

Causeway Coast and Glens Preferred Options Paper – Pre-consultation comments

Contents

Minerals Paper 9 comments	1
PSRNI Policy MIN1 Environmental Protection:	1
SPSS 6.158, PSRNI Policy MIN2 Visual Implications	2
PSRNI Policy MIN 3 Areas of Constraint.....	2
PSRNI Policy MIN 4 Valuable Minerals.....	2
PSRNI Policy MIN 5 Minerals Reserves	2
SPSS 6.159 PSRNI Policy MIN 6 Safety and Amenity	3
SPSS 6.160 PSRNI Policy MIN 7 Traffic.....	3
SPSS 6.161 PSRNI Policy MIN 8 Restoration	3
Mineral resources in the Causeway Coast and Glens District Council area.....	3
Aggregates	3
High Value Minerals	4
Energy Minerals	4
Land Stability.....	5
Introduction	5
Causeway Coast and Glens Overview	5
Groundwater.....	7
Introduction to Groundwater	7
General Groundwater Overview.....	7
Current Status of Aquifers	9
Groundwater and LDP.....	9
Sustainable Use of Groundwater	10
Groundwater Regulation	10
Tourism in the Causeway Coast and Glens District Council area.....	10
SPSS 6.262 Natural and cultural heritage as tourism assets.....	10
The role of the sub-surface in urban planning.....	11
Sustainable Drainage Systems (SuDS).....	11

Minerals

In preparing the Preferred Options Paper the Council should be aware of the different type of commodities which are commonly covered by the term 'mineral' in planning policies and ensure that appropriate language is used to describe the type of mineral and its development. In existing policy statements a differentiation is made for hydrocarbons (SPPS 6.157, NAP Policy MIN1) but high value metallic minerals, precious metals and industrial minerals, which are commonly developed by underground mining, are not differentiated from the minerals (hard rock aggregates, sand and gravel) that are worked in surface quarries. The distinct characteristics of underground mines and surface quarries have different implications with respect to potential impacts arising from their development. Likewise, exploration is a separate and distinct process from the subsequent development of a mineral deposit, following its discovery. Exploration tends to be short term and low impact (with some specific exceptions) whereas development and production will have a duration of years and could have significant impacts, both positive and negative. Causeway Coast and Glens Council may wish to reflect these differences when considering the minerals policies in their Preferred Options Paper. The following comments highlight some of the issues involved.

PSRNI Policy MIN1 Environmental Protection:

The working of surface deposits of sand and gravel, hard rock aggregate material and high value minerals has a greater potential to affect the natural environment from land take, dust, noise and visual amenity. Underground mining techniques can exploit resources with less surface disruption and should be considered appropriately.

Surface deposits of sand, gravel and hard rock aggregate material can be identified and zoned from existing mineral resource maps. They tend to be quite widely distributed and, therefore, there may be considerable flexibility when planning future development of these raw materials essential for infrastructure development and the construction industry.

By contrast, deposits of high value minerals are smaller in size, may occur at depths of hundreds of metres below surface and are much rarer in occurrence. Discovery of such deposits requires the application of a systematic and progressively focussed suite of exploration methodologies. In the initial stages of exploration, this involves surface and shallow sampling techniques which are short term (from days to a few weeks, at most) and have little or no long-term impact. The results of these reconnaissance surveys are used to identify areas of higher mineral potential and exclude large areas from further work. The remaining small highlighted areas are then the focus for more specialised exploration and appraisal techniques. In terms of planning policy the potential impacts are dependent on the methodologies used and the sensitivity of the location. When mitigation measures are built into the design of the exploration programme any potential negative impacts can be avoided or significantly reduced, and the proposed activities assessed on a case-by-case basis. Exploration activities are generally subject to assessment under the relevant legislative instruments for environmental protection, by virtue of the consents required under the terms of the Mineral Prospecting Licences issued by the Department for the Economy.

SPSS 6.158, PSRNI Policy MIN2 Visual Implications

The policy on Visual Implications does not accommodate the development of high value minerals. Any proposal to explore for high value minerals should be considered in light of the proposed activity and not rejected outright for the reasons identified above.

PSRNI Policy MIN 3 Areas of Constraint

DfE recommends that Areas of Constraint on mineral development should not be used to apply blanket bans on exploration activities for high value minerals. This would be incompatible with SPSS 6.157. It is considered that Policy MIN 3 provides for exceptions to the presumption against the development of valuable minerals in Areas of Mineral Constraint.

However, although the policy states that there may be exceptions to MIN3 where 'the proposed operations are short-term and the environmental implications are not 'significant', there is no definition of 'short-term'. This may be important to consider where pre-development feasibility studies for underground mines for high value minerals can take a number of months or even years to complete. In this case, the nature of any surface operations and the environmental implications would presumably be the most relevant factors in any planning decision.

PSRNI Policy MIN 4 Valuable Minerals

Currently two companies hold DfE Mineral Prospecting Licences for metalliferous minerals and Crown Estate options for gold and silver either wholly or partly within the CCG DC area. MIN 4 states that there will not be a presumption against the exploitation of valuable minerals. It should be noted that precious metals (gold and silver) and other metalliferous minerals can be defined as 'valuable minerals' in addition to the examples given in MIN4. Implicit in this policy provision is that there should not be a presumption against the exploration for valuable minerals in any area, including a statutory policy area. The qualifier is that "due weight will be given to the reason for the statutory zoning" in the decision-making process, in addition to all the other pertinent factors. MIN4 has been incorporated into the SPSS in paragraph 6.157.

PSRNI Policy MIN 5 Minerals Reserves

The lignite deposit at Ballymoney has been recognised as a valuable potential mineral resource for Northern Ireland and as such is protected from inappropriate surface development under Designation COU 5 in the Northern Area Plan. This protection is balanced by the provisions for the policy for development in the countryside which sets out the conditions for development in this rural area. The rationale for continuing with a general policy covering the identification and designation of areas as Minerals Reserves (or Minerals Policy Areas as they were previously called) still holds.

The main reason for designating the lignite deposit – that it is a strategically important mineral deposit – remains valid. Though current techniques to exploit the resource are considered unacceptable it is possible that new techniques may developed in the future which would allow the resource value to be realised, perhaps with the implementation of CCS technology. This, however, is probably an issue for the LDP rather than the POP document.

SPPS 6.159 PSRNI Policy MIN 6 Safety and Amenity

Considerations of safety and amenity should be made in the context of the nature, duration and proximity of any proposed development, and any mitigation measures included in the proposal. In terms of amenity prospecting techniques used for high value mineral exploration may produce minor short term impacts. Low impact exploration activities may be possible under Permitted Development Rights whereas oil and gas exploration wells are likely to be deemed Environmental Impact Assessment developments and require planning permission. The potential impacts of any subsequent mineral developments on safety and amenity would clearly be subject to this policy and, by virtue of their longer duration, might be expected to have more significant potential impacts.

The Council area has a high number of abandoned mine workings relating to historic extraction of coal and iron ore located along the north coast close to Ballycastle and in the Antrim hills above Glengariff. The POP should take these into account when assessing any future developments, from a safety consideration.

SPPS 6.160 PSRNI Policy MIN 7 Traffic

No additional comment.

SPPS 6.161 PSRNI Policy MIN 8 Restoration

Restoration of mineral extraction sites is an important part of any proposed development, although the extent and nature of restoration will vary according to the type of mineral extraction proposed (e.g. surface, underground). In all cases the restoration should be designed to secure the long-term safety and stability of the site and to prevent pollution whilst, for surface extraction sites, the remediation to visual landscapes and the potential to create amenity value would also be important factors. Long term monitoring may also be required, depending on the nature of the mineral development.

Mineral resources in the Causeway Coast and Glens District Council area

The following is a brief over view of the mineral potential of the Council area which may contribute to the evidence base upon which detailed minerals policies can be formulated. Further detailed information is available from the Geological Survey of Northern Ireland (GSNI).

Aggregates

The Causeway Coast and Glens District Council area extends from the eastern edge of the Sperrin Mountains onto the Antrim Plateau and across to Cushendall on the north east coast on Antrim. The area is predominantly underlain by volcanic basalt rocks of the Antrim Lava Group which form the Antrim Plateau. Fringing the plateau in the west are metamorphic sedimentary rocks of Dalradian age and these same rocks occur in the north east corner of the area as a geological inlier. There are additional exposures of Palaeozoic to Mesozoic aged sediments between the metamorphic and volcanic units.

The key hard rock aggregate commodity for the DC lies in the basalt and this is worked at a number of locations across the region. The extent of the outcrop makes this a long term viable resource of construction material for the area and beyond. There are adequate mapped occurrences to

accommodate future development without the need to access rocks in designated areas such as the Antrim Hills Special Protection Area in the east, or the Causeway Coast in the north. The Mineral Planning Maps produced by the British Geological Survey and GSNI in 2012 show additional potential resources of sandstone in the west and east of the area.

Sand and gravel resources occur as glaciofluvial deposits sitting on top of the bedrock and these have been worked at a number of locations across the council area. The mineral maps indicate fairly extensive occurrences which could be exploited in the future.

High Value Minerals

The council area has a long history of exploration activity with over 60% of the area having been held under licence at some stage in the past. Currently there are 7 licences issued by the Department for the Economy for metalliferous minerals, five of which have associated Crown Options for precious metals (gold and silver). The key metal targets are platinum and palladium which form the core elements of the Platinum Group Minerals (PGM), and are particularly valuable as high tech minerals. Mineral Prospecting Licences can cover a maximum of 250km² but the ultimate extent of any potential mineral target may only extend to an area which is smaller than a football pitch, and is likely to be at depths extending down to several hundred metres and suitable for underground mining rather than opencast surface extraction.

Energy Minerals

The Ballymoney Lignite deposit forms the greater part of the recognised 1 billion tonne lignite economic resource in Northern Ireland. The extent and nature of this deposit is well defined.

At this stage the Department for the Economy will not issue licences which are required to develop the lignite, but the Lignite Policy Area defined in the Northern Area Plan remains in place to protect it from sterilisation by uncontrolled surface development. The current planning arrangement outlined in the NAP appears to strike the appropriate balance between protection of the resource and unnecessary restriction on surface developments.

The Rathlin sedimentary basin covers much of the Council area and extends offshore beyond Rathlin Island itself. This basin has the potential to contain economic oil and gas fields although none have been discovered to date. The only exploration well drilled in the basin, Ballinlea No.1, recovered some oil to the surface and it is believed that there may be an accumulation of oil in the vicinity, perhaps with associated gas. Conventional oil and gas fields can be developed with a small number of wells and a relatively small surface footprint.

There may also be some potential for the development of unconventional hydrocarbons in the basin but the SPPS contains a presumption against the extraction of unconventional hydrocarbons such as shale gas which require the drilling of multiple wells and the use of high volume hydraulic fracturing until the potential impacts of these activities is clearly demonstrated to the satisfaction of the Department.

There is also some potential for the exploitation of deep geothermal energy in the Council area for direct heating and, possibly, electricity generation if the aquifer rocks are buried deep enough. The areas with the highest potential are between Ballymoney and Ballycastle. There is more widespread potential for the use of shallow geothermal energy resources for heating and cooling purposes, using

Ground Source Heat Pump technology. The council may wish to consider how its policies would relate to this potential low carbon sustainable energy resource.

Land Stability

Introduction

Northern Ireland is generally composed of stable ground with some areas deemed to have variable degrees of land instability that are for example related to landslides, abandoned mines and compressible ground. Within areas of instability subsidence and surface movement events have occurred in the past and could take place in the future.

The majority of landslide events occur naturally but can be triggered by human activity, particularly new development in susceptible areas. The most common forms of landslide in Northern Ireland are mudflows, peat bog bursts, rock falls and debris flows.

Northern Ireland has a rich history of mining activity which has left the legacy of over 2,400 abandoned mine workings. These are predominately located in County Antrim and east County Tyrone with smaller concentrations in other locations throughout Northern Ireland. As with all underground cavities, the surface lands over abandoned mines are susceptible to subsidence as a result of mine collapse. All historic mine sites in Northern Ireland classified as abandoned are vested in the Department for the Economy and are managed by the Northern Ireland Mines Oversight Committee (NIMOC).

In Northern Ireland the most commonly occurring compressible materials include areas of peat, lacustrine and estuarine silts and clays. Subsidence of structures in areas underlain by such material can occur if the foundations are inadequate. In addition, differential movement of the ground has the capacity to cause disruption to the infrastructure network.

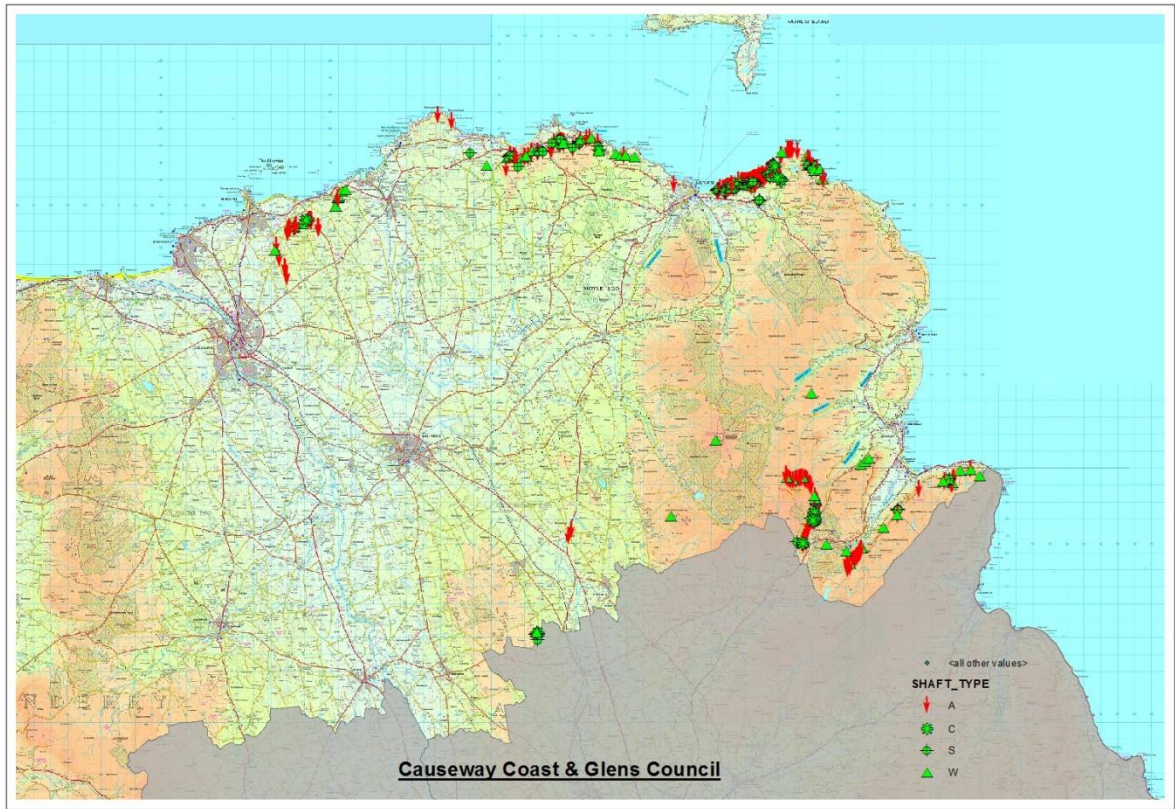
The hazard posed by areas susceptible to land instability can be incorporated into procedures for land use planning to help aid future resilience. It is important that land stability be given adequate consideration for future planning of residential dwellings, commercial properties, infrastructure projects and recreational areas.

Causeway Coast and Glens Overview

The Causeway Coast & Glens DC area contains a total of 551 abandoned mine workings which operated from the mid eighteenth century to the mid twentieth century. These are a legacy of the iron ore and bauxite industry located on the North Coast and the south eastern area of Glenariff and Trostan plus also the coal mines contained within the Greater Ballycastle area.

Landslide occurrences are prevalent within the DC area most notably along the stretch of coastline and steep sided glens. The topography and geology combined with climatic factors makes the area one of the most susceptible to landslides in Northern Ireland. In the past three years the impact of this instability has caused the closure of the A2 Coast Road, Glenariff Road and Altarichard Road.

Compressible ground within the DC area is contained to the upland areas of peat.



Groundwater

Introduction to Groundwater

Groundwater is water that is underground in both the loose material above bedrock and in bedrock itself. Contrary to popular ideas, groundwater is not like surface water in that, typically, it is not found in underground streams and lakes. Groundwater fills the tiny void space between grains of material or in the cracks in the ground. The proportion of voids in the ground affects how much water can infiltrate down through the ground to form what are known as aquifers. The greater the proportion of voids, the larger and more productive the aquifer will be.

As an example, the Sherwood Sandstone Aquifer in the Lagan Valley contains 20 times more water than the Silent Valley reservoir can hold. Groundwater can range in age from being only a few hours old to a few thousand years old. The natural attenuation processes that go on in the ground serve to remove harmful chemicals and bacteria out of groundwater. The water itself dissolves out minerals in the ground so that it takes on similar chemical characteristics. Although groundwater quality is variable across Northern Ireland, in general, groundwater is naturally found in a condition that is suitable for drinking without the need for any treatment.

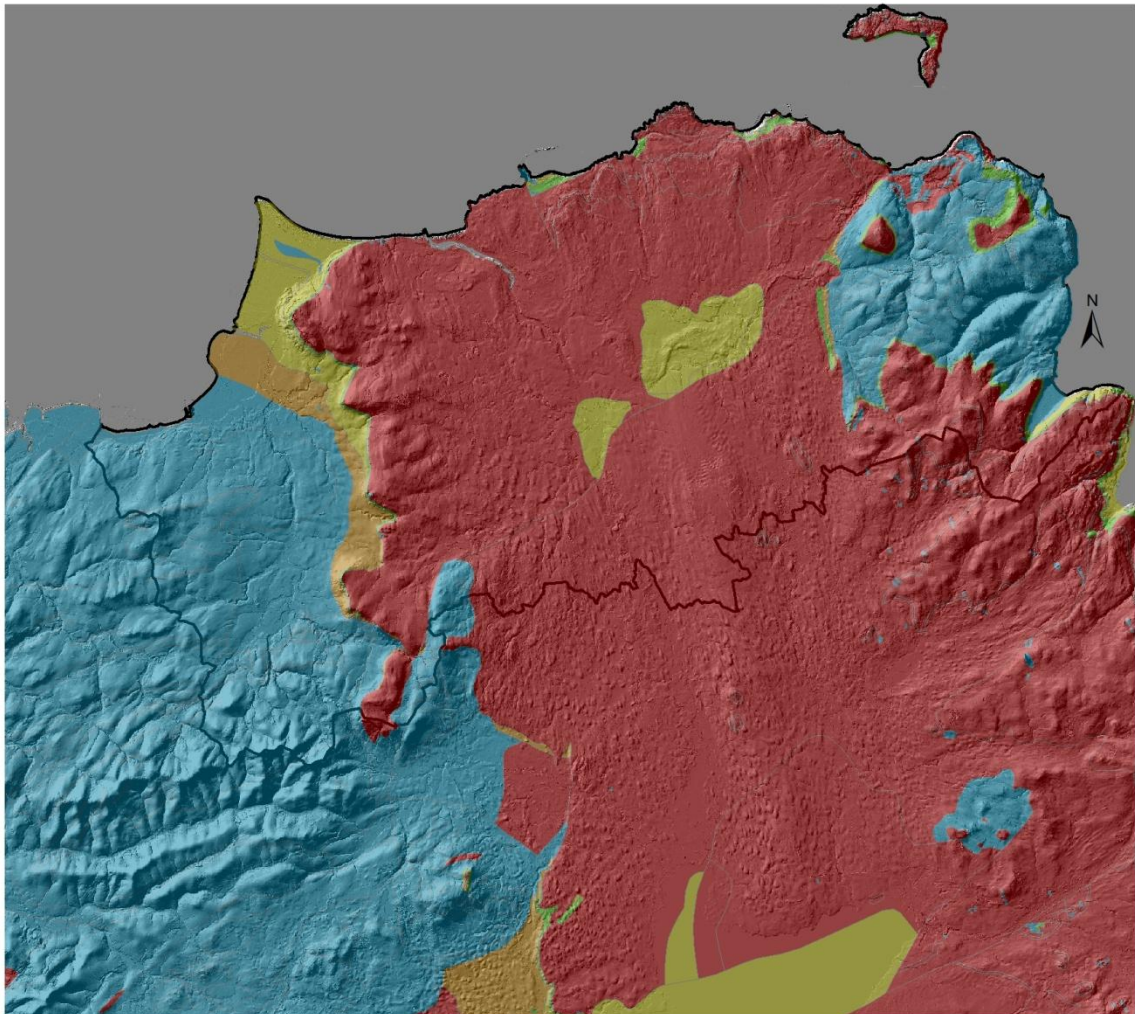
In regards to Local Development Plans, groundwater can be viewed as a natural resource that requires careful protection and as a water source that can be used for growth and economic development. It is important that both aspects are given consideration so as to look after the valuable resource and to use it sustainably to enhance and support future development needs.

General Groundwater Overview

The Causeway Coast and Glens Borough Council (CCGBC) area covers an area with a wide variety of groundwater conditions. Figure 1 shows the distribution of different aquifer classes.

The main bedrock type in the area is basalt (red on Figure 1). Basalt has moderate potential for the supply of groundwater. It is a fractured aquifer meaning that intersecting water bearing fractures during borehole drilling is essential to secure a groundwater supply. Many farms and small business' in the council area are abstracting groundwater from the basalt aquifer. Borehole yields are highly variable with some large supplies being achieved from some boreholes.

The Roe Valley is underlain by a Sherwood Sandstone aquifer (area of orange on Figure 1). This is the most important aquifer in Northern Ireland. Exploration of this aquifer has taken place in the past and proven a good reliable resource. The aquifer was used for public supply in the past but as yet, industry has not followed suit, making it an untapped resource.



0 5 10 20 30 40 Kilometers

- Bh(f)
- Bh(f-k)
- Bh(l-f)
- Bl(f)
- Bm(f)
- Bp(f)
- Causeway Coast and Glens

Figure 1 - Aquifer Classification across the Causeway Coast and Glens Borough Council Area

This map contains material that is based upon Crown Copyright and is reproduced with the permission of Land and Property Services under Delegated Authority from the Controller of Her Majesty's Stationary Office, © Crown Copyright and database right 2012. Permit number DMOU205.

The thin strip of green along the flanks around the base of the Basalts is the outcrop of the Chalk, or Ulster White Limestone. Channels of groundwater can form within this rock as demonstrated by the

density of springs that issue in a line along the base of the chalk. However, securing a reliable supply of water from the chalk can prove difficult with limited knowledge of any operating boreholes or adits abstracting groundwater from the chalk. Many chalk springs have been captured, within the council area and either have or are being used for water supply. These include around Ballypatrick Forest, Knocklyd and at Wellglass near Limavady.

The Chalk, being karstic, displays some interesting features where it outcrops. Stream sinks are common where streams run over the top of exposed chalk causing streams to dry up. The rivers then emerge as springs at the base of the chalk. Solution features such as dolines and dry valleys are also to be found within the council area. The most notable chalk feature within the council area is Loughareema, the vanishing lake. This has been studied extensively by the GSNI in recent years. It is a unique sinkhole feature that becomes inundated with water during high flow conditions causing a lake to form and then drain away through a karstic groundwater system to a spring some 2.5 km downstream in Ballypatrick forest. This site and accompanying spring has the potential to be a popular tourist visitor site but as yet no amenities are available for this, despite the main coast road running through Loughareema.

The area of blue in Figure 1 includes rocks that do not contain significant quantities of water. Only small supplies can be achieved from such rocks, typically capable of supplying single homes or small farms. Groundwater is stored and transported in discrete fractures making it difficult to drill a reliable borehole.

The area of mustard on Figure 1 shows areas of mudstone which do not present reliable prospects for a groundwater supply.

The area also includes a number of significant superficial groundwater aquifers. The Magilligan Foreland is an area of prograding beach ridges and sand dunes containing substantial volumes of freshwater. Sand and gravel deposits near Arroy and Drumbest have in the past been exploited for public water supply with very high yields from boreholes being achieved.

Current Status of Aquifers

In general, the current evidence shows that all of the aquifers within the BCC area are in a healthy state. The Sherwood Sandstone Aquifer (SST) in the Roe Valley is the under-utilised, as are most aquifers in the area.

The quality of groundwater is excellent within the majority of the area and would be expected to exceed drinking water standards. However, in some upland areas, basalt and chalk springs and boreholes can be contaminated by grazing.

An interesting set of conditions exist beneath Coleraine where it appears a steep sided sea gorge has been in-filled with soft deposits. These soft deposits, when drilled have returned water that has a high salinity level. The GSNI has investigated this and discovered that the origin of this salinity is marine and likely from the Bann Estuary. Some industry in Coleraine uses this water but only for non-potable purposes.

Groundwater and LDP

The prospects for groundwater abstraction within the CCGBC area are significant. The combination of the access to both water and transport routes makes the council area an attractive place for

business and industry. In particular the Sherwood Sandstone Aquifer, as shown in Figure 1, has historically provided reliable water supplies. Current groundwater level monitoring suggests that the aquifer is capable of sustaining significantly more abstraction. The coincidence of land zoned for business and industrial use above the SST aquifer would present an attractive prospect to businesses either seeking to expand, locate or relocate. Ensuring that such land remains available for groundwater abstraction is important to ensure the valuable groundwater resource is accessible.

Sustainable Use of Groundwater

It is important that groundwater is used sustainably. Groundwater is recharged from rainfall infiltrating in to the ground. It is important that the rate of abstraction from an aquifer does not exceed the rate of recharge minus the ecological flow requirements of terrestrial water bodies such as rivers and lakes. If it does exceed it, groundwater levels will decline resulting in mining of groundwater.

It is possible to manage this using groundwater monitoring and modelling. Decisions on the capacity of the Sherwood Sandstone aquifer to sustain a level of abstraction should only be made following careful and extensive investigation, monitoring and modelling.

Groundwater Regulation

Groundwater is regulated by the Northern Ireland Environment Agency (NIEA). All abstractions of groundwater over 20 cubic metres per day require an abstraction license from the NIEA to operate. The licensing system operates on a 'first come first served' basis. Therefore once an operator has a license, their investment is protected from others who may wish to use groundwater also.

Groundwater quality is also regulated by measures brought in by the EU Water Framework Directive. These include Nitrate Action Plans to regulate mainly diffuse pollution by land spreading. The Pollution Prevention Control regulations require businesses to operate a license for the appropriate and careful management of all substances used during production processes. The principles upon which these regulations operate are the prevention of any hazardous substance being released in to the environment and the limiting of the release of non-hazardous substances.

Tourism in the Causeway Coast and Glens District Council area

SPSS 6.262 Natural and cultural heritage as tourism assets

Natural and cultural heritage assets have been recognised as tourism assets and the safeguarding of such sites has been identified as essential for maintaining a healthy tourism industry. However, specific mention should be made of the World Heritage Site (Giant's Causeway and Causeway Coast) as this is not only one of the most important tourism assets to Northern Ireland as a whole, but it is the only natural heritage World Heritage Site on the island of Ireland and one of only two in the whole of the UK. Its global context can be understood in that natural heritage World Heritage Sites make up only 2% of all World Heritage Sites worldwide and therefore the Council should consider how to address this in the POP.

The role of the sub-surface in urban planning

The importance of the ground beneath cities and towns is under-recognised and often overlooked. For underground space to remain a societal asset there is a need to plan and manage its use. Consideration should be given to the challenges and opportunities presented by the sub-surface and planning for the use of the sub-surface should be considered in Local Development Plans.

Complex geology, particularly in an urban environment, poses engineering challenges and the underlying geology should be considered early in the planning process to make use of the opportunities that the sub-surface presents, and to avoid unexpected delays and increased costs.

Sustainable Drainage Systems (SuDS)

The sub-surface is relevant to flood management through the use of Sustainable Drainage Systems (SuDS); by mimicking natural drainage systems SuDS can lower flow rates, increase water storage capacity and reduce the transport of pollution to the water environment. However care should be taken to understand the nature of the underlying geology in terms of its groundwater storage capacity and its susceptibility to ground stability hazards. Use of SuDS can improve water quality and enhance the amenity and biodiversity value of the environment.