

# Derry City and Strabane District Council Preferred Options Paper - Minerals

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## Preferred Options – Minerals

The Department welcomes the inclusion of the proposals for mineral development within the Derry and Strabane District Council area within the Economy section of the Planning Options Paper (POP).

Three options are discussed in this section with Option 3 highlighted as the preferred option which is described as a

“Balanced approach, which seeks to promote mineral development in sustainable locations with a focus on the protection of sensitive landscapes and reinstatement of workings.”

The Department for the Economy supports a balanced approach to minerals development although the meaning of the phrase “sustainable locations” in Option 3 is not defined and we would welcome clarification of this phrase.

DfE supports the three elements of this policy option, namely, the promotion of minerals development, the focus on environmental protection and the need to ensure that the timely and proper reinstatement of ‘workings’.

The Department, in conjunction with the Geological Survey of Northern Ireland (GSNI), has produced a [Minerals Information Paper](#) which is published on the DfE website and provides relevant information about minerals (including oil and gas), geothermal energy, groundwater and geohazards in Northern Ireland for use by planners and other stakeholders.

Section 7.67 of the POP outlines the geology of the DSDC area with respect to its mineral potential. The GSNI can provide DSDC with additional information about this topic and a brief summary is given within this response below. (Note: although basalt is present in the county it does not outcrop in the DSDC area which is dominated by generally hard crystalline metamorphic rocks).

Section 7.68 summarises the occurrence, use, extraction and potential impacts of mineral resource development. Several points are important to stress here.

Firstly, minerals can only be worked where they are found and their distribution is uneven across the range of local, regional, national and international scales. In the Northern Ireland context this means that common minerals may be relatively widespread, although concentrated in a few council areas, whereas the presence of other less common but higher value minerals (e.g. gold, silver and other metals) may be important on a regional, national or international scale. This is a reason why DfE would like to consider with Councils the establishment of a NI minerals stakeholder forum which would help to formulate a coherent minerals strategy for Northern Ireland.

Secondly, it is important to distinguish between mineral extraction by surface working (quarrying) and that carried out by underground mining. The former usually relates to large volume, low value materials such as hard rock aggregates or sand and gravel, whereas the latter is usually for precious

metals or metalliferous and non-metalliferous industrial minerals (medium to high value). The potential impacts and many of the planning issues associated with the two types of extraction are generally quite different. Minerals planning policy in Northern Ireland has, historically, been primarily related to surface quarrying – at any one time, 100 to 200 hard rock quarries and sand and gravel pits may be active across Northern Ireland. The nature and planning implications of this type of operation are consequently well understood. By contrast, the underground mining of high value minerals has taken place in Northern Ireland but reached its height in the late nineteenth and early twentieth century and had largely ceased by the 1960's. There is only one active mine (Kilroot salt mine) and any new developments are likely to be few and far between but potentially of greater value and strategic importance and with quite distinct characteristics.

Thirdly, 'sustainable development' has a slightly different meaning when applied to minerals from that used in many other industrial sectors but it should adhere to the aim of 'meeting the needs of the present without compromising the needs of future generations'. In general, there is a move to a 'reduce, recycle, reuse' approach to minerals but, nonetheless, there is likely to be an ongoing demand for new supplies of raw minerals which can only be met by extraction. The types of raw materials required may change (the use of renewable energy sources to replace fossil fuels in the energy mix, and the increasing demand for 'critical' metals used in high tech industries) but mineral extraction will continue into the future. For planning purposes it is important to improve on the legacy of the past where environmental implications of mining practices were not generally considered. DfE supports a minerals planning policy which seeks to minimise/eliminate the potential risks to the environment and health through proper design, operational practice and suitable closure plans, and to maximise the benefits to the local community and the wider NI economy.

The POP document states that the LDP will protect identified Minerals Reserves Areas as well as identifying Areas of Constraint on Minerals Development, in line with the planning framework included in the SPPS. In the case of the former, these are likely to be mainly associated with safeguarding reserves associated with existing quarry sites, in order to protect continuity of supply of common aggregates through the life of the LDP and beyond.

It is important that the integrity of environmentally sensitive areas and areas of special landscape or amenity value are adequately protected. Areas of Constraint on Minerals Development are a planning tool that can be used for this purpose and DfE agrees with their use, provided the policy on 'valuable' minerals outlined in the SPPS is also applied. Paragraph **6.157** states: 'From time to time minerals may be discovered which are particularly valuable to the economy. Their exploitation may create environmental effects which are particular to the methods of extraction or treatment of that mineral. There will not be a presumption against their exploitation in any area, however in considering a proposal where the site is within a statutory policy area, due weight will be given to the reason for the statutory zoning. '

The POP paper also suggests that the "LDP can also consider whether specific 'precious minerals' or 'hydrocarbons' policies are required". The former can perhaps be covered by the guidance given in the SPPS mentioned above. However, the potential for the discovery of gold and silver vein deposits within the DSDC area may mean that a policy specific to these metals should be included in the LDP. With respect to hydrocarbons (oil and gas), the DSDC area does not appear to have any potential for the discovery and development of these resources. The metamorphic rocks that make up most of the

bedrock across the council area have no hydrocarbons potential and the small pockets of Carboniferous rocks that outcrop are too shallow and too close to the margins of the sedimentary basins to be exploration targets. As such, a separate hydrocarbons policy for the DSDC LDP would be superfluous.

## General geology

The Derry City and Strabane District Council (DSDC) area extends from Derry City and Lough Foyle in the north, bounded by the Foyle to the west as far as Strabane, south to West Tyrone (Castleberg and Newtown Stewart), and bounded to the east by the Sperrin Mountains. The bedrock geology is dominated by ancient Dalradian metamorphic rocks, with smaller areas of sedimentary rocks of younger Carboniferous age adjacent to Lough Foyle, in the Newtown Stewart area and in the extreme south of the DSDC area.

Thin layers (from a few metres up to a few tens of metres) of superficial deposits overlie the bedrock in many places and typically consist of widespread glacial till (often known descriptively as 'boulder clay', with glaciofluvial sands and gravels along the flanks of river valleys, thin alluvium on the river floodplains and hill peat on many upland areas.

## Aggregates

Aggregates are an important raw material component in construction materials such as cement, concrete and asphalt. Crushed rock aggregates may be classified as High Specification Aggregates (HSA) for the manufacture of skid-resistant road surfacing material, or as Low Specification Aggregates for general aggregate use.

In the DSDC area the main rock types are metamorphosed sandstones (psammites), siltstones (semi-pelites) and shales (pelites) with minor outcrops of metamorphosed limestones and igneous rocks. The hard psammites, metamorphosed limestones and igneous rocks are often suitable for use as crushed rock aggregates, with some of these rocks having high enough Polished Stone Values (PSV) to be categorised as HSAs. In the past these rocks have also been used in building construction, although the use of finer-grained pelites for roofing slates was displaced by imports from Scotland and Cumbria. In more recent times the distinctive yellow quartzites have been quarried near Claudy for use as building stone. Crushed metalimestones are also used for agricultural purposes.

The Mineral Planning Maps produced by the British Geological Survey and GSNI in 2012 indicate extensive superficial glacial and glaciofluvial deposits in many of the river valleys throughout the DSDC area (Rivers Faughan, Burn Dennet, Mourne, Glenelly, Owenkillew, Strule and Derg). Many of these deposits have been worked to produce fine aggregate for use in the production of concrete, mortar and asphalt. The Derry City and Strabane District Council area is the second largest producer of sand and gravel in Northern Ireland, after the Mid-Ulster Council area.

Glaciofluvial deposits, where sediments were deposited by meltwaters flowing from the ice sheet, are generally well-sorted and better quality whereas ice-contact deposits, deposited directly from the margins of the ice, tend to be poorly sorted, lower quality and of variable thickness. The glaciofluvial

deposits in the Faughan and Strule river valleys are relatively thick and well-developed, and have been the focus for extraction. In contrast, the deposits in the Glenelly and Owenkillew river valleys are more restricted and their potential for extraction is limited by their proximity to environmentally sensitive sites and their location in the Sperrins Area of Outstanding Natural Beauty.

### **High Value Minerals**

Derry City and Strabane District Council area currently has five Mineral Prospecting Licences and live applications completely or partially within the DSDC area. This is the highest proportion of any council in Northern Ireland (covering over 68% of the council area). Whilst prospecting, or exploration, does not usually lead to development, the discovery of significant gold mineralisation elsewhere in the metamorphic rocks of the Sperrins indicates that there is potential for similar mineralisation to be found within the DSDC area. The requirement for a precious mineral policy could therefore be considered to be of relatively high importance for Derry and Strabane, either as a specific policy or by reference to the provisions of the SPPS on mineral deposits of particularly high value.

### **Sustainability of Minerals**

Aggregates, industrial minerals and high value metallic minerals can, by their nature, only be extracted where they occur and, once used they are not renewed on a human timescale. The concept of sustainability for minerals is therefore different to many other types of development although the circular economy principles of reduce, reuse and recycle apply to the sustainable development of minerals.

In terms of the Sustainability Objectives the sustainable development of minerals within the council area can contribute positively to improving health and well-being and sustainable economic growth through the creation of jobs directly and indirectly related to quarrying. Quarrying operations within the Council area can have conflicting impacts on other sustainability objectives – for example, the quarry operations may have some local detrimental effects on air quality but this may be offset by reduced HGV movements that result from local production rather than importing aggregates from outside the council area. In many cases potential negative impacts from quarrying on sustainability objectives such as protecting the environment, landscape character and water resources can be minimised through the use of mitigation measures or proper consideration of these sustainability objectives in individual planning decisions.

### **Energy Minerals**

Hydrocarbons (oil and gas) are commonly regarded as ‘energy minerals’ for the purposes of planning but the potential for finding and producing these resources in the Derry City and Strabane District Council area is extremely low. The metamorphic rocks that form the bedrock across most of the Council area have been heated, folded and faulted to such an extent that any oil or gas that may once have been generated from the original sedimentary rocks has long since been lost. The small pockets of Carboniferous rocks are relatively thin and can be discounted as having any oil or gas potential.

## Sustainable 'earth' energy resources – geothermal energy

There is considerable potential for the use of shallow geothermal energy resources for heating and cooling purposes within the Derry City and Strabane District Council area. The temperature of the ground is similar to the air temperature but, at shallow depths of only a few metres, the temperatures are relatively stable and not significantly affected by seasonal fluctuations in air temperature – at temperatures of about 12°C – 14°C the ground is hotter than winter and cooler than summer air temperatures. Ground source heat pump (GSHP) technology uses the ground's heat energy to provide heating for domestic and non-domestic buildings via horizontal closed loop systems buried at depths of 1 – 2 metres or vertical systems installed in boreholes up to 100 metres deep. Most areas within the DSDC area would be suitable for the deployment of closed loop GSHP systems.

In some locations vertical open loop systems can circulate water through aquifer rocks at depths of a few hundred metres to produce either heating or cooling for buildings according to their seasonal needs. In the DSDC area the potential for the deployment of open loop systems is likely to be limited to a few areas where shallow aquifers exist in areas of thicker glaciofluvial sand and gravel deposits or Carboniferous sandstones.

## Sustainability of energy resources

The development of local conventional hydrocarbons could have varying impacts in terms of the sustainability objectives, but they can be discounted for practical purposes in the DSDC area. The development of small conventional oil and gas fields can contribute to sustainable economic growth and they usually have a small industrial footprint. As a fossil fuel, the burning of oil or gas contributes to carbon emissions and climate change – however, as a substitute for imports, locally produced oil or gas would involve a reduction in carbon emissions. The substitution of gas for oil in the heating sector would also increase energy efficiency and reduce carbon emissions and any gas produced could be fed into the local gas network. However, the potential for the development of oil or gas resources in the DSDC area is considered to be very low.

The greatest reduction in carbon emissions and climate change can be achieved by energy efficiency measures and the use of renewable energy technologies. Wind is by far the most important renewable energy resource in Northern Ireland as far as electricity generation is concerned. Power, heat and transport form the main energy sectors in Northern Ireland and heat has the highest energy demand of these three sectors.

Geothermal energy, from both shallow and deep sources, can play a significant role in meeting part of the heat energy demand in Northern Ireland. **Geothermal energy is a reliable low carbon, sustainable energy resource which can play a significant role in the decarbonisation of the heat sector, particularly where linked to renewable electricity supplies.** Unlike other renewable energy resources such as wind, tidal or solar it is not subject to short term fluctuations – it is available 24/7 and 365 days a year. The other important property of shallow geothermal heat systems is that their heat output is 3F to 4 times the electricity input that the heat pumps use. The main thrust of government energy policy has been on the decarbonisation of electricity and GSHP systems can use electricity generated from renewable sources to meet heat demand whilst only producing very small carbon emissions. The efficiency of deep geothermal energy systems is much greater than shallow GSHP systems but the capital investment involved is also many times higher. Unfortunately the DSDC

area does not contain suitable deep aquifers except perhaps in the immediate vicinity of Derry City and beneath Lough Foyle so the deep geothermal energy potential is low. The DSDC area has considerable potential for the use of shallow geothermal energy and the development of these resources could make a significant contribution towards the energy and climate change sustainability objectives.

### **The role of the sub-surface in urban planning**

The importance of the ground beneath cities 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 incorporated into the Local Development Plan. 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.

### **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.