

Environmental geology

Maps for planning sustainable development

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Land-use planning seeks to resolve the conflict between man's need to utilise land for housing, industry and infrastructure, the extraction of minerals, the disposal of waste, and his need to protect the environment. Over time the perceived balance between the advantages and disadvantages of particular forms of development alters, and planners frequently have to reassess the costs and benefits of such activities. To do this they require appropriate information from many specialists, including geologists.

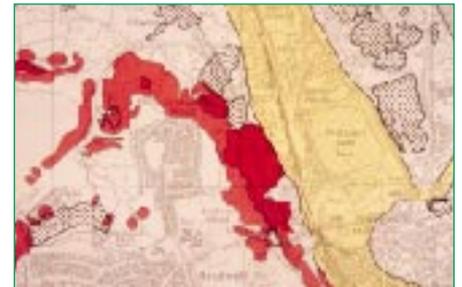
In the past, the implications of earth science factors in the planning process have often been overlooked. This was partly because relevant data were not readily available from a single source, and also because the conventional geological map is of limited help in solving planning problems and is difficult for non-geologists, such as planners, to understand. To meet these needs, a different type of geological map – the environmental geology map (EGM) – has evolved.

The EGM summarises information derived from factual 'basic data' maps and 'interpretive', or derived, maps. The conventional geological map is a fundamental basic data map. Other examples may include maps showing areas of undermining, adits and shafts, areas of made ground or fill, borehole locations, landslides and slope angles, engineering properties and mineral deposits including groundwater. Interpretive maps might show mineral resources or foundation conditions. By combining and summarising the information from

the factual and derived maps, EGMs can depict both the resources for development such as areas providing good foundation conditions, groundwater supplies and mineral resources, and the constraints to development such as ground susceptible to subsidence, landsliding or flooding, and resources which should not be sterilised by building or contaminated by waste disposal.

Over the last 15 years the Department of the Environment, Transport and the Regions (DETR) have commissioned a series of 55 environmental geological mapping projects, the majority of which have been carried out by the BGS. A methodology of EGM presentation has

been established whereby applied geological information can be readily understood and incorporated into the planning process. EGM projects can assist in ensuring that planned land use does not sterilise valuable subsurface mineral resources, does not cause contamination for the future or suffer from contamination in the past, and that planned usage is the most suitable for the type and quality of land available.



Extract from an environmental geology map for the Stoke-on-Trent area showing ground stability factors causing constraints to development. (Red areas – landslips; light red – slopes steeper than 11°; stippled – backfilled quarries; light grey – areas of abandoned, shallow underground mine workings; yellow – areas of weak, compressible valley alluvium.)



The East Merthyr Reclamation Scheme in South Wales. The scheme involved the removal and safe disposal of iron smelting slag from a derelict industrial site above old shallow mine workings followed by an open-cast operation to recover coal from the pillars of the abandoned shallow workings and to extract additional coal from below the old workings. Finally, the site was infilled, landscaped and restored to a condition suitable for housing, other industrial or recreational use.