

New Towns and expanded settlements: [Call for Evidence - Committees - UK Parliament](#)

The British Geological Survey is the UK's National Geological Survey and a world leading geoscience organisation focussed on understanding the Earth and environmental processes.

BGS is responsible for advising the UK government on all aspects of geosciences, as well as providing impartial geological advice and data to industry, academia and the public, drawing on decades of corporate experience in the collection, collation, databasing, statistical evaluation, mapping and interpretation of geological and environmental data. We are the UK's principal provider of objective and authoritative geoscientific information and knowledge for wealth creation, sustainable use of natural resources, reducing risk and living with the impacts of environmental change.

Most relevant for this inquiry is our expertise and knowledge of the subsurface and the complex interactions between the built environment and geology that occur in the ground beneath our towns and cities and are important considerations for supporting urban land-use planning and sustainable development.

The committee is seeking answers to the following questions:

1. If new towns are to be built in i) inner urban, ii) edge of urban, and iii) rural locations:

a. How should the principles of good placemaking adapt in order to build viable places with a positive character and identify?

1. Geology plays an important, though often under-appreciated, role in good-placemaking and the creation of viable settlements with positive character. It is important that the approach for New Town development and expanding settlements takes into account that geological factors can significantly influence the financial viability of sites. The factors may affect land remediation, construction costs and optioneering for urban infrastructure (transport, water, energy). They also influence conveyancing and home insurance, for example in relation to flood risk or subsidence. Characterising the geology and subsurface conditions at an early-stage in the spatial planning process is important to help reduce potential risks and manage costs effectively.

2. We also highlight that the geological environment contributes important social values to good placemaking, such as social benefits associated with the redevelopments of brownfields, the contribution of landscape and building stone to the character of places, and the role of the subsurface in supporting the energy transition, resilient water management, and climate adaptation.

3. There is currently no formal subsurface spatial planning in English planning policy. The development of the New Towns provides a unique opportunity for pioneering subsurface planning approaches that would ensure that high-value subsurface uses are implemented now and safeguarded for the future. We highlight the recent Government Office for Science [Foresight Report on the 'Future of the Subsurface'](#)¹ which summarises the essential role that the subsurface currently provides for society, and highlights the future demands and pressures we are likely to encounter in future. The report notes that *'the subsurface is a space, much the same as the above ground, whose use needs to be monitored,*

¹ <https://www.gov.uk/government/publications/future-of-the-subsurface-report>

planned, and managed. But the data, technologies, and policy tools needed for this lag behind those available for the surface’.

4. To overcome these challenges and in line with the key findings from the report we would recommend the following:

- Explicit consideration and planning of the subsurface environment in the New Towns spatial development strategies.
- Strengthening requirements for development projects to refer to baseline geological data at the pre-planning stage so early-stage geological risks and opportunities are recognised and realised.
- Implementing formal requirements for development projects, particularly publicly-funded works, to submit geological data arising from ground investigations back into the BGS National Geoscience Data Centre for onward-use. Currently we estimate that less than 5% of borehole records from ground investigations are submitted to BGS for curation and sharing. We estimate the value of this data to be in the region of £1.3 Bn/yr² which is currently lost to the UK economy.
- Geological health-based outcomes (e.g. associated with land remediation; implementation of Nature-based solutions, and subsurface-related climate adaptation outcomes, in line with the UK government’s third National Adaptation Programme (NAP3), are central to the long-term sustainability of new settlements and should form part of the social value case.

b. What are the current barriers to good placemaking in these different locations, and how can they be overcome?

5. Recent evidence on the geological and environmental aspects of urban (re)development support the ‘Brownfield First’ approach to the development of new towns and expanded settlements. The approach prioritises development of the inner urban and edge of urban locations on previously developed land. It recognises that the remediation and reuse of brownfield sites specifically delivers the following benefits:

- Improvements to soil and groundwater quality in the immediate vicinity and wider catchment.
- Lower climate impact compared with greenfield sites³.
- Enhancement of both the abiotic and biotic components of Natural Capital through improvements to surface water, groundwater, soils, biodiversity. Improvements in the quality of the natural environment and enhancement of green space delivers secondary social benefits including community health and well-being^{4,5}.

² Bricker, S.; Terrington, R.; Burke, H.; Dobbs, M.; Arnhardt, R.; Kearsey, T.; Thorpe, S. 2022 [Urban geoscience report: the value of geoscience data, information and knowledge for transport and linear infrastructure projects](#). Nottingham, UK, British Geological Survey, 67pp. (OR/21/065) (Unpublished)

³ Hou, D.; Song, Y.; Zhang, J.; Hou, M.; O’Conner, D.; Harclerode, M. 2018. Climate change mitigation potential of contaminated land redevelopment: A city-level assessment method. *Journal of Cleaner Production*, 171, 1396-1406

⁴ Lin, Y.; Wu, B.; Wang, D.; Xiao, W.; Huang, Y.; Fu, S.; He, Y. 2021. Comprehensive evaluation of ecosystem services for brownfield redevelopment in Changsha. *Arabian Journal of Geosciences*, 14

⁵ Zhong, Q.; Zhang, L.; Zhu, Y.; Konijnendijk Van Den Bosch, C.; Han, J.; Zhang, G.; Li, Y. 2020. A conceptual framework for ex ante valuation of ecosystem services of brownfield greening from a systematic perspective. *Ecosystem Health and Sustainability*, 6.

- Economic prosperity increases when brownfield sites are developed including land value, profit, house prices and taxation^{6,7,8,9,10}.

6. Recognising the potentially higher initial investment costs associated with bringing brownfield land back into use, we refer you to:

- Research on laboratory methods to reduce over conservatism in the exposure element of human health risk assessment, specifically being able to demonstrate that bioaccessible concentrations of harmful chemicals in soil are mostly lower than total concentrations (metals and some organic compounds)¹¹. This approach to health-based risk assessments of soil contamination can reduce unnecessary remediation (and the associated cost and environmental impacts).
- The value of decision-support tools such as the BGS [Brownfield Ground Risk tool](#) and similar data-driven approaches¹² which provides information about ground risks and unexpected costs associated with ground conditions across a portfolio of brownfield land sites, allowing better informed investment in the most viable sites.

4. How can new towns be future-proofed, responding to changing working and lifestyle patterns, emerging economies and new technologies?

7. The Government Office for Science [Foresight Report on the 'Future of the Subsurface'](#) evaluates future trends for the subsurface, such as those associated with urbanisation, climate change and emerging technologies. In future, we expect to see significantly increased demands on urban subsurface space and resources for example, for EV charging, urban heat networks, digital networks, underground freight tunnels, and for energy systems such as ground source heating, mine heat extraction, energy storage. In addition, we expect increased reliance on the ground for ecosystems services e.g. to reduce flood risk, reduce the impacts of urban heatwaves and enhance biodiversity through nature-based solutions.

8. It is important that the Government's New Towns policy considers the current and emerging subsurface technologies and innovations, the potential conflicts between uses, and decides how best to manage and regulate these. The Foresight report notes that *'The market can bring investment and a state-of-the-art understanding of subsurface solutions, but without effective regulation and*

⁶Ameller, J.; Rinaudo, J. D.; Merly, C. 2020. The Contribution of Economic Science to Brownfield Redevelopment: A Review. *Integrated Environmental Assessment and Management*, 16, 184-196.

⁷Haninger, K.; Ma, L.; Timmins, C. 2017. The value of brownfield remediation. *Journal of the Association of Environmental and Resource Economists*, 4, 197-241

⁸Kaufman, D. A.; Cloutier, N. R. 2006. The impact of small brownfields and greenspaces on residential property values. *Journal of Real Estate Finance and Economics*, 33, 19-30

⁹Woo, A.; Lee, S. 2015. Illuminating the impacts of brownfield redevelopments on neighbouring housing prices: Case of Cuyahoga County, Ohio in the US. *Environment and Planning A*, 48, 1107-1132

¹⁰<https://www.gov.uk/government/publications/housing-affordability-and-productivity>

¹¹Williams-Clayson, A. M.; Vane, C. H.; Jones, M. D.; Thomas, R.; Taylor, C.; Beriro, D. J. 2024. Dermal absorption of high molecular weight parent and alkylated polycyclic aromatic hydrocarbons from manufactured gas plant soils using *in vitro* assessment. *Journal of Hazardous Materials*, 469. <https://doi.org/10.1016/j.jhazmat.2024.133858>

¹²Hammond, E. B.; Coulon, F.; Hallett, S. H.; Thomas, R.; Dick, D.; Hardy, D.; Dickens, M.; Washbourn, E.; Beriro, D. J. 2023. From data to decisions: Empowering brownfield redevelopment with a novel decision support system. *Journal of Environmental Management*, 347. <https://doi.org/10.1016/j.jenvman.2023.119145>

coordination is unlikely to optimise overall subsurface use for long-term public goods. Policy makers will need to consider how best to balance this trade-off’.

Climate Adaptation

9. New Towns and Expanded Settlements are expected to be resilient to future climate change. Natural hazardous processes can have significant impacts on economic growth, the built environment, lives and livelihoods. Geological and hydrogeological hazards, such as flooding, subsidence, coastal erosion, are likely to be more pronounced under changing climate conditions. BGS provides national-scale datasets that assess the geological hazards to support of climate change evaluations:

- GeoClimate UKCP18: The BGS GeoClimate: shrink–swell national datasets show potential change in subsidence due to changes in climate. They have been developed by combining long-term UK Climate Projection (UKCP) scenarios for rainfall and temperature changes with the geotechnical properties of the ground, to identify areas projected to experience the largest increases in susceptibility to subsidence over the next century.
- GeoCoast: BGS GeoCoast provides information on the morphology, behaviour and vulnerability of the coastline, underpinned by its geology and its coastal context (shape; profile; height, etc.). It can be used to underpin coastal decision making and planning relative to coastal inundation, erosion and climate change impacts.

5. How should nature and biodiversity be incorporated in the development of new towns?

Sustainable drainage systems (SuDS):

10. Sustainable drainage systems (SuDS), should be incorporated at an early-stage in the design of new towns, as part of an Integrated Water Management Plan, and proactive approach to flood risk reduction. Numerous studies evidence the multiple benefits of SuDS, such as contributing to Biodiversity Net Gain targets, enhancing local environments and creating attractive places to live, reducing flood risk, improving air quality, and mitigating urban heat effects. Under the new [National Standards for SuDS](#), infiltration of run-off to the ground is considered a high priority, and is preferable to discharge of run-off to surface water bodies, or to piped drainage systems. Infiltration SuDS offer the greatest opportunity to mimic natural drainage process and make use of natural storage in soils and underlying rock. However, recent engagement by BGS with urban planners, SuDS designers and architects indicates a cautious approach toward installing infiltration SuDS. To overcome this, we suggest:

- closing skills gap, where those involved in the design and construction of SuDS have limited understanding of geology and hydrogeology and improve access to specialists with that knowledge.
- adjust the emphasis of SuDS design and installation to promote use of natural in-situ storage, rather than promoting the conveyance of water to a discharge point.
- resolve challenges relating to the retrofit of SuDS on developed or previously developed land, where there are higher degrees of uncertainty with respect to ground risks, and a need to re-naturalise engineering drainage systems, rather than designing infiltration SuDS from first principles.

Soils:

11. Soil forms the foundation of much terrestrial biodiversity. One way of increasing nature and biodiversity in new town developments is by incorporating areas of pre-existing semi-natural / natural habitats. These areas already support established biodiversity compared to, for instance, a neighbouring field within the development area, and they can help develop green corridors. This does replace the creation of new habitats within the development, which will contribute to biodiversity though their benefits may take time to emerge.

12. Soil habitats play a key role in delivering urban ecosystem services (ES) and green infrastructure (GI), linking soil, nature, biodiversity, ES and GI within the urban environment. Research at BGS¹³ shows that even in a small urban area (~6 km²) contains a wide variety of soil types. These soils result from variations in geology and soil parent material, climate, time, landscape position and human activities such as leisure, waste disposal, construction, and industry. This diversity of soil types and associated biota contributes significantly to the overall urban biodiversity.

13. Analyses indicate that semi natural habitats (such as woodlands and rough pasture) on the edges of urban areas often increase the range of measured soil properties that influence biodiversity and enhance the soil's role in supporting urban ecosystem services.

Geoheritage and building stones:

14. The geodiversity of an area, particularly the landforms, rocks and natural processes, determine the character of our environment, and influence a range of aspects of the design and development of our built environment – including movement, nature, built form, identity, public space and resources. Understanding of a region's geodiversity, therefore supports the delivery of beautiful places that work with the landscape.

15. Geodiversity surveys and audits, conducted by the British Geological Survey, or regional geoconservation groups, can provide assessment of local and regional geodiversity and geoheritage sites to inform plan making and planning decisions, help to direct investment in green infrastructure, and encourage community engagement.

16. Building stone is an important characteristic of urban and rural built environments in England, with locally accessible stone and other building materials (such as brick clay) associated with regional styles and types of buildings in both urban and rural contexts. Ensuring access to building stone for conservation of heritage assets is already recognised within the current planning framework but delivery of new towns may require access to additional stone resources for new developments. The British Geological Survey provides information and advice in relation to building stone resources including [Mineral Planning Factsheets](#) and the [UK Minerals Yearbook](#) to support land-use and mineral planning.

¹³ A.M. Tye et al. 2025. Planning urban soils: Identifying key properties and interactions that could maximise contribution to urban ecosystem services. *Paper to be submitted Jan 26*