| _      | 30                                                                                                                                                                                                                                                                                                                                                                                                                          | 40 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |                                                                                                                                                                                                                                                                                                                                                                                                                             | BGS maps covering East Riding of Yorkshire, North Lincolnshire, North East Lincolnshire                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|        | British<br>Geological Survey Office of the<br>Deputy Prime Minister                                                                                                                                                                                                                                                                                                                                                         | and Kingston upon Hull 54 55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|        | 1835 NATURAL ENVIRONMENT RESEARCH COUNCIL                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                             | 63 64 65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|        | HUMBERSIDE<br>(comprising East Riding of Yorkshire, North                                                                                                                                                                                                                                                                                                                                                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|        | Lincolnshire, North East Lincolnshire and                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 70 -   | City of Kingston upon Hull)                                                                                                                                                                                                                                                                                                                                                                                                 | 71 72 73                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|        | Mineral Resource Information in Support of National,<br>Regional and Local Planning                                                                                                                                                                                                                                                                                                                                         | EAST RIDING OF YORKSHIRE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|        | Mineral Resources                                                                                                                                                                                                                                                                                                                                                                                                           | KINGSTON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|        | Scale 1:100 000                                                                                                                                                                                                                                                                                                                                                                                                             | 79 80 5 81                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|        | Compiled by D.J. Harrison, F.M. McEvoy, P.J. Henney, D.G. Cameron, E.J. Steadman, S.F. Hobbs, D.J. Evans, G.K. Lott, E.L. Bartlett, M.H. Shaw and D.E. Highley. Project Leader: D.E. Highley.                                                                                                                                                                                                                               | most of the second of the seco |
|        | Digital cartography by N.A. Spencer, British Geological Survey.<br>Published 2005.                                                                                                                                                                                                                                                                                                                                          | Report 22<br>NORTH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|        | This map comprises part of a summary of the 'Mineral Resources of Yorkshire and the<br>Humber Region'.<br>For more information see www.mineralsUK.com                                                                                                                                                                                                                                                                       | LINCOLNSHIRE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                             | Report 92 Report 29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 60     | BIBLIOGRAPHIC REFERENCE<br>Harrison, D J, and 10 others. 2005. Mineral Resource Information for National, Regional and Local Planning: Humberside (comprising East<br>Riding of Yorkshire, North Lincolnshire, North East Lincolnshire and City of Kingston upon Hull). <i>British Geological Survey Commissioned</i>                                                                                                       | Report 43 Report 33                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 60 -   | Production of this map was commissioned and funded by the Office of the                                                                                                                                                                                                                                                                                                                                                     | 88 6 89                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|        | Deputy Prime Minister (Contract MP0677).                                                                                                                                                                                                                                                                                                                                                                                    | 80<br>1:63 360 and 1:50 000 map published<br>1:25 000 map published (Industrial Minerals Assessm<br>Sand and Gravel Resource Map)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                             | Current digital availability of these maps can be found at the British Geological Survey website www.bgs.ac.uk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|        | SAND & GRAVEL<br>Superficial deposits                                                                                                                                                                                                                                                                                                                                                                                       | BRICK CLAY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|        | Sub-alluvial: Inferred resources                                                                                                                                                                                                                                                                                                                                                                                            | 'Brick clay' is the term used to describe clay and shale used predominantly in the manufacture of bricks and, to a lesser extent, roof tiles, clay pipes and decorative pottery. These clays may sometimes be used in cement manufacture, as a source of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|        | Sub-alluvial: Indicated resources in areas assessed by BGS                                                                                                                                                                                                                                                                                                                                                                  | constructional fill and for lining and sealing landfill sites. The suitability of a clay for the manufacture of bricks depends<br>principally on its behaviour during shaping, drying and firing. This will dictate the properties of the fired brick such as strength<br>and frost resistance and, importantly, its architectural appearance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|        | River Terrace deposits                                                                                                                                                                                                                                                                                                                                                                                                      | Both bedrock and superficial deposits have been used in the past to provide the raw material for brick and tile manufacture, but activities are now scattered and small in scale. The main brick clay resource in the area is the Triassic Mercia Mudstone Group which until recently was exploited on a large scale for brickmaking near Epworth in North Lincolnshire. Production of facing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|        | Glaciofluvial deposits                                                                                                                                                                                                                                                                                                                                                                                                      | bricks used to total about 35 million bricks a year. The brickworks at Belton closed in 2001 but smaller amounts of brick clay are still produced (about 25,000 tonnes per year) and are trucked to the Birtley Works in Gateshead. The outcrop of the Mercia Mudstone is only shown in the Isle of Axholme. North of this it is covered by thick superficial deposits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 50 -   | Glaciolacustrine deposits                                                                                                                                                                                                                                                                                                                                                                                                   | Several small clay pits on both banks of the Humber, notably at Broomfleet, work alluvium and tidal flat deposits for the manufacture of a range of roofing tiles. These clays are extensive and are only shown in the vicinity of the worked deposits. The clays are approximately 8 m thick and are crushed and blended before use.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|        | Blown sand (silica sand)                                                                                                                                                                                                                                                                                                                                                                                                    | At South Ferriby, large volumes of the Upper Jurassic Ancholme Clay are exploited for cement making. The overlying Chalk is extracted with the clay and mixed in the ratio of 3 parts chalk to 1 part clay to form the raw feed for the kilns which produce                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|        | Head Gravel                                                                                                                                                                                                                                                                                                                                                                                                                 | 750,000 tonnes of cement clinker annually, requiring around 300,000 tonnes of clay raw material.<br>Some laminated glacial lake clays have been worked for fill materials in the area between Newton upon Derwent and Wilberfoss at the northwestern margin of the map. The extent of glaciolacustrine deposits is shown.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|        | Shore/Beach deposits                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        | Sand and gravel deposits of unknown origin         Boundary of area assessed for sand and gravel at the indicated                                                                                                                                                                                                                                                                                                           | CRUSHED ROCK AGGREGATES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                             | A variety of hard rocks are, when crushed, suitable for use as aggregates. Their technical suitability for different applications depends on their physical characteristics, such as crushing strength and resistance to impact and abrasion. Higher quality aggregates are required for coating with bitumen for road surfacing, or for mixing with cement to produce concrete. For applications such as constructional fill and drainage media, with less demanding specifications, lower quality materials are                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|        | BRICK CLAY<br>Alluvium/Tidal Flat Deposits<br>(in areas of workings only)<br>Recent                                                                                                                                                                                                                                                                                                                                         | acceptable.<br>The area has limited resources of rock suitable for use as crushed rock aggregate (see text for Chalk and Limestone). Reported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|        | Mercia Mudstone Group                                                                                                                                                                                                                                                                                                                                                                                                       | production of crushed rock was 52,000 tonnes in 2003 and consists of limestone. Crushed rock is imported by rail to Hull from the UK and also by sea from Norway.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 40 —   | (Isle of Axholme only)                                                                                                                                                                                                                                                                                                                                                                                                      | SILICA SAND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|        | Higher purity chalk (>97% CaCO <sub>3</sub> )                                                                                                                                                                                                                                                                                                                                                                               | Silica (industrial) sands contain a high proportion of silica (SiO <sub>2</sub> ) in the form of quartz and are used for purposes other than as construction aggregates. They are essential raw materials for the glass and foundry castings industries, but also have a wide range of other industrial applications, including in ceramics and chemicals manufacture, for water filtration media and in sports                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        | Lower purity chalk (>93% CaCO <sub>3</sub> )                                                                                                                                                                                                                                                                                                                                                                                | and horticultural applications. They are produced from both loosely consolidated sand deposits and by crushing weakly cemented sandstones. Unlike construction sands, which are used for their physical properties alone, silica sands are valued for a combination of chemical and physical properties. These include a high silica content in the form of quartz and, more                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|        | Concealed higher purity chalk (>97% CaCO <sub>3</sub> )                                                                                                                                                                                                                                                                                                                                                                     | importantly, an absence of impurities, particularly clay, iron oxides and refractory minerals such as chromite. Silica sands<br>typically have a narrow grain size distribution, generally in the range 0.5 mm to 0.1 mm, although coarser grades are required for<br>some applications. For most applications, silica sands have to conform to very closely defined specifications and consistency in<br>quality is of critical importance. Particular uses often require different combinations of properties. Consequently, different                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|        | Concealed lower purity chalk (>93% CaCO <sub>3</sub> )                                                                                                                                                                                                                                                                                                                                                                      | qualities of silica sand are usually not interchangeable in use. Silica sands command a higher price than construction sands.<br>This allows them to serve a wider geographical market.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|        | Approximate western boundary of thick drift cover over Chalk                                                                                                                                                                                                                                                                                                                                                                | Silica sand processing is of varying degrees of complexity and depends on the end use of the sand. It typically requires a high capital investment in plant. Processing is aimed at modifying both the physical and chemical properties of the sand to meet user specifications. The ease with which contaminants (such as iron-bearing impurities and clay) can be removed, together with the level of losses incurred in removing oversize and undersize fractions from a sand, has a major bearing on its potential use.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|        | LIMESTONE                                                                                                                                                                                                                                                                                                                                                                                                                   | Within the UK, deposits of silica sand occur in only limited areas and quantities, and the special characteristics of silica sand extraction, in particular the cost of processing, means that the industry has a restricted distribution.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|        | Lincolnshire Limestone                                                                                                                                                                                                                                                                                                                                                                                                      | Silica sand production in North Lincolnshire is based on the Blown Sand deposits of Quaternary age around Messingham in North Lincolnshire. Sand working has taken place in the area since the 1930s, mostly working the full thickness of sand of around 3.5 m, although current working removes only the upper 2 m of sand above the water table. The sand is very uniform in grain size and consists of sub-rounded particles of quartz with a limonite coating. Silica sand is quarried in the Messingham                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 30 —   | PEAT                                                                                                                                                                                                                                                                                                                                                                                                                        | area for coloured glass manufacture in Yorkshire, which is the major market, and foundry sand which is now a minor market.<br>Other markets include horticultural sand and bagged sand for block paving. The Blown Sand deposits are also worked nearby<br>at Haxey for mortar sand production. Here the Blown Sand is worked in conjunction with underlying River Terrace deposits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|        | EVAPORITES                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        | Potash Approximate western limit of Boulby Potash                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        | Salt Permian                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        | Approximate western limit of Boulby Halite                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        | MINERAL PLANNING PERMISSION (as at 01.08.05)<br>Source: Mineral Planning Authorities                                                                                                                                                                                                                                                                                                                                        | PLANNING PERMISSION FOR MINERAL EXTRACTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|        | Surface planning permission (valid and expired)                                                                                                                                                                                                                                                                                                                                                                             | The extent of all known extant and former planning permissions for mineral working is shown on the map, irrespective of their current planning or operational status. The polygons were digitised by BGS from Plotting Sheets and other documents supplied by East Riding of Yorkshire and North Lincolnshire councils. In addition, planning permission information was digitally acquired                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|        | Underground planning permission (valid and expired)                                                                                                                                                                                                                                                                                                                                                                         | from Ministry of Housing and Local Government maps for the area and incorporated in the data. This data has been checked<br>and amended by the local Authorities shown below. Any queries regarding the sites shown should be directed to these<br>authorities at the addresses shown below. The polygons cover active, former and restored mineral workings and, occasionally,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 20 —   | MINERAL WORKINGS<br>Melton Ross Active site                                                                                                                                                                                                                                                                                                                                                                                 | unworked deposits. Planning Permissions represent areas where a commercial decision to work mineral has been made, a successful application has been dealt with through the provisions of the Town and Country Planning legislation and the permitted reserve will have                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 20     | Burstwick Inactive (including yet to be worked), worked-out                                                                                                                                                                                                                                                                                                                                                                 | been depleted to a greater or lesser extent. The current planning status is not qualified on the map but is available in the underlying database.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|        | and/or restored site Mineral commodity                                                                                                                                                                                                                                                                                                                                                                                      | Contact addresses:<br>East Riding of Yorkshire Council, Planning, Environmental & Technical Services, County Hall, Beverley HU17 9BA, Tel: 01482<br>887700, Fax: 01482 884118, web address: www.eastriding.gov.uk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|        | Ch Chalk Istn Ironstone Peat Peat<br>Cl Clay & Shale Lst Limestone San Sand                                                                                                                                                                                                                                                                                                                                                 | North East Lincolnshire Council, Planning & Transportation Department, Devonshire House, Great Grimsby DN31 1ES, Tel: 01472 300300, Fax: 01472 3245216, web address: www.nelincs.gov.uk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|        | CR Crushed Rock Oil Oil Sg Sand & Gravel<br>Fi Flint Min Unspecified mineral SiS Silica Sand                                                                                                                                                                                                                                                                                                                                | North Lincolnshire Council, Development and Environment Department, Church Square House, PO Box 138, Scunthorpe DN15 6XP, Tel: 01724 297579, Fax: 01724 297886, web address: www.northlincs.gov.uk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|        | Gas Natural Gas MSg Marine sand and gravel                                                                                                                                                                                                                                                                                                                                                                                  | Kingston upon Hull City Council, Technical Services Department, Kingston House, Bond Street, Hull HU1 3ER, Tel: 01482 612222, Fax: 01482 612382, web address: www.hullcc.gov.uk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        | <ul> <li>Active rail aggregate depot</li> <li>Active marine wharf</li> <li>ENVIRONMENTAL DESIGNATIONS (as at 03/11/04)</li> </ul>                                                                                                                                                                                                                                                                                           | Topography reproduced from the OS map by British Geological Survey with the permission of Ordnance Survey on behalf of The Control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|        | National nature conservation designations<br>(SSSIs and NNRs)                                                                                                                                                                                                                                                                                                                                                               | Stationery Office, © Crown copyright.<br>All rights reserved. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Licence number: 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|        | International nature conservation designations<br>(SACs, SPAs and Ramsar sites)                                                                                                                                                                                                                                                                                                                                             | Digital SSSI, NNR, SAC, SPA and RAMSAR boundaries © English Nature 2004.<br>Contact address:<br>English Nature, Northminster House, Northminster, Peterborough, PE1 1UA, Tel: 01733 455000, Fax: 01733 455103, Web page: www.english-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 10     | Area of Outstanding Natural Beauty (AONB): Lincolnshire Wolds (part)                                                                                                                                                                                                                                                                                                                                                        | Positions of Scheduled Monuments at 25th September 2003 as supplied by English Heritage.<br>The majority of monuments are plotted using a centred NGR symbol. Consequently the actual area and/or length of a monument pro<br>constraints of scheduling cannot be represented here. Monuments scheduled since that date are not accounted for. © Copyright English Herit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|        | Heritage Coast                                                                                                                                                                                                                                                                                                                                                                                                              | Contact address:<br>English Heritage, 23 Savile Row, London, WS1 2ET, Tel: 020 7973 3132, Web page: www.english-heritage.org.uk<br>Digital AONB boundaries © Countryside Commission 1986 (now Countryside Agency).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|        | + Scheduled Monument                                                                                                                                                                                                                                                                                                                                                                                                        | Contact address:<br>Countryside Agency, John Dower House, Crescent Place, Cheltenham, Gloucestershire, GL50 3RA, Tel: 01242 521381, Fax: 01242 5<br>www.countryside.gov.uk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|        | ADMINISTRATIVE AREAS                                                                                                                                                                                                                                                                                                                                                                                                        | Published for the Office of the Deputy Prime Minister © Queen's Printer and Controller of Her Majesty's Stationery Office 2005.<br>This publication (excluding logos) may be reproduced free of charge in any format or medium for research, private study or circulation within a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|        | Mineral Planning Authority                                                                                                                                                                                                                                                                                                                                                                                                  | is subject to it being reproduced accurately and not used in a misleading context. The material must be acknowledged as Crown Copyright publication specified.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|        | District                                                                                                                                                                                                                                                                                                                                                                                                                    | Applications for reproduction should be made in writing to: The Copyright Unit, Her Majesty's Stationery Office, St Clements House, 1-16 Co<br>1BQ. Fax 01603 723000 or e-mail: copyright@hmso.gov.uk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                             | Aims and Limitations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                             | The purpose of the maps in this series is to show the broad distribution of those mineral resources which may be of current or potential eco<br>nationally-recognised planning designations. The maps are intended to assist in the consideration and preparation of development plan pol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 400000 | <b>EVAPORITE MINERALS</b><br>Evaporite minerals, including rock salt (halite, NaCl) and, more rarely, potash (potassium chloride, KCl) are precipitated during the evaporation of seawater. The arid conditions that existed in north-east England during Permian times resulted in several cycles of                                                                                                                       | The maps have been produced by the collation and interpretation of mineral resource data principally held by the British Geological Survey.<br>permissions has been obtained from the relevant Mineral Planning Authority (MPA). Some of these permissions may have lapsed or ex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|        | evaporation of seawater. The and conditions that existed in north-east England during Permian times resulted in several cycles of<br>evaporite deposition. The most extensive led to the deposition of the Boulby Halite Formation which includes, at the top, the Boulby<br>Potash Member. The sub-surface extent of the Boulby Halite and the Boulby Potash and their conjectured western limits are shown on<br>the map. | ascertained from the appropriate MPA. Location information on national planning designations has been obtained from the appropriate statute<br>and English Heritage). For further information the relevant body should be contacted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|        | The Boulby Potash and Boulby Halite are worked at the Boulby Mine in the North York Moors National Park to the north. They are not extracted in East Yorkshire and are unlikely to be so in the foreseeable future. However, at Atwick near Hornsea, cavities in salt-bearing strata have been specifically created for the storage of natural gas. The development of the site started in the mid-1970s and gas is         | The mineral resource data presented are based on the best available information, but are not comprehensive and their quality is variable. The approximate. Mineral resources defined on the map delineate areas within which potentially workable minerals may occur. These areas a account of planning constraints that may limit their working. The economic potential of specific sites can only be proved by a detailed evalue essential precursor to submitting a planning application for mineral working. Extensive areas are shown as having no mineral resource poter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|        | stored in nine teardrop-shaped cavities (in the Fordon Evaporites at a stratigraphically lower level than the Boulby Halite) at depths of around 1800 m. The cavities were leached with seawater and the resulting brine dispersed offshore through a sub-sea pipeline. The total usable space is 3,495 GWh and the cavities can deliver gas at the rate of 193 GWh/day. The high flow capacity of salt cavities makes      | occur in these areas. The presence of these operations generally reflect very local or specific situations.<br>The maps are intended for general consideration of mineral issues and not as a source of detailed information on specific sites. The maps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|        | them ideal for meeting peak demands and daily balancing needs. There may be continuing interest in the salt resources of the area for<br>the development of gas storage facilities.                                                                                                                                                                                                                                         | planning applications or in taking other decisions on the acquisition or use of a particular piece of land, although they may give useful b<br>proposal within context.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|        | 30                                                                                                                                                                                                                                                                                                                                                                                                                          | 40 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

