

BRITISH GEOLOGICAL SURVEY DETR SHROPSHIRE (including Telford & Wrekin)

A Summary of Mineral Resource Information for Development Plans: Phase One Mineral Resources (other than Sand and Gravel)

Scale 1:100 000

Compiled by D.J. Harrison, E. Haugh, S. Holloway, K.A. Linley, D.E. Highley, D. Schofield, G. Warrington and D. Wilson. Project Leader: D.E. Highley. Planning Consultant: J.F. Cowley, Mineral and Resource Planning Associates. Digital cartography by G. Simpson, British Geological Survey, Keyworth.

Production of this map was commissioned and funded by the Department of the Environment, Transport and the Regions (Contract MPO624).

Topography based on the Ordnance Survey 1:100 000 scale County maps. © Crown Copyright 1987. Ordnance Survey licence number GD272191/1997. Digital SSSI and NNR boundaries © English Nature 1996.

Positions of Scheduled Monuments at 31st March 1994 as supplied by English Heritage. The majority of monuments are plotted using a centred NGR summit. Consequently the actual area and/or length of a monument protected by the legal constraints of scheduling cannot be represented here. Monuments scheduled since that date are not accounted for. Digital AONB boundaries © Countryside Commission 1986.

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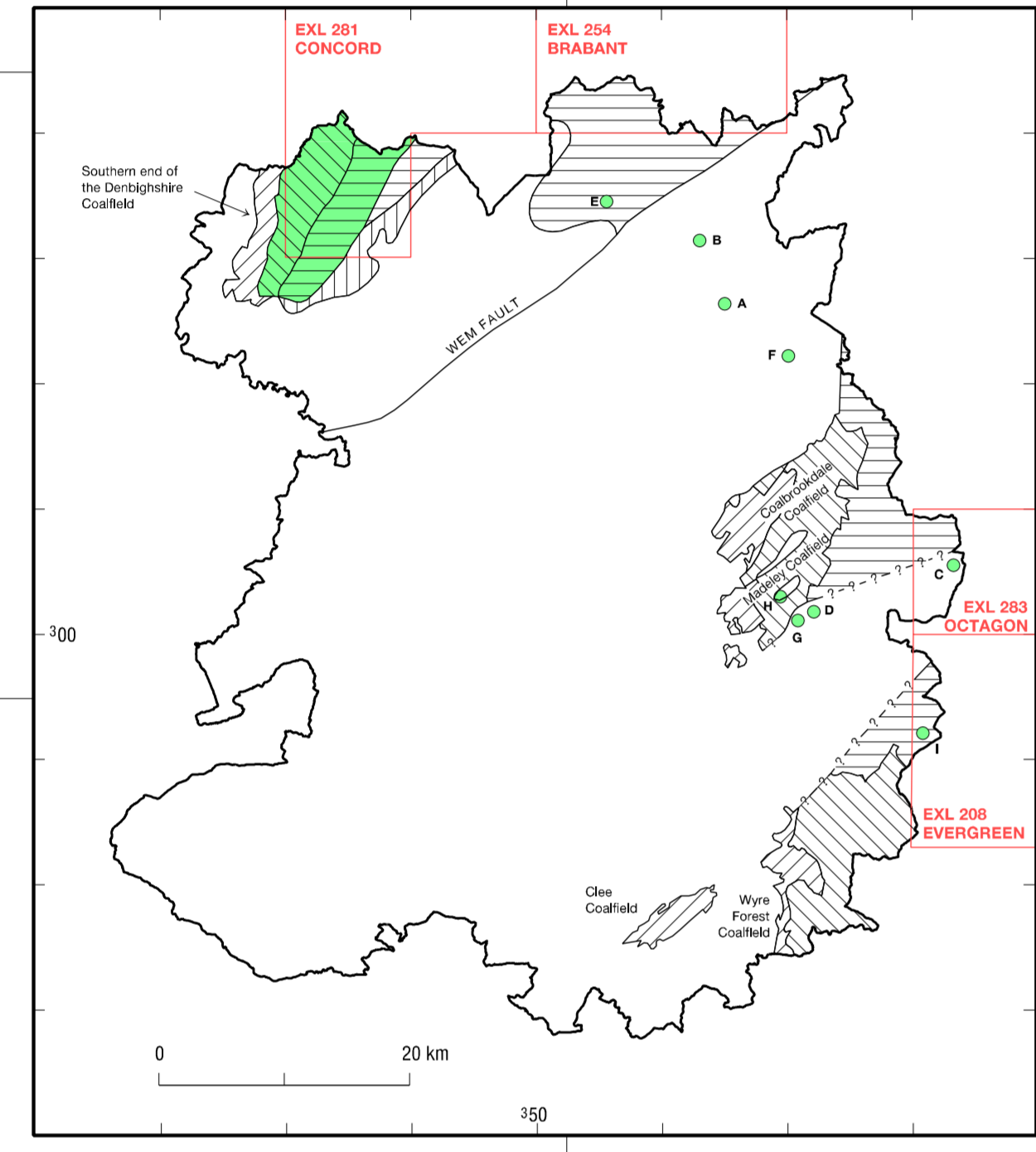
AIMS AND LIMITATIONS The purpose of the maps and associated reports in this series is to show the broad distribution of those mineral resources which may be of current or potential economic interest and to make these resources available to interested parties... The maps have been produced by collating and interpreting of mineral resource data... The mineral resource data presented are based on the best available information, but are not comprehensive and that they are subject to change... The maps should not be used to determine individual planning applications or in taking other decisions on the availability or use of a particular class of land, although they may give valuable background information which sets a specific proposal within context.

Rock Salt Halite (sodium chloride, NaCl) or 'rock salt' underlies about 240 sq. km of north Shropshire. The resource comprises two salt-bearing formations which are present within the Triassic Mercia Mudstone Group in the southern part of the Cheshire Basin. The salt deposits are concealed by younger rocks. Salt does not crop out, because of solution, but has a concealed crop, or 'wet-rock head', masked by collapsed strata and younger deposits. These areas, together with the subsurface extent of the deposits, are shown on the map. The very large rock salt resources of the Cheshire Basin are worked by both brine pumping and underground mining in the northern part of the basin in Cheshire. There has been no rock salt or brine extraction in Shropshire.

Coal Coal-bearing strata occurs at several locations in Shropshire. Commercial interest is likely to be confined to those deposits suitable for opencast extraction. The Coalbrookdale Coalfield has been, and remains, the principal source of coal in the county. Since the closure of the Granville colliery in 1970, production has been entirely by opencast mining, which originally started during the Second World War. The development of Telford New Town in the 1970s also provided the impetus to combine opencast operations with an extensive programme of land reclamation. The coalfield has been intensively worked and only limited sites remain. Opencast coal resources have been mainly defined by including all the seams from the Little Flint to the Fungous Coal. The main opencast resources occur in the lower part of the coal-bearing sequence in the north-western part of the coalfield and to the south of the Ironbridge Gorge. Elsewhere, the only area to have been worked in recent years is the Cleve Coalfield where coal was recovered during overburden removal to extract dolerite for aggregate. The resource potential of the Oswestry Coalfield is believed to be poor and has been shown as a different ornamentation. The Wye Forest and Shrewsbury coalfields are believed to have very limited potential for opencast extraction and are not shown on the main mineral resource map. The areas of former opencast coal sites shown mainly reflect the limits of coal extraction, although in some cases they are site boundaries. No claim is made for the accuracy or completeness of this information. More detailed information on specific sites may be obtained from the Coal Authority.

Clay and Shale, including Fireclay The Etruria Formation (formerly the Hadley Formation) is the principal brick clay resource in Shropshire. It crops out on the periphery of the Coalbrookdale Coalfield and is thickest in the north, but thins southwards, in which direction the proportion of sandstone also increases. The outcrop of the Etruria Formation is shown on the map. Large parts of the resource have been stabilised by urban development, but the formation is worked at two sites near Telford and one near Caughley for the manufacture of bricks and paviors, both locally and outside the county. The Rubicon Formation of the Oswestry area is also the local equivalent of the Etruria Formation. It is almost entirely concealed beneath glacial deposits and only a very limited outcrop is shown on the map. Brick clay is also produced from the Salop Formation at Knowlesands, near Bridgnorth. The clay is used as a minor blend at brickworks located outside the county. The brickmaking potential of the mudstones of the Salop Formation is largely unknown. The extent of the Salop Formation and other mudstone-bearing formations is, therefore, not shown on the map. Fireclays typically occur beneath coals with which they may be worked in opencast sites. Although originally used as a refractory raw material, some fireclays may have relatively low iron contents compared with other brickmaking clays and are now valued mainly for the manufacture of buff-colored facing bricks and paviors. The Coalbrookdale Coalfield has historically been an important source of fireclay and continues to be one of the main centres of fireclay production in Britain. Extensive areas have been worked out. Fireclay resources are largely coincident with opencast coal resources, although those of most economic interest occur in the upper part of the Lower Coal Measures.

Secondary aggregates Secondary aggregates are the waste, or by-products, of mineral extraction and processing operations, certain industrial processes and the demolition of man-made structures that may find application as alternatives to primary aggregates. They exhibit highly variable properties and their production and use may not always be environmentally or economically desirable. There are very limited resources of secondary aggregates in Shropshire. Coal-fired power stations burn pulverised coal as fuel and the main residue is a fine-grained powder called Pulverised Fuel Ash (PFA). It accounts for most of the ash produced at power stations, the remainder being Furnace Bottom Ash (FBA). The only coal-fired power station in Shropshire is Ironbridge (1000 MW). All the PFA is sold as a lightweight aggregate for use in concrete block manufacture and for hardcore. Currently only some 10 per cent of the PFA is sold, primarily for bulk fill for road construction, but some is also used for grouting old mine workings and as an additive in concrete products. Colliery spoil is the waste from mining and processing coal. It consists mainly of mudstone and siltstone. Former tips have largely been reclaimed/restored and are not available for use. Waste tips from former lead-zinc mining operations occur in the Shelve district. Calcite has been recovered in the past. The waste is largely unsuitable for use as secondary aggregate because of its variable composition and the presence of sulphides, which present a potential pollution risk if disturbed.



HYDROCARBON WELLS OF SHROPSHIRE

Well Name	Operator	Depth (m)	Production
1. Telford 1	Shell Exploration Co Ltd	1000	Oil
2. Telford 2	Shell Exploration Co Ltd	1000	Oil
3. Telford 3	Shell Exploration Co Ltd	1000	Oil
4. Telford 4	Shell Exploration Co Ltd	1000	Oil
5. Telford 5	Shell Exploration Co Ltd	1000	Oil
6. Telford 6	Shell Exploration Co Ltd	1000	Oil
7. Telford 7	Shell Exploration Co Ltd	1000	Oil
8. Telford 8	Shell Exploration Co Ltd	1000	Oil
9. Telford 9	Shell Exploration Co Ltd	1000	Oil
10. Telford 10	Shell Exploration Co Ltd	1000	Oil

Sandstone Sandstones are widely distributed in Shropshire in strata ranging from Precambrian to Triassic age. Only a few are of current economic interest, the most important being those used as sources of roadstone. A thick and extensive sequence (>1500 m) of Precambrian (Longmyndian) greywackes (impure sandstones) occupy relatively high ground near Shrewsbury. They are of high strength and yield aggregates with a high resistance to polishing and provide an important resource of road surfacing aggregates with PSVs in excess of 65. Similar material occurs locally within the Myton Flags (Ordovician) between Bishop's Castle and Pontesbury and provides a source of premium grade road surfacing aggregates with a PSVs in excess of 68. The outcrop of a number of sandstone formations of Lower Palaeozoic and Carboniferous age are also shown on the map. Their aggregate properties are largely unknown, although the Wrekin Quartzite (Cambrian) has been worked for aggregate in the recent past. Carboniferous sandstones in the Telford area have been excluded. Triassic sandstones within the upper part of the Sherwood Sandstone Group are quarried on a small scale for building stone and flagstone at two quarries, Grinshill and Webscott, near Wem. Elsewhere in Shropshire, Triassic sandstones at this horizon are largely obscured by glacial overburden, or their suitability for building stone is unknown. Only outcrops in proximity to the existing quarries are shown on the map.

Igneous Rock Igneous rocks of variable composition crop out at a number of widely scattered locations in western, central and southern Shropshire. Many outcrops are too small, or are of unsuitable quality, for aggregate production. Igneous rocks are classified as either intrusive (formed from magma solidified below the earth's surface) or extrusive (formed from lava and volcanic ash erupted at the earth's surface). In general, intrusive rocks tend to be of more consistent quality for aggregate production. Igneous rock is currently extracted at three sites. A dolerite sill is worked at Cleve Hill, near Ludlow, primarily for roadstone, and Precambrian (Uronian) volcanic rocks are worked for general aggregates use at Leaton, near Telford. A thin dolerite dyke is worked within the Callow Hill sandstone quarry, near Minsterley, and dolerite was formerly worked at More Quarry, near Bishop's Castle. An intrusive igneous rock (keratophyre) was until recently worked for roadstone at Bowdler, near Oswestry. A number of other igneous rock quarries have been worked in the past.

LIMESTONE

Light blue	Limestone
Dark blue	Dolomite
Light green	Limestones, including interbedded mudstones / siltstones

SANDSTONE

Yellow	Greywacke (impure sandstone)
Orange	Quartzitic sandstone
Light orange	White / red sandstones (building stones)

IGNEOUS ROCK

Dark blue	Intrusive (dolerite, keratophyre)
Light blue	Extrusive (lavas and volcanic ash)

COAL

Green	Areas of shallow coal (Coalbrookdale and Cleve Coalfield)
Light green	Speculative areas of shallow coal (Oswestry Coalfield)
Red	Opencast coal: Worked area

CLAY

Purple	Etruria Formation: principal brick clay resource
Light purple	Rubicon (Etruria) Formation (exposed area near Oswestry)
Dark purple	Fireclay

SALT

Light blue	Salt (area influenced by groundwater solution - 'wet rock head')
Dark blue	Subsurface extent of salt-bearing strata

MINERAL PLANNING PERMISSIONS (as at 1.1.98)

Source: Shropshire County Council

Surface planning permission (valid and expired)

MINERAL WORKINGS

Black dot	Cleve Hill
Black dot	Bowdler

Active site

Inactive, worked-out and/or restored site

Mineral commodity

Lst	Limestone
Sst	Sandstone
Co	Coal
Cl	Common clay shale
Fr	Fireclay
Sagg	Secondary Aggregates

COAL LICENCE AREAS (as at July 1997)

Source: The Coal Authority

Yellow	Opencast coal site (producing sites)
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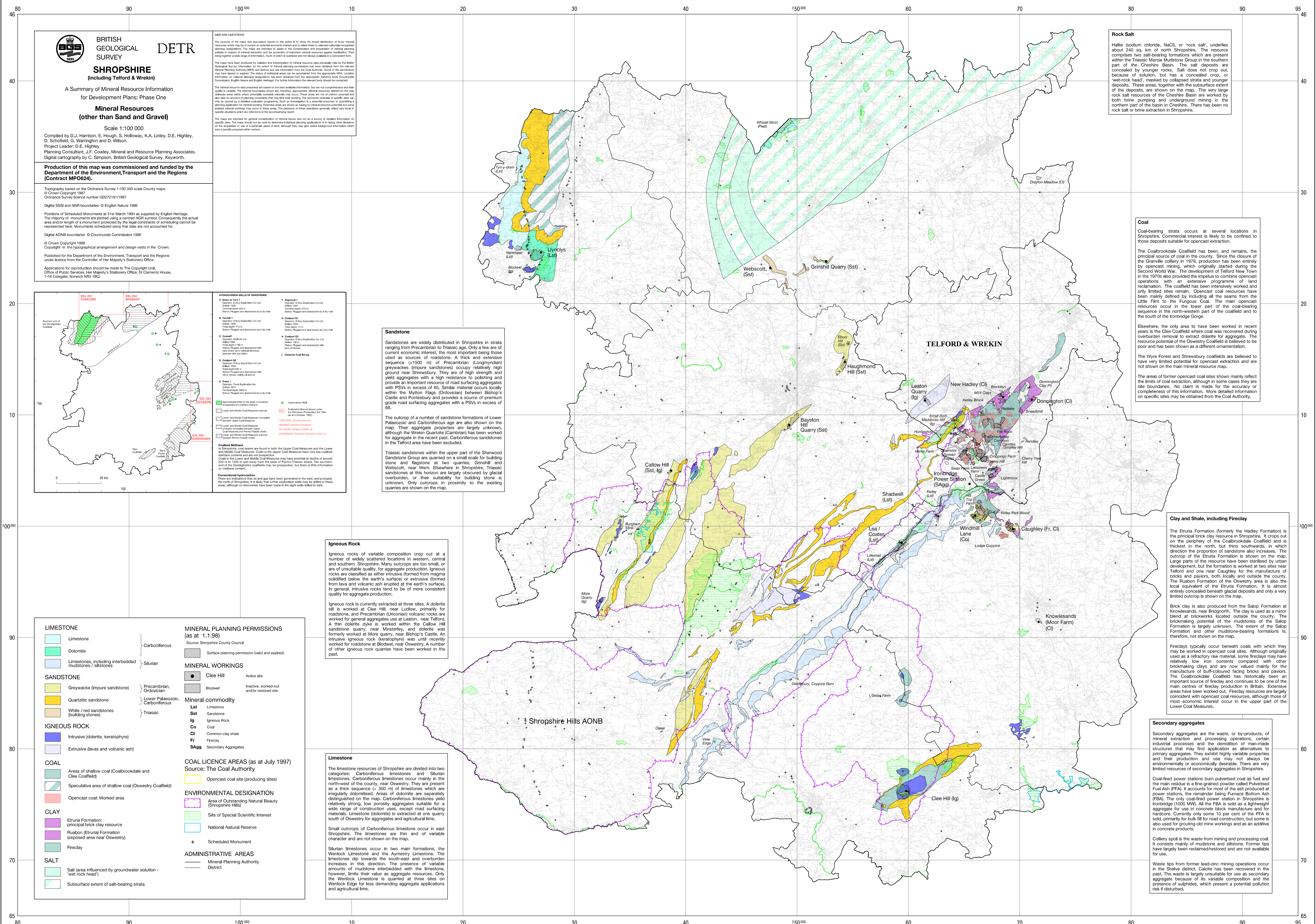
ENVIRONMENTAL DESIGNATION

Blue	Area of Outstanding Natural Beauty (Shropshire Hills)
Light blue	Site of Special Scientific Interest
Light blue	National Natural Reserve
Black dot	Scheduled Monument

ADMINISTRATIVE AREAS

Black line	Mineral Planning Authority District
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Limestone The limestone resources of Shropshire are divided into two categories: Carboniferous limestones and Silurian limestones. Carboniferous limestones occur mainly in the north-west of the county, near Oswestry. They are present as a thick sequence (> 300 m) of limestones which are irregularly dolomitised. Areas of dolomite are separately distinguished on the map. Carboniferous limestones yield relatively strong, low porosity aggregates suitable for a wide range of construction uses, except road surfacing materials. Limestone (dolomite) is extracted at one quarry south of Oswestry for aggregates and agricultural lime. Small outcrops of Carboniferous limestone occur in east Shropshire. The limestones are thin and of variable character and are not shown on the map. Silurian limestones occur in two main formations, the Wenlock Limestone and the Aymestry Limestone. The limestones dip towards the south-east and overburden increases in this direction. The presence of variable amounts of mudstone interbedded with the limestone, however, limits their value as aggregate resources. Only the Wenlock Limestone is quarried at three sites on Wenlock Edge for less demanding aggregate applications and agricultural lime.





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AIMS AND LIMITATIONS
 The purpose of the maps and associated reports in this series is to show the broad distribution of those mineral resources which may be of current or potential economic interest and to make these to selected nationally-recognised planning designations. The maps are intended to assist in the consideration and preparation of development plan policies in respect of mineral extraction and the protection of important mineral resources against destruction. They bring together a wide range of information, much of which is scattered and not always available in a convenient form.
 The maps have been produced by collation and interpretation of mineral resource data principally held by the British Geological Survey. Information on the extent of mineral planning permissions has been obtained from the relevant Mineral Planning Authority (MPA). Some of these permissions may have lapsed or expired. The status of individual areas can be ascertained from the appropriate MPA. Location information on national planning designations has been obtained from the appropriate statutory body (Countryside Commission, English Nature and English Heritage). For further information the relevant body should be contacted.
 The mineral resource data presented are based on the best available information, but are not comprehensive and their quality is variable. The mineral boundaries shown are, therefore, approximate. Mineral resources defined on the map delineate areas within which potentially workable minerals may occur. These areas are not uniform: potential also takes no account of planning constraints that may limit their working. The economic potential of specific sites can only be proved by a detailed evaluation programme. Such an investigation is essential prior to submitting a planning application for mineral workings. Suitable areas are shown as having no mineral resource potential, but some isolated mineral workings occur in these areas. The presence of these workings generally reflect very local or specific situations which are referred to in the accompanying report.
 The maps are intended for general consideration of mineral issues and not as a source of detailed information on specific sites. The maps should not be used to determine individual planning applications or in taking other decisions on the acquisition of land, although they may give useful background information which sets a specific proposal within context.

Sand and Gravel
 The map shows the distribution of sand and gravel resources, principally those that are gravel-bearing. Two main categories are defined: (i) Superficial (drift) deposits, subdivided into river sand and gravel and glacial sand and gravel; and (ii) Bedrock (solid) deposits, represented by pebbly sandstones of the Triassic Sherwood Sandstone Group. The latter are not currently worked in Shropshire.

Bedrock Deposits
 Bedrock resources are confined to the pebble-bearing formations of the Triassic Sherwood Sandstone Group (formerly termed the 'Bunter Pebble Beds'). In northern Shropshire this comprises the Chester Pebble Beds Formation and in eastern Shropshire the Kidderminster Formation. Both formations are concealed by superficial deposits over extensive areas and only exposed areas are shown on the map. Some outcrops are concealed by gravel-bearing superficial deposits. Although an important resource in adjacent parts of Staffordshire, these formations are not worked in Shropshire and have only been worked on a minor scale in the past. Quantitative data on the thickness, extent and pebble content of conglomerate horizons within these formations are not available. Where devoid of pebbles the Sherwood Sandstone is generally of limited value as an aggregate resource because of its fine particle size.

SAND AND GRAVEL

- Superficial Deposits**
- River sand and gravel resources
 - Glacial sand and gravel resources at outcrop
 - Concealed glacial sand and gravel resources (only within areas assessed by BGS)
 - Approximate southern limit of till (boulder clay) areas containing bodies of potentially workable sand and gravel
- Bedrock Deposits**
- Outcrop of Chester Pebble and Kidderminster formations (formerly 'Bunter Pebble Beds') } Triassic, Sherwood Sandstone Group
 - Boundaries of areas assessed for sand and gravel at the indicated resource level

MINERAL PLANNING PERMISSIONS (as at 1.1.98)

Source: Shropshire County Council

Surface planning permission (valid and expired)

MINERAL WORKINGS

- Gonsal Quarry Active site
- Norton Farm Inactive, worked-out and/or restored site

Mineral commodity

Sg Gravel

ENVIRONMENTAL DESIGNATIONS

- Area of Outstanding Natural Beauty (Shropshire Hills)
- Site of Special Scientific Interest
- National Nature Reserve

ADMINISTRATIVE AREAS

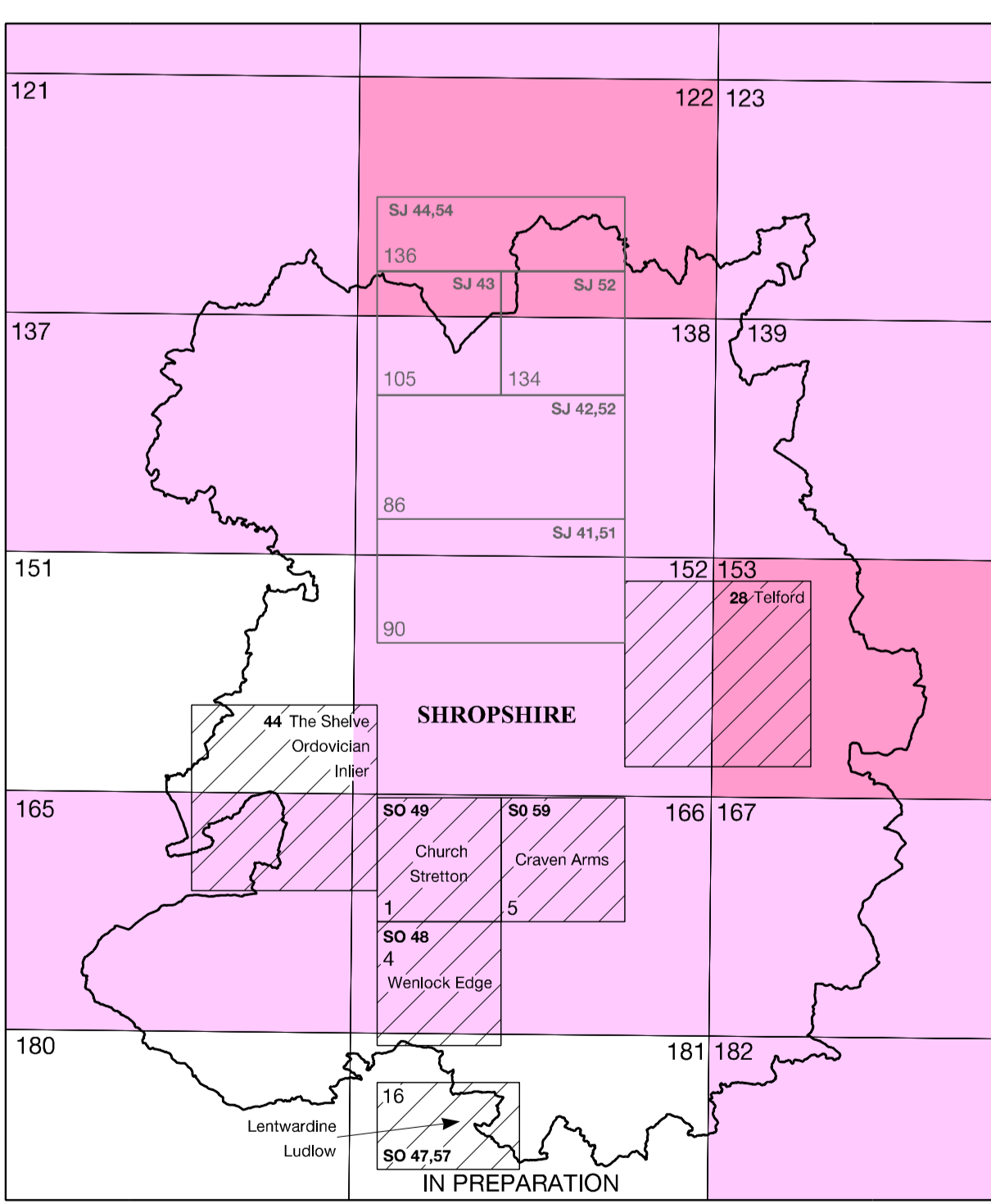
- Scheduled Monument
- Mineral Planning Authority
- District

Superficial Deposits

Superficial deposits cover large parts of the county, particularly in the north. Post-glacial (late-glacial and Flandrian or Recent) river terrace and alluvial deposits are developed along the major river valleys, including those of the Severn, Teme, Onny and Tern. The deposits comprise relatively gravel-rich sand and gravel. Glacioluvial outwash (sandur and valley sandur) deposits comprise relatively sand-rich sand and gravel laid down beyond the glacial ice margin. These have been variously termed 'late-glacial flood gravels' and 'fluvioglacial sand and gravel' on some published maps. They are included with river deposits as they typically occur both beneath low terraces marginal to alluvial deposits and underlying the deposits of river flood plains. This close association with river deposits generally precludes them from being clearly differentiated on some older published maps.

In contrast to river deposits, glacial sand and gravel was deposited by streams flowing on top, within and beneath ice sheets. These deposits are the principal source of sand and gravel in Shropshire. They are closely associated with till and frequently occur as concealed bodies within or beneath this material. They may also grade into till as fines content increases. The delineation of resources is, therefore, difficult.

Parts of the county assessed for sand and gravel by the BGS and other organisations are identified on the map. Within these areas the extent of sand and gravel resources, including the possible extent of glacial sand and gravel beneath till, is based on these studies. These concealed sand and gravel resources were defined by overburden to mineral ratings. Outside resource assessment areas data are more limited and only glacial sand and gravel at outcrop is shown. Resources concealed beneath till may, therefore, be extensive in some areas. Narrow spreads of alluvial deposits are included on the map for completeness but their limited width is likely to preclude economic working of any sand and gravel present.



- 1:50 000 map published
- 1:63 360 map published
- 1:25 000 map published (The Classical areas of British Geology Series)
- 1:25 000 map published (Industrial Mineral Assessment Sand and Gravel Resource map)
- Modern geological maps not available

