

MINERALS PLANNING GUIDANCE: PROVISION OF RAW MATERIAL FOR THE CEMENT INDUSTRY

The cement industry is of major importance to the national economy as it supplies an essential product to the construction and civil engineering industries. The Government recognises that cement production and the quarrying of the raw materials for the industry can have a significant environmental effect and often takes place in areas of attractive and outstanding countryside. The purpose of this

Minerals Planning Guidance Note is to advise minerals planning authorities and the industry on what needs to be done to ensure that there is an adequate and continuous supply of raw material to maintain production in a manner which has full regard to the environment. The Secretaries of State attach importance to the effective and speedy implementation of these guidelines.

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INTRODUCTION

Background

1. These guidelines provide advice to mineral planning authorities (MPAs) on the exercise of planning control over the provision of raw material for the cement industry. They indicate the national policy considerations which need to be taken into account in drawing up minerals policies for the industry in their development plans and some of the other factors that need to be taken into account when determining applications for planning permission. They supplement the general guidance contained in the Mineral Planning Guidance Note 1 "General Considerations and the Development Plan System" (MPG 1).

2. The cement industry is of major importance to the national economy as it supplies an essential product to the construction and civil engineering industries. It is therefore necessary to have an adequate and continuous supply of raw material to maintain production.

3. The Government places great importance on reducing the level of imports of building and construction material, and wishes to encourage domestic production to counter the rising import trend and to provide employment. The Government would also not wish to discourage any export opportunities that might arise. The Government therefore looks to mineral planning authorities to make provision for adequate supplies of raw material for the industry as it endeavours to meet future domestic demand.

4. At the same time the Government recognises that cement production and the quarrying of raw materials for the industry can have a significant environmental impact and often takes place in areas of attractive and outstanding countryside. The White Paper "This Common Inheritance" stresses the importance of combining economic growth with care for the environment in order to attain sustainable development. It is important that short term gains should not be achieved by creating environmental debts for future generations. The encouragement of cement production must therefore be balanced against important environmental and conservation interests. The industry are asked to draw up schemes for new quarrying in consultation with the minerals planning authorities which reflect these environmental considerations. Key features of these schemes will be proposals for the working arrangements and the restoration and after-use of both existing operations and new sites.

5. With regard to disused sites where there are currently no, or no adequate, planning conditions which would ensure reclamation, the industry and the mineral planning authorities have agreed to cooperate to secure solutions based on one or more of the following options:

- to use the review procedures introduced by the 1981 Minerals Act and now contained in S.105 of the Town and Country Planning Act 1990;
- to use the opportunities presented by former cement industry land to provide sites for development or recreation, provided any proposals do not conflict with general planning policies;
- to assess whether a Groundwork Trust approach would be appropriate;
- the use of Derelict Land Grant for eligible sites where the proposals for reclamation are in line with Government policies as set out in Derelict Land Advice Note "Derelict Land Grant Policy" (DLGA 1).

These Guidelines are not intended to deal further with such disused sites. However in respect of the Groundwork option it can be noted that the Kent Thames-Side Groundwork Trust was set up in 1990 with support, inter alia, from Blue Circle Industries and with a target area of the northern parts of the boroughs of Dartford and Gravesham.

Aims

6. The aims of these Guidelines are to advise mineral planning authorities about trends in cement production and consumption, and to provide a national planning context for the cement industry. They:

- i. Briefly outline national trends in cement production and consumption.
- ii. Set out the national planning policy context for the cement industry.
- iii. Outline the specific environmental impacts of the cement industry.
- iv. Identify a policy for the maintenance of adequate permitted reserves of raw materials for the cement industry.
- v. Establish policies for the working, restoration, aftercare and after-use of the cement industry's quarry sites.

7. These policy Guidelines apply only to England and Wales, although reference is made to Scottish plant in the maps and tables for the sake of completeness. The Scottish Office is preparing its own policy advice on minerals planning.

THE NATIONAL PICTURE

Production and Consumption

8. For most of the 1980's British cement production was in the region of about 12-13 million tonnes a year, roughly in line with domestic consumption. This production level was lower than that achieved in the late 1970's when Britain had been a major exporter.

9. In 1990 the 3 major manufacturers delivered about 14.5 million tonnes of cement to its British customers, but only around 13.4 million tonnes of this was home produced.

10. Recent figures confirm that there was a major change in the cement industry's position in mid-1987 and which continued during 1988 and 1989. Domestic demand began to rise, and rapidly outstripped production capacity. The home manufacturers were only able to meet demand by importing large amounts of both clinker, the semi-finished product in the cement manufacturing process, and cement. UK imports by the manufacturers totalled nearly 3 million tonnes, of which 1.8 million tonnes came from imported clinker. In addition to this, independent cement traders imported nearly 1 million tonnes. It remains to be seen whether this surge in demand will continue into the 1990s. Long term forecasts suggest that cement consumption will keep pace with the growth of the economy. Table 1 and Figure 1 shows GB cement production and consumption.

Trade

11. Britain's trade position in cement is illustrated in Table 2 and in Figure 2.

12. In the late 1970s and early 1980s Britain had been a significant exporter of cement. However opportunities for profitable exports then ceased due to increased production at foreign plant closer to the major centres of demand. From 1987 onwards the shortages in domestic production capacity caused the increase in the volume of imports referred to in paragraph 10 above.

13. Increasing domestic capacity by building new plant for the production of cement to meet rising demand is expensive and takes a long time to bring on stream. The current cost of a new kiln to produce 750,000 tonnes of clinker per year, and related equipment, is approximately £100m. It takes at least 3 years to build a new production line once planning permission has been granted. The industry has therefore invested heavily in facilities for the importation of cement in order to help meet this increase in demand.

Table 1 GB production and consumption of cement (000 tonnes)

YEAR	PRODUCTION ^(a)	TOTAL CONSUMPTION ^(b)
1978	16,158	14,154
1979	16,233	14,444
1980	14,119	13,500
1981	12,151	11,722
1982	12,362	12,116
1983	13,000	12,694
1984	12,953	12,967
1985	12,500	12,876
1986	12,943	13,120
1987	13,627	14,185
1988	14,114	16,638
1989	14,050	17,568
1990	13,465	14,572

Footnotes

(a) GB Cement Production records only cement from GB-made clinker, and excludes imports of cement by the GB manufacturers and sold under their own labels. It also excludes cement made from imported clinker.

(b) GB cement consumption includes imports of cement and cement made from imported clinker, as well as cement made from GB-made clinker and cement imported by independent traders.

FIGURE 1. G.B. PRODUCTION AND CONSUMPTION OF CEMENT

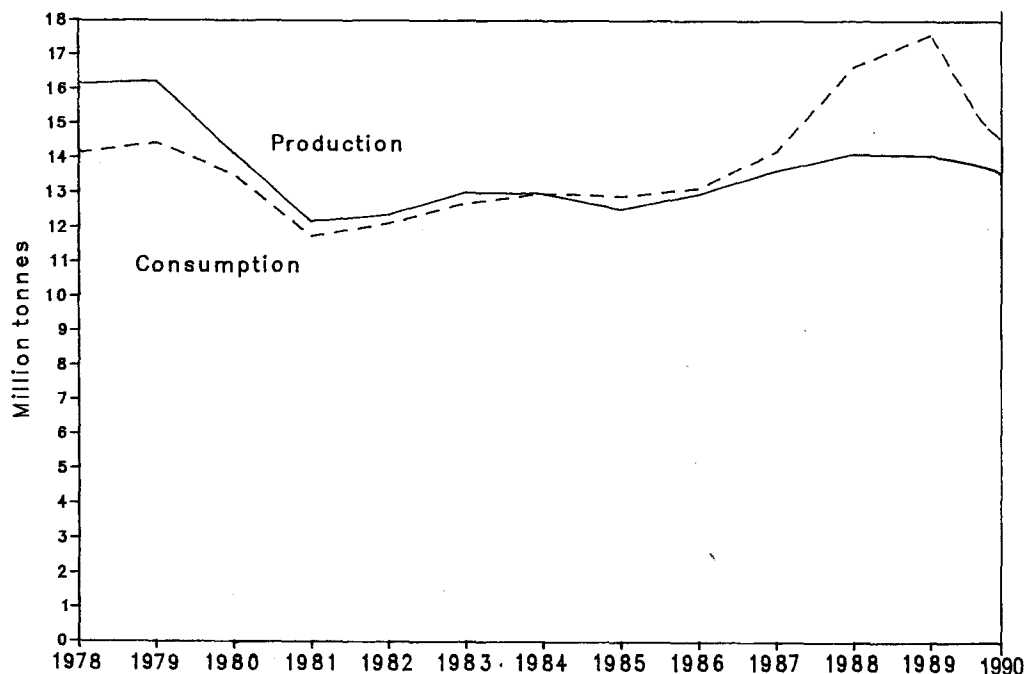


Table 2 GB exports and imports of cement (000 tonnes)

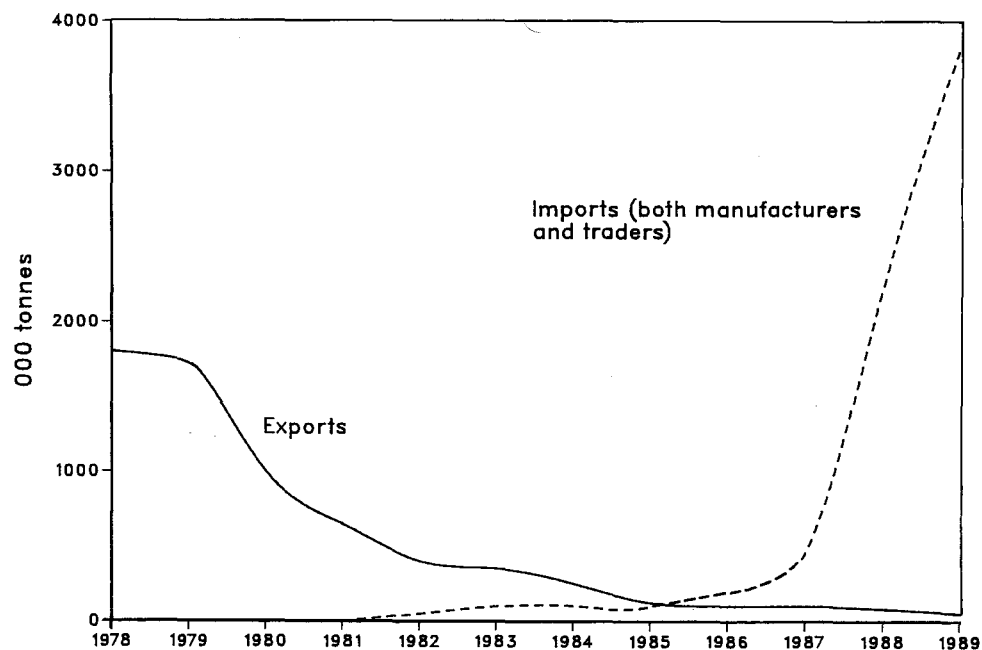
YEAR	EXPORTS	IMPORTS ^(a)	
		Independent Traders	GB Manufacturers
1978	1,940	-	-
1979	1,750	-	-
1980	1,041	-	-
1981	661	53	-
1982	455	83	-
1983	387	134	-
1984	255	140	-
1985	136	152	-
1986	95	249	-
1987	105	379	174
1988	113	515	1,672
1989	78	917	2,934

Footnote

(a) Manufacturers imports include cement made from imported clinker.

Source: British Cement Association

FIGURE 2. G.B. IMPORTS AND EXPORTS OF CEMENT 1978-1989 (000 tonnes)



14. This increasing reliance on imports in 1987-1989 within GB has coincided with a growing worldwide internationalisation of the trade in cement. Throughout Western Europe there has been a growth in the amount of cement made in one country but sold in another. There has also been growing reliance on cement imported from outside Western Europe. There has also been a trend towards a rationalisation of cement producers within Europe—though ownership is not a material consideration for planning applications under the GB planning system.

Regional trends

15. Production of cement is concentrated in some regions more than others. Table 3 analyses production and consumption.

16. The South East region is the largest producer and also the largest consumer of cement. Over one-quarter of all British cement is produced in the region, but despite the scale of these operations the industry has not been able to meet all of the region's needs in recent years. One reason for this is that

Table 3 Regional production and consumption of cement (000 tonnes)^(a)

REGION	PRODUCTION ^(b)			CONSUMPTION ^(c)		
	1987	1988	1989	1987	1988	1989
S East	3,926	3,954	3,596	4,283	5,145	5,048
S West	866	984	995	1,518	1,789	1,730
E Anglia	887	904	923	773	879	836
E Midlands	2,245	2,200	2,306	1,277	1,529	1,508
W Midlands	1,416	1,545	1,596	1,186	1,407	1,525
Yorks & Humb	572	704	664	1,079	1,182	1,337
N West	1,150	1,197	1,301	1,021	1,131	1,256
North	665	666	645	623	705	810
Scotland	575	698	778	958	1,099	1,221
Wales	1,162	1,052	1,022	790	936	1,007
Total	13,464	13,904	13,826	13,508	15,802	16,278

Footnotes

(a) Excludes production and consumption of cement made by ICI

(b) Excludes imports of cement by the 3 UK manufacturers and the independent traders.

(c) Excludes consumption of cement imported by independent traders.

Source: British Cement Association.

production at the largest plant is constrained by a shortage of permitted chalk reserves. The region therefore imported supplies from East Anglia, the East and West Midlands, and from Europe.

17. The next largest producer region is the East Midlands, which makes substantially more than it consumes. The West Midlands, the North West and Wales produce slightly more than they consume.

18. The South West, Yorkshire and Humberside, Scotland, and to a lesser extent the North, consume more cement than they produce.

feasible to manufacture cement in a limited number of locations. Rising energy costs further encourage the use of raw materials with a low moisture content. These costs will continue to influence the location of future plant development.

20. Map 1 and Table 4 show the location of cement plant in relation to the main outcrops of chalk and limestone.

21. Annex A discusses the geological aspects of cement production in further detail.

Geological factors in the location of the cement industry

19. The availability of suitable raw materials, particularly chalk and limestone, is normally the dominant locational factor in the cement industry. Market and transport considerations and the availability and cost of fuel and labour are also important. In order to be considered potentially suitable for use in cement manufacture the raw materials must not only meet fairly stringent quality requirements, but they must be capable of being exploited economically and be available in sufficient quantity to justify the high capital investment required for a modern cement works. Among the factors to be considered in this regard are the geological structure of the deposit, the thickness of overburden, disposition relative to the water-table, cavitation, mineralisation etc. Consequently it is only economically

NATIONAL POLICY FRAMEWORK

General considerations

22. As part of the planning process these guidelines should be read in the context of other Government policies for such matters as the protection and conservation of the environment and the preservation of the cultural heritage. The most important of these are mentioned below but it is necessary to refer to the source documents in each case for the full context within which these policies have been developed.

23. The general policy framework for minerals planning is contained in MPG 1. That document provides guidance on the statutory basis for the control of mineral working, the treatment of minerals in development plans and the main policy considerations for different minerals. Planning Policy Guidance Note 1—"General Policy and Principles" (PPG1) provides further advice on planning

Map 1

Sketch map showing distribution of main limestone, dolomite and chalk resources, together with cement plant

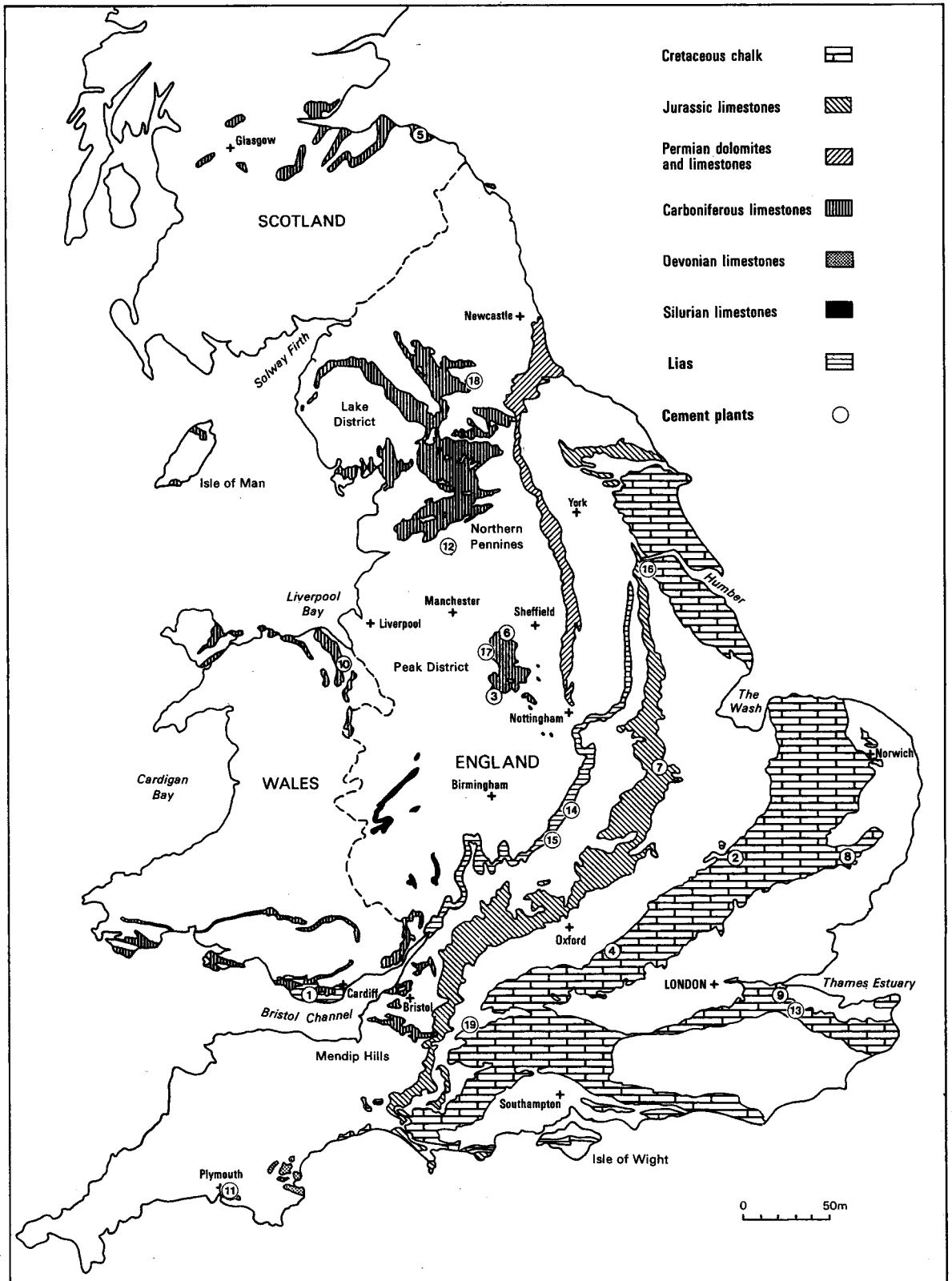


Table 4 Location and clinker capacity of cement plant, 1990

REFERENCE NO. IN MAP	PLANT	PLANNING AUTHORITY	CLINKER CAPACITY (000 TONNES)	KILNS	PROCESS
1.	Aberthaw	South Glamorgan	552	1	dry
2.	Barrington	Cambridgeshire	500	4	wet
3.	Cauldon	Staffordshire	860	1	dry
4.	Chinnor	Oxfordshire	270	3	wet
5.	Dunbar	Lothian	900	1	dry
6.	Hope	Peak Park	1,300	2	dry
7.	Ketton	Leicestershire	1,200	2	dry
8.	Masons	Suffolk	378	1	wet
9.	Northfleet	Kent	1,905	3	1 dry/2 semi/wet
10.	Padeswood	Clwyd	500	3	1 dry/2 wet
11.	Plymstock	Devon	357	1	dry
12.	Ribblesdale	Lancashire	1,300	3	2 wet/1 dry
13.	Rochester	Kent	630	1	semi-wet
14.	Rugby	Warwickshire	375	1	wet
15.	Southam	Warwickshire	405	2	semi-wet
16.	South Ferriby	Humberside	715	2	semi-dry
17.	Tunstead	Derbyshire/Peak Park	214	1	wet
18.	Weardale	Durham	678	2	semi-dry
19.	Westbury	Wiltshire	765	2	wet

Footnote

Cement clinker is converted to cement by inter-grinding an addition of approximately 6% gypsum.

policy for both the mineral planning authorities and the minerals industry.

Development Plans

24. Policies for the development and other use of land, including the extraction of minerals, are set out in statutory development plans drawn up under the Town and Country Planning Act 1990 as amended by the Planning and Compensation Act 1991. These plans form a framework against which individual development proposals can be considered.

25. Outside London and the areas of the former metropolitan county councils, the development plan system consists of two types of plan—structure and local plans. Structure plans set out planning policies on matters of strategic importance; local plans formulate detailed planning proposals on an Ordnance Survey map base in general conformity with the structure plan. Local plan coverage for most forms of development is provided by district local plans prepared by district councils, but the local planning framework for minerals is provided by mineral local plans drawn up by the county councils. The 1991 Act has introduced a duty on county councils, and national park authorities, to prepare minerals and waste disposal local plans to complement the policies in their structure plans. In London and the former metropolitan county council areas unitary development plans or UDPs are

being prepared to constitute the development plan framework. Part 1 of a UDP contains general policies and is analogous to a structure plan. Part II contains site-specific proposals and is analogous to a local plan.

26. Development plans provide an opportunity for considering the various options for the future location of mineral workings, identifying preferred locations and the safeguarding of mineral resources for future working. Structure plans should identify areas for mineral development in broad terms. Mineral local plans should identify areas in more detail using Ordnance Survey-based maps.

27. Development plans should also set out the environmental criteria against which planning applications will be assessed, and policies for the working, reclamation and after-use of mineral working sites. They should also carry forward national policies for landscape and historic or nature conservation and for agriculture which may constrain the choice of sites for mineral working.

28. In cement-producing areas, development plans should try to assess the likely raw material needs of the industry and having examined the various options which are available identify preferred areas of working which will meet these needs. The forecast of possible future demand for minerals used in the production of cement at annex B should inform the assessment of likely needs. Mineral planning authorities should discuss the choice of sites with

the cement industry when formulating these plans. The choice of sites must take into account national policies on landscape and historic or nature conservation and on agricultural land. The plans should also safeguard mineral resources for future working. The plans should set out the development control criteria which new planning applications for mineral extraction must satisfy. They should also set out policies and proposals for the working, landscaping, reclamation and after-use of mineral sites.

29. MPG 1 gives further advice on the development plan system. The Department intends to issue further guidance to take account of the new requirements of the 1991 Planning and Compensation Act on the preparation of mineral and waste disposal local plans.

Supply

30. There is no Government target for GB cement production. As explained in paragraph 2, it is essential for the economic well-being of the country that the cement industry is provided with an adequate and regular supply of raw materials so that it can meet the needs of the community.

31. In general the planning system has operated, and will continue to do so, on the basis that applications for planning permission should be granted, having regard to all material considerations, unless the development proposed would cause demonstrable harm to an interest of acknowledged importance. However, minerals working often causes a greater impact on the environment than other forms of development. There may not be the same flexibility of choice of location as with other forms of development as minerals can only be worked where they occur. Policies for the release of land for mineral working and cement production should therefore balance the need for the development, environmental, social, agricultural and other relevant considerations.

Location of plant and production capacity

32. The high capital cost of investment in the cement industry means that, in the short run at least, investment in new capacity is most likely to take the form of the upgrading of existing plant or the creation of additional capacity at existing plant, rather than the building of new plant on greenfield sites. The rationalisation of production capacity into larger more economic units may lead to the closure of some small plants. In the longer term, the possibility of greenfield sites cannot be ruled out.

33. Map 1 and Table 4 show the location, capacity and type of process of existing plants.

34. It follows from this that, in order to maintain and in some cases increase production at existing plants, it will be necessary for the cement makers

and the mineral planning authorities to identify areas of working and to safeguard resources reasonably near existing plants, after taking account of all environmental criteria. Proposals will also need to be drawn up for the working, landscaping, restoration and after-use of quarries and plant sites.

35. Whether or not an extension to an existing quarry would be less environmentally intrusive than a new quarry will depend upon the circumstances of each case.

Wharves

36. A feature of the cement industry's development in recent years has been the construction of special wharves for the importing of cement. This cement can either be sold directly to customers or can be taken to UK cement makers' plant for bagging. In addition, clinker and bagged cement may be imported through non-specialist wharves. The growth of these wharves reflects the industry's increased dependence on imports to meet customers needs. It also reflects increasing competition as other cement makers and independent traders try to establish themselves in new markets. For their part, planning authorities should make every effort to identify and safeguard suitable locations for wharves in their development plans.

37. Map 2 shows the location of these specialist import facilities as at January 1990.

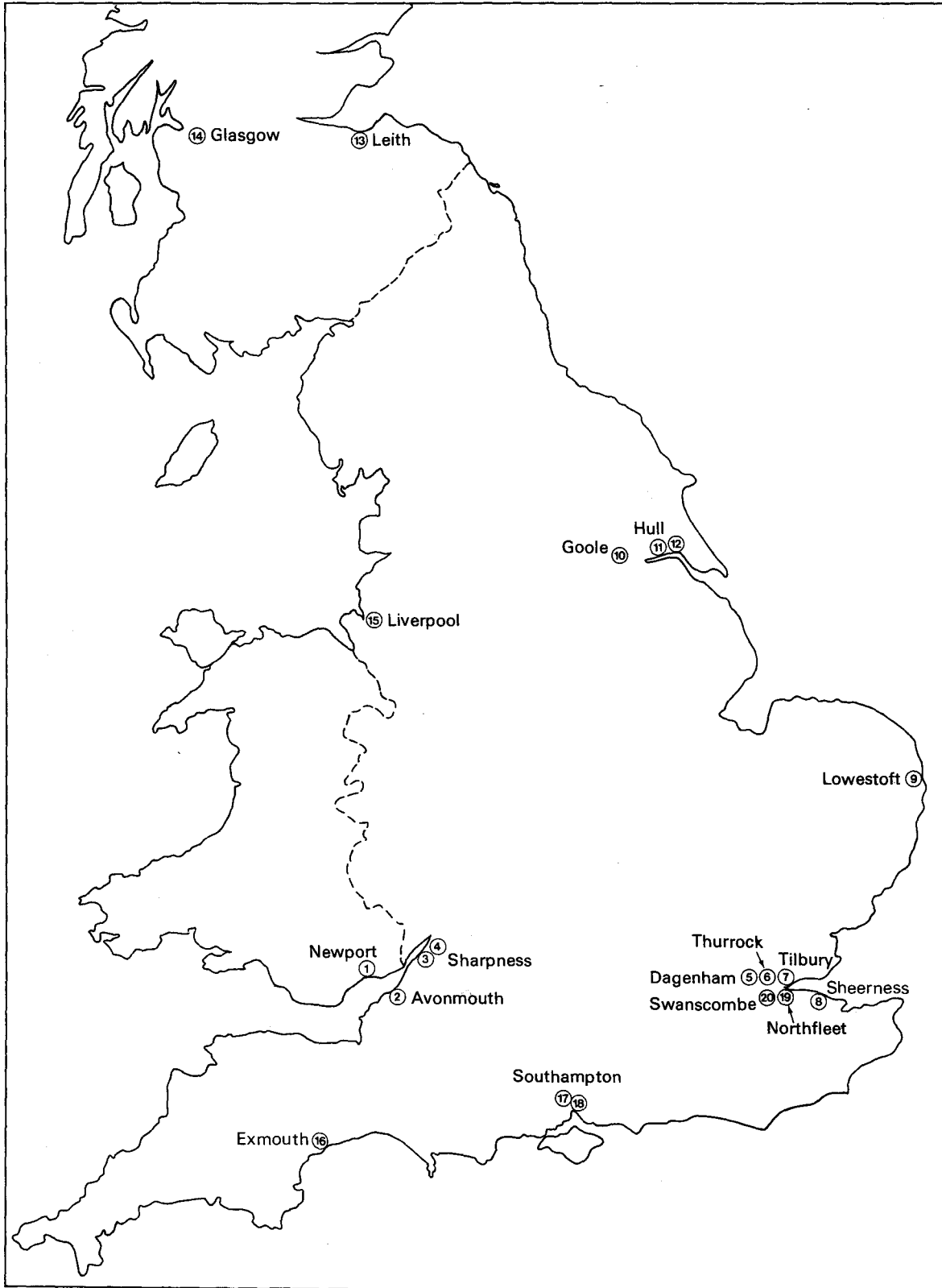
Safeguarding

38. As mineral resources are finite, local planning authorities should make every effort to safeguard in their development plans, and through development control, those deposits which are of economic importance against other types of development which would be a serious hindrance to their extraction. It will usually be necessary to consider need over a much longer period than for most other land use planning issues. When considering the need to extract the mineral as opposed to letting surface development proceed, it will be necessary to consider the timescales of the proposed mineral working in order to keep blight to a minimum. Where it is possible to extract minerals prior to other more permanent forms of development this should be encouraged unless there are good planning reasons for not doing so.

National Parks

39. The Government's policy on the treatment of applications for mineral extraction in the National Parks is set out in MPG 1. Applications must be considered on their merits, but because of the serious impact which mineral working may have on the natural beauty of the Parks, minerals applications in these areas "must be subject to the most

Map 2
Cement Import Terminals



Mapping & Graphic Services OSD2 G00094 7/90

rigorous examination". Extraction should be demonstrated to be in the public interest, and consideration of such applications should therefore normally include an assessment of:

- i. the need for the development, including the extraction of the mineral in terms of national considerations and the impact of permitting or refusing it upon the local economy;
- ii. the availability and cost of alternative sources of supply;
- iii. any detrimental effect on the environment and the landscape and the extent to which that could and should be moderated;
- iv. whether in the light of this assessment the proposed development would be justified in the public interest. (Hansard, House of Commons 9 April 1987 columns 393-394).

Areas of Outstanding Natural Beauty (AONBs)

40. AONBs are designated under the National Parks and Access to the Countryside Act 1949 for the purpose of preserving and enhancing their natural beauty and, as is the case with National Parks, they may also contain valuable chalk and limestone deposits. The Government's policy on AONBs (Hansard, House of Commons 29 July 1982 Cols 707-10) also requires that minerals applications in these areas "should be subject to the most rigorous examination".

National Nature Reserves (NNRs) and Sites of Special Scientific Interest (SSSIs)

41. DOE Circular 27/87 (WO 52/87) emphasises that in determining planning applications and drawing up development plan policies planning authorities should take full account of nature conservation factors particularly in areas designated as National Nature Reserves or Sites of Special Scientific Interest for their flora, fauna or geological or physiographic features. It specifies that mineral applications in these areas should be subject to the most rigorous examination. English Nature should be consulted on such applications in England and in Wales consultation should take place with the Countryside Council for Wales. It is recognised that there may sometimes have been cases where mineral workings have been beneficial in the establishment of new wildlife habitats and in the exposure of important geological features.

Other environmentally important areas

42. Planning authorities may designate in their development plans other environmentally significant areas, such as special landscape areas of great landscape or nature conservation value. These areas

may be important locally and mineral extraction proposals which fall within them will need to be given careful consideration, although the degree of protection given to such areas should not normally be as high as that given to the statutorily designated areas referred to above.

Ancient monuments and archaeological and other cultural interests

43. Mineral working may damage or destroy irreplaceable sites, structures and remains of historic archaeological interest that are of importance to the national heritage. The industry should, wherever practical, ensure the physical preservation of important archaeological and historic remains or features, and mineral planning authorities should have regard to the desirability of preserving historic buildings and landscapes, conservation areas, ancient monuments and their settings when determining applications for extraction. Planning Policy Guidance Note 16: "Archaeology and Planning" (PPG 16), and the CBI Code of Practice for Minerals Operators, underline the importance of identifying as early as possible the likely presence and importance of any archaeological sites liable to be affected by the proposed development. In England this should involve early consultation with the County Archaeological Officer or equivalent (listed in PPG 16) and in Wales with the regional archaeological trust. Where remains are scheduled (under the provisions of the Ancient Monuments and Archaeological Areas Act 1979), the Secretary of State for the Environment's consent is needed before works may proceed. Where buildings are listed, listed building consent is required before they may be altered or demolished.

Agricultural Land

44. Applications for minerals extraction from land used for agriculture are subject to policies set out in DOE Circular 16/87 (WO 25/87). The Government's overall policy is that when considering the allocation of land for development and in deciding applications for planning permission affecting agricultural land, the agricultural implications must be considered together with the environmental and economic aspects. The Circular also recognises that minerals have to be worked where they occur and that mineral workings provide valuable raw materials for industry and can contribute to the rural economy. These factors, and the feasibility of a high standard of restoration, therefore need to be considered in deciding planning applications for mineral working affecting agricultural land. Where minerals underlie good quality agricultural land, the Circular advises that the best and most versatile land is a national resource for the longer term and should in general be protected from irreversible development.

Green Belt

45. Proposals for mineral working also arise within Green Belts. The government's policy is set out in Planning Policy Guidance Note 2 "Green Belts" (PPG2). This states that the extraction of minerals need not be incompatible with Green Belt objectives provided that high environmental standards for working and landscaping are maintained and that the site is well restored to an appropriate use.

SPECIFIC IMPACTS

Local environmental effects

46. Mineral development can have a considerable impact upon the environment. For example, the visual intrusion of a site, the permanent changes to the landscape, the noise, vibration and dust, both from the workings and any associated heavy lorry traffic, can give rise to objections from local communities.

47. Mineral planning authorities should have regard to all material considerations when determining applications, including these guidelines and relevant policies in development plans. They will need to consider in detail matters such as the economic, environmental, nature conservation, agricultural, landscape, traffic, site restoration and other effects of the proposal that are relevant to the planning decision. For its part, the cement industry will need to demonstrate that it has considered these potential effects when preparing planning applications and has sought to mitigate them. The industry should demonstrate that it is taking all practicable steps to satisfy the environmental concerns of neighbouring sites with regard to site operation and restoration. The objective must be to ensure that any environmental damage or loss of amenity caused by mineral working is kept to an acceptable level.

Environmental Assessment

48. Where proposals for development are likely to have significant effects on the environment, the projects concerned will need to be subject to environmental assessment (EA) under the Town and Country Planning (Assessment of Environmental Effects) Regulations 1988. This will involve consultations with all relevant bodies with an interest in the environmental effects of the development and the drawing up of an environmental statement. Whether or not a mineral development proposal will warrant an EA will depend upon such factors as size, sensitivity of location, working methods, arrangements for transporting the material to the plant and proposals for restoration, aftercare and intended future uses of the site. Given the nature of the industry's operations, it is likely

that major proposals will need to be subject to an EA. DOE Circular 15/88 (WO 23/88) explains the provisions of the Regulations and gives advice on their implementation. However it has been the practice of the industry, for many years, to submit environmental statements with larger planning applications. It is therefore the industry's intention to continue its practice of submitting statements, covering all relevant issues, in support of planning applications. The Government welcomes this.

Transport

49. With the exception of a few sites, there is relatively little movement of raw materials involved in the production of cement. Most of the raw materials are excavated close to the plant. Gypsum is required in too small a quantity to make rail transport an attractive option. Most of the imported clinker used to supplement domestic production comes through ports with no suitable rail facilities.

50. Fuel must be brought to the cement plant in order to fire the kilns. This is predominantly coal. The viability of using rail to transport fuel to the plant will depend mainly on whether there is a railhead at the source, whether colliery or port, and at the plant.

51. By far the largest movements within the cement industry are the delivery of the finished product to the customers. It is generally accepted that it is less environmentally intrusive to move bulk materials like cement by rail rather than by road. However the absence of a rail link between the industry and its customers and the current cost disparity between the two modes where they are both available means that the industry relies mainly on road transport. Where distribution depots are employed, rail transport is often used to transfer cement from the works to the depot. Some plants have rail links, but customers generally do not. Road transport is, therefore, required to a varying extent in all customer sales. The industry utilises rail transport where its costs are comparable or lower than road transport and where distribution by depot is desirable. However where there is a choice of mode, the distances and volumes involved in cement sales, usually 20-100 tonnes over an average of 30-50 miles, do not make rail movement economically viable. Road haulage is better suited to these deliveries as it is more flexible and better able to guarantee the timed delivery service demanded by the industry's customers.

52. Table 5 shows the extent to which plants rely on rail and road for the sale of cement.

53. The policy implications for the planning system are that cement plants generate significant amounts of road traffic and that the scope for transferring this to the railways is currently limited. Mineral planning authorities should pay particular consideration

Table 5 Mode of transport used in movement of cement from plant, 1989

PLANT	ROAD	RAIL	WATER
Aberthaw	100%	-	-
Barrington	99.5%	0.5%	-
Cauldon	100%	-	-
Chinnor	100%	-	-
Dunbar	40%	60%	-
Hope	39%	61%	-
Ketton	83%	17%	-
Masons	94%	6%	-
Northfleet	58%	25%	17%
Padeswood	97%	3%	-
Plymstock	100%	-	-
Ribblesdale	90%	10%	-
Rochester	98%	2%	-
Rugby	100%	-	-
Southam	100%	-	-
South	100%	-	-
Ferriby			
Tunstead	100%	-	-
Weardale	50%	50%	-
Westbury	85%	15%	-

Source: British Cement Association

to traffic routing when determining new planning applications. The industry should keep under review the options for using rail transport and use it in preference to road transport wherever it is cost effective to do so taking account of the possibility of obtaining grants under Section 8 of the Railways Act 1974 for the construction of rail facilities.

Water interests

54. There is a substantial body of legislation in relation to water supply, pollution and land drainage. Mineral planning authorities and the industry should take into account the need to protect the flow and quality of water supplies in accordance with British and European Community legislation and the need to ensure that changes in the water table as a result of minerals extraction do not cause environmental damage. The National Rivers Authority should be consulted about all new mineral development proposals.

Air pollution

55. Cement production can generate significant air pollution. Under the Environmental Protection Act 1990 the manufacturer of cement or clinker must be authorised by HMIP for integrated pollution control. The operator must demonstrate the use of the best practical environmental option (BPEO). The bulk handling of cement other than at the point of production requires authorization from the local authority. The Secretary of State is issuing guidance

notes to be used by both HMIP and Local Authorities to assist in achieving the objectives set down in the Environmental Protection Act 1990.

LANDBANKS

56. Landbank policies which provide the industry with a stock of permitted reserves for a number of years are an important feature of minerals planning. The landbank is a stock of planning permissions designed to provide the industry with a steady and secure supply of minerals so it can respond to demand. They reflect the long lead times that can be involved before any mineral extraction site can become fully productive. They enable the mineral planning authorities and the industry to take a long term view of the industry's needs and the planning implications.

57. Mineral planning authorities should therefore maintain landbanks of permitted reserves of raw materials for cement plants, providing that the industry come forward with sufficient environmentally acceptable proposals. These landbanks should include the industry's primary materials (chalk and limestone) and also secondary materials (clay and shale). There should be a landbank calculated for each site.

58. The size of the cement industry's landbank should be directly linked to the scale of capital investment envisaged at a site, for an important feature of the industry is the high cost of investment and the long amortisation periods this entails. Mineral planning authorities should normally aim to maintain cement plant with a stock of permitted reserves of at least 15 years. Where significant new investment (such as a new kiln) is agreed with the mineral planning authority, the plant should be provided with a stock of permitted reserves to provide for at least 25 years. New plant on a greenfield site should be provided with a stock of permitted reserves lasting more than 25 years.

59. Development plans should normally allocate sufficient land for mineral extraction for cement manufacture to provide for the maintenance of landbanks. Structure plans should set out the general principle of maintaining a landbank for cement plant, and mineral local plans should seek to identify areas where minerals will be worked. Sufficient land should be allocated to maintain this landbank throughout, and at the end of, the plan period.

60. It should be noted that the general commitment to maintain a landbank does not remove a mineral planning authority's or the Secretary of State's discretion to refuse planning permission for an application should there be overriding environmental objections. Planning applications may also be refused within areas allocated in development plans

Table 6 Mineral reserves

PLANT	PLANNING AUTHORITY	CHALK/LIMESTONE				CLAY/SHALE			
		Consented reserves 000,000 tonnes at 1.1.90 (dry tonnes) ^(a)	Extraction 000 tonnes per annum (dry tonnes)	Moisture conversion percentage	Landbank (years)	Consented reserves 000,000 tonnes at 1.1.90	Extraction 000 tonnes per annum	Moisture conversion percentage	Landbank (years)
Aberthaw	South Glamorgan	13.0	330	2	39.4	20.7	425	4	48.7
Barrington	Cambridgeshire	27.5	780	15	35	-	-	-	-
Cauldon	Staffordshire	19.7	1,100	2.5	17.9	4.8	190	12.5	25.3
Chinnor ^(b)	Oxfordshire	12.6	437	15	29	-	-	-	-
Dunbar	Lothian	18.0	1,350	2	13.3	1.2	90	7	13.3
Hope	Peak Park	78.8	2,015	1	39.1	13.6	330	10	41.2
Ketton ^(c)	Leicestershire	53.0	1,800	8	29.5	8	360	12	30.5
Masons	Suffolk	6.1	425	25	14.4	2.7	240	15	11.2
Northfleet	Kent	30.0	3,030	22	9.9	7.5	530	22	14.1
Padeswood	Clwyd	101.0	671	2	150	3.6	90	9.5	40
Plymstock	Devon	6.5	490	3	13.3	2.7	30	4	90
Ribblesdale	Lancashire	33.0	2,000	2.5	16.5	-	-	-	-
Rochester	Kent	23.3	869	20	27	2.1	131	20	16
Rugby ^{(d)(e)(f)}	Warwickshire	23.9	454	19.6	25	25.6	130	12.5	91
Southam ^(d)	Warwickshire	23.9	479	19.6	25	25.6	150	12.5	91
South Ferriby	Humberside	49.9	948	10	53	10.3	164	15	63
Tunstead ^(g)	Derbyshire/ Peak Park	NA	NA	NA	NA	NA	NA	NA	NA
Weardale	Durham	17.1	1,030	3	16.6	2.3	70	8.5	32.9
Westbury	Wiltshire	23.6	1,125	12.5	21	5.2	200	19	26

Notes

- (a) Dry tonnes = "As dug" tonnes \times (100 - moisture conversion percentage) / 100.
(b) Not all of the permitted reserves are chemically suitable for cement production.
(c) A small proportion of Ketton limestone is used as building stone.
(d) These plant use chalk transported by pipeline from a quarry at Kensworth, Bedfordshire.
(e) There are consented clay reserves which are excluded as chemically unsuitable.
(f) This plant uses clay transported from Southam.
(g) Cement manufacture at Tunstead is a by-product of other permitted mineral extraction operations.

if the actual development proposal is judged to be unacceptable on environmental grounds.

61. In most parts of the country, mineral planning authority boundaries should constitute a suitable basis on which to base a landbank policy, but mineral planning authorities may choose to adopt either a sub-regional or a sub-county approach as appropriate. Whatever area is chosen for landbank purposes, it is essential that production and reserve data should be available and the industry and mineral planning authorities should work together to facilitate this.

62. Table 6 shows the estimated size of the landbanks at cement plant at 1 January 1990. The size of each cement plant's landbank is calculated by dividing the volume of its existing permitted dry reserves by a factor representing the number of tonnes of raw material needed to produce a tonne of clinker. The precise figure will vary from site to site. This adjusted figure for the volume of reserves should then be divided by the plant's current clinker production capacity.

63. The Government takes the view that it is in the national interest to maintain and increase cement production, and to increase the scope for competition. Sufficient reserves of minerals should be permitted for this. More permitted reserves are particularly needed where the size of the landbank is below the levels recommended in para 58 above. The cement makers and the mineral planning authorities should examine the feasibility of bringing forward planning proposals for new raw material reserves at the best balance of economic, environmental and social cost. In undertaking this the planning authorities may wish to have regard to the forecast at Annex B of the long term future demand for cement minerals.

WORKING PRACTICES, RESTORATION, AFTERCARE AND AFTER-USE

64. The Government looks to the cement industry to adopt working practices in their mineral extraction operations which will cause the least adverse environmental impact and to endeavour to be a good neighbour. The Government has commissioned research into the environmental effects of surface mineral working and this will provide the basis for further advice on good environmental practice for the minerals industry generally. The Government will expect the cement industry to take account of such guidance in operating its present sites and in any future operations.

65. It is established Government policy that restoration and, usually, aftercare will be required to make mineral workings fit for beneficial after-use and environmentally acceptable. This may include restoration to agriculture, forestry, management for

nature conservation, provision of public open space, recreation or other development. Standards of restoration have generally improved over recent years. Continuation of this trend will enable a wider range of sites to be restored to appropriate standards, leading to release of land which has not so far been made available for mineral working. Conversely, if there is serious doubt whether a new extraction proposal can be satisfactorily restored then there must also be a doubt whether permission for mineral working should be given. Wherever practicable, mineral planning authorities and mineral operators should agree schemes of working and reclamation of sites which provide for progressive restoration, unless to do so would be likely to affect adversely the standard of restoration achieved. Advice on restoration and aftercare is given in MPG 7 "The Reclamation of Mineral Workings", including a general review of the essential technical requirements which need to be considered when planning conditions are drawn up.

66. Reinstatement of sites to an appropriate after-use should be an integral part of the planning of raw material supplies for the cement industry. One of the distinguishing features of the industry is the scale and duration of its mineral extraction operations, which can transform the local landscape. For each operational site the industry should therefore draw up a quarry plan, where such a plan is not already in existence, in consultation with the mineral planning authority, for the screening and phasing of working, restoration and aftercare, and the longer term after-use and changes to the landscape. As recognised in MPG 7, whilst final site reclamation and possible after-uses must be considered at the time of a planning application and appropriate provision made in the conditions, it is likely that most such schemes prepared before extraction commences will require updating and amendment during the lifetime of a working. Planning conditions may allow for this by requiring a general treatment scheme to be prepared and agreed before extraction starts, to be followed up by submission of detailed schemes for particular phases as they are completed and by setting a time limit for submission of the final reclamation plan which is commensurate with the duration of the mineral permission.

67. Restoration of mineral sites may involve infilling all or part of the site with waste material. Where wastes other than those generated through the extraction process are being brought onto the site, the nature of the wastes to be used and the method of working need careful attention at the planning application stage and in obtaining an appropriate licence from the waste disposal authority. The Environmental Protection Act will require authorities to be satisfied that there are no hazards or difficulties arising from the landfill before they can provide a Certificate of Completion. This could involve particularly lengthy periods (20-30 years) but, if landfill gas from any site (eg clay extraction and backfill) could be utilised as a fuel for any

adjoining cement plant, the resulting integrated scheme of extraction and use might optimise use of materials and restoration of land. Where the quarry plan envisages an afteruse involving built development, restoration should entail using inert waste to avoid the dangers of methane generation.

68. In practical terms for at least the next few years, mineral planning authorities and the industry will be dealing with two broad categories of extraction sites. Some sites with relatively recent permissions will have conditions which cater adequately for restoration, aftercare and after-use. Other operational sites which were permitted some time ago may have conditions which are now considered ineffective, or in some cases non-existent, to ensure adequate working restoration and after-use. It will be important for mineral planning authorities and the industry to work together, using both statutory and voluntary procedures available, to achieve satisfactory solutions for these older operational sites. The aim should be to do this within 2 years of the publication of these guidelines.

69. Further advice on quarry plans in relation to working, restoration, aftercare and after-use is contained in Annex C.

SPEEDING THE PLANNING SYSTEM

70. The Government accepts that quarrying proposals are often complicated and can arouse local controversy, and it is important that all material considerations receive careful attention. Nevertheless, the Government expects mineral planning authorities to determine applications expeditiously. The industry itself can help to reduce possible delay by discussing its development proposals with the authority, the local community, relevant local bodies such as the County Wildlife Trusts and the appropriate statutory bodies at an early stage before planning applications are formally submitted. Applicants should aim to provide authorities with as much information as possible to help them determine the application. If the authority needs further information, every effort should be made to ensure such requests are comprehensive at the outset. Mineral Planning Guidance Note 2: "Applications, Permissions and Conditions" (MPG 2) provides further guidance on the drawing up and determining of planning applications.

POTENTIAL FOR WASTE DISPOSAL AND ENERGY CONSERVATION

71. Cement kilns can provide the opportunity for the burning of domestic refuse and industrial wastes

along with the usual fuel due to the very high burning temperature (1,450°C) and long residence time within the kiln.

72. However, there needs to be careful control of the overall chemistry to ensure emission limits are not exceeded, and account has to be taken of the production capacities, product quality, energy consumption and capital investment for the safe and practicable burning of potential wastes. Kilns using waste would need appropriate planning and waste disposal licensing consents (these will become waste management licences with the implementation of the 1990 Environmental Protection Act). HMIP should be consulted about proposals for burning wastes.

73. Providing these criteria can be satisfied, cement kilns may provide an attractive alternative to the environmental problems associated with other methods of disposal of these materials. The industry should look for opportunities to dispose safely of waste in this manner.

74. The cement industry can make a contribution to the objective of sustainable development. For example, through the use of pulverised fuel ash (PFA), a waste material produced by power stations. Although it has no hydraulic properties of its own it can be combined with Portland cement to produce a factory-made cement or added as a partial replacement for Portland cement at the concrete mixer. In addition there is potential, in a few cases, for PFA to replace clay as a raw material for cement production. Where the PFA contains a portion of unburnt carbon its use in the cement manufacturing process would help to conserve energy. The use of PFA will depend upon the quality and consistency of its chemical composition, the location of its source, and the cost and reliability of supply. Industry will continue to look for other such opportunities.

75. The cement industry can also use ground granulated blast-furnace slag, a by-product of iron production, in a similar manner to PFA as an additive to the cement or concrete mix. This material does have some inherent hydraulic properties and can be used at higher replacement levels than PFA.

76. The best available estimate of the use of PFA and slag in the current cement market is 1.6 m tonnes per annum.

77. With the introduction of Type I and Type II cements in conformity with European standards, there may be a growing use of other fillers such as powdered chalk or limestone. With Type I cement up to 5% of the cement can be made up of such fillers, and with Type IIF the filler can be up to 20%. It is possible that the overall tonnage of these fillers may form 5-6% of cement tonnage within 10 years, but the change to these cements will be gradual.

78. Cement making is energy intensive and increasing fuel costs have encouraged the industry to become progressively more energy-efficient. One route to achieving energy efficiency has been the use of limestone with its low intrinsic moisture content within the dry process. Where practicable and cost-effective, plants using chalk with high moisture content and the wet process have been converted to the semi-wet process in order to reduce energy consumption.

IMPLEMENTATION AND REVIEW

79. These guidelines will provide the basic framework for the planning of raw material for cement. They will be taken into account by the Secretaries of State when considering development plans and individual planning applications which come before them for decision.

80. Mineral planning authorities should have regard to these guidelines in formulating development plans and when considering development proposals. Development plans should recognise the need to make provision for a continuing supply of raw material in the vicinity of existing plant in a manner compatible with other environmental objectives. The plans should also provide guidance on these environmental objectives and the development control criteria which will be applied. The mineral plans should also maintain a landbank of permissions compatible with these objectives.

81. The cement industry has an important role to play in co-operating with, and contributing to, the development plan process. For example, the successful application of landbank policies depends upon the ready availability of information on reserves and production. The industry should endeavour to ensure that proposals for mineral development reflect these guidelines and come forward at the right time. The industry is also responsible for drawing up the quarry plans, in consultation with the mineral planning authorities, for achieving a high standard of operation while the site is being worked and for restoring the site when working has finished.

82. These guidelines have been based on the best information currently available. They will need updating to reflect changes in demand, technology and environmental standards, but the policy of establishing landbanks will provide flexibility. The guidelines will be reviewed every four years.

GEOLOGICAL FACTORS IN CEMENT MANUFACTURE

A1. The production of Portland cement (so called because of its resemblance to Portland Stone, a type of limestone) requires raw material containing 4 main constituents, namely lime, silica, alumina and iron oxide.

A2. Normally these are found in a primary material, chalk or limestone, which provides most of the lime, and a secondary component, clay or shale, which provides most of the silica, alumina and iron oxide (clay and shale are collectively known as mudrocks). In a typical Ordinary Portland cement raw mix, limestone comprises around 80-90% and clay or shale some 10-15%. For each tonne of cement clinker produced, approximately 1.6 tonnes of dry raw materials are required. However, the total quantity of raw materials and their relative proportions may vary significantly depending on raw material, quality, type of manufacturing process, etc. Depending on the exact composition of these components and the type of cement to be produced, it is often necessary to use small quantities of additional raw materials eg sand and iron ore, in order to achieve the correct raw mix chemistry. Gypsum is also added at the cement milling stage in order to control the setting time of the finished product.

Chalk

A3. Chalk is the youngest of the principal limestone deposits of Britain, found mainly in eastern and southern England. It is normally much softer than other types of limestone and has a higher moisture content.

A4. In Britain, the Portland cement industry had its origins in the south-east, where plentiful supplies of easily-won chalk and clay were available, and where the Rivers Thames and Medway afforded cheap transport of fuel (coal) and the finished product. Chalk is still of major importance to the industry today.

A5. There are 3 sub-divisions of chalk—Upper, Middle and Lower Chalk.

A6. The Lower Chalk is between 45 m and 70 m thick and typically has calcium carbonate contents in the range 63% to 88%. There are no flints in the Lower Chalk and it has a high clay content, particularly towards the base where it overlies the Gault Clay.

A7. The Middle Chalk is between 60 m and 70 m thick and typically has a calcium carbonate content in the range 93% to 97%. There are flints in the upper 43 m of the sequence.

A8. The thickness of the Upper Chalk varies according to how much it has been eroded. It varies between 85 m and 400 m, and typically has a calcium carbonate content in the range 95% to 98%. There are flints throughout most of the Upper Chalk.

A9. Clay for cement works located on chalk may be dug from the Gault Clay which normally underlies the chalk, or from other deposits in the vicinity of the plant. Where the lower parts of the sequence are being worked, all raw materials can be won from one excavation by blending Lower Chalk and Gault Clay recovered together from lower benches with Lower and Middle Chalk recovered from higher benches. Where the upper parts of the sequence are worked, clay may be dug from separate pits in the Gault Clay or from other deposits, eg London Clay, Boulder Clay.

A10. As chalk has a relatively high moisture content, the so-called wet or semi-wet manufacturing processes are usually used to make cement from this material.

Limestone

A11. Limestones (other than chalk) vary from shelly or oolitic deposits (such as the Jurassic Limestones) to more crystalline limestones (such as the Carboniferous Limestones). Calcium carbonate contents for limestones suitable for cement manufacture are typically in the range of 80% in Jurassic Limestones to 98% in the high purity Carboniferous Limestones. Although limestones of various types and ages are of fairly widespread occurrence in the United Kingdom, not all of these are suitable for cement manufacture. For example the Magnesian Limestone and some of the older limestones contain an excess of magnesia which renders them chemically unsuitable, while many of the Scottish deposits are relatively thin and overlain by thick overburden, precluding their economic exploitation.

A12. Limestones are often either overlain, underlain or interbedded with clays or shales, providing the opportunity for recovery of both raw materials at one location.

A13. As limestones (other than chalk) have a relatively low moisture content, the so-called dry or semi-dry manufacturing processes are used to make cement from this material.

FORECAST OF DEMAND FOR MINERALS USED IN THE MANUFACTURE OF CEMENT

Background

B1. To provide guidance on the long term trend in demand for cement minerals the Department employed independent consultants, ECOTEC Research and Consulting Ltd, to prepare a methodology to forecast demand for the cement minerals over the 20 year period to 2011. Based upon this methodology a range of forecasts of demand for the period 1990–2011 were produced by the consultants in 1990. These forecasts were subsequently revised in 1991 and these are produced below.

B2. The forecasts which have been produced by the consultants essentially represent a trend in possible demand over the period of the guidelines and cannot be used to denote the level of demand over the short term or in any one year or a small group of years nor do these represent targets for production. It must also be recognised that as with all long term forecasts there will be greater uncertainty towards the end of the forecast period. Mineral planning authorities may wish to have regard to these projections when considering planning applications.

The Methodology

B3. ECOTEC identified that a major determinant in the demand for cement is the level of construction activity. Long term forecasts of construction activity were commissioned from Cambridge Econometrics for use in the ECOTEC forecasting model.

Cambridge Econometrics

B4. Cambridge Econometrics (CE) regularly produce long term forecasts for the British economy based on the Cambridge Multi-sectoral Dynamic Model (MDM). This is currently disaggregated into 43 sectors of British industry of which construction is one. The forecasts are normally published for 10 years ahead (presently to the year 2000), but the model has been extended to the year 2011 and forecasts to this horizon are produced for some subscribers.

B5. The forecasts of construction activity which CE produce are based upon a detailed examination of long term trends in economic activity combined with analyses of specific major factors influencing construction activity. This includes consideration of the national house building and road building programmes. Their forecasts are the result of a major "bottom-up" exercise combined with strategic judgements about the overall growth rate of the

economy. This forecast of construction activity can be measured as construction output or construction investment. For the purposes of the present exercise it was decided to use construction investment (referred to as investment in buildings and works).

B6. CE were asked to produce 3 scenarios of construction activity and these were subsequently updated in 1991. The *base* forecast represents their most likely estimate of growth. The two other CE scenarios are based on differences in policy assumptions which lead to alternative long term economic growth rates; these are the *high* and *low* forecasts.

B7. The CE construction activity forecasts below were produced in April 1991. The average annual growth rates for the *base* forecast for investment in buildings and works are:

	1980	1985	1990	1995	2000	2005
	-85	-90	-95	-2000	-05	-11
Investment in buildings & works	1.3	5.5	1.3	2.6	3.3	2.8

B8. The CE *high* growth scenario is broadly based on assumptions of higher world growth, particularly as a response to European integration; this leads to higher productivity in GB. This indicates that construction investment growth would be 6.7% above the base by 2010. The *low* scenario is derived from a continued deterioration in GB economic performance with a longer recovery period. This indicates construction investment at 6.5% below the base.

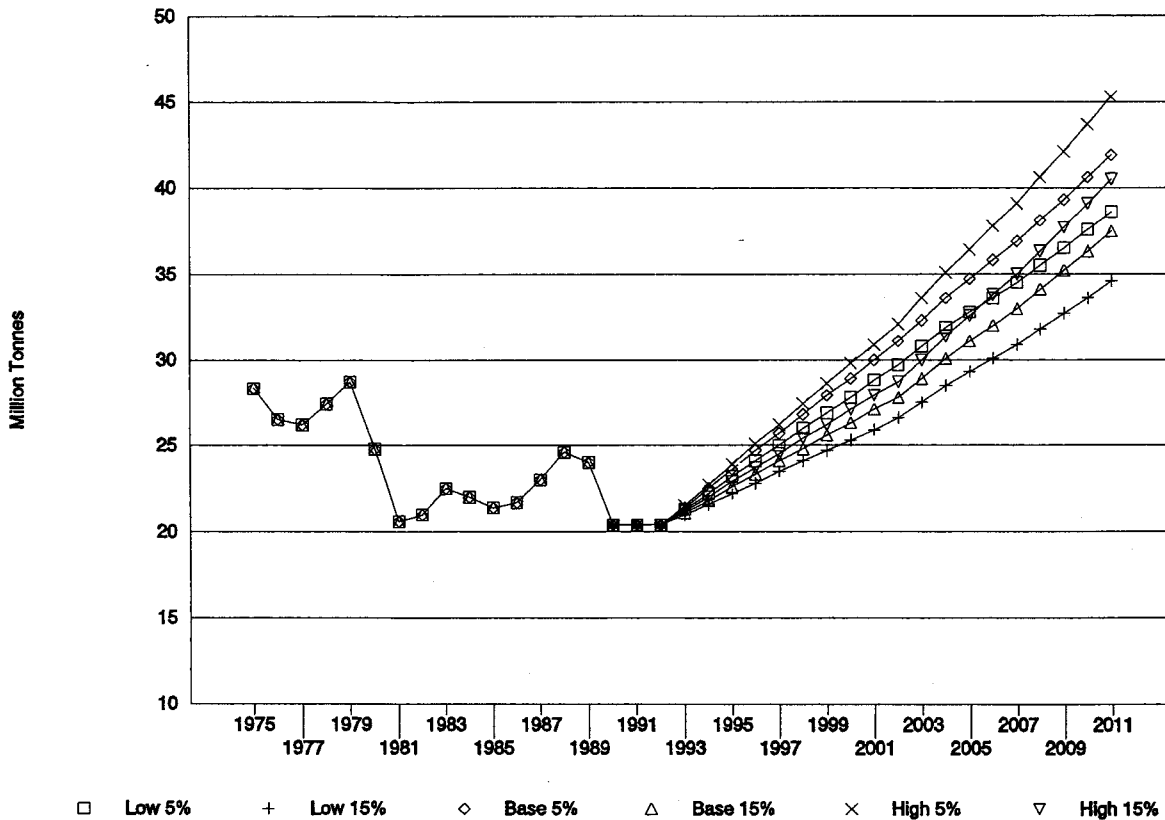
ECOTEC

B9. ECOTEC established that the relationship between the demand for cementitious materials and construction investment was sufficiently strong to produce a reliable regression model to be used in forecasting the future demand for cementitious materials and cement. This model was based on the fifteen year trend 1975–1989. The long term projections on construction investment produced by Cambridge Econometrics were used by ECOTEC in producing their forecasts.

B10. The ECOTEC regression model also contained a judgement relating to the intensity of use of cementitious materials used per unit of construction activity (measured in constant prices). For the purposes of the forecasting exercise a judgement was made that the trend in intensity of use, identified by the regression analysis over the period 1975–1989, would continue.

B11. The projections in demand for cementitious materials required adjustments to produce projections of demand for British made cement. Account

FIGURE B1 FORECASTS OF GB MINERALS DEMAND FOR CEMENT



was taken of the levels of imported cement used to meet domestic demand. For modelling purposes ECOTEC were advised to assume that imports of cement by 2003 would be either 5% or 15% of demand. It was assumed that the projections would make adjustment to production capacity over 10 years from 1993 to meet the assumptions on import levels.

B12. The potential increase in the use of “cement additions” (as referred to in paragraph 77 of the guidelines) was assumed for the purposes of this exercise to grow to 2.3 mtpa in the next 10 years before levelling off.

B13. The need for minerals to produce cement was achieved by converting the projected need for home produced cement by a conversion factor of 1.6, ie for every tonne of Portland cement 1.6 tonnes of dry minerals, excluding gypsum, is required.

The forecast

B14. This methodology produced 6 scenarios with a range of forecasts in the long term trend in demand for cement. The results of the exercise are shown at Figure B1.

Monitoring and review

B15. It is proposed that the forecast will be monitored and reviewed every four years. This will ensure that changes in assumptions can be considered.

B16. Copies of the consultants’ reports used in preparing the long term forecast of demand for cement minerals can be obtained from the offices of the Department, where copies are also available for inspection.

QUARRY PLANS FOR WORKING, RESTORATION, AFTERCARE AND AFTER-USE

C1. Quarry working and restoration (including aftercare and after-use), by its very nature, must be site specific. There can be no blueprints applicable to all situations. Nevertheless there are certain principles of good management which can assist in ensuring that a proper balance is achieved between maintaining the environment of local communities close to a quarry and desirable landscape and restoration objectives on the one hand and, on the other, the planning of a quarrying operation which is both practicable and economic. It follows that the ways of securing best practice in the working and restoration of a specific quarry should be considered as an integral part of the preparation of plans for landscaping and quarry development from the earliest stages. This calls for close cooperation between the quarry operator and the mineral planning authority from the outset.

C2. In the process of planning the development and subsequent restoration of a quarry to a beneficial after-use, the following principles may usefully be applied to the preparation and implementation of detailed plans. Reference should also be made to relevant published Government and other guidance, particularly some other MPGs and Planning Policy Guidance Notes (PPGs). For sites involving filling with controlled wastes, additional guidance is contained in DOE/HMIP Waste Management Papers.

The Preparation of a Quarry Plan

C3. Consultation with the mineral planning authority on operational practice, landscaping and restoration should take place from an early stage so that appropriate consideration can be given to its views while the Quarry Plan is in preparation. Informal pre-application discussions can help to resolve potential difficulties (for example, minimising the land area taken for a given tonnage of mineral may conflict with achieving the best ultimate landform) and clarify the requirements for documentation to accompany the planning application. Pre-application discussions can also clarify the requirements of other possible statutory consultees, such as MAFF, the Welsh Office Agriculture Department (WOAD), or the Forestry Commission (where agricultural or forestry after-use is intended).

C4. Whilst details of quarry operations, final site restoration and after-use must be considered at the time of planning application, the timescale of a major quarry means that the planning conditions and the related Quarry Plan will probably need updating and amendment (see para. 66).

C5. Sometimes potential future quarrying areas can be screened by planting, years before detailed quarry plans are prepared or working commences.

C6. The Quarry Plan should be long term and phased, incorporating progressive restoration wherever possible. For future and recently-permitted sites, it will normally be linked to relevant planning conditions dealing with stripping and storage of soils, landscaping and restoration and aftercare. The Plan should be monitored to ensure compliance with such conditions, and regularly reviewed to incorporate site experience gained.

C7. The Plan should aim to minimise the need to rehandle, or to import into or export from the quarry, topsoils, subsoils and overburden or quarry waste. Soils should be stripped, handled and stored so as to minimise any damage to their structure (see, for guidance, Table 1 of MPG 7).

C8. The phases of the Plan, with progressive restoration where possible (including temporary restoration on, for instance, soil or overburden stockpiles) should generally seek to minimise the area of exposed workings.

C9. The quarry plan should require that details are kept of the depth, extent and profile of the quarry. Where it is likely or conceivable that the after-use could include built development, infilling materials should be inert and non-degradable in order to prevent the risk of methane generation, and selected and placed to ensure the limited and quick settlement of the fill.

C10. Where landfilling with controlled waste is involved, the Plan will need to take account of the requirements of both the planning permission and the site licence. Care will be needed to ensure that there is no conflict or incompatibility between the two. Any proposal to use controlled wastes in backfilling will also require consultation with the waste disposal authority at an early stage. They will expect to see a working plan for the disposal operations and early preparation of this eases the agreement of a suitable disposal site licence.

Implementation of the Quarry Plan

C11. The aim should be to integrate working restoration and landscaping work into routine quarry management operations, thereby avoiding large variations in operational costs and using the general stock of quarry equipment and materials where possible. The workforce should be trained to achieve this pattern of working; and to regard

carrying out of requirements for restoration to be of equal importance with meeting output requirements.

C12. The Plan may provide for varying of slopes and contours during extraction to soften geometric quarry shapes and to assist in restoration. It may be possible in some locations to replicate naturally-occurring landforms.

C13. Where appropriate to the agreed after-use, planting of vegetation should reflect woodland, grassland and flowering plants occurring naturally in the area, and provide wildlife habitats. Since many of the country's limestone and chalk outcrops support limited areas of semi-natural grassland which are of nature conservation value, the Plan may be able to replicate an appropriate plant community in parts of the restored quarry. It may also be appropriate to consider whether any features of geological importance which have been revealed during the quarrying operations can and should be preserved and included in the restoration scheme.

C14. Restoration design and methods should take into account possible effects on groundwater and surface water drainage.

C15. Vegetation cover in all restored areas should have regular management and maintenance either as a formal aftercare requirement of the planning permission or as part of voluntary "good housekeeping".

C16. Quarry operators will normally expect to maintain control of, and responsibility for, their sites until completion of restoration and aftercare; and for any post-closure responsibilities arising from landfills. However in the longer term it may be intended that the land should be leased or sold. Discussions may therefore be needed with agricultural, forestry or nature conservation bodies, and the National Rivers Authority, depending on the actual after-use.

REFERENCES

Primary legislation

Town and Country Planning Act 1990

Planning and Compensation Act 1991

Ancient Monuments and Archaeological Areas Act 1979

Environmental Protection Act 1990

Statutory Instruments

Town and Country Planning (Assessment of Environmental Effects) Regulations 1988

DOE Circulars

16/87 (WO 25/87): Development Involving Agricultural Land

27/87 (WO 52/87): Nature Conservation

15/88 (WO 23/88): Environmental Assessment

Minerals Planning Guidance Notes

MPG 1—General considerations and the Development Plan System

MPG 2—Applications, Permissions and Conditions

MPG 4—The Review of Mineral Working Sites

MPG 7—The Reclamation of Mineral Workings

Planning Policy Guidance Notes

PPG 1 —General Policy and Principles

PPG 2 —Green Belts

PPG 16—Archaeology and Planning

Derelict Land Advice Notes

DLGA 1—Derelict Land Grant Policy

Other Publications

This Common Inheritance (Cmmd 1200) HMSO ISBN 0 10 112002 8 (£24.50)

CBI Archaeological Investigations—Code of Practice for Mineral Operators

Reports

ECOTEC Research and Consulting Ltd: A Forecasting Methodology for the Estimation of Demand of Cement and Cement Minerals

Cambridge Econometrics: Forecasts of Long-term Economic Growth and Construction Output