton grass. The area includes a large number of pools and lochans; it is also notable for peat mounds supporting vegetation more usually found on dry heaths
Ronas Hill, North Roe	Areas of active blanket bog on lower lying ground and alpine and sub-alpine heaths are present. Also peat mounds capped with a vegetation community more usually associated with dry heaths. Heathlands are generally dominated by heather and carpets of woolly hair moss (with several areas of juniper vegetation). Bog vegetation dominated by heather, hare's tail cotton grass and deer grass, with a well-developed understorey of mosses and liverworts. Pools and oligotrophic lochans provide breeding sites for red throated divers. Acid scree is also a designated feature of the site.
Mousa	The qualifying features of Mousa SAC include reefs and sea caves as well as common seal. Mousa is home to the largest single colony of breeding common seals within Shetland (about 600 breeding females) which represents about 2% of the total UK common seal population
Papa Stour	Exposed rocky coastline fringed by submerged bedrock and boulder reefs. Habitats include extensive kelp forests and deeper reefs dominated by invertebrates such as soft coral. Papa Stour has excellent examples of caves, tunnels and arches, with rich communities of algae and sponges
The Vadills	A complex lagoon system comprised of a number of shallow basins of varying salinity, separated by the sea by shallow rock, boulder or shingle narrows. The area supports a graduation of habitats and a high diversity of communities and species, including several species rare or unknown elsewhere in Shetland
East Mires and Lumbister	Active blanket bog
Yell Sound Coast	Nationally and internationally important population of breeding otters. It is estimated that the site supports at least 192 otters, representing

Site	Description
	about a quarter of the Shetland population. Common seal is also a qualifying feature of Yell Sound Coast SAC
Fair Isle	European dry heaths; vegetated sea cliffs of the Atlantic and Baltic coasts
North Fetlar	Alkaline fens; European dry heaths
Sullom Voe	Coastal lagoons; large shallow inlets and bays; reefs

Source: Scottish Natural Heritage Information service. http://www.snh.org.uk/snhi/ (accessed 4/03/09)

The EU Birds Directive also requires steps to be taken to protect birds outwith designated sites. In particular, Article 4.4 requires Member States to strive to avoid pollution or deterioration of the habitat of species listed in Annex 1 of the Directive. The SEA should therefore consider the effects of the Wind Energy IPP on the habitat of Annex 1 species outwith designated sites. The following Annex 1 species nest in Shetland:

- Red-throated diver
- Whooper swan
- Red-necked phalarope
- Manx shearwater
- Merlin
- Common tern
- Storm petrel
- Peregrine
- Arctic tern
- Golden plover

Several other Annex 1 species, such as Leach's Petrel, occur as migrant or wintering birds.

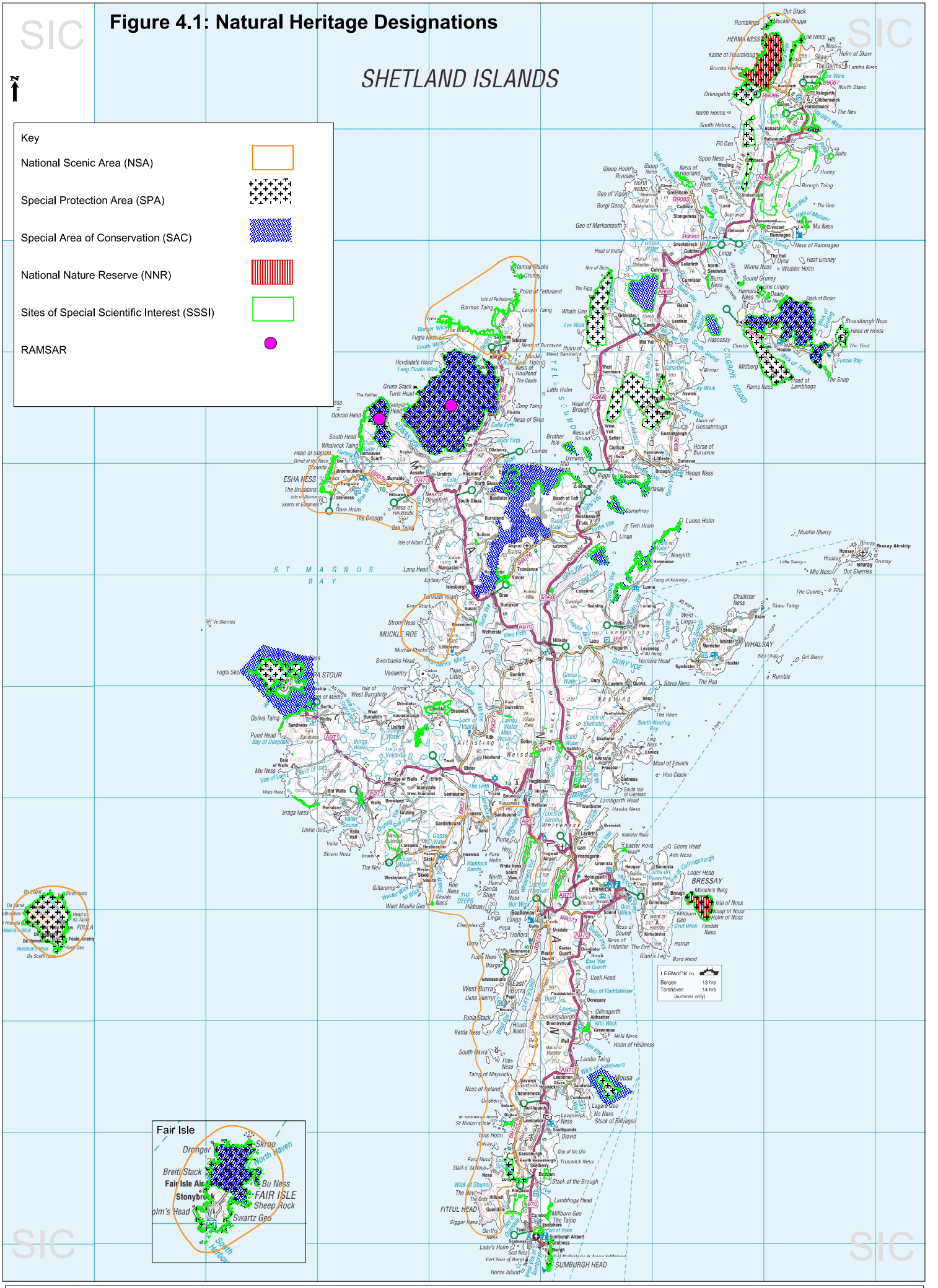
Sites of Special Scientific Interest (SSSI)
These areas are protected under the Wildlife and Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act 2004. Sites are designated due to the presence of important flora, fauna or geographical features. Shetland has 81 sites designated for the interests listed below in Table 4.3. Some sites are designated for several reasons. The location of SSSIs on Shetland are shown in Figure 4.1.

Table 4.3 Summary of notified features for SSSIs in Shetland

Geology (31 sites)	Intertidal Habitats (6 sites)
Geomorphology (7 sites)	Aquatic Flora (6 sites)
Montane habitats (1 site)	Rare Plants (5 sites)
Serpentine Vegetation (4 sites)	Seabirds (9 sites)
Other Heatherland (4 sites)	Wildfowl (3 sites)
Marsh and Meadow (4 sites)	Aquatic Fauna (3 sites)
Limestone and Grassland (1 site)	Mammals (3 sites)
Sand Dune Flora (2 sites)	Trees and Woodland (4 sites)

Source: Scottish Natural Heritage Information service. http://www.snh.org.uk/snhi/ (accessed 4/03/09)

Figure 4.1: Natural Heritage Designations



Date 23/01/2009

Scale 1:210000

Ramsar Sites
Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. Under the Convention wetland is defined as:

"areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. [wetlands] may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands"

One site in Shetland - Ronas Hill, North Roe and Tingon -was designated as a Ramsar site in August 1997. It is important primarily for its red-throated divers and the nationally rare Arctic water flea, *Eurycerus elacialis*.

National Nature Reserves (NNR)
NNRs are declared by the statutory country conservation agencies under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981. They are managed to conserve their habitats or to provide special opportunities for scientific study of the habitats communities and species represented within them. Shetland has three NNRs (see Figure 4.1):

- Hermaness
- Keen of Hamar
- Noss

Two of Britain's largest seabird colonies can be found at Noss and Hermaness. Rare plants can be found at the Keen of Hamar, one of which, Edmonston's chickweed, found only at one site in the world[7].

Marine Consultation Areas (MCA)
MCAs are designated due to the quality and sensitivity of the marine environment. There are four MCAs in Shetland and these are listed in Table 4.4.

Table 4.4 Marine Consultation Areas in Shetland

Site	Description
Brindister Voe and the Vadills	Brindister Voe includes communities representative of Shetland voes in general. The Vadills comprises the most complex and least disturbed lagoon system in Shetland, unique in the British Isles
Swinister Voe and the Houb of Fora Ness	Swinister Voe is included because of its rich lower shore fauna and flora. The Houb contains communities characteristic of shallow, submerged, extremely sheltered conditions. The gravel rapids community is probably the best such example in Shetland
The Houb, Fugla Ness	The site contains extensive areas of sediment shores, (unusual in Shetland), as well as more widespread boulder/shingle shores
Whiteness Voe	The bay at the head of the Voe is of high scientific interest because it contains the best-developed bed of eel grass in Shetland and because the rich sediments include both widely occurring and rare communities and species

Source: Scottish Natural Heritage Information service. http://www.snh.org.uk/snhi/ (accessed 4/03/09)

[7] Scottish Natural Heritage (2009) *The Story of Keen of Hamar National Nature Reserve*. Available at: http://www.snh.org.uk/nnr-scotland/downloads/publications/The_Story_of_Keen_of_Hamar_National_Nature_Reserve.pdf

Local Protection Areas (LPA)
These are sites designated by the Council as worthy of protection. Reasons can include scenic or historic value or presence of flora or fauna. It is the Council's policy to keep these areas free from development unless the development provides facilities that benefit the community as a whole[8].

RSPB Reserves
There are four RSPB reserves in Shetland, which are located at:

- Sumburgh Head (NGR: HU 407 079);
- Mousa (NGR: HU 460 241);
- Fetlar (NGR: HU 619 921); and
- Loch of Spiggie (NGR: HU 371 166).

Table 4.5 below summarises the designated sites on Shetland. It should be noted that all NNRs and Ramsar sites and the terrestrial parts of most SPAs and SACs are also notified as SSSIs. The total land coverage of designated areas in Shetland is therefore only slightly greater than the area of SSSIs. There are also a number of marine areas designated as Marine SACs, or proposed as marine extensions to seabird SPAs, which amount to a total area of approximately 440km^2 of inshore waters.

Table 4.5 Designated Areas

Designation	Total Number	Area within Shetland (ha)	% of Total Area of Shetland
Site of Special Scientific Interest (SSSI)	81	20,138	12.2%
Special Areas of Conservation (SAC)	12	15,348	9.3%
Special Protection Areas (SPA)	12	15,157	9.2%
Ramsar	1	5,470	3.3%
Marine Consultation Areas	4	Info not available	Info not available
National Nature Reserve (NNR)	3	1,307	0.8%

Source: Scottish Natural Heritage Information service. http://www.snh.org.uk/snhi/ (accessed 4/03/09)

Designated Species

It will be important to consider the effects of any proposals on European and nationally protected species in the area. European species are given a high level of protection under Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora which is transposed into UK law by The Conservation (Natural Habitats &c) Regulations 1994. These species include otter and cetaceans, both of which occur on Shetland or its surrounding sea. Since 1980, eighteen species of cetacean have been recorded along the coast or in nearshore waters (within 60 km of the coast). Of these, eight species (29% of the UK cetacean fauna) are either present throughout the year or recorded annually as seasonal visitors, these include the humpback whale (*Megaptera novaeangliae*), minke whale (*Balaenoptera acutorostrata*), long-finned pilot whale

[8] Shetland Islands Council (2004*) Shetland Local Plan*. Available at: http://www.shetland.gov.uk/developmentplans/shetlandlocalplan.asp

(*Globicephala melas*), killer whale (*Orcinus orca),* risso's dolphin (*Grampus griseus),* white-beaked dolphin (*Lagenorhynchus albirostris*), atlantic white-sided dolphin (*Lagenorhynchus acutus)* and harbour porpoise (*Phocoena phocoena*)[9]. Disturbance to any of these species requires a license from the Scottish Government and demonstration that no reasonable alternative exists and that proposals would not affect the conservation status of the species.

A number of animal and plant species are protected under the Wildlife and Countryside Act 1981 as amended by the Nature Conservation (Scotland) Act 2004. Species protected under the Wildlife and Countryside Act 1981 which occur in Shetland are as follows:

Schedule 1 (breeding birds):

- Red-throated diver
- Black-tailed godwit
- Greenshank
- Merlin
- Peregrine
- Leach's petrel
- Red-necked phalarope
- Whooper swan
- Whimbrel

Schedule 5 (other animals):

- Cetaceans
- Otter
- Freshwater pearl mussel

Schedule 8 (plants):

- *Arenaria norvegicus* (Norwegian sandwort)
- *Hieracium attenuatifolium* (Weak-leaved hawkweed)
- *Hieracium northroense* (North Roe hawkweed)
- *Hieracium zetlandicum* (Shetland Hawkweed)

Although not all of these species occur across Shetland, some, such as otter have been recorded on a regular basis.

Priority Habitats and Species

The Nature Conservation (Scotland) Act 2004 places an obligation on all public bodies to further the conservation of biodiversity, particularly in respect of habitats and species listed in the SBS. The Scottish Biodiversity List is a list of flora, fauna and habitats considered by the Scottish Ministers to be of principal importance for biodiversity conservation. The list includes many species and habitats, both terrestrial and marine, which occur in Shetland[10].

As part of the Living Shetland *draft* Local Biodiversity Action Plan, priority habitats and species have been identified. Priority habitats include roadside verges,

[9] Sea Watch Foundation (2008) *Cetaceans of Shetland*

[10] Biodiversity Scotland (2009)The Scottish Biodiversity List - Finding the species near you. Available at: http://www.biodiversityscotland.gov.uk/sbl_la.php?id=39&type=2&navID=93&refpage=sbl_la&laCODE=26 (accessed 4/03/09)

machair, herb-rich meadows, wet meadows and arable crops. In some cases, habitat action plans have been developed. Table 4.6 lists the priority species for which specific action plans have been developed.

Table 4.6 Species Action Plans in Shetland

List of Species Action Plans in Shetland	
Arable weeds	Bumblebees
Harbour porpoise	Oysterplant
Skylark	Arctic char
Breeding waders	Red necked phalarope
Merlin	Farmlands birds
Hawkweeds	Red-throated diver
Eider	

Source: Living Shetland: Action for Shetland's Biodiversity (2004)Shetland Local Biodiversity Action Plan

The presence of some species in Shetland is highly significant in a national context, for example 90% of the UK population of the red-necked phalarope is present in Shetland. Similarly, Shetland is home to approximately 90% of the UK's whimbrel population. Coastal cliffs provide important nesting sites for breeding seabirds. Shetland is home to one tenth of the total seabird population of Britain; in excess of one million birds from 22 species. The varied coastline of Shetland supports diverse habitats and species. Voes (inlets/sea lochs) provide shelter and muddy conditions exist at the heads of some of the longer voes, which are inhabited by species such as cockles and lugworms. In deep water, reefs are formed from large horse mussels. Sandeels, which are an important food source for Shetland's many seabirds, mammals, and commercial fish stocks are supported by finite offshore supplies of sand.

4.2.2 Population and Human Health

Background

Shetland's population has fallen by four percent over the last 25 years, an average of 35 people a year. The trend towards centralisation of the population towards Lerwick and within a 15 to 20 minute commute of Lerwick continues.

Around 41 percent of the population now lives in Lerwick. Since 1991, Shetland's population aged over 65 has risen by 31 percent and the progression of an ageing population looks set to continue, with the population of over 50s increasing by 1.9 percent in the last year[11].

Accessibility and Social Exclusion

A recent report[12] by SIC found that a section of the Shetland community, namely those without easy access to private car use, have difficulty in accessing certain services and opportunities. This affects peoples' opportunity to access employment, education, social events and to purchase healthy food at a reasonable cost. This is a particular problem for those in outlying communities or those with mobility problems.

[11] Shetland islands council (2003) *Shetland in Statistics (30th edition)*. ISBN 0 904562 40 9. Available at: http://www.shetland.gov.uk/council/documents/18170-Shet-in-Statistics.pdf

[12] Deprivation and Social Exclusion in Shetland, Shetland Islands Council, 2006

Health and Healthy Lifestyles

The following data (Tables 4.7, 4.8, & 4.9) provide an overview of the proportions of people who are in good and poor health. When viewing these figures, it is important to take into account that the population is declining and aging.

Table 4.7 Health Statistics for Shetland

Health Issues	Statistics for Shetland
Average age of a person with good health	59.58
Average age of a person with a limiting long term illness	32.29
Percentage of economically inactive people who are permanently sick/disabled	15.45
Percentage of households with one or more carers resident	15.45
General health - % Good % Fairly good % Not good	71.72 21.55 6.73
Percentage of population with a limiting long term illness	15.74
Percentage of population that does not have a limiting long term illness	84.26
Life Expectancy at birth (2002-4)	74.2

Source: Scottish Executive Statistics. http://www.scotland.gov.uk/Topics/Statistics/ (accessed 4/03/09)

Table 4.8 All Heart Diseases Standardised Mortality Rate Per 100,000 Population <75

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
Shetland	123.6	147.8	152.8	133.1	86.1	88.0	53.8	85.2	86.0

Source: Shetland Islands Council Health & Community Care Plan 2005 - 08

Table 4.9 Stroke/Cerebrovascular Standardised Mortality Rate Per 100,000 Population <75

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
Shetland	42.8	45.0	18.8	28.9	19.2	31.1	35.8	13.2	17.0

*Due to the small numbers the figures should be interpreted with caution

Source: Shetland Islands Council Health & Community Care Plan 2005 - 08

Employment

Table 4.10 shows the breakdown of male and female employment in Shetland by Industrial Group. It should be noted that Census of Employment figures only include employees. Sectors with high levels of self-employment such as agriculture and fishing are therefore often under-represented in the figures.

Table 4.10 Male and Female Employment in Shetland by Industrial Group (1993)

Standard Industrial Classification Grouping	Male %	Female %
Agriculture and Fishing	4%	1%
Energy and Water	13%	2%
Manufacturing	10%	7%
Construction	12%	8%
Distribution, Hotels and Restaurants	13%	26%
Transport & Communications	21%	4%
Banking, Finance and Insurance	14%	8%
Public admin, Education and Health	11%	39%
Other services	3%	5%

Source: Shetland Island Council (2003)

4.2.3 Soils and Geology

Soils and Geology

The majority of the rocks of Shetland are part of an old, deeply eroded mountain chain called the Caledonian Orogenic Belt which was raised up as a mountain block between 400 to 600 million years ago. This same mountain chain forms most of Norway, Scotland and Northern Ireland. In the south-eastern and western parts of Shetland, these rocks have been overlain by sedimentary rocks of old sandstone age. These rocks were laid down and folded during the Devonian era around 400 million years ago. Running north-south through Shetland are several tear faults where blocks of rock have been displaced by movements of the earth's crust. The principal fault of this type is the walls Boundary fault. This fault is thought to be the northern extension of the Great Glen fault found on mainland Scotland.

Metamorphic schist and gneiss extends from Fitful Head and the Clift Hills of south Mainland, through central Mainland and the coastal portion of north Mainland, east to the islands of Whalsay and Out Skerries and north to the island of Yell and the western parts of Fetlar and Unst. In central Mainland, the metamorphosed-siliceous sedimentary rocks are interspersed with bands of crystalline metamorphosed limestone which have been eroded to form a series of valleys. Superficial deposits of glacial drift, boulder clay and alluvium overlie bedrock in places, particularly on low lying areas, and the higher ground is commonly blanketed with peat. The eastern parts of Unst and Fetlar are characterised by serpentine and gabbro bedrock with a surface layer of shattered rock and glacial drift.

Much of the north Mainland, west of the Walls Boundary fault (from Ronas Hill and the North Roe plateau to the island of Muckle Roe), consists of red granite and other igneous rocks. These rocks are overlain with superficial deposits of peat, boulder clay and glacial drifts. The cliffs of Eshaness and the island of Papa Stour are formed by lavas and tuffs (volcanic ash) of old red sandstone age. The West Mainland is characterised by folded sandstone of old red sandstone age, with granite in the extreme south. The area is overlain by peat and areas of boulder clay. The south eastern coastal strip of mainland (from Sumburgh Head northwards to Lerwick), and the adjacent islands of Bressay, Mousa and Noss are formed of gently inclined sandstones, flagstones and conglomerates of old red sandstone age. In places the sandstone is interbedded with limestone and mudstone. These rocks are overlain by significant areas of boulder clay and other glacial drifts. the outlying islands of Fair Isle and Foula are formed predominantly of sandstone.

Shetland has recently become a UNESCO European Geopark, using its exceptional geological heritage to promote sustainable development, particularly in the field of tourism and education. Shetland's earth heritage is therefore potentially of economic importance as well as academic interest. Inappropriate development can be damaging to earth heritage if it destroys or obscures geological features, however if development is appropriate and sympathetic to its surroundings it can also be beneficial in restoring those sites that have been damaged in the past [13].

[13] Shetland Islands Council (2001) *Report of Survey for The Shetland Structure Plan 2001-2016*

Peat

The Soil Survey of Scotland 1:250000 Soil Map provides information on generic soil types for the islands and this, accompanied by local knowledge, could be used to identify areas where deep peat and overburden are likely to be encountered (and from a plan-making view-point these areas should be avoided). Applicants should consult this at an early stage of the design of their proposal.

Vegetation

Shetland's vegetation is dominated by peatland, heather moorland and Montane habitats. Improved rough grassland is concentrated along the coast, around the voes and in the valleys. The best agricultural land available in Shetland, improved grassland and good rough grassland, can be found in the valleys of the central Mainland; along the south and east coasts of the southern Mainland; in eastern regions of Unst and Fetlar; and along the Walls boundary fault. These are the areas of greatest agricultural production.

Shetland's flora is impoverished in comparison to that of mainland Britain. This is largely due to the climate and the islands' isolation. Shetland has the highest average humidity in Britain. This, combined with its salt-laden atmosphere, limits the botanical diversity and the scope for crop growing in the Islands.

Shetland is predominantly treeless. There is plantation woodland Kergord in the Weisdale valley and small patches of trees are scattered throughout Shetland in various sheltered locations. Although these are the most visible trees in Shetland, they are mainly non-native species. There is a large number of remaining native trees, particularly in the north, west and central Mainland which are of greater ecological importance. These are generally small and occur singly or occasionally in small groups, often in exposed situations, on cliff ledges, in ravines and on holms in lochs which are inaccessible to grazing animals[13].

Agricultural Land

In recent years there has been a decline in agricultural activity. As detailed in Table 4.12, the total land used for tillage in Shetland was almost 437 hectares in 2001. This figure fell to 400 by 2003. Intensive sheep farming has increased its dominance of the agricultural economy, particularly over the past 30 years. Crofting comprises a small percentage of the farmed land on Shetland and is used mainly for rough grazing for sheep, although small scale crofting activities have been widely recognised as having an important role in the care and enhancement of the environment and wildlife habitats.

The amount of land suitable for agriculture in Shetland is limited and as such, fertilisation and reseeding of moorland has been used to increase agricultural productivity. The amount classed as improved or good grassland is also somewhat limited. Farmers have been encouraged to manage land in a more environmentally sensitive manner since Shetland was designated an Environmentally Sensitive Area (under the Agriculture Act 1986) in 1993[14].

[14] Environmentally Sensitive Areas (Shetland Islands) Designation Order 1993

Table 4.11 Agricultural Land Use in Shetland

Agricultural Land Use Practice	Hectares
Vegetables for human consumption	17.35
Other crops	2.31
Bare fallow	131.59
Total tillage	436.51
Grass under 5 years old	2,580.61
Arable	3,017.12
Total crops and grass	22,016.11
Sole right rough grazing	56,179.8

Source: Environmental Report: Strategic Environmental Assessment of the Shetland Regional Transport Strategy. Shetland Islands Council. 2006

4.2.4 Water

Surface Water Quality

The Scottish Environment Protection Agency (SEPA) monitors surface water quality in watercourses, estuaries and other water bodies. In addition, under the Water Framework Directive, enacted in Scotland in the Water Environment and Water Services (Scotland) Act 2003, SEPA has new responsibilities relating the management and protection of river catchments (river basin districts), which includes the groundwater resource within those catchments.

SEPA classifies rivers in terms of water quality from A1 (excellent), A2 (good) to D (seriously polluted) this classification is based on a combination of chemical, biological and aesthetic criteria. Similarly estuarine waters are also classified from A to D.

Within Shetland SEPA carry out a range of monitoring of surface and coastal waters. A selection of the most up to date available data are contained within Table 4.12 below.

Table 4.12 Water Quality Monitoring in Shetland

Surface Water Body / Coastal Length Monitored	Classification
Burn of Voxter/Burn of Laxdale	A2
Burn of Dale	A2
Stromfirth Burn	A2
Burn of Weisdale	A2
South Burn of Burrafirth	A2
Burn of Laxo Bigging	A2
Laxo Burn	A2
Burn of Bouster	A2
Burn of Arisdale	B
Bressay Sound	B
Bressay Sound (at Lerwick)	C
Yell Sound (Colla Firth)	B
Sullom Voe	B
Mid Yell Voe	C
Balta Sound (Unst)	B
Vidlin Voe	B
Vassa Voe (Cat Firth)	A
West Burra (Hamnavoe)	A
East Voe of Scalloway	C

Source: SEPA Water Quality Monitoring and Classification
http://www.sepa.org.uk/scotlands_environment/data__reports/water/water_quality_classification.aspx (accessed 4/03/09)

The Public Water Supply

The public water supply is extracted from 24 lochs and burns (See Table 4.13) and piped to one of 21 treatment works. In addition, seven water supply zones have a total of 17 service reservoirs. Table 4.15 gives details of the treatment works and their use.

Table 4.13 Water Sources in Shetland

Water Bodies Used as Sources	Water Available per Day (M lpd)*	Associated Water Treatment Works
Arthur's Loch	0.10	West Burrafirth
Bu Water	0.20	Whalsay
Burn of Channerwick	0.30	Sandwick
Burn of Geosetter	0.10	Bigton
Burn of Greystanes	0.20	Sandwick
Burn of Laxdale	0.20	Cunningsburgh
Eela Water	2.50	Sullom Voe II
Gorda Water	0.20	Papa Stour
Helliers Water	0.50	Unst
Laxo Burn	0.60	Mid Yell
Loch of Brindister	1.20	Lerwick
Loch of Brough	0.70	Bressay
Loch of Brough	0.50	Cullivoe
Loch of Brow	0.40	Sumburgh
Loch of Huesbreck	0.50	Sumburgh
Loch of Huxter	1.50	Whalsay
Loch of Kettlester	1.22	South Yell
Loch of Watlee	1.00	Unst
Roer Water	4.55	Sullom Voe II
Sandy Loch	6.20	Lerwick
Skerries Reservoir	0.03	Skerries
Skutes Water	0.70	Fetlar
Springs Burn	0.06	Foula
Vaadal Burn	0.06	Fair Isle

M lpd - million litres per day
Source: Report of Survey for The Shetland Structure Plan 2001-2016

Table 4.14 Water Treatment and Usage in Shetland

Water Treatment Works	Population Served	Average Water Consumption (M lpd)	Average Daily Demand as % of Capacity
Bigton	170	0.06	60
Bressay	330	0.10	67
Cullivoe	260	0.06	60
Cunningsburgh	450	0.13	87
Fair Isle	70	0.02	33
Fetlar	100	0.04	40
Foula	50	0.01	20
Lerwick	9,000	5.32	78
Mid Yell	550	0.25	50
Papa Stour	40	0.05	100
Sandness*	150	0.04	80
Sandwick	840	0.24	48

Water Treatment Works	Population Served	Average Water Consumption (M lpd)	Average Daily Demand as % of Capacity
Skeld and Reawick*	400	0.10	50
Skerries	90	0.02	67
South Yell	300	0.10	83
Sullom Voe II	3,600	3.30	55
Sumburgh	1,500	0.47	78
Unst	1,000	0.46	92
Walls*	400	0.12	80
West Burrafirth	30	0.02	67
Whalsay	1,020	0.27	54

* These works will be abandoned when the West Mainland Water Scheme is completed.
Source: Report of Survey for The Shetland Structure Plan 2001-2016

Flooding and Surface Run-Off

The most common cause of historical flooding events in Shetland has been inundation by the sea. However, the trend has shifted in recent times and heavy rainfall is now the cause of the majority of incidents. Burns in Shetland tend to be short and steep, which can increase flood risk during heavy rainfalls. This is likely to be exacerbated by climate change in the future, as predictions for Shetland are for extended periods of drought followed with more severe bursts of rain[15].

The Development Plans Service at SIC is carrying out a survey of watercourses that are likely to be affected by future development. From this, the capacity of watercourses to carry surface water discharge from developments will be determined. The survey work undertaken so far has targeted areas under the greatest development pressure to enable Shetland Islands Council to determine the likelihood of a flood threat or risk.

Vulnerability to the Effects of Climate Change

Although the relative significance of rainfall-related flooding events has increased, coastal-related flooding is still a highly significant issue and again, climate change is predicted to cause further problems. Shetland is thought to be sinking at a rate of approximately 2 to 3 millimeters (mm) per year and sea level rise over the next century has been predicted to be between 0.5 and 1m. Even at present, storm hazard on Shetland is potentially greater than anywhere else in the UK and maximum wave heights around Shetland have been rising in recent decades. In addition, increases in the frequency and severity of storms are predicted, with coastal water extreme levels forecasted to become 5 to 10 times more likely by the 2050. The combination of the above factors will extend the inward limit of storm driven water and whilst this is not a problem for many areas of Shetland's rocky coastlines, voe heads could be significantly affected due to the funnelling of storm surges.

Existing coastal defences will need to be replaced or modified to adapt to the effects of climate change. A recent report into the predicted effects of climate change on sea level rise showed that, even at the lowest estimates, flooding in coastal areas is expected to increase. Modest predictions suggest that in order to bring the level of protection back to that of the 1990s defences will need to be increased in height by 10 to 30 centimeters (cm). Less conservative estimates suggest required increases of almost 80 cm. Erosion of beaches from rising sea levels and increased wave action is a current problem which is predicted to

[15] Shetland Islands Council (2007) 6th Biennial Flooding Report from Shetland Islands Council to The Scottish Government. Available at: http://www.shetland.gov.uk/developmentplans/Information.asp

become more significant in coming years. Offshore sediment supplies are finite and the potential for natural recharging of these beaches is therefore limited. Human activity such as provision of coastal defences and other physical structures can cause additional erosion[16].

Fishing and Aquaculture Industries
In 2003, a total of 31,659,776 tonnes of wet fish was landed in Shetland. The seas around Shetland are spawning and nursery areas for Norway pout, lemon sole, haddock, herring, sandeel and whiting. The fishing industry is supported by the following species:

- pelagic fishery – mackerel, herring, blue whiting;
- white fishery – haddock, cod, anglerfish, nephrops; and
- inshore fishery – scallops, crabs, lobsters, nephrops.

Fish farms occupy many of the suitable voes and produce salmon, sea-trout, char, halibut, cod and shellfish. Mussels are the most commonly farmed seafood in the voes. Membership of the Shetland Salmon Farmers' Association, in 2002/2003 (the most recent figures published), stood at 46 salmon farms and six smolt hatcheries. This represents 100 per cent of production in Shetland equating to a total of 59,295 tonnes of gutted fish[17].

Marine Pollution
Marine pollution arises from various different sources including domestic sewage, industrial waste, naturally occurring nutrients and ballast discharged offshore by oil tankers. Other forms of pollution are those caused by noise and light; these are especially relevant in terms of aquaculture. Eutrophication, the enrichment of water, is the consequence of high levels of pollution from too many sewage outfalls and badly positioned septic tanks[13].

4.2.5 Air Quality

Background
The Air Quality Strategy provides a framework for air quality control through air quality management and air quality standards. These and other air quality standards and their objectives have been enacted in Scotland through the Air Quality (Scotland) Regulations 1997, as amended, most recently in 2002. The Environment Act 1995 requires Local Authorities to undertake air quality reviews.

In areas where an air quality objective is not anticipated to be met, Local Authorities are required to establish Air Quality Management Areas (AQMA) and to develop and implement Air Quality Action Plans that detail the measures to be taken to work towards reducing pollution levels to below the objective targets.

The main industrial area on the islands is the Gremista and Green Head Industrial Estate to the north of Lerwick. There is a high concentration of regulated activity in this area including a landfill site, energy recovery plant and an oil-fired power station. The Sullom Voe oil terminal handles around 25 million tonnes of oil each year and also contains a power station that supplies some of the islands electricity. Other industrial processes include quarrying, mineral processes and fish processing activities[17].

[16] ZETtrans (2006) *Environmental Report: Strategic Environmental Assessment of the Shetland Regional Transport Strategy.*
[17] Shetland Aquaculture (2009*) Statistics: Production Figures.* Available at: http://www.shetlandaquaculture.com/production-figures

Air Quality Management in Shetland
The 1995 report, 'Review and Assessment of Air Quality in Shetland'[18], presents air quality monitoring results and information on possible pollutant sources for Shetland. The second round of the review and assessment process was completed in 2003. The report concluded that there was no risk of exceedance of any of the relevant objectives in the assessment years. Consequently, no Air Quality Management Areas (AQMAs) were declared and no Air Quality Management Plans (AQMPs) are in place. There are no existing air quality constraints or significant areas of pollution in Shetland.

The LAQM Progress Report (2007) provides an update on pollutant monitoring data and information on industrial, transport, commercial and domestic atmospheric emissions. The report notes that a recent assessment of atmospheric emissions from the Lerwick Power Station predicted exceedences of the NO_2 1-hour mean objective in areas around the power station. The report concludes that there are no predicted exceedences of other NAQS objectives in Shetland.

4.2.6 Climatic Factors

Under the Kyoto Protocol the UK Government is committed to reducing greenhouse gas emissions by 12.5% below 1990 levels. The UK Government also set a more ambitious domestic target of reducing CO_2 emissions by 20% below 1990 levels by 2010. The Climate Change (Scotland) Act 2009 received Royal Assent on August 5, 2009 and has introduced a statutory target to reduce Scotland's greenhouse gas emissions by at least 80 per cent by 2050.

The Climate Change (Scotland) Act 2009 sets an interim target that the net Scottish CO_2 emissions account for the year 2020 is at least 42% lower than the baseline. In order to achieve this annual targets resulting in a year on year reduction of emissions must be set by Scottish Ministers.

The SIC Corporate Plan sets a target of reducing Shetland's CO_2 emissions by 30% by 2020. The SIC Sustainable Development Implementation Plan contains actions to ensure implementation on SIC's Climate Declaration.

4.2.7 Material Assets

Background
Scotland's Sustainable Development Strategy highlights that current lifestyle patterns are unsustainable, and discusses their global significance. It also sets out a number of priorities to help reduce the "global footprint". A major challenge is to move towards more sustainable consumption and production. This will include reducing inefficient use of resources; looking at the impact of products and materials across their whole life-cycle and encouraging people to think about the social and environmental consequences of their purchasing choices.

Minerals
Table 4.15 shows that Shetland is a net exporter of aggregates, most of which are high quality roadstone chippings extracted from Brindister quarry. Imports are predominantly sand and are likely to continue. The Scottish Government has agreed to a ban on subtidal aggregate extraction (hydraulic dredging) around Shetland to protect shellfish beds and prevent damage to Shetland's marine

18 Shetland Islands Council Environment and Transportation Department – Operations Division (2007) *'Air Quality in Shetland – Review and Assessment'*

environment. Near Quendale, some commercial sand extraction occurs but the possible exacerbation of coastal erosion limits the potential for further extraction.

Table 4.15 Aggregate/Mineral Imports and Exports (tonnes)

Year	Imports	Exports
1996	6,875	13,623
1997	9,789	29,814
1998	8,757	33,476
1999	3,924	22,467

Source: Report of Survey for The Shetland Structure Plan 2001-2016

The only commercial talc quarry currently operates at Cross Geo on Unst. Talc deposits, with potential for extraction, are located on Fetlar and Unst and near Cunningsburgh. Shetland produced 12,000 tonnes of talc in 1986, almost all of it from Unst; this represented over 99% of total UK production. Talc production increased until 1990 but has since fallen and is likely to remain at approximately 5,500 tonnes per annum over the coming years.

A survey carried out in 1996 by the council into potential sources of flagstones in Shetland identified a number of locations that may have the potential to be quarried for local use.

There has been copper mining at Sandwick and Quendale in the past. Chromite was quarried around Baltasound during the 19th century. Iron ores are associated with copper ores at Sandwick and Levenwick. Magnetite was mined at Sullom during the 1950s. In the 1970s some interest was shown in exploiting copper in the Vidlin area, but no development followed. Non-commercial deposits of other minerals (e.g. baryte and kaolin) occur in Shetland. Surveys have suggested that gold could potentially be exploited in parts of the Mainland and Unst[9].

Waste Management

There are limitations to imposing waste minimisation and use of recycled resources given Shetland's remote location and relatively small community. Currently the majority of waste is sent to landfill on a single landfill site to the north of Lerwick. Not all sustainable measures used for waste management on mainland Scotland are suitable for Shetland (Any materials for recycling have to be transported by vehicle to a central collection point in Shetland and then onwards by sea for 250 miles to Aberdeen. A final road journey is then required to the factory of destination. As can be envisaged the costs of such a journey both actually and in environmental terms are high) and have caused some problems in the past in terms of monitoring. Issues surrounding waste management on Shetland are discussed further in Section 4.3.5.

4.2.8 Cultural Heritage

Background

Shetland possesses a rich heritage and is home to many sites of historical value including Viking settlements, brochs, standing stones, ancient crofts and ruined chapels. These are all important contributors to Shetland's strong and unique cultural identity. A number of areas and features have been designated due to their historical importance.

Designated Areas

Scheduled Monuments

Scheduled monuments are given legal protection under the Ancient Monuments and Archaeological Areas Act 1979 as they are considered to be of national importance. Shetland currently has 365 scheduled ancient monuments which fall under the following categories (Table 4.16):

Table 4.16 Scheduled Ancient Monuments in Shetland

Classification	Number of Sites in Shetland
Prehistoric: ritual and funerary	111
Prehistoric: domestic and defensive	227
Crosses and carved stones	3
Secular	50
Ecclesiastical	21
Industrial	17

Source: Environmental Report: Strategic Environmental Assessment of the Shetland Regional Transport Strategy. Shetland Islands Council. 2006

Conservation Areas

A Conservation Area is 'an area of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance' (Planning (Listed Buildings and Conservation Areas) Act 1990). There are three Conservation Areas in Shetland, two in Lerwick and one in Scalloway.

Listed Buildings

Buildings are listed by Historic Scotland for their special architectural or historic interest. They are assigned to one of three categories depending on relative importance:

- **Category A** - Of national or international importance either historic or architectural, or fine little-altered examples of a particular period, style or building type;
- **Category B** - Of regional or more than local importance, or major examples of a particular period, style or building type which may have been altered; and
- **Category C** - Of local importance, lesser examples of any period, style or building type, as originally constructed or altered; and simple, traditional buildings grouped well with other in categories A and B or part of a planned group such as an estate or industrial complex.

The current (2009) number of listed buildings in the Shetland Islands is 349, in the following categories:

- Category A: 13
- Category B: 173
- Category C(S): 158

Table 4.17 indicates the number and grading of listed buildings in each Shetland district.

Table 4.17 Listed Buildings in Shetland

Location	Cat A	Cat B	Cat C	Total
Bressay	1	10	3	**14**
Delting	0	10	4	**14**
Dunrossness	4	18	8	**30**
Fetlar	0	3	3	**6**
Lerwick	3	57	47	**107**
Lerwick Landward	0	1	1	**2**
Nesting	0	14	8	**22**
Northmavine	0	10	8	**18**
Sandsting & Aithsting	2	7	6	**15**
Tingwall	1	5	15	**21**
Unst	3	10	12	**25**
Walls & Sandness	0	13	10	**23**
Yell	2	10	18	**30**

Source: Environmental Report: Strategic Environmental Assessment of the Shetland Regional Transport Strategy. Shetland Islands Council. 2006

Shetland Sites and Monuments Record

In addition to designated areas and buildings, the Shetland Amenity Trust maintains the Sites and Monuments Record. This holds records of all known sites, ranging from pre-historic to the Cold War. There are currently 7,229 recorded sites, these are detailed in Table 4.18:

Table 4.18 Shetland Sites and Monuments Record

Classification	Number of Sites in Shetland
Broch / possible broch	141
Chambered cairns	118
Souterrains	26
Fishing stations	32
Burnt mounds	340
Viking / Norse houses	52
Military remains	436
Wheelhouses	7

Source: Environmental Report: Strategic Environmental Assessment of the Shetland Regional Transport Strategy. Shetland Islands Council. 2006

Archaeological Sites

In addition to the protected sites listed above, there is also the potential for development related activities to affect Shetland's many archaeological sites. Shetland's rich archaeological heritage includes Viking sites, standing stones, ancient crofts and ruined chapels. Whilst many sites are identified within the Sites

and Monuments Register, there is the potential for unknown archaeological sites to be affected[17].

Designated Wrecks
There are two protected wrecks in Shetland waters which have been designated due to their importance in terms historical and archaeological value. These have exclusion zones surrounding the wrecks, within which it is an offence, without a licence, to tamper with, damage or remove any objects or part of the vessel or to carry out any diving or salvage operation. The wrecks are the Wrangles Palais, which sank in 1687 (100m exclusion zone) and the Kennemerland, which sank in 1664 (250m exclusion zone)[5].

Gardens and Designed Landscapes

There are four sites designated as Gardens and Designed Landscapes from the Inventory of Gardens and Designed Landscapes in Scotland can be found in the Shetland Islands[19]. They are;

- Belmont House (NGR: HP 563 009);
- Brough Lodge(NGR: HU 579 926);
- Lunna House (NGR: HU 486 691); and
- Gardie House (NGR: HU 487 421).

4.2.9 Landscape

Landscape Character
SNH, in conjunction with partner councils, has undertaken detailed review and classification of the various landscape areas and types in Scotland. The Shetland landscape character assessment[20], identifies seven primary landscape types which are further subdivided into detailed landscape character areas. Inland landscapes are characterised by rolling hills, heather and rough grassland with historic buildings and features. Historic land use practices, particularly crofting and peat cutting, have helped to create the diverse landscapes. These landscape types are listed below:

- Coastal edge
- Farmed and settled lowlands and coast
- Farmed and settled voes and sounds
- Inland valleys
- Major uplands
- Peatland and moorland
- Undulating moorland with lochs

Designated Areas

National Scenic Areas (NSA)
These are areas of exceptional scenic value and comprise some of the best examples of Scotland's landscapes. Presently NSAs are primarily regulated through planning controls. National Scinic Areas are regulated through the Town and Country Planning (Scotland) Act 1997. One NSA in Shetland covers seven of

[19] Historic Scotland (2009) *PASTMAP*. Available at:www.pastmap.org.uk
[20] Gillespies (1998) A Landscape Assessment of The Shetland Isles. Scottish Natural Heritage, Review No 93

Shetland's finest sections of coastline[21]. The locations of the seven zones are listed below:

- Hermaness (including Muckle Flugga and the western slopes of Saxa Vord);
- Fethaland (broad coastal strip from Uyea to Burravoe in Northmavine);
- Eshaness (including Hillswick Ness and the intervening coastline);
- Muckle Roe (western half of the island);
- Foula;
- Fair Isle; and
- South West Mainland (from Fitful Head to Weisdale Voe and Skeld and including Burra, Trondra and the islands to the north).

Tree Preservation Orders (TPO)
Under the Town and Country Planning (Scotland) Act 1997, SIC must be given prior notification of intended works to protected trees. It is an offence to chop down, top, lop or wilfully destroy trees protected by a TPO without consent. There are 2 TPOs in Shetland; at Helendale House and the rear of Montfield Hospital, both in Lerwick. Possible future TPO sites include[13]:

- Seafield at the Ness of Sound
- Scalloway
- Busta House
- Halligarth, Baltasound
- Tresta

Local Protection Areas
These areas are detailed in the Section 4.2.1 in relation to biodiversity. LPAs may also be designated by Shetland Islands Council for their landscape value.

4.3 CURRENT ENVIRONMENTAL ISSUES

Schedule 2 of the Scottish Act requires that the Environmental Report includes a description of existing environmental problems, especially those relating to any areas of particular environmental importance. The purpose of this section is to explore the key environmental issues that are relevant to SIC and whether the Wind Energy IPP is likely to have an effect either positively or negatively on these issues.

This review of environmental problems, issues and opportunities across Shetland, both strategically and in the context of the Wind Energy IPP, has been undertaken by the environmental assessment team. The process has involved:

- reviews of issues from relevant strategies, plans and programmes;
- review of baseline environmental data;
- team knowledge of environmental conditions in Shetland;
- team knowledge of contemporary national (and regional) environmental issues relevant to general development;
- an SEA workshop held with Shetland Islands Council Officers (see Annex G); and
- comments received from the Consultation Authorities at the scoping stage (see Annex B).

[21] Scottish Natural Heritage (2009) *SNH Information service. http://www.snh.org.uk/snhi/* (accessed 4/03/09)

A summary of the key findings of the review is presented below. Where appropriate, opportunities for the environment in relation to the Wind Energy IPP are included.

Current environmental issues that have been identified are:

4.3.1 Biodiversity, Flora and Fauna

Strategic Context

- The abundance of nationally and internationally designated conservation sites in coastal areas, restricts the amount of land available for development and so may 'push' developments further inland where there are other planning pressures such as transport infrastructure and noise sensitivity.
- Protected species by their nature are mobile and frequently rely on areas of land and sea that lie out side of the SPA or SAC boundary. Seabirds nesting within SPAs are dependent on sea areas outwith the sites while raptors, wading birds and otters often rely on the use of land outwith designated sites. Therefore these animals may be particularly sensitive to development.
- Owing to changes in sea temperature and the predicted effects of climate change populations of some species, for example sand eels (*Ammodytes marinus*), may migrate away from the Shetland Islands. This would have many knock-on effects for protected species (under national and international legislation).
- Population decline and loss of biodiversity is a global problem, and this extends to the Shetland Islands.

Wind Energy IPP Context – Issues and Problems

- The risk of direct and indirect impacts on designated sites (European, national and local), European Protected Species and nationally important species, caused by wind energy developments.
- Loss of habitat and species (particularly those identified within the Local Biodiversity Action Plan - LBAP) associated with land under consideration for wind farm development.
- A number of moorland breeding species occur in Shetland at much higher densities than elsewhere in Britain (these include golden plover and red-throated diver, both of which are on Annex 1 of the Birds directive, whimbrel, of which Shetland holds 9 % of the GB population and great skua, of which Shetland has 43% of the GB population). The potential for wind energy developments to affect regional and national populations of these species adversely is likely to be a constraint on such developments.
- Changes in land use resulting in changes to habitat composition (as well as landscape change) caused by the wind farm and associated infrastructure.
- Habitat fragmentation and severance associated with new wind energy developments.
- Disturbance of species from construction works, operational works and traffic.
- Direct species loss.
- Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).

Opportunities

- Ensuring that new wind energy development does not affect designated sites or important species.
- Planning development to avoid severance and fragmentation.

4.3.2 Population and Human Health

Strategic Context

- The way of life for many people in the Shetland Islands is changing and the move away from small-scale fishing and crofting towards more commercial ventures has coincided with a shift in population from rural areas to urban areas. Because of this 'rural drift' over-centralisation around Lerwick is a possibility along with the migration of some of the population to mainland Scotland.
- The large numbers of small, isolated communities that exist in Shetland mean that providing access to employment and essential services is challenging and costly.

Wind Energy IPP Context – Issues and Problems

- Aerodynamic and engine noise from aerogenerators can affect sensitive receptors such as housing, hospitals and places of work.
- Nuisance caused by shadow flicker from turbine blades can affect public health and well-being.
- Community severance effects e.g. by access tracks for turbine maintenance or safety of road crossings in vicinity of new developments.
- Loss of visual amenity and recreational space caused by wind energy development on open spaces.
- Impact of wind energy on the visual aspect of Shetlands environment leading to loss of tourism and associated employment.
- Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).

Opportunities

- Good operational practice offers the opportunity to minimise nuisance impacts and impacts on human health from construction.
- Planning activities offer opportunities for minimising community severance effects.
- Creating an environment into which successful planning applications for wind energy development may benefit the community by creating jobs.
- Direct benefits to communities through community benefit funds, which apportion some funds created by wind energy development to a local trust for use in community projects.
- Good design offers opportunities to avoid nuisance impacts from renewable energy devices and also development that impinges on outdoor privacy, open or greenspace.

4.3.3 Water

Strategic Context

- Because of the scarcity of areas available for water storage, Shetland has a finite water resource and so this must be carefully managed and protected. This is especially relevant to the Out Skerries, a small group of Shetland islands which have in the past experienced drought.
- The ratio of coast to area of land in Shetland is high and the marine and coastal environment this creates is key to the prosperity of natural species and to economic activities such as fishing. Maintaining a high marine water quality is therefore of paramount importance.

Wind Energy IPP Context – Issues and Problems (Freshwater Environment)

- Flooding associated with insufficient drainage maintenance and capacity.
- Pressure on private abstractions.
- Water abstraction can affect important habitats.
- Surface discharges contaminated during construction or operation of developments.

Issues and Problems (Marine Environment)

- Direct and indirect impacts on coastal waters.
- Flooding and sea level rise.
- Pollution from construction related activities or from spills once development sites operational.

Opportunities

- Good site construction and operational practice offers the opportunity to minimise impact on the freshwater and marine environment.
- Good practice in surface and waste water management including the use of sustainable urban drainage schemes (SUDS) provides opportunities to protect the water environment.

4.3.4 Soils and Geology

Strategic Context

- Shetland has a unique geology and as such, this must be protected. Shetland recently became a UNESCO European Geopark and will use its exceptional geological heritage to promote sustainable development, particularly in the field of tourism and education. Shetland's earth heritage is therefore potentially of economic importance as well as academic interest. Inappropriate development can be damaging to earth heritage if it destroys or obscures geological features, however if development is appropriate and sympathetic to its surroundings it can also be beneficial in restoring those sites that have been damaged in the past.
- Peat deposits on the Shetland Islands can pose a serious landslip hazard if there is a period of drought followed by heavy rain. This particular issue has implications for soil and geological resources, biodiversity, water quality, flooding and the safety of property and life.

- Blanket bog is an important and internationally rare habitat and also provides a significant sink for carbon dioxide. Developments which disturb the hydrology or physical structure of bogs can affect the stability of peatland over a much wider area, with implications for both its ecology and the release of CO_2. Peat bogs also emit methane and research is ongoing to further understand the sink/emission balance.
- Peat can also be lost to erosion if the hydrological balance is disturbed, causing it to dry out.
- Land available for agriculture on the Shetland Islands has traditionally been of poor quality. This, added to the fact that there is an economic demand for the Shetlands' farming products (e.g. Shetland lamb) means that pressure to 'improve' land for agriculture needs to be balanced against conservation interests and other land uses such as wind energy and other development.

Wind Energy IPP Context– Issues and Problems

- Direct and indirect impact on statutory and non-statutory designated sites (these include geological Sites of Special Scientific Important (SSSI), Geological Conservation Review (GCR) Sites and Regionally Important Geological Sites (RIGS).
- Direct and indirect impact on the Geopark.
- Pressure on soil resources from inappropriate development, particularly those supporting prime agricultural land.
- Pressure on the peat resource from inappropriate development including the exacerbation of land slip and erosion risks (particularly from access tracks to new developments).
- Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).

Opportunities

- Sensitive siting and good operational practice offers the opportunity to minimise impact on soils and geology.
- Following advice on avoidance of soil and peat instability.
- Avoidance of areas where peat at risk.

4.3.5 Material Assets

Strategic Context

- Allowing for future changes in supply and demand for oil and gas must be taken into account as these commodities already form a large proportion of the local economy.
- The drive for sustainable energy sources on the Shetland Islands means that a number of renewable energy options are being taken forward. The environmental impact of such schemes may have the potential to cause significant environmental effects.
- Shetland has few options available for waste disposal and currently the majority of waste is sent to landfill on a single landfill site to the north of Lerwick.

- A great deal of food, goods and materials are imported from outside the community. This means that transportation by sea is vital and the environmental effects of such activities are difficult to mitigate.
- As a result of the heightened coastal flood risk on Shetland, a large amount of material resources are used to build coastal defences. Locally quarried rock armour is often used for this purpose.

Wind Energy IPP Context – Issues and Problems

- Plant, equipment and transport related fuel and energy use.
- Pressure for aggregates to be used in access track construction, and associated effects of extraction and transport to sites.
- Development on 'greenfield' sites.
- Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).
- Landscape and visual impacts of quarry operations in sensitive landscapes.

Opportunities

- Promote wise use of existing road and other transport infrastructure.
- Development on 'brownfield' sites.
- Promote reduction of non-renewable resources.
- Promote re-use of aggregates and other road materials.
- Opportunity to exploit the potential for renewables in the face of dwindling oil resource.

4.3.6 Climatic factors

Strategic Context

- A large proportion of the houses, roads and economic infrastructure on Shetland are located at the coast. The properties may therefore be more susceptible to coastal flooding than other places in Scotland.
- Strong westerly storms are a feature of the weather and as a result of this storm management measures may be needed to avoid coastal flooding.
- Meeting targets for reducing greenhouse gases poses a challenge as there is a lack of infrastructure that will be needed to deliver this.

Wind Energy IPP Context – Issues and Problems

- Emissions of greenhouse gases from operational plant, equipment, traffic and transport.
- In some cases the disturbance of the soil can contribute to releasing significant quantities of CO_2 into the atmosphere, thus contributing to the emissions of greenhouse gases. Peat is especially vulnerable to this affect.
- Rising sea levels.
- Embodied carbon within the concrete base of wind turbines and within the steel used to fabricate the turbines.

Opportunities

- Replacement of existing oil-fired power station that currently supplies Shetland's electricity, with a clean and sustainable alternative, which gives off no operational CO_2 emissions.

4.3.7 Air Quality

Strategic Context

- Shetland has an outstandingly high air quality due to its exposed position and lack of air polluting developments. Maintaining this high level of air quality must be a priority as any degradation would have effects on sensitive species and on the human population.
- Although air quality issues are relatively minor on Shetland (because of their isolated location and consistently windy conditions) large developments do have the potential to adversely affect air quality and cause localised nuisances associated with noise, odour and dust emissions. Quarrying, energy production and activities relating to the fishing industry all have the potential to generate nuisance effects and adversely affect air quality.

Wind Energy IPP Context – Issues and Problems

- Levels of NO2 and PM10 associated with plant, equipment and traffic flows associated with new developments.
- Noise, other nuisance (e.g. shadow flicker and reflected light) from turbines and dust and noise emissions from other plant, equipment and traffic.
- Increasing traffic flows (especially the car) associated with new developments.

Opportunities

- Replacement of existing oil-fired power station, which currently supplies Shetland's electricity, with a clean and sustainable alternative.
- Improvement to plant, equipment and vehicles (e.g. greener equipment and cleaner fuels and vehicles used during construction).

4.3.8 Cultural Heritage

Strategic Context

- Due to its unique remoteness the Shetland Islands have a strong identity and maintaining this into the future should be recognised as an important challenge.
- There is also a wealth of archaeological resources on the islands that date back to prehistory, encroachment of development could have the potential to threaten the setting or the integrity of such sites if unmitigated.

Wind Energy IPP Context – Issues and Problems

- Direct and indirect impacts on statutory and non-statutory designated sites and the impact on their settings (Scheduled Ancient Monuments (SAMs), Listed Buildings (LBs), Designed Landscapes and Conservation Areas), and locally designated sites.

- Need to take account of and conserve important historic landscapes and specific sites such as Viking Unst, Mousa, Beorgs of Uyea, Fethaland and Catpund.
- Risks of impacts on unknown and as yet undiscovered resources.
- Variety of locally important sites which should be safeguarded.

Opportunities

- Policy on the placing of turbines would have the opportunity to direct wind energy to those locations that do have the minimum impact and away from any historical or culturally sensitive sites.

4.3.9 Landscape and Seascape

Strategic Context

- Scenic areas in Shetland are predominantly coastal and large parts of the islands are designated as National Scenic Areas (NSAs). This means that any wind farm developments on or near to the coast, which are highly conspicuous in nature, could potentially have an adverse effect on the landscape.
- Shetland is relatively flat and there are very few trees on the islands. This means that there is very little opportunity to screen any large wind farm developments or associated 'borrow pits' (small quarries for access track aggregate) and so they are more at risk of creating an adverse effect on the landscape if not carefully sited and planned.

Wind Energy IPP Context – Issues and Problems

- Due to the relatively flat topography any on-shore and off-shore wind energy development and its associated infrastructure is likely to have an impact on the landscape and visual amenity of Shetland.
- Direct and indirect impacts on designated sites (such as NSAs, Historic Gardens and Designed Landscapes).
- Gradual erosion of landscape character (cumulative effects).

Opportunities

- Policy on the placing of turbines would have the opportunity to direct wind energy to those locations that do have the minimum impact and potentially off-shore in the future.

4.4 FUTURE OF THE ENVIRONMENT IN THE ABSENCE OF THE WIND ENERGY IPP

The principle purpose of carrying out an SEA is to anticipate and understand the impact the plan – in this case the Wind Energy IPP – is likely to have on the environment of the plan area. The Directive also seeks examination of how the environment of Shetland is likely to evolve without the adoption and implementation of the Wind Energy IPP.

Given that the objective of developing a large wind farm on Shetland is asserted in the Shetland Islands Council Corporate Plan (2008), the absence of up to date wind energy development policies (which the Wind Energy IPP presents) would mean that such development would either fail to be realised or would proceed

without full consideration of the social, economic and environmental impacts such a project could have.

Existing Local Plan and Structure Plan policies (Local Plan policy ENG 6 and ENG 7 and Structure Plan policies ENG 3 and ENG 4), along with the Shetland Energy Plan do provide a framework for the development of renewable energy in general but do not focus specifically on wind energy and, being some years old, are likely to be less in touch with best practice and less in tune with changing legislation. It is difficult to predict the likely evolution of some environmental aspects without the Wind Energy IPP. However assumptions have allowed some trends to be assessed and these are reported in table 4.19.

A cable connecting Shetland to the mainland would be required for any major development in renewable energy in Shetland and this could facilitate further opportunities in development of marine renewable energy in the future.

Table 4.19 Evolution of the Environment without the Wind Energy IPP

SEA Topic (Section of the Environmental Issues)	Environmental Issues influenced by the Wind Energy IPP	Evolution of the Environment without the Wind Energy IPP
Biodiversity, Flora and Fauna (Section 4.3.1)	SIC has a key role to play in influencing the behaviour of wind energy developers towards the issues of biodiversity and the natural heritage. This could be done through: • Ensuring that new wind farm development does not affect designated sites or important species. International and national ecological designations will help to prevent or restrict development on the most environmentally sensitive sites but other factors such as migration routes must also be taken into account. • Planning wind energy developments to avoid severance and fragmentation. • Making sure that the impact of wind energy development on biodiversity is considered at the earliest opportunity alongside the impact of its supporting infrastructure (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).	Major renewable energy schemes (such as windfarms) could impact on habitats and species. Existing policies within the Structure Plan and Local Plan that focus on protecting designated sites (such as SP NE4, SP NE5, SP NE6, SP NE7, SP NE8, SP NE9; LP NE10) and those that enhance biodiversity (e.g. LP NE13) would provide protection against the loss of biodiversity to any development, including wind energy development. However wind energy development can have specific impacts on particular species such as birds (e.g. impacts on local raptor species, effects on moving migratory bird populations and displacement of resident breeding species), and structure and local plan policies may not draw sufficient attention to this. The overall trend irrespective of the plan is therefore likely to be adverse.
Population and Human Health (Section 4.3.2)	Potential risks to population and health include: • Aerodynamic and engine noise from aerogenerators can affect sensitive receptors such as housing, hospitals and places of work. • Nuisance caused by shadow flicker from turbine blades can affect public health and well-being. • Community severance effects e.g. impacts of access tracks and safety of road crossings in vicinity of new developments • Loss of visual amenity and recreational space caused by wind energy development on open spaces. • Impact of wind energy developments on the visual quality and amenity value of Shetland's environment leading to	Local Plan policy ENG 7 (Control of Potential Nuisance from Energy Generators) does address the human impact of development of renewable energy including the potential for shadow flicker and light reflection, noise emission, electromagnetic disturbance, visual intrusion, safety and access. However, the current policy would not fully recognise the potential for wind energy developments to have cumulative impacts due to the potential need for further infrastructure (transmission stations) in order to make them viable. The overall effect is therefore considered to be slightly adverse in the absence of the Wind Energy IPP.

SEA Topic (Section of the Environmental Issues)	Environmental Issues influenced by the Wind Energy IPP	Evolution of the Environment without the Wind Energy IPP
	and amenity value of Shetland's environment leading to loss of tourism and associated employment.	
Water (Section 4.3.2)	Shetland has a finite water resource and so this must be carefully managed and protected. Maintaining a high marine water quality is also of paramount importance.	Current water and drainage policies within the Local Plan protect catchments and water supplies against adverse impacts from development per se, rather than from wind energy development specifically. Local Plan Policies do not however, include a requirement for developers to implement, complete and maintain any mitigation works. The overall effect is therefore considered to be slightly negative in the absence of the Wind Energy IPP.
Soils and Geology (Section 4.3.4)	The construction of wind farm developments (including turbines and access tracks) has the potential to impact on important peat resources and cause soil contamination from activities undertaken at the construction sites (e.g. fuel spillages/leakages, surface water scouring of suspended solids etc) as a well as cause erosion from run-off and peat stability/slippage. In some cases the disturbance of the soil can contribute to releasing significant quantities of CO_2 into the atmosphere, thus contributing to the emissions of greenhouse gases. Peat is especially vulnerable to this affect.	**Soil and Peat** Existing Local Plan policy (LP MIN 10) and Minerals IPP policy (SPG MIN 4) refer to protection of peat against unsustainable commercial peat extraction, rather than the potential impacts of development (wind or otherwise) on the island peat resources. SIC Construction and Design IPP Policy SPG 26 (General Requirements for All New Developments) places protection on peat resources but does not mention the risk of peat slip or the carbon cost of disturbing peatland. The Wind Energy IPP clearly has an important role to play in ensuring that wind energy development does not proceed in such as way as to destroy important peat and soil resources. The overall effect on soil and peat is therefore considered to be strongly adverse in the absence of the Wind Energy IPP. **Geodiversity** The SIC Minerals IPP sets out a suite of policies aimed at protecting Shetlands geological resources from inappropriate exploitation or harm from unsuitable development. The Minerals

SEA Topic (Section of the Environmental Issues)	Environmental Issues influenced by the Wind Energy IPP	Evolution of the Environment without the Wind Energy IPP
		IPP provides a comprehensive framework for protecting geodiversity and so, while the Wind Energy IPP should complement the Minerals IPP, geodiversity would be protected even in the absence of the Wind Energy Development IPP. The resulting impact on geodiversity in the absence of the plan would therefore be neutral.
Air Quality (Section 4.3.7)	The Shetland Islands have an outstandingly high quality of air, due to their exposed position. Maintaining this high level of air quality must be a priority as any degradation would have effects on sensitive species and on the human population. Housing and commercial development has the potential to impact on air quality through: • Levels of NO2 and PM10 associated with plant, equipment and traffic flows associated with new developments • Noise from plant, equipment and traffic • Increasing traffic flows associated with new developments • Dust from extraction activities (at a localised level) • Possible cumulative impacts from traffic from various developments	Shetland's energy is currently derived from an oil-fired power station. The absence of the Wind Energy IPP will not necessarily mean that the move towards cleaner energy ceases, but it will mean that a potential cleaner energy source lacks a clear framework for development. Specific policies within the Wind Energy IPP do address how best to develop Shetland's wind energy sector and in the absence of the plan it is clear that progress would be slowed down with consequential localised effects on air quality (especially around the oil fired power station in Lerwick, which is the current source of the greater proportion of Shetland's energy). The overall effect is therefore considered to be slightly adverse in the absence of the Wind Energy IPP.
Climatic Factors (Section 4.3.6)	• Emissions of greenhouse gases from energy generation on Shetland and in Scotland • Predicted increases in storm event frequency and severity from climate change in future • Rising sea levels • Dependency on oil	Wind energy development on Shetland has the potential to contribute to Scotland's commitment to an 80% reduction in greenhouse gas emissions by 2050. Rather than allowing wind energy generation on too large a scale (that may compromise other aspects of the environment) or too small a scale (that may fail to realise the full potential for wind energy to contribute to the creation of a sustainable energy mix), Shetland should seek to realise the optimum potential for wind energy generation. In the absence of the Wind Energy IPP the opportunity for SIC to carefully plan to achieve this optimum will be lost. Although wind energy development may still proceed, it would do so in a 'piece meal' or fragmented way, thus reducing the

SEA Topic (Section of the Environmental Issues)	Environmental Issues influenced by the Wind Energy IPP	Evolution of the Environment without the Wind Energy IPP
		potential contribution that Shetland can make to reducing Scotland's greenhouse gas emissions. In this respect the evolution of the environment without the plan would be largely adverse. As an outcome of the Scottish Climate Change Act (2009) there should be an overall decrease in CO_2 emissions attributable to Scotland, in line with reduction targets, even in the absence of the Wind Energy IPP. On a global scale, however, without substantial and immediate cuts in greenhouse gas emissions it is likely that climate change will continue unabated. SEPA in its State of Scotland's Environment 2006 report states that Scotland needs to "take action to tackle the problem and to prepare itself for the inevitable impacts". Therefore, climate change is certain to continue even in the absence of the Wind Energy IPP so the overall effect will be adverse.
Material Assets (Section 4.3.5)	• Plant, equipment and transport related fuel and energy use • Pressure for aggregates to be used in access track construction, and associated effects on the environment of extraction and transport to sites • Development on brownfield sites • Development on greenfield sites • Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable.	Policy on the use of aggregates in development has been set out by SIC in the Minerals Interim Planning Policy. Within this document, Policy SPG MIN 11 details which sites can be used as borrow pits, such as might be needed to create access tracks, and sets key environmental requirements that borrow pit excavation must meet including restoration. Policies within this document further define how mineral resources will be protected and used in a sustainable manner. Given the extensive policy framework in existence within the SIC Minerals Interim Planning Policy the presence or absence of the Wind Energy IPP on this will be neutral.

SEA Topic (Section of the Environmental Issues)	Environmental Issues influenced by the Wind Energy IPP	Evolution of the Environment without the Wind Energy IPP
		Local Plan policies IND 4 and IND 5 deal with the placing of business and industry proposals in existing rural settlements, and in the open countryside, and therefore give some steer on how development will be dealt with on greenfield and directed toward brownfield sites. However, these policies may not be fit for purpose as wind energy may not typically lend itself to being sited on brownfield land as some brownfield land may be sensitive to such development for other reasons. Further indication as to the suitability of particular locations is therefore needed from the Wind Energy IPP and in the absence of such policy the impact on material assets will be negative.
Cultural Heritage (Section 4.3.8)	There is a wealth of archaeological resources on the Islands that date back to prehistory, and encroachment of wind energy development could have the potential to threaten the setting or the integrity of such sites if unmitigated. There is however, an opportunity to place wind energy in the best possible locations, using a strategic approach to map the areas of cultural and historical sensitivity, and then avoiding these sites and their setting. The creation of the policy also provides the opportunity to engage with stakeholders to find those areas that are less constrained.	SIC Local Plan policy LPNE10 states that the Council will refuse development proposals that would have a significant adverse effect on the integrity or character of historically designated sites. It therefore gives strong protection to those sites that are locally, nationally and internationally protected. The existing policy framework however, does not recognise the specific issues around the siting of wind energy development and the potential for large developments to cumulatively impact upon historical sites. The overall effect is therefore considered to be adverse in the absence of the Wind Energy IPP.
Landscape and Seascape (Section 4.3.9)	Due to the relatively flat topography any on-shore and off-shore wind energy development and its associated infrastructure is likely to have an impact on the landscape or seascape and the visual amenity of Shetland. Inappropriate or insensitive development could therefore affect the capacity of the landscape to absorb new infrastructure. It could also lead to the gradual erosion of landscape character (cumulative	Existing Policy within the Local Plan does protect the landscape and designated sites against adverse impacts from certain types of developments. However, although Policy LP ENG7 does mitigate against potential nuisance from energy generators it does not deal with the potentially far reaching landscape impacts of commercial aerogenerators. SIC can influence developers on where commercial aerogenerators are likely to have the least

SEA Topic (Section of the Environmental Issues)	Environmental Issues influenced by the Wind Energy IPP	Evolution of the Environment without the Wind Energy IPP
	development effects). With the implementation of the Wind Energy IPP there are opportunities to direct wind energy development to areas most able to accommodate it.	visual impact on the landscape through its policies and measures within the Wind Energy IPP. In the absence of the plan it is clear that wind energy development could be proposed in areas which do not have the best possible combination of landscape features and low visual sensitivity that is needed. The overall effect is therefore considered to be adverse in the absence of the Wind Energy IPP.

5 ASSESSMENT OF THE ENVIRONMENTAL EFFECTS AND PROPOSED MITIGATION

5.1 INTRODUCTION

The procedure for assessing the likely environmental impacts of the Wind Energy IPP has been described in Section 2.6. An overall summary of the environmental assessment of the Wind Energy IPP Policies against the SEA objectives is given in Table 5.1. Although there were no explicit alternative plans or policies considered during development of the Wind Energy IPP, consideration was given to development options with a wide range of environmental implications. How alternatives were assessed is discussed in Section 5.2.

5.2 ASSESSMENT OF ALTERNATIVES

The SEA Directive and the Scottish SEA Act require the Environmental Report to consider the impacts of alternatives to the proposed plan as part of the SEA. There have not been any literal "alternatives" to the Wind Energy IPP and its suite of policies since SIC has sought an integrated and balanced approach to policy development right from the start. Rather than developing alternative policies SIC has evolved its policy document in an iterative way making use of the SEA process during this "evolution" to remove any undesirable environmental effects, should they exist, and to make sure that environmental sustainability elements within the policies were strengthened where possible.

As a result, therefore, of this iterative assessment and consultation process some of the supporting text and objectives within the Wind Energy IPP have been refined. The following summarises the overall impact that the SEA process has had in the evolution of the Wind Energy IPP and the key changes made:

- widening of the understanding of the impact that developments can have through interactions with consultees;
- consideration of flood risks associated with future developments;
- recognition of the need to consider embodied energy and carbon associated with the manufacturing and construction of plant and equipment used in wind energy developments.

5.3 ASSESSMENT OF THE DRAFT WIND ENERGY IPP AND PROPOSED MITIGATION

5.3.1 Introduction

Building on the assessment that was undertaken for the individual policies of the Wind Energy IPP (see Annex A), the Wind Energy IPP has been considered as a whole in the context of the SEA Topics. Table 5.1 outlines the environmental effects that are predicted to arise as a result of the adoption of the draft Wind Energy IPP and are summarised. In reaching the conclusions included in Table 5.1, professional judgement has also been exercised in considering the likelihood of secondary, cumulative, indirect and synergistic effects arising from the adoption of the proposed Wind Energy IPP.

Overall, the assessment finds that the adoption of the plan will result in an improvement on the potential environmental consequences of adopting the "do minimum" approach outlined in Table 4.19 above.

Where appropriate, mitigation that is contained within the Plan is outlined and further suggestions for strengthening this are made.

Table 5.1 SEA Appraisal Summary of the Wind Energy IPP

SEA Topic	SEA Objectives	Summary Assessment of the 3 Spatial Policies and 9 Development Management Criteria
Biodiversity, Flora and Fauna	1. To further the conservation of biodiversity	Summary Score: **0** for most but leading to ✓ in some cases Wind Energy development and its associated infrastructure and access network could lead to a reduction in biodiversity (particularly for larger developments). The influence of the Shetland Structure Plan and Local Plan (with the appropriate biodiversity protection policies) would be beneficial if policies are used vigorously not only to protect biodiversity but also to enhance it. The rigorous application of the policies that focus on protecting designated sites (such as SP NE4, SP NE5, SP NE6, SP NE7, SP NE8, SP NE9; LP NE10) and those that enhance biodiversity (e.g. LP NE13) would afford the necessary protection. The Wind Energy Development IPP itself sets out clear aims of avoiding any significant environmental effects on biodiversity. The introductory text in Paragraphs 4.10 to 4.12 makes it quite clear that relevant protective nature conservation legislation must be met as well as recognising the importance of protected species such as the otter and the importance of protecting their habitats and surrounding environment. Development Management Criterion 1 within the IPP provides a further layer of protection for biodiversity and should provide mitigation for the possible effects of wind energy developments.
Population and Human Health	2. To improve the quality of life for people and communities across Shetland 3.To improve the quality of human health in Shetland	Summary Score: **0** for most but leading to ✓ in some cases Requirements are built into Development Management Criterion 6 for safeguarding sensitive locations such as residential properties, schools and workplaces from the potentially adverse impacts of wind turbines. This criterion covers a range of factors including noise, shadow flicker, electromagnetic interference, and construction/decommissioning logistics and phasing which can all have significant adverse effects on public health. There is the potential for traffic and transport associated with the construction, operation and maintenance of any wind energy development to pose risks to safety and place restrictions on access, if traffic is not carefully managed. Wording within Development Management Criterion 6 identifies this issue and places a requirement on developers to: *"provide method statements that demonstrate how they will manage this disruption during the construction, operation, maintenance and decommissioning phases, and how these will be agreed and updated where necessary"*

SEA Topic	SEA Objectives	Summary Assessment of the 3 Spatial Policies and 9 Development Management Criteria
		Furthermore, the supporting text for this Criterion states that: *"applicants will need to demonstrate how [quality of life issues] will be managed throughout the project lifecycle so as to keep adverse impacts on tourism and recreation to a minimum. This includes minimising disruption to statutory access rights (construction and maintenance method statements should include how the access rights will be managed during construction and operational phases, and full re-instatement of these rights will be required after decommissioning"* Development Management Criterion 6 does not currently consider flood risk amongst the quality of life factors and so it is recommended that wording in the criterion be modified to include a requirement for wind energy development proposals to be accompanied by an assessment of the flood risk to proposed developments and exacerbation of flood risk to other receptors. The following wording is suggested: *"Planning applications must be accompanied by an assessment of the effects on sensitive receptors/locations covering a range of factors including noise, shadow flicker, electromagnetic interference, and construction/decommissioning logistics and phasing**. In addition to this proposals for wind energy development or any component infrastructure must be accompanied by an assessment of the flood risk posed to the developments and exacerbation of flood risk to other receptors caused by new developments."*** In addition, Policy WED DM1 (Development Management Policy) recognises the potential for wind energy developments to have cumulative impacts (because they may require further infrastructure in order to make them viable) and for these impacts to be fully assessed. Policies within the Wind Energy IPP and in particular the Development Management Criteria: • 5 – Impact on Water Resources • 6 – Impact on Quality of Life and Amenity • 9 – Aviation all recognise the importance of protecting the amenity and quality of life for Shetland residents and will therefore support the population and health related SEA objectives.
Soils and Geology	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	Summary Score: Broadly ✓ **Soil and Peat** Existing Local Plan policy (LP MIN 10) and Minerals IPP policy (SPG MIN 4) refer to protection of

SEA Topic	SEA Objectives	Summary Assessment of the 3 Spatial Policies and 9 Development Management Criteria
		peat against unsustainable commercial peat extraction, rather than the potential impacts of development (wind or otherwise) on the island peat resources. SIC Construction and Design IPP Policy SPG 26 (General Requirements for All New Developments) places protection on peat resources but does not mention the risk of peat slip or the carbon cost of disturbing peatland. The Wind Energy Development IPP Development Management Criterion 8 (Peat and Soil Disturbance) states a clear requirement for wind energy development to minimise disturbance of soil and peat in order to protect against peat slip and carbon emission. The disturbance of deep peat will be a significant factor in the release of CO_2 and so supporting text for Development Management Criterion 8 states that: *"An indicative map showing peat depth is available, and applicants should consult this at an early stage of the design of their proposal"* There is therefore a requirement for potential developers to take account of areas of deep peat and to seek out further information in order to avoid them when planning wind energy development. The application of Development Management Criterion 8 will therefore have a positive effect on this SEA objective. **Geodiversity** Development Management Criterion 2 (Geodiversity) confers protection on sites designated for their geological importance (including sites of special scientific interest and the newly designated Shetland Geopark) and will be applied alongside the suite of policies within SICs Minerals IPP, which provides a clear framework for the sustainable use of minerals and aggregates within the development context. Geodiversity will therefore be protected at multiple levels of the planning process and so the impact of the IPP on Geodiversity will be positive.

SEA Topic	SEA Objectives	Summary Assessment of the 3 Spatial Policies and 9 Development Management Criteria
Water	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably	Summary Score: Broadly **0** leading to ✓ in a number of cases The Shetland Structure Plan and Local Plan do place an emphasis on protecting the natural environment of Shetland and there are policies that address pollution prevention (SPWD1, LPWD 5 and 6). Local Plan and Structure Plan policies do not however, include a requirement for developers to implement, complete and maintain any mitigation works. Application of the Wind Energy IPP Development Management Criterion 5 (Impact on Water Resources) will provide the requirement for developers to put into place the necessary mitigation against adverse effects on water resources. The supporting text to Criterion 5 clearly recognises the need to design wind farm developments in order to minimise the impact on the water environment. It recognises the controls now enforced by SEPA (through for example the Water Environment (Controlled Activities) (Scotland) Regulations 2005 (as amended) (CAR)) and also the mitigation that can be afforded through best operational practices. Early discussion with SEPA at the pre-application stage is encouraged to identify the key issues that would relate to protecting and enhancing water quality.
Air	7. To protect Shetland's air quality	Summary Score: **0** for most but leading to ✓ in some cases It is recognised that the climate of Shetland tends to ensure a high standard of local air quality and that energy production from renewable resources such as wind does not a present significant threat to local air quality. Because of the climatic conditions it is unlikely that additional traffic and transport created during the construction, operation and maintenance of wind energy developments will have a significantly adverse effect on air quality. Policies/criteria within the Wind Energy IPP are likely to broadly support the maintenance of local air quality by facilitating the growth of renewable energy in place of existing energy production, which relies on fossil fuels (e.g. oil or solid fuel such as peat). These policy criteria will make sure that no wind energy development projects are supported that could lead to a negative effect on Shetland's air quality.

SEA Topic	SEA Objectives	Summary Assessment of the 3 Spatial Policies and 9 Development Management Criteria
Climatic Factors	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target 9. To adapt to the predicted effects of climate change	Summary Score: Broadly **0** **Carbon Emissions** Wind energy development could carry a potential carbon cost relating to the following: • Embodied carbon within building materials (e.g. from steel and concrete); • Traffic and transport related carbon emissions during construction, operation and maintenance; • Carbon emitted as a result of peat disturbance during construction. However the support of wind energy development should help to reduce carbon emissions from energy generation in the longer term and will do more than conventional fossil fuel powered energy production. Since the Wind Energy IPP should help to facilitate the sustainable growth of renewable energy, its overall effect in contributing towards Scotland's 80% CO_2 reduction target should be strongly positive. Because of the importance of reducing carbon emissions associated with any future developments, however and recognising that wind energy developments will have impacts themselves associated with the fabrication of the component parts of turbines and associated equipment, the construction of wind farm sites and carbon emitted from the disturbance of peat, it is recommended that the following wording be added to policy WED DM1 Development Management Policy: *'The specific design of wind energy developments can vary and consideration of embodied, construction and operational carbon should be included in proposals'.* **Adapting to Climate Change and Flood Risk** Depending on their location, wind farm sites could potentially be at risk from flooding or could cause or exacerbate localised flooding. Although flood risk would be a statutory component of an Environmental Impact Assessment (EIA), and the IPP does assert the condition that EIA be carried out as part of wind energy development proposals, the specific issue of flooding is not picked up specifically in the IPP document. It is therefore suggested that wording be added into Development Criterion 6 (Impact on Quality of Life and Amenity) in order to further protect sensitive receptors against flood risk. Current wording within this policy includes the following:

SEA Topic	SEA Objectives	Summary Assessment of the 3 Spatial Policies and 9 Development Management Criteria
		"Planning applications must be accompanied by an assessment of the effects on sensitive receptors/locations covering a range of factors including noise, shadow flicker, electromagnetic interference, and construction/decommissioning logistics and phasing" It is recommended that this wording be enhanced to include a requirement for wind energy development proposals to be accompanied by an assessment of the flood risk to proposed developments and exacerbation of flood risk to other receptors. The following wording is therefore suggested: *"Planning applications must be accompanied by an assessment of the effects on sensitive receptors/locations covering a range of factors including noise, shadow flicker, electromagnetic interference, and construction/decommissioning logistics and phasing. In addition to this proposals for wind energy development or any component infrastructure must be accompanied by an assessment of the flood risk posed to the developments and exacerbation of flood risk to other receptors caused by new developments."*
Material Assets	10.To promote the sustainable use of natural resources	Summary Score: Broadly **0** and ✓ in one or two cases Policy on the use of aggregates in development has been set out by SIC in the Minerals Interim Planning Policy. Within this document, Policy SPG MIN 11 details which sites should be used as borrow pits, particularly those that might be needed to create access tracks for wind farm developments, and sets key environmental requirements that borrow pit excavation must meet including restoration. Policies within this document further define how mineral resources will be protected and used in a sustainable manner. Local Plan policies IND 4 and IND 5 deal with the location of business and industry premises in existing rural settlements and in the open countryside and therefore give some steer on how development will be dealt with on Greenfield sites and how they will be directed toward brownfield sites. However, these policies may be difficult to apply directly to wind farm developments since wind energy may not always be best located on brownfield land (since it will be dependant on exposure to, and availability of appropriate wind speeds). Also some brownfield land may be sensitive to such development for other reasons (such as proximity of housing and other sensitive receptors). Map 3 (Areas of Significant Constraint) within the Wind Energy IPP shows those areas which are designated Local Protection Areas under the Local Plan and as such are afforded substantial protection from development. With regard to the minimisation of waste, the IPP includes the Development Management Criteria

SEA Topic	SEA Objectives	Summary Assessment of the 3 Spatial Policies and 9 Development Management Criteria
		8a, which will ensure that material recycling, reuse and recovery is maximised and that a site waste management plan (SWMP) be included in any wind energy construction. Any negative impacts on waste generation will therefore be mitigated by the IPP.
Cultural Heritage (including Architectural and Archaeological Heritage)	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage	Summary Score: Broadly **0** Development Management Criteria 4 (Historic and Archaeological Environment) states that: *On-shore wind energy development and any associated infrastructure will not be permitted in locations where they would have significant adverse impacts on the site or setting of a;* • *Scheduled Ancient Monument;* • *Listed Building;* • *Conservation Area; or* • *Site Included in the Inventory of Historic Gardens and Designed Landscapes.* The policy also puts into place the requirement for applications that would affect a site of known or suspected archaeological value to be submitted along side an evaluation made by a suitably qualified archaeologist. This policy is supported by the accompanying mapped information in Map 5 (Spatial Distribution of Other Constraints) that pinpoints the location of Listed Buildings and Scheduled Ancient Monuments and Map 3 (Areas of Likely Significant Constraint) that shows the locations of Historic Gardens and Designed Landscapes and Archaeology Constraint Zones. The IPP is supportive of this SEA objective and will therefore have an overall neutral impact on the historic environment.
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded	Summary Score: Broadly **0** leading to ✓ in some cases The importance of Shetland's landscape and seascape is fully recognised in the Wind Energy Development IPP. The IPP establishes a number of protective measures against the degradation of the landscape including Development Management Criterion 3 (Landscape and Visual Impacts), which sets out requirements for wind energy development applications to be accompanied by full landscape and visual assessment including a cumulative assessment. Strong guidance is given in the Map 3 (Areas of Likely Significant Constraint) on the locations of high sensitivity landscapes, which would be a constraint to wind energy development. Policy LP ENG7 within the Local Plan also protects the landscape and designated sites against

SEA Topic	SEA Objectives	Summary Assessment of the 3 Spatial Policies and 9 Development Management Criteria
		adverse impacts from certain types of developments. Protection for many parts of the natural and built environment is also provided by the simultaneous application of policy SPG 1. The resulting impact of the IPP on these SEA objectives would therefore be broadly neutral.

5.4 ENVIRONMENTAL IMPLICATIONS

5.4.1 Positive Implications

In general terms the Wind Energy IPP does not generate any strongly negative environmental effects and puts into place a suite of Development Management Criteria that will mitigate against inappropriate and environmentally damaging wind energy development. Overall the Wind Energy IPP is likely to deliver a positive contribution to the broad environmental trends for Shetland. In the absence of the policies and Development Management Criteria the evolution of the SEA topic areas in general would be likely to show an adverse trend.

Overall, in environmental terms, the Wind Energy IPP aims to:

- facilitate the creation of more sustainable forms of energy generation (from renewables) in line with the SIC Corporate Plan (2008);
- identify spatially, those geographical areas of Shetland least able to support wind energy because of their environmental, social, historical or visual sensitivity;
- outline the specific criteria planning applications for wind energy development must meet, in order to minimise the potential environmental impacts of wind energy development (e.g. air quality, water quality, visual etc);
- emphasise the importance of the protection of the natural and cultural heritage designations;
- ensure that new developments are environmentally sustainable.

The suite of policies attempt to address:

Climatic Factors

Through:

- outlining the circumstances under which wind energy development can take place in order to optimise the carbon saving potential of this form of renewable energy while ensuring Shetland's environment and unique character are protected;
- seeking to encourage the application of sustainable development principles (that will include addressing the use of fossil fuels, energy efficiency, the role of renewables and climate change issues) through the requirements built into key overarching policies.

Use of Natural resources and Material Assets

Through:

- ensuring that waste is minimised and that reused or recycled materials are used wherever possible in wind energy development;
- directing development of wind energy away from inappropriate land (such as locally protected areas).

Population and Health

Through:

- seeking to encourage the application of best practice principles, that will include: addressing emissions of noise, shadow flicker from aerogenerators and other nuisances that can affect public health and well-being, addressing traffic and transport issues, addressing the need to maintain visual amenity, ensuring that water supply and quality is not affected by developments and through the requirements built into key overarching policies and development criteria;
- ensuring that the cumulative impact of numerous wind energy developments and their associated infrastructure is taken into consideration when assessing the impacts of a single wind energy development application.

Air

Through:

- facilitating the growth of renewable energy in place of existing energy production, which relies on fossil fuels (e.g. oil or solid fuel such as peat);
- ensuring that nuisances caused by construction (noise, dust, etc) are minimised.

Soils and Geology

Through:

- outlining a requirement for wind energy development to minimise disturbance of soil and peat in order to protect against peat slip and carbon emissions;
- protecting sites designated for their geological importance (including Sites of Special Scientific Interest and the newly designated Shetland Geopark).

Water

Through:

- seeking to encourage the application of best practice principles (that will include surface water drainage and management, groundwater/hydrogeological survey and management, site- specific measures to minimise pollution etc) through the requirements built into specific Development Management Criteria.

Landscape, Biodiversity and Cultural Heritage

Through:

- seeking to encourage the application of sustainable development principles (that include recognising the importance of biodiversity, landscape and cultural heritage and the implementation of measures such as assessing the landscape and ecological value of development proposals, assessing archaeological remains and historic features and implementing measures for their preservation and recording, etc) through the requirements built into specific Development Management Criteria;
- identifying spatially, those geographical areas of Shetland least able to support wind energy because of their environmental, social, historical or visual sensitivity;

- encouraging the adoption of environmental management systems and environmental performance standards to address the effects of developments on biodiversity, landscape and seascape, the historic environment and cultural heritage.

5.4.2 Indirect Environmental Implications

Notwithstanding the above positive elements it is likely that there will be some environmental implications arising from any new wind energy developments that ultimately will come on stream as a consequence of this Wind Energy IPP. Some issues are almost inevitable, and would arise as a result of any new type of development and these include:

- emissions of greenhouse gases from energy use and traffic both during construction and operational activities;
- embodied energy and carbon in plant and equipment used in wind energy developments;
- an increased burden on air quality from emissions generated by plant and equipment as well as traffic associated with any developments;
- threats to the water and soil environment from construction activities and changes to on-site drainage as a result of the development.

Other issues are highly dependant on the nature, scale and location of particular developments. It is not inconceivable that some future developments might have implications for biodiversity (for example damage to habitats, disturbance of species and loss or damage to particular flora and fauna), landscape and historic character (including visual impact, effects on landscape and historic features) and wider transport impacts during construction, operation and maintenance.

Although SIC can and does influence developers to adopt sustainable development principles and best practice in avoiding and/or mitigating any of these effects it has no direct control over the operation of individual developments. It is assumed that some of the above implications would be picked up more specifically by controls exerted by other agencies such as Scottish Natural Heritage, Scottish Environment Protection Agency (SEPA) and Historic Scotland.

5.5 POSSIBLE CUMULATIVE EFFECTS ASSOCIATED WITH THE WIND ENERGY IPP

A summary of the assessment of the possible cumulative effects is given in Annex E. Clearly to deal with some of the effects there will need to be supporting action at the Government or Agency level, for example to help deal with:

- **energy** supply and **CO_2** emissions;
- reliance on **fossil fuels**;
- **embodied energy** and **carbon**;
- **traffic** and transportation alternatives;
- **waste** management and disposal;
- **wate**r supply and treatment; and
- wider **biodiversity and geodiversity conservation** issues.

However the Wind Energy IPP has a significant role to play in contributing to the management and mitigation of those effects associated with the role of SIC as the Planning Authority. In particular the Wind Energy IPP policies and Development Management Criteria can:

- steer new wind energy developments away from sites of nature conservation, landscape and seascape, historic and cultural heritage importance;
- address the contribution of the renewable energy development sector in Shetland to more global level issues (e.g. climate change, use of fossil fuels and energy, waste generation, loss of biodiversity) through influencing action at the local (Shetland) level;
- address resource use and material asset issues through encouraging more sustainable design and construction within new wind farm developments (e.g. effective waste minimisation, use of low embodied carbon materials in manufacture, fabrication and construction of turbines and associated infrastructure, sustainable sourcing of materials etc); and
- create the right development policy framework and approach to site design, location and construction that will help to provide proactive solutions to these problems.

Table 5.2 below summarises an assessment of the possible cumulative effects of the Wind Energy IPP. An analysis of this table indicates that for each SEA objective the overall cumulative effect of the Wind Energy IPP policies is broadly neutral (see "summary" column). Looking at the table as a whole in some instances the Wind Energy IPP policies have a positive effect on the SEA objectives, and in some cases a strongly positive effect.

Annex E summarises in more detail possible cumulative effects and the local and wider significance of these. The rigorous implementation of all of the Wind Energy Development IPP overarching policies and Development Management Criteria should help to mitigate against any possible cumulative effects arising as a result of the implementation of the Wind Energy IPP.

Table 5.2 Summary Assessment of the Possible Cumulative Effects of the Wind Energy IPP Policies and Development Management Criteria

IPP Policy	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
Policy LDP WED SP1 Off-Shore Wind Energy Development	0	0	0	✓	✓	✓	0	0	?	✓	✓	✓	✓	0
Policy LDP WED SP2 The Areas to be Afforded Significant Protection	✓	0	0	✓	0	0	0	0	0	✓	0	0	✓	0
Policy LDP WED SP3 All Other Areas	✓	✓	✓	0	0	0	0	✓	0	✓	0	0	✓	✓
WED DM1 Development Management Policy	✓	✓	0	✓	✓	0	✓	✓	0	✓	✓	✓	✓	0
Development Management Criteria 1: Biodiversity	✓✓	0	0	0	0	0	0	0	0	0	0	0	✓	✓

IPP Policy	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
Development Management Criteria 2: Geodiversity	0	0	0	✓✓	0	0	0	0	0	✓✓	0	0	✓✓	0
Development Management Criteria 3: Landscape and Visual Impact	✓	✓	0	0	0	0	0	0	0	0	0	✓	✓✓	0
Development Management Criteria 4: Historical and Archaeological Environment	0	✓	0	0	0	0	0	0	0	✓	✓✓	✓✓	✓	0
Development Management Criteria 5: Impact on Water Resources	0	0	0	0	✓✓	✓	0	0	0	0	0	0	0	0
Development Management Criteria 6: Impact on Quality of Life	0	✓✓	✓	0	0	0	0	0	?	0	0	0	0	0

IPP Policy	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
and Amenity														
Development Management Criteria 7: Availability of Grid Connection	**0**	**0**	**0**	**0**	**0**	**0**	**0**	✓✓	**0**	**0**	**0**	**0**	**0**	**0**
Development Management Criteria 8: Peat and Soil Disturbance	✓	**0**	**0**	✓	✓	**0**	**0**	✓	**0**	✓✓	**0**	**0**	✓	**0**
Development Management Criteria 8a:Minimisation of Waste Materials	**0**	**0**	**0**	✓	✓	**0**	**0**	**0**	**0**	✓✓	**0**	**0**	**0**	**0**
Development Management Criteria 9: Aviation	**0**	**0**	✓	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Summary	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	✓	**0**	**0**	✓	**0**

✓	**Overall effect likely to be positive and supportive**	**?/ ✓**	**Uncertain possible positive effect**
✓✓	**Clear strong positive effects**	**?/ 0**	**Uncertain possible neutral effect**
✖	**Overall effect likely to be negative**	**?**	**Uncertain effect**
?/ ✖	**Uncertain possible negative effect**	**0/✖**	**Neutral or possible negative effect**
0	**Neutral effect**	**0/✓**	**Neutral or possible positive effect**

5.6 PROPOSED MITIGATION

As indicated in Section 5.4 above the precise effects of some of the Wind Energy Development IPP overarching policies and Development Management Criteria are clearly going to be difficult to predict at a very local level. The effects, whether positive, negative or cumulative will depend on:

- how policies are implemented on the ground;
- the precise nature of any proposed wind energy developments that are taken forward;
- the environmental characteristics of the potential locations.

Mitigation has been developed within the wording of policies and in particular the Development Management Criteria and there were no cases where any of these were found to generate an overall negative environmental impact or clear, strong negative impacts on any of the SEA objectives. It is of course important to recognise that the policies and criteria must be simultaneously applied and not considered in isolation. Table 5.3 below summarises the more detailed information in Annex E and indicates mitigation of possible cumulative environmental effects associated with the Wind Energy Development IPP.

Table 5.3 Application of Policies that will help to mitigate Potential Cumulative Environmental Effects associated with the Wind Energy Development IPP

Potential Cumulative Environmental Effect	Wind Energy Development IPP Policies, Structure Plan and Local Plan Policies that will help to Mitigate possible Cumulative Effects
Water Resources (water use and water quality impacts)	Wind Energy IPP Policy WED DM1 and Development Management Criterion 5, Structure and Local Plan Policies SPW D1, LPWD 6 and LPWD 12
Impacts on designated sites Loss of Biodiversity	Wind Energy IPP Policy WED DM1 and Development Management Criterion 1, Structure and Local Plan Policies SP NE4, NE5, NE6, NE7, NE8, NE9 and NE10
Climatic Factors - Traffic Levels and Congestion	Wind Energy IPP Policy WED DM1 and Development Management Criterion 6, together with Structure Plan Policies SPTP 1 and SPTP 2
Climatic Factors – embodied energy and carbon	Dealt with in additional wording added to Wind Energy IPP Policy WED DM1
Waste Management	Wind Energy IPP Policy WED DM1 and Development Management Criterion 8a, together with the re-worded SPG 26
Historic and Cultural Heritage	Wind Energy IPP Policy WED DM1 and Development Management Criterion 4 and also LDP 2, SPG 6, SPG 14 and SPG 26
Landscape and Visual	Wind Energy IPP Policy WED DM1, Development Management Criterion 3 and Local Plan Policy LP ENG7.

5.7 MONITORING

Monitoring of the effects of implementing the plan will be based on the performance of a set of key indicators (some illustrative examples are shown in Table 5.4). Monitoring will be undertaken by regimes currently in place for local authority infrastructure maintenance and also delivered by the environmental regulators.

SEPA will continue to monitor water quality and would report back to Shetland Islands Council if wind energy developments appear to be contributing to increased pollution.

SNH has a responsibility to monitor and report on the condition of SSSIs and has a similar regime in place for monitoring the status of sites designated under the Habitats Directive, including Special Protection Areas (SPAs) and Special Areas for Conservation (SACs). Locally designated sites are the responsibility of local authorities (in this case Shetland Islands Council), and existing programmes for maintaining the condition of such sites will continue throughout the implementation and adoption of the Wind Energy Development IPP.

Monitoring will therefore rely on the continued day-to-day management and site knowledge of those managing land for which they have responsibility, and the ongoing activities of the environmental regulators.

Table 5.4 Key Indicators

SEA Topic	Objective	Example Indicators (to be developed)
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity	• Number of measures included in planning applications which would benefit biodiversity in short-term and on restoration • Number of proposals that have the potential to significantly affect bird populations at a regional level.
Population	2. To improve the quality of life for people and communities across Shetland	• Number of applications where visual intrusion, nuisance, community severance, etc is an issue
Human Health	3. To improve the quality of health in Shetland	• Number of complaints regarding traffic and/or dust and emissions from construction or specific developments
Soil	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	• Number of applications in blanket bog, high quality heath or improved agricultural land
Water	5. To protect and enhance freshwater and marine water quality	• Number of surface water bodies affected by wind energy development applications • Water quality (marine and fresh water)
	6. To ensure that Shetland's water resources are used effectively and sustainably	
Air	7. To protect Shetland's air quality	• As objective 3
Climatic Factors	8. To reduce greenhouse gas emissions and to contribute to Scotland's 80% CO_2 reduction target	• Distance travelled by vehicles accessing new wind farm developments • Volume of construction/fabrication materials imported from outside Shetland • Number of applications outwith areas of flood risk

SEA Topic	Objective	Example Indicators (to be developed)
	9. To adapt to the predicted effects of climate change	
Material Assets	10. To promote the sustainable use of Shetland's natural resources	• Percentage of recycled materials used in new wind farm developments • Area of agricultural/crofting land lost to wind energy development
Cultural Heritage	11. To conserve and protect the historic environment	• Number of development applications affecting historic sites and scheduled monuments (directly and indirectly i.e. effects on setting) • Number of development sites consented which significantly impact on the setting of listed buildings, historic sites and scheduled monuments • Number of development sites refused which significantly impact on the setting of listed buildings, historic sites and scheduled monuments
	12. To conserve and promote the distinctive cultural heritage	
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	• Number of applications affecting National Scenic Areas and/or areas of recognised local landscape value • Number of applications significantly affecting all landscapes, especially unique coastal landscape and seascape • Number of applications approved that incorporate measures to improve degraded landscapes
	14. To improve those landscapes and seascapes that are degraded	

6 NEXT STEPS

6.1 PROPOSED STAGES

The following stages in the development of the Wind Energy Development IPP and its environmental assessment are envisaged:

- The Environmental Report, which reports the findings of the SEA of the Wind Energy Development IPP will be published for consultation alongside the IPP. This is programmed for March 2010, and the consultation period is scheduled to last for 8 weeks.
- Following consultation on the IPP and the Environmental Report, the Wind Energy Development IPP will be revised and updated where necessary taking account of the comments received.
- Following revision of the IPP, an SEA Statement will be prepared and made available to the Consultation Authorities and the public, setting out how the findings of consultation and the environmental assessment have been incorporated into the development of the Wind Energy Development IPP.

It is intended to finalise the IPP and associated documents by June 2010 and it is anticipated that the Wind Energy Development IPP will be adopted in July 2010.

6.2 ANTICIPATED MILESTONES

The key milestones in the development of the IPP and the SEA are as follows:

- Submission of the Environmental Report to the Consultation Authorities
- Consultation on the Wind Energy Development IPP and Environmental Report
- Finalisation and adoption of the Wind Energy Development IPP

7 COMMENTS

Any queries on the SEA of the Shetland Wind Energy Development IPP should be addressed to:

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Annex A

SEA Appraisal of the SIC Wind Energy Development Interim Planning Policy

A1 Introduction

This annex reports the screening undertaken of the policies within SIC's Wind Energy IPP against the various SEA Objectives.

A screening system was developed and used based on the following scale of effects.

Table A1 Assessment Key

Clear contribution to the SEA objective, very positive	✓✓
Broadly supportive	✓
Neutral, no discernible effect	**0**
Negative effect, incompatible	**x**
Very negative effect	**xx**
Uncertain effect	**?**
Positive and negative effects	**x✓**

The screening is summarised in the following table which lists the policies and presents the findings of the screening in relation to each of the SEA Objectives.

To carry out the screening process, a set of questions based on key criteria that relate to the SEA Objectives was established to aid in the decision making process for assessing whether the policies would impact on the SEA Objective. The questions are summarised in the following table.

Table A2 SEA Appraisal Framework

SEA Topic	SEA Objectives	SEA Questions
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity	• Does it impact on plants and animals? • Does it conserve and protect biodiversity? • Does it contribute to the aims of the Local Biodiversity Action Plan? • Does it contribute to public awareness and understanding about biodiversity?
Population	2. To improve the quality of life for people and communities across Shetland	• Does it contribute towards improving quality of life for people and communities across Shetland?
Human Health	3. To improve the quality of health in Shetland	• Does it contribute towards improving the quality of health associated with the environment (Air quality, water quality, noise and vibration)? • Does it contribute to the goal of creating active, healthy lifestyles for Shetland islanders? • Does it contribute towards improving access to health and care services for all Shetland islanders?
Soil	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	• Does it protect Shetland's peat, soils and geological resources? • Does it encourage the use of them only in a sustainable manner?
Water	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably	• Does it protect and enhance freshwater and marine water quality? • Does it ensure that Shetland's water resources are used effectively and sustainably? • Does it protect the integrity of the physical aspect of the water environment? • Does it promote a sustainable drainage infrastructure?
Air	7. To protect Shetland's air quality	• Does it pose any risks to air quality? • Does it encourage activities that could contribute to lowering air quality?
Climatic Factors	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80%	• Does it help in reducing greenhouse gas emissions? • Does it take account of the predicted effects of climate change, and adapt

SEA Topic	SEA Objectives	SEA Questions
	CO^2 reduction target 9. To adapt to the predicted effects of climate change	appropriately? • Is the risk or likelihood of flooding of any property, planned or existing, increased? • Will it put other assets at risk from flooding? • Will it ensure that people and property are protected from flooding?
Material Assets	10. To promote the sustainable use of Shetland's natural resources	• Does the plan or programme encourage the sustainable use of natural resources? • Will it lead to a reduction in the use of natural resources? • Does it encourage the use of local or imported materials? • Will it promote or enable greater use of recycling?
Cultural Heritage	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage	• Does it impact on the historic environment? • Does it conserve and protect the historic environment? • Does it help in raising public awareness and understanding of cultural heritage and how the public influence the continuing development of cultural heritage? • Does it conserve and enhance cherished aspects of local cultural heritage? • Does it contribute to local character, customs and traditions? • Will it affect the setting of any listed buildings, historic sites or culturally important sites?
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded	• Does it consider all landscape and seascape implications? • Does it contribute to landscape and seascape protection? • Does it enhance degraded landscapes and seascapes?

Table A3 SEA Appraisal of Wind Energy IPP Policies

IPP Policy	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
LDP WED SP1 Off-Shore Wind Energy Development	**0**	**0**	**0**	✓	✓	✓	**0**	**0**	**?**	✓	✓	✓	✓	**0**
	This policy places the detailed consideration of off-shore wind energy development outwith the jurisdiction of the Wind Energy IPP, but also states that planning applications for the necessary on-shore component infrastructure of off-shore wind energy will be subject to the provisions set out in the Wind Energy IPP. The Policy does not identify the conditions with regard to flood risk or exacerbation of flood risk under which the on-shore component of off-shore wind energy will be allowed. Since such components are likely to form the linkage between on-shore and off-shore they are likely to be placed on the coast and therefore flood risk should be considered. Being as the policy states that development will be subject to the provisions in the whole IPP, the success of this policy in mitigating the effects of onshore development rests on the success off the suite of policies throughout the IPP. It is therefore suggested that further wording be added into Development Management Criteria 6 (Impact on Quality of Life and Amenity) which states a requirement for wind energy development to protect infrastructure, people and property against increased risk of flooding as a result of wind energy development (see Assessment of Development Criteria 6 for suggested wording).													

IPP Policy	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
LDP WED SP2 The Areas to be Afforded Significant Protection	✓	0	0	✓	0	0	0	0	0	✓	0	0	✓	0
	This policy provides significant protection against wind energy development to certain sites of environmental sensitivity (as represented in the accompanying Map 2) and outlines the limited circumstances under which exceptions will be made. By doing this the policy asserts the strongest, most basic level of protection for those areas which are nationally or internationally designated. This policy therefore sets the baseline onto which Development Management Policy and suite of criteria can be layered. As such it has a broadly neutral effect on most SEA objectives except those concerned with protecting natural heritage and environmental assets.													
LDP WED SP3 All Other Areas	✓	✓	✓	0	0	0	0	✓	0	✓	0	0	✓	✓
	Robust policy supporting small scale sustainable energy projects and therefore will have broadly positive impacts on social and environmental topics. There is the possibility for negative landscape impact but the clause "unless there are significant adverse environmental or amenity impacts that outweigh the community benefit of the proposed scheme" should help to mitigate landscape issues.													

Development Management Criteria	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
WED DM1 Development Management Policy	✓	✓	**0**	✓	✓	**0**	✓	✓	**0**	✓	✓	✓	✓	**0**
	Overarching policy giving protection to environmental objectives ensuring that developments will; • be subject to Environmental Impact Assessment (including an assessment of cumulative impacts); • be assessed against all the Development Management Criteria; and • provide on-site and off-site mitigation or compensation in order to achieve an acceptable level of environmental impact (as determined through the Environmental Impact Assessment); Policy recognises the potential for wind energy developments and their associated infrastructure to have cumulative impacts, being as they may require further infrastructure in order to make them viable, and places a requirement for this cumulative impact to be assessed as part of any wind energy proposal. This means that the wind turbine component of any development will not be granted permission in isolation, but only once the environmental impact of all associated developments have been fully considered. Because of the importance of reducing carbon emissions associated with any future developments and recognising that wind energy developments will have impacts associated with the fabrication of the component parts of turbines and associated equipment, the construction of wind farm sites and carbon emitted from the disturbance of peat, it is recommended that the following wording be added to this policy: *'The specific design of wind energy developments can vary and consideration of embodied and operational carbon should be included in proposals'.*													

Development Management Criteria	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
1. Biodiversity.	✓✓	0	0	0	0	0	0	0	0	0	0	0	✓	0
	This criterion will have broadly neutral effects on the majority of SEA objectives but will have strong positive effects for the conservation of biodiversity.													
2. Geodiversity	0	0	0	✓✓	0	0	0	0	0	✓✓	0	0	✓✓	0
	The application of this criterion will have broadly neutral affects on the majority of SEA objectives, it will have strong positive effects on objectives relating to soil, natural resources and landscape. This criterion will be applied alongside the suite of policies within SICs Minerals IPP, which provides a clear framework for the sustainable use of minerals and aggregates within the development context. Geodiversity will therefore be protected at multiple levels of the planning process.													
3. Landscape and Visual Impact	0	✓	0	0	0	0	0	0	0	0	0	✓	✓✓	0
	This criterion focuses on minimising landscape and visual impacts and will therefore have strong positive effects on the objectives relating to landscape. It will have broadly neutral effects on other objectives.													
4. Historical and Archaeological Environment	0	0	0	0	0	0	0	0	0	0	✓✓	✓✓	✓	0
	The criterion has broadly neutral effects on the majority of the SEA objectives but has clear support for the historic environment and those objectives conserving and promoting the cultural heritage of Shetland.													
5. Impact on Water Resources	0	0	0	0	✓	✓	0	0	0	0	0	0	0	0
	This criterion will prevent wind energy developments from being sited where they would have a significantly adverse effect on groundwater, surface water and water supplies. It is broadly neutral in impact on most of the SEA objectives but is supportive of those that seek to protect and enhance Shetland's water environment and the sustainable use of water.													

Development Management Criteria	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
6. Impact on Quality of Life and Amenity	**0**	**✓✓**	**✓**	**0**	**0**	**0**	**0**	**0**	**?**	**0**	**0**	**0**	**0**	**0**
	Requirements are built into this policy for safeguarding sensitive locations such as residential properties, schools and workplaces from the potentially adverse impacts of wind turbines. The policy will therefore support the population and health related SEA objectives. However the policy does not currently take regard of the risk of flooding to these sensitive receptors and, as the issue of flooding is not picked up elsewhere in the IPP document, it is recommended that further wording be added here. Current wording within this policy includes the following: *"Planning applications must be accompanied by an assessment of the effects on sensitive receptors/locations covering a range of factors including noise, shadow flicker, electromagnetic interference, and construction/decommissioning logistics and phasing"* It is recommended that this wording be enhanced to include a requirement for wind energy development proposals to be accompanied by an assessment of the flood risk to proposed developments and exacerbation of flood risk to other receptors. The following wording is therefore suggested: *"Planning applications must be accompanied by an assessment of the effects on sensitive receptors/locations covering a range of factors including noise, shadow flicker, electromagnetic interference, and construction/decommissioning logistics and phasing. In addition to this proposals for wind energy development or any component infrastructure must be accompanied by an assessment of the flood risk posed to the developments and exacerbation of flood risk to other receptors caused by new developments."*											
7. Availability of Grid Connection	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**✓✓**	**0**	**0**	**0**	**0**	**0**	**0**
	The criterion is specifically related to grid capacity and therefore is likely to have broadly neutral effects on all SEA objectives.													

Development Management Criteria	SEA Objective													
	1. To further the conservation of biodiversity	2. To improve the quality of life for people and communities across Shetland	3. To improve the quality of health in Shetland	4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner	5. To protect and enhance freshwater and marine water quality	6. To ensure that Shetland's water resources are used effectively and sustainably	7. To protect Shetland's air quality	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target	9. To adapt to the predicted effects of climate change	10. To promote the sustainable use of Shetland's natural resources	11. To conserve and protect the historic environment	12. To conserve and promote the distinctive cultural heritage	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	14. To improve those landscapes and seascapes that are degraded
8. Peat and Soil Disturbance	✓	**0**	**0**	✓✓	✓	**0**	**0**	✓	**0**	✓	**0**	**0**	✓	**0**
	Existing Local Plan policies refer to protection of peat against unsustainable commercial peat extraction, rather than the potential impacts of development (wind or otherwise) on the island peat resources. Other Local Plan policies protect soil, but only in relation to agriculture, rather than the wider soil resource. The application of this criterion will have positive effect on environmental SEA objectives, especially those relating to soil resources. It is likely to have broadly neutral effects on other objectives. It will have positive effects in reducing greenhouse gas emissions and climate change as the criterion will "ensure soil disturbance is minimised in order to maximise the carbon-saving potential".													
8a. Minimisation of Waste Materials	**0**	**0**	**0**	✓	✓	**0**	**0**	**0**	**0**	✓✓	**0**	**0**	**0**	**0**
	This criterion specifically addresses the sustainable management of building materials and waste and would therefore be strongly positive in terms of the sustainable use of Shetland's natural resources. It would have broadly neutral effects on other SEA objectives.													
9. Aviation	**0**	**0**	✓	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	This criterion deals with aviation safety relating to wind energy developments and would therefore have a positive effect on public health and safety and otherwise broadly neutral effects on the other SEA objectives.													

Annex B

Review of Relevant Plans, Programmes and Strategies

Table B1: Review of Relevant Plans, Programmes and Strategies

DOCUMENT	KEY MESSAGES AND IMPLICATIONS FOR THE SEA	RELEVANT SEA OBJECTIVE RELATING TO THE KEY MESSAGES
NATIONAL		
Scottish Planning Policy: October 2008	The document is a statement of the Scottish Government policy on land use planning. Shetland Islands Council will be required to adhere to the principles of development planning set out by the Scottish Government.	Overarching plan which will relate to all SEA Objectives
Biodiversity: The UK Action Plan (1994)	The plan assesses the current status of the UK's habitats and species and sets out a strategy for their future conservation and enhancement. **The SIC Wind Energy Development IPP** should aim to promote the maintenance and enhancement of the UK's biodiversity	1. To further the conservation of biodiversity
Scotland's Biodiversity, Its In Your Hands (2004)	**The SIC Wind Energy Development IPP** should aim to help to conserve Scotland's biodiversity for future generations by conserving habitats and species and raising public awareness on the importance of biodiversity	1. To further the conservation of biodiversity
Nature Conservation (Scotland) Act (2004)	This Act puts in place legal measures for the conservation of biodiversity .The Act places a "Biodiversity Duty" on Shetland Islands Council	1. To further the conservation of biodiversity
The UK Climate Change Act (2008)	Sets legally binding targets on green house gas emission reductions through action in the UK and abroad of at least 80% by 2050, and reductions in CO2 emissions of at least 26% by 2020, against a 1990 baseline. **The SIC Wind Energy Development IPP** will play a key role in reducing greenhouse gas emissions through the development of wind technologies	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target
Securing the Future – UK Government Sustainable Development Strategy (2005)	To enable people to access a better quality of life with new skills and qualifications without compromising the needs of future generations Four guiding principles: • Living within environmental limits • Ensuring a strong, healthy and just society • Achieving a sustainable economy • Promoting good governance • Using sound science responsibly **The SIC Wind Energy Development IPP** should aim to fit in with these guiding principles	1. To further the conservation of biodiversity 2. To improve the quality of life for people and communities across Shetland 4. To protect Shetland's soil resources and use them in a sustainable manner 6. To ensure that Shetland's water resources are used effectively and sustainably 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target

DOCUMENT	KEY MESSAGES AND IMPLICATIONS FOR THE SEA	RELEVANT SEA OBJECTIVE RELATING TO THE KEY MESSAGES
		10. To promote the sustainable use of Shetland's natural resources
Changing Our Ways - Scotland's Climate Change Programme (2006)	Details the Scottish Government programme for reducing and adapting to climate change. **The SIC Wind Energy Development IPP** should consider ways of cutting greenhouse gas emissions associated with development activities	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target
Choosing Our Future: Scotland's Sustainable Development Strategy (2005)	Details the Scottish Government strategy for tackling issues such as climate change, biodiversity, resource use and pollution. As a Scottish public body, **The SIC Wind Energy Development IPP** should aim to accord with this strategy	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target
Climate Change (Scotland) Bill (2009)	Sets a CO_2 reduction target for the year 2050, an interim target for the year 2020, and makes provisions for annual targets, for the reduction of greenhouse gas emissions; confers power on Ministers to impose climate change duties on public bodies and to make further provision with regard to mitigation of and adaptation to climate change. **Shetland Islands Council** are under duty to play their part in meeting these targets	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target
Water Environment and Water Services (Scotland) Act, 2003.	Ensures that all human activity that can have a harmful impact on water is controlled. **The SIC Wind Energy Development IPP** should follow all appropriate guidance and legislation.	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably
Environment Protection Act 1990	This Act relates to the control of pollution and protection of the natural environment. **The SIC Wind Energy Development IPP** must comply with the Act	4. To protect Shetland's soil resources and use them in a sustainable manner 5. To protect and enhance freshwater and marine water quality 7. To protect Shetland's air quality
Water Environment (Controlled Activities) Regulations 2005	Requires authorization over point source discharges, abstractions, impoundments and engineering activities. **The SIC Wind Energy Development IPP** must comply with these regulations	4. To protect Shetland's soil resources and use them in a sustainable manner 5. To protect and enhance freshwater and marine water quality
The Air Quality Limit Values (Scotland) Regulations 2005	Limits values of relevant pollutants in ambient air which must be complied with. **Shetland Islands Council** must ensure compliance with these values at all stages of wind development	7. To protect Shetland's air quality
SPP6 : Renewable Energy (2007)	This SPP gives guidance on delivery of renewable energy	1. To further the conservation of biodiversity

DOCUMENT	KEY MESSAGES AND IMPLICATIONS FOR THE SEA	RELEVANT SEA OBJECTIVE RELATING TO THE KEY MESSAGES
Energy (2007)	delivery of renewable energy targets. Shetland Islands Council must note that support for renewable energy developments must be compatible with protecting and enhancing the natural and historic environment	2. To improve the quality of life for people and communities across Shetland 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target 11. To conserve and protect the historic environment 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes
PAN 45 Annex: Planning for Micro-Renewables (2006)	This PAN focuses on the Scottish Governments commitment to micro-renewables as an important aspect to reduce carbon emissions in support of climate change and renewable objectives. This PAN will be relevant to the **SIC Wind Energy Development IPP** in terms of small scale wind developments	1. To further the conservation of biodiversity 2. To improve the quality of life for people and communities across Shetland 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target 11. To conserve and protect the historic environment 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes
PAN 68 : Design Statements (2003)	This document explains what a design statement is, why it is a useful tool, when it is required and how it should be prepared and presented. This is essential to **The SIC Wind Energy Development IPP** as certain wind developments may require desing statements	11. To conserve and protect the historic environment 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes
PAN 83 : Masterplanning (2008)	This document promotes masterplanning as a means to ensure developments are designed successfully and in a sustainable manner, minimising impact on the environment. Masterplanning will be an important aspect of wind developments for the Shetland Islands	1. To further the conservation of biodiversity 2. To improve the quality of life for people and communities across Shetland 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target 11. To conserve and protect the historic environment 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes

DOCUMENT	KEY MESSAGES AND IMPLICATIONS FOR THE SEA	RELEVANT SEA OBJECTIVE RELATING TO THE KEY MESSAGES
PAN 84 : Reducing Carbon Emissions in New Development (2008)	This PAN provides good practice guidance and technical calculations to deliver low and zero carbon developments. This will be important for **The SIC Wind Energy Development IPP** especially on larger scale developments.	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target
Designing Places : A Policy Statement for Scotland (2001)	This document focuses on ensuring sensitive siting and design of all development making the most of its setting in the landscape. The principles set out in this policy statement will be of relevance to wind development in the Shetland Isles	11. To conserve and protect the historic environment 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes
Scottish Planning Policy 23: Planning and the Historic Environment (SPP 23)	This SPP supersedes and consolidates National Planning Policy Guidelines – NPPG 18: Planning and the Historic Environment and NPPG 5: Archaeology and Planning. It sets out the national planning policy for the historic environment and indicates how the planning system will contribute towards the delivery of Scottish Ministers' policies as set out in the current Scottish Historic Environment Policy. **The SIC Wind Energy Development IPP** will need to ensure protection of negative impacts to historic heritage	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage
Scottish Historic Environment Policy (SHEP)	This outlines Scottish Minister's policies on the Historic Environment and is produced by Historic Scotland. The key environmental protection objective of the legislation and policy framework is 'to protect and, where appropriate, enhance the historic environment'.	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage
The Wildlife and Countryside Act (1981)	The Wildlife and Countryside Act 1981 is the principal legislation dealing with nature conservation in Britain. The SIC Construction and Design IPP should aim to promote the maintenance and enhancement of the UK's biodiversity.	1. To further the conservation of biodiversity
Shetland Amenity Trust: The Shetland Woodland Strategy (2002)	Guide to the conservation of Shetland's native trees and woodland planting may also be relevant under Local strategies	1. To further the conservation of biodiversity 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes
LOCAL AND REGIONAL		
Living Shetland Project:	This project aims to engage with	1. To further the conservation

DOCUMENT	KEY MESSAGES AND IMPLICATIONS FOR THE SEA	RELEVANT SEA OBJECTIVE RELATING TO THE KEY MESSAGES
Local Biodiversity Action Plan	local communities to promote the conservation and restoration of habitats and species. The project also involves developing Local Biodiversity Action Plans. **The SIC Wind Energy Development IPP** should seek to contribute to this project and help to raise awareness of the need and responsibilities for biodiversity conservation and enhancement at the local level	of biodiversity 2. To improve the quality of life for people and communities across Shetland 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded
'Seas the Opportunity' A Strategy for the Long Term Sustainability of Scotland's Coasts and Seas	This strategy sets out aims to enhance and conserve the overall quality of Scotland's coasts and seas, their natural processes and their biodiversity. **The SIC Wind Energy Development IPP** should be in accordance with the strategy	1. To further the conservation of biodiversity 5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded
Shetland Regional Transport Strategy (2008)	This document sets out a Strategy for the development of an efficient and reliable transport system for Shetland. The strategy places an emphasis on maintaining and improving external linkages as well as inter-island linkages. **The SIC Wind Energy Development IPP** should seek to contribute to the development of the transport system in Shetland where appropriate	2. To improve the quality of life for people and communities across Shetland 7. To protect Shetland's air quality 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes
Orkney and Shetland Area Waste Plan	This plan sets out a waste management strategy for Orkney and Shetland with the aim of controlling waste generation and reducing the environmental impacts of waste production. **The SIC Wind Energy Development IPP** should take into consideration the Waste Plan and develop measures aimed at controlling and reducing waste generation associated with development activities in Shetland	2. To improve the quality of life for people and communities across Shetland 4. To protect Shetland's soil resources and use them in a sustainable manner 5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably

DOCUMENT	KEY MESSAGES AND IMPLICATIONS FOR THE SEA	RELEVANT SEA OBJECTIVE RELATING TO THE KEY MESSAGES
		7. To protect Shetland's air quality 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target 10. To promote the sustainable use of Shetland's natural resources
Shetland Island Council Structure Plan (2001)	This plan provides the island's strategy for land-use planning until 2015. **The SIC Wind Energy Development IPP** should be in accordance with the Structure Plan	Overarching plan which will relate to all SEA Objectives
Shetland Local Plan (2004)	This plan presents a series of policies, proposals and recommendations for the development and use of land throughout Shetland. **The SIC Wind Energy Development IPP** should be in accordance with the Local Plan	Overarching plan which will relate to all SEA Objectives
Shetland Island Council Corporate Plan (2008)	Sets out the overall objective of maintaining and improving the quality of life experienced by people in Shetland. Targets include: increasing employment opportunities by 1,000 FTE by 2025; ensuring equal opportunities and decreasing social inequalities; and reducing CO_2 emissions by 30% by 2020. **The SIC Wind Energy Development IPP** will be instrumental in the achievement of the renewable energy and carbon reduction objectives and targets set out in the Corporate Plan	Overarching plan which will relate to all SEA Objectives
Shetland Island Council Sustainable Development Implementation Plan (2008)	Sets out priorities and actions which contribute to the achievement of sustainable development in Shetland. **The SIC Wind Energy Development IPP** should conform to the direction of this plan.	Overarching plan which will relate to all SEA Objectives
Shetland Islands Council Draft Interim Planning Policy: Towards Sustainable Construction and Better Design (2009)	Document provides location, design and amenity guidance and policy for Housing and Other Development within Shetland. Policies laid out in the Construction and Design IPP will sit alongside and complement **The SIC Wind Energy Development IPP**, providing further planning controls over development.	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 reduction target 10. To promote the sustainable use of Shetland's natural resources 11. To conserve and protect the historic environment 12. To conserve ad promote the distinctive cultural heritage 13. To protect the special qualities and characteristics of

DOCUMENT	KEY MESSAGES AND IMPLICATIONS FOR THE SEA	RELEVANT SEA OBJECTIVE RELATING TO THE KEY MESSAGES
		Shetland's landscapes and seascapes
Shetland Islands Council Draft Interim Planning Policy: Minerals	This plan gives sound and comprehensive policies for minerals development leading into the next decade, based on up-to-date information and legislation. Wind development will overlap with minerals in terms of the impacts from access tracks and aggregates. Policies laid out in the Minerals IPP will sit alongside and complement **the SIC Wind Energy Development IPP**	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 10. To promote the sustainable use of Shetland's natural resources 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes
Shetland Islands Council Draft Interim Planning Policy: Energy	This planning policy provides policies for the provision of energy and energy infrastructure leading into the next decade, based on up-to-date information and legislation. **The SIC Wind Energy Development IPP** should align with the policies relating to wind energy development	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO_2 10. To promote the sustainable use of Shetland's natural resources

Wind Energy Annex C

Summary of Statutory Consultee Responses

Table C1 Summary of Statutory Consultee Responses

Consultee	Contact	Date	Information/Comments	Response/Comments
Historic Scotland	Andrew Stevenson	19.08.09	**Summary of Representative Plans, Programmes and Strategies (PPS) relevant to the Wind Energy Development IPP** Historic Scotland (HS) note that this section sets out the relationship of the SPG to wider scale environmental protection/enhancement policies and objectives. HS note the inclusion of NPPG 5 and 18 but draw attention to the recent changes in the policy background outlined below. • Scottish Planning Policy 23: Planning and the Historic Environment (SPP 23): This SPP supersedes and consolidates National Planning Policy Guidelines – NPPG 18: Planning and the Historic Environment and NPPG 5: Archaeology and Planning. It sets out the national planning policy for the historic environment and indicates how the planning system will contribute towards the delivery of Scottish Ministers' policies as set out in the current Scottish Historic Environment Policy (see below). • Scottish Historic Environment Policy (SHEP): This outlines Scottish Minister's policies on the Historic Environment and is produced by Historic Scotland and available at http://www.historic-scotland.gov.uk/shep-july-2009.pdf In summary, the key environmental protection objective of the legislation and policy framework is 'to protect and, where appropriate, enhance the historic environment'.	Noted, these documents have now been included in the review of plans, programmes and strategies and have been taken into consideration throughout the assessment.
			HS records indicate the following number of listed buildings in the Shetland Islands planning authority area: Category A 13 Category B 173 Category C(S) 158	Baseline information has been updated accordingly.
			Gardens and Designed Landscapes should also be included in this baseline. HS noted there are 4 such sites from the Inventory of Gardens and Designed Landscapes in Scotland that can be found in the Shetland Islands. They are; • Belmont House • Brough Lodge • Lunna House • Gardie House	Baseline information has been updated accordingly.
			Noted a key issue for wind energy development in relation to the historic	Noted

Consultee	Contact	Date	Information/Comments	Response/Comments
			environment is the potential impact on the setting of archaeological sites, scheduled monuments, gardens and designed landscapes and listed buildings. HS welcome the inclusion of the SEA objectives and the specific questions for the historic environment. HS note the scoping report considers that there are no alternative plans to the WED IPP but that alternative objectives and policies have been considered during its evolution. Stated it would be helpful for this process to be fully documented within the environmental report. HS note that indicators are proposed to aid in the monitoring of the effects of the plan and HS welcome those included for the historic environment. The second indicator may need to be refined in order to clarify the purpose of this indicator. For example, • Number of development sites consented which significantly impact on the setting of listed buildings, historic sites and scheduled monuments • Number of development sites refused which significantly impact on the setting of listed buildings, historic sites and scheduled monuments	Noted, this process has been further detailed in section 5.2 of the Environmental Report These suggested indicators have now been included in the monitoring section of the Environmental report (Section 5.7)
SEPA	Susan Haslan	18.08.09	• Environmental Baseline • We are finding that the generation of waste materials, specifically waste peat and overburden, is a specific problem associated with windfarm applications in rural areas. In view of this it would be valuable for the baseline section on soils and geology to specifically provide the information available on the localities of deep peat. The Soil Survey of Scotland 1:250000 Soil Map would provide information on generic soil types for the islands and this, accompanied by local knowledge, could be used to identify areas where deep peat and overburden are likely to be encountered (and from a plan-making view-point these areas should be avoided).	Mitigation measures to protect deep peat included in the IPP and text within the plan states: *"An indicative map showing peat depth is available, and applicants should consult this at an early stage of the design of their proposal"* However, due to data licensing issues this map has not been directly included in the Plan or the SEA. The SEA Environmental Report has therefore simply signposted this information and

Consultee	Contact	Date	Information/Comments	Response/Comments
				highlighted the requirement for potential developers to take account of it.
			• Plan Alternatives • 2.1 We note that there are no alternatives to reviewing the policies; this is accepted. • 2.2 We also note that different possible objectives and policies are being developed; we would expect these to be assessed as these represent reasonable alternatives.	Noted, this process has been further detailed in section 5.2 of the Environmental Report
			• We welcome the inclusion of a sample assessment matrix in the scoping report, considering this good practice. The assessment table presents an assessment of residual effects after mitigation has been applied where as the Act requires the identification of likely significant effect on the environment, and then what mitigation is proposed to prevent, reduce and as fully as possible offset any significant adverse effects. We therefore request that it be amended with this in mind	The assessment matrix used has been revised and now appears as shown in Table 2.5 of the Environmental Report
			• Notwithstanding the above we also welcome the direct linking of affects with mitigation measures. One of the most important mitigation measures to consider in the report is the way in which the policies have been modified as a result on the environmental assessment process. It would be useful if the ER made it clear how carrying out the assessment had impacted upon the policies being consulted upon	Agreed, various suggestions and word changes to policies *have* been made in the SEA and the difference made by this is covered in section 5.2 of the Environmental Report.
			• We would expect enough information to be provided in the comments column to understand the assessments presented. Generally when carrying out the assessment please refer to sections 6.3.7 to 6.3.3.12 of the Scottish Government SEA Toolkit which outlines the proposed coverage of the issues expected	Noted
SNH	Graham Neville Operations North Manager, Ground Floor Stewart Building Alexandra Wharf Lerwick Shetland	18.08.09	• Subject to the detailed comments in Annex 1, SNH is content with the scope and level of detail proposed for the environmental report.	Noted

Consultee	Contact	Date	Information/Comments	Response/Comments
	ZE1 0LL northern_isles@snh.gov.uk 01595 693345			
			• The Wildlife and Countryside Act 1981 is the principal legislation dealing with nature conservation in Britain and should be considered along with the strategies and plans relevant to the Design and Construction IPP set out in Table 2.1. The Shetland Woodland Strategy published in 2002 by Shetland Amenity Trust to guide the conservation of Shetland's native trees and woodland planting may also be relevant under Local strategies	This has been amended accordingly in the Environmental Report and the relevant annex and has been taken into account throughout the assessment.

			• Table 2.2. and 2.3, listing respectively the designated features of Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) in Shetland contain a number of inaccuracies and omissions:
			  • As great skuas are ground-nesting birds, the description of Noss SPA should read "Cliffs and moorland supporting internationally breeding populations.." The qualifying features of the SPA include puffin as well as the listed species and the seabird colony as a whole.
			  • Black guillemot and red-throated diver are not qualifying species for Fetlar SPA, however dunlin and great skua are.
			  • Hermaness and Saxa Vord SPA was enlarged in 2001 and renamed Hermaness, Saxa Vord and Valla Field SPA. Its qualifying interests include shag and red-throated diver as well as the species listed.
			  • Qualifying interests on Fair Isle SPA include Artic tern, gannet and razorbill in addition to the listed species. The importance of Fair Isle as a bird migration landfall is not relevant to the SPA as the site is designated solely for its breeding bird populations.
			  • On Foula SPA, Arctic tern, kittiwake, Leach's petrel and red-throated diver are qualifying interests in addition to the species listed. All the qualifying species are of international, rather than just national importance.
				These various observations have now been incorporated to the environmental baseline section of the Environmental Report.

Consultee	Contact	Date	Information/Comments	Response/Comments
			• Qualifying interests on Sumburgh Head SPA include fulmar, guillemot and kittiwake and the seabird colony as a whole, as well as Arctic tern. • Neither Arctic skua nor whimbrel is a qualifying feature of Ronas Hill – North Roe and Tingon SPA. • Papa Stour SPA does not qualify for its seabird colony; only for Arctic skua and ringed plover populations, both of which are internationally important. • The nature of the vegetation on Otterswick and Graveland is not relevant to the SPA designation. • Keen of Hamar SAC is designated for its dry heathland as well as base rich scree and calaminarian grassland. • On Ronas Hill – North Roe, red-throated divers are not relevant to the SAC designation, however the dystrophic (peat-stained) pools and lochans on which they nest, and the oligotrophic lochs on the site constitute designated features in their own right. Acid scree is also a designated feature of the site. • The qualifying features of Mousa SAC include reefs and sea caves as well as common seal. • Common seal is also a qualifying feature of Yell Sound Coast SAC	
			• Table 2.4 is entitled “List of SSSIs in Shetland” but is in fact a summary of the notified features of SSSIs in Shetland. Many sites have more than one notified feature, hence the total number of features is greater than the number of SSSIs in Shetland • The four RSPB reserves listed on page 13 are those that are publicised and promoted to visitors. There are several others which are not publicised because of the sensitivity of the bird species that they support. These sites are generally not covered by statutory designations but, because of the rarity and sensitivity of the species that they support, should be considered by the SEA. Details of the reserves can be obtained from the RSPB Shetland office. • Table 2.6 (Page 14) shows the area of Shetland covered by each designation. It should be noted that all NNRs and Ramsar sites and	These various observations have now been incorporated to the environmental baseline section of the Environmental Report

Consultee	Contact	Date	Information/Comments	Response/Comments
			the terrestrial parts of most SPAs and SACs are also notified as SSSIs. The total land coverage of designated areas in Shetland is therefore only slightly greater than the area of SSSIs	
			• Under "Designated Species" on page 14, the report states that some cetaceans (whales and dolphins) are European Protected Species (EPS). In fact all cetaceans are afforded this protection, however, as marine species these do not need to be considered here. The only other EPS occurring in Shetland is the otter, so reference to wildcats, great crested newts and bats is not relevant. • None of the species listed in the report as being protected under the Wildlife and Countryside Act 1981 which do occur in Shetland are as follows: Schedule 1 (breeding birds): Red-throated diver, black tailed godwit, greenshank, merlin, perergrine, leach's petrel, red-necked phalarope, whooper swan, whimbrel. Schedule 5 (other animals): Cetaceans, otter, freshwater pearl mussel. Schedule 8 (plants): Norwegian sandwort, weak-leaved hawkweed, north roe hawkweed, and Shetland hawkweed. • Under "Priority Habitats and Species" on page 14, the report lists habitats and species identified in the draft Shetland Local Biodiversity Action Plan (LBAP) but makes no reference to the UK Biodiversity Action Plan (UKBAP) or the Scottish Biodiversity Strategy (SBS). The Nature Conservation (Scotland) Act 2004 places an obligation on all public bodies to further the conservation of biodiversity, particularly in respect of habitats and species listed in the SBS. The Scottish Biodiversity List includes many species and habitats, both terrestrial and marine, which occur in Shetland and which should therefore be addressed in this SEA. • The statement about trees under "Vegetation" on page 17 is true only in respect of the small areas of woodland planted over the past century and a half. Although these are the most visible trees in Shetland, they are mainly composed of non-native species. A large number of relict native trees also exist, particularly in the north, west and central Mainland. These are generally small and occur singly or occasionally in small groups, often in exposed situations, on cliff ledges, in ravines and on holms in lochs which are inaccessible to	These various observations have now been incorporated to the environmental baseline section of the Environmental Report

Consultee	Contact	Date	Information/Comments	Response/Comments
			grazing animals	
			• Schedule 2 of the Environmental Assessment (Scotland) Act 2005 requires the environmental report to identify "environmental problems relevant to the plan or programme". In a number of instances it is not clear how the issues identified in Section 2.4 – Current Environmental Issues – are relevant to the IPP. We also question the accuracy of some of the statements and suggest other issues that should be included	Noted, see comments below for specific points
			• With respect to the first issue identified under "Biodiversity, flora and fauna", the great majority of designated sites in Shetland are in remote upland or coastal area where there is little evidence of development pressure. In low lying areas where there might otherwise be potential for development, designated sites are generally small and make up a miniscule proportion of the land area. The statement that "the abundance of nationally and internationally designated conservation sites in and around the Shetland Islands restricts the amount of available land and so places a strain on development" is therefore questionable	This statement has been amended to reflect these comments.
			• The second statement is also incorrect: Seabirds nesting within SPAs are dependent on sea areas out with the sites, but not generally on surrounding land, however raptors, wading birds and otters, all of which are dependent on areas out with the sites that are designated for them may be particularly sensitive to development as a result	This statement has been amended to reflect these comments.
			• We would identify a further environmental issue with respect to birds; that a number moorland breeding species occur in Shetland at much higher densities than elsewhere in Britain. These include golden plover and red-throated diver, both of which are on Annex 1 of the Birds directive, whimbrel, of which Shetland holds 9 % of the GB population and great skua, of which Shetland has 43% of the GB population. The potential for wind energy developments to adversely affect regional and national populations of these species is likely to be a constraint on such developments.	This point has been incorporated into the SEA as an environmental issue, as shown in section 4.3.1, and has been considered throughout the SEA appraisal
			• With respect to the second issue identified under "Soils and Geology", it should be noted that blanket bog is an important and	This is an important point and has been

Consultee	Contact	Date	Information/Comments	Response/Comments
			internationally rare habitat and also provides a significant sink for carbon dioxide. Active blanket bog is a priority habitat under the Habitats Directive and the UK Biodiversity Action Plan. Destabilisation of peat therefore has implications for biodiversity and climate change as well as for soil and geological resources, water quality, flooding and the safety of property.	included in this issue and has been considered throughout the SEA appraisal.
			• Whilst it is true that in the past there was pressure for agricultural improvement in Shetland, as stated at bullet point 3, this was largely as a result of agricultural subsidies, and recent changes in agricultural support mechanisms mean that this is no longer the case. In any case, it is not clear how this issue relates to the SIC Wind Energy Development policy	This issue has been altered, in accordance with this comment, but left in, in recognition of the role agriculture has to play in Shetlands economy.
			• In section 3.3.2, the meaning of paragraphs 2 and 3 is unclear.	These paragraphs have not been carried through to the Environmental Report. The establishment of indicators is dealt with in Section 5.7 of the Environmental report.
			• We would suggest that an appropriate Biodiversity indicator would be the number of proposals that have the potential to significantly affect bird populations at a regional level.	This indicator has been included in Table 5.4 of the Environmental Report.

Annex D

SEA Scoping Report

Shetland Islands Council

Interim Planning Policy: Wind Energy Development

SEA Scoping Report

July 2009

natural CAPITAL

Scoping Report

Shetland Islands Council

Strategic Environmental Assessment (SEA): Scoping Report for Shetland Islands Council Interim Planning Policy: Wind Energy Development

July 2009

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Scoping Report

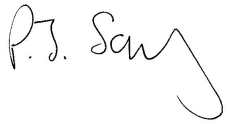
Shetland Islands Council

Strategic Environmental Assessment (SEA): Scoping Report for Shetland Islands Council Interim Planning Policy: Wind Energy Development

For and on behalf of
Natural Capital Ltd.

Approved by: Dr Phil Say

Signed:



Position: Director

Date: 16th July 2009

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1 INTRODUCTION

1.1 BACKGROUND TO INTERIM PLANNING POLICY: WIND ENERGY DEVELOPMENT

The current Shetland Structure Plan (2001) was based on information gathered during the late 1990s. If a new Local Development Plan is to provide sound and comprehensive policies for development leading into the next decade, and in particular renewable energy, it is imperative that it is based on up-to-date information and legislation. Work commenced during 2007 and 2008 on a number of topic areas, including renewable energy developments as national policy or changes to local objectives indicated a review was required.

The Shetland Islands Council Corporate Plan[1] seeks to support the development of a large wind farm on Shetland, which will contribute to the national target of energy generated from renewable sources, increase the local skills base, and provide a security of income in the face of a declining oil industry. Alongside this there is strong support for community generation schemes, including those for energy security in remote communities, wind-to-heat schemes for community facilities, energy supply for district heating schemes, and householder projects.

Shetland Islands Council has adopted planning policy in the past to support renewable energy developments in principle, and this was detailed in planning policies both within the Structure Plan and also the Local Plan of 2004.

This current interim planning policy document seeks to refine the scope of relevant Structure Plan policy and revisit the Local Plan policies that are applicable to the consideration of proposals for wind energy development within Shetland, to ensure the development plan is compliant with SPP6[2]. It gives detailed advice as to how development proposals will be assessed, and as such supports the policies in the current development plan.

The IPP sets out:

- **The Planning Context:** This chapter sets out the planning context.
- **The Spatial Policies:** This chapter sets out the three spatial policies against which all proposals for wind energy development and any associated infrastructure will be initially assessed.
- **Development Plan Management:** This chapter sets out the development plan management process.
- **The Development Management Criteria:** This chapter presents a suite of criteria many of which are environmental.
- **Broad Area of Search Methodology:** It recognises that this will not to be used as a driver for a sequential approach to the siting of large scale windfarms. Similarly it emphasises that no area of Shetland is unconstrained and so no area of Shetland could be said to have a presumption in favour of large scale wind farm development. The Broad Area of Search will be used an indication of the areas of Shetland where it is considered that large scale windfarms could most easily be accommodated.

[1] The Shetland Islands Council Corporate Improvement Plan 2007-08, Shetland Islands Council
[2] Scottish Planning Policy SPP 6 Renewable Energy, Scottish Executive, 2007

Box 1: Summary of Key Facts relating to the Wind Energy Development IPP

Name of Responsible Authority: Shetland Islands Council

Title of Plan/Programme: Interim Planning Policy: Wind Energy Development in Shetland

What prompted the Plan: The Publication of Scottish Planning Policy 6 sends a clear message that there is the requirement to make positive prevision for renewable energy. In addition, the Shetland Islands Corporate Plan (2008) seeks to support the development of a large windfarm on Shetland, which will contribute to the national target of energy generated from renewable sources, increase the local skills base and provide a security of income in the face of a declining Oil industry.

Plan Subject: Wind Energy

Period covered by Plan: 2009 - 2014

Frequency of Updates: Every 5 Years

Plan Area: All areas of the Shetland Islands

Plan Purpose/Objectives: To provide guidance on location, design and policy for Wind energy Development within Shetland and off-shore areas for which it is responsible.

Contact Point: Hannah Nelson – Development Plans Manager
Infrastructure Services
Shetland Islands Council
Grantfield
Lerwick
ZE1 ONT

1.2 THE STAGES IN THE SEA PROCESS

In line with the SEA process (as determined in the Environmental Assessment (Scotland) Act, 2005), Shetland Islands Council (SIC) undertook an internal screening exercise which established that the organisation would need to undertake a strategic environmental assessment of its WED IPP (WED IPP).

SIC recognised that the WED IPP and the resultant policies would be likely to have significant environmental effects because:

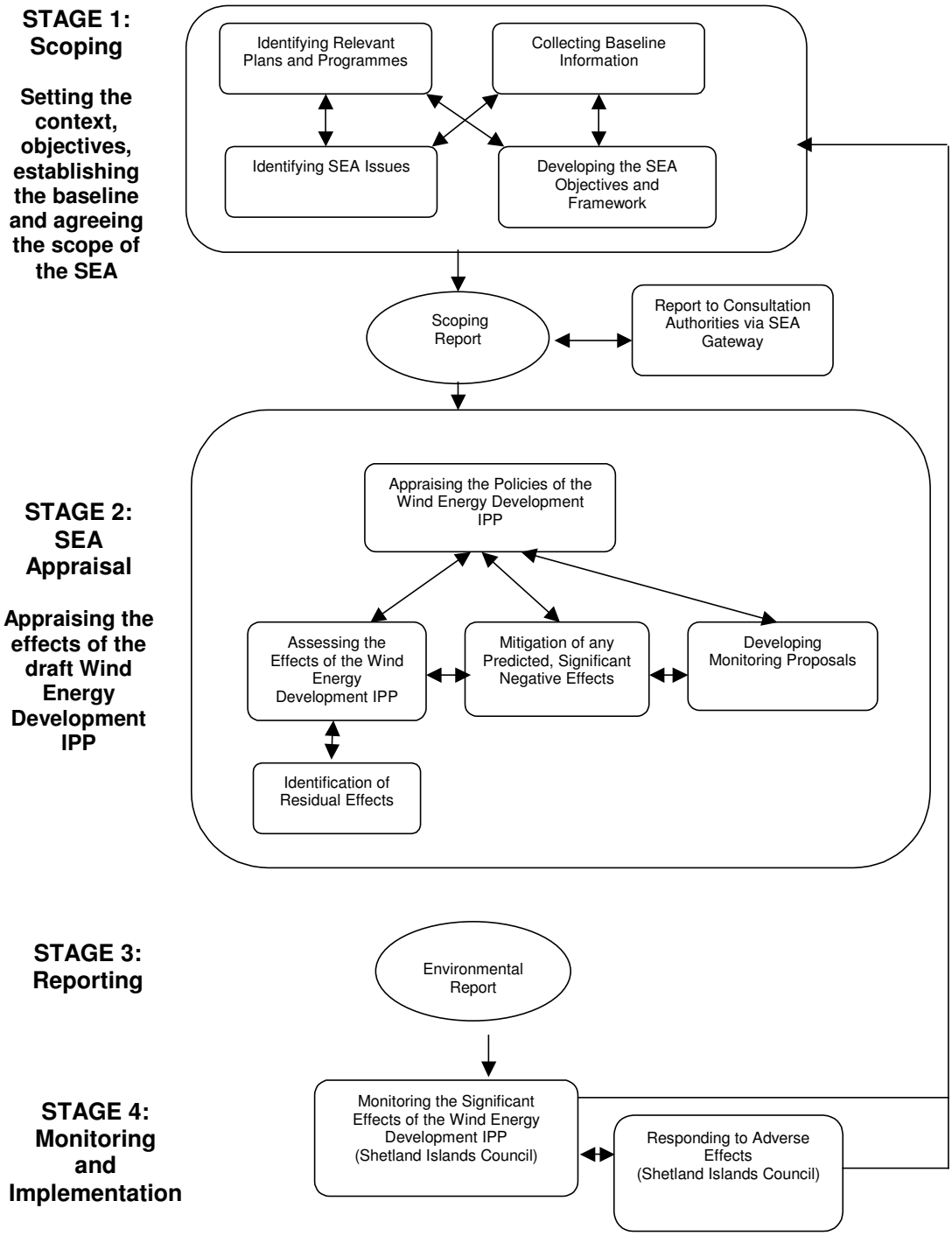
- the plan would set a policy framework for all subsequent projects and activities associated with WED IPP and the associated construction and design of new wind energy developments;
- there are a number of significant environmental issues associated with WED IPP;
- the potential environmental effects of WED IPP construction and design have been widely reported and documented;
- effects can lead to cumulative and transboundary effects;
- there can be risks to human health;
- the magnitude and spatial effects can be significant;
- Shetland has vulnerable natural and cultural heritage assets that could be affected.

SIC proposes to take the SEA process forward in six steps that are part of the formal SEA process illustrated in Figure 1 below:

- **Step 1:** the scoping exercise and associated report which is the focus of this document;
- **Step 2:** the SEA appraisal;
- **Step 3:** the production of an Environmental Report;
- **Step 4:** public consultation;
- **Step 5:** revision of the WED IPP and formal approval;
- **Step 6:** monitoring and Implementation.

Steps 2 and 3 will be undertaken following consultation on this scoping report (see Section 3).

Figure 1: The Strategic Environmental Assessment Process: Stages for the Appraisal of SIC WED IPP



1.3 STATUTORY FRAMEWORK

The Environmental Assessment (Scotland) Act 2005 is the statutory mechanism by which the requirements of the European Directive 2001/42/EC – *"On the assessment of the effects of certain plans and programmes on the environment"* (known as the Strategic Environmental Assessment or SEA Directive) are now delivered in Scotland. The purpose of the SEA Directive is twofold. Firstly it aims to provide for a high level of protection of the environment and secondly to contribute to the integration of environmental considerations into the preparation and adoption of plans with a view to promoting sustainable development (see Section 1.4 below).

SIC recognises that the WED IPP has the potential to generate significant environmental effects through its potential influence on the location, design and construction of any resultant wind energy developments. It is therefore appropriate that a high level suite of policies of this nature should be appraised so that any possible negative effects can be mitigated and the positive effects strengthened as far as is possible.

1.4 SUSTAINABLE DEVELOPMENT

Sustainable development can be defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'[3].

The UK Government launched a new sustainable development strategy in 2005[4] *"Securing the Future – delivering UK sustainable development strategy"* with a set of shared UK principles:

- *"Living within Environmental Limits"*
- *"Ensuring a Strong, Healthy and Just Society"*
- *"Achieving a Sustainable Economy"*
- *"Promoting Good Governance"*
- *"Using Sound Science Responsibly"*

In 2005, Scottish Ministers also set out their aims for sustainable development in a new strategy *"Choosing our Future – Scotland's Sustainable Development Strategy"*[5]. The main thrust of the strategy is enshrined in four key goals:

- *"The well being of Scotland's people"*
- *"Supporting thriving communities"*
- *"Scotland's global contribution"*
- *"Protecting Scotland's natural heritage and resources"*

There is a strong environmental strand within this strategy so testing SIC's WED against the requirements of the SEA Directive will make sure that SIC makes a contribution to each of these four goals and is effective in protecting the environment whilst providing direction on future wind energy development in Shetland.

[3] World Commission on Environment and Development 1987
[4] *"Securing the Future"* – Delivering the UK Sustainable Development Strategy, HM Government, 2005
[5] *"Choosing our Future* – Scotland's Sustainable Development Strategy", Scottish Executive, December 2005

1.5 THE SCOPING REPORT

The purpose of this SEA scoping report is to set out sufficient information on SIC's WED IPP to enable the Consultation Authorities to form a view on the consultation periods and scope/level of detail that will be appropriate for the accompanying environmental report. The report has been prepared in accordance with Regulation 15 of the Environmental Assessment (Scotland) Act 2005.

The document sets out the methodology to be followed for the SEA; summarises the baseline information and related plans and programmes which have been reviewed (to inform the assessment of key environmental issues and help in the development of objectives and indicators), and presents the draft proposed framework for the appraisal.

The following organisations are statutory consultees under the SEA Regulations:

- Historic Scotland;
- Scottish Natural Heritage (SNH); and
- the Scottish Environment Protection Agency (SEPA).

The scoping report is being distributed to these organisations for comment via the Scottish Government's SEA Gateway. All comments received will be taken into account and the methodology including the SEA appraisal framework will be amended as required.

1.6 LAYOUT OF THE REPORT

The remainder of the document is structured as follows:

- **Section 2**: describes the plan context, the links with other relevant plans and programmes, the environmental baseline and key environmental issues and sets out the SEA objectives;
- **Section 3**: sets out how the environmental assessment will be carried out and includes the assessment methodology; the appraisal framework; the establishment of the SEA indicators and the proposed structure of the Environmental Report.

The main text is supported by the following annexes:

- **Annex A:** Bibliography
- **Annex B:** Relevant Plans and Programmes Reviewed

2 PLAN CONTEXT

2.1 LINKS WITH OTHER RELEVANT PLANS, PROGRAMMES AND ENVIRONMENTAL OBJECTIVES

The WED IPP will have an influence on, and will draw from, other plans produced by Shetland Islands Council. Following analysis of the relevant plans, programmes and environmental protection objectives it is concluded that the Interim Planning Policy should emphasise the following:

- promotion of sustainable development;
- protection of the quality of life for local communities;
- protection of the natural and historic environment; and
- support for renewable energy.

An understanding of the relevance of other legislation, policy and plans to the WED IPP is an essential step in understanding its context and in deriving the necessary baseline for the assessment. A summary list of the policies, plans and programmes together with their environmental objectives relevant to the WED IPP are presented in Table 2.1 below. These were used to help formulate the SEA objectives in Table 2.2 and to shape the emerging indicators (see Table 3.6). Other plans and programmes, together with more details on the key environmental messages used to shape the SEA objectives, are given in Annex B.

Table 2.1: Summary of Representative Plans, Programmes and Strategies (PPS) relevant to the Wind Energy Development IPP (see Annex B for more details)

Policy, Plan or Programme	Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP
National	
Scottish Planning Policy: October 2008	Protection and enhancement of the national and built environment – key policy direction
Biodiversity: The UK Action Plan (1994)	The plan assesses the current status of the UK's habitats and species and sets out a strategy for their future conservation and enhancement
Scottish Biodiversity Strategy: Scotland's Biodiversity, Its in Your Hands (2004)	To conserve Scotland's biodiversity for future generations
Nature Conservation (Scotland) Act (2004)	This Act puts in place legal measures for the conservation of biodiversity .The Act places a "Biodiversity Duty" on Shetland Islands Council
The UK Strategy for Sustainable Development "Securing the Future" (2005)	To ensure the effective protection of the environment, maintenance of economic growth, employment and prudent use of natural resources
UK Climate Change Programme (2006)	To reduce greenhouse gas emissions. The UK target is to cut emissions by 12.5% below 1990 levels by 2008-2012
"Choosing Our Future": Scotland's Sustainable Development Strategy (2005)	Details the Scottish Government's strategy for tackling issues such as climate change, biodiversity, resource use and pollution
"Changing Our Ways" Scotland's Climate Change Programme (2006)	To make an equitable contribution to the UK commitment on climate change and enable Scotland to make the transition to a low carbon economy
Climate Change (Scotland) Bill (2009)	Sets a CO_2 reduction target for the year 2050, an interim target for the year 2020, and makes provisions for annual targets, for the reduction of greenhouse gas emissions; confers power on Ministers to impose climate change duties on public bodies and to make further provision with

Policy, Plan or Programme	Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP
	regard to mitigation of and adaptation to climate change
Water Environment and Water Services (Scotland) Act 2003	Ensures that all human activity that can have a harmful impact on water is controlled
Environment Protection Act 1990	This Act relates to the control of pollution and protection of the natural environment
Water Environment (Controlled Activities) (Scotland) Regulations 2005	Requires authorization over point source discharges, abstractions, impoundments and engineering activities
The Air Quality Limit Values (Scotland) Regulations 2005	Limits values of relevant pollutants in ambient air which must be complied with
SPP3 : Planning for Housing (2003)	Promotion of clear guidance to encourage good quality well designed development which makes a significant contribution to environmental quality
SPP6 : Renewable Energy (2007)	Delivery of renewable energy targets Need for spatial plans for large windfarms (>20 megawatts) Support for renewable energy developments must be compatible with protecting and enhancing the natural and historic environment
SPP20 : Role of Architecture and Design Scotland (2005)	Importance of design in delivering sustainable and social communities and landscape quality
PAN 44 : Fitting New Housing Development (1994)	Maintaining the character and identify of landscape and securing the quality of Scotland's environment
PAN 45 Annex : Planning for Micro-Renewables (2006)	Micro-renewables which can be integrated into new developments in the design stage
PAN 67 : Housing Quality (2003)	Designing successful and sustainable places through layout, landscape, scale and mix and details
PAN 68 : Design Statements (2003)	Ensuring design principles and therefore environmental quality are at the centre of a proposed development
PAN 71 : Conservation Area Management (2004)	Good practice for managing change within Conservation Areas and minimising impact on the built environment
PAN 72 : Housing in the Countryside (2005)	Key message – ensuring that developments enhance local character and make a positive contribution to the environment
PAN 83 : Masterplanning (2008)	Key message – masterplanning ensures developments are designed successfully and in a sustainable manner, minimising impact on the environment
PAN 84 : Reducing Carbon Emissions in New Development (2008)	Good practice guidance and technical calculations to deliver low and zero carbon developments
Designing Places : A Policy Statement for Scotland (2001)	Ensure sensitive siting and design of all development making the most of its setting in the landscape
NPPG 5 - Archaeology and Planning – Scottish Executive 1998	Government planning policy is set out on the protection, conservation and management of archaeological resources
NPPG 18: Planning and the Historic Environment (1999)	To conserve Scotland's culture and historic environment
SPP1 The Planning System (2002)	To ensure that future planning contributes towards sustainable development
Local and Regional	
Living Shetland Project: Local Biodiversity Action Plan (199)	Aims to engage with local communities to promote the conservation and restoration of local habitats and species
'Seas the Opportunity' A Strategy for the Long Term Sustainability of	Strategy sets out aims to enhance and conserve the overall quality of Scotland's coasts and seas, their

Policy, Plan or Programme	Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP
Scotland's Coasts and Seas (2005)	natural processes and their biodiversity
Shetland Transport Strategy 2007 (draft)	Sets out strategy for development of an efficient and reliable transport system for Shetland
Orkney and Shetland Area Waste Plan (2003)	Sets out a waste management strategy for Orkney and Shetland. The Wind Energy Development IPP should develop measures aimed at controlling and reducing waste generation and associated environmental impacts
Shetland Island Council Structure Plan (2000)	The Wind Energy Development IPP is not itself part of the statutory plan (Shetland Structure Plan 2000 and Shetland Local Plan 2004).However it responds to Scottish Government objectives contained within the statutory plan The Shetland Structure Plan 2000 sets out the general development strategy for the Shetland Islands and gives detailed guidance on all development including commercial and housing development. The Wind Energy Development IPP will be used to update the policies within the structure plan and so will be closely related to this document
Shetland Local Plan (2004)	Presents policies and recommendations for the development and use of land throughout Shetland. Sets out policies in relation to all potential developments As above, the WED IPP will be used to update the policies within the local plan and so will be closely related to this document
Shetland Island Council Corporate Plan (2008)	Sets out measures aimed at achieving a range of 'Targets and Priorities' developed by the Community Planning Board
Shetland Islands Council Priorities & Targets (2007)	Conserve and where possible improve the quality of life and the environment
Shetland Island Council Sustainable Development Implementation Plan (2008)	Sets out priorities and actions which contribute to the achievement of sustainable development in Shetland
Shetland Cultural Strategy (2004)	Sets out objectives for developing cultural facilities, services and activities for the benefit of the Shetland community
Shetland Islands Council Draft Interim Planning Policy: Towards Sustainable Construction and Better Design (2009)	Provides location, design and amenity guidance and policy for Housing and Other Development within Shetland
Shetland Islands Council Draft Interim Planning Policy: Minerals	Provides sound and comprehensive policies for minerals development leading into the next decade, based on up-to-date information and legislation.
Shetland Islands Council Draft Interim Planning Policy: Energy	Provides policies for the provision of energy and energy infrastructure leading into the next decade, based on up-to-date information and legislation.

2.2 ENVIRONMENTAL BASELINE AND KEY ENVIRONMENTAL ISSUES

2.2.1 Baseline

This section describes the proposed structure and level of detail, which will be used to form the environmental baseline in the SEA Environmental Report on the WED IPP. The key environmental issues and problems are summarised in Section 2.3. These have been identified from the review of plans and programmes, consultations within SIC and a review of baseline information held by SIC. To establish an environmental baseline of current conditions that relate to the SEA and SIC objectives existing environmental and sustainability data were reviewed from a range of sources that included the following:

- Scottish Environment Statistics On-line;
- Scottish Social Statistics (SE National Statistics Publication, 2001);
- Shetland Islands Council (internal documents and reports);
- Shetland in Statistics 2008 and
- SEPA.

The baseline information provided below describes the current state of the environment and provides a basis for predicting the likely evolution of the environment without implementation of the plan (as required in the Scottish Act Schedule 3, Para 2). The indicators and their baseline (set out in Table 3.6) are specific to the activities of SIC and will be used to monitor the environmental effects of the WED IPP and reference will be made to the broader picture described below.

2.2.2 Biodiversity, Flora and Fauna

Shetland is home to many habitats that are designated under international or national legislation or by SIC. This section sets out these areas and highlights their respective level of protection. This section also provides details regarding species that are protected under European or national legislation, together with further information on priority species and habitats.

Designated Areas

Special Protection Areas (SPAs)
SPAs are strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC), also known as the Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species. The 12 SPAs in Shetland include Foula, one of only seven known EU breeding sites for Leach's Petrel. The full list and a description of SPAs in Shetland are given in Table 2.2:

Table 2.2: Special Protection Areas in Shetland

Site	Description
Noss	High cliffs supporting internationally important breeding populations of migratory seabirds including fulmar, gannet, great skua, kittiwake and guillemot
Fetlar	Heathlands, marshes, cliffs and rocky shores important for breeding birds and waders including internationally important populations of red-necked phalarope, Arctic tern, fulmar, whimbrel, Arctic skua and black guillemot; nationally important populations of dunlin and notable populations of red-throated diver
Hermaness and Saxa Vord	Sea cliffs and moorland supporting internationally important breeding populations of fulmar, gannet, great skua, guillemot and puffin
Fair Isle	Large colonies of breeding seabirds (including fulmars, shags, Arctic skuas, kittiwakes, guillemots and puffins); internationally important bird migration landfall and study site; endemic Fair Isle sub-species of wren
Foula	Rocky coastline and large areas of moor, supporting internationally important breeding populations of seabirds (including breeding great skua, guillemot and puffin) and nationally important numbers of breeding fulmar, shag, Arctic skua and razorbill
Mousa	Low grassy island with internationally important breeding colonies of storm petrel and Arctic tern
Ramna Stacks and Gruney	Group of small rocky islets with internationally important colony of Leach's petrel
Sumburgh Head	Cliffs and boulder beaches supporting a nationally important breeding population of Arctic tern, plus other breeding seabirds
Ronas Hill, North Roe and Tingon	Areas of blanket bog supporting nationally important numbers of breeding red-throated diver, merlin, whimbrel, Arctic skua and great skuas.
Lochs of Spiggie and Brow	Eutrophic 'machair type' loch regularly supporting nationally important wintering population of Icelandic whooper swans.
Papa Stour	Heathland and cliffs supporting nationally important numbers of ringed plover and Arctic skua, and large seabird colonies.
Otterwick and Graveland	Comprises two areas of open moorland with numerous pools and lochans on Yell. Inland areas are dominated by blanket bog, with some stretches of dry heather moorland. A band of maritime grassland extends along the coastal stretch to the Graveland peninsula. Breeding population of European importance species red-throated diver

Source: www.snh.gov.uk

Special Areas of Conservation (SACs)

SACs are designated under the EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, known as the Habitats Directive. In the UK, sites are protected under The Conservation (Natural Habitats, &c.) Regulations 1994, due to the presence of one or more habitats or species listed in the Directive and management plans are written to ensure 'favourable conservation status.' The 12 SACs in Shetland are listed and described in Table 2.3 below:

Table 2.3: Special Areas of Conservation in Shetland

Site	Description
Hascosay	Active blanket bog with an intact pool system displaying a range of shallow mud-bottom hollows with typical Shetland blanket bog vegetation and a diverse range of Sphagnum species
Keen of Hamar	Vegetated calaminarian grassland area on serpentine bedrock and (base-rich) scree areas that support a unique community of plants including a number of rare northern species and one sub-species (Edmondston's chickweed) found only in Unst
Tingon	An extensive area of active blanket bog dominated by Sphagnum bog moss in the hollows, undisturbed heather and hare's tail cotton grass. The area includes a large number of pools and lochans; it is also notable for peat mounds supporting vegetation more usually found on dry heaths
Ronas Hill, North Roe	Areas of active blanket bog on lower lying ground and alpine and sub-alpine heaths are present. Also peat mounds capped with a vegetation community more usually associated with dry heaths. Heathlands are generally dominated by heather and carpets of woolly hair moss (with several areas of juniper vegetation). Bog vegetation dominated by heather, hare's tail cotton grass and deer grass, with a well-developed understorey of mosses and liveworts. Pools and lochans provide breeding sites for redthroated divers
Mousa	The largest single colony of breeding common seals within Shetland (about 600 breeding females) which represents about 2% of the total UK common seal population
Papa Stour	Exposed rocky coastline fringed by submerged bedrock and boulder reefs. Habitats include extensive kelp forests and deeper reefs dominated by invertebrates such as soft coral. Papa Stour has excellent examples of caves, tunnels and arches, with rich communities of algae and sponges
The Vadills	A complex lagoon system comprised of 8 shallow basins of varying salinity, separated by the sea by shallow rock, boulder or shingle narrows. The area supports a graduation of habitats and a high diversity of communities and species, including several species rare or unknown elsewhere in Shetland
East Mires and Lumbister	Active blanket bog
Yell Sound Coast	Nationally and internationally important population of breeding otters. It is estimated that the site supports at least 192 otters, representing about a quarter of the Shetland population
Fair Isle	European dry heaths; vegetated sea cliffs of the Atlantic and Baltic coasts
North Fetlar	Alkaline fens; European dry heaths
Sullom Voe	Coastal lagoons; large shallow inlets and bays; reefs

Source: www.snh.gov.uk

Sites of Special Scientific Interest (SSSI)

These areas are protected under the Wildlife and Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act 2004. Sites are designated due to the presence of important flora, fauna or geographical features. Shetland has 81 sites designated for the interests listed below in Table 2.4. Some sites are designated for several reasons.

Table 2.4: Sites of Special Scientific Interest in Shetland

List of SSSIs in Shetland	
Geology (31 sites)	Intertidal Habitats (6 sites)
Geomorphology (7 sites)	Aquatic Flora (6 sites)
Montane habitats (1 site)	Rare Plants (5 sites)
Serpentine Vegetation (4 sites)	Seabirds (9 sites)
Other Heatherland (4 sites)	Wildfowl (3 sites)
Marsh and Meadow (4 sites)	Aquatic Fauna (3 sites)
Limestone and Grassland (1 site)	Mammals (3 sites)
Sand Dune Flora (2 sites)	Trees and Woodland (4 sites)

Source: Shetland Island Council

Ramsar Sites
Wetland areas of high ecological value can be designated as Ramsar sites under the convention on wetlands of international importance.

One site in Shetland - Ronas Hill, North Roe and Tingon -was designated as a Ramsar site in August 1997. It is important primarily for its red-throated divers and the nationally rare Arctic water flea, Eurycerus Glacialis.

National Nature Reserves (NNR)
NNRs are sites of special natural interest, and provide opportunities for environmental education and the informal enjoyment of nature by the public. Shetland has three NNRs and these are listed below:

- Hermaness
- Keen of Hamar
- Noss

Two of Britain's largest seabird colonies can be found at Noss and Hermaness. Rare plants can be found at the Keen of Hamar, one of which, Edmonton's chickweed, is only found at one other site in the world.

Marine Consultation Areas (MCA)
MCAs are designated due to the quality and sensitivity of the marine environment. There are four MCAs in Shetland and these are listed in Table 2.5.

Table 2.5: Marine Consultation Areas in Shetland

Site	Description
Brindister Voe and the Vadills	Brindister Voe includes communities representative of Shetland voes in general. The Vadills comprises the most complex and least disturbed lagoon system in Shetland, unique in the British Isles
Swinister Voe and the Houb of Fora Ness	Swinister Voe is included because of its rich lower shore fauna and flora. The Houb contains communities characteristic of shallow, submerged, extremely sheltered conditions. The gravel rapids community is probably the best such example in Shetland
The Houb, Fugla Ness	The site contains extensive areas of sediment shores, (unusual in Shetland), as well as more widespread boulder/shingle shores. The rapids at this site are of boulders
Whiteness Voe	The bay at the head of the Voe is of very high scientific interest because it contains the best-developed bed of eel grass in Shetland and because the rich sediments include both widely occurring and rare communities and species

Source: www.snh.gov.uk

Local Protection Areas (LPA)
These are Council designated sites which are regarded by the Council as worthy of protection. Reasons can include scenic or historic value or presence of flora or fauna. It is the Council's policy to keep these areas free from development unless the development provides facilities that benefit the community as a whole.

RSPB Reserves
There are 4 RSPB reserves in Shetland, which are located at:

1) Sumburgh Head;
2) Mousa;
3) Fetlar: and
4) Loch of Spiggie.

Table 2.6 below summarises the designated sites on Shetland.

Table 2.6: Designated Areas

Designation	Total Number	Area within Shetland (ha)	% of Total Area of Shetland
Site of Special Scientific Interest (SSSI)	81	20,138	12.2%
Special Areas of Conservation (SAC)	12	15,348	9.3%
Special Protection Areas (SPA)	12	15,157	9.2%
Ramsar	1	5,470	3.3%
Marine Consultation Areas	4	Information not available	Information not available
National Nature Reserve (NNR)	3	1,307	0.8%

Source: www.snh.gov.uk

Designated Species
It will be important to consider the effects of any proposals on European and nationally protected species in the area. European species are given a high level of protection under Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora which is transposed into UK law by The Conservation (Natural Habitats &c) Regulations 1994. These species include otter, wildcat, great crested newt, some cetaceans and all bat species. Disturbance to any of these species requires a license from the Scottish Government and demonstration that no reasonable alternative exists and that proposals would not affect the conservation status of the species.

A number of animal and plant species are protected under the Wildlife and Countryside Act 1981 and the Nature Conservation (Scotland) Act 2004 including golden eagle, osprey, hen harrier, pine marten, red squirrel and water vole. Statutory protection is also given to badger under the Protection of Badgers Act 1992.

Although not all of these species occur on the Shetland Islands, some, such as otter have been recorded on a regular basis within boundary of the WED IPP.

Priority Habitats and Species
As part of the Living Shetland *draft* Local Biodiversity Action Plan, priority habitats and species have been identified. Priority habitats include roadside verges, machair, herb-rich meadows, wet meadows and arable crops. In some cases, habitat action plans have been developed. Table 2.7 lists the priority species for which specific action plans have been developed.

Table 2.7: Species Action Plans in Shetland

List of Species Action Plans in Shetland	
Arable Weeds	Bumble bees
Harbour porpoise	Oyster plant
Skylark	Arctic Char
Breeding Waders	Red necked Phalarope
Merlin	Farmlands birds
Hawkweeds	Red-throated diver
Eider	

Source: Shetland Islands Council

The presence of some species in Shetland is highly significant in a national context, for example 90% of the UK population of the red-necked phalarope is present in Shetland. Similarly, Shetland is home to approximately 90% of the UK's Whimbrel population. Coastal cliffs provide important nesting sites for breeding seabirds. Shetland is home to one tenth of the total seabird population of Britain; in excess of one million birds from 22 species. The varied coastline of Shetland supports diverse habitats and species. Voes (inlets/sea lochs) provide shelter and muddy conditions exist at the heads of some of the longer voes, which are inhabited by species such as cockles and lugworms. In deep water, reefs are formed from large horse mussels. Sandeels, which are an important food source for Shetland's many seabirds, mammals, and commercial fish stocks are supported by finite offshore supplies of sand.

2.2.3 Population and Human Health

Background
Shetland's population has fallen by four percent over the last 25 years, an average of 35 people a year. The trend towards centralisation of the population towards Lerwick and within a 15 to 20 minute commute of Lerwick continues.

Around 41 percent of the population now lives in Lerwick. Since 1991, Shetland's population aged over 65 has risen by 31 percent and the progression of an ageing population looks set to continue, with the population of over 50s increasing by 1.9 percent in the last year.

Accessibility and Social Exclusion
A recent report[6] by SIC found that a section of the Shetland community, namely those without easy access to private car use, have difficulty in accessing certain services and opportunities. This affects peoples' opportunity to access employment, education, social events and to purchase healthy food at a reasonable cost. This is a particular problem for those in outlying communities or those with mobility problems.

Access to the Natural and Built Environment
No relevant baseline information was obtained relating to access to the built or natural environment.

[6] Deprivation and Social Exclusion in Shetland, Shetland Islands Council, 2006

Health and Healthy Lifestyles

The following data (Table 2.8, 2.9, & 2.10) provides an overview of the proportions of people who are in good and poor health. When viewing these figures, it is important to take into account that the population is declining and aging.

Table 2.8: Health Statistics for Shetland

Health Issues	Statistics for Shetland
Average age of a person with good health	59.58
Average age of a person with a limiting long term illness	32.29
Percentage of economically inactive people who are permanently sick/disabled	15.45
Percentage of households with one or more carers resident	15.45
General health - % Good % Fairly good % Not good	71.72 21.55 6.73
Percentage of population with a limiting long term illness	15.74
Percentage of population that does not have a limiting long term illness	84.26
Life Expectancy at birth (2002-4)	74.2

Source: Scottish Executive Statistics

Table 2.9: All heart Diseases standardised Mortality Rate per 100,000 Population <75

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
Shetland	123.6	147.8	152.8	133.1	86.1	88.0	53.8	85.2	86.0

Source: NHS

Table 2.10: Stroke/Cerebrovascular standardised Mortality Rate per 100,000 Population <75

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
Shetland	42.8	45.0	18.8	28.9	19.2	31.1	35.8	13.2	17.0

*Due to the small numbers the figures should be interpreted with caution.
Source: NHS

Employment

Table 2.11 shows the breakdown of employment in Shetland by Industrial Group. It should be noted that statistics for Self-Employed are included in the figures for Primary, Manufacturing, Construction and Services. These figures do not include agricultural employment.

Table 2.11: Employment in Shetland by Industrial Group (2003 and 2007)

Standard Industrial Classification Grouping	Total numbers employed (2003)	Total numbers employed (2007)
Primary	1,620	1,136
Manufacturing	928	906
Construction	717	893
Services	8,882	9,309

Source:Shetland in Statistics 2008

2.2.4 Soils and Geology

Geology
The majority of the rocks of Shetland are part of an old, deeply eroded mountain chain called the Caledonian Orogenic Belt which was raised up as a mountain block between 400 to 600 million years ago. This same mountain chain forms most of Norway, Scotland and Northern Ireland. In the south-eastern and western parts of Shetland, these rocks have been overlain by sedimentary rocks of old sandstone age. These rocks were laid down and folded during the Devonian era around 400 million years ago. Running north-south through Shetland are several tear faults where blocks of rock have been displaced by movements of the earth's crust. The principal fault of this type is the walls Boundary fault. This fault is thought to be the northern extension of the Great Glen fault found on mainland Scotland.

Metamorphic schist and gneiss extends from Fitful Head and the Clift Hills of south Mainland, through central Mainland and the coastal portion of north Mainland, east to the islands of Whalsay and Out Skerries and north to the island of Yell and the western parts of Fetlar and Unst. In central Mainland, the metamorphosed-siliceous sedimentary rocks are interspersed with bands of crystalline metamorphosed limestone which have been eroded to form a series of valleys. Superficial deposits of glacial drift, boulder clay and alluvium overlie bedrock in places, particularly on low lying areas, and the higher ground is commonly blanketed with peat. The eastern parts of Unst and Fetlar are characterised by serpentine and gabbro bedrock with a surface layer of shattered rock and glacial drift.

Much of the north Mainland, west of the walls Boundary fault (from Ronas Hill and the North Roe plateau to the island of Muckle Roe), consists of red granite and other igneous rocks. These rocks are overlain with superficial deposits of peat, boulder clay and glacial drifts. The cliffs of Eshaness and the island of Papa Stour are formed by lavas and tuffs (volcanic ash) of old red sandstone age. The West Mainland is characterised by folded sandstone of old red sandstone age, with granite in the extreme south. The area is overlain by peat and areas of boulder clay. The south eastern coastal strip of mainland (from Sumburgh Head northwards to Lerwick), and the adjacent islands of Bressay, Mousa and Noss are formed of gently inclined sandstones, flagstones and conglomerates of old red sandstone age. In places the sandstone is interbedded with limestone and mudstone. These rocks are overlain by significant areas of boulder clay and other glacial drifts. the outlying islands of Fair Isle and Foula are formed predominantly of sandstone.

Vegetation
Shetland's vegetation is dominated by peatland, heather moorland and montane. Improved rough grassland is concentrated along the coast, around the voes and in the valleys. The best agricultural land available in Shetland, improved grassland and good rough grassland, can be found in the valleys of the central mainland; along the south and east coasts of the southern mainland; in eastern regions of Unst and Fetlar; and along the Walls boundary fault. These are the areas of greatest agricultural production.

Shetland's flora is impoverished in comparison to that of mainland Britain. This is largely due to the climate and the islands' isolation. Shetland has the highest average humidity in Britain. This, combined with its salt-laden atmosphere, limits the botanical diversity and the scope for crop growing in the Islands.

Shetland is predominantly treeless. The only significant tree growth is situated at

Kergord in the Weisdale valley, although small patches of trees are scattered throughout Shetland at various sheltered locations.

Agricultural Land
In recent years there has been a decline in agricultural activity. As detailed in Table 2.12, the total land used for tillage in Shetland was almost 437 hectares in 2001. This figure fell to 400 by 2003. Intensive sheep farming has increased its dominance of the agricultural economy, particularly over the past 30 years.

The amount of land suitable for agriculture in Shetland is limited and as such, fertilisation and reseeding of moorland has been used to increase agricultural productivity. The amount classed as improved or good grassland is also somewhat limited. Farmers have been encouraged to manage land in a more environmentally sensitive manner since Shetland was designated an environmentally Sensitive Area in 1993.

Table 2.12: Agricultural Land Use in Shetland

Agricultural Land Use Practice	Hectares
Vegetables for human consumption	17.35
Other crops	2.31
Bare fallow	131.59
Total tillage	436.51
Grass under 5 years old	2,580.61
Arable	3,017.12
Total crops and grass	22,016.11
Sole right rough grazing	56,179.8

Source: Scottish Agricultural Census 2001

2.2.5 Water

Surface Water Quality
The Scottish Environment Protection Agency (SEPA) monitors surface water quality in watercourses, estuaries and other water bodies. In addition, under the Water Framework Directive, enacted in Scotland in the Water Environment and Water Services (Scotland) Act 2003, SEPA has new responsibilities relating the management and protection of river catchments (river basin districts), which includes the groundwater resource within those catchments.

SEPA classifies rivers in terms of water quality from A1 (excellent), A2 (good) to D (seriously polluted) this classification is based on a combination of chemical, biological and aesthetic criteria. Similarly estuarine waters are also classified from A to D.

Within Shetland SEPA carry out a range of monitoring of surface and coastal waters. A selection of the most up to date available data is contained within Table 2.13 below.

Table 2.13: Water Quality Monitoring in Shetland

Surface Water Body / Coastal Length Monitored	Classification
Burn of Voxter/Burn of Laxdale	A2
Burn of Dale	A2
Stromfirth Burn	A2
Burn of Weisdale	A2
South Burn of Burrafirth	A2
Burn of Laxo Bigging	A2
Laxo Burn	A2
Burn of Bouster	A2
Burn of Arisdale	B
Bressay Sound	B
Breesay Sound (at Lerwick)	C
Yell Sound (Colla Firth)	B
Sullom Voe	B
Mid Yell Voe	C
Balta Sound (Unst)	B
Vidlin Voe	B
Vassa Voe (Cat Firth)	A
West Burra (Hamnavoe)	A
East Voe of Scalloway	C

Source: www.sepa.gov.uk

The Public Water Supply

The public water supply is extracted from 24 lochs and burns (See Table 2.14) and piped to one of 21 treatment works. In addition, seven water supply zones have a total of 17 service reservoirs. 2.15 gives details of the treatment works and their use.

Table 2.14: Water Sources in Shetland

Water Bodies used as Sources	Water available per Day (M lpd)*	Associated Water Treatment Works
Arthur's Loch	0.10	West Burrafirth
Bu Water	0.20	Whalsay
Burn of Channerwick	0.30	Sandwick
Burn of Geosetter	0.10	Bigton
Burn of Greystanes	0.20	Sandwick
Burn of Laxdale	0.20	Cunningsburgh
Eela Water	2.50	Sullom Voe II
Gorda Water	0.20	Papa Stour
Helliers Water	0.50	Unst
Laxo Burn	0.60	Mid Yell
Loch of Brindister	1.20	Lerwick
Loch of Brough	0.70	Bressay
Loch of Brough	0.50	Cullivoe
Loch of Brow	0.40	Sumburgh
Loch of Huesbreck	0.50	Sumburgh
Loch of Huxter	1.50	Whalsay
Loch of Kettlester	1.22	South Yell
Loch of Watlee	1.00	Unst
Roer Water	4.55	Sullom Voe II
Sandy Loch	6.20	Lerwick
Skerries Reservoir	0.03	Skerries
Skutes Water	0.70	Fetlar
Springs Burn	0.06	Foula
Vaadal Burn	0.06	Fair Isle

M lpd - million litres per day
Source: North of Scotland Water Authority

Table 2.15: Water Treatment and Usage in Shetland

Water treatment works	Population served	Average water consumption (M lpd)	Average daily demand as % of capacity
Bigton	170	0.06	60
Bressay	330	0.10	67
Cullivoe	260	0.06	60
Cunningsburgh	450	0.13	87
Fair Isle	70	0.02	33
Fetlar	100	0.04	40
Foula	50	0.01	20
Lerwick	9,000	5.32	78
Mid Yell	550	0.25	50
Papa Stour	40	0.05	100
Sandness*	150	0.04	80
Sandwick	840	0.24	48
Skeld and Reawick	400	0.10	50
Skerries	90	0.02	67
South Yell	300	0.10	83
Sullom Voe II	3,600	3.30	55
Sumburgh	1,500	0.47	78
Unst	1,000	0.46	92
Walls	400	0.12	80
West Burrafirth	30	0.02	67
Whalsay	1,020	0.27	54

Flooding and Surface Run-Off
The most common cause of historical flooding events in Shetland has been inundation by the sea. However, the trend has shifted in recent times and heavy rainfall is now the cause of the majority of incidents. Burns in Shetland tend to be short and steep, which can increase flood risk during heavy rainfalls. This is likely to be exacerbated by climate change in the future, as predictions for Shetland are for extended periods of drought followed with more severe bursts of rain.

The Development Plans Service at SIC is carrying out a survey of watercourses that are likely to be affected by future development. From this, the capacity of watercourses to carry surface water discharge from developments will be determined.

Vulnerability to the Effects of Climate Change
Although the relative significance of rainfall-related flooding events has increased, coastal-related flooding is still a highly significant issue and again, climate change is predicted to cause further problems. Shetland is thought to be sinking at a rate of approximately 2 to 3 millimeters (mm) per year and sea level rise over the next century has been predicted to be between 0.5 and 1 metre. Even at present, storm hazard on Shetland is potentially greater than anywhere else in the UK and maximum wave heights around Shetland have been rising in recent decades. In addition, increases in the frequency and severity of storms are predicted, with coastal water extreme levels forecasted to become 5 to 10 times more likely by the 2050. The combination of the above factors will extend the inward limit of storm driven

water and whilst this is not a problem for many areas of Shetland's rocky coastlines, voe heads could be significantly affected due to the funnelling of storm surges.

Existing coastal defences will need to be replaced or modified to adapt to the effects of climate change. Modest predictions suggest that in order to bring the level of protection back to that of the 1990s defences will need to be increased in height by 10 to 30 centimeters (cm). Less conservative estimates suggest required increases of almost 80 cm.

Erosion of beaches from rising sea levels and increased wave action is a current problem which is predicted to become more significant in coming years. Offshore sediment supplies are finite and the potential for natural recharging of these beaches is therefore limited. Human activity such as provision of coastal defences and other physical structures can cause additional erosion.

Fishing and Aquaculture Industries
In 2003, a total of 31,659,776 tonnes of wet fish was landed in Shetland. The seas around Shetland are known spawning and nursery areas for Norway pout, lemon sole, haddock, herring, sandeel and whiting. The fishing industry is supported by the following species:

- Pelagic fishery – mackerel, herring, blue whiting
- White fishery – haddock, cod, anglerfish, nephrops
- Inshore fishery – scallops, crabs, lobsters, nephrops

Fish farms occupy the many of the suitable voes and produce salmon, sea-trout, char, halibut, cod and shellfish, mussels being the most common. In 2003 there were 46 salmon farms, which produced a total of 63,948 tonnes.

Marine Pollution
Marine pollution arises from various different sources including domestic sewage, industrial waste, naturally occurring nutrients and ballast discharged offshore by oil tankers. Other forms of pollution are those caused by noise and light; these are especially relevant in terms of aquaculture. Eutrophication, the enrichment of water, is the consequence of high levels of pollution from too many sewage outfalls and badly positioned septic tanks. This can cause damage to marine habitats and an example of this is in upper Whiteness Voe where the source of the majority of the pollution is Wormadale.

2.2.6 Air Quality

Background
The Air Quality Strategy provides a framework for air quality control through air quality management and air quality standards. These and other air quality standards and their objectives have been enacted in Scotland through the Air Quality (Scotland) Regulations 1997, as amended, most recently in 2002. The Environment Act 1995 requires Local Authorities to undertake air quality reviews.

In areas where an air quality objective is not anticipated to be met, Local Authorities are required to establish Air Quality Management Areas (AQMA) and to develop and implement Air Quality Action Plans that detail the measures to be taken to work towards reducing pollution levels to below the objective targets.

The main industrial area on the islands is the Gremista Industrial Estate to the north of Lerwick. There is a high concentration of regulated activity in this area including a

landfill site, energy recovery plant and an oil-fired power station. The Sullom Voe oil terminal handles around 25 million tonnes of oil each year and also contains a power station which supplies some of the islands electricity. Other industrial processes include quarrying, mineral processes and fish processing activities.

Air Quality Management in Shetland

The 1995 report, 'Review and Assessment of Air Quality in Shetland'[7], presents air quality monitoring results and information on possible pollutant sources for Shetland. The second round of the review and assessment process was completed in 2003. The report concluded that there was no risk of exceedance of any of the relevant objectives in the assessment years. Consequently, no Air Quality Management Areas (AQMAs) were declared and no Air Quality Management Plans (AQMPs) are in place. There are no existing air quality constraints or significant areas of pollution in Shetland.

The LAQM Progress Report (2007) provides an update on pollutant monitoring data and information on industrial, transport, commercial and domestic atmospheric emissions. The report notes that a recent assessment of atmospheric emissions from the Lerwick Power Station predicted exceedences of the NO_2 1-hour mean objective in areas around the power station. The report concludes that there are no predicted exceedences of other NAQS objectives in the Shetland Islands.

2.2.7 Climatic Factors

Under the Kyoto Protocol the UK Government is committed to reducing greenhouse gas emissions by 12.5% below 1990 levels. The UK Government also set a more ambitious domestic target of reducing CO_2 emissions by 20% below 1990 levels by 2010. More recently, under the Climate Change Bill (2008) the UK has committed to an 80% reduction in CO_2 by 2050.

In 2006 the Scottish Executive (now Government) published Scotland's Climate Change Programme[8]. This document sets out how Scotland will make its contribution to UK targets. The Scottish Programme will contribute directly to the UK domestic goal of reducing emissions of carbon dioxide to 20% below 1990 levels by 2010. It has identified the "Scottish Share" towards this reduction as being 1.7 million tonnes of carbon (MtC) in annual savings and sets out a range of strategies for delivering this reduction.

The SIC Corporate Plan sets a target of reducing Shetland's CO_2 emissions by 30% by 2020. The SIC Sustainable Development Implementation Plan contains actions to ensure implementation on SIC's Climate Declaration.

2.2.8 Material Assets

Background

Scotland's Sustainable Development Strategy highlights that current lifestyle patterns are unsustainable, and discusses their global significance. It also sets out a number of priorities to help reduce the "global footprint". A major challenge is to move towards more sustainable consumption and production. This will include reducing inefficient use of resources; looking at the impact of products and materials across

[7] 'Air Quality in Shetland – Review and Assessment' Shetland Islands Council Environment and Transportation Department – Operations Division

[8] *Changing Our Ways*, Scotland's Climate Change Programme, Scottish Executive, 2005

their whole life-cycle and encouraging people to think about the social and environmental consequences of their purchasing choices.

Minerals
Table 2.16 shows that Shetland is a net exporter of aggregates, most of which are high quality roadstone chippings extracted from Brindister quarry. Imports are predominantly sand and are likely to continue. The Scottish Government have agreed to a ban on subtidal aggregate extraction (hydraulic dredging) around Shetland to protect shellfish beds and prevent damage to Shetland's marine environment. Near Quendale, some commercial sand extraction occurs but the possible exacerbation of coastal erosion limits the potential for further extraction.

Table 2.16: Aggregate/Mineral Imports and Exports (tonnes)

Year	Imports	Exports
1996	6,875	13,623
1997	9,789	29,814
1998	8,757	33,476
1999	3,924	22,467

Source: Shetland Island Council

The only commercial talc quarry currently operates at Cross Geo on Unst. Talc deposits, with potential for extraction, are located on Fetlar and Unst and near Cunningsburgh. Shetland produced 12,000 tonnes of talc in 1986, almost all of it from Unst; this represented over 99% of total UK production. Talc production increased until 1990 but has since fallen and is likely to remain at approximately 5,500 tonnes per annum over the coming years.

A survey carried out in 1996 into potential sources of flagstones in Shetland identified a number of locations that may have the potential to be quarried for local use.

There has been copper mining at Sandwick and Quendale in the past. Chromite was quarried around Baltasound during the 19th century. Iron ores are associated with copper ores at Sandwick and Levenwick. Magnetite was mined at Sullom during the 1950s. In the 1970s some interest was shown in exploiting copper in the Vidlin area, but no development followed. Non-commercial deposits of other minerals (e.g. baryte and kaolin) occur in Shetland. Surveys have suggested that gold could potentially be exploited in parts of the Mainland and Unst.

2.2.9 Cultural Heritage

Background
Shetland possesses a rich heritage and is home to many sites of historical value including Viking settlements, brochs, standing stones, ancient crofts and ruined chapels. These are all important contributors to Shetland's strong and unique cultural identity. A number of areas and features have been designated due to their historical importance.

Designated Areas

Scheduled Monuments
Scheduled monuments are given legal protection under the Ancient Monuments and Archaeological Areas Act 1979 as they are considered to be of national importance. Shetland currently has 365 scheduled ancient monuments which fall under the following categories (Table 2.17):

Table 2.17: Scheduled Ancient Monuments in Shetland

Classification	Number of Sites in Shetland
Prehistoric: ritual and funerary	111
Prehistoric: domestic and defensive	227
Crosses and carved stones	3
Secular	50
Ecclesiastical	21
Industrial	17

Source: Shetland Islands Council

Conservation Areas

A Conservation Area is 'an area of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance' (Planning (Listed Buildings and Conservation Areas) Act 1990). There are three Conservation Areas in Shetland, two in Lerwick and one in Scalloway.

Listed Buildings

Buildings are listed by Historic Scotland for their special architectural or historic interest. They are assigned to one of three categories depending on relative importance:

- **Category A** - Of national or international importance either historic or architectural, or fine little-altered examples of a particular period, style or building type;
- **Category B** - Of regional or more than local importance, or major examples of a particular period, style or building type which may have been altered; and
- **Category C** - Of local importance, lesser examples of any period, style or building type, as originally constructed or altered; and simple, traditional buildings grouped well with other in categories A and B or part of a planned group such as an estate or industrial complex.

There are currently 327 listed building in Shetland. Table 2.18 indicates the number and grading of listed buildings in each Shetland district.

Table 2.18: Listed Buildings in Shetland

Location	Cat A	Cat B	Cat C	Total
Bressay	1	10	3	**14**
Delting	0	10	4	**14**
Dunrossness	4	18	8	**30**
Fetlar	0	3	3	**6**
Lerwick	3	57	47	**107**
Lerwick Landward	0	1	1	**2**
Nesting	0	14	8	**22**
Northmavine	0	10	8	**18**
Sandsting & Aithsting	2	7	6	**15**
Tingwall	1	5	15	**21**
Unst	3	10	12	**25**
Walls & Sandness	0	13	10	**23**
Yell	2	10	18	**30**
Totals	**16**	**168**	**143**	**327**

Source: Shetland Islands Council

Shetland Sites and Monuments Record
In addition to designated areas and buildings, the Shetland Amenity Trust maintains the Sites and Monuments Record. This holds records of all known sites, ranging from pre-historic to the Cold War. There are currently 7,229 recorded sites, these are detailed in Table 2.19:

Table 2.19: Shetland Sites and Monuments Record

Classification	Number of Sites in Shetland
Broch / possible broch	141
Chambered cairns	118
Souterrains	26
Fishing stations	32
Burnt mounds	340
Viking / Norse houses	52
Military remains	436
Wheelhouses	7

Source: Shetland Islands Council

Archaeological Sites
In addition to the protected sites listed above, there is also the potential for development activities to affect Shetland's many archaeological sites. Shetland's rich archaeological heritage includes Viking sites, standing stones, ancient crofts and ruined chapels. Whilst many sites are identified within the Sites and Monuments Register, there is the potential for unknown archaeological sites to be affected.

Designated Wrecks
There are 2 protected wrecks in Shetland waters which have been designated due to their importance in terms historical and archaeological value. These have exclusion zones surrounding the wrecks, within which it is an offence, without a licence, to tamper with, damage or remove any objects or part of the vessel or to carry out any diving or salvage operation. The wrecks are the Wrangles Palais, which sank in 1687 (100m exclusion zone) and the Kennemerland, which sank in 1664 (250m exclusion zone).

2.2.10 Landscape

Landscape Character
SNH, in conjunction with partner Councils, has undertaken detailed review and classification of the various landscape areas and types in Scotland. The Shetland Islands landscape character assessment[9], identifies seven primary landscape types which are further subdivided into detailed landscape character areas. Inland landscapes are characterised by rolling hills, heather and rough grassland with historic buildings and features. Historic land use practices, particularly crofting and peat cutting, have helped to create the diverse landscapes. These landscape types are listed below:

- Coastal edge
- Farmed and settled lowlands and coast
- Farmed and settles voes and sounds
- Inland valleys
- Major uplands

[9] Gillespies 1998. A landscape assessment of The Shetland Isles. Scottish Natural Heritage, Review No 93

- Peatland and moorland
- Undulating moorland with lochs

Designated Areas

National Scenic Areas (NSA)
These are areas of exceptional scenic value and comprise some of the best examples of Scotland's landscapes. One NSA in Shetland covers seven of Shetland's finest sections of coastline. The locations of the seven zones are listed below:

- Hermaness (including Muckle Flugga and the western slopes of Saxa Vord)
- Fethaland (broad coastal strip from Uyea to Burravoe in Northmavine)
- Eshaness (including Hillswick Ness and the intervening coastline)
- Muckle Roe (western half of the island)
- Foula
- Fair Isle
- South West Mainland (from Fitful Head to Weisdale Voe and Skeld and including Burra, Trondra and the islands to the north)

Source: www.snh.gov.uk

Tree Preservation Orders (TPO)
Under the Town and Country Planning (Scotland) Act 1997, SIC must be given prior notification of intended works to protected trees. It is an offence to chop down, top, lop or wilfully destroy trees protected by a TPO without consent. There are 2 TPOs in Shetland; at Helendale House and the rear of Montfird Hospital, both in Lerwick. Possible future TPO sites include:

- Seafield at the Ness of Sound
- Scalloway
- Busta House
- Halligarth, Baltasound
- Tresta

Source: Shetland Islands Council

Local Protection Areas
These areas have been detailed in the Section 2.2.2 in relation to biodiversity. However it should be noted that they may also be designated by Shetland Islands Council due to landscape value.

2.3 LIKELY EFFECTS ON BASELINE CONDITIONS WITH OR WITHOUT WED IPP

Forecasting the evolution of the environment in the absence of the WED IPP should help to understand how the plan and its policies will contribute to changes in the environment in the future. This section in the Environmental Report will therefore evaluate the likely changes to the environment in Shetland assuming no WED IPP is implemented. The assumption is not, however, that previously adopted, draft and future relevant plans and programmes will not continue to be implemented. The SEA should therefore, assume that other adopted plans, programmes and policies will be delivered as planned.

2.4 CURRENT ENVIRONMENTAL ISSUES

Schedule 2 of the Scottish Act requires that the Environmental Report should include a description of existing environmental problems, especially those relating to any areas of particular environmental importance. The purpose of this section is to explore the key environmental issues that are relevant to SIC and whether the WED IPP is likely to have an effect either positively or negatively on these issues.

Current strategic environmental issues that have been identified are:

- **Biodiversity, flora and fauna:**
  - The abundance of nationally and internationally designated conservation sites in and around the Shetland Islands restricts the amount of available land and so places a strain on all kinds of development including those designed to harness wind energy. Because of this, greater planning pressure is exerted on the more 'urbanised' centres.
  - Due to the fact that many of the designated areas in the Shetland Islands are designated for their birds in particular seabird colonies, the protected species in question are particularly mobile and frequently rely on areas of land and water that lie out-side of the SPA or SAC boundary. Therefore, depending on location they can be particularly sensitive to wind energy developments.
  - Owing to changes in sea temperature and the predicted effects of climate change populations of some species, for example sand eels (*Ammodytes marinus*), may migrate away from the Shetland Islands. This would have many knock-on effects for protected species.
  - Population decline and loss of biodiversity is a global problem, and this extends to the Shetland Islands.

- **Population and Human Health:**
  - The way of life for many people in the Shetland Islands is changing and the move away from small-scale fishing and crofting and towards more commercial ventures has coincided with a shift in population from rural areas to urban areas. Because of this 'rural drift' over-centralisation around Lerwick is a possibility along with the migration of some of the population to mainland Scotland.
  - The large numbers of small, isolated communities that exist in the Shetland Islands mean that providing access to employment and essential services is challenging and costly.

- **Water:**
  - Because of the scarcity of areas available for water storage, Shetland has a finite water resource and so this must be carefully managed and protected. This is especially relevant to the Out Skerries, a small group of Shetland islands which have in the past experienced drought.
  - The ratio of coast to area of land in the Shetland Islands is very high and the marine and coastal environment this creates, is key to the prosperity of natural species and to economic activities such as fishing. Maintaining a high marine water quality is therefore of paramount importance.

- **Soils and Geology:**
  - The Shetland Islands hold a wealth of unique geology and as such, this must be protected.
  - Peat deposits on the Shetland Islands can pose a serious landslip hazard if there is a period of drought followed by heavy rain. This particular issue has implications for soil and geological resources, water quality, flooding and the safety of property.
  - Land available for agriculture on the Shetland Islands has traditionally been of poor quality. This, added to the fact that there is an economic demand for the islands' farming products (e.g. Shetland lamb) means that pressure to 'improve' land for agriculture needs to be balanced against conservation interests and other land uses such as housing.

- **Material Assets**:
  - Allowing for future development of oil and gas must be taken into account as these commodities already form a large proportion of the local economy.
  - The drive for sustainable energy sources on the Shetland Islands means that a number of renewable energy options are being taken forward. The environmental impact of such schemes may have the potential to cause significant environmental effects.
  - The Shetland Islands have few options available for waste disposal and currently the majority of waste is sent to landfill on a single landfill site to the north of Lerwick.
  - Due to the finite resources on the Shetland islands, a great deal of food, goods and materials are imported form outside the community. This means that transportation by sea is vital and the environmental effects of such activities are difficult to mitigate.
  - As a result of the heightened coastal flood risk on the Shetland Islands, a large amount of material resources are used to build coastal defences. Locally quarried rock armour is often used for this purpose.

- **Climatic Factors**:
  - A large proportion of the houses, roads and economic infrastructure on the on the Shetland Islands are located on the coast. The Islands are therefore more susceptible to coastal flooding than most other places in Scotland.
  - Strong westerly storms are a feature of the weather on the Shetland Islands and because of this storm management is needed to avoid coastal storm flooding.
  - Meeting targets for reducing greenhouse gases poses a challenge on the Shetland Islands as there is a lack of infrastructure that will be needed to deliver this. For example, most transportation in and around the islands is by either road or by boat, and the particularly isolated nature of many communities means that public transport is often not viable.

- **Air Quality**:
  - Shetland has an outstandingly high quality of air, due to their exposed position. Maintaining this high level of air quality must be a priority as any degradation would have effects on sensitive species and on the human population.
  - Although issues of air quality are diminished on the Shetland Islands (because of their isolated location and steady, windy, conditions) large

developments do have the potential to adversely affect air quality. Quarrying, energy production, transport and activities relating to the fishing industry all have the potential to adversely affect air quality and noise levels.

- **Cultural Heritage**
  - Due to its unique remoteness the Shetland Islands have a strong identity and maintaining this into the future should be recognised as an important challenge.
  - There is also a wealth of archaeological resources on the Islands that date back to prehistory encroachment of development could have the potential to threaten the setting or the integrity of such sites if unmitigated.

- **Landscape**
  - Scenic areas in the Shetland Islands are predominantly coastal and large parts of the Islands are designated as National Scenic Areas. This means that any developments on or near to the coast, which are conspicuous in nature, could potentially have an adverse effect on the landscape.
  - The Shetland Islands are quite flat in contour and there are very few trees on the island. This means that there is very little to screen any large developments and so they are more at risk of creating an adverse effect on the landscape.

2.5 SEA OBJECTIVES

The Environmental Assessment (Scotland) Act 2005 (the Scottish Act) does not require the generation of objectives or indicators by SIC to appraise the potential effects of its plan/programme. However, environmental protection objectives from other policies, plans and programmes should be taken into consideration where they are appropriate. The development of specific SEA objectives and indicators is a recognised way in which environmental effects can be described, analysed and compared. SEA objectives will describe the intent and desired direction of environmental change, whilst indicators will measure the performance of the WED IPP against these objectives.

To fulfil the requirements of the SEA Directive and the Scottish Act the SEA objectives should cover:

'…. biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape and the interrelationships between them.'

(Schedule 3 of the Environmental Assessment (Scotland) Act, 2005)

Table 2.20 summarises draft SEA objectives for the WED IPP. The objectives have been developed as a result of integrating a number of strands of relevant information and are designed to consolidate:

- the environmental topics of Schedule 3 of the Scottish Act ;
- the objectives within the WED IPP;
- the Corporate Objectives of SIC;
- objectives from other relevant plans and programmes (most notably Scotland's Sustainable Development Strategy – see *Section 2.1* above)

- environmental issues and problems identified as part of the baseline analysis (see *Section 2.4* above).

Table 2.20: Draft SEA Objectives for the WED IPP

SEA Topic	SEA Objectives
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity
Population	2. To improve the quality of life for people and communities across Shetland
Human Health	3. To improve the quality of health in Shetland
Soil	4. To protect Shetland's soil resources and use them in a sustainable manner
Water	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably
Air	7. To protect Shetland's air quality
Climatic Factors	8. To reduce greenhouse gas emissions and to contribute to Scotland's 80% CO_2 reduction target 9. To adapt to the predicted effects of climate change
Material Assets	10. To promote the sustainable use of Shetland's natural resources
Cultural Heritage	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded

3 ENVIRONMENTAL ASSESSMENT

3.1 INTRODUCTION

This section sets out the scope, approach and level of detail proposed for the detailed environmental assessment of the WED IPP. An initial consideration of alternative objectives within the WED IPP is described together with, and analysis of, the key environmental issues. The proposed framework to be used for the appraisal of the WED IPP during the environmental assessment is also outlined.

The results of the assessment will be presented in the Environmental Report.

3.2 PLAN ALTERNATIVES AND SCOPING OF SIGNIFICANT ENVIRONMENTAL EFFECTS

3.2.1 Plan Alternatives

There are no alternative plans to the WED IPP framework but alternative objectives and policies within the framework have been considered during its evolution. The initial screening process (see Section 1.2) and evolution of the WED IPP have led to modifications being made to certain objectives and policies as the WED IPP has evolved.

Shetland Islands Council Structure Plan and Local Plan policies relating to windfarm location and design require updating in order to ensure that they are in accordance with the current legislation. Policies require to be more specific and detailed in order to provide clear and consistent policy guidelines to developers, local communities and the general public and provide the decision making framework for processing applications in terms of sustainable development. Without the review the existing policies would not:

- promote sustainable development
- promote sustainable use of renewable technologies.

Consequently Shetland Islands Council considers that there is only one alternative:

'*to undertake a policy review to ensure compliance with Scottish Government current objectives.'*

3.2.2 Scoping of Significant Environmental Effects

In accordance with the Environmental Assessment (Scotland) Act 2005, the study team has considered whether the environmental effects (positive and negative) of the WED IPP are likely to be significant. This initial scoping assessment was based on preliminary information about the scope of objectives and measures in the WED IPP; information made available by SIC; the known environmental baseline likely to be affected by the IPP and the likely environmental issues.

A summary of the initial scoping appraisal is presented in Table 3.1.

Table 3.1: Scoping of Significant Effects

SEA Issues	Scoped In	Scoped Out	Reasons
Biodiversity, flora and fauna	Yes	No	On the basis of information available (see Section 1.2) the character of the baseline and the fact that potentially significant environmental effects on natural heritage, climate change, resource use, cultural resources and people cannot be scoped out.
Population	Yes	No	
Human health	Yes	No	
Soil	Yes	No	
Water	Yes	No	
Air	Yes	No	
Climatic factors	Yes	No	
Material assets	Yes	No	
Cultural heritage	Yes	No	
Landscape	Yes	No	

Shetland Islands Council considers that the majority of the possible effects identified in Table 3.1, and which have resulted in the topic being scoped in, are controllable provided that sufficiently detailed policies are developed, consistently applied and enforced, in to ensure there is no adverse impact.

The location and design of wind energy developments can have significant adverse effects on the environment and communities (these significant adverse effects may include, for example, impacts on biodiversity, landscape and noise disturbance). This can be mitigated against by ensuring that submissions for planning permission provide sufficient detail to enable full evaluation and assessment of the proposal and developing a suite of policies which require either critical criteria to be met (full protection) or a demonstration by the applicant that their development proposal will not result in adverse impact (medium scale protection).

Shetland Islands Council consider that the development of precise and detailed policies is fundamental, together with consistent decision making in terms of development plan policy, regular monitoring and swift enforcement when necessary.

3.3 ENVIRONMENTAL APPRAISAL

The next stages in the SEA process (see Section 1) once the consultation on the Scoping Report has been completed, are the assessment of the effects of the draft WED IPP and the preparation of the Environmental Report.

3.3.1 Assessment Methodology

A framework approach will be used to evaluate the effects of the WED IPP. The draft SEA framework (see Table 3.2) has been evolved from the work undertaken during this scoping stage. It is based on the SEA objectives presented in Section 2.4 and Table 2.20 above. A set of appraisal criteria has been developed drawn from the literature, feedback in discussions with SIC, the study team's own experience of other SEAs and plan appraisals. These criteria will be used to focus the appraisal of the WED IPP against the SEA objectives.

Table 3.2 : Draft SEA Appraisal Framework

SEA Topic	SEA Objectives	SEA Questions
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity	• Will the policy cause impacts on plants and animals? • Will the policy cause impacts on protected habitats and species? • Does the policy conserve and protect biodiversity? • Does the policy contribute to the aims of the Local Biodiversity Action Plan? • Does the policy contribute to public awareness and understanding about biodiversity?
Population	2. To improve the quality of life for people and communities across Shetland	• Does the policy contribute towards improving quality of life for people and communities across Scotland?
Human Health	3. To improve the quality of health in Shetland	• Does the policy contribute towards improving the quality of health associated with the environment (air quality, water quality, noise and vibration)? • Does the policy impact on access to health and care services for Shetland islanders?
Soil	4. To protect Shetland's soil resources and use them in a sustainable manner	• Will the policy impact on Shetland's soil resources? • Does the policy protect Shetland's soil resources? • Does the policy encourage the use of them in a sustainable manner?
Water	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably	• Does the policy pose any risks towards Shetland's freshwater and marine water quality? • Does the policy protect and enhance freshwater and marine water quality? • Does the policy ensure that Shetland's water resources are used effectively and sustainably?
Air	7. To protect Shetland's air quality	• Does the policy pose any risks to air quality? • Does the policy encourage activities that could contribute to lowering air quality?

SEA Topic	SEA Objectives	SEA Questions
Climatic Factors	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target 9. To adapt to the predicted effects of climate change	• Does the policy help in reducing greenhouse gas emissions? • Does the policy take account of the predicted effects of climate change, and adapt appropriately? • Is the risk or likelihood of flooding of any property, planned or existing, increased? • Will the policy put other assets at risk from flooding? • Will the policy ensure that people and property are protected from flooding?
Material Assets	10. To promote the sustainable use of Shetland's natural resources	• Does the policy encourage the sustainable use of natural resources? • Will the policy lead to a reduction in the use of natural resources? • Does the policy encourage the use of local or imported materials? • Will the policy promote or enable greater use of recycling?
Cultural Heritage	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage	• Does the policy impact on the historic environment? • Does the policy conserve and protect the historic environment? • Does the policy help in raising public awareness and understanding of cultural heritage and how the public influence the continuing development of cultural heritage? • Does the policy conserve and enhance cherished aspects of local cultural heritage? • Does the policy contribute to local character, customs and traditions?
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded	• Will the policy pose a risk to the landscape and seascape? • Does the policy consider all landscape and seascape implications? • Does the policy contribute to landscape and seascape protection? • Does the policy enhance degraded landscapes and seascapes?

The SEA framework will be used to predict the potential effects of each WED IPP policy/objective. Best practice guidance on evaluation will be followed and wherever possible the assessment will be quantitative. Effects will be considered in terms of their scale; the sensitivity of the resource; whether the effects are temporary or permanent, positive or negative, direct or indirect and whether there is the potential for effects to build up. Wherever the potential for significant environmental effects is identified the potential for mitigation will be considered.

It is proposed at this stage to use a simple scoring system to assess the policies/objectives against the SEA framework, as set out in Table 3.3 below.

Table 3.3 SEA Framework Scoring System

Major positive effect	✓✓
Minor positive effect	✓
Neutral effect	**0**
Minor negative effect	✖
Major negative effect	✖✖
Uncertain effect	**?**

The findings of each assessment will be set out in a matrix table (see *Table 3.4* below). Each will be supported by text as appropriate to ensure that the summaries in the tables are auditable and the methods of assessment transparent. The text will set out where qualitative appraisal only has been possible and what information has been used to inform the findings and recommendations.

In undertaking the final appraisals of residual effects it will be important to take account of the scale and nature of the effects. It will be particularly important to consider the potential for indirect and cumulative effects of policies in the WED IPP. The depth of these analyses will depend on the availability of relevant information. The potential for cumulative effects to arise from WED IPP objectives will be set out in *Table 3.5* (below).

The cumulative environmental effects of the WED IPP will be evaluated in light of the evolution of the environment without the plan, and the net effects identified and reported in the Environmental Report.

Table 3.4: Example Matrix for Documenting the Assessment of an WED IPP Policy Objective

CONSTRUCTION AND DESIGN IPP Objective: XXX									
SEA Objective	**Indicator**	**Summary Baseline**	**Potential Impacts**	**Mitigation**	**Nature of Residual Effect**	**Assessment of Residual Effect** (see Table 3.1 for scoring system)			**Comments**
						Short term	**Med term**	**Long term**	
									To cover for example: - Likelihood/certainty of effect occurring - Geographical scale of effect - Whether temporary or permanent - Frequency of effects and potential for reversibility - Assumptions made in assessment - Future opportunities for mitigation - Potential for indirect effects - Potential for secondary effects - Potential for synergistic effects - Potential for cumulative effects - Requirements for consultation - Identification of any partners to deliver mitigation etc - Any recommendations for issues to be considered at different stages of the planning process - Recommendations for data collation - etc

Table 3.5 : Matrix for Assessing the Potential for Cumulative Effects of WED IPP Objectives

WED IPP Objective	SEA Objective 1	SEA 2	SEA 3	SEA 4 etc
Topic	**Biodiversity**	**Population**	**Health**	**etc**
1				
2				
3 etc				
Potential for Significant Cumulative Effects and Recommendations for Mitigation or Capturing the Benefit				
Key: + positive; - negative; o neutral; ? uncertain				

3.3.2 Establishing the SEA Indicators

The selection of appropriate SEA indicators on which the progress of achieving the SEA objectives and ultimately the effects of the WED IPP can be measured will be undertaken in two stages:

- **Stage 1 –** making an initial selection of potential indicators with reference to those used at the national and local levels in related plans and programmes.
- **Stage 2 –** robustly analysing potential indicators to test their relevancy to SIC activities through a process of detailed consultation with appropriate SIC staff, seeking ideas for changes and modifications in order to create more meaningful indicators and carrying out a "reality" check for the collection and management of data.

The environmental impact of SIC activities in terms of the location, design and construction of future wind energy developments is primarily indirect, in terms of its responsibility for the preparation of both the strategic and detailed policies for determining planning applications for developments within Shetland.

Its direct effects on the key environmental issues (see Section 2.3 above) will therefore tend to come from strategic policies that will influence the location, design and construction of future wind energy developments in Shetland. The indicators, therefore, for measuring and monitoring the environmental effects of SIC activity will be determined through further consultation with SIC but some draft illustrative indicators are presented in Table 3.6.

The indicators would be expected to satisfy the criteria that they should be simple, relevant to SIC activities and be in line with baseline information that was readily accessible. The suggested indicators (see Table 3.6) are specific and relevant to the activities of SIC and are the means by which the delivery of the WED IPP can be best measured (i.e. the intention is that they should be SMART – specific, measurable, achievable, realistic and time-bound).

Table 3.6: SEA Objectives and Suggested Indicators

SEA Topic	Objective	Example Indicators (to be developed)
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity	• Number of measures included in planning applications which would benefit biodiversity in short-term and on restoration
Population	2. To improve the quality of life for people and communities across Shetland	• Number of applications where visual intrusion, nuisance, community severance, etc could be an issue
Human Health	3. To improve the quality of health in Shetland	• Number of complaints regarding traffic and/or dust and emissions from construction or specific developments • Level of severance on local roads
Soil	4. To protect Shetland's soil resources and use them in a sustainable manner	• Number of applications in blanket bog, high quality wet or dry heath or improved agricultural land • Number of applications with risk of peat slip resulting
Water	5. To protect and enhance freshwater and marine water quality	• Number of surface water bodies affected by applications • Water quality (marine and fresh water)
	6. To ensure that Shetland's water resources are used effectively and sustainably	
Air	7. To protect Shetland's air quality	• As Objective 3
Climatic Factors	8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% CO^2 reduction target	• Distance travelled by vehicles accessing new developments • Volume of building materials imported from outside Shetland • Number of applications outwith areas of flood risk
	9. To adapt to the predicted effects of climate change	
Material Assets	10. To promote the sustainable use of Shetland's natural resources	• Percentage of recycled building materials used in new developments. • Number of old vacant or derelict areas of land brought back into sustainable use • Area of agricultural land lost to development
Cultural Heritage	11. To conserve and protect the historic environment	• Number of development applications affecting historic sites and scheduled monuments (directly and indirectly i.e. effects of setting) • Number of development sites which affect the setting of historic sites and scheduled monuments
	12. To conserve and promote the distinctive cultural heritage	
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes	• Number of applications affecting National Scenic Areas and/or areas of recognised local value directly or indirectly • Number of applications affecting unique coastal landscape and seascape • Number of applications affecting 'wild' areas
	14. To improve those landscapes and seascapes that are degraded	

3.3.3 Monitoring

Proposals to monitor the effects of implementing the WED IPP will be identified including how the indicators will be used and the measures to check:

- that the WED IPP is contributing to the achievement of SEA objectives;
- that mitigation measures are performing as well as can be expected or require modifying; and
- whether any remedial measures are necessary to mitigate any adverse significant effects which had not been identified previously.

3.3.4 Proposed Structure of the Environmental Report

Box 3.1: Draft Structure of the Report

The report will broadly follow Scottish Government guidance[7] to ensure that the contents cover the required contents of an SEA Environmental Report and would include:

- An introduction to the report which sets out what it is trying to achieve and signposts in a table where the information required by the SEA Regulations is located;
- The statutory context for the WED IPP;
- The objectives and policies within the WED IPP;
- A description of the assessment methodology;
- A review of the consultation process and the input it has made;
- A review of relevant plans and programmes and how they have influenced the SEA in particular in developing objectives and indicators;
- A description of the relevant environmental baseline highlighting any shortfalls in data;
- The SEA framework including objectives and indicators;
- Description of the key environmental issues identified;
- Assessments of the WED IPP objectives and policies using the SEA framework;
- A description of proposed mitigation measures;
- Proposals for monitoring future effects of the WED IPP; and
- A Non-Technical Summary of the above.

[7] SEA Guidance Templates, SEA Gateway, Scottish Executive (now Government)

4 NEXT STEPS

4.1 PROPOSED CONSULTATION METHODS, INPUTS AND TIMESCALES

The following inputs from further consultation are proposed:

- Responses to the WED IPP and Environmental Report consultation processes that include – distribution of hard copies to key stakeholders and publication on the SIC website and any issues relating to environmental problems or issues for the SEA will be taken into account in finalising the WED IPP.

- Further discussion with relevant consultees as and when required in the context of the Scottish Government Consultation Process. The consultation period will run for three months, in line with Scottish Government Guidance.

- The Environmental Report, which will report the findings of the SEA of the WED IPP, will be published for consultation at the same time as the draft WED IPP. This is currently programmed for 24th August 2009, and as stated, is scheduled to last for three months.

4.2 ANTICIPATED MILESTONES

The key milestones in the development of the WED IPP and the SEA are as follows:

- Submission of SEA Scoping Report to SEA Gateway in July 2009.

- Preparation of the Environmental Report in July and August 2009.

- Consultation on the draft WED IPP and Environmental Report from August to early October 2009.

- Finalisation of the WED IPP in October 2009.

4.3 PROPOSED CONSULTATION TIMESCALES

In terms of section 15(3) of the Act, it is proposed that the Environmental Report will be presented for public consultation. A period of at least six weeks will be allowed for representations to be made in respect of the Environmental Report.

4.4 ANTICIPATED MILESTONES IN THE SEA AND PLANNING PROCESSES RELATED TO THE REVIEW

- submit SEA screening report to SEA gateway
- submit SEA scoping report to SEA gateway (5 week consultation period)
- public consultation of draft Environmental Report
- submit draft Environmental Report to SEA gateway with draft Interim Planning Policy
- final adoption of Interim Planning Policy and Environmental Report

ANNEX A

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BIBLIOGRAPHY

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Annex E

Assessment of Cumulative Effects

E1 Introduction

This Annex summarises the cumulative implications and possible effects associated with the Wind Energy IPP and its objectives under the main SEA issues of:

- Water resources
- Loss of Biodiversity
- Traffic levels and congestion
- Material Assets and Waste Management
- Climatic Factors and Emissions of Greenhouse Gases
- Historic and cultural heritage

The table outlines the context of the issue, any cumulative and synergistic impacts, the likely receptors, how the Wind Energy IPP influences the issue and gives examples of mitigation to ameliorate the impact.

Table E1 Cumulative Effects

Key Environmental Issue	Causes	Cumulative and/or Synergistic Effects	Affected Receptor	Influence of the Wind Energy Development IPP	Potential mitigation
Water Resources (water use and water quality impacts)	Issues could arise with regard to surface water management around developments during construction, operation and maintenance that could lead to a wider pollution load to local streams and lochans. The specific design of wind energy development and its associated infrastructure will have a bearing on the hydrological regime and this will need to be considered as part of each EIA.	Large scale wind energy developments or increasing numbers of smaller developments together with the growth in housing and other commercial developments could lead to an increased demand for, and pressure on water resources so making those water resource assets gain even greater importance in ensuring a sustainable supply of water to Shetland communities. There may be additional risks for surface and groundwater. If more infrastructure is needed this could put costs up for Scottish Water and in turn for the consumer.	Controlled waters (rivers, streams groundwaters and coastal waters), habitats and biodiversity, water companies and consumers.	Drainage and design of wind energy development and its associated infrastructure could impact on water resources and put pressure on the current surface water regime through increased run-off and sedimentation. The Wind Energy Development IPP does place an emphasis on the prevention of adverse impacts on water resources and the protection of water quality.	Application of the IPP as a whole (WED DM1 – Development Management Policy and Development Management Criterion 5 – Impact on Water Resources) and in conjunction with the overarching Structure Plan and Local Plan policies that set out broad requirements for implementing sound pollution control measures (e.g. Policies SPW D1, LPWD 6 and LPWD 12) should provide adequate measures to address these issues. Existing water pollution control legislation as administered by SEPA should also provide for adequate protection of controlled waters.
Threats to Designated Areas for Nature Conservation and possible loss of biodiversity and geodiversity	Development can impact or put pressure on areas of international (SPA, SAC and Ramsar sites), national (SSSIs) and local nature conservation importance. Similarly	There will be the potential to disturb, remove and replace habitats or areas of geodiversity interest and associated as well as flora and fauna (possibly including protected	Land take, local ecology, biodiversity, geodiversity and public amenity.	Additional wind energy development together with the construction of any associated energy transmission infrastructure could lead to adverse impacts on biodiversity	The rigorous application of Structure Plan and Local Plan policies that focus on protecting designated sites (such as SP NE4, SP NE5, SP NE6, SP NE7, SP NE8, SP NE9; LP

Key Environmental Issue	Causes	Cumulative and/or Synergistic Effects	Affected Receptor	Influence of the Wind Energy Development IPP	Potential mitigation
	impact and pressure may be placed on sites of geodiversity interest. All of these areas of conservation importance may be coastal marine sites as well as inland areas. The threats may come directly or indirectly (cumulatively) by adding to the pressures already starting to build up. Threats to biodiversity may not just be restricted to conservation areas but also in the wider rural and island environment including areas of recreational amenity value to local communities.	species) at the sites of development and then depending on their location there could be indirect negative impacts on nearby sites of conservation importance. There may also be risks of possible fragmentation of habitats and destruction or interruption of wildlife corridors caused by the location of wind turbines or associated access tracks. Indirect effects of further development in sensitive areas could be associated with increases in traffic associated with developments (during construction, operation and maintenance) and the disturbing impacts that this could have on biodiversity. Cumulative effects could arise from the construction of roads, access tracks and other infrastructure that would arise as a consequence of the development.		and geodiversity. The influence of the Wind Energy Development IPP (with appropriate development management criteria) could be beneficial if the policies and criteria are applied vigorously not only to protect biodiversity and geodiversity but also to enhance it where appropriate.	NE10) together with those within the Wind Energy IPP itself that provide a degree of protection (WED DM1 – Development Management Policy and Development Management Criterion 1 – Biodiversity) should all provide mitigation for possible effects.

Key Environmental Issue	Causes	Cumulative and/or Synergistic Effects	Affected Receptor	Influence of the Wind Energy Development IPP	Potential mitigation
Climatic Factors **Including:** • **Traffic and transport** • **Embodied carbon**	Increases in the number of wind energy developments could clearly add to traffic pressures and lead to an increase in the number of vehicles on the road primarily due to construction traffic but also from maintenance operations. The fabrication of wind turbines will involve material supply and manufacturing processes that will inevitably lead to carbon emissions and therefore an embodied carbon footprint for these construction materials.	Increases in road traffic and fossil fuel operated plant and equipment will inevitably lead to increases in emissions and risks of associated atmospheric pollution. Increased construction traffic can create additional noise, vibration and other nuisances that together with emissions will affect local residents close to roads and general amenity in the near vicinity. Increases in emissions, noise and vibration are likely to have a negative impact on human health, biodiversity, the historic and built environment, and the general image and amenity value of the areas affected. Increased vehicle exhaust emissions will also increase the mount of CO_2 emitted, thus adding to the Scottish contribution of greenhouse gas emissions and contributions to climate change.	Global atmosphere Air quality Local residents and communities Biodiversity Historic and built environment Local amenity and image	Additional wind farm developments in Shetland will inevitably bring with them increased construction traffic and associated operational maintenance traffic. This potential increase in traffic will contribute transport related emissions (e.g. noise, vibration, dust and exhaust emissions) the impact of which will depend on the size of the development. The Wind Energy Development IPP recognises this and in particular under Criterion 6 – Impact on Quality of Life and Amenity – sets out criteria and developer requirements that would protect against such potentially adverse effects. The Wind Energy Development IPP does not include any provisions for addressing embodied energy and carbon in construction materials and the knock-on environmental effects of these contributions to	Application of Criterion 6 together with other elements of the IPP as a whole (e.g. WED DM1 – Development Management Policy), whilst not entirely removing the threats posed by increased traffic altogether could substantially reduce them. Some additional wording is recommended for WED DM1 Development Management Policy that would provide SIC with the information necessary to consider the embodied carbon implications of potential future developments.

Key Environmental Issue	Causes	Cumulative and/or Synergistic Effects	Affected Receptor	Influence of the Wind Energy Development IPP	Potential mitigation
		Use of materials with a high embodied energy and carbon footprint will add further to the Scottish contribution of greenhouse gas emissions.		carbon emissions.	
Waste management	The development of wind farms will inevitably lead to waste being generated during the construction phase and ongoing waste generation from maintenance activities. Legislation will continue to put pressure on land filling of waste and encourage the search for alternative disposal routes. There will be further pressure to prevent or reduce waste generated in the first place and to minimise and recycle all forms of waste.	More wind energy developments are likely to increase the volumes of waste generated, particularly during the construction phase. This in turn will exacerbate the already present challenges of waste minimisation and management. Increases in waste in Shetland will put pressure on the search for more sustainable waste disposal and management solutions. In the short term there may be more pressure on local land fill sites adding to the burden of possible contaminated land, groundwater (from leachate) and atmospheric pollution (from methane generation). There may also be knock-on effects on local biodiversity.	Land take Habitats and biodiversity Air quality (methane, climate change, human health) Roads Local people and communities	The supporting framework for further wind energy development set out in the IPP is likely to result in an increase in the number of developments and as a consequence an increase in the volumes of waste generated, which in turn will exacerbate the problems of waste minimisation and management in Shetland. Although not directly addressed in the IPP the Criterion 6 that focuses on 'Impact on Quality of Life and Amenity' does provide some broad support for addressing waste issues.	Application of some supporting waste related policies in the Shetland Structure Plan together with the IPP (including WED DM1 – Development Management Policy, and Criterion 6) should provide adequate mitigation to address waste in relation to wind energy development.

Key Environmental Issue	Causes	Cumulative and/or Synergistic Effects	Affected Receptor	Influence of the Wind Energy Development IPP	Potential mitigation
		There may be a rise in vehicle use associated with increases in the collection and transportation of waste.			
Historic and cultural Heritage	Increasing numbers of wind farm developments in Shetland could put increasing pressure on historic sites, buildings, monuments and archaeological sites and their settings.	Wind energy developments and associated infrastructure if poorly located could cause the removal or irreversible damage to historic sites, archaeological remains, valuable buildings, monuments or heritage assets. An individual small-scale development (e.g. up to six turbines) may not in isolation create a significant adverse effect but large-scale wind farms (e.g. in excess of 100 turbines) or the combination of several smaller ones could affect the setting of historic sites and features.	Archaeological sites, Buildings, Historic sites Public amenity Local residents and communities.	The Wind Energy Development IPP contains a specific Criterion – number 4 that focuses entirely on the protection of the historic and archaeological environment. There is a clear recognition of the significance of Shetland's historic and archaeological heritage and therefore of the need to afford protection from the potential adverse impacts from wind energy developments.	Application of the full IPP and in particular WED DM1 – Development Management Policy and Criterion 4, should provide the necessary mitigation.
Landscape and Seascape	Increasing numbers of wind farm developments in Shetland could put increasing pressure on the natural landscape and seascape eventually causing significant	Wind energy developments and associated infrastructure if poorly located could create significant adverse impacts on the Shetland landscape and seascape.	Landscape and seascape character of Shetland Local residents and communities Tourists and visitors	The Wind Energy Development IPP contains a specific Criterion – number 3 that focuses entirely on safeguarding the landscape of Shetland.	Application of the full IPP in particular WED DM1 – Development Management Policy and Criterion 3 should provide the necessary mitigation.

Key Environmental Issue	Causes	Cumulative and/or Synergistic Effects	Affected Receptor	Influence of the Wind Energy Development IPP	Potential mitigation
	adverse impacts. The problem is exacerbated by the relatively flat topography and lack of trees to provide any visual protection or screening.	An individual small-scale development (e.g. up to six turbines) may not in isolation create a significant adverse effect and might be relatively easily accommodated but large scale wind farms (e.g. in excess of 100 turbines) or the combination of several smaller ones could affect significantly the landscape character, and impact on views across Shetland.		There is a clear recognition of the significance of the unique Shetland landscape and seascape and therefore of the need to afford protection from the potential adverse impacts that wind energy developments could create.	

Annex F

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Annex G

SEA Workshop Report

Workshop Report

Shetland Islands Council

Strategic Environmental Assessment: SEA Workshop 2

December 16th 2008

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Workshop Report

Shetland Islands Council

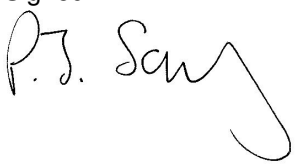
Strategic Environmental Assessment: SEA Workshop 2

December 16th 2008

For and on behalf of Natural Capital Ltd.

Approved by: Dr Phil Say

Signed:



Position: Director

Date: 22nd December 2008

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1 PURPOSE OF THE WORKSHOP

1.1 BACKGROUND

The first SEA workshop facilitated by Natural Capital was held on 13th November 2008 and focused on:

- a review of the basic principles of the SEA process;
- the preparation of a set of SEA Objectives that could be used by SIC as a basis for carrying out all future strategic environmental assessment work on qualifying plans, programmes and strategies.

The development of a common set of SEA objectives was seen as a cost effective way of avoiding 're-inventing the wheel' each time that SIC undertook SEA and would streamline the approach to the Scoping stage.

The purpose of this second workshop was to:

- develop a 'corporate' set of environmental issues that would need to be considered for any future development on Shetland and that could be used as a basis for all future SEA scoping studies;
- to familiarise delegates with the SEA assessment process by piloting the use of the previously developed SEA Objectives in a screening matrix for the Minerals Plan Review policies;
- to finalise the SEA Objectives following the 'road test' and make any alterations necessary for future use.

1.2 THE WORKSHOP

The workshop was held on 16 December 2008 at the Isles burgh Community Centre. Invitations were extended to SIC officers across various departments who had been invited to the previous workshop. A list of attendees is included in Appendix A.

The workshop ran from 1.00pm to 5.00pm and was facilitated by Phil Say and Andy Keba of Natural Capital.

1.3 LAYOUT OF THE WORKSHOP REPORT

The remainder of the report is structured as follows:

- Section 2 sets out the agenda that was used for the workshop
- Section 3 presents the key environmental issues developed and the finalisation of the SEA Objectives
- Appendix A is a list of the people who attended the workshop
- Appendix B presents the environmental issues
- Appendix C includes the revised SEA Objectives with supporting questions

2 WORKSHOP

2.1 INTRODUCTION

The workshop format and agenda is summarised in this section. The group exercise is described.

2.2 WORKSHOP AGENDA

The workshop agenda was as follows:

Agenda Item	Lead	Time
Assemble plus Coffee from 13.00		
• Introduction to Workshop - recap of previous session - workshop objectives - how the session will work	PS	13.00-13.30 (30mins)
• Identifying the Key Environmental Issues – small group work	PS	13.30-14.30 (60mins)
• Coffee/tea with feedback		14.30-15.00 (30mins)
• Using the SEA Objectives – screening the Minerals Plan Review policies, small group work	PS	15.00-16.00 (60mins)
• Group work - feedback	PS	16.00-16.30 (30mins)
• SEA Objectives, refining – Group feedback	PS	16.30-16.50 (20mins)
• Concluding Remarks and Actions	PS and All	16.50-17.00 (10mins)
• CLOSE		17.00

2.3 WORKSHOP PROCESS

The workshop was designed to provide all participants with opportunities to learn further about SEA, share ideas and concerns (in groups and also in plenary sessions) and to contribute towards developing a common set of high level Environmental Issues and to take the opportunity of refining the SEA objectives for future use by the Council. Outputs from the workshop exercises were collated on flipchart sheets during the workshop and are summarised in this report (see Section 3.2 and also Appendices B and C).

3 OUTPUTS FROM THE WORKSHOP

3.1 INTRODUCTION

This section of the report presents the outputs from the small group work and plenary feedback sessions. The outputs are in two sections one which summarises the development of the Key Environmental Issues (Section 3.2) the other that summarises the revisions made to the SEA Objectives (Section 3.3).

3.2 KEY ENVIRONMENTAL ISSUES

3.2.1 Introduction

Attendees were divided into four groups with each given two or more of the key SEA environmental topic headings under which they were invited to develop key environmental issues for Shetland. These were:

- Biodiversity (flora and fauna)
- Population
- Human health
- Soil
- Water
- Air
- Climatic factors
- Material assets
- Cultural heritage
- Landscape

3.2.2 SEA Environmental Issues

Schedule 2 of the Scottish Environmental Assessment Act requires that the Environmental Report includes a description of existing environmental problems, especially those relating to any areas of particular environmental importance. Table 3.2 summarises the key environmental issues developed by the groups and further refined in the plenary session. They are further summarised in Table B1 in Appendix B together with supporting explanatory text for use in future SEA scoping work.

Table 3.2 Key Environmental Issues for Shetland Identified by the Workshop Groups

Biodiversity, flora and fauna	○ Constraints on development due to abundance of important biodiversity sites ○ Protected species outwith designated areas ○ Population shift of species ○ Population decline and loss of diversity
Population and Human Health	○ Sustainability and viability of the population - stemming rural drift ○ Avoidable deaths (cancer/heart disease) – environmental factors contributing to this ○ Access to services ○ Over-centralisation around Lerwick ○ Risks posed by large developments (e.g. dust and noise)
Water	○ Maintain a high quality marine environment ○ Manage scarce water resources
Soils and Geology	○ Risks to peat from development (esp. landslip) ○ Poor soil quality and pressure to improve land for agriculture ○ Wealth of unique geology (including geopark)
Material assets	○ Future development of oil and gas

	○ Environmental consequences of renewables ○ Waste going to landfill – lack of infrastructure for recycling ○ Importing goods and materials (e.g. food)
Climatic factors	○ Flood risk and coastal plains ○ Storm management ○ Meeting targets for reducing greenhouse gases – lack of infrastructure to deliver this
Air Quality	○ Transport emissions ○ Emissions from power station ○ Industrial emissions (e.g. odour) ○ Maintain high air quality
Cultural heritage and Landscape	○ Unique remoteness and strong identity ○ Maritime landscape ○ Flat/treeless landscape – poses scale problems for development; low potential for screening development ○ Landscape – maritime landscape; scale and fragility; flatness ○ Wealth of archaeological resources

3.3 REVISIONS TO SEA OBJECTIVES

Having used the SEA Objectives developed during the first workshop to screen the policies in the Minerals Policy Review, the groups were invited to comment further on the Objectives and to decide whether there was a need to make any revisions. Changes were made to the first draft set of SEA Objectives and the current set of Objectives now in use are summarised in Table 3.3.

Table 3.3 Revised SEA Objectives

SEA Topic	SEA Objectives
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity
Population	2. To improve the quality of life for people and communities across Shetland
Human Health	3. To improve the quality of health in Shetland
Soil	4. To protect Shetland's soil resources and use them in a sustainable manner
Water	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably
Air	7. To protect Shetland's air quality
Climatic Factors	8. To reduce greenhouse gas emissions and to contribute to Scotland's 80% CO_2 reduction target 9. To adapt to the predicted effects of climate change
Material Assets	10. To promote the sustainable use of Shetland's natural resources
Cultural Heritage	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage

SEA Topic	SEA Objectives
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded

The current set of SEA Objectives together with supporting questions that will be used in future SEA projects are set out in Appendix C.

Appendix A

Workshop Attendees

Appendix A: Workshop 2 Attendees

Name	Department	Email
Anita Jamieson	Housing	anita.jamieson@shetland.gov.uk;
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John Simpson	Planning	john.simpson@shetland.gov.uk;
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Jon Dunn	Economic Development	jon.dunn@shetland.gov.uk;

Appendix B

Key Environmental Issues

Table B1 Key Environmental Issues with Explanatory Text

SEA Topics	Key Environmental Issues
Biodiversity, flora and fauna	o The abundance of nationally and internationally designated conservation sites in and around the Shetland Islands restricts the amount of available land and so places a strain on development. Because of this, greater planning pressure is exerted on the more urbanised centres. o Due to the fact that many of the designated areas in the Shetland Islands are designated for their seabird colonies, the protected species in question are particularly mobile and frequently rely on areas of land which lie out side of the SPA or SAC boundary. They are therefore particularly sensitive to development. o Owing to changes in sea temperature and the predicted effects of climate change populations of some species, for example sand eels (*Ammodytes marinus*), may migrate away from the Shetland Islands. This would have many knock-on effects for protected species. o Population decline and loss of biodiversity is a global problem, and this extends to the Shetland Islands.
Population and Human Health	o The way of life for many people in the Shetland Islands is changing and the move away from small-scale fishing and crofting and towards more commercial ventures has coincided with a shift in population from rural areas to urban areas. Because of this 'rural drift' over-centralisation around Lerwick is a possibility along with the migration of some of the population to mainland Scotland. o The large numbers of small, isolated communities that exist in the Shetland Islands mean that providing access to employment and essential services is challenging and costly.
Water	o Because of the scarcity of areas available for water storage, Shetland has a finite water resource and so this must be carefully managed and protected. This is especially relevant to the Out Skerries, a small group of Shetland Islands which have in the past experienced drought. o The ratio of coast to area of land in the Shetland Islands is very high and the marine and coastal environment this creates is key to the prosperity of natural species and to economic activities such as fishing. Maintaining a high marine water quality is therefore of paramount importance.
Soils and Geology	o The Shetland Islands hold a wealth of unique geology and as such, this must be protected. o Peat deposits on the Shetland Islands can pose a serious landslip hazard if there is a period of drought followed by heavy rain. This particular issue has implications for soil and geological resources, water quality, flooding and the safety of property. o Land available for agriculture on the Shetland Islands has traditionally been of poor quality. This, added to the fact that there is an economic demand for the Islands' farming products (e.g. Shetland lamb) means that pressure to 'improve' land for agriculture needs to be balanced against conservation interests and other land uses such as housing.
Material assets	o Allowing for future development of oil and gas must be taken into account as these commodities already form a large proportion of the local economy. o The drive for sustainable energy sources on the Shetland Islands means that a number of renewable energy options are being taken forward. The environmental impact of such schemes may have the potential to cause significant environmental effects. o The Shetland Islands have few options available for waste disposal and currently the majority of waste is sent to landfill on a

	single landfill site to the north of Lerwick. o Due to the finite resources on the Shetland Islands, a great deal of food, goods and materials are imported form outside the community. This means that transportation by sea is vital and the environmental effects of such activities are difficult to mitigate. o As a result of the heightened coastal flood risk on the Shetland Islands, a large amount of material resources are used to build coastal defences. Locally quarried rock armour is often used for this purpose.
Climatic factors	o A large proportion of the houses, roads and economic infrastructure on the on the Shetland Islands are located on the coast. The Islands are therefore more susceptible to coastal flooding than most other places in Scotland. o Strong westerly storms are a feature of the weather on the Shetland Islands and because of this storm management is needed to avoid coastal storm flooding. o Meeting targets for reducing greenhouse gases poses a challenge on the Shetland Islands, as there is a lack of infrastructure which will be needed to deliver this. For example, most transportation in and around the islands is by either road or by boat, and the particularly isolated nature of many communities means that public transport is often not viable.
Air Quality	o The Shetland Islands have an outstandingly high quality of air, due to their exposed position. Maintaining this high level of air quality must be a priority as any degradation would have effects on sensitive species and on the human population. o Although issues of air quality are diminished on the Shetland Islands (because of their isolated location and steady, windy, conditions) large developments do have the potential to adversely affect air quality. Quarrying, energy production and activities relating to the fishing industry all have the potential to adversely affect air quality and noise levels.
Cultural heritage	o Due to its unique remoteness the Shetland Islands have a strong identity and maintaining this into the future should be recognised as an important challenge. o There is also a wealth of archeological resources on the Islands that date back to prehistory encroachment of development could have the potential to threaten the setting or the integrity of such sites if unmitigated.
Landscape	o Scenic areas in the Shetland Islands are predominantly coastal and large parts of the Islands are designated as National Scenic Areas. This means that any developments or quarries on or near to the coast, which are conspicuous in nature, could potentially have an adverse effect on the landscape. o The Shetland Islands are quite flat in contour and there are very few trees on the island. This means that there is very little to screen any large developments or quarries and so they are more at risk of creating an adverse effect on the landscape.

Appendix C

SEA Objectives and Key Questions

Table C1 Revised SEA Objectives with Supporting Appraisal Questions

SEA Topic	SEA Objectives	SEA Questions
Biodiversity (Flora and Fauna)	1. To further the conservation of biodiversity	• Does it impact on plants and animals? • Does it conserve and protect biodiversity? • Does it contribute to the aims of the Local Biodiversity Action Plan? • Does it contribute to public awareness and understanding about biodiversity?
Population	2. To improve the quality of life for people and communities across Shetland	• Does it contribute towards improving quality of life for people and communities across Scotland
Human Health	3. To improve the quality of health in Shetland	• Does it contribute towards improving the quality of health associated with the environment (Air quality, water quality, noise and vibration)? • Does it contribute to the goal of creating active, healthy lifestyles for Shetland islanders? • Does it contribute towards improving access to health and care services for all Shetland islanders?
Soil	4. To protect Shetland's soil resources and use them in a sustainable manner	• Does it protect Shetland's soil resources? • Does it encourage the use of them in a sustainable manner?
Water	5. To protect and enhance freshwater and marine water quality 6. To ensure that Shetland's water resources are used effectively and sustainably	• Does it protect and enhance freshwater and marine water quality? • Does it ensure that Shetland's water resources are used effectively and sustainably?
Air	7. To protect Shetland's air quality	• Does it pose any risks to air quality? • Does it encourage activities that could contribute to lowering air quality?
Climatic Factors	8. To reduce greenhouse gas emissions and to contribute to Scotland's 80% CO_2 reduction target 9. To adapt to the predicted effects of climate change	• Does it help in reducing greenhouse gas emissions? • Does it take account of the predicted effects of climate change, and adapt appropriately? • Is the risk or likelihood of flooding of any property, planned or existing, increased? • Will it put other assets at risk from flooding? • Will it ensure that people and property are protected from flooding?
Material Assets	10. To promote the sustainable use of Shetland's natural resources	• Does the plan or programme encourage the sustainable use of natural resources? • Will it lead to a reduction in the use of natural resources? • Does it encourage the use of local or

SEA Topic	SEA Objectives	SEA Questions
		imported materials? • Will it promote or enable greater use of recycling?
Cultural Heritage	11. To conserve and protect the historic environment 12. To conserve and promote the distinctive cultural heritage	• Does it impact on the historic environment? • Does it conserve and protect the historic environment? • Does it help in raising public awareness and understanding of cultural heritage and how the public influence the continuing development of cultural heritage? • Does it conserve and enhance cherished aspects of local cultural heritage? • Does it contribute to local character, customs and traditions?
Landscape	13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes 14. To improve those landscapes and seascapes that are degraded	• Does it consider all landscape and seascape implications? • Does it contribute to landscape and seascape protection? • Does it enhance degraded landscapes and seascapes?

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