DERBYSHIRE AND DERBY MINERALS LOCAL PLAN

Towards a Minerals Local Plan:

Winter 2021/2022 Consultation

Proposed Draft Plan

Background Paper

A Methodology to Map Environmentally Sensitive Areas in The Trent Valley

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1   Introduction and Background to the Project

1.1   The Trent Valley was, and in part still is, a distinctive landscape focused on the river; rich in historical features and wildlife. Permanent grasslands for seasonal grazing would traditionally define the floodplain with people living in villages located on the elevated river terraces along the valley surrounded by traditional mixed farming. In the last 50 years these essential qualities have been eroded as a result of new development, mineral working and changing agricultural practices.

1.2   Recent work undertaken by Derbyshire County Council (DCC) as part of the emerging Minerals Local Plan has highlighted the need for a more coordinated approach to planning for landscape change in the Trent Valley and arrest further erosion of its essential qualities. The concept of a forward looking vision for the Trent Valley has already gained the support of many key stakeholders, including the Local Nature Partnership (LNP) for Lowland Derbyshire and Nottinghamshire, a strategic partnership established by the Government to work alongside the Local Economic Partnerships (LEP). The LNP's vision is to help businesses, communities and individuals to create and enjoy the benefits of a better natural environment as part of a sustainable approach to development. A landscape strategy for the Trent Valley has also gained support through recent consultation at the Issues and Options stage and the sand and gravel drop-in sessions.

1.3   The Local Aggregate Assessment 2019, has identified a need for a further 8 million tonnes of sand and gravel to be provided from Derby and Derbyshire by 2036. The requirement to identify further mineral sites to meet this need will place further demands on the landscape, historic and natural environment of the Trent Valley in the short and long-term.

1.4   In this context an important initial step is to identify those areas of the landscape that continue to be of existing value for a range of environmental factors. In assisting the minerals industry and providing certainty to local residents it is

essential that those areas of landscape with significant intrinsic value are identified and retained as part of the developing landscape vision and strategy.

1.5 The overall aims of this project are:

- to adopt an holistic approach to identify those areas of landscape considered to be of multiple environmental sensitivity relating to ecology, historic environment and landscape attributes

- to identify those areas which might thus be considered most vulnerable or sensitive to development related impacts, and those areas which might be considered comparatively less sensitive

- to develop a methodology that uses landscape characterisation as a spatial framework for the analysis of other environmental data allowing the outputs to nest within National, Regional and Countywide landscape character initiatives[1]

- to establish a framework that allows for the assessment of the whole of the Trent Valley landscape in accordance with the principles of the European Landscape Convention and to indicate broadly how sites should be restored within the context of the landscape character assessment

- to utilise a Geographic Information System (GIS) as a tool for analysing and collating known environmental datasets and presenting the outputs spatially.

1.6 The assessment undertaken by the DCC's Conservation and Design Section in response to the project aims included:

- utilising data collected as part of the Derbyshire Landscape Character Assessment

- the analysis of data produced as part of the Derbyshire Historic Landscape Character Assessment and held in the Historic Environment Record (HER)

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[1] National Character Areas (NCA) as defined by Natural England (formerly Countryside Commission/Countryside Agency), the East Midlands Landscape Framework (2010) by Natural England (former East Midlands region), and the Landscape Character of Derbyshire (2003), Derbyshire County Council.

- the analysis and collation of various data sets relating to known habitat information and Environmental Stewardship (Higher Level) Scheme agreements aimed at managing ecological interests.

- a desk-based analysis of aerial photographs and maps to identify areas of landscape that remain currently intact, including the ground-truthing of identified areas.

2   Methodology

2.1   In order to define these areas of environmental value, it was necessary to identify a spatial framework within which to assess, analyse and collate the environmental data held and managed by DCC. It was also important that the spatial unit was robust, meaningful and operated at an appropriate scale to deliver a strategic assessment and yet respond to the underlying character of each Landscape Character Type and National Character Area (NCA).

2.2   It was decided that the most appropriate spatial unit for undertaking this exercise was the Land Cover Parcel (LCP); the smallest building block of the Derbyshire Landscape Character Assessment. In general terms, LCPs are distinct and relatively homogenous units of land defined by a number of attributes relating to:
- physiography - the relationship between geology and landform
- ground type – the relationship between geology and soils
- landcover – a reflection of surface vegetation; both land use and tree cover
- cultural pattern – an assessment of settlement and enclosure pattern, and farm type.

2.3   Not only do LCPs provide a meaningful and structured spatial framework for the analysis of other environmental data, they also provide full coverage of the Trent Valley. Furthermore, all LCPs are mapped digitally and form part of a GIS allowing for various data sets to be compared through a process of overlay and query mapping.

2.4   In general terms, those landscapes of highest environmental value will be areas where the landscape remains intact visually and structurally, have strong historic and cultural identity, contain expanses or multiple areas of semi-natural habitats, with associated linkages appropriate to the character of the area, and have evidence of appropriate land management practices.

2.5   Sections 2.6, 2.7 and 2.8 that follow, describe how each of these indicators was assessed. Sections 2.9 and 2.10 conclude the methodology, describing how the historic, ecological and landscape indicators have been brought together to map environmentally sensitive areas.

Ecological Data

2.6   The DCC Ecologist is in receipt of various data sets relating to the biodiversity of the county many of which are now held electronically in a GIS. The main objective of this exercise is to identify those areas of significant ecological value by identifying and taking account of a range of habitat types that contribute to biodiversity and the landscape character of the Trent Valley. In addition to this, data relating to Environmental Stewardship (ES) agreements have also been included as a measure of appropriate, proactive and sustainable land management of valued habitat features across the Trent Valley. To identify areas of highest environmental value it was decided that only Higher Level Schemes would be included from the ES database as this funding tends to require more exacting qualification criteria – i.e. reflecting the value of qualifying features for nature conservation.

2.7   As a result the following spatial data sets were amalgamated into a single overlay of ecological data:
- Ancient woodland (including woods under 2Ha).
- Local Wildlife Sites.
- Environmental Stewardship Agreements.
- Countryside Stewardship Schemes.
- Regionally Important Geodiversity Sites (RIGS).

2.8   These datasets were chosen specifically as a means of identifying those areas of landscape where there are numerous intact and connected semi-natural habitats across the Trent Valley. In this context local wildlife sites designated from former gravel workings have been excluded from the assessment as it was felt these designations do not reflect areas of intact landscape or remnant habitat. Furthermore these habitats can be recreated through restoration and are unlikely to be worked in any case because the mineral reserve is likely to have already been removed.

2.9   National designations for the natural environment have also been excluded from the assessment for similar reasons outlined above. The majority of Sites of Special Scientific Interest (SSSI) in the Trent Valley are former sand and gravel workings and the fact that they are designated conveys a significant degree of protection with respect to future mineral extraction and site allocation.

2.10   The amalgamation of the above datasets creates a single 'ecological resource' layer, identifying all areas which have been identified as supporting habitats of notable ecological value. NB. Where datasets, such as local wildlife sites and HLS agreements overlap with each other, then the combined dataset is amalgamated so that the same area is only counted once.

2.11   The combined dataset was then analysed within the spatial framework of the LCP to calculate the total area coverage of ecological interest within each LCP expressed as a percentage.

        Note: the mean average for the ecological dataset is 11.48% - see below

Historic Environment Data

2.12   Assessment of the historic environment draws its data from two sources; the Historic Landscape Character Assessment (HLCA) and the Historic Environment Record (HER) both managed by the DCC Archaeologist. The HLCA essentially divides the landscape into a series of pre-defined land-use and field morphology categories based on historic map evidence. For the

purpose of this exercise it was decided areas of intact irregular and fossilised strip fields were the most important with respect to the historic landscape and the most sensitive to change. These areas of landscape have longer time depth, are impossible to replicate and are often associated with other historic features such as ancient hedgerows that are worthy of retention.

2.13　In addition to these areas of earliest enclosure, it was also decided to include specific heritage asset data taken from the HER, which again was considered to be a measure of intact landscape and contribute to the overall historic value of a LCP. The specific features chosen tend to be above ground earthworks such as ridge and furrow, which contribute to the overall character and visual distinctiveness of the landscape and are a further measure of the longevity of the landscape in these areas. Selected records included:

- palaeochannels
- above ground earthworks as identified in the SHINE (Selected Heritage Inventory for Natural England) project.

2.14　Again data relating to historic environment designations such as Conservation Areas, Scheduled Monuments and Historic Parks and Gardens were excluded from the assessment because, the designation (and its setting) conveys a significant degree of protection with respect to future mineral extraction and site allocation.

2.15　As with the ecological data this information was combined into a single overlay of historic environment data, ensuring that duplicate areas were only counted once. This information was analysed within the spatial framework of the LCPs with total coverage expressed as a percentage.

Note: the mean average for the historic environment dataset is 25.34% - see below

Landscape Data

2.16　Landscape data informing this project has been developed from an

independent desk top assessment and visual appraisal of aerial photographs and maps using a GIS. The assessment involved identifying 'Areas of Landscape Interest' by defining areas of landscape that appear to be visually intact and representative of the wider landscape character description when comparing recent aerial photographs with earlier photos and historic maps. To ensure the overall validity of this data these areas have been ground-truthed by further field work.

2.17   As with the other data sets this information was then analysed within the spatial framework of the LCP with total coverage expressed as a percentage.

Note: the mean average for the landscape dataset is 22.40% - see below

Identifying the Environmental Sensitivity of Each LCP

2.18   It was decided that for each dataset, 'significant percentage cover' of an LCP is defined as that which is above the 'average' % coverage i.e. LCPs which are above 'average' for each of the datasets are considered to hold significant interest. The average was calculated as the mean value.

2.19   The thresholds for each dataset were as follows:
- Ecology - >= 11.48 %.
- Historic environment - >= 25.34%.
- Landscape - >= 22.40%.

Defining Areas of Environmental Sensitivity

2.20   Having selected the individual significance thresholds, as outlined above, the overall value of each LCP was defined through the correlation of the individual datasets and colour coded on the supporting map. Four zones have been identified, as set out below:
- **Purple Zone** – where an LCP was recorded as significant for each of the individual datasets.
- **Dark Red Zone** - where an LCP was recorded as significant for at least

two of the individual datasets.

- **Medium Red Zone** – where an LCP was recorded as significant for one of the individual datasets.

- **Pink Zone** – where an LCP was recorded as having no significance with respect to any of the individual datasets.

2.21 Each of these zones is considered important for the strategic planning of the Trent Valley, informing the emerging Minerals Local Plan, and upholding the principles of the European Landscape Convention.

2.22 The Purple and Dark Red Zones are clearly the areas of highest environmental value and would be most vulnerable or sensitive to mineral extraction pressures and most vulnerable to change. These areas will attract a strong focus on conservation through protection of their intrinsic environmental value.

2.23 The Medium Red Zone retains some environmental value with respect to one of the datasets used but are weaker in other areas. These areas will attract a strong focus on the Management (Conservation and Enhancement) of these areas; that is maintaining those features of existing value but also addressing those in decline e.g. landscape restoration, habitat creation, etc.

2.24 The Pink Zones are not identified as being of strategic landscape value although that is not to say that there aren't pockets of land of some environmental value. These areas would benefit from a strong forward looking Planning (Restoration/creation) strategy.

2.25 Overlaying each of the defined zones are the National Designations (as set out above) that impose their own specific constraints with respect to future mineral working. These designations operate in addition to each of the strategies outlined above.

2.26 It is important to acknowledge the relevance of this work to the strategic planning of mineral working in the Trent Valley and in developing a landscape

vision and restoration strategy for the future. The Pink Zone areas shouldn't be interpreted simply as a 'yes' for mineral planning purposes as there are clearly environmental issues associated with these areas, such as national designations and local interests. Equally, the Purple Zone should not be interpreted as 'no' although it is clear that these areas are environmentally sensitive across multiple disciplines, are most likely to be environmentally constrained, and development in this area is most likely to result in multiple environmental impacts, even if the designated sites and features are avoided.

3   Findings

3.1   The resultant areas identified by the methodology have been verified by some field survey work. Within the study area the overall breakdown of the identified zones is:

- Purple and Dark Red Zones – 36%
- Medium Red Zone – 24%
- Pink Zone – 40%.

3.2   Of the total land area of the Trent Valley, the area with the greatest environmental constraint tends to be concentrated towards the west of the Trent Valley and along the lower reaches of the Dove Valley. Other pockets of value are then scattered through the remaining Trent Valley most notably associated with land to the north of Repton and around Elvaston Castle and Park.

3.3   Conversely the light red areas are associated mainly with the eastern end of the Trent Valley, often in association with existing gravel extraction sites such as those around Barrow-upon-Trent and Shardlow. Overall, in these areas mineral development is less likely to be constrained by environmental issues.

Environmental Sensitivity Mapping
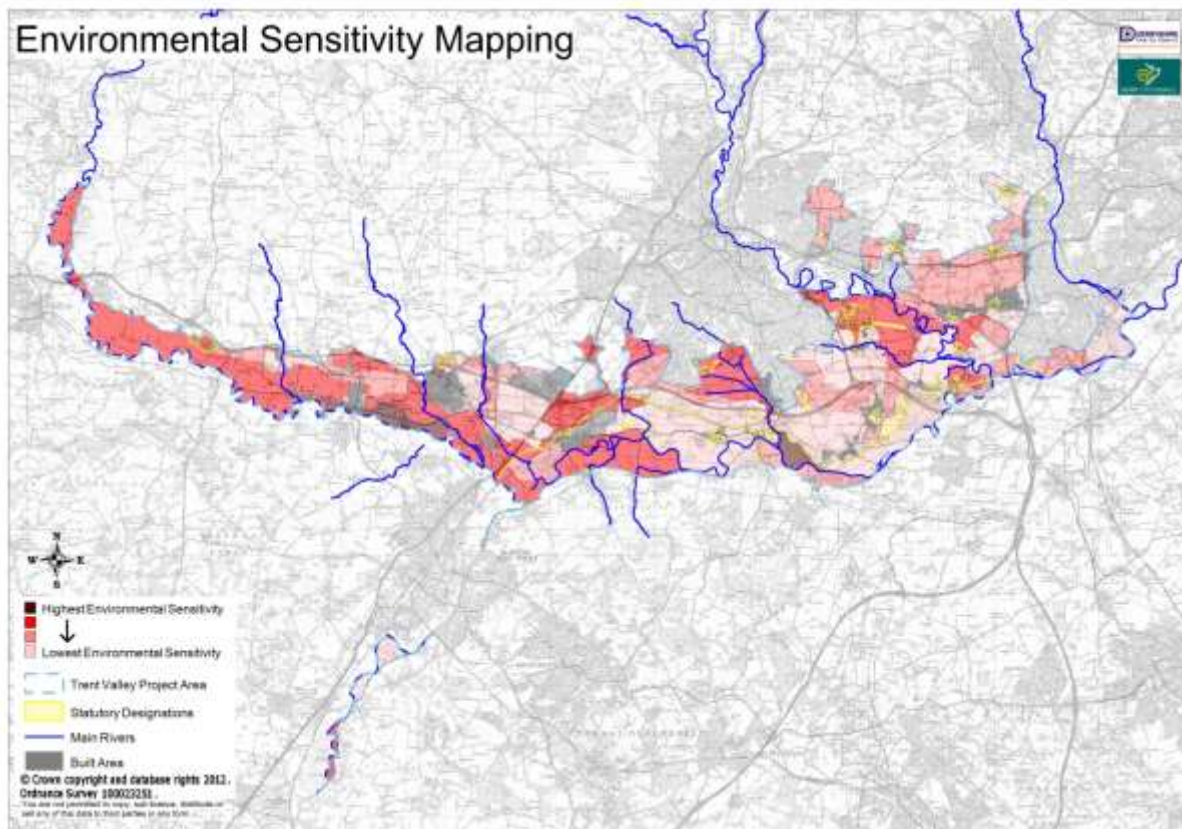
4   Summary and Conclusion

4.1   Overall, the methodology outlined above has allowed for different datasets to be analysed within a spatial framework to identify those areas of landscape that are considered to be of greatest sensitivity with respect to landscape character, biodiversity and the historic environment. At the same time, the spatial framework selected for the assessment nests within the Landscape Character Types identified in the Derbyshire Landscape Character Assessment and in turn these sit within the Regional Landscape Character Types and the National Character Areas.

4.2   This is the first attempt at establishing a strategic environmental baseline for land-use planning within the Trent Valley through the assessment of its current assets relating to landscape character, ecology and the historic environment. This work is an important environmental baseline to inform the emerging Minerals Local Plan and feed into a wider landscape vision and strategy for the Trent Valley, as supported by various stakeholders including the LNP for

Lowland Derbyshire and Nottinghamshire.   A landscape strategy will ensure that future mineral allocation and extraction can proceed in a sustainable and coordinated manner, providing certainty to the mineral industry and those local communities who have to live with the impacts of mineral workings.