Chapter 3

Characteristics of Comhairle nan Eilean Siar’s Area

Location

The Western Isles (Figure 2 Map A) are located to the north-west of mainland Scotland. The Islands measure 210km in length from the Butt of Lewis in the north to the small uninhabited Islands of Berneray and Mingulay at the southern extremity. The Islands are 60km at the widest point, with the Clisham in North Harris being the highest peak at 799 metres.

Figure 2: Map A - The Western Isles.

General Geography

The landscape of the Western Isles is a combination of hills, moorland and machair, with a rural settlement pattern based on traditional crofting communities. Over 75% of land is in crofting tenure and there are approximately 6,000 crofts throughout the Islands. The coastline of the Western Isles area totals approximately 2,400 Km². The total area of the Western Isles is estimated at 2898 Km² excluding inter-tidal land.

Climate of the Western Isles

The Western Isles enjoys a Temperate Maritime Climate – a climate without extremes, modified by the effect of the ocean. Weather systems in the Northern Hemisphere in general move from west to east, so the prevailing weather in the Western Isles follows a 5000 Kilometre sea track, all the way from the eastern seaboard of the United States. The warm ocean current known initially as the Gulf Stream and further north as the North Atlantic Drift flows from the Gulf of Mexico past the Islands ensuring the temperatures never vary by extremes, but also providing a plentiful supply of moisture ensuring the Islands reputation for rain.
The Western Isles are at high latitude, so seasonal variations in day length are very noticeable. Wind is the element most associated with the Western Isles. Mean monthly wind speeds range from about 12 knots (13 mph) in July/August to about 16 knots (18 mph) in December/January, though daily mean wind speed over 30 knots (35 mph) with gusts in excess of 50 knots (58 mph) are not uncommon, even occasionally during the summer months. The highest gust recorded at Stornoway in recent years was 98 knots (113 mph) in February 1962.

If a high pressure system settles over Scandinavia, cold dry easterly winds, often persisting for a week or two, are a common feature during April and May. From mid–July there is a tendency for a mobile south-westerly to westerly airstream to become established, characterised by moist but mild conditions carried along on a succession of Atlantic frontal systems. As autumn progresses into winter the south-westerly winds continue but with a tendency for the winds to swing more frequently to north-westerly or north bringing heavy showers, often of hail or even snow after the turn of the year.

**Coasts and Machair Land**

The extensive coastline of the Western Isles is a dominant feature of the natural landscape. Generally speaking the east coast tends largely to be cliff-bound, with the deep waters of the Minch close inshore, whilst much of the west coast has gently sloping sandy beaches. The beach material is derived both from glacial debris and crushed shells and is constantly moved along by the persistent Atlantic swell. Immediately behind the sandy foreshore there is commonly a narrow belt of dunes separating the coastal edge from the interior of the Islands. The vegetation of these dunes is dominated by the tough Marram grass which helps to stabilise the constantly shifting sands.

Constant erosion and deposition by countless years of onshore winds and tides has created the low, sandy coastal plain, known as machair, which lies further inland. In the Western Isles the machair areas lie along the west coast, particularly in the Uists and Benbecula, where nearly 6,000 hectares of machair make up about 8% of the land area.

**Peatland and Moorland**

A large proportion of the inland areas of the Western Isles consists of moorland, characterised by a blanketing accumulation of nutrient poor peat. This is especially the case in Lewis, where it has been estimated there is a covering of peat nearly 595 Km² and averaging a depth of 1.5m. Drainage of the moor varies from area to area, with the result that peat tends to accumulate faster in rock depressions and slower on knolls, giving rise to the distinctive undulating appearance of much of northern Lewis. Most of the peatland of the Western Isles is divided up into common grazing areas that are allocated to individual crofting townships and managed by an elected local committee.

In addition to the utilisation of the moor for grazing, each croft, and many of the non-crofting families, have access to a small area of moor for cutting peat. This is largely done manually using a spade-shaped implement, and once dried the peat is transported home for use in domestic cooking and heating. The rough topography and uneven depth of peat does not permit large-scale commercial peat extraction in the Western Isles.

**Upland Areas**

There are isolated hills in the Uists and Barra, but the largest continuous upland area is formed by the hills of South Lewis/North Harris, stretching in a belt from the lochs in the east to the bold bare tops of Uig in the west of the island. The highest summit in the islands, the Clisham (799m) lies within this range. Throughout most of the uplands, the
dominant land use is unimproved grazing for sheep and/or deer. In a few localities the hill land is managed for grouse shooting by the annual burning of different strips of heather.

Flora and Fauna

The flora of the Western Isles is restricted by their geology, climate and geographical position. Almost completely composed of impermeable Lewisian gneiss, they support only those acid loving plants which can cope with an oceanic climate and exposure to wet salty gales. Where these westerly winds have blown shell sand over peat a greatly enriched flora exists on the resultant machair. One of the botanical wonders of the Islands is the golden spread of primroses by the airfield on Barra. Elsewhere the machair is noted for vast numbers of orchids and associated vegetation. Three heathers, ling, bell heather and cross-leafed heather, dominate the moorland vegetation which does hold, however, large numbers of insectivorous plants such as sundews.

Formerly covered by discontinuous scrub moorland, the Islands are now devoid of natural woods except for pockets on inland cliffs and on freshwater islets, secure from fire and sheep. The most important mixed wood is that around Lews Castle at Stornoway, dating from the mid 19th century. A large part of the Western Isles is covered by water and bog and both sustain important communities of peat and wetland vegetation.

There are only two native land mammals in the Western Isles, red deer and otter. The rabbit, blue hare, hedgehog, brown and black rat, feral cat, polecat and mink were introduced by man. The only reptile is the slow-worm and no native amphibians are known. Any frogs, newts or toads found have been introduced. Pipistrelle bats occur in and around Stornoway.

Marine mammals include the grey and common seal and many species of whale, dolphin and porpoise. Freshwater fishes present include salmon, sea trout, brown trout, Arctic char, rainbow trout, European eel, sticklebacks, thick lipped mullet and flounder.

Three hundred and twenty seven species of birds have been recorded in the Western Isles and more than 100 breed. The Islands provide a natural flyaway for migrating land birds to and from their Arctic breeding grounds and a refuge for windblown vagrants from America and Northern Europe. Golden eagles inhabit the uplands of Lewis, Harris and North and South Uist.

Neighbouring Local Authorities

The nearest Mainland Councils to the Western Isles are Highland Council and Argyll and Bute Council. The Orkney Islands are the nearest Island Council areas to the Western Isles.

Influences on Strategy

Like all other local authorities, Comhairle nan Eilean Siar is democratically accountable. The strategic development of its response to the contaminated land regime, and the implementation of its strategy, will be influenced by the population of the Western Isles and communities through their elected representatives.

The provision of services through a number of Comhairle Departments, with roles in the development and implementation of the Strategy will have significant and possibly unique influences on the Strategy.

Airborne deposition of contaminants will be an important potential pollutant linkage to consider. Wind direction has perhaps the greatest impact on air quality at a given point, for changes in wind direction have a great effect on the pollution received from a source.
The landscape of the Western Isles has a distinctive geography that will have a major influence on the practicalities of carrying out investigations and site inspections and as such will influence staff and resource deployment. The logistical difficulties of transporting staff between communities and islands will further influence staff and resource deployment.

Land being contaminated by neighbouring authorities is thought to be remote.

**History**

The Western Isles have been occupied for at least five thousand years, and possibly as much as eight thousand years. The remains of this history are visible in the landscape about us; the very ecology is the result of generation after generation of human activity, clearing the woodlands, farming the land, managing the drainage pattern, hunting, gathering, fishing and farming. Prehistoric ruins stand visible in the machair and on the moors; prehistoric field walls underlie later fields. Our ancestors’ cemeteries and settlements also erode out of the coastline.

During the first half of the twentieth century, political changes led to a series of laws extending the rights of crofters to secure tenancies. Cleared land was purchased by the government and re-crofted, and landowners were encouraged to re-establish cleared townships. In Lewis and Harris, the strength of the Harris Tweed industry, sustained the crofting economy, as did the fishing industry.

In the latter years of the twentieth century, elements of the earlier life still survive within a modern Island society. Most of the population is still in the rural areas. Many people have croft tenancies, and manage livestock, though cultivation is much decreased. Peat is still cut, as it has been for four thousand years. However, there is now a move towards other forms of fuel for domestic heating. Many archaeological monuments have been recognised as being of national and international importance.

**Industrialisation**

Over the passage of time industrial processes tend to have been focused within the major settlements. The greatest concentration of land affected is in and around the Old Burgh of Stornoway. The Harris Tweed industry has been one of the principal industrial processes along with development related to the fishing industry, with fish and shellfish processing persisting at a significant scale to the present day. In addition a large steel fabrication yard was set up at Arnish Point in the 1970’s and was the focal point of the Islands contribution to oil fabrication work for around 25 years.

The need for economic activities relating to natural resources e.g. seaweed, resulted in industrial processes (past and present) based in remoter parts of the islands. One of the slightly newer operations is fish farming that developed in large scale in the 1980’s.

Other processes likely to affect land are agricultural/crofting practices, and shipping/marine activity. Small scale industrial activities may have also impacted on land for example through lime and kelp burning, peat oil extraction, fish salting, dumps of fuel oil from garages and stores, and any biological hazards e.g. animal burials.

Finally, looking towards the future, a process that may impact upon the land is the possible development of oil and gas west of the Hebrides.

**Industrial and Economic Perspective**

The industrial base of the Islands is very narrow, being represented broadly by Harris Tweed manufacture, fishing, fish processing, agriculture and construction. Retail, tourism,
professional and public providers dominate the service industries. Employment is significantly dependent on traditional primary industries of fishing (approximately 40 fishing boats working out of Stornoway harbour), fish processing and increasingly public sector service providers. The Rural Scotland Price Survey of winter 1998-99 found that of 80 areas in Scotland, generally costs and prices in the islands are higher than on the mainland, largely because of the additional burdens imposed by the sea crossings.

The highest figures were in Tarbert, in terms of total expenditure on a range of domestic necessities. Stornoway, however, ranked with Grampian as being among the areas where the cost of the standard items was lower. Despite the fragile nature of the area economy, the cultural and social infrastructure remains buoyant.

**Industrial Process Operators**

There are currently 10 authorised process operators in the Western Isles, 1 Part A process and 9 Part B processes. There are no heavy industrial areas with most industrial activities being centred in areas of higher population and in particular, Stornoway. SEPA regulate these industrial activities.

**Military**

The Western Isles have had a continuing association with the military, particularly in training, strategic deployment, and in providing personnel and recruits for all the services in campaigns and wars fought throughout the last two Centuries. There are a number of in-use and disused army installations on the Islands.

**Influences on Strategy**

The Western Isles are blessed with an archaeological heritage that is remarkably well preserved. Archaeological remains of all periods occur throughout the Western Isles, and are important as both potential sources and receptors. Pre-industrial archaeological remains are less likely to act as sources but due to their nature, they are potential receptors within the contaminated land regime.

Historic and more recent industrial practices can potentially act as sources of pollutants and contamination.

Military activity throughout the Western Isles has the potential to provide both sources of contaminants and receptors. Areas occupied or used by military forces may also contain valuable environmental receptors, and may be within close proximity of controlled waters.

**Geology**

The following sections give a general overview of the regional geology and its implications for contaminated land. However, the geology of the Western Isles is complicated and for a thorough review the reader is directed to the British Geological Survey (BGS) Regional Geology Guides.

**Solid Geology**

This section refers to the complex strata of rock found underneath the soils. The predominant rock type is a metamorphic rock known as Lewisian gneiss, which takes its name from the largest island area in the archipelago. Geologists have dated this rock at nearly 3000 million years, making it the oldest rock formation in Britain. The Western Isles as a complete structural unit, is believed to have been separated from the Mainland in early Pliocene times when, as Western Scotland subsided, the Atlantic waters invaded the area now known as the Minch. However, the division of this unit into the islands of today
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is thought to have resulted from a rise in sea level at the end of the Ice Age, about 10,000 years ago.

Unaltered sedimentary rocks are limited to an area north and east of Stornoway. These are mainly sandstones and conglomerates and are believed to date from Triassic times (about 200 million years).

Igneous rocks are mainly found as intrusive dyke swarms, many of which form an extension of the Tertiary igneous complexes of Skye and Mull. Most of the dykes are composed of basalt and are aligned in a NW-SE direction. Their relative softness has resulted in the erosion of a large number of precipitous coastal inlets or geos. The small stacks known as the Maddies, that guard the entrance to Lochmaddy harbour are thought to be the remnants of an intrusive dolerite sill.

The most important structural feature in the Western Isles is the Outer Hebrides thrust zone. The thrust plane, which marks the boundary between moved and unmoved rock, stretches for almost 200 km from Barra to Northern Lewis. Movement along the thrust resulted in the formation of a wide range of cataclastic rocks. Perhaps the most interesting of these is pseudotachylite, a glassy rock formed by frictional melting, which is well exposed near Greian on the Isle of Barra. The following table shows the main rock types of the Western Isles.

Table 2: Solid Geology of The Western Isles Area, falls into five general groups of main elements.

<table>
<thead>
<tr>
<th>Main Elements</th>
<th>Description</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreland</td>
<td>Basement rock, product of repeated deformation and metamorphism</td>
<td>Precambrian crust of uncertain origin</td>
</tr>
<tr>
<td>Lewisian</td>
<td>Quartzites, sandstones siltstones, limestones and others</td>
<td>Cambro-Ordovician (430-600 Ma)</td>
</tr>
<tr>
<td>Cambro-Ordovician</td>
<td>Sandstones, schists, mica, and metamorphosed shales and siltstones</td>
<td>Silurian/Devonian (c.400 Ma)</td>
</tr>
<tr>
<td>Moine Thrust Zone</td>
<td>Metamorphosed sandstones, shales, mudstones, granite (post-metamorphic)</td>
<td>Post-Cambrian/ pre-Silurian (c.500 Ma)</td>
</tr>
<tr>
<td>Caledonides</td>
<td>Metamorphosed sandstones, shales, limestones, granite (post-metamorphic)</td>
<td>Cambrian (c.600 Ma)</td>
</tr>
<tr>
<td>Moine Schists</td>
<td>Sandstones, mudstones, shales and conglomerates</td>
<td>Devonian (350-400 Ma)</td>
</tr>
<tr>
<td>Dalradian Schists</td>
<td>Volcanic sequences (primarily basaltic) underlain by Triassic and Jurassic rocks</td>
<td>Tertiary (c.60 Ma)</td>
</tr>
<tr>
<td>Stornoway Beds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lavas</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hydrogeology

Different rock types present potential pathways for both natural and artificial contaminants. An aquifer is a subsurface layer or layers of rock or other geological strata.
of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater. Aquifers represent a zone of saturation and that perched aquifers can occur in the unsaturated zone. They are classified as highly, moderately or weakly permeable aquifers in terms of their hydraulic characteristics (fissured, fissure-porous and porous) and rock make up. It is worth mentioning that weakly permeably aquifers, although low yielding, can provide water for private water supplies and will not be discounted in considering pollution of controlled waters and harm to human health.

The unsaturated zone is that part of the aquifer which lies above the water table. It can play an important role in attenuation of pollutants, through physical, chemical and biochemical processes, and by acting as a delay mechanism. Travel times through the unsaturated zone can vary depending on the geology and the rainfall recharge. Cracks in the aquifer will allow faster movement whereas rocks with a predominant intergranular flow may slow movement down significantly. The important factors that could be deemed to pose a threat to aquifers are; physical disturbance, waste disposal on land, contaminated land, disposal of sludges and slurries to land and discharges to underground strata.

There is only one major aquifer in the Western Isles, the Stornoway Beds and this has been classified as highly permeable. This formation consists of conglomerates and coarse grained sandstones of the Permo Triassic age. These comprise an outlier of limited extent, cropping out on the isthmus separating the Eye Peninsula from the town of Stornoway, and northwards along the east coast of the island. This formation is capable of yielding good quality groundwater, and a number of wells are indicated on the 1:25,000 Ordnance Survey Map. It is important therefore that these important receptors are protected.

The groundwater vulnerability map of Scotland classifies the Lewisian as weakly permeable, the Stornoway Beds as highly permeable and the machair lands as moderately permeable. Porous substrata, such as the Stornoway Beds have the potential to allow substances to permeate to ground waters, with the additional possibility of being transported to other receptors.

**Superficial Deposits**

The Western Isles area has been extensively shaped and formed by glacial events, leaving large amounts of glacial deposition in some areas, while having left other areas devoid of much drift through the scouring effect.

The British Geological Survey (BGS) were commissioned by Comhairle nan Eilean Siar, Scottish Natural Heritage and LEADER to undertake a reconnaissance survey of sand and gravel resources in the Outer Hebrides in 1993. The technical report explained that, the low-lying windswept, coastal sandy plains (machairs) that are widespread in the Western Isles, together with sand dunes and hillocks, form up to 10% of the land area. They are best developed along the western coasts of the Uists. The sand that builds the machair consists of a mixture of siliceous and calcareous fractions in varying proportions. The siliceous fraction has been derived mostly from till and glaciofluvial sediments deposited on the offshore platform – this is also the source of the shingle and cobbles which form long ridges at the back of many of the beaches.

A complete picture of Quaternary sediments for the Western Isles is not available. However, the BGS has indicated that they intend to survey the Western Isles and expect to have this completed by 2007-9 and the Comhairle considers this to be very important in terms of the implementation and development of this strategy.
Certain naturally occurring elements and chemicals found in bedrock and soils can pose risks to local receptors given a suitable pathway. These include arsenic, uranium, radium, lead, and some greenhouse gases, including methane, which can be produced naturally in areas such as peat bogs, common in the Western Isles.

Geology, both solid and quaternary, may be considered as important pathways and/or receptors by virtue of their capacity to hold water, and may by containing naturally occurring “contaminants”, also be considered as potential sources.

Influences on Strategy

Geology has implications in all aspects of land contamination and to a large extent will dictate whether pollutants remain in situ or are able to migrate through the strata, potentially reaching water sources or other receptors.

Aquifers will be the main types of solid geology to be considered within the strategy as these are capable of storing and transporting controlled waters. They can both be a receptor and a pathway in terms of the contaminated land regime. Identification of important and vulnerable groundwaters will be an important consideration within the development and implementation of the strategy.

Information on soils and naturally occurring elements and compounds at some stage may be available through BGS and the MacAulay Land Use Research Institute (MLURI). Both these sources will be pursued in the development of the contaminated land database.

Community

Population

The population of the Western Isles has fallen steadily during this century to 27,180 (mid-year estimate 2000). Census data from 1991 states the populations in the following inhabited islands of the Western Isles as being: Lewis (population 19,600), Bernera (260), Harris (1,800), Scalpay (380), Berneray (140), North Uist (1,400), Grimsay (200), Benbecula (1,800), South Uist (2,100), Eriskay (150), Barra (1,200), and Vatersay (70).

Settlements

Stornoway has a population of around 6,000 and is the largest settlement in the Western Isles. The 5 other main centres of population and human activity are: Tarbert in Harris (480), Lochmaddy in North Uist (260), Balivanich in Benbecula (500), Lochboisdale in South Uist (280), and Castlebay in Barra (540). The rest of the population is spread throughout a series of around 280 scattered crofting townships that are of relatively low population density and are both linear and dispersed in their settlement patterns.

The impact of remoteness on communities outwith the major population centre, in terms of service provision is recognised in the Comhairle’s draft structure plan. The structure plan supports the consolidation of existing settlement hierarchy, while seeking to enhance remote and peripheral areas. The draft structure plan states:

“The Comhairle, along with its Community Planning partners, will give specific consideration to levels of service provision, development opportunities and availability of land development in areas suffering from the impact of peripherality, insularity or remoteness” DM2 Remote and Peripheral Areas.

Housing

Housing in the Western Isles is principally of four main types; croft houses, private houses, local authority and Housing Association houses. In 1999, it was estimated that there were approximately 13,400 dwellings.
The vast majority of houses were built after the 1st World War, which gives an indication of the poor standard of housing before that time. A series of initiatives has been undertaken since then to effect improvements in housing standards, with remarkable results. The most recent of these were the Housing Action Areas of the 1980’s that are still helping to improve houses in townships throughout the Islands.

The Structure Plan recognises that the provision of quality housing, social and recreational facilities is as important in the fight against population decline and in developing sustainable communities as the creation of employment opportunities. While the Comhairle is no longer a direct provider of housing (through new builds), it still plays a key role through the provision of housing grants for upgrading of existing properties. The Comhairle also manages over 2000 Comhairle owned stock. The Comhairle works closely with Scottish Homes and local housing associations to find suitable sites and locations throughout the Western Isles.

Importantly, the draft Structure Plan highlights that the provision of adequate housing must be met in a way, which minimises the impact on the environment.

Recreation

The Comhairle accepts that access to good quality social and leisure facilities is an essential factor in retaining the population and attracting inward migration. This is in tandem with the sustainable use of our natural and built heritage resources. The Comhairle recognises issues of land use related to the provision and the importance of safeguarding sports fields and parks from development.

The Comhairle confirms its support for recreational land protection and provision in its draft Structure Plan Policy (HCL4):

"Existing sports and leisure facilities, including public open space, should be safeguarded from development unless acceptable alternative provision can be provided".

Influences on the Strategy

The population of the Western Isles is a major potential receptor within the contaminated land regime. Whilst there is a variety of instances and situations where a pollutant linkage may arise with regard to elements of the population, be it groups or individuals, the initial broad screening for this receptor will be prioritised according to population density.

Generally speaking, areas with high population density are likely to have had an historic association with industrial land use. They have greater numbers of people within proximity to potential sources, and have a greater risk associated with potential hazards. Pollutant linkages are likely to have greater significance in more densely populated areas.

This approach will not exclude the investigation of sites in remoter or less populated areas within the Western Isles, although it may dictate the timescale within which they are conducted.

Economy

Business and industry

The creation of an improved business environment is an important strategic theme within the Comhairles’ Structure Plan. It recognises that the provision for business and industry is closely related to community, environmental and infrastructure considerations. The Comhairle is committed to the creation of a diversified sustainable economy and is focusing on opportunities arising from growth industries such as renewable energy, Information Communications Technology, tourism and fish farming. The fragility of the
Western Isles economy and its dependency on relatively few major employers makes it essential that an opportunity to assist in the new growth of new and emerging industries, as well as existing businesses, is taken.

The Comhairle’s Structure Plan identifies areas for the promotion of business and industrial development in policies reproduced for information in Appendix IV.

**Land Management, Crofting and Bio-diversity**

A major characteristic of agriculture in the Western Isles is its stewardship of the high environmental quality of the area. The Structure Plan seeks to set out policies, which promote and maintain its agricultural and crofting sectors whilst recognising the changing nature of crofting. The Structure Plan supports sustainable land management practices that promote bio-diversity and will advocate the application of agri-environment schemes across the whole of the Western Isles.

It will seek to safeguard agricultural land which although of lesser quality may nevertheless be important locally for the viability of a farm unit or croft. These policies are reproduced for information in Appendix IV.

**Fisheries and Aquaculture**

The sea fishing industry is seeing the increasing importance of shellfish landings, which accounts for around 90% of total Western Isles landings. A significant proportion of shellfish is exported and the value of landings is partly a reflection of the value of sterling.

The most significant change in the composition of the fleet in the last decade has been the decline in the number of boats in the 10 to 15 metre category. This trend reflects the changing economics of inshore fishing and is not unique to the Western Isles. Decommissioning has encouraged retirements and ‘trading down’ to smaller vessels with lower running costs.

Due to the high costs of boats and licences for quota species, new entrants to the industry are mainly in the under 10m sector. The Western Isles has the largest fleet of small vessels of any fishery district in Scotland and is therefore well placed to develop the shellfish and non-quota stocks in inshore waters. Despite the economic pressures on fishing, the total numbers employed in the catching sector have remained fairly stable in recent years. As well as the 680 directly employed in fish catching there are an estimated 300 persons employed in ancillary activities, including 200 engaged in processing and around 100 in other activities such as product marketing, gear manufacture and vessel maintenance and repair.

The fish farming industry in the Western Isles provides around 550 full time equivalent (FTE) jobs. Direct employment, mainly in marine salmon farming, accounts for over 350 FTE jobs while related activities such as processing, marketing and distribution provide around 200 jobs. Due mainly to lower market prices, many smaller companies have been forced out of salmon farming and three companies now account for over 80% of production.

Fishing and aquaculture make a significant contribution to the economy of the Western Isles. These industries account for 15% of the Western Isles GDP. The Comhairle works closely with other agencies and representatives of these industries to ensure sustainable management of fish stocks and of the marine environment. The activities associated with these industries straddle both land and offshore areas and at present the remit of the planning system only covers the landward part of this. However, this situation is changing and offshore issues are increasingly falling within the planning remit.
Recreational fishing is also important to the Western Isles economy and is recognised in the draft Structure Plan.

Tourism

The Western Isles’ unique and attractive environment offers tremendous potential for tourist visitors. The total annual number of visitors to the Western Isles is estimated to be around 95,000, contributing some 30 million to the local economy.

There are obvious linkages between tourism and the environment, culture, language and way of life in the Western Isles. Tourism based on culture, environment and outdoor recreation often attracts people ‘out of season’ thus helping to extend economic activity through more of the year. The Gaidhlig language and Gaidhlig culture is a unique selling point of the Western Isles and the Gaidhealtachd.

The tourism product of the Western Isles relies heavily on the quality of the cultural, natural and built heritage of the islands. These can be utilised in a sustainable manner to the economic benefit of the residents through the promotion of niche tourism packages such as water-based recreation, eco-tourism, genealogy and cultural tourism. As the tourist season is relatively short at present, there is potential to extend it through increased promotion of the area and the provision of indoor visitor facilities. The 2000-2005 Tourism in the Western Isles Strategic Plan seeks to ensure the development of tourism in a sustainable manner that enhances and protects the culture, environment and communities of the Western Isles. Consequently the Structure Plan will support sustainable development that meets these objectives.

Visitors receive their first impression of the Western Isles when they arrive, either by air or sea, at one of the Islands ‘ports of entry’ and often spend a considerable amount of time within these ports. The impact this has on visitors cannot be underestimated and the importance of creating a quality environment, and consequently a pleasurable experience for visitors, is recognised in the draft Structure Plan.

Influence on Strategy

Agriculture, aquaculture, fishing and shooting involve crops and animals specified in the statutory guidance as receptors covered within the description of property. These receptors will be considered within the development and implementation of the strategy.

Potential sites that fall outwith planning control, for example, developers with Class 44 permitted development rights, but with comparable contamination profiles, will be given higher priority for consideration within the contaminated land regime because their potential problems are less likely to be dealt with through the planning redevelopment process. To this end, the Planning Authority will contact all existing developers with permitted development rights outlining the requirements of the contaminated land regime and request that they should contact the Department for Sustainable Communities prior to any proposed future development.

The Comhairle recognises the importance of balancing the demands on land in its efforts to sustain communities, and in its role in directing and integrating development. This role will have a major effect in addressing development pressures, which are likely to drive redevelopment of sites through the Development Control process and therefore remove them from consideration within the contaminated land regime.
Land

Land Cover

Table 3: Land use characteristics and land cover of the Comhairle’s area.

<table>
<thead>
<tr>
<th>Land use category</th>
<th>% of land cover</th>
<th>Area (Hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arable</td>
<td>0.2</td>
<td>6.5</td>
</tr>
<tr>
<td>Improved Grassland</td>
<td>3.2</td>
<td>98.8</td>
</tr>
<tr>
<td>Good rough grassland</td>
<td>0.9</td>
<td>27.8</td>
</tr>
<tr>
<td>Heather Moorland</td>
<td>8.1</td>
<td>248.5</td>
</tr>
<tr>
<td>Peatland</td>
<td>14.5</td>
<td>449.0</td>
</tr>
<tr>
<td>Recent Plantings/Fellings</td>
<td>0.1</td>
<td>3.8</td>
</tr>
<tr>
<td>Coniferous Woodland</td>
<td>0.2</td>
<td>5.3</td>
</tr>
<tr>
<td>Broad-leaved/Mixed Woodland</td>
<td>&lt; 0.05</td>
<td>1.3</td>
</tr>
<tr>
<td>Fresh Water</td>
<td>5.7</td>
<td>177.0</td>
</tr>
<tr>
<td>Development-Rural/Urban</td>
<td>0.4</td>
<td>9.8</td>
</tr>
</tbody>
</table>

A profile of the land cover within the Comhairle’s area is presented in Table 3.

Land Ownership

Information will be obtained from the Crofters’ Commission on occupiers of croft land throughout the Western Isles. The Comhairle will establish a crofting ownership database. Land ownership information may also be available through the Comhairle’s Assessors and Area Valuation Rolls. Ownership information may also be held within other Comhairle services. Other Comhairle departments hold information on land ownership and this information will be sourced to establish a land ownership database. This information will be useful where potential significant contamination issues arise in relation to property or sites highlighted during implementation of the strategy.

Information on potential land contamination may be available from property owners or estates where there may have been historical contaminative land use. A mandatory accountancy standard applicable to most organisations producing financial statements, known as “FRS12 -Provisions, Contingent Liabilities and Contingent Assets” requires the assessment of provisions and contingent liabilities. Organisations with potentially contaminated land, or those whose activities may have lead to historic contamination would need to consider such potentially contaminated land as Provisions or Contingent Liabilities. Such assessments and the strategies these organisations prepare to deal with sites, may be very useful to local authorities when implementing their inspection strategies.

Comhairle Estate Portfolio

The Comhairle own a number of sites and premises throughout the Islands, ranging from schools to business units. Comhairle ownership is not restricted to occupied buildings but also extends to a vacant properties and land. The Comhairle is actively involved in monitoring it’s own land ownership and that will help to define areas most likely to be
inspected for contamination. In particular land and buildings used for industrial purposes and for the transfer and disposal of wastes.

Issues of ground contamination are most likely to arise on land with industrial use associated historically with contamination, and land used in the past for the transfer and disposal of wastes. There is also a potential for the existence of contaminated materials in parcels of reclaimed land managed by the Comhairle. Information on the extent of the Comhairle’s estate is held by Corporate Services in the corporate property database. This database is mainly paper based and has in part been transferred to electronic format.

A comprehensive assets register will be established for all Comhairle owned land and property. This will be facilitated by the purchase of a corporate land and property management software package. A working group has been established to facilitate this acquisition.

Once established in electronic format the corporate property database will be linked to a Geographical Information System (GIS) called MapInfo. Potentially contaminated land will be identified using point and shapefile polygons for each parcel of land or property. Priority sites already identified are being investigated.

Any decisions on investigation and remediation of Comhairle owned or managed sites will be the same as that for privately owned land and will have due regard to the policies and procedures referred to in this strategy.

Waste disposal

Almost 90% of our domestic waste is disposed of to landfill – burying untreated waste in holes in the ground (such as disused quarries). If not properly managed landfill sites can give rise to a variety of pollution problems, including leachate (a liquid formed when waste is broken down by bacteria which can cause contamination of groundwater); production of potentially explosive levels of methane gas, dangerous levels of carbon dioxide, plus trace concentrations of a range of organic gases and vapours. In the past it was possible for the owner of a site to close it down and walk away without legal obligation or liability. The Environmental Protection Act 1990 and the recently introduced European Directive on Landfill places new responsibilities on the owners and operators of landfill sites to ensure that the site is monitored and maintained after closure. The Western Isles, in common with many remote settlements across mainland Scotland and the Islands, have historically disposed of waste in local tips. Local knowledge and the Cleansing Service records will be used to identify these historic community settlement tips.

The nature of household wastes up until relatively recently was such that in general, material going to the tip would have been relatively inert and not considered as a problem. Management of “tips” would have consisted of judicious burning, selective scavenging and burial of the remaining materials and residues.

The significant change in composition of the waste stream in the last 50 years, the greater potential for disposal to impact within the local environment, and increasing awareness of waste and environmental issues, has sponsored a series of waste management legislation and the tighter regulation of disposal. This and the major structural changes in the provision and delivery of local services have driven both the centralisation of waste management and disposal, and the increase in size and capacity of disposal sites. As a result most of the local tip sites have been closed.

It should also be borne in mind that unregulated disposal of commercial and industrial waste may be associated with tip sites. Commercial and industrial waste composition can have an important effect on the likely pollution from, or contamination in, such sites.
It is possible that historic commercial and industrial waste materials have been used in land reclamation and landscaping, or may have been tipped into convenient quarries or other excavations.

Existing licensed landfill sites, subject to current regulatory regimes are outwith the scope of the contaminated land regime. Historic tip sites and landfill will be considered as potential sources of contamination (migration of landfill gas to sensitive receptors). Information held within the Comhairle, and by Comhairle staff regarding historical disposal will be collated and other sources of such information explored.

**Potentially Contaminative Land Use**

The most probable sources of soil contamination to be considered within this regime are likely to have arisen from the supply, storage, use of, and wastes arising from materials used in historic commercial and industrial processes. These are highlighted below. Such industrial land uses within the Western Isles will also include Part A and Part B process operators regulated by SEPA.

- Agriculture (disposal of farm wastes on site, burial of diseased animals)
- Quarrying
- Manufacture and processing of textiles & paraffin (from peat cuttings)
- Steel fabrication and Engineering
- Land where significant quantities of chemicals or fuels have been stored or used,
- Gasworks, electricity generation,
- Dock yards, airports,
- Use, storage, or disposal of explosives or military ordinance,
- Waste recycling, treatment, disposal and sewage works.

There may also be issues of land contamination associated with the historic disposal of domestic wastes and on land used in military activities

Industry in the Western Isles has developed around the exploitation of abundant natural resources, and the growth of population around ports of entry.

**Influences on the Strategy**

Information on land use and ownership, including Comhairle owned land and property is fundamental to the development and implementation of the strategy.

Many Western Isles communities will have within close proximity of their settlements a disused or closed tip site, there may be numerous unofficial tips particularly in remoter areas, and commercial or industrial wastes may have been used historically in land filling or landscaping. Materials migrating from these sites may affect environmental receptors, property or controlled waters. Known, suspected and potential historic tip or landfill sites will be identified within the strategy.

Liaison with representatives of industry and organisations with potential contaminated land interests will be advised and encouraged to address any potential contaminated land liabilities and obligations. Similarly liaison within the Comhairle will ensure that potential liabilities and obligations within the current and previous local authority estate portfolio are addressed.
Water

Controlled Waters

Paragraphs B50 and B51 of the statutory guidance, contained in The Scottish Executive Circular 1/2000, provides guidance to local authorities on the determination of pollution of controlled waters. Pollution of controlled waters is defined in section 78A(9) of Part II as:

“the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter”.

This is not further defined, although poisonous, noxious or polluting matter is often viewed as being capable of causing harm or making water impure.

Controlled waters are as defined in Section 30A of the Control of Pollution Act (COPA) 1974 (as amended) and in general include:

- Relevant territorial waters (extending seaward for three miles from the baseline from which the breadth of territorial sea adjacent to Scotland is measured)
- Coastal waters (extending from the baselines above as far as the limit of the highest tide or as far as the fresh-water limit of the river or watercourse which adjoins waters within that area)
- Inland waters (including the waters of any relevant loch or pond and rivers or other watercourses above the fresh-water limit)
- Ground waters (contained in underground strata, including water in wells, boreholes and excavations into underground strata)

Assessment of Water Pollution

External guidance on the pollution of controlled waters arising from contaminated land has been issued by SEPA to all Scottish Local authorities. It states that the key principles in the assessment of water pollution are as follows:

- there is no risk if there is no mechanism for contaminants to enter water.
- a contaminant can enter water without causing pollution i.e. pollution means adverse impact not just entry.
- contaminants that pose the greatest risk to water are those which are mobile or leachable and have the potential to adversely impact on aquatic life and other users of water.

SEPA’s external guidance will be referred to when assessing water pollution.

Surface waters

Surface waters in the Western Isles area provide a valuable resource, not only in terms of supporting environmental and biological quality, but also in provision of water supply, their recreational, commercial and industrial uses, and their impressive scenic and landscape value. Maintaining and protecting marine and freshwater surface water resources are important priorities within the Comhairle’s strategic response to the contaminated land regime.

Some surface water quality is surveyed on a routine basis. In Scotland SEPA undertakes this responsibility and assesses quality on the basis of chemistry, biology, nutrients, dangerous substances and aesthetic conditions. SEPA will be consulted on the quality of
such waters as they are incorporated as potential receptors within the contaminated land database.

The implementation of the EC Water Framework Directive (WDF) is soon to be transposed into Scots law by the Water Environment Act. The strategy recognises that the standards to be applied relate to groundwater and surface waters. When inspecting potentially contaminated sites consideration will be given to groundwater and surface water pollution from the site. Reference will be made to the Environmental Quality Standard (EQS) and the Environmental Quality Objective (EQO) in terms of the entry of substances to surface waters. As and when appropriate, human drinking water standards, bathing waters regulations, surface waters regulations (fresh water & marine), and surface waters (dangerous substances) regulations will be referred too.

**Ground water**

*Groundwater is important in terms of potable water supply and other industrial/commercial uses, in addition to supplying surface water bodies. It is a valuable resource throughout Scotland and within the Western Isles and comprises bodies of water contained as aquifers within both solid and drift geology.*

A ground water policy was initially developed by the National Rivers Authority (NRA), a statutory body established for England and Wales under the Water Act 1989, to take over the responsibilities of their water authorities. In 1992 the NRA outlined a policy for protecting ground water supplies and defined source protection zones. Whilst this policy is not statutory, the compilation of maps showing groundwater areas and their vulnerability has been undertaken by the Environment Agency (SEPA’s equivalent in England and Wales), and are available to English and Welsh local authorities.

Scotland’s strategy for the protection of ground water was originally published in 1995, and by SEPA in 1997 (SEPA Policy No 19) and uses the same approach as the NRA in identifying protection zones. SEPA indicated their plan to prepare similar maps for Scotland in their policy and these will be sourced as soon as they become available.

**Water supplies**

North of Scotland Water Authority (NOSWA) undertakes the provision and maintenance of public water supply throughout the Western Isles area. There are 32 public water supplies serving Western Isles communities.

The Comhairle regulates and monitors approximately 40 private water supplies across the area. These supplies serve a population estimated at 300 and range in size from those serving individual domestic properties, to those supplying major food and drinks manufacturers. (reference; Private Water Supplies (Scotland) Regulations 1992, 2000 Return.Comhairle nan Eilean Siar, Sustainable Communities).

Water supplies arise either in groundwater or surface waters, and as such are receptors in terms of the contaminated land regime. In addition their distribution and use allows them to be considered as possible pathways to human population receptors.

**Influences on Strategy**

Consideration of the Western Isles water resources will be significant within the development and implementation of the strategy. Liaison with a number of agencies whose responsibilities include water resource issues is essential within the strategy.

Information on controlled waters, vulnerable ground and surface waters, and private and public water supplies will be incorporated into the contaminated land database.
Ecology

International and National Conservation Areas

The natural resources of the Western Isles are recognised as being of international importance and this is recognised by the number and extent of conservation designations that have been applied. The presence and quality of our natural resources have been supported over the years by sensitive land use practiced by the people living and working on the land and sea - the low intensity systems practiced on the Machairs being a prime example. Without appropriate and sensitive land use, some of our most important natural resources would probably go into a phase of rapid decline. There is clearly a need to look forward to integrated sustainable development.

The following information was obtained from Scottish National Heritage and indicates the number of designated areas in the Western Isles. These are listed below:

- 1 World Heritage site;
- 5 Ramsar sites;
- 3 National Scenic Areas (includes large marine component - covering St Kilda; South Lewis, Harris and North Uist; and South Uist Machair; recognising unique qualities of the Western Isles landscape);
- 4 National Nature Reserves;
- 55 Sites of Special Scientific Interest, and;
- 15 Special Protection Areas – SPAs, Candidate Special Areas of Conservation - SACs (two new proposed SACs are under consultation at present), and
- The Natura 2000 network consists of a series of sites designated as important for nature conservation under the EU Habitats and Birds Directives. The network encompasses areas classified as SPAs (for birds), and SACs (for habitats and species other than birds).

Whilst sustainable land use is of prime importance to support and protect our natural resources, extra opportunities exist to use these resources to the benefit of the Western Isles, including:

- Use of environment as a marketing tool.
- Development of tourism industry.
- Education and training.
- Environmental research.
- Public health - recreation and access.
- Environmental management – e.g. control of introduced alien species

Archaeological Sites

Many generations of careful land management practices have resulted in a landscape in which the remains of the past continue to be visible.

The Sites and Monuments Record held by Comhairle nan Eilean Siar records a total of 6859 archaeological sites and monuments in the islands, dating from between 5,000 years old and 50 years old. The distribution of these is uneven, reflecting the history of archaeological survey rather than the real density of monuments.
Of the 6859 archaeological sites and monuments, only 247 are protected by law as Scheduled Ancient Monuments, a designation defined as applying to ‘sites of national importance’. Again, this relatively low number reflects the history of archaeological work in the Islands, rather than the quality of the sites on the ground; there are many more ‘schedulable’ sites in the Islands.

There are at least 262 buildings in the Western Isles that have been listed by the Secretary of State of Scotland as buildings of special architectural or historic interest. Of these 17 are in Category A i.e. buildings of national or more than local importance, 166 in Category B and 79 in Category C. A proportion is listed as “group listings”, most of which are groups of traditional thatched dwellings.

The main concentration of listed buildings is within the Stornoway Outstanding Conservation Area. To date four Conservation Areas have been designated in the Western Isles, at Garenin, Lewis, Ruisgary, Berneray, at Howmore, South Uist and the fourth is in Stornoway.

This information will be imported into the contaminated land MapInfo database.

**Influences on Strategy**

National and international sites are identified locations of specified receptors within ecological systems.

Due to past land management practices on some areas of land already designated as conservation areas, statutory consultation with SNH will be initiated in line with the strategy prioritisation scheme. There is also the possibility that some of the species present may be key receptors, particularly marine species and birds in any contaminated estuarine or coastal areas.