

## The sand and gravel resources of the country between Mildenhall and Barrow, Suffolk

Description of 1:25 000 sheets TL 76, 77 and part of 87

A. R. Clayton

The first twelve reports on the assessment of British sand and gravel resources appeared in the Report Series of the Institute of Geological Sciences as a subseries. Report No. 13 and subsequent reports appear as Mineral Assessment Reports of the Institute.

Details of published reports appear at the end of this Report.

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*The asterisk on the cover indicates that part of a sheet adjacent to the ones cited is described in this report.*

## **PREFACE**

National resources of many industrial minerals may seem so large that stocktaking appears unnecessary, but the demand for minerals and for land for all purposes is intensifying and it has become increasingly clear in recent years that regional assessments of the resources of these minerals should be undertaken. The publication of information about the quantity and quality of deposits over large areas is intended to provide a comprehensive factual background against which planning decisions can be made.

Sand and gravel, considered together as naturally occurring aggregate, was selected as the bulk mineral demanding the most urgent attention, initially in the south-east of England, where about half the national output is won and very few sources of alternative aggregates are available. Following a short feasibility project, initiated in 1966 by the Ministry of Land and Natural Resources, the Industrial Minerals Assessment Unit (formerly the Mineral Assessment Unit) began systematic surveys in 1968. The work is now being financed by the Department of the Environment and is being undertaken with the cooperation of the Sand and Gravel Association of Great Britain and independent members of the extractive industry.

This report describes the sand and gravel resources of the country between Mildenhall and Barrow, Suffolk, shown on the accompanying 1:25 000 resource sheet TL 76 and 77 and part of TL 87. The survey was conducted by Mr A. R. Clayton assisted by Mr J. R. Gozzard. Mr Clayton has been responsible for the data reduction and compiling the report and map for publication. The work is based on six-inch and 1:10 000 scale geological surveys carried out by the Institute's Field Staff in 1976-1979 and published as 1:50 000 Geological Sheet 189 (Bury St. Edmunds). Information for the northern-most part of the district, within the area covered by Geological Sheet 174 (Thetford), is available for consultation at the Institute's Keyworth Office. The geological lines now presented at 1:25 000 scale include minor amendments resulting from the present work. Particular thanks are due to Dr. C. R. Bristow and Dr. B. S. P. Moorlock of the Institute's Field Staff for their constructive comments on the geology of the district.

The Institute's Land Agents were responsible for negotiating access to land for drilling. The ready co-operation of landowners and tenants in this work is gratefully acknowledged.

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The sand and gravel resources of the country between Mildenhall and Barrow <b>in pocket</b>			



# The sand and gravel resources of the country between Mildenhall and Barrow, Suffolk

Description of 1:25 000 sheets TL 76, 77 and part of 87

A. R. Clayton

## SUMMARY

The geological maps of the Institute of Geological Sciences, pre-existing borehole information, and 144 boreholes drilled for the Industrial Minerals Assessment Unit form the basis of the assessment of the sand and gravel resources of the country around Mildenhall and Barrow, Suffolk.

All the deposits in the district that might be potentially workable for sand and gravel have been investigated and a simple statistical method has been used to estimate the volume. The reliability of the volume estimates is given at the symmetrical 95 per cent probability level.

The 1:25 000 map is divided into eight resource blocks, containing between 2.8 and 16.5 km<sup>2</sup> of sand and gravel. For each block the geology of the deposits is described, and the mineral-bearing area, the mean thickness of overburden and mineral and the mean gradings are stated. Detailed borehole data are also given. The geology, the position of the boreholes and the outlines of the resource blocks are shown on the accompanying map.

## Notes

Each borehole registered with the Institute is identified by a four-element code (e.g. TL 77 NW 75). The first two elements define the 10-km square (of the National Grid) in which the borehole is situated; the third element defines a quadrant of that square, and the fourth is the accession number of the borehole. In the text of the report the borehole is normally referred to by the last three elements alone (e.g. 77 NW 75). Exposures are referred to in a similar manner to boreholes, but are given the prefix 'E'.

All National Grid references in this publication lie within the 100-km square TL unless otherwise stated. Grid references are given to eight figures, accurate to within 10 m, for borehole locations. (In the text, four- and six-figure grid references are used for more extensive locations, for example for farms).

Elevations are given in metres above Ordnance Datum (OD); in the text, heights are quoted to the nearest metre, and in the borehole records to the nearest tenth of a metre.

## Bibliographical reference

CLAYTON, A. R. 1983. The sand and gravel resources of the country between Mildenhall and Barrow, Suffolk: description of 1:25 000 sheets TL 76, TL 77 and part of TL 87. *Miner. Assess. Rep. Inst. Geol. Sci.*, No 123.

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## INTRODUCTION

The survey is concerned with the estimation of resources, which include deposits that are not currently exploitable but have a foreseeable use, rather than reserves, which can only be assessed in the light of current, locally prevailing, economic considerations. Clearly, neither the economic nor the social factors used to decide whether a deposit may be workable in the future can be predicted; they are likely to change with time. Deposits not currently economically workable may be exploited as demand increases, as higher-grade or alternative materials become scarce, or as improved processing techniques are applied to them. The improved knowledge of the main physical properties of the resource and their variability, which this survey seeks to provide, will add significantly to the factual background against which planning policies can be decided (Archer, 1969; Thurrell, 1971, 1981; Harris and others, 1974).

The survey provides information at the 'indicated' and 'inferred' levels. Indicated assessments "are computed partly from specific measurements, samples or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to permit the mineral bodies to be outlined completely or the grade established throughout". 'Inferred' assessments are those "based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any samples or measurements". (Bureau of Mines and Geological Survey, 1948, p 15).

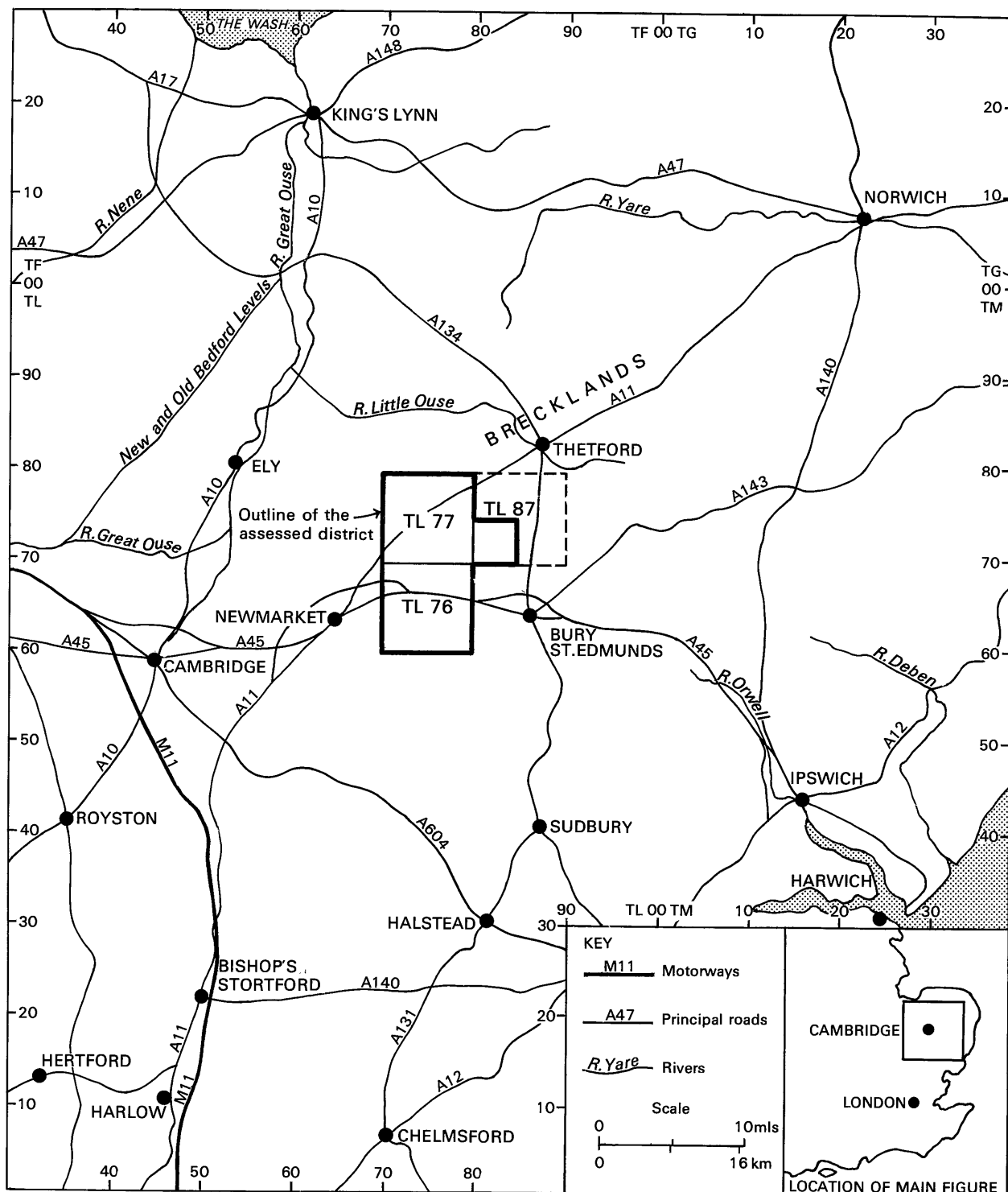
It follows that the whereabouts of reserves must still be established and their size and quality proved by the customary detailed exploration and evaluation undertaken by the industry. However, the information provided by this survey should assist in the selection of the best targets for such further work. The following arbitrary physical criteria have been adopted:

- a The deposit should average at least 1 m in thickness.
- b The ratio of overburden to sand and gravel should be no more than 3:1.
- c The proportion of fines (particles passing the No. 240-mesh B.S. sieve, about  $\frac{1}{16}$  mm) should not exceed 40 per cent.
- d The deposit should lie within 25 m of the surface, this being taken as the likely maximum working depth under most circumstances. It follows from the second criterion that boreholes are drilled no deeper than 18 m if no sand and gravel has been proved.

A deposit of sand and gravel that broadly meets these criteria is regarded as 'potentially workable' and is described and assessed as 'mineral' in this report. As the assessment is at the indicated level, parts of such a deposit may not satisfy all the criteria.

Pre-Pleistocene rocks, which are usually consolidated and devoid of potentially workable sand and gravel, are referred to as 'bedrock'; 'waste' is any material other than bedrock or mineral; 'overburden' is waste that occurs between the surface and an underlying body of mineral.

For the particular needs of assessing sand and gravel resources, a grain-size classification based on the geometric scale  $\frac{1}{16}$  mm,  $\frac{1}{4}$  mm, 1 mm, 4 mm, 16 mm, 64 mm has been adopted. The boundaries between fines (that is,



**Figure 1** Sketch-map showing the location of the 1:25 000 sheets TL 76, 77 and 87.

the clay and silt fractions) and sand, and between sand and gravel material, are placed at  $\frac{1}{8}$  mm and 4 mm respectively (see Appendix C).

The volume and other characteristics are assessed within resource blocks, each of which, ideally, contains approximately 10 km<sup>2</sup> of sand and gravel. No account is taken of any factors, for example roads, villages or land of high agricultural or landscape value, which might stand in the way of sand and gravel being exploited, although towns are excluded. The estimated total volume therefore bears no simple relationship to the amount that could be extracted in practice.

*It must be emphasised that the assessment applies to the resource block as a whole; valid conclusions cannot*

*be drawn about mineral in parts of a block, except in the immediate vicinity of the actual sample points.*

#### DESCRIPTION OF THE DISTRICT

##### General

The district lies to the west of Bury St Edmunds and is served by the Cambridge - Ipswich trunk road (A45), the London - Norwich trunk road (A11) and the main Cambridge - Ipswich railway line (Figure 1).

The scenery and relief of the district is varied. In the north-east, chalk uplands rising to about 55 m above Ordnance Datum (OD) are covered by thin Drift deposits

and blown sand, giving rise to Breckland\* scenery. This terrain gives way westwards to the low ground of the Lark valley, which crosses the district from east to west. The River Lark occupies a wide floodplain lying at about 8 m OD and is flanked, mainly to the south, by wide river terraces. At Barton Mills [730 740] an old channel of the River Lark (now occupied by an artificial drainage channel) trends northwards; it also is flanked by river terraces. In the central part of the district the low Drift-covered ground rises gently southwards giving place to undulating chalk hills of no great relief, reaching 70 m OD around Higham [750 660]. Farther south this terrain gives way to a dissected boulder clay plateau which rises to around 115 m OD in elevation.

Remnants of ancient turf fens and Breckland heath have been preserved at Tuddenham Heath [745 730] and Cavenham Heath [765 725], and are designated National Nature Reserves.

Over much of the northern and north-eastern parts of the district, soils are generally thin, light and sandy. A large proportion of the poorer Brecklands are forested, especially north of West Stow [820 705] and east of Mildenhall [740 750], or remain as heathland. Cereals are important and some root crops are grown despite the need for irrigation to obtain good yields: dairying and beef production are carried on locally. On the more fertile boulder clay soils to the south, sugar beet and cereals are important crops whilst fruit growing is carried on in some sheltered places. The chalk soils of the central part of the district are particularly well suited to cereal growing.

Sand and gravel has been quarried in a number of places, principally north of Kentford [710 680], on Cavenham Heath [755 715] and at Lackford [795 715] and workings are still active at these locations. Chalk is quarried south of Barton Mills [at 711 722] for use in cement manufacture.

### Geology

The first geological survey of the country around Mildenhall and Barrow was made at the one-inch scale by W. H. Penning, F. J. Bennett, J. H. Blake and W. Whittaker and was published in 1882. The descriptive memoir for sheet 189 (Bury St Edmunds) was published in 1886 (Bennett and Blake, 1886). The area was mapped at the six-inch to one mile and 1:10 000 scale by Dr. C. R. Bristow, Mr T. E. Lawson and Dr. B. S. P. Moorlock in 1976-1979 and the results of some of this work are now published on 1:50 000 Geological Sheet 189 (Bury St Edmunds). Information for the district north of Grid-line 77, within the area covered by 1:50 000 Geological Sheet 174 (Thetford), is currently only available at the 1:10 560 scale but may be consulted at the Institute's Keyworth Office.

The geological sequence is given in Table 1, and a brief description of the deposits is given below. The distribution of the principal Drift deposits is shown in Figure 2; a schematic section across the district is shown in Figure 3.

### SOLID

Lower Chalk This formation comprises mainly grey massive chalk but is distinctly white in the upper part (Chatwin 1961). It is exposed in the western and north-western parts of the district but is more commonly overlain by Drift deposits.

Middle Chalk In most of the northern and central parts of the district Middle Chalk forms the bedrock. It consists of massive, greyish white, shelly chalk with some

**Table 1** Geological Sequence

<b>DRIFT</b>	
<b>Recent and Pleistocene</b>	
Blown Sand	Fine quartz sand
Peat	Soft brown organic matter
Alluvium	Clay and silt, locally shelly and peaty
Cover Sand	Clayey sand with some pebbles
River Terrace Deposits	Sand and gravel, locally clayey, mostly composed of flint with some chalk
Head	Clays, sands and gravels in varying proportions
Glacial Silt	Soft grey silts and clays
Boulder Clay	Grey chalky pebbly clays
Glacial Sand and Gravel	Sand and gravel, locally clayey
<b>SOLID</b>	
<b>Cretaceous</b>	
Upper Chalk	Massively bedded white chalk with thin seams of flint
Middle Chalk with Melbourne Rock at base	White chalk, locally shelly or marly
Lower Chalk Upper Beds	Grey chalk with marly seams

marly partings and occasional seams of nodular and tabular flints. At the base of the formation about 2 m of hard yellowish white nodular chalk (the Melbourne Rock) forms an impersistent topographical feature.

Upper Chalk On the higher ground of the east and south of the district Upper Chalk forms the bedrock. It comprises massively bedded white chalk with some seams of nodular and tabular flints.

### DRIFT

The principal Drift deposits in the district are the glacial deposits, comprising Glacial Sand and Gravel, Boulder Clay and Glacial Silt, together with the River Terrace Deposits. Head, Cover Sand and Blown Sand are also present locally.

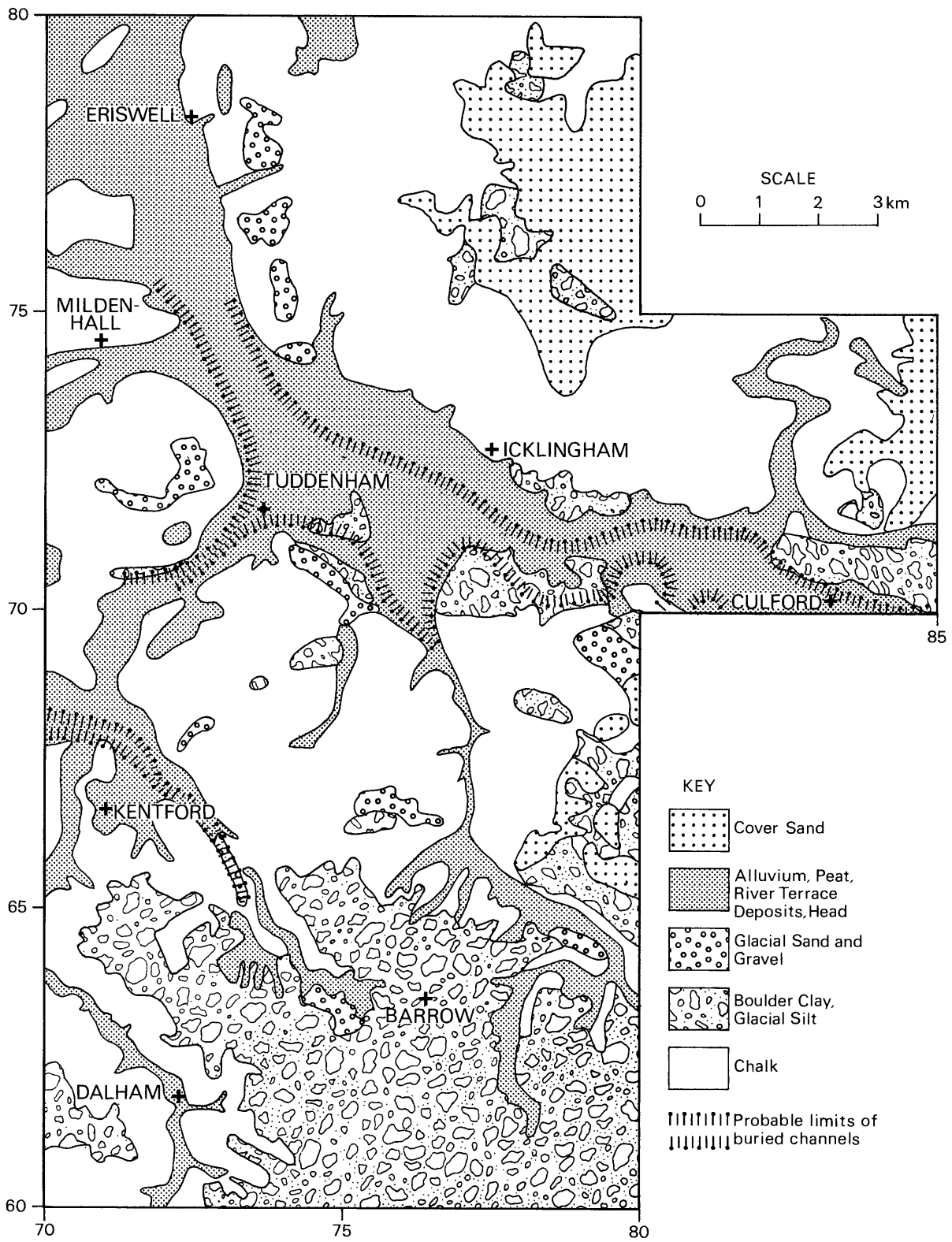
Glacial Sand and Gravel and Boulder Clay occur mainly in the south of the district. They may be concealed in part by thin discontinuous spreads of Head, Cover Sand and other younger Drift deposits. The Glacial Silt is present mainly beneath the River Terrace Deposits of the Lark and Kennett valleys where it infills a system of deep buried channels. Beneath the Glacial Silt in these channels are discontinuous deposits of sands and gravels also referred to as Glacial Sand and Gravel. The probable extent of both the buried channels and the associated Glacial Sand and Gravel deposits is indicated on the accompanying resource map: the buried channels are shown in Figure 2.

The River Terrace Deposits occur mainly in the Lark and Kennett valleys where they crop out at the surface, except where concealed by later Peat and Alluvium.

Both Blown Sand and Cover Sand are present over much of the district, but have only been mapped where they are more than 1 m thick.

Glacial Sand and Gravel Small, isolated outcrops of Glacial Sand and Gravel occur on the higher ground of the district at elevations ranging from 23 m to 90 m. The most extensive deposits are south and east of Eriswell [724 780] where they are overlain by thin spreads of Boulder Clay. In some places Glacial Sand and Gravel is

\* Open sandy heathland characteristic of the district around Thetford, Norfolk (Figure 1).

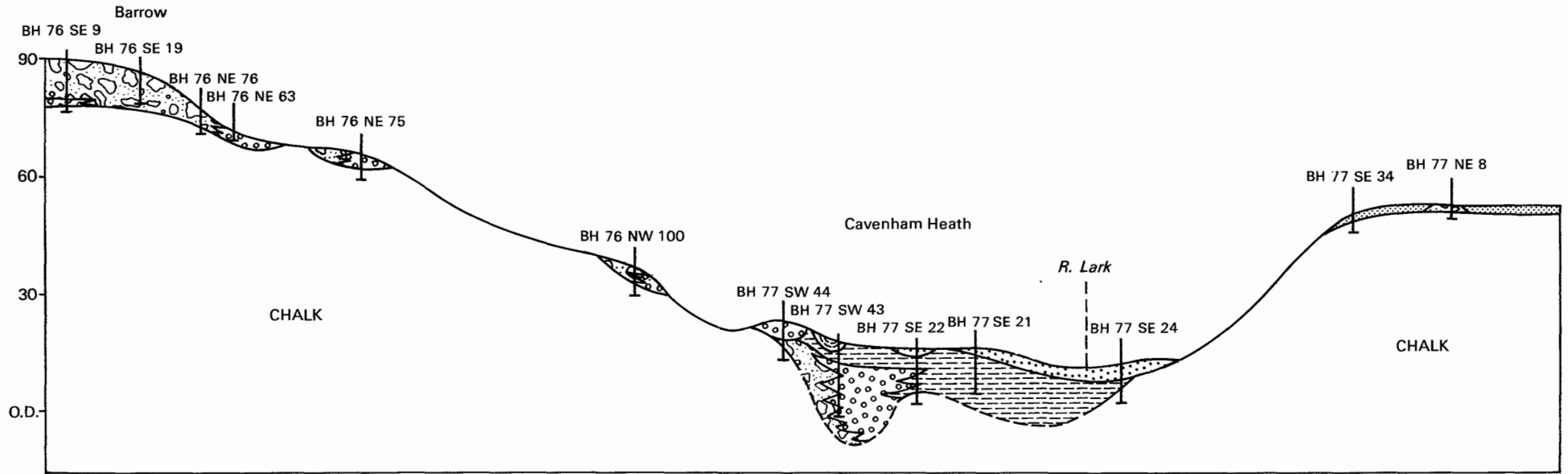


**Figure 2** Generalised map of the Drift geology of the district.



A  
763 640

A'  
800 760



Height relative to O.D. in metres

0 1 2 3 km

Horizontal Scale

Vertical exaggeration x 40

KEY



N.B. Thin or discontinuous deposits may be omitted or exaggerated.  
The line of section is shown on the resource map.

Figure 3 Generalised geological section across the district showing the relationships between the principal Drift deposits.

also underlain by Boulder Clay, but, in these instances it is invariably thin and discontinuous. Mapped deposits of Glacial Sand and Gravel in the southern part of the district are of very limited extent and wedge-out rapidly beneath, or as intercalations within, the Boulder Clay deposits.

Other deposits of Glacial Sand and Gravel occur partly filling the system of buried channels in the vicinity of Tuddenham [740 713] and West Stow [818 707], and are discontinuous: the suggested limits of these deposits, inferred from evidence from six Industrial Minerals Assessment Unit (IMAU) assessment boreholes, are indicated on the accompanying resource map.

Though of limited areal extent, the buried Glacial Sand and Gravel deposits are exceptionally thick in places. In two IMAU boreholes, 77 SW 43 and 87 SW 28, the base of the deposits was not proved: in borehole 77 SW 43 near Tuddenham [743 712] the deposits are in excess of 32 m thick and in borehole 87 SW 28 at West Stow [821 704] are in excess of 24 m thick. Elsewhere, the deposits range from 2.3 m to 7.2 m in thickness. Glacial Sand and Gravel occurring in the buried channels is proved to overlie Boulder Clay locally (for example, in IMAU boreholes 77 SW 29 and 36).

Both the surface and buried deposits comprise sand and gravel in varying proportions, often with clayey seams.

**Boulder Clay** Extensive outcrops of Boulder Clay cover much of the southern part of the district, giving rise to a prominent clay plateau. Farther north, more limited deposits of Boulder Clay occur both on the higher ground, notably north-east of Icklingham (for example at [79 75]), and along the margins of the buried channel system, for example, near Bunker's Barn [at 770 702].

The recorded thickness of Boulder Clay ranges from 1.4 m in IMAU boreholes near Bernersfield Farm [790 754], to a maximum of 36 m in the south of the district, for example near Denham [at 760 723] where IGS Hydrogeology Unit record 76 SE 13 proved the full thickness of the deposit.

Boulder Clay is usually a dark grey, locally silty, clay. It contains pebbles of chalk, flint and quartz in varying proportions together with some sedimentary and igneous rock types. In places, thin, decalcified Boulder Clay deposits comprise clayey sands and gravels. Where Boulder Clay deposits occur along the margins of buried channels, they appear to pass up gradually into the overlying Glacial Silt or Glacial Sand and Gravel.

**Glacial Silt** Deposits of Glacial Silt occur within the buried channels of the central part of the district. They are commonly concealed by more recent deposits but crop out at the surface in a number of localities along the Lark valley, notably on Cavenham Heath [at 750 714], and around Lackford [793 704].

Glacial Silt consists of bluish grey silty or sandy clay, frequently finely laminated: deposits may also contain thin, poorly defined seams of chalk sand with soft, pebble-sized chalk pellets.

At the margins of the buried channels, the deposits are thin and deeply weathered, but towards the centre of these channels they may be locally in excess of 20 m thick. The base of the Glacial Silt was proved only in IMAU boreholes near the channel margins where it was often recorded overlying Boulder Clay.

**Head Solifluxion** products, comprising sands, sandy clays and sandy gravels have been mapped as Head. Those deposits occurring at higher elevations in the south of the district, for example south of Higham [747 637] and at [790 646], are closely associated with the Glacial Sand and Gravel or Boulder Clay deposits which they overlie and from which they have been derived. Such deposits usually have a high clay and chalk content. On lower ground, at elevations up to about

25 m, the Head deposits are more closely associated with, and are of similar composition to, the River Terrace Deposits, especially the Third, Fourth and Fifth Terraces. Other deposits of Head, occupying narrow 'dry' valleys on the exposed Chalk bedrock, are mainly chalky clays and sandy clays. The recorded thicknesses of Head deposits range from 1.9 m in borehole 76 SW 7 to a maximum of 6.9 m in borehole 77 NW 68, but many of the smaller outcrops are probably less than 0.5 m thick.

**River Terrace Deposits** A small outcrop of pebbly sand occurring at an elevation of 8.0 m above near Eriswell [780 790] is mapped as Fifth Terrace. This deposit is about 1.6 m thick.

The broadest outcrops of Fourth Terrace deposits occur around Kentford [710 667] but have been largely worked out. Typically, the deposits comprise 'clayey' pebbly sand\* ranging from 2.5 m thick in borehole 76 NW 96, to 4.0 m thick in the A45 Trunk Road Site Investigation Boreholes. In the vicinity of Kentford Heath [712 682], these deposits overlie Glacial Silt: elsewhere, Fourth Terrace deposits generally rest on Chalk bedrock.

In the north of the district, east of Eriswell [at 747 797], small deposits of pebbly sand of the order of 4.0 m thick have been mapped as Third Terrace. Farther south, near Kentford, Third Terrace deposits have not been differentiated from younger Second Terrace deposits, both having been mapped as a single unit. Minor patches of Third Terrace deposits have also been mapped in the Kennett valley where 3.3 m were recorded in borehole 76 SW 8.

The most extensive outcrops of Second Terrace deposits occur along the Lark valley between Tuddenham [737 715] and Culford [833 702], and along the now-abandoned course of the River Lark north of Mildenhall. Smaller outcrops occur between Tuddenham and Kentford [707 667], where they have been extensively worked. Minor deposits also occur along rivulets in the south of the district, but are generally thin and discontinuous.

Second Terrace deposits range in grade from sand to gravel and may be 'clayey' to 'very clayey' locally; north of Mildenhall they comprise sand with only scattered pebbles. Overall, the deposits classify as sandy gravel. The mean thickness of the deposits, based on results from 26 IMAU boreholes, is 4.2 m, but the recorded thicknesses range from only 0.9 m in borehole 77 SW 31 near Tuddenham, to a maximum of 13.3 m in borehole 77 SE 24.

Small outcrops of First Terrace deposits occur mainly to the south of the River Lark between Mildenhall and Icklingham, and in the extreme north-western part of the district [around 700 800].

First Terrace deposits are similar in grade and composition to Second Terrace sediments (see 'Composition of the Sand and Gravel Deposits'). The deposits vary widely in thickness, from a minimum recorded value of 1.7 m in boreholes 77 SE 41 and 87 SW 19, to a maximum of 9.6 m in borehole 77 NW 69. The mean thickness of the deposits, based on the results from 31 boreholes, is 4.5 m.

**Cover Sand** Thin, discontinuous spreads of Cover Sand overlie both Solid and Drift deposits throughout the district, but are often too thin to warrant mapping. They consist mainly of 'clayey' to 'very clayey' pebbly sand containing rounded to well rounded quartz. Pebbles are mainly fine and of patinated flint, though subrounded quartz pebbles are not uncommon.

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\* The system of classification and description of sand and gravel is explained in Appendix C.

**Table 2** Mean grading characteristics of the potentially workable sand and gravel deposits.

Resource Block	Number of boreholes	Mean thickness (m)	Mean grading percentages					
			Fines - $\mu$ mm	Fine sand + $\mu$ - $\frac{1}{4}$ mm	Medium sand + $\frac{1}{4}$ -1 mm	Coarse sand +1 -4 mm	Fine gravel +4 -16 mm	Coarse gravel +16 mm
<b>First Terrace</b>								
B	12	4.0	6	26	32	7	16	13
C	1	4.1	12	14	22	9	20	21
G	8	4.9	6	36	26	6	14	12
All blocks	21	4.3	6	30	29	6	16	13
<b>Second Terrace</b>								
A	10	4.0	5	45	36	4	6	4
B	14	5.9	8	38	30	4	10	10
C	7	2.7	8	39	29	4	10	10
G	6	2.7	5	52	25	3	7	8
All blocks	37	4.1	7	42	30	5	9	8
<b>Third Terrace</b>								
C+D	3	4.1	13	35	19	6	14	13
<b>Fourth Terrace</b>								
C	11	2.5	23	42	21	3	5	6
<b>Fifth Terrace</b>								
D	1	1.6	6	26	35	10	15	8
<b>Head</b>								
A, B, E, G +H	25	6.3	11	22	28	8	15	16
<b>Cover Sand</b>								
B, E, F, G + H	14	1.7	18	42	23	3	5	9

The Cover Sand is rarely more than a few metres thick but exhibits a wide variation in thickness. Where it overlies other sand and gravel deposits its base is usually indistinct.

**Alluvium** Variably sandy clays form the Alluvium deposits of the Rivers Lark and Kennett and some tributary streams in the district. These deposits are commonly about 0.5 m thick, but range up to a maximum recorded thickness of 3.7 m in borehole 77 SW 28 near Mildenhall, where they are overlain by a thin deposit of peat.

**Peat** Deposits of peat occur in the Lark valley west of Mildenhall, to the east of Eriswell [at 717 785] and west of Tuddenham [at 732 717]. They range from less than 0.5 m thick near Eriswell, where they form discontinuous spreads, to a maximum recorded thickness of 4.0 m in borehole 77 SW 40 in the Lark valley.

**Blown Sand** In historical times, deposits of blown sand have accumulated along man-made windbreaks in the north-east of the district, giving rise to narrow, elongated outcrops. The deposits comprise fine quartz sands with some fine flint pebbles locally. Blown Sand may reach thicknesses of 2 m, but is often too thin to be mapped.

#### Composition of the Sand and Gravel Deposits

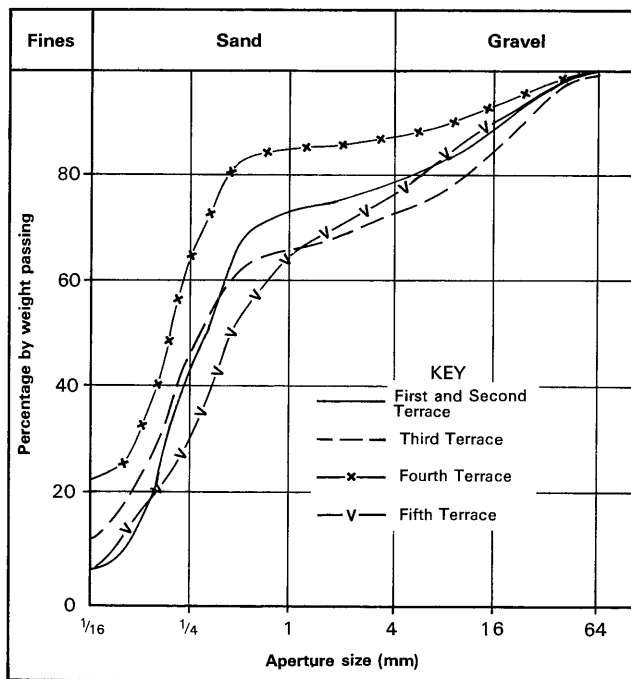
The principal potentially workable sand and gravel deposits in the district are the River Terrace Deposits and Glacial Sand and Gravel. Deposits of Head, Blown Sand and Cover Sand may be potentially workable locally, but are usually either too thin or too 'clayey' to be classified as 'mineral'.

The mean grading characteristics of the sand and gravel deposits proved in assessment boreholes are given in Table 2 and Figure 4. The grading of individual samples is shown in Figure 5. Compositional data for the +4-16 mm (fine gravel) fraction in the sand and gravel deposits are given in Table 3. The system of classification and description of sand and gravel deposits is described in Appendix C.

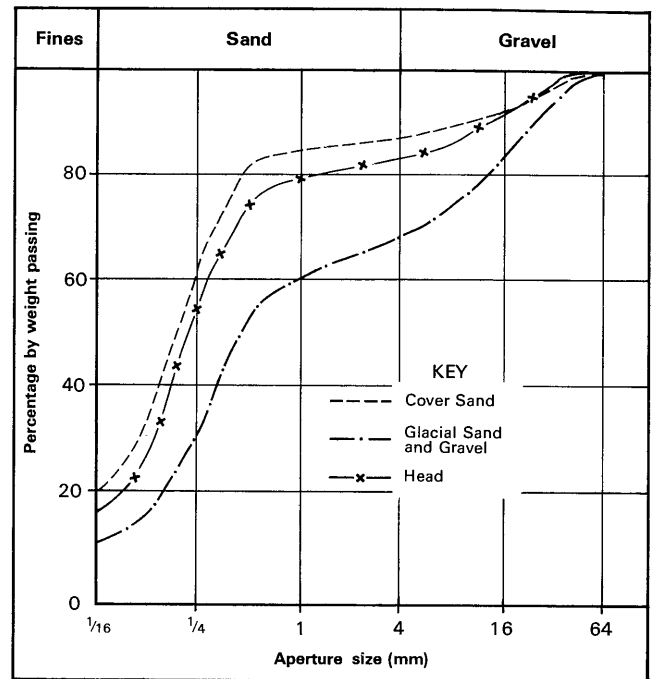
**Lithological Constituents** The principal lithological constituents in the sand and gravel fractions are brown and black flint, chalk, quartz and quartzite. Subordinate and minor constituents include mudstone, limestone, sandstone and ironstone. Other constituents, for example igneous and metamorphic rock types, occur only rarely.

The constituents of both the sand and the gravel fractions are similar, though proportions of each rock type may vary between the size ranges. Generally, the sand fractions in each of the deposits contain proportionally more quartz than do the gravel fractions. Similarly, in the gravel fractions chalk is more dominant in the fine range than in the coarse range.

Two types of flint have been identified, particularly within the gravels: brown, generally patinated flint and black unpatinated flint. Brown patinated flint is the predominant type in most samples from boreholes and commonly comprises about 50 per cent of the gravel fractions compared to 20 to 30 per cent for unpatinated flint. The thickness of the patina is variable and gives the surface of the flint a greyish brown to brownish white colour in contrast to the dark grey, dark brown or black colour of unpatinated flint. Brown flint is generally more rounded than the black type which has more freshly fractured faces. Roeder (1977) suggested that patinated flint is more porous than the black unpatinated type and



a. River Terrace Deposits



b. Other deposits

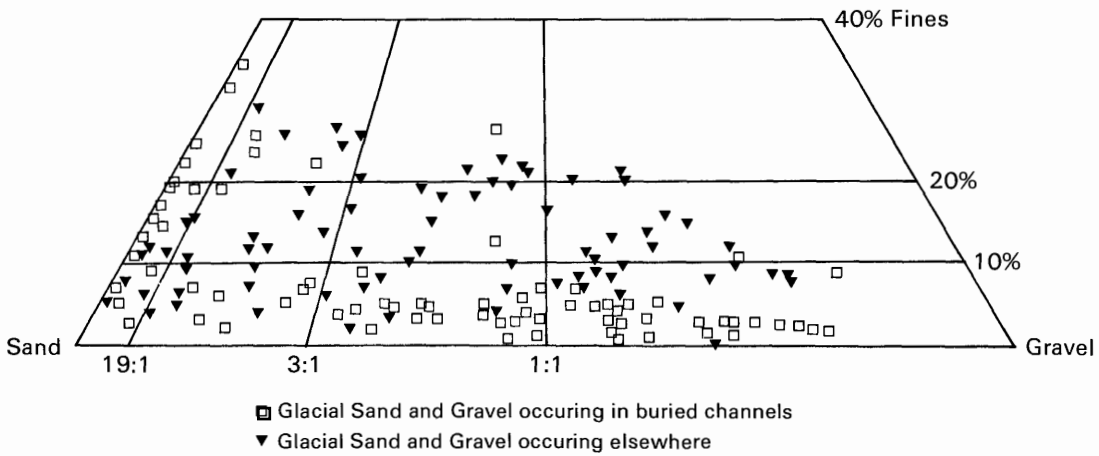
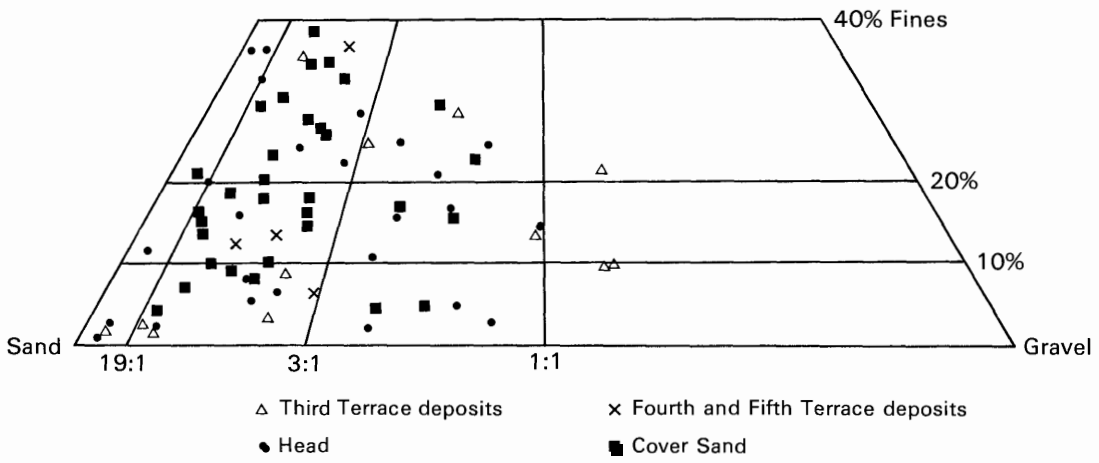
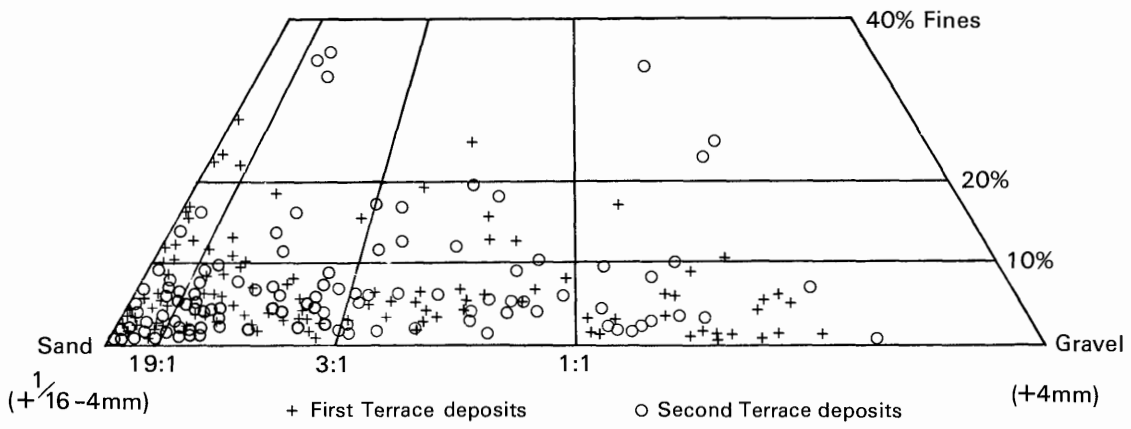
**Figure 4** Mean particle-size distribution of the sand and gravel deposits based on mean gradings of mineral in IMAU boreholes.

**Table 3** Mean composition of the +4-16 mm gravel fractions in the principal sand and gravel deposits.

Deposit*	Number of boreholes sampled †	Lithological constituents (percentage by weight)				
		Flint		Chalk	Quartz and Quartzite	Others
		Black	Brown			
<b>First Terrace</b>	7	26	58	9	5	2
<b>Second Terrace</b>	8	24	60	10	4	2
<b>Third Terrace</b>	1	28	63	4	3	2
<b>Head</b>	2	48	35	6	8	3
<b>Glacial Sand and Gravel</b>						
In buried channels	3	17	49	17	12	5
Elsewhere	6	30	46	12	7	5
All	9	23	47	15	10	5
<b>Cover Sand</b>	1	18	71	1	19	1

\* Fourth and Fifth Terraces were not sampled.

† The results are based on analyses of bulk samples taken from representative boreholes in each of the deposits. Detailed information accompanies the appropriate borehole logs (see Appendix D).



**Figure 5** The classification of individual samples from assessment boreholes.

under certain conditions of alternate freezing and thawing, will absorb water and disintegrate ("popping"). The classification of pebbles as patinated and unpatinated is somewhat arbitrary. Characteristically, in samples from boreholes, the proportion of unpatinated flint decreases with depth relative to other lithological constituents.

Chalk, ranging from soft, crumbly 'pellets' to very indurated grains is present in both the sand and gravel fractions. The soft pelletal chalk is rarely greater than 8 mm in diameter; indurated chalk pebbles are rarely more than 16 mm in diameter. Though usually comprising only between about 5 and 10 per cent of the sand and gravel fractions, higher concentrations of chalk occur in poorly defined seams in many boreholes: the chalk content of the majority of the River Terrace Deposits increases towards the base of the deposits, especially in close proximity to the Chalk bedrock, for example, in borehole 77 SW 41.

Ironstone, goethite, iron-cemented sandstone and other ferruginous fragments have only occasionally been recorded in samples from IMAU boreholes. These constituents are present only in minor proportions in the sand and fine gravel fractions.

Glacial Sand and Gravel The mean grading of these deposits is 13 per cent fines, 56 per cent sand and 31 per cent gravel and they classify as 'clayey' sandy gravel. The widely scattered surface deposits of Glacial Sand and Gravel vary little in grade and composition between outcrops. Similarly, Glacial Sand and Gravel deposits occurring in buried channels are also uniform in grade but exceptionally, in one borehole (77 SW 43) near Tuddenham [at 743 712], they comprise mainly 'very clayey' sand.

The sand fraction is predominantly fine- and medium-grained with subordinate amounts of coarse sand. The gravel fraction is general evenly graded, comprising almost equal proportions of fine and coarse pebbles but with minor amounts of cobble-gravel in the buried channel deposits. Constituents in both the sand and gravel fractions are principally angular to subrounded patinated brown flint with subordinate amounts of unpatinated darker flint, subrounded chalk, quartz and quartzite. Minor amounts of mudstone and sandstone are also present.

Head These deposits are variable both in grade and composition. The mean grading of potentially workable Head deposits proved in six IMAU boreholes is 15 per cent fines, 67 per cent sand and 18 per cent gravel but the deposits may contain up to 40 per cent fines.

The sand fraction is typically fine- to medium-grained, with coarse sand usually present only in minor proportions. The gravel fraction commonly contains equal amounts of fine and coarse pebbles. The composition of the fines, sand and gravel fractions is closely related to the composition of older deposits occurring upslope from the Head outcrops. Principal constituents are subangular flint and subrounded (often soft) chalk in varying proportions.

River Terrace Deposits These deposits are broadly similar in grade (Table 2, Figure 3), but exhibit marked local differences both vertically and laterally. Overall, the deposits grade as pebbly sand, having a mean grading of 9 per cent fines, 69 per cent sand, 22 per cent gravel, but range from sands to sandy gravels: they are commonly 'clayey'. The sand is predominantly fine- to medium-grained, with coarse sand commonly comprising less than 20 per cent of the sand fraction. Gravel is usually fine- to coarse-grained with cobbles present only rarely.

The deposits are also similar in composition (Table 3), with variations being principally the differences in the chalk content; older terraces contain generally less chalk than younger terraces. The fines fraction comprises clay

and silt, often with conspicuous amounts of finely comminuted chalk. Subrounded quartz is the dominant constituent in the fine sand fraction, but is present only in minor proportions in the coarse range: subangular brown patinated and grey to black unpatinated flint are the dominant constituents in the medium and coarse ranges. Chalk is an important constituent of all sand fractions and ranges from around 5 per cent to as much as 60 per cent of the fraction in some samples from boreholes.

In the gravel fractions, subangular patinated and unpatinated flint are the major constituents, typically comprising about 80 per cent of the gravel; chalk, quartz and quartzite are subordinate constituents whilst mudstone, limestone, and ferruginous fragments are present only in minor proportions.

Cover Sand Overall, these deposits grade as 'very clayey' pebbly sand and have a mean grading of 18 per cent fines, 68 per cent sand and 14 per cent gravel. Deposits are usually uniform in grade but the fines content may locally reach 39 per cent (borehole 87 SW 30). The gravel content ranges from 3 per cent in borehole 77 NE 5 to 30 per cent in borehole 77 NE 10.

The sand fraction comprises mainly rounded to subrounded quartz with subordinate subangular flint. In the gravel fractions subangular to angular patinated flint is dominant; chalk, sandstone and quartzite are present in minor proportions.

### **The Map**

The sand and gravel resource map, which includes an inset map covering part of sheet TL 87, is folded into the pocket at the end of this report. The base map is the Ordnance Survey 1:25 000 Outline Edition in grey, on which the geological data are shown in black and the mineral resource information in shades of red.

Geological data The geological boundary lines, symbols, etc., shown are taken from the geological map of this area, which were surveyed recently at the 6-inch or 1:10 000 scale. This information was obtained by detailed application of field mapping techniques by the field staff in the Institute's East Anglia and South-East England Unit.

The geological boundaries are the best interpretation of the information available at the time of survey. However, it is inevitable that local irregularities and discrepancies will be revealed as new evidence from boreholes and excavations becomes available.

Borehole data, which include the stratigraphic relations, thicknesses and mean particle-size distribution of the sand and gravel samples collected during the assessment survey, are also shown on the map.

Mineral resource information The mineral-bearing ground is divided into resource blocks (see Appendix A). Within a resource block the mineral is subdivided into areas where it is exposed, that is where the overburden averages less than 1 m in thickness, and areas where it is present in continuous, almost continuous, or discontinuous spreads beneath overburden. The recognition of these categories is dependent upon the importance attached to the proportion of boreholes which did not find potentially workable sand and gravel and the distribution of barren boreholes within a block. The mineral is described as 'almost continuous' if it is present in 75 per cent or more of the boreholes in a resource block. The 'discontinuous' category has been recognised only in part of Resource Block C.

Areas where bedrock crops out, where boreholes indicate absence of sand and gravel beneath cover and where sand and gravel beneath cover is interpreted to be not potentially workable, are uncoloured on the map; where appropriate, the relevant criterion is noted. In such cases it has been assumed that mineral is absent except in infrequent and relatively minor patches that

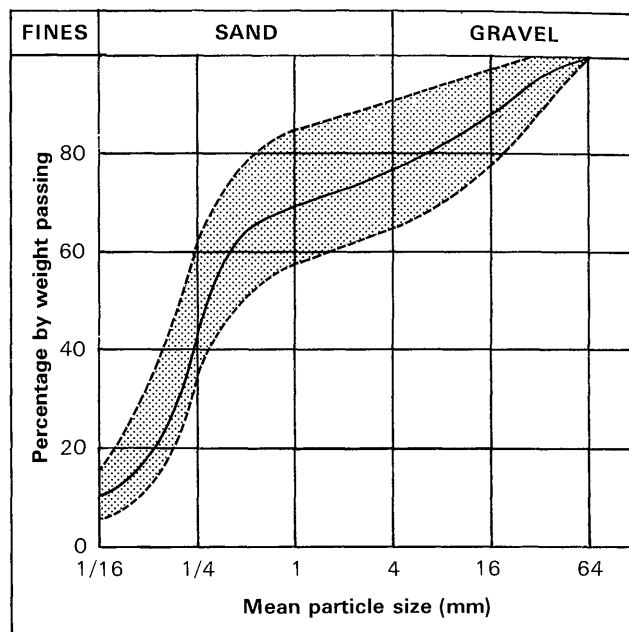
can neither be outlined nor assessed quantitatively in the context of this survey. Areas of unassessed sand and gravel, for example in built-up areas, are indicated by a red stipple.

The area of the mineral-bearing ground is measured, where possible, from the mapped geological boundary lines. The whole of this area is considered as mineral-bearing, even though it may include small areas where sand and gravel is not present or is not potentially workable. Inferred boundaries have been inserted to delimit areas where sand and gravel beneath cover is interpreted to be not potentially workable or absent. Such boundaries (for which a distinctive zig-zag symbol is used) are drawn primarily for the purpose of volume estimation. The symbol is intended to indicate an approximate location within a likely zone of occurrence rather than to represent the breadth of the zone, its size being determined only by cartographic considerations. For the purpose of measuring areas, the centre line of the symbol is used.

### Results

The statistical results are summarised in Table 4. Fuller grading particulars are shown in Figures 6, 8 and 9: data from IMAU boreholes are given in Tables 5 to 12.

**Accuracy of results** For the six resource blocks assessed at the indicated level, the accuracy of the results at the 95 per cent probability level (that is, on average nineteen out of every twenty sets of limits constructed in this way contain the true value for the volume of mineral) varies between 18 per cent and 50 per cent (Appendix B). However, the true volumes are more likely to be nearer the figure estimated than either of the limits. Moreover, it is probable that roughly the same percentage limits would apply for the statistical estimate of mineral volume within a very much smaller parcel of ground (say 100 hectares) containing similar sand and gravel deposits, if the results from the same number of sample points (as provided by, say, ten boreholes) were used in the calculation. Thus, if closer limits are needed for quotation of reserves, data from more sample points would be required, even if the area were quite small. This point can be illustrated by considering the whole of the potentially workable sand and gravel in Blocks A to H. The total volume (284 million m<sup>3</sup>) can be estimated to limits of  $\pm 13$  per cent at the 95 per cent



**Figure 6** Mean particle-size distribution of the total assessed thickness of mineral in resource blocks A to H (solid line): the shaded area indicates the envelope within which the mean grading curves for blocks A to H fall.

probability level by a calculation based on the data from the 141 sample points spread across the eight resource blocks. However, it must be emphasised that the quoted volume of mineral has no simple relationship with the amount that could be extracted in practice, as no allowance has been made in the calculations for any restraints (such as existing buildings and roads) on the use of the land for mineral working.

### Notes on the Resource Blocks

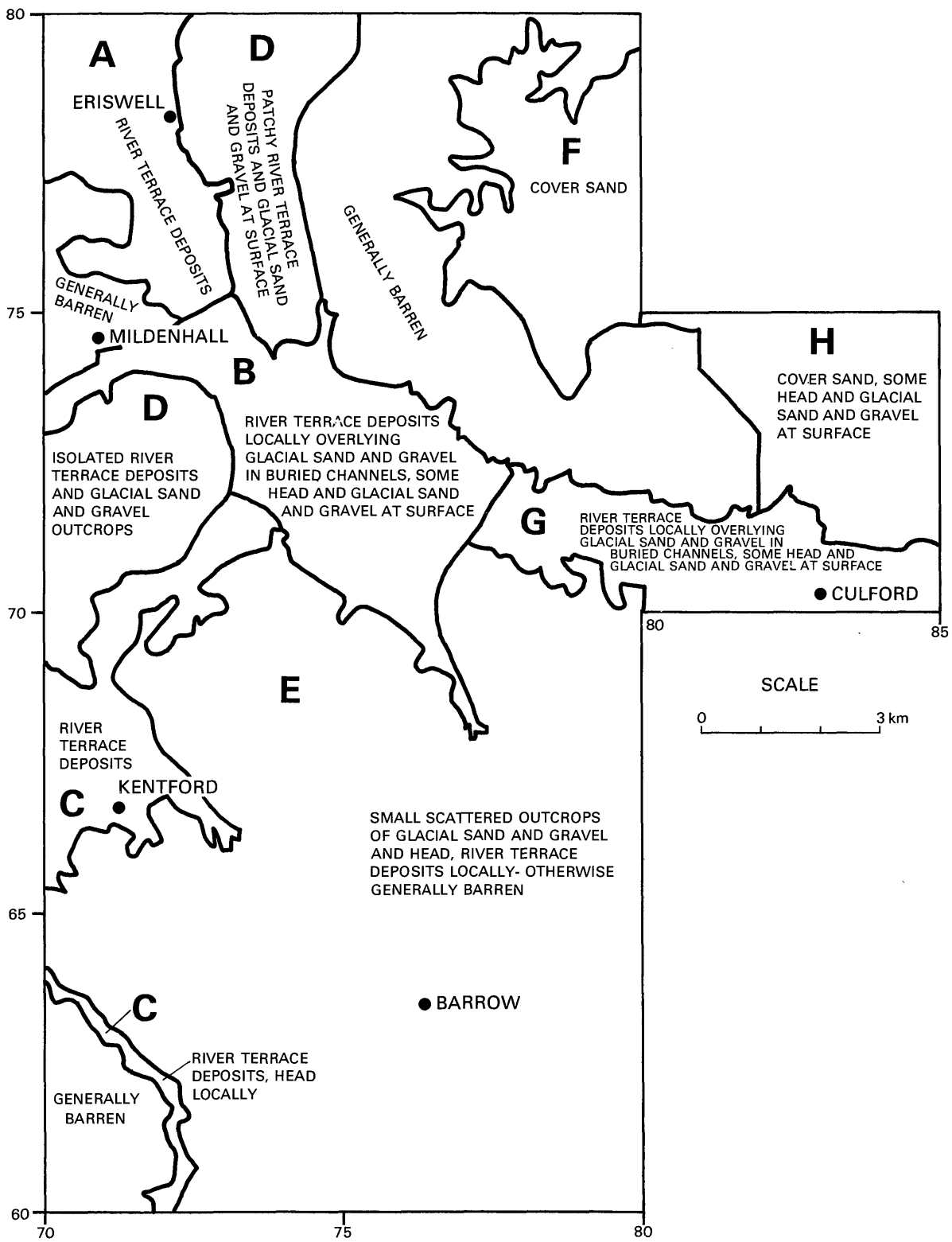
Within the district, all of the potentially workable sand and gravel deposits have been investigated. In each of the eight resource blocks the mineral has been assessed as a single mineral unit and the results of the assessments are given in Table 4 and Figure 6. Head deposits

**Table 4** The sand and gravel resources of the country between Mildenhall and Barrow: summary of statistical results.

Block	Area		Mean thickness		Volume of sand and gravel			Mean grading percentage		
	Block	Mineral	Over-burden	Mineral	Limits at the 95% probability level			Fines - $\frac{1}{16}$ mm	Sand $+\frac{1}{16}$ -4 mm	Gravel +4 mm
					$\pm$ %	$\pm$ m <sup>3</sup> x 10 <sup>6</sup>				
km <sup>2</sup>	km <sup>2</sup>	m	m	m <sup>3</sup> x 10 <sup>6</sup>						
A	10.7	10.3	0.4	5.0	52	29	15	5	85	10
B	17.6	16.5	1.0	5.9	97	24	23	9	67	25
C	10.4	8.2	0.5	3.3	27	18	4	11	60	29
D*	20.4	3.3	0.3	4.2	14	Speculative		10	73	17
E*	86.3	2.8	0.3	4.1	12	Speculative		17	47	36
F	13.3	13.3	0.2	1.6	21	27	6	15	70	15
G	11.5	9.1	0.9	5.5	50	36	18	16	61	23
H	12.7	3.9	0.2	2.7	11	50	6	16	54	30
All †	182.9	66.3	0.6	4.3	284	13	36	10	66	24

\* Inferred assessment

† Unassessed areas total 42.1 km<sup>2</sup>



**Figure 7** Map summarising the main characteristics of each resource block.



lying in valleys on the higher ground in the district are not generally considered to be potentially workable, since they are often less than 1 metre thick and contain more than 40 per cent fines (eg borehole 76 SE 32). However, locally, where there is evidence to suggest that Head deposits may comprise 'mineral' (eg borehole 76 NW 97), they have been included in the assessment of resources. The main characteristics of each resource block are shown in Figure 7.

Statistical assessments have been made for resource blocks A, B, C, F, G and H, but because of the variable and discontinuous nature of the mineral in blocks D and E, only inferred assessments have been made for these blocks.

#### Block A (Table 5, Figure 8).

The principal mineral deposits in this block are the Second Terrace deposits; small patches of First and Third Terrace, Head and Glacial Sand and Gravel are also present along the eastern margin of the block. The total area of the block is 10.7 km<sup>2</sup> of which 96 per cent is mineral-bearing.

The assessment of resources is based on 11 Industrial Minerals Assessment Unit (IMAU) boreholes and 2 other records. The mean thickness of mineral in the block is 5.0 m; recorded thicknesses range from a maximum of 9.6 m in the immediate vicinity of an old channel of the River Lark (borehole 77 NW 69), to a minimum of 2.8 m, in the western part of the block (borehole 77 NW 70). The estimated volume of mineral is 52 million m<sup>3</sup> ± 29 per cent.

Overall, the mean grading of the mineral is 5 per cent fines, 85 per cent sand and 10 per cent gravel and the deposits are fairly uniform in grade. The mean fines content in IMAU boreholes ranges from 3 per cent in boreholes 77 NW 60 and 67, to a maximum of 12 per cent in borehole 77 NW 62. The gravel content is more variable: in boreholes in the western part of the block gravel is either absent or only a minor constituent while elsewhere it commonly comprises more than 10 per cent of the deposit.

Overburden, mainly peat, occurs as thin sporadic patches, generally less than 0.5 m thick, except in the vicinity of borehole 77 NW 63 where 1.9 m were proved, and south of Mildenhall where 3.0 m were proved in borehole 77 SW 28. The mean thickness of overburden is 0.4 m.

#### Block B (Table 6, Figure 8)

This block occupies 17.6 km<sup>2</sup> of low-lying ground flanking the River Lark and contains 16.5 km<sup>2</sup> of potentially workable sand and gravel deposits. These deposits are mainly of the First and Second Terrace, occurring both at the surface and beneath overburden, together with less extensive outcrops of Head and Glacial Sand and Gravel deposits. A lower mineral unit also comprising Glacial Sand and Gravel underlies part of the block, locally infilling a buried channel, in two restricted areas outlined on the resource map by a distinctive symbol. All of the sand and gravel deposits in the block are considered to comprise mineral and are assessed together as a single unit. In addition, because of the possibly discontinuous nature of the buried Glacial Sand and Gravel deposits, a separate assessment (see below) has been made which excludes these deposits: this is considered to give more realistic confidence limits for the volume of the principal potentially workable sand and gravel deposits in the block. The assessment of resources is based on results from 31 IMAU boreholes and 4 other records.

The River Terrace Deposits, though proved to range from 1.7 m to 8.0 m thick in assessment boreholes, are of generally uniform thickness, being on average 4.8 m thick. The Head and surface Glacial Sand and Gravel deposits exhibit a range of thicknesses similar to the River Terrace Deposits, though where the Head deposits occupy narrow and shallow 'dry' valleys they thin-out rapidly up-stream. However, Glacial Sand and Gravel deposits occurring in the buried channels are locally exceptionally thick, notably in borehole 77 SW 43 where deposits were proved to a depth of 32.0 m but, for the purposes of this survey, the sand and gravel occurring below a depth of 23.4 m in this borehole has not been assessed (see page 1). Elsewhere, the buried Glacial Sand and Gravel deposits are about 6 m thick though in borehole 76 NE 73, an isolated deposit is 12.0 m thick. A persistent waste seam, of variable thickness and comprising grey silty clay (Glacial Silt), separates the Glacial Sand and Gravel deposits from the overlying River Terrace Deposits in boreholes 77 SW 36, 41 and 43; it is not included in the assessed thickness of mineral.

The mean thickness of all mineral in the block, assessed together, is 5.9 m and the estimated volume of mineral is 97 million m<sup>3</sup> ± 24 per cent. Excluding Glacial Sand and Gravel occurring in the buried channels from the assessment gives a mean thickness for the surface

**Table 5** Block A: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentages						
			Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel	Cobbles
	Overburden	Mineral	- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 -64 mm	+64 mm
77 NW 59	0.1	5.1	5	55	37	2	1	0	0
77 NW 60	0.4	3.1	3	53	41	2	1	0	0
77 NW 61	0.3	a 1.7	4	60	35	1	0	0	0
		b 1.8	8	50	21	8	11	2	0
77 NW 62	0.1	3.9	12	61	22	2	2	1	0
77 NW 63	1.9	6.0	4	32	45	7	6	6	0
77 NW 64	0.2	4.0	5	44	29	6	11	5	0
77 NW 65	0.5	8.7	4	26	42	7	12	9	trace
77 NW 67	0.0	3.0	3	67	28	1	1	trace	0
77 NW 68	1.0	6.9	7	52	26	5	4	6	0
77 NW 69	0.2	9.6	No grading data available for this deposit						
77 NW 70	0.1	2.8	4	50	39	2	3	2	0
Block mean grading			5	46	35	4	6	4	0

**Table 6** Block B: data from IMAU boreholes

Borehole	Recorded thickness (m)		Mean grading percentages					
	Over-burden	Mineral	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 mm
77 SW 34	0.4	a 4.0	3	53	39	2	2	1
		b 7.2	4	8	25	10	28	25
77 SW 35	4.7	5.3	7	1	5	20	38	29
77 SW 36 <sup>1</sup>	0.2	a 5.2	4	45	38	5	7	1
		b 5.3	24	44	23	4	3	2
77 SW 37	0.4	1.2	15	44	30	4	6	1
77 SW 39	0.0	3.2	8	49	34	3	5	1
77 SW 40	4.0	3.9	3	5	21	11	34	26
77 SW 41 <sup>2</sup>	0.4	a 2.5	15	22	24	7	20	12
		b 6.0	5	3	17	21	36	18*
77 SW 42	0.3	4.2	7	54	28	3	4	4
77 SW 43 <sup>3</sup>	1.6	a 2.2	36	35	23	4	2	0
		b 15.0	19	33	47	1	0	0
77 SW 44	0.2	1.5	No grading data available for this deposit					
77 SW 27	0.4	2.1	27	37	26	2	4	4
77 SW 28	3.0	4.4	6	22	36	9	14	13
77 SW 29	0.1	a 8.0	7	52	34	2	3	2
		b 2.3	3	7	28	15	25	22*
77 SE 19	3.8	4.7	3	8	59	5	15	10
77 SE 20	0.6	5.2	2	41	52	2	3	0
77 SE 21	0.8	3.4	7	28	22	5	15	23
77 SE 22	0.3	3.9	17	14	30	10	18	11
77 SE 23	0.5	4.3	5	34	25	5	18	13
77 SE 24	0.3	a 7.9	2	46	45	2	3	2
		b 5.4	3	8	24	9	26	30
77 SE 25	0.2	6.6	5	41	33	4	7	10
77 SE 26	0.4	3.2	10	55	25	2	4	4
77 SW 29	0.1	a 8.0	1	32	34	2	3	2*
		b 2.3	3	7	28	15	25	22*
77 SE 19	3.8	4.7	3	8	59	5	15	10
77 SE 20	0.6	5.2	2	41	52	2	3	0
77 SE 21	0.8	3.4	7	28	22	5	15	23
77 SE 22	0.3	3.9	17	14	30	10	18	11
77 SE 23	0.5	4.3	5	34	25	5	18	13
77 SE 24	0.3	a 7.9	2	46	45	2	3	2
		b 5.4	3	8	24	9	26	30
77 SE 25	0.2	6.6	5	41	33	4	7	10
77 SE 26	0.4	3.2	10	55	25	2	4	4
77 SE 27	0.3	8.1	5	36	28	7	13	11
77 SE 28	0.3	6.9	3	36	32	5	10	14
77 SE 29	2.5	2.0	11	11	22	6	24	26
77 SE 30	2.1	3.6	3	5	28	13	30	21
77 SE 42	0.6	7.4	19	48	23	2	4	4
77 SE 43	0.5	10.4	11	34	26	3	10	15*
76 NE 73	0.3	a 3.7	6	51	34	3	7	9
		b 12.0	3	11	22	10	26	26*
76 SE 74	0.1	4.1	11	20	16	7	21	23*

1 A waste parting 3.0 m thick separates mineral units a and b.

2 A waste parting 0.7 m thick separates mineral units a and b.

3 A waste parting 5.0 m thick separates mineral units a and b

\* The coarse gravel fractions include minor proportions of cobbles.

deposits of 4.6 m and an estimated volume of mineral of 76 million m<sup>3</sup> ± 20 per cent.

Although the mean grading of the mineral in the block is 8 per cent fines, 67 per cent sand and 25 per cent gravel, the deposits are highly variable in grade both vertically and laterally. For example, the lowest mean fines content is 2 per cent in borehole 77 SE 20 (classified as First Terrace deposits), but values range up to a maximum of 36 per cent in the upper part of borehole 77 SW 43 (Head deposits). The mean gravel content ranges from less than 3 per cent in boreholes 77 SW 34, 43 and 77 SE 20 (in which the mineral comprises different deposits) up to a maximum of 67 per cent in borehole 77 SW 35 (First Terrace deposits).

The mean thickness of overburden in the block is 1.0 m. Adjacent to the River Lark however, mapped deposits of peat and alluvium range from 0.2 m to 4.7 m thick and have a mean thickness of 3.3 m. Elsewhere, overburden is commonly less than 0.8 m thick and is mainly soil.

#### Block C (Table 7, Figure 8)

This block occupies a total of 10.4 km<sup>2</sup> of low-lying ground adjacent to the River Kennett and is in two unequal parts. The main part of the block, around Kentford [705 665] and Herringswell [720 700], contains 7.2 km<sup>2</sup> of potentially workable deposits comprising mainly River Terrace Deposits with minor spreads of Head deposits. Glacial Sand and Gravel deposits infilling a buried channel have been recorded in only one borehole (76 NW 96) and their full extent remains conjectural; these deposits have therefore not been assessed separately from the other deposits in the block. The smaller, subsidiary part of the block, lying north and south of Dalham [623 616], contains only 1 km<sup>2</sup> of possibly discontinuous River Terrace Deposits with associated Head deposits: Glacial Sand and Gravel deposits have not been proved hereabouts.

In assessment boreholes, the River Terrace Deposits and Head deposits appear fairly uniform in thickness, grade and composition. However, the Head deposits often contain more than 40 per cent fines, and thin-out rapidly where they occupy narrow tributary valleys or occur as marginal deposits to the River Kennett, notably

around Needham Street [720 660] and [733 660], and in the southern portion of the block: they may not always, therefore, constitute 'mineral'.

The mean thickness of mineral in the block as a whole, based on 13 IMAU boreholes and 12 other records, is 3.3 m; the mean thickness of deposits in the northern portion of the block only is 3.2 m and in the southern portion is 3.7 m. The maximum range of recorded thickness is from 0.9 m in borehole 77 SW 31 to 6.0 m+ at an exposure south of Kentford (E 76 NW A). In borehole 76 NW 96 a waste parting 1.1 m thick separates 2.5 m of River Terrace Deposits from the underlying 2.4 m of Glacial Sand and Gravel: this waste parting is not included in the assessed thickness of mineral in the block. The estimated volume of mineral in the northern portion of the block is 23 million m<sup>3</sup> ± 18 per cent: in the southern portion the estimated volume is approximately 4 million m<sup>3</sup> but, if considered separately, percentage confidence limits cannot be satisfactorily calculated for this small parcel of ground. The total estimated volume of all mineral in the resource block, assessed together, is 27 million m<sup>3</sup> ± 18 per cent.

The mean grading of mineral in the block as a whole, is 11 per cent fines, 60 per cent sand and 29 per cent gravel. The fines content reaches a maximum of 26 per cent in the lower part of borehole 76 NW 93 but is also 20 per cent in borehole 76 NW 97 and 23 per cent in the upper part of borehole 76 NW 96. Elsewhere the fines content ranges from 4 per cent to 13 per cent. The gravel content is less than 10 per cent in boreholes 77 SW 33 and 76 NW 98 (both east of Herringswell) but elsewhere ranges up to a maximum of 64 per cent.

Overburden commonly comprises soil less than 0.5 m thick but, in areas where peat or alluvium are mapped at the surface, it may reach thicknesses of up to 2.5 m or more (for example, in borehole 77 SW 33). The mean thickness of overburden in the block as a whole is 0.5 m.

#### Block D (Table 8, Table 8)

This block consists of two separate areas in the north and west of the district. The total area of the block is 20.4 km<sup>2</sup> but mineral is present over only 3.3 km<sup>2</sup>; the remainder comprises bedrock at surface or beneath a thin veneer of blown sand usually less than 1 m thick.

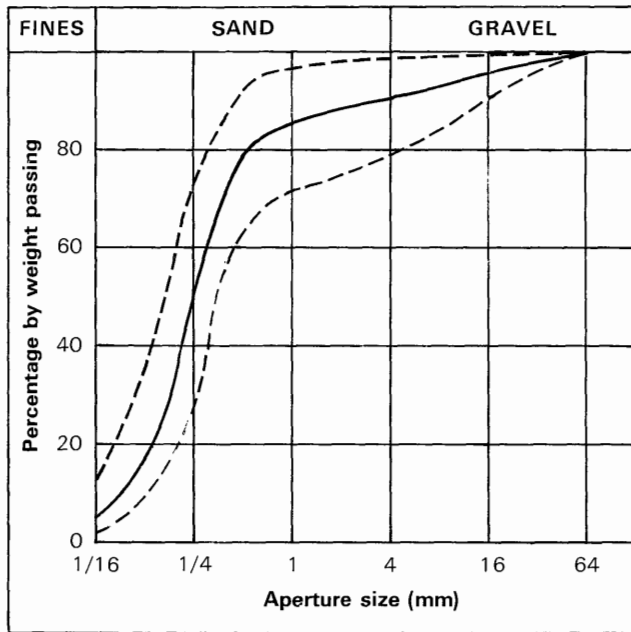
**Table 7** Block C: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentages						
	Over-burden	Mineral	Fines - $\frac{1}{8}$ mm	Fine sand + $\frac{1}{8}$ - $\frac{1}{4}$ mm	Medium sand + $\frac{1}{4}$ -1 mm	Coarse sand +1 -4 mm	Fine gravel +4 -16 mm	Coarse gravel +16 -64 mm	Cobbles +64 mm
76 NW 92	0.5	1.8	13	15	19	9	21	23	0
76 NW 93	0.1	a2.4	7	48	24	3	8	10	0
		b2.5	26	15	16	6	19	18	0
76 NW 94	0.2	3.5	11	25	20	7	17	20	0
76 NW 95	0.3	2.0	4	35	24	5	14	18	0
76 NW 96 <sup>1</sup>	0.2	a2.5	23	42	21	3	5	6	0
		b2.4	8	5	13	10	24	38	2
76 NW 97	0.1	3	3	20	29	18	5	14	14
76 NW 98	0.1	3.9	6	65	19	3	4	3	0
76 SW 4 <sup>2</sup>	0.2	4.1	12	14	22	10	19	21	2
76 SW 7 <sup>2</sup>	1.9	absent							
76 SW 8 <sup>2</sup>	0.1	3.3	11	12	15	12	25	25	0
77 SW 31	0.7	0.9	No grading data available for this deposit						
77 SW 32	0.4	4.5	6	46	27	5	11	5	0
77 SW 33	2.5	1.4	8	67	16	3	5	1	0
77 SW 38	1.0	1.9	5	63	24	3	5	0	0
Block mean grading			11	34	20	6	14	15	trace

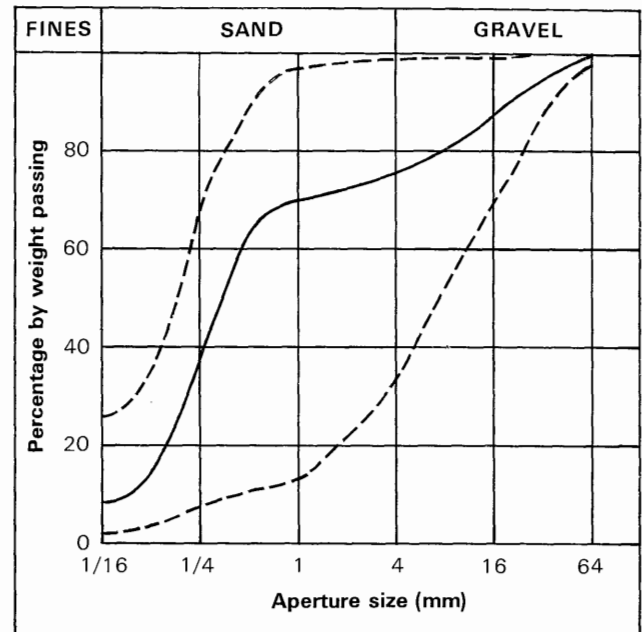
1 A waste seam, 1.1 m thick, separates the upper and lower mineral units.

2 Boreholes 76 SW 4, 7 and 8 lie in the separate, southern-most part of the block (see text).

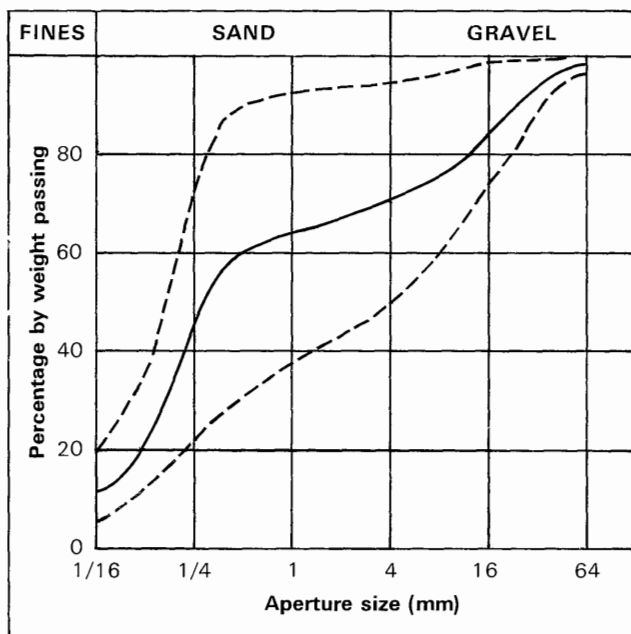
**BLOCK A**



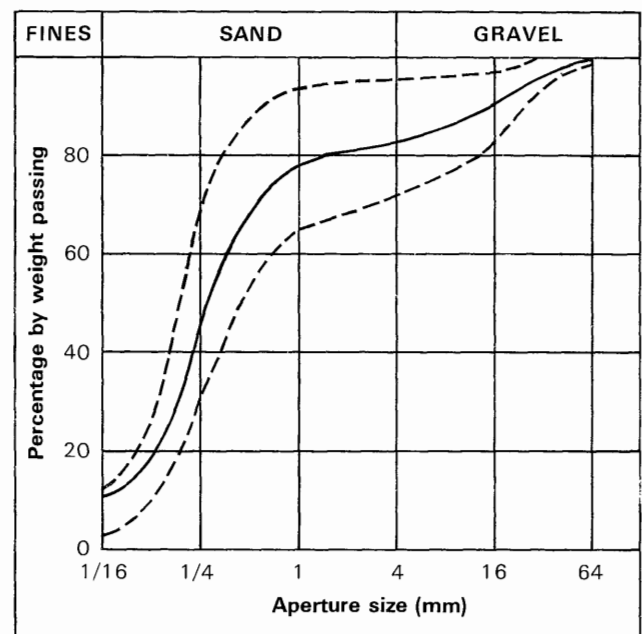
**BLOCK B**



**BLOCK C**



**BLOCK D**



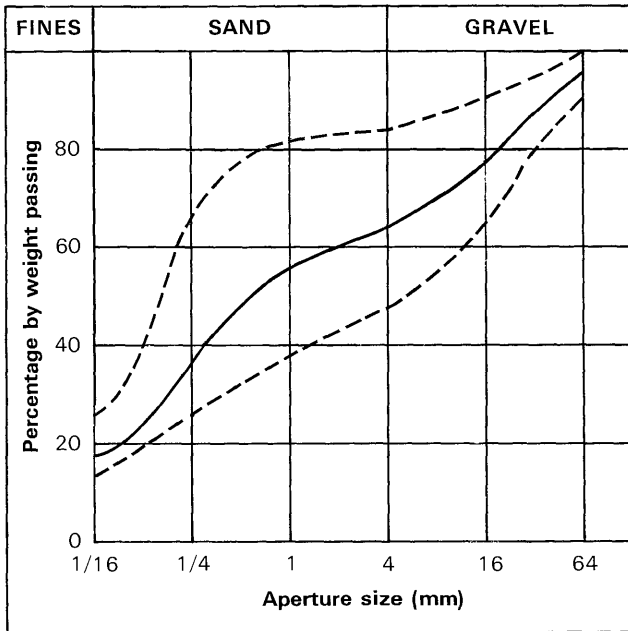
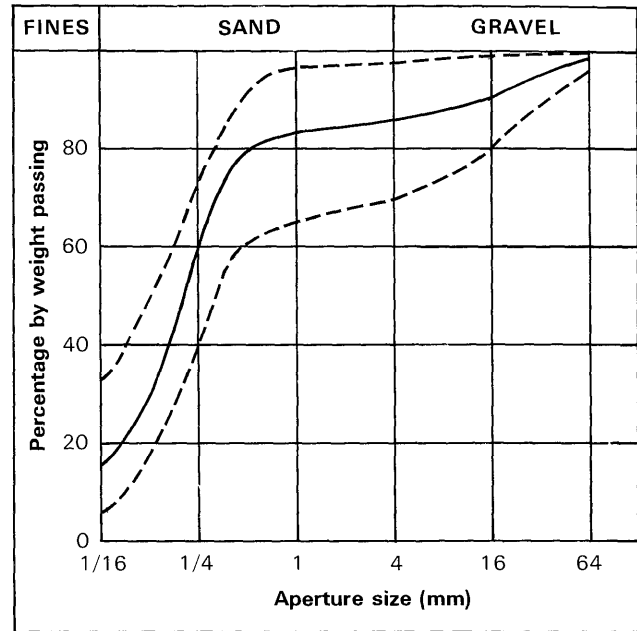
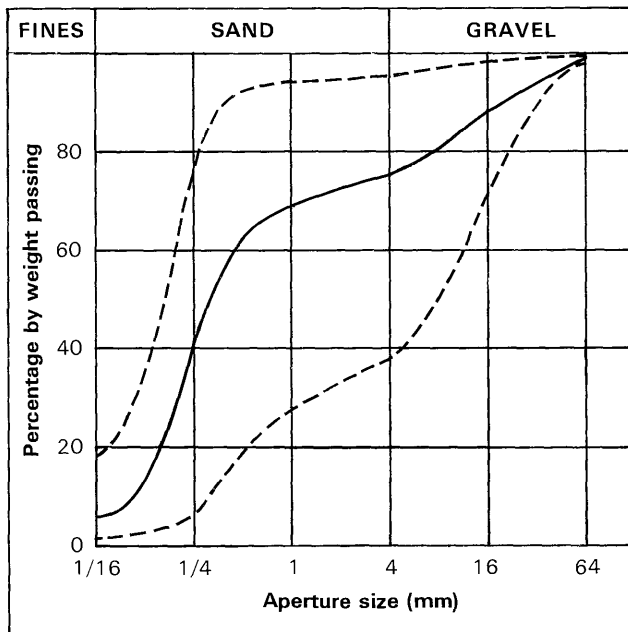
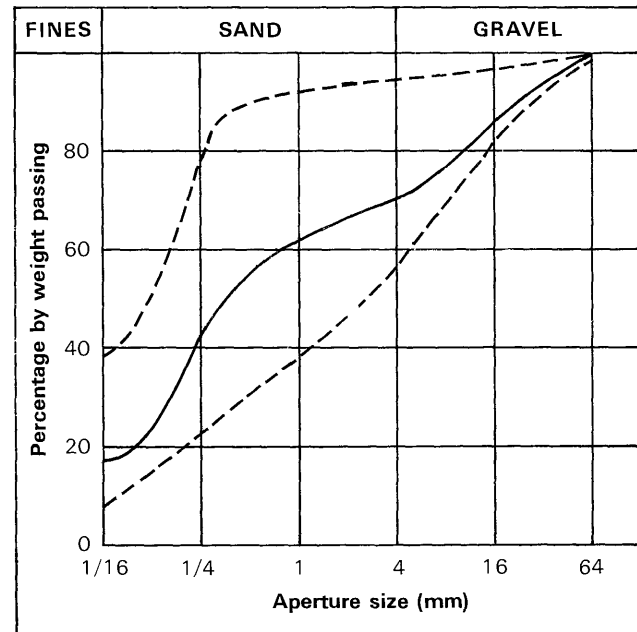
**Figure 8** Mean particle-size distribution of mineral in blocks A - D: the broken lines indicate the envelope within which the mean grading curves of assessment boreholes fall.

The potentially workable deposits comprise small isolated outcrops of River Terrace Deposits (excepting First Terrace) and Glacial Sand and Gravel occurring at elevations between 15 and 36 m above OD. Head deposits are either too thin or too 'clayey' to be classified as mineral except where they overlie potentially workable sand and gravel. Deposits of Glacial Silt and Boulder Clay occur as thin spreads of overburden overlying Glacial Sand and Gravel in the vicinity of borehole 77 NW 74. Elsewhere in the block, for example south of Eriswell [at 724 780], small deposits of Glacial Silt are not underlain by sand and gravel. A small isolated outcrop of Second Terrace deposits in the western-most part of the block [at 701 710] is the continuation of a more extensive deposit assessed in the report for the adjacent sand and gravel resource sheet TL 66 and 67

(Corser, 1982). Mineral was proved in six assessment boreholes but was absent from borehole 77 NW 66.

Only an inferred assessment has been attempted for the potentially workable deposits in this block. The mean proved thickness of mineral is 4.2 m but the deposits vary greatly, from 0.9 m thick in borehole 77 NW 73 to 10.3 m in borehole 77 NW 72. In borehole 77 SW 30 a 1.1 m thick waste parting occurs within the Glacial Sand and Gravel but is probably only of local significance: it has not been included in the assessed thickness of mineral. The total estimated volume of mineral is approximately 14 million m<sup>3</sup>.

The deposits vary widely in grade: in the vicinities of boreholes 77 NW 71 and 72 the mineral comprises sandy gravel but elsewhere grades as pebbly sand. Though 'clayey' in parts, the mineral generally contains less than

**BLOCK E****BLOCK F****BLOCK G****BLOCK H**

**Figure 9** Mean particle-size distribution of mineral in blocks E - H: the broken lines indicate the envelope within which the mean grading curves of assessment boreholes fall.

20 per cent fines. The mean grading for the block is 10 per cent fines, 73 per cent sand and 17 per cent gravel. All of the deposits are broadly similar in composition (see 'Composition of the Sand and Gravel Deposits'), though the River Terrace Deposits contain higher proportions of chalk sand and pebbles (up to 10 per cent) at depth than do the Glacial Sand and Gravel deposits.

Overburden, mainly soil, is generally less than 0.5 m thick, though it may be as much as 1 m thick north of Mildenhall Warren [at 740 755] where it comprises pebbly clay. The mean thickness of overburden is 0.3 m.

#### Block E (Table 9, Figure 9)

Although the total area of this block is 86.3 km<sup>2</sup>, mineral is present as small widely scattered outcrops over only 2.8 km<sup>2</sup>. These outcrops are individually no-

where greater in extent than 0.9 km<sup>2</sup> and only marginally fall within the 'potentially workable' category; only an inferred assessment has been attempted. Numerous small outcrops of sand and gravel occur throughout the block but do not comprise mineral and they have been excluded from the assessment of resources.

The mineral in this block comprises mainly outcrops of Glacial Sand and Gravel together with small, closely associated deposits of Head and Cover Sand. Locally the Glacial Sand and Gravel wedges-out rapidly beneath, or within, Boulder Clay deposits and has nowhere been found to extend much beyond the mapped surface outcrops.

The mean thickness of mineral, based on seven IMAU boreholes and two other records, is 4.1 m but the recorded thicknesses range from a minimum of 1.6 m in

**Table 8** Block D: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentages					
	Over-burden	Mineral	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			$-\frac{1}{16}$ mm	$+\frac{1}{16} - \frac{1}{4}$ mm	$+\frac{1}{4} - 1$ mm	$+1 - 4$ mm	$+4 - 16$ mm	$+16$ mm
77 NW 66	7.4	absent						
77 NW 71	0.2	1.6	6	26	34	11	15	8
77 NW 72	0.2	10.7	11	20	34	5	14	16
77 NW 73	0.5	0.9	5	61	25	1	3	5
77 NW 74	0.4	1.6	4	27	47	9	11	2
77 NW 75	0.3	4.0	11	60	21	3	3	2
77 SW 30*	0.2	a3.6	10	31	50	2	3	4
		b3.0	13	44	38	1	2	2
Block mean grading			10	35	33	5	8	9

\* A waste parting, 1.1 m thick, separates the upper and lower mineral units. This borehole lies in the separate southernmost division of the block.

**Table 9** Block E: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentages						
	Over-burden	Mineral	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel	Cobbles
			$-\frac{1}{16}$ mm	$+\frac{1}{16} - \frac{1}{4}$ mm	$+\frac{1}{4} - 1$ mm	$+1 - 4$ mm	$+4 - 16$ mm	$+16 - 64$ mm	$+64$ mm
76 NW 99	0.6	1.6	21	21	15	6	14	20	3
76 NW 100*	0.6	a1.4	18	26	20	7	14	15	0
		b2.8	12	14	26	7	19	21	1
76 NE 77	0.0	2.8	26	37	16	4	8	9	0
76 NE 80	0.0	5.8	15	36	31	2	6	10	0
76 NE 81	0.3	1.7	19	14	30	9	15	13	0
76 SW 12	0.0	10.5	16	10	12	9	18	27	8
76 SE 31	0.0	5.1	19	16	18	8	13	19	7
Block mean grading			17	21	19	7	14	18	4

\* A waste seam, 3.8 m thick, separates the upper and lower mineral units.

borehole 76 NW 99 to a maximum of 10.5 m in borehole 76 SW 12. A waste seam 3.8 m thick separates the mineral in borehole 76 NW 100 into an upper and lower unit and has not been included in the total thickness of assessed mineral. The total estimated volume of mineral in the block is approximately 12 million m<sup>3</sup>.

Overall, the mineral grades as 'clayey' pebbly sand and has a mean grading of 17 per cent fines, 47 per cent sand and 36 per cent gravel: the deposits are uniform in grade.

Overburden, comprising sandy soil, was proved in three boreholes but was absent elsewhere: the mean thickness is 0.3 m.

The deposits of sand and gravel which are either too thin or too localised in extent to be classified as mineral and which have not been included in the assessment of resources are as follows:

Cover Sand deposits, principally in the vicinity of Risby [790 660], are less than 1 m thick but may locally reach 1.3 m thick, for example in borehole 76 NE 85.

River Terrace Deposits lying along a small valley between Cavenham [760 700] and Gt Saxham [790 640] are up to 1.8 m thick in Hydrogeology Unit record 76 NE 59. Farther south, assessment boreholes prove the deposits to be less than 1 m thick.

Head deposits may locally grade as mineral and may reach thicknesses of 2.1 m or more, for example in borehole 76 SE 35, but, overall, evidence from IMAU boreholes indicates that except where closely associated with other potentially workable sand and gravel deposits, Head deposits themselves do not generally constitute mineral.

Glacial Sand and Gravel outcrops, commonly less than 0.1 km<sup>2</sup> in extent, occur widely throughout the block, for example near Dalham [733 616], south-east of Barrow, [around 777 630], and in the vicinity of borehole 76 NE 75 north of Higham [758 668], but are generally thin and very localised in extent.

#### Block F (Table 10, Figure 9)

Except for a few hectares of barren ground, mineral is present over virtually the whole area of this block, amounting to 13.3 km<sup>2</sup>, and comprises mainly Cover Sand. Locally, mapped deposits of Boulder Clay in part comprise sand and gravel and have also been classified as mineral.

The thicknesses of mineral proved in six IMAU boreholes and at one exposure vary only within closely defined limits (1.3 m to 2.5 m) and the mean thickness is

**Table 10** Block F: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentages					
	Overburden	Mineral	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 mm
77 NE 5	0.5	1.3	21	50	25	1	2	1
77 NE 6	0.1	1.3	10	62	17	1	2	8
77 NE 7	0.2	1.4	8	62	18	1	2	9*
77 NE 8	0.4	1.4	33	40	13	2	4	8
77 NE 10	0.1	1.8	6	45	15	4	10	20
77 SE 34	0.2	2.5	15	25	41	2	7	10
Block mean grading			15	44	24	2	5	10

\* Includes 4 per cent of cobbles.

**Table 11** Block G: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage					
	Overburden	Mineral	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 mm
77 SE 31	0.5	a 6.0	5	56	34	2	2	1
		b 3.9	4	44	30	4	11	7
77 SE 35	1.8	7.1	13	35	30	5	10	6*
77 SE 36	0.0	4.8	6	65	24	2	2	1
77 SE 37	0.8	5.1	6	4	20	12	33	25
77 SE 39	0.8	2.7	8	68	17	2	3	2
77 SE 40	0.4	4.5	3	45	27	3	10	12*
77 SE 41	0.2	1.7	6	24	19	8	22	21
87 SW 18	0.3	0.7	4	47	34	5	7	3
87 SW 19	1.1	1.7	8	42	31	5	7	7
87 SW 20	0.3	6.4	5	52	28	3	6	6
87 SW 21	2.1	4.5	1	5	22	10	34	28*
		a 1.7	22	46	19	3	4	6
87 SW 22	0.3	b 4.6	19	60	11	trace	trace	trace
		c 2.3	5	7	37	8	21	21
		2.8	3	30	24	7	15	21
87 SW 26	8.2	5.1	35	44	15	2	3	1
87 SW 27	0.6	6.3	7	13	42	5	16	17
87 SW 28	0.6	a 5.6	3	42	32	5	10	8
		b 17.81+	5	17	30	11	18	19*
87 SW 33	0.9	1.0	16	37	32	3	5	7
87 SW 37	0.6	2.2	9	27	44	5	7	8
Block mean grading			7	31	28	6	13	12

\* The coarse gravel fractions contain minor proportions of cobbles, generally less than 1 per cent.

1.6 m. The estimated volume of mineral is 21 million m<sup>3</sup>  $\pm$  27 per cent.

Overall, the deposits grade as 'clayey' pebbly sand and have a mean grading of 15 per cent fines, 70 per cent sand and 15 per cent gravel but there is a wide range in grading characteristics between boreholes. Overburden is generally thin and has a mean thickness of only 0.2 m.

Cover Sand deposits extend eastwards, beyond the boundary of this block, into the area covered by sheet TL 87 NW. Thereabouts, these deposits have been proved in boreholes and by geological mapping to be generally less than 1 m thick and to form discontinuous spreads.

Block G (Table 11, Figure 9)

This block covers 11.5 km<sup>2</sup> of ground adjacent to the

River Lark between Icklingham [780 720] and Culford [840 700]. The block lies partly in the area shown on the main resource sheet (TL 76 and 77), but also extends into the area covered by Sheet TL 87 (SW), shown as an inset on the main map margin.

Potentially workable sand and gravel deposits extend over 9.1 km<sup>2</sup> and comprise River Terrace Deposits and Glacial Sand and Gravel outcrops, together with smaller outcrops of Head and Cover Sand (for example south of Wordwell [829 715] and east of Culford [at 842 703]). Also, a lower mineral unit comprising Glacial Sand and Gravel deposits partly infilling a buried channel was recorded in two IMAU boreholes: in 87 SW 22 these deposits were proved to be 2.3 m thick and in 87 SW 28, 17.8 m were proved, though here the base of the deposit was not reached. The extent of the buried Glacial Sand and Gravel deposits in this block remains conjectural but

**Table 12** Block H: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage					
	Overburden	Mineral	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			$\frac{1}{16}$ mm	$+\frac{1}{16} - \frac{1}{4}$ mm	$+\frac{1}{4} - 1$ mm	$+1 - 4$ mm	$+4 - 16$ mm	$+16$ mm
87 SW 23	0.3	4.7	9	27	29	5	14	16
87 SW 24	0.3	1.9	9	44	24	2	7	14
87 SW 29	0.3	2.2	21	51	17	2	2	7
87 SW 30	0.2	1.5	39	29	14	2	2	4
87 SW 31	0.3	8.9	14	10	15	17	26	18
87 SW 32	4.4	absent						
87 SW 34	9.0	absent						
87 SW 35	0.3	2.9	27	35	17	3	8	10
87 SW 36	0.4	1.6	16	30	23	4	11	16
Block mean grading			16	27	19	8	16	14

an inferred limit to the deposits has been shown on the map.

An assessment has been made of all mineral in the block, taken as a single unit, and is based on 18 IMAU boreholes and eight other records. Also, due to the variable and possibly discontinuous nature of the buried Glacial Sand and Gravel deposits, a separate assessment (see below) has been made which excludes these deposits: this is considered to give more realistic confidence limits for the volume of the principal potentially workable sand and gravel deposits in the block.

The mean thickness of all mineral in the block is 5.5 m but recorded thicknesses range widely from 0.7 m in borehole 87 SW 18 to 23.4 m+ in 87 SW 28 where the lower mineral unit, 17.8 m thick, comprises Glacial Sand and Gravel. More often, recorded thicknesses range from 2.2 m (in 87 SW 37) to 7.1 m (in 77 SE 35). The mean thickness of mineral excluding the Glacial Sand and Gravel in the buried channel is 4.8 m.

The total estimated volume of mineral in the block, including the Glacial Sand and Gravel in buried channels, is 50 million m<sup>3</sup> ± 36 per cent. However, excluding the buried Glacial Sand and Gravel deposits from the assessment gives an estimated volume of mineral of 44 million m<sup>3</sup> ± 26 per cent: the lower confidence limits reflecting the smaller variations in thicknesses within the surface deposits.

Mean grading figures for all mineral in the block are: 16 per cent fines, 61 per cent sand and 23 per cent gravel. As in other blocks, there is a wide variation in grade between the mineral deposits proved in IMAU boreholes. The fines content ranges from 1 per cent in borehole 87 SW 21 to 35 per cent in 87 SW 26 but is usually less than 10 per cent. Similarly, the gravel content ranges from 3 per cent in borehole 77 SE 36 to 62 per cent in 87 SW 21 but it more often lies between 10 and 22 per cent.

Mapped deposits of Alluvium form overburden about 1 m thick adjacent to the River Lark and its tributaries. Boulder Clay, ranging from 1.8 m thick in borehole 77 SE 35 to 8.2 m in 87 SW 26, partly conceals Glacial Sand and Gravel deposits lying to the north of the River Lark. In areas where the mineral is 'exposed', overburden is usually about 0.5 m thick but overall, the mean thickness for the block is 0.9 m.

Block H (Table 12, Figure 9)  
Deposits of Cover Sand, Head, Second Terrace and Glacial Sand and Gravel form the mineral in this block

and are present over 3.9 km<sup>2</sup>; the remainder of the block (8.8 m<sup>2</sup>) is barren. Cover Sand deposits comprise mineral in the south-eastern part of the block, where they are between 1.5 m and 2.9 m thick (boreholes 87 SW 30 and 35). They thin-out to the north where they are classified as non-mineral. Head deposits up to 2 m thick occur as sinuous outcrops in the west and south, and as an isolated outcrop in the north-east: they classify as mineral except in the vicinity of borehole 87 SW 32 where they comprise pebbly clay. Small deposits of Glacial Sand and Gravel, partly overlain by younger deposits, were proved in two IMAU boreholes. In the west, 4.7 m of Glacial Sand and Gravel were proved in borehole 87 SW 23 and in the south, 8.9 m were proved in 87 SW 31: these deposits are thus significantly thicker than any other deposits in the block.

The mean thickness of mineral based on seven IMAU boreholes and six other records is 2.7 m. Recorded thicknesses range from 1.5 m in borehole 87 SW 30 to 4.7 m in 87 SW 23 but, exceptionally, 8.9 m of mineral was proved in borehole 87 SW 31. The estimated volume of all mineral in the block is 11 million m<sup>3</sup> ± 50 per cent. However, if the exceptionally large thickness of Glacial Sand and Gravel proved in borehole 87 SW 31 is excluded from the assessment of resources, the confidence limits for the block may be more realistically calculated as ± 30 per cent, reflecting the more uniform range of thicknesses of the majority of the deposits. The block mean grading is 16 per cent fines, 54 per cent sand and 30 per cent gravel.

Overburden is either thin or absent and has a mean thickness of only 0.2 m.

#### Notes on Sand and Gravel Workings in the District

The River Terrace Deposits have been extensively worked for sand and gravel near Kentford [715 675], Lackford [797 708] and on Cavenham Heath [755 715]. Head and Glacial Sand and Gravel outcrops have been worked in a number of places, principally east of Higham [770 660 to 770 680] and near Denham [745 635]. To date, throughout the whole of the district, workings have extended over about 2.5 km<sup>2</sup> and estimates suggest that some 1.5 million m<sup>3</sup> of sand and gravel have been removed. No workings are known to exploit Glacial Sand and Gravel deposits occurring in buried channels.

Some of the worked areas near Lackford and Kentford are now abandoned and the land has been returned to agricultural or recreational use.



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WP/KW/LKW

**APPENDIX A**

**FIELD AND LABORATORY PROCEDURES**

Trial and error during initial studies of the complex and variable glacial deposits of East Anglia and Essex showed that an absolute minimum of five sample points evenly distributed across the sand and gravel are needed to provide a worthwhile statistical assessment, but that, where possible, there should be not less than ten. Sample points are any points for which adequate information exists about the nature and thickness of the deposit and may include boreholes other than those drilled during the survey and exposures. In particular, the cooperation of sand and gravel operators ensures that boreholes are not drilled where reliable information is already available; although this may be used in the calculations, it is held confidentially by the Institute and cannot be disclosed.

The mineral shown on each 1:25 000 sheet is divided into resource blocks. The arbitrary size selected is a compromise to meet the aims of the survey by providing sufficient sample points in each block. As far as possible the block boundaries are determined by geological boundaries so that, for example, glacial and river terrace gravels are separated. Otherwise division is by arbitrary lines, which may bear no relationship to the geology. The blocks are drawn provisionally before drilling begins.

A reconnaissance of the ground is carried out to record any exposures and inquiries are made to ascertain what borehole information is available. Borehole sites are then selected to provide an even pattern of sample points at a density of approximately one per square kilometre. However, because broad trends are independently overlain by smaller-scale characteristically random variations, it is unnecessary to adhere to a square grid pattern. Thus such factors as ease of access and the need to minimise disturbance to land and the public are taken into account in siting the holes; at the same time it is necessary to guard against the possibility that ease of access (that is, the positions of roads and farms) may reflect particular geological conditions, which may bias the drilling results.

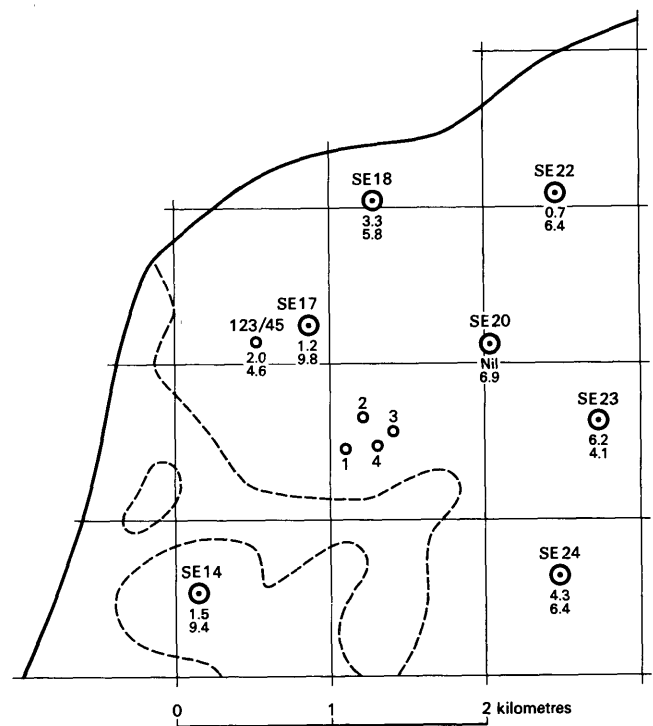
The drilling machine employed should be capable of providing a continuous sample representative of all unconsolidated deposits, so that the in-situ grading can be determined, if necessary, to a depth of 30 m (100 ft) at a diameter of about 200 mm (8 in), beneath different types of overburden. It should be reliable, quiet, mobile and relatively small (so that it can be moved to sites of difficult access). Shell and auger rigs have proved to be almost ideal.

The rigs are modified to enable deposits above the water table to be drilled 'dry', instead of with water added to facilitate the drilling, to minimise the amount of material drawn in from outside the limits of the hole. The samples thus obtained are representative of the in-situ grading, and satisfy one of the most important aims of the survey. Below the water table the rigs are used conventionally, although this may result in the loss of some of the fines fraction and the pumping action of the bailer tends to draw unwanted material into the hole from the sides or the bottom.

A continuous series of bulk samples is taken throughout the sand and gravel. Ideally samples are composed exclusively of the whole of the material encountered in the borehole between stated depths. However, care is taken to discard, as far as possible, material which has caved or has been pumped from the bottom of the hole. A new sample is commenced whenever there is an appreciable lithological change within the sand and gravel, or at every 1 m (3.3 ft) depth. The samples, each weighing between 25 and 45 kg (55 and 100 lb), are despatched in heavy-duty polythene bags to a laboratory for grading. The grading procedure is based on B.S. 1337 (British Standards Institution, 1967). Random checks of the accuracy of the grading are made in the Institute's laboratories.

All data, including mean grading analysis figures calculated for the total thickness of the mineral, are entered on standard record sheets, abbreviated copies of which are reproduced in Appendix E.

Detailed records may be consulted at the appropriate offices of the Institute, upon application to the Head, Industrial Minerals Assessment Unit.



- SE24 IMAU borehole
- 4.3 Overburden } Thickness in metres
- 6.4 Mineral }
- Other boreholes
- Boundary of resource block
- Boundary of sand and gravel deposit

Example of resource block assessment: map of a fictitious block

## APPENDIX B

### STATISTICAL PROCEDURE

#### Statistical assessment

1 A statistical assessment is made of an area of mineral greater than 2 km<sup>2</sup>, if there are at least five evenly spaced boreholes in the resource block (for smaller areas, see Paragraph 12 below).

2 The simple methods used in the calculations are consistent with the amount of data provided by the survey (Hull, 1981). Conventional symmetrical confidence limits are calculated for the 95 per cent probability level, that is, on average nineteen out of every twenty sets of limits constructed in this way contain the true value for the volume of mineral.

3 The volume estimate (V) for the mineral in a given block is the product of two variables, the sampled areas (A) and the mean thickness ( $\bar{l}_m$ ) calculated from the individual thicknesses at the sample points. The standard deviations for these variables are related such that

$$S_V = \sqrt{(S_A^2 + S_{\bar{l}_m}^2)} \quad [1]$$

4 The above relationship may be transposed such that

$$S_V = S_{\bar{l}_m} \sqrt{(1 + S_A^2 / S_{\bar{l}_m}^2)} \quad [2]$$

From this it can be seen that as  $S_A^2 / S_{\bar{l}_m}^2$  tends to 0,  $S_V$  tends to  $S_{\bar{l}_m}$ .

If, therefore, the standard deviation for area is small with respect to that for thickness, the standard deviation for volume approximates to that for mean thickness.

5 Given that the number of approximately evenly spaced sample points in the sampled area is  $n$  with mineral thickness measurements  $l_{m1}, l_{m2}, \dots, l_{mn}$ , then the best estimate of mean thickness,  $\bar{l}_m$ , is given by

$$\Sigma (l_{m1} + l_{m2} \dots l_{mn}) / n.$$

For groups of closely spaced boreholes a discretionary weighting factor may be applied to avoid bias (see note on weighting below). The standard deviation for mean thickness  $S_{\bar{l}_m}$ , expressed as a proportion of the mean thickness, is given by

$$S_{\bar{l}_m} = (1/\bar{l}_m) \sqrt{[\Sigma (l_m - \bar{l}_m)^2 / (n - 1)]}$$

where  $l_m$  is any value in the series  $l_{m1}$  to  $l_{mn}$ .

6 The sampled area in each resource block is coloured pink on the map. Wherever possible, calculations relate to the mineral within mapped geological boundaries (which may not necessarily correspond to the limits of a deposit). Where the area is not defined by a mapped boundary, that is, where the boundary is inferred, a distinctive symbol is used. Experience suggests that the errors in determining area are small relative to those in thickness. The relationship  $S_A / S_{\bar{l}_m} \leq 0.3$  is assumed in all cases. It follows from Equation [2] that

$$S_{\bar{l}_m} \leq S_V \leq 1.05 S_{\bar{l}_m} \quad [3]$$

7 The limits on the estimate of mean thickness of mineral,  $L\bar{l}_m$ , may be expressed in absolute units  $\pm (t/\sqrt{n}) \times S_{\bar{l}_m}$  or as a percentage  $\pm (t/\sqrt{n}) \times S_{\bar{l}_m} \times (100/\bar{l}_m)$  per cent, where  $t$  is Student's  $t$  at the 95 per cent probability level for  $(n - 1)$  degrees of freedom, evaluated by reference to statistical tables. (In applying Student's  $t$  it is assumed that the measurements are distributed normally).

8 Values of  $t$  at the 95 per cent probability level for values of  $n$  up to 20 are as follows:

$n$	$t$	$n$	$t$
1	infinity	11	2.228
2	12.706	12	2.201
3	4.303	13	2.179
4	3.182	14	2.160
5	2.776	15	2.145
6	2.571	16	2.131
7	2.447	17	2.120
8	2.365	18	2.110
9	2.306	19	2.101
10	2.262	20	2.093

(from Table 12 in *Biometrika Tables for Statisticians*, Volume 1, Second Edition, Cambridge University Press, 1962). When  $n$  is greater than 20, 1.96 is used (the value of  $t$  when  $n$  is infinity).

9 In calculating confidence limits for volume,  $L_V$ , the following inequality, corresponding to Equation [3], is applied:

$$L\bar{l}_m \leq L_V \leq 1.05 L\bar{l}_m.$$

10 In summary, for values of  $n$  between 5 and 20,  $L_V$  is calculated as

$$[(1.05 \times t)/\bar{l}_m] \times [\sqrt{\Sigma (l_m - \bar{l}_m)^2 / n (n - 1)}] \times 100$$

per cent,

and when  $n$  is greater than 20, as

$$[(1.05 \times 1.96)/\bar{l}_m] \times [\sqrt{\Sigma (l_m - \bar{l}_m)^2 / n (n - 1)}] \times 100$$

per cent.

11 The application of this procedure to a fictitious area is illustrated in the accompanying Figure and example of a block calculation.

#### Inferred assessment

12 If the sampled area of mineral in a resource block is between 0.25 km<sup>2</sup> and 2 km<sup>2</sup>, an assessment is inferred on the basis of geological and topographical information, usually supported by the data from one or two boreholes. The volume of mineral is calculated as the product of the area, measured from field data, and the estimated thickness. Confidence limits are not calculated.

13 In some cases a resource block may include an area left uncoloured on the map, within which mineral (as defined) is interpreted to be generally absent. If there is reason to believe that some mineral may be present, an inferred assessment may be made.

14 No assessment is attempted for an isolated area of mineral less than 0.25 km<sup>2</sup>.

15 Note on weighting The thickness of a deposit at any point may be governed solely by the position of the point in relation to a broad trend. However, most sand and gravel deposits also exhibit a random pattern of local, and sometimes considerable, variation in thickness. Thus the distribution of sample points needs to be only approximately regular and in estimating the mean thickness only simple weighting is necessary. In practice, equal weighting can often be applied to thicknesses at all sample points. If, however, there is a distinctly unequal distribution of points, bias is avoided by dividing the sampled area into broad zones, to each of which a value roughly proportional to its area is assigned. This value is then shared between the data points with the zone as the weighting factor.

## Block calculation

Scale: 1:25 000  
Block: Fictitious

Area  
Block: 11.08 km<sup>2</sup>  
Mineral: 8.32 km<sup>2</sup>

Mean thickness  
Overburden: 2.5 m  
Mineral: 6.5 m

Volume  
Overburden: 21 million m<sup>3</sup>  
Mineral: 54 million m<sup>3</sup>

Confidence limits of the estimate of mineral volume at the 95 per cent probability level:  $\pm 20$  per cent  
That is, the volume of mineral (with 95 per cent probability):  $54 \pm 11$  million m<sup>3</sup>

Thickness estimate (measurements in metres)  
 $l_o$  = overburden thickness  $l_m$  = mineral thickness

Sample point	Weighting w	Overburden		Mineral		Remarks
		$l_o$	$wl_o$	$l_m$	$wl_m$	
SE 14	1	1.5	1.5	9.4	9.4	IMAU boreholes
SE 18	1	3.3	3.3	5.8	5.8	
SE 20	1	nil	-	6.9	6.9	
SE 22	1	0.7	0.7	6.4	6.4	
SE 23	1	6.2	6.2	4.1	4.1	
SE 24	1	4.3	4.3	6.4	6.4	
SE 17	$\frac{1}{2}$	1.2	-1.6	9.8	-7.2	Hydrogeology Unit record
123/45	$\frac{1}{2}$	2.0		4.6		
1	$\frac{1}{4}$	2.7	-2.6	7.3	-5.8	Close group of four boreholes (commercial)
2	$\frac{1}{4}$	4.5		3.2		
3	$\frac{1}{4}$	0.4		6.8		
4	$\frac{1}{4}$	2.8		5.9		
Totals	$\Sigma w = 8$	$\Sigma wl_o = 20.2$		$\Sigma wl_m = 52.0$		
Means		$\overline{wl_o} = 2.5$		$\overline{wl_m} = 6.5$		

## Calculation of confidence limits

$wl_m$	$ (wl_m - \overline{wl_m}) $	$(wl_m - \overline{wl_m})^2$
9.4	2.9	8.41
5.8	0.7	0.49
6.9	0.4	0.16
6.4	0.1	0.01
4.1	2.4	5.76
6.4	0.1	0.01
7.2	0.7	0.49
5.8	0.7	0.49

$$\Sigma (wl_m - \overline{wl_m})^2 = 15.82$$

$$n = 8$$

$$t = 2.365$$

$L_V$  is calculated as

$$1.05 (t / \overline{wl_m}) \sqrt{[\Sigma (wl_m - \overline{wl_m})^2 / n(n-1)] \times 100}$$

$$= 1.05 \times (2.365 / 6.5) \sqrt{[15.82 / (8 \times 7)] \times 100}$$

$$= 20.3$$

$$\approx 20 \text{ per cent.}$$

## APPENDIX C

### CLASSIFICATION AND DESCRIPTION OF SAND AND GRAVEL

For the purposes of assessing resources of sand and gravel a classification should take account of economically important characteristics of the deposit, in particular the absolute content of fines and the ratio of sand to gravel.

The terminology commonly used by geologists when describing sedimentary rocks (Wentworth, 1922) is not entirely satisfactory for this purpose. For example, Wentworth proposed that a deposit should be described as a 'gravelly sand' when it contains more sand than gravel and there is at least 10 per cent of gravel, provided that there is less than 10 per cent of material finer than sand ( $< \frac{1}{16}$  mm) and coarser than pebbles ( $> 64$  mm in diameter). Because deposits containing more than 10 per cent fines are not embraced by this system, a modified binary classification based on Willman (1942) has been adopted.

When the fines content exceeds 40 per cent the material is considered to be not potentially workable and falls outside the definition of mineral. Deposits which contain 40 per cent fines or less are classified primarily on the ratio of sand to gravel but qualified in the light of the fines content, as follows: less than 10 per cent fines - no qualification; 10 per cent or more but less than 20 per cent fines - 'clayey'; 20 to 40 per cent fines - 'very clayey'.

The term 'clay' (as written, with single quote marks) is used to describe all material passing  $\frac{1}{16}$  mm. Thus it has no mineralogical significance and includes particles falling within the size range of silt. The normal meaning applies to the term clay where it does not appear in single quotation marks.

The ratio of sand to gravel defines the boundaries between sand, pebbly sand, sandy gravel and gravel (at 19:1, 3:1 and 1:1).

Thus it is possible to classify the mineral into one of twelve descriptive categories (see the accompanying Figure). The procedure is as follows:

- 1 Classify according to the ratio of sand to gravel.
- 2 Describe the fines.

For example, a deposit grading 11 per cent gravel, 70 per cent sand and 19 per cent fines is classified as 'clayey' pebbly sand. This short description is included in the borehole log (see Appendix D)

Many differing proposals have been made for the classification of the grain size of sediments (Atterberg, 1905; Udden, 1914; Wentworth, 1922; Wentworth, 1935; Allen, 1936; Twenhofel, 1937; Lane and others, 1947). As Archer (1970a, b) has emphasised, there is a pressing need for a simple metric scale acceptable to both scientific and engineering interests, for which the class limit sizes correspond closely with certain marked changes in the natural properties of mineral particles. For example, there is an important change in the degree of cohesion between particles at about the  $\frac{1}{16}$ -mm size, which approximates to the generally accepted boundary between silt and sand. These and other requirements are met by a system based on Udden's geometric scale and a simplified form of Wentworth's terminology (see the accompanying table), which is used in the Report.

The fairly wide intervals in the scale are consistent with the general level of accuracy of the qualitative assessments of the resource blocks. Three sizes of sand are recognised, fine ( $+\frac{1}{16}$  -  $-\frac{1}{4}$  mm), medium ( $+\frac{1}{4}$  -  $-1$  mm) and coarse ( $+1$  -  $-4$  mm). The boundary at 16 mm distinguishes a range of finer gravel ( $+4$  -  $-16$  mm), often characterised by abundance of worn tough pebbles of vein quartz, from larger pebbles, often of notably different materials. The boundary at 64 mm distinguishes pebbles from cobbles. The term 'gravel' is used loosely to denote both pebble-sized and cobble-sized material.

The size distribution of borehole samples is determined by sieve analysis, which is presented by the laboratory as logarithmic cumulative curves (see, for example, British Standards Institution, 1967). In this report the grading is tabulated on the borehole record sheets (Appendix E), the intercepts corresponding with the simple geometric scale  $\frac{1}{8}$  mm,  $\frac{1}{4}$  mm, 1 mm, 4 mm, 16 mm and so on as required. Original sample grading curves are available for reference at the appropriate office of the Institute.

Each bulk sample is described, subjectively, by a geologist at the borehole site. Being based on visual examination, the description of the grading is inexact, the accuracy depending on the experience of the observer. The descriptions recorded are modified, as necessary, when the laboratory results become available.

The relative proportions of the rock types present in the gravel fraction are indicated by the use of the words 'and' or 'with'. For example, 'flint and quartz' indicates roughly equal proportions with neither constituent accounting for less than about 25 per cent of the whole; 'flint with quartz' indicates that flint is dominant and quartz, the principal accessory rock type, comprises 5 to 25 per cent of the whole. Where the accessory material accounts for less than 5 per cent of the whole, but is still readily apparent, the phrase 'with some' has been used. Rare constituents are referred to as 'trace'.

The terms used in the field to describe the degree of rounding of particles, which is concerned with the sharpness of the edges and corners of a clastic fragment and not the shape (after Pettijohn, 1975), are as follows.

**Angular:** showing little or no evidence of wear; sharp edges and corners.

**Subangular:** showing definite effects of wear. Fragments still have their original form but edges and corners begin to be rounded off.

**Subrounded:** showing considerable wear. The edges and corners are rounded off to smooth curves. Original grain shape is still distinct.

**Rounded:** original faces almost completely destroyed, but some comparatively flat surfaces may still remain. All original edges and corners have been smoothed off to rather broad curves. Original shape is still apparent.

**Well rounded:** not original faces, edges or corners left. The entire surface consists of broad curves; flat areas are absent. The original shape is suggested by the present form of the grain.

Classification of gravel, sand and fines

Size limits	Grain-size description	Qualification	Primary classification
64 mm	Cobble		
16 mm	Pebble	Coarse	Gravel
4 mm		Fine	
1 mm		Coarse	
$\frac{1}{4}$ mm	Sand	Medium	Sand
$\frac{1}{8}$ mm		Fine	
	Fines (silt and clay)		Fines

- I Gravel
- II 'Clayey' gravel
- III 'Very clayey' gravel
- IV Sandy gravel
- V 'Clayey' sandy gravel
- VI 'Very clayey' sandy gravel
- VII Pebbly sand
- VIII 'Clayey' pebbly sand
- IX 'Very clayey' pebbly sand
- X Sand
- XI 'Clayey' sand
- XII 'Very clayey' sand

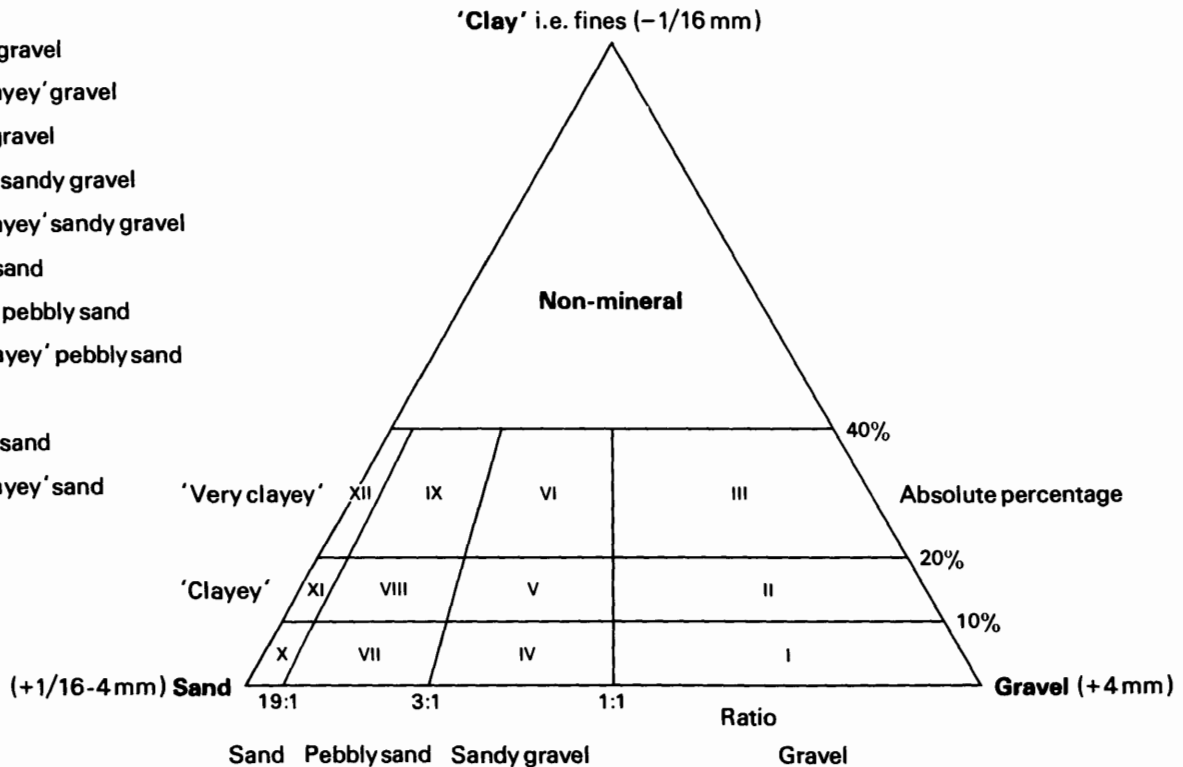


Diagram showing the descriptive categories used in the classification of sand and gravel

**APPENDIX D**

**EXPLANATION OF THE BOREHOLE RECORDS**

**Annotated fictitious example**

CK 66 NW 5<sup>1</sup>      6191 6962<sup>2</sup>      Northfields<sup>3</sup>

**Block B**

Surface level (+49.7 m) +163 ft<sup>4</sup>  
 Water struck at +45.9 m<sup>5</sup>  
 October 1972<sup>6</sup>

Overburden<sup>7</sup> 2.8 m  
 Mineral 5.4 m  
 Waste 1.1 m  
 Mineral 1.4 m  
 Bedrock 0.7 m<sup>8</sup>

**LOG**

Geological classification	Lithology <sup>9</sup>	Thickness m	Depth m
	Soil	0.2	0.2
Alluvium	Clay, silty, dark brown	2.6	2.8
River Terrace Deposits	<b>a</b> Gravel Gravel: fine to coarse, with cobbles towards base, angular to rounded flint and limestone with ironstone and some quartz and chalk Sand: medium with coarse and some fine, quartz and limestone	5.4	8.2
Boulder Clay	Clay, sandy and pebbly, red-brown <sup>10</sup>	1.1	9.3
Glacial Sand and Gravel	<b>b</b> Sand, 'clayey' in part: fine, subangular to rounded, quartz with some coal	1.4	10.7
Lias	Mudstone, blue-grey, fossiliferous	0.7+	11.4

**GRADING<sup>11</sup>**

	Mean for deposit percentages			Depth below surface (m) <sup>12</sup>	percentages						
	Fines	Sand	Gravel		Fines		Sand		Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
<b>a</b>	5	46	49	2.8-3.9	20	14	62	2	2	0	0
				3.8-4.8	2	2	12	18	42	24	0
				4.8-5.8	1	3	24	13	35	24	0
				5.8-6.8	0	4	21	20	26	29	0
				6.8-8.2	4	3	23	10	23	30	7
				<b>Mean</b>	<b>5</b>	<b>5</b>	<b>28</b>	<b>13</b>	<b>25</b>	<b>22</b>	<b>2</b>
<b>b</b>	5	95	0	9.3-10.3	3	73	23	1	0	0	0
				10.3-10.7	9	85	5	1	0	0	0
				<b>Mean</b>	<b>5</b>	<b>77</b>	<b>17</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>a+b</b>	<b>5</b>	<b>56</b>	<b>39</b>	<b>Mean</b>	<b>5</b>	<b>20</b>	<b>26</b>	<b>10</b>	<b>20</b>	<b>17</b>	<b>2</b>

**COMPOSITION<sup>13</sup>**

Depth below surface (m)	percentages by weight in the +8-16 mm fraction				
	Flint	Quartz	Limestone	Chalk	Ironstone
3.8-4.8	41	5	50	1	3
4.8-5.8	39	3	45	5	8
5.8-6.8	45	2	42	5	6
6.8-8.2	19	6	61	3	11
<b>Mean</b>	<b>35</b>	<b>4</b>	<b>51</b>	<b>3</b>	<b>7</b>

The numbered paragraphs below correspond with the annotations given on the specimen record opposite.

#### 1 Borehole Registration Number

Each Industrial Minerals Assessment Unit (IMAU) borehole is identified by a Registration Number. This consists of two statements.

- a The number of the 1:25 000 sheet on which the borehole lies, here CK 66.
- b The quarter of the 1:25 000 sheet on which the borehole lies and the number of the borehole in a series for that quarter, here NW 5.

Thus the full Registration Number is CK 66 NW 5.

#### 2 National Grid Reference

All National Grid References fall in the 100 km square identified by the first two letters of the Registration Number. Grid references are given to eight figures, accurate to within 10 m.

#### 3 Location

The position of the borehole is generally referred to the nearest named locality on the 1:25 000 base map and the resource block in which the borehole lies is stated.

#### 4 Surface level

The surface level at the borehole site is given in metres and feet above Ordnance Datum. All measurements were made in feet; approximate conversions to metres are given in brackets.

#### 5 Groundwater conditions

If groundwater was present the level at which it was encountered is normally given (in metres relative to Ordnance Datum).

#### 6 Type of drill and date of drilling

The type of rig used, the diameter of the casing and the month and year of completion of drilling are stated.

#### 7 Overburden, mineral, waste and bedrock

Mineral is sand and gravel which, as part of a deposit, falls within the arbitrary definition of potentially workable material (see p. 1). Bedrock is the 'formation', 'country rock' or 'rock head' below which potentially workable sand and gravel will not be found. Waste is any material other than bedrock or mineral. Where waste occurs between the surface and mineral it is classified as overburden.

8 The plus sign (+) indicated that the base of the deposit was not reached during drilling.

#### 9 Lithological description

When sand and gravel is recorded a general description based on the grading characteristics (for details see Appendix C) is followed by more detailed particulars of the gravel and/or sand fraction. Where more than one bed of mineral is recognised each is designated by a letter, e.g. **a**, **b**, etc. The description of other deposits is based on visual examination in the field.

10 Colour names referred to in lithological descriptions are based on the Geological Society of America Rock-Color Chart, (1975). The colour of material comprising the fines fractions in the sand and gravel deposits is usually given following the description of the sand fraction.

#### 11 Grading data

A continuous series of bulk samples is taken throughout the thickness of sand and gravel. A new sample is commenced whenever there is an appreciable lithological change or at every 1 m of depth.

For each bulk sample the percentages of fines ( $-\frac{1}{16}$  mm), fine sand ( $+\frac{1}{16}-\frac{1}{4}$  mm), medium sand ( $+\frac{1}{4}-1$  mm),

coarse sand ( $+1-4$  mm), fine gravel ( $+4-16$  mm), coarse and ( $+16-64$  mm) and cobble gravel ( $+64$  mm) are stated.

The mean grading of groups of samples making up an identified bed of mineral are also given in detail and in summary. Where more than one bed is recognised the mean grading for the whole of the mineral in the borehole may be given. Where necessary, in calculating mean gradings, data for individual samples are weighted by the thickness represented.

Fully representative sampling of sand and gravel is difficult to achieve, particularly where groundwater levels are high. Comparison between boreholes and adjacent exposures commonly suggests that in borehole samples the proportion of sand may be higher and the proportion of fines and coarse gravel may be lower.

#### 12 Sampling

A continuous series of bulk samples is taken throughout the thickness of sand and gravel. A new sample is taken wherever there is an appreciable lithological change within the sand and gravel or at every 1 m of depth. Samples obtained by bailing are indicated by an asterisk (\*).

#### 13 Composition

Details of the composition of selected samples or groups of samples may be given.

**APPENDIX E  
INDUSTRIAL MINERALS ASSESSMENT UNIT BOREHOLE RECORDS**

Fines: moderate brown, locally comprising thin chalky clay seams

Middle Chalk Chalk, soft 1.0+ 6.0

**TL 76 NW 92 7012 6886 The Hall, Kentford Block C**  
 Surface level 23.5 m (77 ft)  
 Water not struck  
 August 1980  
 Overburden 0.5 m  
 Mineral 1.8 m  
 Bedrock 0.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Made ground	Cinders, brick and soil	0.5	0.5
River Terrace Deposits (Second Terrace)	'Clayey' gravel Gravel: fine and coarse, mainly subangular grey and black flint Sand: fine and medium with coarse, subrounded quartz with angular to subangular flint; dusky brown fines	1.8	2.3
Middle Chalk	Chalk, soft	0.5+	2.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
13	43	44	0.5-1.6	9	16	14	8	23	30	0
			1.6-2.3	20	14	25	11	20	10	0
			<b>Mean</b>	<b>13</b>	<b>15</b>	<b>19</b>	<b>9</b>	<b>21</b>	<b>23</b>	<b>0</b>

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand	Gravel				
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
<b>a</b>	7	75	18	0.1-1.1	3	44	32	2	7	12	0
				1.1-2.5	9	50	19	3	10	9	0
				<b>Mean</b>	<b>7</b>	<b>48</b>	<b>24</b>	<b>3</b>	<b>8</b>	<b>10</b>	<b>0</b>
<b>b</b>	26	37	37	2.5-3.5*	29	20	18	7	16	10	0
				3.5-5.0*	22	13	15	6	22	22	0
				<b>Mean</b>	<b>26</b>	<b>15</b>	<b>16</b>	<b>6</b>	<b>19</b>	<b>18</b>	<b>0</b>
<b>a+b</b>	<b>16</b>	<b>56</b>	<b>28</b>	<b>0.1-5.0</b>	<b>16</b>	<b>32</b>	<b>20</b>	<b>4</b>	<b>14</b>	<b>14</b>	<b>0</b>

**COMPOSITION**

	Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
		Flint		Chalk	Quartz and quartzite	Others
		Black	Brown			
<b>a</b>	0.1-2.5	23	64	5	5	3
<b>b</b>	2.5-5.0	38	59	3	0	0
<b>a+b</b>	<b>0.1-5.0</b>	<b>28</b>	<b>63</b>	<b>4</b>	<b>3</b>	<b>2</b>

**TL 76 NW 93 7062 6751 North-west of Cock and Bull Farm, Kentford Block C**  
 Surface level 26.0 m (85 ft)  
 Water struck at 22.5 m  
 September 1980  
 Overburden 0.1 m  
 Mineral 4.9 m  
 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.1	0.1
River Terrace Deposits (Third Terrace)	<b>a</b> Pebbly sand Gravel: fine and coarse, subangular to rounded dark unpatinated flint, some subangular patinated flint Sand: fine with medium, subrounded quartz with subangular flint; light brown fines	2.4	2.5
	<b>b</b> 'Very clayey' pebbly sand Gravel: fine and coarse, mainly subangular to rounded dark unpatinated flint, some fine rounded chalk Sand: fine and medium subrounded quartz with medium and coarse flint and chalk	2.5	5.0

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.2	0.2
River Terrace Deposits (Second Terrace)	'Clayey' sandy gravel Gravel: fine and coarse, subangular to subrounded flint with some subrounded quartz, traces of chalk increasing with depth Sand: fine and medium, subangular to subrounded, flint and quartz; moderate brown fines	3.5	3.5
Middle Chalk	Chalk, soft, some flint nodules	1.0+	4.7

**TL 76 NW 94 7038 6626 South of Kentford Block C**  
 Surface level 29.6 m (97 ft)  
 Water struck at 27.1 m  
 September 1980  
 Overburden 0.2 m  
 Mineral 3.5 m  
 Bedrock 1.0 m+



**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
11	52	37	0.2-1.2	18	38	22	2	9	11	0
			1.2-2.2	11	21	19	8	21	20	0
			2.2-3.2	9	22	21	9	18	21	0
			3.2-3.7	4	11	17	9	21	38	0
			<b>Mean</b>	<b>11</b>	<b>25</b>	<b>20</b>	<b>7</b>	<b>17</b>	<b>20</b>	<b>0</b>

**TL 76 NW 95 7109 6944**

**St. George's Plantation, Herringswell**

**Block C**

Surface level 22.5 m (74 ft)  
Water not struck  
August 1980

Overburden 0.3 m  
Mineral 2.0 m  
Waste 1.7 m  
Bedrock 0.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy, slightly pebbly	0.3	0.3
Blown Sand on River Terrace Deposits (Second Terrace)	Sandy gravel Gravel: fine and coarse, subangular brown and grey flint, traces of fine subrounded quartz and chalk Sand: fine with medium, some coarse, subrounded quartz with subordinate subangular flint, traces of chalk	2.0	2.3
	Pebbly clay, stiff, abundant flint and chalk pebbles, becomes very chalky and pebbly below 3.4 m	1.7	4.0
Middle Chalk	Chalk, indurated	0.4+	4.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	64	32	0.3-0.9	5	53	20	2	7	13	0
			0.9-1.9	3	25	27	7	17	21	0
			1.9-2.3	4	31	21	6	20	18	0
			<b>Mean</b>	<b>4</b>	<b>35</b>	<b>24</b>	<b>5</b>	<b>14</b>	<b>18</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	Others
	Black	Brown	Chalk		
0.3-2.3	4	76	15	0	5

**TL 76 NW 96 7140 6799**

**Kentford Heath**

**Block C**

Surface level 32.0 m (105 ft)  
Water not struck  
September 1980

Overburden 0.2 m  
Mineral 2.5 m  
Waste 1.1 m  
Mineral 2.4 m  
Bedrock 0.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.2	0.2
River Terrace Deposits (Second Terrace)	a 'Very clayey' pebbly sand Gravel: fine to coarse, subangular to subrounded mainly white and brown flint Sand: fine with medium, subangular to subrounded quartz, traces of chalk; moderate brown fines	2.5	2.7
Glacial Silt	Silt, moderate yellowish brown, soft, sandy partings, occasional flint pebbles	1.1	3.8
Glacial Sand and Gravel	b Gravel Gravel: fine to coarse, scattered cobbles subangular to subrounded dark and pale flint Sand: medium and coarse subangular flint and subrounded quartz	2.4	6.2
Middle Chalk	Chalk, hard	0.8+	7.0

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand			Gravel	
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
<b>a</b>	23	66	11	0.2-1.2	13	46	26	3	4	6	0
				1.2-2.2	37	33	17	2	7	4	0
				2.2-2.7	14	49	20	2	5	10	0
				<b>Mean</b>	<b>23</b>	<b>42</b>	<b>21</b>	<b>3</b>	<b>5</b>	<b>6</b>	<b>0</b>
<b>b</b>	8	28	64	3.8-4.8	8	5	13	10	24	38	2
				4.8-6.2	8	5	13	10	24	38	2
				<b>Mean</b>	<b>8</b>	<b>5</b>	<b>13</b>	<b>10</b>	<b>24</b>	<b>38</b>	<b>2</b>
<b>a+b</b>	<b>16</b>	<b>47</b>	<b>37</b>	<b>Mean</b>	<b>16</b>	<b>24</b>	<b>17</b>	<b>6</b>	<b>15</b>	<b>21</b>	<b>1</b>

**TL 76 NW 97 7163 6610**

**North-west of Needham Street**

**Block C**

Surface level 20.5 m (67 ft)  
Water not struck  
September 1980

Overburden 0.1 m  
Mineral 3.3 m  
Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.1	0.1
Head	'Very clayey' sandy gravel Gravel: fine and coarse, subangular and subrounded flint with minor amounts of chalk	3.3	3.4

Sand: fine with medium, subangular to rounded quartz with some flint in medium and coarse range, minor amounts of chalk; light brown fines

Middle Chalk Chalk, with flints 0.7+ 4.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
20	52	28	0.1-1.5	16	36	17	4	12	15	0
			1.5-2.5	21	23	21	7	18	10	0
			2.5-3.4	25	23	16	4	14	18	0
			<b>Mean</b>	<b>20</b>	<b>29</b>	<b>18</b>	<b>5</b>	<b>14</b>	<b>14</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	Others
	Black	Brown	Chalk		
0.1-3.4	48	40	6	6	0

TL 76 NW 98 7210 6969 South of Herringswell Block C

Surface level 19.5 m (64 ft) Overburden 0.1 m  
 Water struck at 15.9 m Mineral 3.9 m  
 August 1980 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy with some flint pebbles	0.1	0.1
River Terrace Deposits (Second Terrace)	Pebble sand Gravel: fine and coarse, subangular, pale coloured flint with minor amounts of chalk; chalk content increases near base Sand: fine with medium, mainly subrounded quartz with subordinate subangular flint and minor amounts of chalk; light brown fines	3.9	4.0
Middle Chalk	Chalk, rubble with some flint cobbles at top	1.0+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
6	87	7	0.1-1.1	4	63	24	1	5	3	0
			1.1-1.6	8	74	11	1	1	5	0
			1.6-2.0	7	75	17	1	0	0	0
			2.0-3.0	5	69	17	2	3	4	0
			3.0-4.0	8	56	19	7	9	1	0
			<b>Mean</b>	<b>6</b>	<b>65</b>	<b>19</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>0</b>

TL 76 NW 99 7280 6816 Hall Hill Farm, Herringswell Block E

Surface level 45.7 m (150 ft) Overburden 0.6 m  
 Water not struck Mineral 1.6 m  
 August 1980 Bedrock 3.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy with flint pebbles	0.6	0.6
Glacial Sand and Gravel	'Very clayey' sandy gravel Gravel: fine and coarse, subangular to subrounded flint with subordinate chalk Sand: fine and medium, subangular to subrounded, quartz with subordinate flint and chalk	1.6	2.2
Middle Chalk	Pebble chalky clay and chalk marl	3.8+	6.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
21	42	37	0.3-1.2	21	39	18	2	6	14	0
			1.2-2.2	22	9	13	9	19	23	5
			<b>Mean</b>	<b>21</b>	<b>21</b>	<b>15</b>	<b>6</b>	<b>14</b>	<b>20</b>	<b>3</b>

TL 76 NW 100 7454 6918 Century Belt North, Herringswell Block E

Surface level 40.0 m (131 ft) Overburden 0.6 m  
 Water not struck Mineral 1.4 m  
 August 1980 Waste 3.8 m  
 Mineral 2.8 m  
 Waste 1.2 m  
 Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, slightly clayey, some flint pebbles	0.6	0.6
Glacial Sand and Gravel	a 'Clayey' sandy gravel Gravel: fine and coarse angular to subangular pale flint some subrounded quartz, scattered chalk pebbles Sand: fine to medium mainly subrounded quartz with subangular flint in coarser grades; moderate to reddish brown fines	1.4	2.0
	Silty clay, moderate yellowish brown, mottled light brown, soft to firm, locally sandy and pebbly, laminated near base, ironstone concretions	3.8	5.8
	b 'Clayey' sandy gravel Gravel: fine and coarse, scattered cobbles near base, subangular to subrounded dark flint, traces of chalk Sand: medium with fine, some coarse, mainly subangular flint, traces of chalk; moderate yellowish brown fines	2.8	8.6

		Pebbly clay, light brown, abundant flint and chalk pebbles, slightly sandy	1.2	9.8
Middle Chalk		Chalk, firm	0.7+	10.5

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
<b>a</b>	18	53	29	0.6-1.1	17	41	18	4	9	11	0
				1.1-1.8	19	18	21	9	16	17	0
				1.8-2.0	19	18	21	9	16	17	0
				<b>Mean</b>	<b>18</b>	<b>26</b>	<b>20</b>	<b>7</b>	<b>14</b>	<b>15</b>	<b>0</b>
<b>b</b>	12	47	41	5.8-6.4	22	8	22	11	23	14	0
				6.4-7.1	8	11	29	5	21	26	0
				7.1-8.1	10	23	31	6	13	17	0
				8.1-8.6	10	9	22	6	21	28	4
				<b>Mean</b>	<b>12</b>	<b>14</b>	<b>26</b>	<b>7</b>	<b>19</b>	<b>21</b>	<b>1</b>
<b>a+b</b>	<b>14</b>	<b>50</b>	<b>36</b>	<b>Mean</b>	<b>14</b>	<b>18</b>	<b>25</b>	<b>7</b>	<b>17</b>	<b>19</b>	<b>trace</b>

**COMPOSITION**

	Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
		Flint			Quartz and quartzite	Others
		Black	Brown	Chalk		
<b>a</b>	0.6-2.0	20	61	3	8	8
<b>b</b>	5.8-8.6	31	54	5	9	1

<b>TL 76 NW 101</b>	<b>7470 6524</b>	<b>Higham</b>		<b>Block E</b>
Surface level 80.0 m (263 ft)			Waste	5.9 m
Water not struck			Bedrock	1.0 m+
September 1980				

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.3	0.3
Boulder Clay	Sandy silt, moderate brown, firm, scattered flint pebbles	0.8	1.1
	Pebbly clay, moderate to light brown, stiff, abundant chalk and flint pebbles	4.8	5.9
Upper Chalk	Chalk, soft	1.0+	6.9

<b>TL 76 NE 72</b>	<b>7605 6989</b>	<b>Park Farm, Cavenham</b>		<b>Block B</b>
Surface level 23.2 m (76 ft)			Overburden	0.4 m
Water not struck			Mineral	4.6 m
October 1980			Bedrock	1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy	0.4	0.4
Head	'Clayey' pebbly sand, 'very clayey' at base with clay seam between 3.4 m and 3.6 m Gravel: fine and coarse, subangular pale flint, traces of subrounded quartz and chalk Sand: fine with medium subrounded quartz, some subangular flint, traces of chalk; moderate yellowish brown fines Clay: pale yellowish brown, very abundant chalk pebbles	4.6	5.0
Middle Chalk	Chalk, indurated	1.0+	6.0

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
	16	68	16	0.4-1.4	7	44	28	3	5	13	0
				1.4-2.4	8	49	27	2	6	8	0
				2.4-3.4	8	49	27	2	6	8	0
				3.4-3.6	Clay parting, assumed to comprise 100% fines						
				3.6-5.0	23	37	19	4	9	8	0
				<b>Mean</b>	<b>16</b>	<b>41</b>	<b>24</b>	<b>3</b>	<b>7</b>	<b>9</b>	<b>0</b>

<b>TL 76 NE 73</b>	<b>7644 6954</b>	<b>South of Cavenham</b>		<b>Block B</b>
Surface level 25.0 m (82 ft)			Overburden	0.3 m
Water struck at 16.6 m			Mineral	15.7 m
August 1980			Bedrock	2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	<b>a</b> Pebbly sand Gravel: fine, subangular patinated flint Sand: fine and medium, subrounded quartz and subangular flint, traces of chalk; moderate brown fines	3.7	4.0
? Glacial Sand and Gravel	<b>b</b> Gravel, thin peat seam at 8.5 m Gravel: fine and coarse, some cobbles, subangular patinated flint with subrounded unpatinated flint and some subrounded quartz and quartzite, traces of chalk at top increasing to maximum of 30% near base	12.0	16.0

Sand: fine to coarse, angular to subangular patinated flint, some subrounded quartz traces of chalk at top increasing to c 50% near base  
 Fines: moderate brown, becoming chalky with depth

Middle Chalk Chalk, rubble 2.0+ 18.0

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Percentages						
					-½	+½ - ¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
<b>a</b>	6	88	6	0.3-0.8	9	56	26	3	6	0	0
				0.8-2.0	9	56	26	3	6	0	0
				2.0-3.0*	5	50	35	3	5	2	0
				3.0-4.0*	1	44	45	3	4	3	0
				<b>Mean</b>	<b>6</b>	<b>51</b>	<b>34</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>0</b>
<b>b</b>	2	44	54	4.0-4.7*	1	18	27	6	19	27	2
				4.7-6.0*	3	4	10	10	33	39	1
				6.0-7.0*	2	3	11	8	34	41	1
				7.0-8.0*	2	2	10	7	35	44	0
				8.0-8.5*	3	20	35	5	18	19	0
				8.5-12.5*	3	11	19	12	30	22	3
				12.5-13.5*	3	17	39	6	16	19	0
				13.5-14.5*	4	22	37	9	15	13	0
				14.5-15.5*	4	14	27	12	20	19	4
				15.5-16.0*	5	16	26	11	20	22	0
				<b>Mean</b>	<b>3</b>	<b>11</b>	<b>22</b>	<b>10</b>	<b>26</b>	<b>26</b>	<b>2</b>
<b>a+b</b>	<b>3</b>	<b>53</b>	<b>44</b>	<b>0.3-16.0</b>	<b>3</b>	<b>21</b>	<b>24</b>	<b>8</b>	<b>22</b>	<b>21</b>	<b>1</b>

**TL 76 NE 74 7699 6870 South of Cavenham Block B**  
 Surface level 22.2 m (73 ft) Overburden 0.1 m  
 Water struck at 18.0 m Mineral 4.1 m  
 August 1980 Bedrock 0.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy	0.1	0.1
River Terrace Deposits (Second Terrace)	Gravel, 'very clayey' in upper and lower parts Gravel: fine and coarse, scattered cobbles in parts subangular dark and pale flint with subordinate chalk below c 3.0 m, traces of subrounded quartz and quartzite throughout Sand: fine and medium with coarse subangular pale flint with mainly fine and medium subrounded quartz, traces of chalk below c 3.0 m; moderate brown fines, chalky at base	4.1	4.2
Middle Chalk	Chalk, putty-like with flints	0.1+	4.3

**GRADING**

Mean for deposit percentages	Depth below surface (m)	Percentages								
		Fines			Sand			Gravel		
		-½	+½ - ¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm		
11	43	46	0.0-1.0	10	25	13	4	18	28	2
			1.0-1.5	4	37	14	4	18	23	0
			1.5-2.5	6	21	25	10	24	14	0
			2.5-3.2	5	18	18	9	24	19	7
			3.2-4.2	24	8	11	6	22	29	0
			<b>Mean</b>	<b>11</b>	<b>20</b>	<b>16</b>	<b>7</b>	<b>21</b>	<b>23</b>	<b>2</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction					
	Flint			Quartz and quartzite		Others
	Black	Brown	Chalk	Quartz and quartzite		
0.0-4.2	17	65	8	5	5	

**TL 76 NE 75 7580 6680 Near Heath Farm, Higham Block E**  
 Surface level 66.2 m (217 ft) Waste 3.3 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Soil on pebbly sandy silt, dark yellowish orange, scattered chalk and flint pebbles	3.3	3.3
Upper Chalk	Chalk, hard, some flints	1.0+	4.3

**TL 76 NE 76 7515 6530 East of Higham Block E**  
 Surface level 79.0 m (260 ft) Waste 4.7 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Pebbly clay, moderate brown becoming dark grey at base, abundant chalk and flint pebbles	4.4	4.7
Upper Chalk	Chalk, firm, some nodular flints	1.0+	5.7

**TL 76 NE 77 7691 6595 Barrow Bottom Block E**  
 Surface level 42.8 m (140 ft) Mineral 2.8 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Head	'Very clayey' pebbly sand Gravel: fine and coarse, mainly subrounded nodular flint with subordinate chalk in lower 1.8 m Sand: fine with medium, subangular to rounded flint and quartz; moderate brown fines	2.8	2.8
Middle Chalk	Chalk, soft, some flints	1.0+	3.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
26	57	17	0.0-1.0	25	45	16	3	5	6	0
			1.0-2.0	26	33	15	4	8	14	0
			2.0-2.8	29	35	16	4	10	6	0
			<b>Mean</b>	<b>26</b>	<b>37</b>	<b>16</b>	<b>4</b>	<b>8</b>	<b>9</b>	<b>0</b>

**TL 76 NE 78 7791 6535 Barrow Heath Block E**  
 Surface level 45.0 m (148 ft) Waste 2.0 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Made ground	Made ground	0.8	0.8
Alluvium	Pebbly silt, moderate brown, sandy, common fine subangular pale flint pebbles, minor amounts of chalk and quartz pebbles	1.2	2.0
Middle Chalk	Chalk, putty-like	1.0+	3.0

**TL 76 NE 79 7845 6851 North-west of Risby Pools Heath Block E**  
 Surface level 44.8 m (147 ft) Waste 1.8 m  
 Water not struck Bedrock 1.1 m+  
 August 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, medium brown, sandy, scattered flint pebbles	0.5	0.5
Cover Sand	'Clayey' sand Gravel: trace of fine subangular flint Sand: medium with fine subrounded quartz, traces of chalk medium brown fines	0.7	1.2
Boulder Clay	Chalky pebbly clay, moderate reddish brown, stiff, slightly sandy, pebbles mainly chalk	0.6	1.8
Upper Chalk	Chalk, ironstained, hard	1.1+	2.9

**TL 76 NE 80 7966 6920 Hall Heath, Lackford Block E**  
 Surface level 40.1 m (132 ft) Mineral 5.8 m  
 Water not struck Bedrock 5.0 m  
 August 1980 Bedrock 2.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: fine and coarse, subangular pale flint with some subrounded quartz and quartzite, chalk very rare Sand: fine with medium, mainly subrounded quartz with subordinate subangular to angular flint Fines: yellowish brown to brownish orange, not cohesive	5.8	5.8
Boulder Clay	Clay, light brownish orange, stiff, slightly sandy, thin seams of clayey pebbly sand (as above), scattered flint cobbles	5.0	10.8
Upper Chalk	Chalk and clay (solution fissure)	2.4+	13.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
15	69	16	0.0-1.0	12	49	24	2	4	9	0
			1.0-2.0	10	54	20	2	4	10	0
			2.0-3.0	12	52	20	2	6	8	0
			3.0-4.0	12	21	40	3	11	13	0
			4.0-5.0	19	22	41	3	6	9	0
			5.0-5.8	26	17	38	2	7	10	0
			<b>Mean</b>	<b>15</b>	<b>36</b>	<b>31</b>	<b>2</b>	<b>6</b>	<b>10</b>	<b>0</b>

**TL 76 NE 81 7958 6800 East of Risby Poors Heath Block E**

Surface level 47.9 m (157 ft)  
 Water not struck  
 September 1980

Overburden 0.3 m  
 Mineral 1.7 m  
 Waste 2.2 m  
 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, mainly fine quartz sand	0.3	0.3
Brown Sand on Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, subangular and sub-rounded white and brown flint with rounded chalk Sand: medium with fine and coarse, subangular to subrounded flint and quartz, traces of chalk	1.7	2.0
? Boulder Clay	Pebbly silt, light brown, soft, cohesive, common chalk and pale flint clasts	2.2	4.2
Upper Chalk	Chalk, hard	1.0+	5.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{3}{8}$	+ $\frac{3}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
19	53	28	0.3-1.3	20	15	28	10	16	11	0
			1.3-2.0	19	14	30	7	13	17	0
			<b>Mean</b>	<b>19</b>	<b>14</b>	<b>30</b>	<b>9</b>	<b>15</b>	<b>13</b>	<b>0</b>

**TL 76 NE 82 7951 6751 Bullocks Lane, Risby Block E**

Surface level 51.6 m (169 ft)  
 Water not struck  
 March 1980

Waste 3.3 m  
 Bedrock 1.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil on Boulder Clay	Soil, dark greyish brown, sandy and clayey, some pebbles	0.8	0.8
	Sand: fine and medium, clayey; pale yellowish brown fines	0.5	1.3
	Clay, orange-brown, weathered and ironstained, chalky	2.0	3.3
Upper Chalk	Chalk, hard	1.7+	5.0

**TL 76 NE 83 7900 6665 West of Risby Block E**

Surface level 62.2 m (204 ft)  
 Water not struck  
 September 1980

Waste 4.5 m  
 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	'Clayey' sand and soil Gravel: trace only, fine pale flint Sand: fine and medium rounded quartz and subangular flint; light brown fines	0.5	0.5
	Pebbly silt, light brown, soft, slightly clayey, common rounded chalk and subangular flint pebbles	4.0	4.5
Upper Chalk	Chalk, soft at top	1.0+	5.5

**TL 76 NE 84 7857 6564 Near Symond's Farm, Barrow Block**

Surface level 68.6 m (225 ft)  
 Water not struck  
 March 1980

Waste 5.5 m  
 Bedrock 1.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Clay, pale brown, stiff, contains sand to pebble-sized chalk	5.5	5.5
Upper Chalk	Chalk, hard, some nodular flints	1.5+	7.0

**TL 76 NE 85 7985 6618 Risby Block E**

Surface level 68.2 m (224 ft)  
 Water not struck  
 September 1980

Overburden 0.2 m  
 Mineral 1.3 m  
 Waste 5.2 m  
 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.2	0.2
Cover Sand	'Very clayey' pebbly sand Gravel: fine and coarse, subangular white flint and subrounded chalk Sand: fine some medium, subangular to rounded quartz and flint; light brown	1.3	1.5
Boulder Clay	Chalky pebbly clay, light brown, locally silty, abundant chalk and flint clasts	5.2	6.7
Upper Chalk	Chalk, soft at top	1.0+	7.7

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm
26	67	7	0.2-1.0	31	45	15	2	2	5	0
			1.0-1.5	19	56	16	2	4	3	0
			<b>Mean</b>	<b>26</b>	<b>49</b>	<b>16</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>0</b>

**TL 76 NE 86      7981 6517      South of Railway, Risby**

**Block E**

Surface level c 70.0 m (c230 ft)  
Water not struck  
September 1980

Waste 6.8 m  
Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.2	0.2
Boulder Clay	Chalky pebbly clay, light to moderate brown, stiff, silty and sandy in upper 3.0 m and below 6.0 m, abundant chalk and pale flint elasts	6.6	6.8
Upper Chalk	Chalk, soft, some nodular flints	1.0+	7.8

**TL 76 SW 3      7129 6446      West of Gazeley**

**Block E**

Surface level 90.8 m (298 ft)  
Water not struck  
September 1980

Waste 8.6 m  
Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.3	0.3
Boulder Clay	Pebbly clay, light brown mottled grey in lowest 1 m; chalk and flint pebbles	8.3	8.6
Upper Chalk	Chalk, soft	1.0+	9.6

**TL 76 SW 4      7075 6338      Southwest of Gazeley**

**Block C**

Surface level 41.6 m (136 ft)  
Water not struck  
September 1980

Overburden 0.2 m  
Mineral 4.1 m  
Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy and pebbly	0.2	0.2
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: fine and coarse, some cobbles, mainly subangular and subrounded nodular black flint with minor amounts of fine rounded chalk Sand: medium with fine and coarse, subangular to subrounded mainly quartz with some chalk; pale yellowish brown fines	4.1	4.3
Middle Chalk	Chalk, rubbly with some gravel at top	1.2+	5.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm
12	46	42	0.2-1.2	9	10	16	8	24	31	2
			1.2-2.2	8	15	22	10	21	21	3
			2.2-3.2	13	18	24	10	22	13	0
			3.2-4.3	16	15	24	12	11	18	4
			<b>Mean</b>	<b>12</b>	<b>14</b>	<b>22</b>	<b>10</b>	<b>19</b>	<b>21</b>	<b>2</b>

**COMPOSITION**

Depth below surface (m)      Percentages by weight in +4-16 mm fraction

Depth below surface (m)	Flint				
	Black	Brown	Chalk	Quartz and quartzite	Others
0.2-4.3	49	26	20	4	1

**TL 76 SW 5      7027 6175      East of Ashley**

**Block E**

Surface level 97.0 m (318 ft)  
Water not struck  
November 1980

Waste 7.1 m  
Bedrock 1.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy and clayey	0.3	0.3
Boulder Clay	Chalky pebbly clay, moderate yellowish brown, decalcified in upper 0.6 m, sand seam between 1.3 m and 1.5 m; abundant chalk and scattered flint pebbles	6.9	7.1
Upper Chalk	Chalk, firm	1.4+	8.5

**TL 76 SW 6**      **7247 6349**      **South-east of Gazeley**      **Block E**  
 Surface level 91.4 m (300 ft)  
 Water not struck  
 September 1980  
 Waste 8.3 m  
 Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.3	0.3
Boulder Clay	Pebbly clay, moderate brown, stiff, silty in upper 6 m. Pebbles of chalk and flint with subordinate quartz and quartzite up to cobble size. Layer of redeposited chalk at 7.5 m to 8.0 m	8.0	8.3
Upper Chalk	Chalk	0.7+	9.0

**TL 76 SW 7**      **7210 6179**      **Dalham**      **Block C**  
 Surface level 53.0 m (174 ft)  
 Water not struck  
 November 1980  
 Waste 1.9 m  
 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.3	0.3
Boulder Clay	Chalky pebbly clay, moderate brown, decalcified at top, very clayey pebbly sand seam from 1.1 m to 1.5 m. Pebbles mainly chalk with flint	1.6	1.9
Middle Chalk	Chalk, rubbly, some flint cobbles	1.0+	2.9

**TL 76 SW 8**      **7222 6095**      **South of Dalham**      **Block C**  
 Surface level 52.2 m (171 ft)  
 Water struck at 45.1 m  
 November 1980  
 Overburden 0.1 m  
 Mineral 3.3 m  
 Waste 4.7 m  
 Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, dark brown, clayey and pebbly	0.1	0.1
River Terrace Deposits (Third Terrace)	'Clayey' gravel Gravel: fine and coarse, subangular to subrounded flint, trace of rounded quartzite, very rare chalk Sand: fine to coarse, mainly subangular flint, some rounded quartz; moderate brown fines	3.3	3.4
Boulder Clay	Silty clay, yellowish grey, stiff, scattered fine flint pebbles, trace of chalk sand in parts	4.7	8.1
Middle Chalk	Chalk, rubbly with some nodular flints	1.2+	9.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			-½	+½ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
11	39	50	0.1-1.9	10	11	15	12	25	27	0
			1.9-2.9	10	11	15	13	25	26	0
			2.9-3.4	14	15	18	10	25	18	0
			<b>Mean</b>	<b>11</b>	<b>12</b>	<b>15</b>	<b>12</b>	<b>25</b>	<b>25</b>	<b>0</b>

**TL 76 SW 9**      **7315 6481**      **Tank Hall, north-east of Gazeley**      **Block E**  
 Surface level 63.0 m (207 ft)  
 Water struck at c 53.0 m  
 November 1981  
 Waste 24.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, dark yellowish brown, clayey and sandy, scattered pebbles	0.3	0.3
Boulder Clay	Chalky pebbly clay, dark grey, weathered yellowish brown and decalcified in upper 4 m, abundant sand to pebble-sized chalk and flint, very gravelly at base	8.3	8.6
Glacial Silt	Clayey sandy silt, greyish orange, becoming light grey at c 14 m; soft, locally laminated, contains abundant fine sand, some fine chalk and flint pebbles in parts	15.4+	24.0

**TL 76 SW 10**      **7347 6187**      **Leipsic Wood, Dalham**      **Block E**  
 Surface level 93.9 m (381 ft)  
 Water not struck  
 November 1980  
 Waste 15.5 m  
 Bedrock 0.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, clayey, yellowish brown	0.4	0.4
Boulder Clay	Chalky pebbly clay, moderate yellowish brown, becoming grey between 5.7 m and 13.1 m, stiff, slightly sandy, numerous chalk and flint pebbles	15.1	15.5
Upper Chalk	Chalk, soft, rubbly	0.2+	15.7



**TL 76 SW 11 7317 6093 Clumpsey Barn, Dalham Block E**  
 Surface level c90.0 m (c295 ft) Waste 3.5 m  
 Water not struck Bedrock 0.2 m+  
 November 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Clayey soil	0.1	0.1
Boulder Clay	Chalky pebbly clay, moderate yellowish brown, stiff, contains chalk sand and pebbles with some flint pebbles	3.5	3.6
Upper Chalk	Chalk, white, compact	0.2+	3.8

**TL 76 SW 12 7452 6377 North-east of Desning Hall, Dalham Block E**  
 Surface level 65.0 m (213 ft) Mineral 10.5 m  
 Water not struck Bedrock 1.8 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Head on Glacial Sand and Gravel	'Clayey' gravel, 'very clayey' between 4.0 m and 5.0 m Gravel: fine and coarse with abundant cobbles, angular to subrounded black flint with subordinate pale flint, some fine subrounded quartz, trace of fine chalk in upper part increasing below 8.0 m Sand: fine to coarse, becoming mainly medium to coarse below 4.0 m, subangular flint and subrounded quartz; moderate brown fines	10.5	10.5
Upper Chalk	Chalk, soft, rubbly with some flint gravel at top	1.8+	12.3

**GRADING**

Mean for deposit percentages	Depth below surface (m)	Percentages								
		Fines			Sand			Gravel		
		-1/16	+1/16 - 1/4	+1/4 - 1/2	+1/2 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
16	31	53	0.0-1.0	7	19	13	10	23	25	3
			1.0-2.0	7	19	13	10	23	25	3
			2.0-3.0	11	10	20	10	15	24	10
			3.0-4.0	20	28	12	6	16	18	0
			4.0-5.0	53	6	8	4	10	16	3
			5.0-6.0	13	5	20	11	17	31	3
			6.0-7.0	8	3	8	8	17	29	27
			7.0-8.0	15	4	11	13	21	32	4
			8.0-9.0	12	5	11	9	19	32	12
			9.0-10.0	9	5	8	8	19	36	15
			10.0-10.5	14	8	12	13	26	27	0
			<b>Mean</b>	<b>16</b>	<b>10</b>	<b>12</b>	<b>9</b>	<b>18</b>	<b>27</b>	<b>8</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	Others
	Black	Brown	Chalk		
0.0-10.5	64	29	2	3	2

**TL 76 SW 13 7467 6327 North-east of Denham Castle Block E**  
 Surface level c91.0 m (c300 ft) Waste 10.7 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, clayey	0.2	0.2
Boulder Clay	Pebbly clay, light brown becoming medium to dark grey between 1.5 m and 6.5 m, stiff, common chalk and flint pebbles, becomes slightly silty below c 6 m	10.5	10.7
Upper Chalk	Chalk, white, hard	1.0+	11.7

**TL 76 SW 14 7450 6264 West of Denham Castle Block E**  
 Surface level 95.0 m (312 ft) Waste 19.7 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.2	0.2
Boulder Clay	Silty clay, light brown, stiff, scattered flint pebbles in upper 0.7 m, chalk and flint pebbles common below c 1.0 m, sandy seams in parts	4.1	4.3
Upper Chalk	Pebbly clay, dark grey, weathered greyish brown in upper 1.0 m, stiff, chalk and flint pebbles common throughout Chalk, white, soft	15.4	19.7
		1.0+	20.7

**TL 76 SW 15**      **7441 6158**      **Coy's Grove, East of Dalham**      **Block E**  
 Surface level 103.5 m (340 ft)      Waste      19.2 m+  
 Water not struck  
 November 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, clayey	0.3	0.3
Boulder Clay	Chalky pebbly clay, medium grey, decalcified and weathered moderate yellowish brown in upper 5 m, stiff, slightly sandy, abundant chalk and flint pebbles, becomes increasingly chalky towards base	18.9+	19.2

**TL 76 SE 19**      **7531 6465**      **Cannamore Cottages, Barrow**      **Block E**  
 Surface level c 80.0 m (c 263 ft)      Waste      15.2 m  
 Water not struck      Bedrock      0.4 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Made ground	Made ground	0.4	0.4
Boulder Clay	Pebbly silty clay, dark grey, weathered in upper 2.6 m, scattered chalk and flint pebbles particularly near the top	14.8	15.2
Upper Chalk	Chalk, white, hard	0.4+	15.6

**TL 76 SE 20**      **7542 6362**      **West of Barrow**      **Block E**  
 Surface level c 85.0 m (c280 ft)      Waste      2.7 m  
 Water not struck      Bedrock      1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.1	0.1
Boulder Clay	Silty clay, moderate brown, scattered subangular white and brown flint pebbles, becoming more pebbly with some cobbles below 1.5 m, sandy with some chalk pebbles below 1.5 m	2.6	2.7
Upper Chalk	Chalk, white, soft	1.0+	3.7

**TL 76 SE 21**      **7542 6255**      **Hockerhill Wood, Denham**      **Block E**  
 Surface level c 96.0 m (c 315 ft)      Waste      15.4 m  
 Water not struck      Bedrock      1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Made ground	Made ground	0.4	0.4
Boulder Clay	Silty clay, light brown, soft, some thin sand seams in parts	1.1	1.5
	Pebbly clay, medium light grey weathered at top, abundant rounded chalk and subangular flint pebbles, thin sand seams in parts	13.3	14.8
	Clay, mottled light olive grey and olive brown, stiff, structureless	0.6	15.4
Upper Chalk	Chalk, white, hard	1.0+	16.4

**TL 76 SE 22**      **7548 6056**      **Little Southwood Park Farm, Hargrave**      **Block E**  
 Surface level c 96.0 m (c 315 ft)      Waste      20.0 m+  
 Water not struck  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.3	0.3
Boulder Clay	Pebbly clay, dark grey, weathered brown in upper 4.0 m, firm, abundant subrounded chalk and subangular flint pebbles	19.7+	20.0

**TL 76 SE 23**      **7653 6421**      **North of Barrow**      **Block E**  
 Surface level c 90.0 m (c295 ft)      Waste      16.1 m  
 Water not struck      Bedrock      1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.4	0.4
Boulder Clay	Pebbly clay, moderate brown, mottled light grey in parts, firm to stiff, abundant subrounded quartz and subangular flint pebbles with cobbles in places	15.7	16.1
Upper Chalk	Chalk, pinkish white, some flint cobbles	1.0+	17.1

**TL 76 SE 24 7655 6240 South of Barrow** **Block E**  
 Surface level 89.8 m (295 ft) Waste 20.0 m+  
 Water not struck  
 September 1981

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.3	0.3
Boulder Clay	Pebbly clay, dark grey, weathered light to moderate brown in upper 4.0 m, abundant subrounded chalk and subangular flint pebbles	19.7+	20.0

**TL 76 SE 25 7665 6155 Hargrave Hall** **Block E**  
 Surface level c 90.0 m (c 295 ft) Waste 20.7 m+  
 Water not struck  
 September 1981

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Soil on pebbly clay, dark grey, weathered light olive brown and decalcified in upper 4.0 m, abundant subangular flint and subrounded chalk pebbles	20.7+	20.7

**TL 76 SE 26 7895 6450 Gt. Papeley Wood, Gt. Saxham** **Block E**  
 Surface level c 75.0 m (c245 ft) Waste 10.0 m  
 Water not struck Bedrock 0.7 m+  
 September 1981

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.3	0.3
Boulder Clay	Pebbly clay, dark grey, weathered light to moderate brown in upper 2.0 m and below 8.5 m, abundant flint and chalk pebbles, some limestone fragments in parts	9.7	10.0
Upper Chalk	Chalk, white, hard	0.7+	10.7

**TL 76 SE 27 7795 6358 Wilsummer Wood, Denham** **Block E**  
 Surface level 73.0 m (240 ft) Waste 1.3 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.3	0.3
Boulder Clay	Silty pebbly clay, light brown, firm, numerous flint and chalk pebbles, some flint cobbles	1.0	1.3
Upper Chalk	Chalk, white, soft becoming hard	1.0+	2.3

**TL 76 SE 28 7791 6312 Lower Farm, Saxham** **Block E**  
 Surface level 68.3 m (224 ft) Waste 4.8 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.3	0.3
Boulder Clay	Silty clay, moderate brown, stained moderate and light olive brown, firm, scattered flint pebbles	2.2	2.5
	Pebbly clay, moderate brown, stiff, slightly sandy in parts, abundant chalk and scattered flint pebbles	2.3	4.8
Upper Chalk	Chalk, white, hard, some flint nodules	1.0+	5.8

**TL 76 SE 29 7754 6261 South of Wilsummer Wood, Barrow** **Block E**  
 Surface level 73.3 m (240 ft) Waste 19.6 m+  
 Water not struck  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Topsoil	0.3	0.3
Boulder Clay	Pebbly clay, medium dark grey, weathered moderate brown in upper and lower parts, abundant chalk and flint pebbles and cobbles especially in lower part	19.3+	19.6

**TL 76 SE 30**      **7712 6048**      **Hargrave**      **Block E**  
 Surface level 89.0 m (292 ft)      Waste      20.0 m+  
 Water not struck  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Soil on pebbly clay, light to moderate brown becoming dark grey at 5 m, stiff, pebbles of chalk and flint common; becomes slightly sandy below 14.0 m	20.0+	20.0

**TL 76 SE 31**      **7895 6450**      **Little Papeley Wood, Great Saxham**      **Block E**  
 Surface level 89.0 m (292 ft)      Mineral      5.1 m  
 Water not struck      Bedrock      1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: coarse with fine, some cobbles especially at base, subangular to rounded black and pale flint, traces of subrounded chalk and quartzite Sand: fine to coarse, subangular to subrounded flint and quartz, trace of chalk; moderate brown fines	5.1	5.1
Upper Chalk	Chalk, soft, some gravel at top	1.0+	6.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
19	42	39	0.0-1.2	27	40	15	4	10	4	0
			1.2-2.2	21	15	15	8	11	22	8
			2.2-3.2	21	4	16	12	15	32	0
			3.2-3.7	23	6	21	16	22	12	0
			3.7-5.1	9	10	22	7	13	21	18
			<b>Mean</b>	<b>19</b>	<b>16</b>	<b>18</b>	<b>8</b>	<b>13</b>	<b>19</b>	<b>7</b>

**TL 76 SE 32**      **7890 6380**      **Twites Farm, Great Saxham**      **Block E**  
 Surface level 62.0 m (203 ft)      Waste      3.0 m  
 Water not struck      Bedrock      0.5 m+  
 October 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Head	Soil on very sandy pebbly clay, dark yellowish orange, scattered flint pebbles; sand mainly medium and fine quartz and flint	0.7	0.7
	Clay, light brown, firm, slightly sandy	2.3	3.0
Upper Chalk	Chalk, white, soft	0.5+	3.5

**TL 76 SE 33**      **7869 6343**      **The Rectory, Great Saxham**      **Block**  
 Surface level 79.8 m (262 ft)      Waste      7.1 m  
 Water not struck      Bedrock      1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Made ground and topsoil	0.4	0.4
Boulder Clay	Pebbly clay, light olive brown, mottled medium grey below 4 m, stiff, common chalk and flint pebbles	6.7	7.1
Upper Chalk	Chalk, white, soft, some flint nodules	1.0+	8.1

**TL 76 SE 34**      **7868 6257**      **South of Great Saxham**      **Block E**  
 Surface level 90.8 m (280 ft)      Waste      18.0 m+  
 Water not struck  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Soil on 'clayey' sandy gravel comprising fine and coarse flint and chalk pebbles with medium and fine flint sand	0.4	0.4
	Clay, dark brown, humic, scattered flint pebbles	0.2	0.6
	Clay, grey and brown, becoming dark grey with depth, soft becoming stiff at 5.5 m, locally sandy, contains abundant chalk and flint pebbles	17.4+	18.0

**TL 76 SE 35 7820 6164 South of Hearse Wood, Great Saxham Block E**

Surface level c96.0 m (c315 ft) Overburden 1.1 m  
 Water struck at c94.0 m Mineral 2.1 m  
 September 1980 Waste 6.2 m  
 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Clayey loam	0.1	0.1
Head	Silty clay, moderate brown, soft, traces of fine quartz sand in parts	1.0	1.1
	'Very clayey' sandy gravel Gravel: fine and coarse, mainly subangular pale and dark flint with some fine subrounded chalk and traces of fine subrounded quartz. Sand: fine to coarse subangular quartz and flint Fines: silty and clayey matrix, some thin silty partings; moderate brown fines	2.1	3.2
Boulder Clay	Pebbly clay, greyish brown, stiff, sand to cobble-sized chalk and flint clasts common, scattered Jurassic-derived pebbles	6.2	9.4
Upper Chalk	Chalk, putty-like	1.0+	10.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
21	42	37	1.1-2.1	19	19	16	10	18	18	0
			2.1-3.2	22	15	14	13	22	14	0
			<b>Mean</b>	<b>21</b>	<b>17</b>	<b>14</b>	<b>11</b>	<b>21</b>	<b>16</b>	<b>0</b>

**TL 76 SE 36 7960 6294 Larner's Wood, Great Saxham Block E**

Surface level 81.5 m (267 ft) Waste 12.6 m  
 Water not struck Bedrock 0.4 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Soil on pebbly clay, light to moderate brown becoming grey below 5 m, stiff, numerous chalk and flint pebbles	12.0	12.0
	Silt, moderate olive brown with paler mottle, stiff, indistinctly laminated, sandy in places	0.6	12.6
Upper Chalk	Chalk, white, hard	0.4+	13.0

**TL 76 SE 37 7908 6195 Cobb's Hall Farm, Great Saxham Block E**

Surface level c95.0 m (310 ft) Waste 21.0 m+  
 Water not struck  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Soil on pebbly clay, moderate yellowish brown becoming dark grey below 3.5 m, stiff, chalk and flint pebbles common	6.2	6.2
	Chalk and flint cobbles	0.2	6.4
	Pebbly clay, dark grey, chalk and flint pebbles common	13.4+	21.0

**TL 76 SE 38 7910 6030 Chevington Hall Farm, south of Great Saxham Block E**

Surface level c90.0 m (c295 ft) Waste 20.0 m+  
 Water not struck  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Soil on pebbly clay, light to moderate brown becoming dark grey below 5.0 m, chalk and flint pebbles common	20.0+	20.0

**TL 77 NW 59 7038 7951 North of Wilde Street Block A**

Surface level 5.0 m (16 ft) Overburden 0.1 m  
 Water struck at 4.0 m Mineral 5.1 m  
 November 1980 Waste 0.8 m  
 Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy	0.1	0.1
River Terrace Deposits (Second Terrace)	Sand Gravel: trace of fine subangular pale flint Sand: fine with medium subrounded quartz, trace of coarse subangular flint, very rare chalk; light brown fines	5.1	5.2
	Silty clay, light olive grey, soft, very chalky	0.8	6.0
Lower Chalk	Chalk, hard	0.6+	6.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
5	94	1	0.1-1.1	3	60	34	2	1	0	0
			1.1-2.1*	6	51	38	2	3	0	0
			2.1-3.1*	4	56	38	1	1	0	0
			3.1-5.2*	6	55	36	2	1	0	0
			<b>Mean</b>	<b>5</b>	<b>55</b>	<b>37</b>	<b>2</b>	<b>1</b>	<b>trace</b>	<b>0</b>

**TL 77 NW 60 7075 7842 Near Wilde Street**

**Block A**

Surface level 5.0 m (16 ft)  
Water struck at 4.0 m  
September 1980

Overburden 0.4 m  
Mineral 3.1 m  
Waste 2.9 m  
Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy	0.4	0.4
River Terrace Deposits (Second Terrace)	Sand: fine with medium, mainly subrounded quartz, traces of flint and chalk; scattered pebbles	3.1	3.5
	Silt, medium grey, becoming pale grey with depth, soft, fine chalk sand common at top increasing towards base	2.9	6.4
Lower Chalk	Chalk, firm	0.6+	7.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	96	1	0.4-1.4	5	64	28	2	1	0	0
			1.4-2.4*	2	43	51	2	2	0	0
			2.4-3.5*	2	50	46	2	0	0	0
			<b>Mean</b>	<b>3</b>	<b>53</b>	<b>41</b>	<b>2</b>	<b>1</b>	<b>trace</b>	<b>0</b>

**TL 77 NW 61 7062 7751 North of Holywell Row**

**Block A**

Surface level c6.0 m (c20 ft)  
Water struck at c5.0 m  
September 1980

Overburden 0.3 m  
Mineral 3.5 m  
Waste 1.7 m  
Bedrock 0.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy	0.3	0.3
River Terrace Deposits	<b>a</b> Sand: fine and medium, mainly subrounded quartz traces of angular flint, chalk absent; moderate brown fines	1.7	2.0
	<b>b</b> Pebbly sand Gravel: fine with some coarse, mainly subrounded chalk with minor amounts of subangular flint Sand: fine with medium, subrounded quartz with some subangular flint, traces of chalk; moderate yellowish brown fines	1.8	3.8
	Silty clay, medium grey, soft, minor amounts of fine chalk sand	1.7	5.5
Lower Chalk	Chalk, putty-like	0.5+	6.0

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
<b>a</b>	4	96	0	0.3-1.0	4	55	40	1	0	0	0
				1.0-2.0*	5	62	31	1	1	0	0
				<b>Mean</b>	<b>4</b>	<b>60</b>	<b>35</b>	<b>1</b>	<b>trace</b>	<b>0</b>	<b>0</b>
<b>b</b>	8	79	13	2.0-3.0*	6	45	23	10	12	4	0
				3.0-3.8*	10	56	18	6	9	1	0
				<b>Mean</b>	<b>8</b>	<b>50</b>	<b>21</b>	<b>8</b>	<b>11</b>	<b>2</b>	<b>0</b>
<b>a+b</b>	<b>6</b>	<b>87</b>	<b>7</b>	<b>0.3-3.8</b>	<b>6</b>	<b>55</b>	<b>28</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>0</b>

**TL 77 NW 62 7060 7588 Sandy Plantation, Mildenhall**

**Block A**

Surface level 7.2 m (24 ft)  
Water struck at 2.7 m  
September 1980

Overburden 0.1 m  
Mineral 3.9 m  
Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.1	0.1
River Terrace Deposits (Second Terrace)	'Clayey' sand Gravel: fine, some coarse, subangular pale flint Sand: fine with medium, subrounded quartz with some subangular flint; moderate yellowish brown fines	3.9	4.0
Lower Chalk	Chalk, firm	1.0+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Gravel				
				-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
12	85	3	0.1-1.1	16	76	6	1	1	0	0
			1.1-2.1	10	67	20	1	1	1	0
			2.1-3.1	2	50	44	2	2	0	0
			3.1-4.0	19	49	18	5	6	3	0
			<b>Mean</b>	<b>12</b>	<b>61</b>	<b>22</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>

**TL 77 NW 63 7177 7962 High Fen, Eriswell**

Surface level 3.3 m (11 ft)  
Water struck at c2.0 m  
September 1980

Overburden 1.9 m  
Mineral 6.0 m  
Bedrock 1.0 m+

**Block A**

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil, sandy and peaty	0.7	0.7
Peat	Peat, dusky red, some thin fine chalk sand seams	1.2	1.9
River Terrace Deposits (Second Terrace)	Pebble sand Gravel: mainly in lower part; fine and coarse, subangular pale flint, minor amounts of rounded quartz and quartzite Sand: fine with medium subrounded quartz, coarsening towards base, subangular flint in medium and coarse range; moderate yellowish brown fines	6.0	7.9
Lower Chalk	Chalk, putty-like	1.0+	8.9

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Gravel				
				-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
4	84	12	1.9-3.0*	10	66	21	2	0	1	0
			3.0-4.0*	4	51	40	2	2	1	0
			4.0-5.0*	4	26	52	9	7	2	0
			5.0-6.0*	3	20	50	13	8	6	0
			6.0-7.0*	0	16	56	6	10	12	0
			7.0-7.9*	3	8	54	11	10	14	0
			<b>Mean</b>	<b>4</b>	<b>32</b>	<b>45</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>0</b>

**TL 77 NW 64 7201 7869**

**Chamberlain's Hall Farm, Eviswell**

**Block A**

Surface level c8.0 m (c26 ft)  
Water struck at 5.0 m  
September 1980

Overburden 0.2 m  
Mineral 4.0 m  
Waste 3.1 m  
Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.2	0.2
River Terrace Deposits (Second Terrace)	Sand on pebbly sand Gravel: concentrated in lower 2.0 m; fine with coarse, subrounded pale and dark flint with some rounded quartz and quartzite, traces of chalk Sand: fine coarsening slightly towards base, subrounded quartz with some subangular flint, traces of chalk	4.0	4.2
?Glacial Silt	Sandy clay, moderate yellowish brown, contains about 30% sand, up to 35% gravel in lower 0.5 m	3.1	7.3
Lower Chalk	Chalk, putty-like	1.0+	8.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Gravel				
				-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
5	79	16	0.2-1.2	3	76	17	2	2	0	0
			1.2-2.2	6	57	22	6	5	4	0
			2.2-3.0	6	25	35	9	15	10	0
			3.0-4.2	6	19	41	8	20	6	0
			<b>Mean</b>	<b>5</b>	<b>44</b>	<b>29</b>	<b>6</b>	<b>11</b>	<b>5</b>	<b>0</b>

**TL 77 NW 65 7185 7801**

**West of Eriswell**

**Block A**

Surface level c8.0 m (c26 ft)  
Water struck at c7.4 m  
September 1980

Overburden 0.5 m  
Mineral 8.7 m  
Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat, very dusky red	0.5	0.5
River Terrace Deposits (Second Terrace)	Pebble sand, more gravelly near base Gravel: fine and coarse subangular to subrounded dark coloured flint, minor amounts of rounded quartz, trace of chalk near top increasing towards base Sand: medium with fine, coarsening towards base, subrounded quartz, with subangular flint mainly in coarse range, trace of chalk near top increasing towards base; moderate yellowish brown fines	8.7	9.2
Lower Chalk	Chalk, rubbly	1.2+	10.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				-1 $\phi$	+1 $\phi$ -1/2	+1/2-1	+1-4	+4-16	+16-64	+64 mm
4	75	21	0.5-1.5*	4	45	40	3	5	3	0
			1.5-2.5*	2	28	60	3	5	2	0
			2.5-3.0*	5	19	41	7	13	12	0
			3.0-4.5*	4	40	43	4	4	5	0
			4.5-5.5*	6	20	45	5	10	14	0
			5.5-6.5*	4	20	49	8	13	6	0
			6.5-7.5*	4	17	31	12	21	15	0
			7.5-8.5*	4	12	34	13	23	14	0
			8.5-9.2*	5	7	30	12	23	13	0
			<b>Mean</b>	<b>4</b>	<b>26</b>	<b>42</b>	<b>7</b>	<b>12</b>	<b>9</b>	<b>trace</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	Others
	Black	Brown	Chalk		
0.5-4.5	40	37	16	1	6
4.5-9.2	20	61	11	7	1
<b>Mean</b>	<b>30</b>	<b>50</b>	<b>13</b>	<b>4</b>	<b>3</b>

**TL 77 NW 66 7238 7795 South of Old Bell Farm, Eriswell Block D**  
 Surface level 11.7 m (38 ft) Waste 7.4 m  
 Water struck at 4.3 m Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.8	0.8
Glacial Silt	Clay, pebbly in parts, moderate yellowish brown; contains some flint pebbles and chalk sand	2.5	3.3
	Very sandy pebbly clay Gravel: fine with coarse subangular dark flint some subrounded quartz, traces of flint Sand: fine with medium, mainly rounded quartz with chalk, subordinate subangular flint; moderate yellowish brown fines, cohesive	0.8	4.1
	Clay, becomes very sandy below 4.5 m, moderate yellowish brown, laminated with thin sand seams in upper 0.4 m, becomes sandy and pebbly (mainly flint with chalk) with depth	3.3	7.4
Upper Chalk	Chalk, firm	1.0+	8.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				-1 $\phi$	+1 $\phi$ -1/2	+1/2-1	+1-4	+4-16	+16-64	+64 mm
46	43	11	3.3-4.1	46	24	14	5	8	3	0

**TL 77 NW 67 7178 7678 Wellington Plantation, Holywell Row Block A**  
 Surface level 7.0 m (23 ft) Mineral 3.0 m  
 Water struck at 1.6 m Bedrock 2.4 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Second Terrace)	Sand, scattered pebbles Gravel: fine subrounded quartz and pale flint Sand: fine with medium, mainly subrounded quartz; moderate brown fines	3.0	3.0
Lower Chalk	Chalk, rubbly	2.4+	5.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				-1 $\phi$	+1 $\phi$ -1/2	+1/2-1	+1-4	+4-16	+16-64	+64 mm
3	96	1	0.0-1.0	5	64	29	1	1	0	0
			1.0-1.6	3	65	30	1	1	0	0
			1.6-3.0	2	67	27	1	2	1	0
			<b>Mean</b>	<b>3</b>	<b>67</b>	<b>28</b>	<b>1</b>	<b>1</b>	<b>trace</b>	<b>0</b>

**TL 77 NW 68 7272 7707 Eriswell Lode, Eriswell Block A**  
 Surface level 9.0 m (30 ft) Overburden 1.0 m  
 Water struck at 6.4 m Mineral 6.9 m  
 September 1980 Bedrock 1.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	1.0	1.0
Head	Pebbly sand, 'clayey' below 5.0 m, more gravelly at base Gravel: fine and coarse, subrounded to subangular pale and dark flint with minor amounts of rounded quartz, quartzite and sandstone, trace of chalk Sand: fine and medium, subrounded quartz and subangular pale flint, trace of chalk; pale moderate brown fines	6.9	7.9
Lower Chalk	Chalk, rubbly	1.1+	9.0



**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
7	83	10	1.0-2.0	1	51	43	3	2	0	0
			2.0-3.0	2	62	25	4	2	5	0
			3.0-4.0*	3	65	27	3	1	1	0
			4.0-5.0*	6	49	23	6	7	9	0
			5.0-6.6*	12	52	27	7	2	0	0
			6.6-7.0*	20	51	22	3	2	2	0
			7.0-7.9*	15	25	13	5	14	28	0
			<b>Mean</b>	<b>7</b>	<b>52</b>	<b>26</b>	<b>5</b>	<b>4</b>	<b>6</b>	<b>0</b>

**TL 77 NW 69 7254 7650 North-east of St. Helena Farm, Mildenhall**

**Block A**

Surface level 7.0 m (23 ft)  
Water struck at 5.6 m  
October 1980

Overburden 0.2 m  
Mineral 9.6 m  
Waste 1.2 m  
Bedrock 2.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.2	0.2
River Terrace Deposits (Second Terrace)	Sand (1.0 m) on 'clayey' sand Gravel: fine with coarse, some cobbles in lower 3.0 m, subangular pale and dark flint, subordinate chalk, trace of rounded quartz and quartzite Sand: fine and medium, mainly subrounded quartz with subangular flint, subordinate chalk; yellowish brown fines	9.6	9.8
Glacial Silt	Silty clay, medium grey, soft	1.2	11.0
Lower Chalk	Chalk, putty-like	2.5+	13.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
			0.2-9.8	No grading data available for this deposit						

**TL 77 NW 70 7229 7542 St. Helena Farm, Mildenhall**

**Block A**

Surface level 9.2 m (30 ft)  
Water struck at 0.2 m  
September 1980

Overburden 0.1 m  
Mineral 2.8 m  
Waste 7.9 m  
Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy, pebbly soil	0.1	0.1
River Terrace Deposits (Second Terrace)	Pebbly sand Gravel: fine some coarse, subangular pale flint Sand: fine and medium, mainly subrounded quartz, some coarse subangular flint; pale moderate brown fines	2.8	2.9
Glacial Silt	Silty clay, moderate grey, soft, minor amounts of chalk sand throughout, some chalk and flint pebbles in parts	7.9	10.8
Lower Chalk	Chalk, rubbly	1.0+	11.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
4	91	5	0.1-1.1	6	64	27	1	2	0	0
			1.1-2.5	2	48	44	2	3	1	0
			2.5-2.9	8	26	47	3	8	8	0
			<b>Mean</b>	<b>4</b>	<b>50</b>	<b>39</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>0</b>

**TL 77 NW 71 7302 7866 North-east of Eriswell**

**Block D**

Surface level 27.0 m (89 ft)  
Water not struck  
September 1980

Overburden 0.2 m  
Mineral 1.6 m  
Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.2	0.2
River Terrace Deposits (Fifth Terrace)	Pebbly sand Gravel: fine with coarse, angular and subangular pale flint, some subrounded quartz and quartzite, trace of chalk Sand: medium with fine, some coarse, mainly subangular and subrounded flint, trace of chalk; moderate brown fines	1.6	1.8
Middle Chalk	Chalk, putty-like	0.6+	2.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
6	71	23	0.2-1.8	6	26	34	11	15	8	0

**TL 77 NW 72 7360 7766 Foxhole Heath, Eriswell Block D**

Surface level 23.2 m (76 ft)  
 Water not struck  
 September 1980

Overburden 0.2 m  
 Mineral 10.7 m  
 Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.2	0.2
Glacial Sand and Gravel	Sandy gravel becoming increasingly 'clayey' and less gravelly towards base Gravel: fine and coarse, subangular to subrounded, flint and quartz, trace of chalk Sand: medium with fine and coarse, becoming finer towards base, subrounded quartz with subangular flint, trace of chalk	10.7	10.9
Middle Chalk	Chalk, putty-like	0.7+	11.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
11	59	30	0.2-1.5	2	6	55	9	15	13	0
			1.5-2.1	9	5	44	14	16	12	0
			2.1-3.1	6	19	63	5	5	2	0
			3.1-4.1	7	8	54	4	11	16	0
			4.1-5.1	9	6	30	5	23	27	0
			5.1-6.1	10	5	14	5	20	46	0
			6.1-7.1	11	13	23	4	29	20	0
			7.1-8.1	10	12	30	7	18	23	0
			8.1-9.0	16	39	26	3	8	8	0
			9.0-10.0	21	60	12	1	2	4	0
			10.0-10.9	26	48	13	5	3	5	0
			<b>Mean</b>	<b>11</b>	<b>20</b>	<b>34</b>	<b>5</b>	<b>14</b>	<b>16</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction					
	Flint			Quartz and quartzite		Others
	Black	Brown	Chalk			
0.2-3.1	10	13	42	10	25	
3.1-8.1	5	60	22	8	5	
8.1-10.9	17	52	26	5	0	
<b>Mean</b>	<b>11</b>	<b>42</b>	<b>30</b>	<b>8</b>	<b>9</b>	

**TL 77 NW 73 7369 7663 Codson Hill, Eriswell Block D**

Surface level 32.0 m (105 ft)  
 Water not struck  
 September 1980

Overburden 0.5 m  
 Mineral 0.9 m  
 Waste 5.8 m  
 Bedrock 0.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.5	0.5
Glacial Sand and Gravel	Pebbly sand Gravel: fine and coarse, subangular pale flint with some subrounded quartz Sand: fine with medium, subrounded quartz, traces of subangular flint; moderate yellowish brown fines	0.9	1.4
Boulder Clay	Chalky pebbly clay, greyish brown, decalcified in upper 0.4 m, comprises mainly chalk and flint clasts with chalky sandy matrix	5.8	7.2
Middle Chalk	Chalk, compact	0.4+	7.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
5	87	8	0.5-1.4	5	61	25	1	3	5	0

**TL 77 NW 74 7411 7533 High Lodge Farm, Mildenhall Block D**

Surface level 35.6 m (117 ft)  
 Water not struck  
 September 1980

Overburden 0.4 m  
 Mineral 1.6 m  
 Waste 0.7 m  
 Bedrock 0.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Clayey pebbly soil	0.4	0.4
Glacial Sand and Gravel	Pebbly sand, gravel mainly at top Gravel: fine, trace of coarse, subangular to subrounded pale flint and subrounded quartz trace of subrounded quartzite and ironstone; moderate brown fines Sand: medium with fine, some coarse at top, subrounded quartz with subangular flint, trace of ironstone; moderate brown fines	1.6	0.4
Boulder Clay	Chalky pebbly clay, pale moderate brown, stiff, abundant sand to pebble-sized chalk	0.7	2.7
Middle Chalk	Chalk, putty-like	0.5+	3.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
4	83	13	0.4-1.4	4	18	47	14	14	3	0
			1.4-2.0	4	44	46	1	5	0	0
			<b>Mean</b>	<b>4</b>	<b>27</b>	<b>47</b>	<b>9</b>	<b>11</b>	<b>2</b>	<b>0</b>

**TL 77 NW 75 7447 7950 Eriswell Low Common**

**Block D**

Surface level c15.0 m (c50 ft)  
Water not struck  
September 1980

Overburden 0.3 m  
Mineral 4.0 m  
Bedrock 0.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.3	0.3
River Terrace Deposits (Third Terrace)	Pebbly sand, 'very clayey' at base Gravel: fine and coarse, mainly subangular grey flint, trace of chalk increasing towards base Sand: fine with medium, mainly subrounded quartz, some flint, trace of chalk increasing towards base; yellowish brown fines, chalky at base	4.0	4.3
Middle Chalk	Chalk, putty-like	0.5+	4.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
11	84	5	0.3-1.3	2	77	18	1	1	1	0
			1.3-2.3	2	66	23	2	4	3	0
			2.3-3.2	2	65	25	2	3	3	0
			3.2-4.3	36	35	16	6	5	2	0
			<b>Mean</b>	<b>11</b>	<b>60</b>	<b>21</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>0</b>

**TL 77 NE 5 7800 7889**

**Napthen's Farm, Eriswell High Common**

**Block F**

Surface level 48.0 m (158 ft)  
Water not struck  
September 1980

Overburden 0.5 m  
Mineral 1.3 m  
Waste 6.8 m  
Bedrock 0.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.5	0.5
Blown Sand	'Very clayey' sand Gravel: trace of fine subangular pale flint Sand: fine with medium, subrounded quartz, some subangular pale flint; pale moderate brown fines	1.3	1.8
Boulder Clay	Chalky pebbly clay, moderate yellowish brown, decalcified at top, abundant sand to pebble-sized chalk and some flint; 'clayey' sand seam at 6.8 m to 7.3 m	6.8	8.6
Middle Chalk	Chalk, firm	0.2+	8.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
21	76	3	0.5-1.8	21	50	25	1	2	1	0

**TL 77 NE 6 7759 7699**

**Gate Lodge, A11, Eriswell**

**Block F**

Surface level c49.0 m (c161 ft)  
Water not struck  
September 1980

Overburden 0.1 m  
Mineral 1.3 m  
Waste 1.4 m  
Bedrock 0.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.1	0.1
Blown Sand	'Clayey' pebbly sand Gravel: mainly coarse subangular pale flint Sand: fine some medium, mainly subrounded quartz; moderate brown fines	1.3	1.4
Boulder Clay	Chalky pebbly clay, moderate yellowish brown, decalcified at top, abundant sand-sized chalk, some flint	1.4	2.8
Middle Chalk	Chalk, firm	0.3+	3.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
10	80	10	0.1-1.4	10	62	17	1	2	8	0

**TL 77 NE 7      7803 7746      Gate Lodge, A11, Eriswell      Block F**

Surface level c52.0 m (c171 ft)      Overburden 0.2 m  
 Water not struck      Mineral 1.4 m  
 September 1980      Bedrock 0.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.2	0.2
Blown Sand	Pebbly sand Gravel: coarse with fine, some cobbles in upper part, mainly subangular to angular grey flint Sand: fine with medium, subrounded quartz with subordinate subangular flint in coarse range; moderate brown fines	1.4	1.6
Upper Chalk	Chalk, putty-like	0.4+	2.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
8	81	11	0.2-1.1	9	61	17	1	2	4	6
			1.1-1.6	7	61	21	2	2	7	0
			<b>Mean</b>	<b>8</b>	<b>62</b>	<b>18</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>4</b>

**TL 77 NE 8      7899 7534      North of Bernersfield Farm, Eriswell      Block F**

Surface level c52.0 m (c171 ft)      Overburden 0.4 m  
 Water not struck      Mineral 1.4 m  
 September 1980      Bedrock 0.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.4	0.4
Blown Sand	'Very clayey' pebbly sand Gravel: coarse with fine, subangular to subrounded flint, subordinate rounded chalk Sand: fine with medium, subrounded pale flint and rounded chalk; moderate brown fines	1.4	1.8
Upper Chalk	Chalk, firm	0.3+	2.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
33	55	12	0.4-1.8	33	40	13	2	4	8	0

**TL 77 NE 9      7975 7982      North of Larling Heath, Elveden**

Surface level 39.0 m (128 ft)      Waste 5.6 m  
 Water not struck      Bedrock 0.4 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Clayey soil with some white flint pebbles	0.7	0.7
Boulder Clay	Chalky pebbly clay, pale yellowish brown, stiff, abundant sand to pebble-sized chalk and flint	4.9	5.6
Middle Chalk	Chalk, firm	0.4+	6.0

**TL 77 NE 10      7974 7734      Berner's Heath, north of Icklingham      Block F**

Surface level c51.0 m (c167 ft)      Overburden 0.1 m  
 Water not struck      Mineral 1.8 m  
 September 1980      Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil with some pebbles	0.1	0.1
Blown Sand	Sandy gravel Gravel: coarse with fine, subangular to angular pale flint with traces of rounded chalk and quartz Sand: fine with medium, subrounded quartz with subordinate angular to subangular pale flint, very rare chalk	1.8	1.9
Upper Chalk	Chalk, putty-like	0.9+	2.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
6	64	30	0.1-0.6	5	38	17	5	11	24	0
			0.6-1.6	4	47	15	4	11	19	0
			1.6-1.9	17	41	12	3	8	19	0
			<b>Mean</b>	<b>6</b>	<b>45</b>	<b>15</b>	<b>4</b>	<b>10</b>	<b>20</b>	<b>0</b>

TL 77 SW 27 7006 7323 Golf Course, Worlington

Surface level 10.0 m (33 ft)  
Water struck at 7.0 m  
September 1980

Block B

Overburden 0.4 m  
Mineral 2.1 m  
Waste 0.5 m  
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.4	0.4
River Terrace Deposits (Second Terrace)	'Very clayey' pebbly sand, low fines content in upper 0.6 m Gravel: fine and coarse, mainly subrounded chalk with subangular pale flint Sand: fine with medium, subrounded quartz with some subangular pale flint, traces of medium and coarse chalk; yellowish brown fines	2.1	2.5
	Very sandy clay, moderate brown, comprises 50% sand with scattered pebbles	0.5	3.0
Middle Chalk	Chalk, soft to firm	1.0+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
27	65	8	0.4-1.0	7	40	36	3	7	7	0
			1.0-1.5	34	32	25	2	5	2	0
			1.5-2.5	36	38	20	2	2	2	0
			<b>Mean</b>	<b>27</b>	<b>37</b>	<b>26</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>0</b>

TL 77 SW 28 7149 7420 River Lark, Mildenhall

Surface level 5.4 m (18 ft)  
Water struck at 2.4 m  
September 1980

Block B

Overburden 3.0 m  
Mineral 4.4 m  
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Soil	Peaty soil and leaf litter	0.9	0.9
Peat	Peat, reddish brown, abundant gastropod shells, sandy in lower 0.3 m	2.1	3.0
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine and coarse, angular and subangular pale flint at top but with chalk content increasing and becoming dominant towards base Sand: medium with fine, some coarse, mainly subangular dark and pale flint at top but chalk becoming increasingly dominant towards base; pale yellowish brown chalky fines	4.4	7.4
Lower Chalk	Chalk, rubbly	0.6+	8.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
6	67	27	3.0-4.0*	6	13	26	17	31	7	0
			4.0-5.0*	7	38	38	4	5	8	0
			5.0-6.0*	5	22	41	6	13	13	0
			6.0-7.4*	6	18	36	9	10	21	0
			<b>Mean</b>	<b>6</b>	<b>22</b>	<b>36</b>	<b>9</b>	<b>14</b>	<b>13</b>	<b>0</b>

TL 77 SW 29 7286 7457 River Lark, east of Mildenhall

Surface level 8.8 m (29 ft)  
Water struck at 6.0 m  
September 1980

Block B

Overburden 0.1 m  
Mineral 10.3 m  
Waste 8.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.1	0.1
River Terrace Deposits (Second Terrace)	a Pebbly sand, 'clayey' to 'very clayey' in lower 3.0 m Gravel: fine and coarse, mainly subangular pale flint with minor amounts of rounded quartz, traces of chalk Sand: fine with medium, mainly subrounded quartz with subangular pale flint; moderate brown fines	8.0	8.1
Glacial Sand and Gravel	b Sandy gravel Gravel: fine and coarse with scattered cobbles at base, mainly subangular pale flint, traces of rounded quartz and chalk Sand: medium with coarse, some fine, mainly subrounded quartz with traces of chalk; moderate brown fines	2.3	10.4
Boulder Clay	Silty clay, medium grey, firm, slightly sandy but no clasts larger than 2 mm	8.9+	19.2

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines	Sand	Gravel					
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
a	7	86	5	0.1-1.1	1	61	37	0	1	0	0
				1.1-2.1	2	70	27	1	0	0	0
				2.1-3.1*	6	40	42	5	5	2	0
				3.1-4.1*	2	54	33	3	4	4	0
				4.1-5.1*	2	44	47	2	2	3	0
				5.1-6.1*	11	46	32	3	4	4	0
				6.1-7.1*	13	47	29	4	3	4	0
				7.1-8.1*	23	50	25	2	0	0	0
				<b>Mean</b>	<b>7</b>	<b>52</b>	<b>34</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>0</b>
b	3	50	47	8.1-9.1*	5	11	36	17	24	7	0
				9.1-9.8*	1	5	23	15	28	28	0
				9.8-10.4*	3	4	17	10	24	41	1
				<b>Mean</b>	<b>3</b>	<b>7</b>	<b>28</b>	<b>15</b>	<b>25</b>	<b>22</b>	<b>trace</b>
a+b	6	79	15	0.1-10.4	6	41	33	5	8	7	trace

**COMPOSITION**

	Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
		Flint			Quartz and quartzite	Others
		Black	Brown	Chalk		
<b>a</b>	0.1-8.1	Insufficient material for analysis				
<b>b</b>	8.1-10.4	16	72	1	4	7

TL 77 SW 30	7224 7249	South of Barton Mills	Block D
Surface level 35.0 m (115 ft)			Overburden 0.2 m
Water not struck			Mineral 3.6 m
August 1980			Waste 1.1 m
			Mineral 3.0 m
			Bedrock 0.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.2	0.2
Glacial Sand and Gravel	<p><b>a</b> Pebbly sand, 'clayey' in parts Gravel: fine to coarse, mainly subangular pale flint Sand: medium with fine, subrounded quartz with subangular pale flint; moderate yellowish brown fines</p> <p>Clay, moderate brown, contains c 35% fine subrounded quartz sand</p> <p><b>b</b> Sand, 'clayey' at the top with clay parting between 5.8 m and 6.1 m Gravel: trace of fine subangular pale flint Sand: fine with medium subrounded quartz Fines: light brown, comprise silty laminated clay between 5.8 m and 6.1 m</p>	3.6	3.8
		1.1	4.9
		3.0	7.9
Middle Chalk	Chalk, compact	0.4+	8.3

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Gravel						
					- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
<b>a</b>	10	83	7	0.2-0.7	9	45	37	2	2	5	0
				0.7-1.2	6	27	39	4	7	17	0
				1.2-1.7	11	16	64	3	3	3	0
				1.7-2.7	6	22	66	2	3	1	0
				2.7-3.8	15	41	39	1	2	2	0
			<b>Mean</b>	<b>10</b>	<b>31</b>	<b>50</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>0</b>	
<b>b</b>	17	83	0	4.9-5.8	11	60	27	1	1	0	0
				5.8-6.1	Clay parting, assumed to comprise 100% fines						
				6.1-6.8	5	69	25	1	0	0	0
				6.8-7.9	7	67	25	0	1	0	0
					<b>Mean</b>	<b>17</b>	<b>59</b>	<b>23</b>	<b>1</b>	<b>trace</b>	<b>trace</b>
<b>a+b</b>	<b>13</b>	<b>83</b>	<b>4</b>	<b>Mean</b>	<b>13</b>	<b>44</b>	<b>38</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>0</b>

TL 77 SW 31	7303 7121	Fen Farm, west of Tuddenham	Block C
Surface level 14.0 m (46 ft)			Overburden 0.7 m
Water not struck			Mineral 0.9 m
August 1980			Waste 0.3 m
			Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil with some pebbles	0.5	0.5
River Terrace Deposits (Second Terrace)	Pebbly sandy clay, mottled yellowish orange and yellowish brown, stiff, abundant sand and pebble-sized flint and chalk	0.2	0.7
	'Clayey' sand, mainly medium subrounded quartz and chalk; moderate yellowish brown fines: scattered chalk and flint pebbles	0.9	1.6
Boulder Clay	Chalky pebbly clay, light grey, abundant sand to pebble-sized chalk and pale flint	0.3	1.9
Middle Chalk	Chalk, rubbly to putty-like	0.9+	2.8
	Grading data not available		

TL 77 SW 32	7137 7010	West of Herringswell	Block C
Surface level 20.0 m (66 ft)			Overburden 0.4 m
Water struck at 15.1 m			Mineral 4.5 m
August 1980			Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil, some pebbles	0.4	0.4
River Terrace Deposits (Second Terrace)	Pebbly sand, 'clayey' at base Gravel: fine to coarse, subangular pale and dark coloured flint with subangular to subrounded quartzite and sandstone, minor amounts of chalk Sand: fine with medium subrounded quartz with medium and traces of coarse subangular flint, traces of chalk; light brown fines	4.5	4.9
Middle Chalk	Chalk, rubbly	0.6+	5.5

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages							
	Fines	Sand	Gravel		Gravel							
					- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
<b>a</b>	6	78	16	0.4-1.4	3	60	24	2	7	4	0	
				1.4-1.9	4	57	20	3	11	5	0	
				1.9-2.9	3	58	25	3	7	4	0	
				2.9-3.9	8	30	35	7	15	5	0	
				3.9-4.9	12	32	25	7	14	10	0	
					<b>Mean</b>	<b>6</b>	<b>46</b>	<b>27</b>	<b>5</b>	<b>11</b>	<b>5</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	Others
	Black	Brown	Chalk		
0.4-4.9	13	80	3	0	4

<b>TL 77 SW 33</b>	<b>7251 7013</b>	<b>Hall Farm, Herringswell</b>	<b>Block C</b>
Surface level 16.0 m (53 ft)			Overburden 2.5 m
Water struck at 13.5 m			Mineral 1.4 m
August 1980			Waste 1.5 m
			Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Shell Marl	Shell marl, dark yellowish brown, calcareous silty matrix with abundant gastropod shells and carbonaceous remains	1.0	1.0
Peat	Peat, reddish black, slightly silty and clayey, some thin shell marl seams	0.4	1.4
Alluvium	Silty clay, pale brownish grey, some fine sand	1.1	2.5
River Terrace Deposits (Second Terrace)	Sand, pebbly at base Gravel: fine, some trace of coarse subangular pale flint Sand: fine, some medium, subrounded quartz, trace of pale flint and chalk	1.4	3.9
	Clay, pale yellowish brown, numerous flint and chalk pebbles	0.8	4.7
?Head	Very sandy pebbly clay, yellowish brown, contains about 40% sand (flint and quartz with some chalk) with up to 10% pebbles	0.7	5.4
Middle Chalk	Chalk, putty-like	0.6+	6.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Percentages						
				-½	+½ - ½	+½ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
8	86	6	2.5-3.6*	9	74	15	1	1	0	0
			3.6-3.9*	6	43	19	8	20	4	0
			<b>Mean</b>	<b>8</b>	<b>67</b>	<b>16</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>0</b>

<b>TL 77 SW 34</b>	<b>7359 7409</b>	<b>Bury Belt, Mildenhall Warren</b>	<b>Block B</b>
Surface level 10.0 m (33 ft)			Overburden 0.4 m
Water struck at 6.4 m			Mineral 11.2 m
September 1980			Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy peaty soil	0.4	0.4
River Terrace Deposits (First Terrace)	a Sand Gravel: fine with coarse subangular and subrounded pale flint, traces of rounded quartzite at top Sand: fine with medium, subrounded quartz with subangular pale flint, some rounded chalk; moderate brown fines	4.0	4.4
Glacial Sand and Gravel	b Gravel Gravel: fine to coarse, coarsening towards base, subangular with subrounded pale and dark flint, minor amounts of rounded and subrounded quartz and quartzite in fine range; traces of chalk, increasing slightly towards base Sand: medium with fine at top coarsening towards base, mainly subangular flint with subrounded quartz and traces of chalk; moderate brown fines	7.2	11.6
Middle Chalk	Chalk, rubbly	0.6+	12.2

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Percentages						
					-½	+½ - ½	+½ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
a	3	94	3	0.4-1.4	4	56	35	1	1	3	0
				1.4-2.4	2	48	46	2	2	0	0
				2.4-3.4	2	52	39	3	2	2	0
				3.4-4.4*	2	57	37	2	1	1	0
				<b>Mean</b>	<b>3</b>	<b>53</b>	<b>39</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>
b	4	43	53	4.4-5.4*	2	28	49	7	7	7	0
				5.4-6.4*	3	12	28	12	29	16	0
				6.4-7.4*	3	4	15	9	32	37	0
				7.4-8.4*	4	7	37	11	23	18	0
				8.4-8.9*	2	2	13	6	41	36	0
				8.9-9.4*	3	4	23	12	34	24	0
				9.4-10.4*	5	4	21	18	31	21	0
				10.4-10.9*	11	3	13	8	29	36	0
				10.9-11.6*	9	2	6	7	28	48	0
				<b>Mean</b>	<b>4</b>	<b>8</b>	<b>25</b>	<b>10</b>	<b>28</b>	<b>25</b>	<b>0</b>
a+b	4	61	35	0.4-11.6	4	24	30	7	18	17	0

**TL 77 SW 35 7331 7344 East of Barton Mills Block B**

Surface level 9.0 m (30 ft)  
 Water struck at 4.7 m  
 March 1980

Overburden 4.7 m  
 Mineral 5.3 m  
 Waste 6.0 m  
 Bedrock 0.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Peat	Peaty soil	1.0	1.0
Alluvium	Silty clay, grey, traces of organic material throughout, thin seam of flint pebbles between 4.3 m and 4.5 m, laminated below 4.5 m	3.7	4.7
River Terrace Deposits (First Terrace)	Gravel, 'clayey' at top Gravel: fine and coarse, mainly subangular flint with some chalk Sand: coarse some medium and fine, mainly subangular flint with rounded chalk Fines: grey, some thin silty clay seams in parts	5.3	10.0
Boulder Clay	Chalky pebbly clay, pale grey, abundant sand to pebble-sized chalk and flint; very pebbly between 13.2 m and 14.4 m	6.0	16.0
Lower Chalk	Chalk, rubbly	0.5+	16.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
7	26	67	4.7-6.0	11	2	5	22	35	25	0
			6.0-10.0	6	1	5	19	38	31	0
			<b>Mean</b>	<b>7</b>	<b>1</b>	<b>5</b>	<b>20</b>	<b>38</b>	<b>29</b>	<b>0</b>

**TL 77 SW 36 7358 7266 Nod's Hall, Tuddenham Block B**

Surface level 12.0 m (39 ft)  
 Water struck at 9.8 m  
 August 1981

Overburden 0.2 m  
 Mineral 5.2 m  
 Waste 3.0 m  
 Mineral 5.6 m  
 Waste 2.1 m  
 Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.2	0.2
River Terrace Deposits (Second Terrace)	<b>a</b> Pebbly sand, more gravelly towards base Gravel: fine with some coarse, mainly subangular pale flint with traces of chalk Sand: fine with medium, mainly subangular pale flint with subrounded quartz and traces of chalk Fines: reddish brown at top becoming moderate brown	5.2	5.4

Glacial Sand and Gravel Very sandy clay, moderate brown, firm, contains 40 to 50% fine and medium sand 3.0 8.4

**b** Clayey' to 'very clayey' pebbly sand 5.6 14.0  
 Gravel: fine to coarse, mainly subangular pale flint with some subrounded quartz and traces of chalk  
 Sand: fine with medium, subrounded quartz and subangular pale flint, traces of chalk, increasing towards base  
 Fines: moderate brown, locally as silty clay seams

Boulder Clay Chalky pebbly clay, olive grey, abundant sand to pebble-sized chalk; seam of laminated light brown sandy clay at 15.8 to 15.9 m 2.1 16.1

Lower Chalk Chalk, putty-like 0.7+ 16.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand		Gravel			
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm		
<b>a</b>	4	80	8	0.2-1.3	5	64	30	0	1	0	0
				1.3-2.2	6	48	40	3	3	0	0
				2.2-3.4*	4	35	44	8	8	1	0
				3.4-4.4*	1	50	34	5	8	2	0
				4.4-5.4*	6	28	40	10	13	3	0
				<b>Mean</b>	<b>4</b>	<b>45</b>	<b>38</b>	<b>5</b>	<b>7</b>	<b>1</b>	<b>0</b>
<b>b</b>	24	71	5	8.4-9.2*	35	49	15	1	0	0	0
				9.2-10.2*	26	39	24	5	4	2	0
				10.2-11.2*	24	41	23	5	4	3	0
				11.2-12.6*	19	48	25	5	3	0	0
				12.6-13.1*	25	48	25	2	0	0	0
				13.1-13.6*	19	47	24	4	6	0	0
				13.6-14.0*	23	38	21	3	2	13	0
				<b>Mean</b>	<b>24</b>	<b>44</b>	<b>23</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>0</b>
<b>a+b</b>	<b>14</b>	<b>79</b>	<b>7</b>	<b>Mean</b>	<b>14</b>	<b>45</b>	<b>30</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>0</b>

**TL 77 SW 37 7330 7208 North of Tuddenham Block B**

Surface level 10.5 m (34 ft)  
 Water struck at 8.9 and -0.5 m  
 August 1980

Overburden 0.4 m  
 Mineral 1.2 m  
 Waste 11.2 m  
 Bedrock 0.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.4	0.4
River Terrace Deposits (Second Terrace)	'Clayey' pebbly sand Gravel: fine with some coarse subangular flint and chalk Sand: fine to medium subangular flint and subrounded quartz traces of chalk; moderate yellowish brown fines	1.2	1.6
Glacial Silt	Silty clay, olive grey, slightly sandy, scattered pale flint and chalk pebbles mainly below 6.9 m	9.6	11.2
Middle Chalk	Chalk, rubbly with some cobble-sized flints	0.5+	11.7



**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
15	78	7	0.4-1.6	15	44	30	4	6	1	0

**TL 77 SW 38 7365 7145 Tuddenham Block C**

Surface level 15.4 m (47 ft)  
 Water struck at 3.4 m  
 March 1980

Overburden 1.0 m  
 Mineral 1.9 m  
 Waste 10.3 m  
 Bedrock 1.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Pebbly soil	0.7	0.7
	Sandy clay, yellowish brown, sand-sized chalk and flint	0.3	1.0
River Terrace Deposits (Second Terrace)	Pebbly sand Gravel: fine, angular to subangular flint Sand: fine with medium subrounded quartz and flint, traces of chalk; moderate brown fines	1.9	2.9
Boulder Clay	Sandy silty clay, moderate brown becoming medium grey at 3.5 m, pebble-sized chalk and flint; chalk becomes dominant below 12.0 m	10.3	13.2
Middle Chalk	Chalk, rubbly	1.8+	15.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
5	90	5	1.0-2.9	5	63	24	3	5	0	0

**TL 77 SW 39 7461 7415 Three Hills, Mildenhall Block B**

Surface level 9.6 m (32 ft)  
 Water not struck  
 September 1980

Mineral 3.2 m  
 Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
River Terrace Deposits (First Terrace)	Pebbly sand, traces of soil at top Gravel: fine with some medium, subangular pale flint, traces of rounded quartz and chalk Sand: fine and medium, mainly subangular pale flint; moderate brown fines	3.2	3.2
Middle Chalk	Chalk, soft	0.6+	3.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	86	6	0.0-1.0	4	48	39	3	5	1	0
			1.0-2.0	6	39	42	3	7	3	0
			2.0-3.2	13	60	21	3	3	0	0
			<b>Mean</b>	<b>8</b>	<b>49</b>	<b>34</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>0</b>

**TL 77 SW 40 7461 7359 North of Turf Fen, Tuddenham Block B**

Surface level 8.0 m (26 ft)  
 Water struck at 4.2 m  
 September 1980

Overburden 4.0 m  
 Mineral 3.9 m  
 Bedrock 1.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat, dusky red to black, fibrous, very sandy at base	4.0	4.0
River Terrace Deposits (First Terrace)	Gravel Gravel: fine and coarse subangular and subrounded (nodular) dark flint with subordinate rounded quartzite, traces of quartz and chalk Sand: medium with coarse, some fine, subrounded quartz and subangular flint, minor amounts of chalk; moderate brown fines	3.9	3.9
Middle Chalk	Chalk, soft	1.9+	9.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
5	37	60	4.0-5.0*	1	7	28	12	31	21	0
			5.0-6.0*	1	2	20	15	36	26	0
			6.0-7.0*	4	3	15	10	39	29	0
			7.0-7.9*	6	6	21	8	27	30	0
			<b>Mean</b>	<b>3</b>	<b>5</b>	<b>21</b>	<b>11</b>	<b>34</b>	<b>26</b>	<b>0</b>

**TL 77 SW 41 7430 7301 Tuddenham Heath Block B**

Surface level 11.0 m (36 ft)  
 Water struck at 10.5 m  
 August 1980

Overburden 0.4 m  
 Mineral 2.5 m  
 Waste 0.7 m  
 Mineral 6.0 m  
 Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.4	0.4
River Terrace Deposits (First Terrace)	a 'Clayey' sandy gravel Gravel: fine with coarse, subangular and angular pale flint Sand: fine and medium, subrounded quartz and flint, traces of chalk; yellowish brown, fines	2.5	2.9
Glacial Silt	Sandy clay, light olive brown mottled olive grey	0.7	3.6
Glacial Sand and Gravel	b Gravel Gravel: fine and coarse, angular and subangular pale and flint with rounded chalk (up to 50%), traces of rounded quartzite, mudstone and limestone Sand: medium and coarse, angular and subangular flint with subordinate rounded chalk and traces of quartz; moderate yellowish brown fines	6.0	9.6
Lower Chalk	Chalk, rubbly, some flint	0.6+	10.2

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Percentages						
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
<b>a</b>	15	53	32	0.4-1.4*	20	24	25	7	16	8	0
				1.4-2.9*	13	21	22	7	22	15	0
				<b>Mean</b>	<b>15</b>	<b>22</b>	<b>24</b>	<b>7</b>	<b>20</b>	<b>12</b>	<b>0</b>
<b>b</b>	5	41	54	3.6-4.6*	3	3	20	15	38	21	0
				4.6-5.6*	4	7	23	11	34	21	0
				5.6-6.6*	5	2	17	17	35	24	0
				6.6-7.6*	5	2	14	26	37	16	0
				7.6-8.6*	5	2	12	25	33	22	1
				8.6-9.6*	6	2	16	32	40	4	0
				<b>Mean</b>	<b>5</b>	<b>3</b>	<b>17</b>	<b>21</b>	<b>36</b>	<b>18</b>	<b>trace</b>
<b>a+b</b>	8	45	47	<b>Mean</b>	<b>8</b>	<b>9</b>	<b>19</b>	<b>17</b>	<b>31</b>	<b>16</b>	<b>trace</b>

**COMPOSITION**

	Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
		Flint				
		Black	Brown	Chalk	Quartz and quartzite	Others
<b>a</b>	0.4-2.9	3	88	6	0	3
<b>b</b>	3.6-6.6	13	72	7	5	3
	6.6-9.6	18	13	42	14	13

**TL 77 SW 42 7442 7214 Tuddenham Heath Block B**

Surface level 16.8 m (55 ft)  
 Water struck at 15.3 m  
 August 1980

Overburden 0.3 m  
 Mineral 4.2 m  
 Waste 12.0 m  
 Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	Pebbly sand, 'clayey' at base Gravel: fine to coarse, mainly subangular pale flint Sand: fine with medium, subrounded quartz with some subangular to angular flint, traces of chalk Fines: moderate yellowish brown, forming coherent 'clayey' matrix at base, passing into-	4.2	4.5
Glacial Silt	Silty clay, moderate yellowish brown but grey in lower 2 m; minor amounts of sand to pebble-sized flint and chalk throughout but becoming dominant at base	12.0	16.5
Middle Chalk	Chalk, rubbly	0.9+	17.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Percentages						
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
7	85	8	0.3-1.3	5	61	18	1	4	11	0
			1.3-2.6*	3	61	27	3	3	3	0
			2.6-3.6*	4	50	33	4	6	3	0
			3.6-4.5*	17	44	34	3	2	0	0
			<b>Mean</b>	<b>7</b>	<b>54</b>	<b>28</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>0</b>

**TL 77 SW 43 7432 7118 South-east of Tuddenham Block B**

Surface level 19.0 m (62 ft)  
 Water struck at 8.8 m  
 August 1980

Overburden 1.6 m  
 Mineral 2.2 m  
 Waste 5.0 m  
 Mineral 15.0 m  
 Waste 8.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Sandy soil	0.4	0.4
Head	Very sandy clay, dark orange brown; abundant medium subrounded quartz sand with some flint pebbles	1.2	1.6
	a 'Very clayey' sand Gravel: fine, subangular pale flint with some rounded chalk Sand: fine with medium, mainly subrounded quartz with subangular flint, traces of chalk Fines: thin clayey partings - often banded, some calc tufa at 3.2 m; yellowish brown to orange	2.2	3.8

**TL 77 SW 44**      **7437 7073**      **South-east of Tuddenham**      **Block B**

Surface level 25.0 m (82 ft)  
 Water not struck  
 March 1980

Overburden 0.2 m  
 Mineral 1.5 m  
 Waste 3.3 m  
 Bedrock 1.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Peaty soil	0.2	0.2
Glacial Sand and Gravel	Sandy gravel Gravel: fine with coarse, angular to subrounded pale and dark flint with some rounded quartz Sand: mainly medium, angular to rounded, quartz and flint	1.5	1.7
	Clay, yellowish brown, silty, locally sandy, laminated in parts	2.1	3.8
	Gravel Gravel: fine and coarse, angular to subrounded flint with chalk Sand: mainly fine flint and chalk	0.5	4.3
	Chalky pebbly clay, moderate yellowish brown	0.7	5.0
Middle Chalk	Chalk, rubbly	1.5+	6.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
			0.2-1.7	No grading data available for this deposit						

**TL 77 SE 19**      **7531 7334**      **North-east of Tuddenham**      **Block B**

Surface level 8.0 m (26 ft)  
 Water struck at 6.6 m  
 March 1980

Overburden 3.8 m  
 Mineral 4.7 m  
 Bedrock 1.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Made ground	Sandy soil, some rubble	1.4	1.4
Peat	Peat, brown	2.4	3.8
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine, with coarse mainly at top, angular to subangular pale flint with traces of subrounded chalk Sand: mainly medium, angular to subangular flint with traces of chalk; greyish brown fines	4.7	8.5
Middle Chalk	Chalk, putty-like at top firm below	1.5+	10.0

Clayey silt, olive grey, soft, abundant fine sand 5.0 8.8

Glacial Sand and Gravel b 'Very clayey' sand with clayey silt parting at 15.9 to 16.2 m 15.0 23.8

Gravel: very rare, fine, white flint  
 Sand: medium with fine, subangular to angular white flint with rounded chalk, some subrounded quartz  
 Fines: disseminated and as thin seams of finely bedded grey to orange clayey silt

c Sandy gravel 8.2+ 32.0

Gravel: fine with coarse, mainly subangular pale flint, traces of chalk  
 Sand: medium and coarse, some fine, mainly subangular pale flint with rounded chalk, traces of subrounded chalk; chalk becomes dominant in lower 3.2 m  
 Fines: dark yellowish brown, comprising silty clay seam at 27.4 to 27.5 m

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand	Gravel				
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
a	36	62	2	1.6-2.0	33	38	23	3	3	0	0
				2.0-3.0	36	30	27	5	2	0	0
				3.0-3.8	37	41	19	2	1	0	0
				<b>Mean</b>	<b>36</b>	<b>35</b>	<b>23</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>
b	19	81	0	8.8-9.8*	23	49	27	1	0	0	0
				9.8-10.8*	17	30	52	1	0	0	0
				10.8-11.8*	16	28	55	1	0	0	0
				11.8-12.8*	5	35	59	0	0	1	0
				12.8-13.8*	7	40	53	0	0	0	0
				13.8-15.9*	13	51	35	1	0	0	0
				15.9-16.2*	Clay parting, assumed to comprise 100% fines						
				16.2-17.8*	20	26	53	1	0	0	0
				17.8-19.8*	32	29	38	1	0	0	0
				19.8-21.8*	20	29	49	2	0	0	0
				21.8-23.8*	11	24	61	3	1	0	0
				<b>Mean</b>	<b>19</b>	<b>33</b>	<b>47</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
c	5	51	41	23.8-25.8*	11	24	61	3	1	0	0
				25.8-26.8*	7	14	43	15	14	7	0
				26.8-27.8*	9	15	27	23	23	3	0
				27.8-28.8*	5	9	23	28	29	6	0
				28.8-29.8*	3	4	7	16	41	29	0
				29.8-30.8*	3	2	9	22	44	17	3
				30.8-32.0*	4	6	23	21	29	17	0
				<b>Mean</b>	<b>5</b>	<b>9</b>	<b>25</b>	<b>20</b>	<b>29</b>	<b>12</b>	<b>trace</b>

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
3	72	25	3.8-4.5	4	9	24	5	35	23	0
			4.5-6.0	3	7	65	5	12	8	0
			6.0-7.0	3	7	65	5	12	8	0
			7.0-8.5	3	8	65	5	11	8	0
			<b>Mean</b>	<b>3</b>	<b>8</b>	<b>59</b>	<b>5</b>	<b>15</b>	<b>10</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint				
	Black	Brown	Chalk	Quartz and quartzite	Others
3.8-8.5	19	65	6	8	2

**TL 77 SE 20**

**7532 7284**

**Cavenham Heath**

**Block B**

Surface level 12.2 m (40 ft)  
Water struck at c 6 m  
March 1980

Overburden 0.6 m  
Mineral 5.2 m  
Bedrock 0.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat, brown, sandy	0.6	0.6
River Terrace Deposits (First Terrace)	Sand Gravel: fine angular pale flint Sand: fine and medium, mainly rounded quartz, traces of pale flint, chalk and ironstone; yellowish brown fines	5.2	5.8
Middle Chalk	Chalk, soft to rubbly	0.5+	6.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
2	95	3	0.6-1.7	2	41	52	2	3	0	0
			1.7-3.8	2	41	52	2	3	0	0
			3.8-5.8	2	41	52	2	3	0	0
			<b>Mean</b>	<b>2</b>	<b>41</b>	<b>52</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>

**TL 77 SE 21**

**7551 7221**

**Cavenham Heath**

**Block B**

Surface level c18.0 m (c60 ft)  
Water struck at c16.5 m  
March 1980

Overburden 0.8 m  
Mineral 3.4 m  
Waste 15.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat, dark brown, sandy	0.8	0.8
River Terrace Deposits (Second Terrace)	Sandy gravel Gravel: fine to coarse, subangular pale flint with traces of rounded quartz and chalk Sand: fine and medium, subrounded quartz and subangular pale flint, traces of chalk; moderate brown fines	3.4	4.2
Boulder Clay	Very silty clay, yellowish brown becoming bluish grey with depth, soft, traces of fine sand, slightly micaceous, traces of chalk sand below 8.0 m, laminated near base  Chalky pebbly clay, dark grey, firm, some sand to pebble-sized chalk	4.8	9.0
	Very silty clay, grey, very compact, traces only of chalk sand	10.7+	22.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
7	55	38	0.8-1.8	9	72	41	9	14	5	0
			1.8-3.0	6	30	15	3	16	30	0
			3.0-4.2	6	30	15	3	16	30	0
			<b>Mean</b>	<b>7</b>	<b>22</b>	<b>5</b>	<b>15</b>	<b>23</b>	<b>0</b>	<b>0</b>

**TL 77 SE 22**

**7506 7162**

**East of Tuddenham**

**Block B**

Surface level c18.0 m (c60 ft)  
Water struck at c15.4 m  
August 1980

Overburden 0.3 m  
Mineral 3.9 m  
Waste 7.8 m  
Bedrock 0.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	'Clayey' sandy gravel with clay seam between 0.9 m and 1.1 m Gravel: fine and coarse, mainly subangular pale flint but with chalk dominant between 1.1 m and 3.1 m, traces of rounded chalk Sand: fine and medium, becoming medium and coarse in lower 2.1 m, mainly subrounded quartz and subangular pale flint, chalk locally dominant between 1.1 m and 3.1 m	3.9	4.2

		Fines: moderate yellowish brown, comprising chalky pebbly clay between 0.9 m and 1.1 m		
Boulder Clay		Chalky pebbly clay, olive grey soft, abundant sand to pebble-sized chalk	7.8	12.0
Middle Chalk		Chalk, firm	0.3+	12.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
17	54	29	0.3-0.9	13	37	21	3	11	15	0
			0.9-1.1	Clay parting assumed to comprise 100% fines						
			1.1-2.1	17	22	29	9	17	6	0
			2.1-3.1	19	4	35	10	20	12	0
			3.1-4.2	1	4	40	15	24	16	0
			<b>Mean</b>	<b>17</b>	<b>14</b>	<b>30</b>	<b>10</b>	<b>18</b>	<b>11</b>	<b>0</b>

**TL 77 SE 23 7561 7071 North of Cavenham Block B**

Surface level 13.0 m (43 ft)	Overburden 0.5 m
Water struck at 6.1 m	Mineral 4.3 m
August 1980	Waste 1.8 m
	Bedrock 2.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.5	0.5
River Terrace Deposits (Second Terrace)	Sandy gravel, thin 'clayey' seams in parts Gravel: fine and coarse, angular to subangular dark and pale flint, traces of rounded chalk, quartz and quartzite Sand: fine and medium, subrounded quartz, with subangular pale flint mainly in coarse range, traces of chalk Fines: moderate brown, often comprising 1 to 10 cm thick 'clayey' seams	4.3	4.8
Glacial Silt	Silty clay, yellowish brown to moderate yellowish orange, small pockets of fine sand locally, scattered chalk and flint pebbles throughout	1.8	6.6
Middle Chalk	Chalk, marly to rubbly	2.1+	9.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
5	64	31	0.5-1.5	6	48	24	4	12	8	0
			1.5-2.5	7	39	25	7	15	7	0
			2.5-3.5	3	27	28	5	19	18	0
			3.5-4.8	4	23	23	6	25	19	0
			<b>Mean</b>	<b>5</b>	<b>34</b>	<b>25</b>	<b>5</b>	<b>18</b>	<b>13</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	Others
	Black	Brown	Chalk		
0.5-4.8	39	49	7	4	1

**TL 77 SE 24 7636 7316 Camp Close, north-west of Icklingham Block B**

Surface level 13.0 m (43 ft)	Overburden 0.3 m
Water struck at 8.2 m	Mineral 11.3 m
September 1980	Bedrock 0.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.3	0.3
River Terrace Deposits (Second Terrace)	a Pebbly sand Gravel: fine with coarse, subangular patinated flint Sand: fine and medium, subrounded quartz with subangular flint; moderate yellowish brown fines	7.9	8.2
	b Gravel Gravel: fine and coarse, subangular patinated flint some subrounded nodular flint, subordinate subrounded quartzite and chalk Sand: medium with fine and coarse, mainly subrounded quartz with subordinate subangular patinated flint and rounded chalk; greyish orange fines	5.4	11.6
Middle Chalk	Chalk, rubbly	0.4+	12.0

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand		Gravel		
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
a	2	93	5	0.3-0.6	4	37	34	3	12	10	0
				0.6-1.6	1	53	43	2	1	0	0
				1.6-2.6	1	49	49	1	0	0	0
				2.6-3.6	1	54	43	1	1	0	0
				3.6-4.2	2	47	49	1	1	0	0
				4.2-5.2	2	29	46	4	7	12	0
				5.2-6.2	2	54	42	1	1	0	0
				6.2-7.2	2	47	41	3	3	4	0
				7.2-8.2	2	36	52	4	4	2	0
				<b>Mean</b>	<b>2</b>	<b>46</b>	<b>45</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>0</b>
b	3	41	56	8.2-9.2	6	14	37	11	18	14	0
				9.2-10.2	3	6	29	8	25	29	0
				10.2-11.2	1	3	7	7	39	43	0
				11.2-11.6	3	10	23	8	16	40	0
				<b>Mean</b>	<b>3</b>	<b>8</b>	<b>24</b>	<b>9</b>	<b>26</b>	<b>30</b>	<b>0</b>
a+b	2	77	21	<b>Mean</b>	<b>2</b>	<b>35</b>	<b>38</b>	<b>4</b>	<b>10</b>	<b>11</b>	<b>0</b>

**TL 77 SE 25 7671 7302 River Lark, Icklingham Block B**

Surface level 10.0 m (33 ft)  
 Water struck at 8.2 m  
 September 1980

Overburden 0.2 m  
 Mineral 6.6 m  
 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.2	0.2
River Terrace Deposits (First Terrace)	Pebbly sand becoming sandy gravel in lower 2 m Gravel: fine to coarse, subangular patinated flint, traces of rounded quartz and chalk in lower part Sand: fine with medium, subrounded quartz with subangular flint, traces of chalk Fines: moderate brown, becoming chalky towards base	6.6	6.8
Middle Chalk	Chalk, rubbly, some flint sand and pebbles	1.0+	7.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
5	78	17	0.2-1.2	9	58	29	2	2	0	0
			1.2-1.8	9	50	30	3	4	4	0
			1.8-2.8	3	44	32	4	7	0	0
			2.8-3.8	2	63	35	0	0	0	0
			3.8-4.8	2	35	54	2	3	4	0
			4.8-5.5	5	37	23	4	14	17	0
			5.5-6.5	7	18	23	10	15	27	0
			6.5-6.8	5	14	26	13	21	21	0
			<b>Mean</b>	<b>5</b>	<b>41</b>	<b>33</b>	<b>4</b>	<b>7</b>	<b>10</b>	<b>0</b>

**TL 77 SE 26 7670 7248 North of Cavenham Heath Block B**

Surface level 14.0 m (46 ft)  
 Water not struck  
 September 1980

Overburden 0.4 m  
 Mineral 3.2 m  
 Waste 1.7 m  
 Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy peaty soil	0.4	0.4
River Terrace Deposits (First Terrace)	Pebbly sand, 'clayey' in lower 0.8 m Gravel: fine to coarse, mainly subangular pale flint Sand: fine with medium, subrounded quartz with some subangular flint and traces of chalk; moderate brown fines	3.2	3.6
Boulder Clay	Chalky pebbly clay, yellowish brown, stiff, abundant sand to pebble-sized chalk in upper 0.9 m only	1.7	5.3
Middle Chalk	Chalk, rubbly	0.7+	6.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
10	82	8	0.4-1.8	5	56	26	2	5	6	0
			1.8-2.8	9	61	21	3	3	3	0
			2.8-3.6	22	44	28	2	3	1	0
			<b>Mean</b>	<b>11</b>	<b>55</b>	<b>25</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>0</b>

**TL 77 SE 27 7658 7208 Cavenham Heath Block B**

Surface level c18.0 m (c60 ft)  
 Water struck at c15.0 m  
 September 1980

Overburden 0.3 m  
 Mineral 8.1 m  
 Waste 11.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	Sandy gravel with 2.0 m of sand at top Gravel: fine and coarse, some cobbles at base subangular to angular dark flint with traces of rounded quartz and chalk Sand: fine at top coarsening towards base, mainly subrounded quartz with angular to subangular pale flint, traces of chalk below 4.0 m; moderate brown fines	8.1	8.4
Glacial Silt	Silty clay, olive grey, soft to firm, traces of chalk sand, becomes very silty below 13.0 m	11.6+	20.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
5	71	24	0.3-1.3	1	79	19	0	1	0	0
			1.3-2.0	1	69	23	2	3	2	0
			2.0-3.0	6	37	23	5	16	13	0
			3.0-4.0	10	51	30	2	4	3	0
			4.0-5.1	5	30	37	9	13	6	0
			5.1-6.1	2	13	24	8	27	26	0
			6.1-7.1	2	28	42	6	12	10	0
			7.1-8.0	5	4	31	19	23	18	0
			8.0-8.4	10	6	20	9	19	32	4
			<b>Mean</b>	<b>5</b>	<b>36</b>	<b>28</b>	<b>7</b>	<b>13</b>	<b>11</b>	<b>trace</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	
	Black	Brown	Chalk	Others	
0.3-6.1	20	68	7	5	0
6.1-8.4	3	87	8	1	1
<b>Mean</b>	<b>12</b>	<b>78</b>	<b>7</b>	<b>3</b>	<b>trace</b>

TL 77 SE 28 7620 7133 South of Cavenham Heath

Block B

Surface level c21.0 m (c70 ft)  
Water struck at c18.7 m  
August 1980

Overburden 0.3 m  
Mineral 6.9 m  
Waste 11.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	Pebbly sand Gravel: fine and coarse, angular and subangular pale flint with traces of subrounded chalk Sand: fine and medium, subrounded quartz and subangular flint, some subrounded chalk in coarse range; moderate brown fines	6.9	7.2
Glacial Silt	Silty clay, light olive grey, soft to firm, very rare flint pebbles	2.7	9.9
	Sandy clay, moderate olive grey, soft to firm, silty with abundant fine sand, traces of sand to pebble-sized chalk and flint	8.9+	18.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				-½	+½-½	+½-1	+1-4	+4-16	+16-64	+64 mm
3	13	24	0.3-1.3	6	33	32	4	11	14	0
			1.3-2.3	2	60	34	1	2	1	0
			2.3-3.3	2	42	36	5	6	9	0
			3.3-4.3	2	36	35	7	7	13	0
			4.3-5.3	2	31	34	8	8	17	0
			5.3-6.3	2	27	32	7	16	16	0
			6.3-7.2	2	16	23	6	19	34	0
			Mean	3	36	32	5	10	14	0

COMPOSITION

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	Others
	Black	Brown	Chalk		
0.3-7.2	21	60	9	5	5

TL 77 SE 29 7618 7051

North of Cavenham

Block B

Surface level 20.0 m (66 ft)  
Water struck at 16.8 m  
August 1980

Overburden 2.5 m  
Mineral 2.0 m  
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Peaty soil	0.4	0.4
Shell Marl	Clay, yellowish brown, soft, sandy, traces of comminuted shells	0.5	0.9
Peat	Peat, dusky brown, soft, slightly silty	1.6	2.5
River Terrace Deposits (First Terrace)	Gravel, 'very clayey' in upper 0.5 m Gravel: fine and coarse, angular to subangular unpatinated flint, traces of subrounded chalk, quartz and quartzite Sand: fine and medium, coarsening towards base mainly subrounded quartz with subangular patinated flint, traces of chalk; moderate brown fines become very chalky at base	2.0	4.5
Middle Chalk	Chalk, rubbly	0.3+	4.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				-½	+½-½	+½-1	+1-4	+4-16	+16-64	+64 mm
11	39	50	2.5-3.0	25	26	19	3	13	14	0
			3.0-4.0	5	5	15	7	32	36	0
			4.0-4.5	7	10	39	10	17	17	0
			Mean	11	11	22	6	24	26	0

TL 77 SE 30 7746 7229

River Lark, Icklingham

Block B

Surface level 11.7 m (38 ft)  
Water struck at 9.6 m  
September 1980

Overburden 2.1 m  
Mineral 3.6 m  
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat, dusky brown, soft, slightly clayey and sandy Sand: fine and medium, rounded quartz, traces of chalk	1.8 0.2	1.8 2.0
	Silty clay, pale grey, soft	0.1	2.1
River Terrace Deposits (First Terrace)	Gravel Gravel: fine and coarse, mainly subangular flint, some fine subrounded quartz and chalk Sand: medium with coarse mainly subangular flint with subrounded quartz and traces of chalk	3.6	5.7
Middle Chalk	Chalk, rubbly	0.4+	6.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				-½	+½ - 1	+1 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
3	46	51	2.1-3.1	1	3	10	9	37	40	0
			3.1-4.1	3	6	42	16	26	7	0
			4.1-5.1	2	7	43	16	21	11	0
			5.1-5.7	5	4	11	9	39	32	0
			<b>Mean</b>	<b>3</b>	<b>5</b>	<b>28</b>	<b>13</b>	<b>30</b>	<b>21</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint		Quartz and quartzite		Others
	Black	Brown	Chalk		
2.1-5.7	9	87	2	2	1

**TL 77 SE 31      7757 7148      Mill Heath, Lackford**

Surface level 20.0 m (66 ft)  
Water struck at 14.8 m  
August 1980

**Block G**

Overburden 0.5 m  
Mineral 9.9 m  
Waste 9.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.5	0.5
River Terrace Deposits (First Terrace)	<p><b>a</b> Sand, 'clayey' at base Gravel: fine with coarse, angular to subangular flaky patinated flint Sand: fine and medium, mainly subrounded quartz some subangular patinated flint and traces of rounded ironstone, traces of chalk in lower part; moderate yellowish brown fines</p> <p><b>b</b> Sandy gravel Gravel: fine and coarse, mainly angular to subangular patinated flint, traces of fine subrounded quartz and quartzite, rare chalk Sand: fine and medium, coarsening towards base, subrounded quartz with angular to subangular patinated flint, traces of rounded chalk; moderate yellowish brown fines</p>	6.0	6.5
Glacial Silt	Silty clay, olive grey, firm, minor amounts of fine and medium flint and chalk sand	9.6+	20.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand			Gravel		
				-½	+½ - 1	+1 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
<b>a</b>	5	92	3	0.5-1.5	2	48	40	3	4	3	0
				1.5-2.5	1	57	36	2	3	1	0
				2.5-3.5	2	71	24	1	1	1	0
				3.5-4.5	3	64	30	1	2	0	0
				4.5-5.5*	5	52	37	2	2	2	0
				5.5-6.5*	17	45	36	1	1	0	0
				<b>Mean</b>	<b>5</b>	<b>56</b>	<b>34</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>b</b>	3	55	42	6.5-7.5*	4	32	26	6	21	11	0
				7.5-8.5*	6	42	29	5	13	5	0
				8.5-9.5*	2	7	27	14	30	20	0
				9.5-10.4*	1	4	14	10	37	34	0
				<b>Mean</b>	<b>3</b>	<b>22</b>	<b>24</b>	<b>9</b>	<b>25</b>	<b>17</b>	<b>0</b>
<b>a+b</b>	<b>4</b>	<b>78</b>	<b>18</b>	<b>0.5-10.4</b>	<b>4</b>	<b>44</b>	<b>30</b>	<b>4</b>	<b>11</b>	<b>7</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction					
	Flint		Quartz and quartzite		Others	
	Black	Brown	Chalk			
<b>a</b>	0.2-3.7	10	89	trace	trace	0

**TL 77 SE 32      7696 7114      South-west of Mill Heath, Lackford**

Surface level 16.0 m (52 ft)  
Water struck at 14.2 m  
October 1980

**Block E**

Overburden 0.1 m  
Mineral 1.3 m  
Waste 7.1 m  
Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Cover Sand	'Very clayey' pebbly sand Gravel: fine and coarse subangular patinated flint with subrounded chalk Sand: fine with medium, mainly subrounded quartz with some subangular patinated flint, traces of chalk; moderate yellowish brown fines	1.3	1.4
Boulder Clay	Chalky pebbly clay, grey, weathered greyish orange to yellowish brown in upper 2.0 m, soft to firm, abundant sand to pebble-sized chalk (up to 60%), some flint sand and pebbles	7.1	8.5
Middle Chalk	Chalk, rubbly	0.7+	9.2



**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
20	71	9	0.1-01.4	20	46	24	1	5	4	0

**TL 77 SE 33 7719 7024 Near Bunker's Barn, Lackford**

**Block E**

Surface level 37.0 m (121 ft)  
Water struck at 31.2 m  
August 1980

Waste 5.8 m  
Bedrock 0.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Sandy soil	0.5	0.5
Boulder Clay	Sandy clay, moderate brown, firm, sand mainly medium subrounded quartz and subangular flint, scattered flint and chalk pebbles	1.2	1.7
	Chalky pebbly clay, moderate brown, firm, abundant sand to pebble-sized chalk, traces of flint	4.1	5.8
Middle Chalk	Chalk, soft, yellowish white	0.2+	6.0

**TL 77 SE 34 7854 7453 South of Bernersfield Farm, Icklingham**

**Block F**

Surface level c52.0 m (c170 ft)  
Water not struck  
August 1980

Overburden 0.2 m  
Mineral 2.5 m  
Bedrock 0.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Sandy soil	0.2	0.2
Cover Sand	'Clayey' pebbly sand Gravel: fine to coarse, subangular patinated flint Sand: medium and fine, mainly subrounded quartz with subangular flint and traces of chalk	2.5	2.7
Upper Chalk	Chalk, firm	0.4+	3.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
15	68	17	0.2-2.7	15	25	41	2	7	10	0

**TL 77 SE 35 7869 7184**

**Netherhill Farm, Icklingham**

**Block G**

Surface level 25.1 m (82 ft)  
Water not struck  
September 1980

Overburden 1.8 m  
Mineral 7.1 m  
Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil, scattered pebbles	0.6	0.6
? Boulder Clay	Pebbly clay, moderate brown, stiff, sandy especially near top, abundant angular patinated flint pebbles, decalcified	1.2	1.8
Glacial Sand and Gravel	'Clayey' pebbly sand, gravel concentrated at top and in lower 2.6 m; 0.4 m thick waste parting near top Gravel: fine with medium, scattered cobbles at base, predominantly subangular patinated flint, traces of fine chalk near base Sand: mainly fine with medium, subrounded quartz with angular to subangular patinated flint, traces of chalk; light brown fines	7.1	8.9
Middle Chalk	Chalk, rubbly	0.6+	9.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
13	70	17	1.8-2.9	7	12	30	8	21	22	0
			2.9-3.3	Clay parting assumed to comprise 100% fines						
			3.3-4.3	12	75	11	1	1	0	0
			4.3-5.3	8	81	10	0	1	0	0
			5.3-6.3	12	59	24	1	4	0	0
			6.3-7.3	7	11	59	9	12	2	0
			7.3-8.9	4	7	47	11	17	11	3
			<b>Mean</b>	<b>13</b>	<b>35</b>	<b>30</b>	<b>5</b>	<b>10</b>	<b>6</b>	<b>1</b>

**TL 77 SE 36 7437 7073**

**Home Heath, Lackford**

**Block G**

Surface level 16.9 m (55 ft)  
Water struck at 13.1 m  
August 1980

Mineral 4.8 m  
Waste 13.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Second Terrace)	Sand, some gravel mainly at base Gravel: fine with some coarse at base, mainly subangular patinated flint Sand: fine with medium, subrounded quartz with subangular flint; moderate yellowish brown fines	4.8	4.8
Glacial Silt	Very silty clay, olive grey, firm, slightly sandy, some chalk and flint pebbles below c 8 m	13.2+	18.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{3}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
6	91	3	0.0-1.0	6	65	24	1	3	1	0
			1.0-2.0	1	74	23	1	1	0	0
			2.0-3.0	2	75	20	2	1	0	0
			3.0-4.0*	14	63	21	1	1	0	0
			4.0-4.8*	7	42	34	4	6	7	0
			<b>Mean</b>	<b>6</b>	<b>65</b>	<b>24</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>

**TL 77 SE 37**

**7887 7113**

**Lackford Bridge**

**Block G**

Surface level 13.5 m (44 ft)  
Water struck at 12.7 m  
September 1980

Overburden 0.8 m  
Mineral 5.1 m  
Waste 22.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.8	0.8
River Terrace Deposits (First Terrace)	Gravel, 'clayey' at base Gravel: fine and coarse, subangular with some subrounded patinated and unpatinated flint, traces of subrounded quartz and quartzite Sand: mainly medium and coarse, angular to subangular flint with subrounded quartz and chalk; moderate brown fines	5.1	5.9
Glacial Silt	Very silty clay, dark olive grey, firm, locally finely laminated, some sandy partings, scattered fine flint pebbles and chalk grains. Very sandy between 9.5 m and 10.6 m, pebbly below 23.7 m	22.1+	28.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{3}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
6	36	58	0.8-1.8*	2	11	21	13	33	20	0
			1.8-2.8*	1	3	16	10	36	34	0
			2.8-3.8*	2	2	19	14	35	28	0
			3.8-4.8*	6	1	24	11	31	27	0
			4.8-5.9*	18	3	21	12	30	16	0
			<b>Mean</b>	<b>6</b>	<b>4</b>	<b>20</b>	<b>12</b>	<b>33</b>	<b>25</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction					
	Flint			Quartz and quartzite	Others	
	Black	Brown	Chalk			
0.8-5.9	15	67	3	11	4	

**TL 77 SE 38**

**7803 7042**

**Clamp Heath, west of Lackford**

**Block E**

Surface level 23.0 m (75 ft)  
Water struck at 20.5 m  
August 1980

Mineral 0.8 m  
Waste 8.2 m  
Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Cover Sand	'Very clayey' pebbly sand Gravel: fine and coarse, subangular patinated flint Sand: fine with medium, mainly subrounded quartz; moderate brown fines	0.8	0.8
Boulder Clay	Pebbly clay, light brown, firm, sandy, scattered flint and chalk pebbles, passing into:  Chalky pebbly clay, grey, firm, abundant sand to pebble-sized chalk and flint, some ironstone and mudstone	2.7 5.5	3.5 9.0
Middle Chalk	Chalk, marly and rubbly	0.9+	9.9

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{3}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
27	60	13	0.0-0.8	27	42	16	2	6	7	0

**TL 77 SE 39**

**7868 7060**

**North of the Manor House, Lackford**

**Block G**

Surface level 18.8 m (62 ft)  
Water struck at 16.8 m  
August 1980

Overburden 0.8 m  
Mineral 2.7 m  
Waste 8.2 m  
Bedrock 1.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.8	0.8
River Terrace Deposits (Second Terrace)	Pebbly sand, 'clayey' at base Gravel: fine and coarse, subangular patinated flint Sand: fine with medium, subrounded quartz with subangular patinated flint; moderate yellowish brown fines	2.7	3.5
Glacial Silt	Silty, clay, light olive grey, firm to stiff, traces of sand to pebble-sized flint and chalk	8.2	11.7
Middle Chalk	Chalk, putty-like	1.6+	13.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	87	5	0.8-1.8	7	68	18	2	3	2	0
			1.8-2.8	4	75	19	1	1	0	0
			2.8-3.5	14	60	12	3	6	5	0
			<b>Mean</b>	<b>8</b>	<b>68</b>	<b>17</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>0</b>

**TL 77 SE 40 7926 7159 East of Rampart Field, Icklingham**

Surface level 16.5 m (54 ft)  
Water struck at 14.2 m  
November 1980

**Block G**

Overburden 0.4 m  
Mineral 4.5 m  
Waste 0.8 m  
Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.4	0.4
River Terrace Deposits (Second Terrace)	Pebbly sand, interbedded sands and sandy gravels Gravel: fine and coarse, mainly subangular patinated flint Sand: fine with medium, subrounded quartz with subangular patinated flint; moderate orange-brown fines	4.5	4.9
Boulder Clay	Pebbly clay, moderate brown, mainly flint with some chalk pebbles	0.8	5.7
Middle Chalk	Chalk, firm	1.2+	6.9

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	75	22	0.4-1.4	1	59	37	1	1	1	0
			1.4-2.3	2	36	30	4	14	14	0
			2.3-3.3*	3	70	23	1	1	2	0
			3.3-4.9*	5	26	22	5	18	23	1
			<b>Mean</b>	<b>3</b>	<b>45</b>	<b>27</b>	<b>3</b>	<b>10</b>	<b>12</b>	<b>trace</b>

**TL 77 SE 41 7958 7054 East of Lackford**

Surface level 20.0 m (66 ft)  
Water struck at -1.1 m  
November 1980

**Block G**

Overburden 0.2 m  
Mineral 1.7 m  
Waste 9.5 m  
Bedrock 1.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.2	0.2
River Terrace Deposits (First Terrace)	Sandy gravel, 'clayey' in upper 0.4 m Gravel: fine to coarse, subangular patinated flint Sand: fine and medium, some coarse, subrounded quartz with subangular flint; moderate brown fines	1.7	1.9
Glacial Silt	Very silty clay, medium grey, soft, some sand to pebble-sized chalk below 10.6 m	9.5	11.4
Middle Chalk	Chalk, firm	1.6+	13.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
6	51	43	0.2-0.6	16	40	21	4	11	8	0
			0.6-1.9	3	19	18	10	26	24	0
			<b>Mean</b>	<b>6</b>	<b>24</b>	<b>19</b>	<b>8</b>	<b>22</b>	<b>21</b>	<b>0</b>

**TL 77 SE 42 7571 7170 Cavenham Heath**

Surface level c21.0 m (c70 ft)  
Water struck at c19.0 m  
November 1980

**Block B**

Overburden 0.6 m  
Mineral 7.4 m  
Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.6	0.6
River Terrace Deposits (Second Terrace)	Pebbly sand, 'very clayey' in lower 3.7 m Gravel: fine with coarse, mainly subangular patinated flint, traces of fine subrounded quartz and chalk Sand: fine with medium, subrounded quartz with subangular patinated flint in coarser grades, traces of chalk; moderate yellowish brown fines	7.4	8.0
Middle Chalk	Chalk, soft to firm	2.0+	10.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
19	73	8	0.6-1.6	4	49	40	3	4	0	0
			1.6-2.6	2	61	26	1	2	8	0
			2.6-3.6	1	59	29	2	6	3	0
			3.6-4.3	2	43	26	5	14	10	0
			4.3-6.5	37	41	15	1	3	3	0
			6.5-8.0	37	41	15	1	3	3	0
			<b>Mean</b>	<b>19</b>	<b>48</b>	<b>23</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>0</b>

**TL 77 SE 43**

**7670 7168**

**Black Ditches, Cavenham**

**Block B**

Surface level c21.0 m (c70 ft)  
Water struck at c19.6 m  
November 1980

Overburden 0.5 m  
Mineral 10.4 m  
Waste 26.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil, traces of peat	0.5	0.5
River Terrace Deposits (Second Terrace)	'Clayey' sandy gravel with pebbly sand seams locally Gravel: fine to coarse, some cobbles near base, mainly subangular patinated flint with traces of subrounded quartzite and chalk Sand: fine and medium, subangular patinated flint and subrounded quartz, some chalk (up to c10%) Fines: moderate yellowish brown at top, olive grey below, silty	10.4	10.9
Glacial Silt	Silty clay, pale olive grey, weathered at top, firm to stiff, slightly sandy, poorly laminated in parts	14.1	25.0
	Sandy pebbly clay, pale olive grey, firm, abundant sand to pebble-sized flint and chalk, some mudstone. Chalk content decreases below 32 m	12.6+	37.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
11	63	26	0.5-1.5	2	69	22	1	4	2	0
			1.5-2.4	6	62	25	1	2	4	0
			2.4-3.4	2	51	37	2	6	2	0
			3.4-4.4	12	47	25	3	8	5	0
			4.4-5.4	26	14	7	2	16	35	0
			5.4-6.4	12	30	24	3	7	24	0
			6.4-7.4	7	37	49	4	3	0	0
			7.4-8.4	8	34	50	5	3	0	0
			8.4-9.4	7	9	11	2	16	51	4
			9.4-10.4	34	10	12	4	19	21	0
			10.4-10.9	3	7	19	8	34	25	4
			<b>Mean</b>	<b>11</b>	<b>34</b>	<b>26</b>	<b>3</b>	<b>10</b>	<b>15</b>	<b>1</b>

**TL 87 SW 18**

**8026 7169**

**Wideham Barn, West Stow**

**Block G**

Surface level c20.0 m (c65 ft)  
Water not struck  
October 1980

Overburden 0.3 m  
Mineral 0.7 m  
Waste 1.7 m  
Bedrock 1.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	Pebbly sand Gravel: fine and coarse, mainly subrounded quartz with some subangular patinated flint Sand: fine and medium, mainly subrounded quartz traces of subangular flint and subrounded chalk; moderate orange brown fines	0.7	1.0
Boulder Clay	Sandy clay, moderate orange brown firm, scattered quartz and flint pebbles, traces of chalk	1.7	2.7
Upper Chalk	Chalk, firm	1.7+	4.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
4	86	10	0.3-1.0	4	47	34	5	7	3	0
			0.3-1.0	4	47	34	5	7	3	0
			<b>Mean</b>	<b>4</b>	<b>47</b>	<b>34</b>	<b>5</b>	<b>7</b>	<b>3</b>	<b>0</b>

**TL 87 SW 19**

**8015 7060**

**Hall Farm, Lackford**

**Block G**

Surface level 19.9 m (65 ft)  
Water struck at 18.8 m  
November 1980

Overburden 1.1 m  
Mineral 1.7 m  
Waste 0.6 m  
Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	1.1	1.1
River Terrace Deposits (First Terrace)	Pebbly sand Gravel: fine and coarse, mainly subangular patinated flint, traces of subrounded quartz and quartzite. Rare chalk, increasing to c10% near base Sand: fine with medium, subrounded quartz with subangular patinated flint, traces of chalk; moderate yellowish brown fines	1.7	2.8
Glacial Silt	Silty sandy clay, orange-brown, firm to stiff, finely laminated	0.6	3.4
Upper Chalk	Chalk, putty-like to rubbly	1.2+	4.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
8	78	14	1.1-2.2*	8	46	26	4	8	8	0
			2.2-2.8*	10	32	42	7	5	4	0
			<b>Mean</b>	<b>8</b>	<b>42</b>	<b>31</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>0</b>

**TL 87 SW 20 8110 7102 West Stow Heath**

**Block G**

Surface level 21.8 m (72 ft)  
Water struck 17.8 m  
October 1980

Overburden 0.3 m  
Mineral 6.4 m  
Waste 10.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	Pebbly sand, 'clayey' at top and bottom Gravel: fine and coarse, mainly subangular patinated and unpatinated flint Sand: fine and medium, subrounded quartz with subangular patinated flint in coarser ranges; moderate brown fines	6.4	6.7
Glacial Silt	Silty clay, moderate grey, weathered brown in upper 1.4 m, stiff, poorly laminated	8.8	15.5
? Boulder Clay	Clay, moderate grey, stiff, some sand to pebble-sized chalk and flint	1.5+	17.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
5	83	12	0.3-1.3	12	53	33	1	1	0	0
			1.3-2.3	2	39	33	5	10	11	0
			2.3-3.3	2	69	24	1	1	3	0
			3.3-4.0	2	51	24	2	7	14	0
			4.0-5.0	3	49	27	4	10	7	0
			5.0-6.0	2	56	25	3	6	8	0
			6.0-6.7	12	44	35	4	4	1	0
			<b>Mean</b>	<b>5</b>	<b>52</b>	<b>28</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>0</b>

**TL 87 SW 21 8108 7057 West Stow**

**Block G**

Surface level 16.4 m (54 ft)  
Water struck at 15.2 m  
November 1980

Overburden 1.2 m  
Mineral 4.5 m  
Waste 18.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Peaty soil	0.7	0.7
Peat	Peat, black, silty seams in parts	0.5	1.2
River Terrace Deposits (First Terrace)	Gravel Gravel: fine and coarse, subangular patinated and unpatinated flint Sand: medium with some coarse and fine, mainly subrounded quartz with subangular patinated flint; light brown fines	4.5	5.7
Glacial Silt	Very silty clay, moderate olive grey, firm to stiff, traces of chalk sand in parts, poorly laminated	18.3+	24.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
1	37	62	1.2-2.2*	3	4	31	10	28	22	2
			2.2-3.2*	1	5	20	9	38	27	0
			3.2-4.2*	1	5	20	9	37	28	0
			4.2-5.2*	0	6	20	9	35	30	0
			5.2-5.7*	1	6	15	12	32	34	0
			<b>Mean</b>	<b>1</b>	<b>5</b>	<b>22</b>	<b>10</b>	<b>34</b>	<b>28</b>	<b>trace</b>

**TL 87 SW 22 8182 7122 North of West Stow**

**Block G**

Surface level 20.0 m (66 ft)  
Water struck at 18.0 m  
October 1980

Overburden 0.3 m  
Mineral 8.3 m  
Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil, slightly clayey	0.3	0.3
Cover sand	a 'Very clayey' pebbly sand Gravel: fine and coarse, mainly subangular patinated flint, some rounded quartz and quartzite Sand: fine with medium, subrounded quartz with some quartzite; orange brown fines	1.4	1.7
River Terrace Deposits (First Terrace)	b 'Very clayey' sand with silty clay parting between 2.9 m and 3.4 m Gravel: scattered flint pebbles at top Sand: fine, some medium locally, mainly subrounded quartz Fines: moderate brown silty comprising laminated silty clay between 2.9 m and 3.4 m	4.6	6.3

Glacial Sand and Gravel      e Sandy gravel      2.3      8.6  
 Gravel: fine and coarse some cobbles in parts, subangular patinated and unpatinated flint and subrounded quartz and quartzite, traces of chalk  
 Sand: medium with fine and coarse, mainly subrounded quartz with some subangular patinated flint; moderate yellowish brown fines

Middle Chalk      Chalk, rubbly, indurated      0.9+      9.7

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Gravel						
					-½	+½-1	+1-1	+1-4	+4-16	+16-64	+64 mm
<b>a</b>	22	68	10	0.3-0.7	18	45	23	3	6	5	0
				0.7-1.7	24	46	18	3	3	6	0
				<b>Mean</b>	<b>22</b>	<b>46</b>	<b>19</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>0</b>
<b>b</b>	29	71	0	1.7-2.9	24	73	2	0	0	1	0
				2.9-3.4	Clay parting, assumed to comprise 100% fines						
				3.4-4.4	28	70	1	1	0	0	0
				4.4-5.4	12	43	45	0	0	0	0
				5.4-6.3	17	81	1	1	0	0	0
				<b>Mean</b>	<b>29</b>	<b>60</b>	<b>11</b>	<b>trace</b>	<b>trace</b>	<b>trace</b>	<b>0</b>
<b>c</b>	5	52	43	6.3-7.2	7	11	25	11	25	21	0
				7.2-8.0	5	5	33	7	22	24	4
				8.0-8.6	2	4	57	6	14	17	0
				<b>Mean</b>	<b>5</b>	<b>7</b>	<b>37</b>	<b>8</b>	<b>21</b>	<b>21</b>	<b>1</b>
<b>a+b+c</b>	<b>21</b>	<b>65</b>	<b>14</b>	<b>0.3-8.6</b>	<b>21</b>	<b>43</b>	<b>19</b>	<b>3</b>	<b>7</b>	<b>7</b>	<b>trace</b>

**TL 87 SW 23      8242 7370      Home Heath, Wordwell      Block H**  
 Surface level c26.0 m (c85 ft)      Overburden 0.3 m  
 Water not struck      Mineral 4.7 m  
 October 1980      Bedrock 1.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Pebbly sandy soil	0.3	0.3
Head	Sandy gravel, 'clayey' in lower 2.3 m Gravel: fine and coarse, subangular patinated flint Sand: fine and medium, mainly subrounded quartz; moderate brown fines	4.7	5.0
Upper Chalk	Chalk, soft	1.5+	6.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Gravel						
				-½	+½-1	+1-1	+1-4	+4-16	+16-64	+64 mm
9	61	30	0.3-0.9	5	31	20	5	20	19	0
			0.9-1.7	2	48	17	3	10	20	0
			1.7-2.7	3	24	23	8	24	18	0
			2.7-3.3	17	14	30	7	14	18	0
			3.3-4.3	11	17	40	5	12	15	0
			4.3-5.0	16	31	40	3	5	5	0
			<b>Mean</b>	<b>9</b>	<b>27</b>	<b>29</b>	<b>5</b>	<b>14</b>	<b>16</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	
	Black	Brown	Chalk	Others	
0.3-5.0	48	31	6	10	5

**TL 87 SW 24      8244 7284      Wordwell Hall, Wordwell      Block H**  
 Surface level c25.0 m (c80 ft)      Overburden 0.3 m  
 Water not struck      Mineral 1.9 m  
 October 1980      Bedrock 0.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
Head	Pebbly sand Gravel: coarse with fine, mainly subangular patinated flint Sand: fine with medium, mainly subrounded quartz, traces of chalk at base	1.9	2.2
Upper Chalk	Chalk, soft to firm	0.8+	3.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Gravel						
				-½	+½-1	+1-1	+1-4	+4-16	+16-64	+64 mm
9	70	21	0.3-1.3	8	46	23	1	7	15	0
			1.3-2.2	11	41	25	3	7	13	0
			<b>Mean</b>	<b>9</b>	<b>44</b>	<b>24</b>	<b>2</b>	<b>7</b>	<b>14</b>	<b>0</b>

TL 87 SW 25 8242 7187 Wordwell Hall, Wordwell Block G  
 Surface level 24.0 m (78 ft)  
 Water struck at 22.5 m  
 October 1980  
 Overburden 1.5 m  
 Mineral 2.8 m  
 Bedrock 0.8 m+

LOG		Thickness	Depth
Geological classification	Lithology	m	m
Soil	Peaty soil	0.8	0.8
Peat	Peat, dark brown, soft, silty at base	0.7	1.5
River Terrace Deposits (Second Terrace)	Sandy gravel Gravel: fine and coarse, subangular unpatinated flint with subrounded quartz and quartzite, minor amounts of chalk (up to c10%) Sand: fine and medium, mainly subrounded quartz, subangular unpatinated coarse sand, minor amounts of chalk (up to 10%)	2.8	4.3
Upper Chalk	Chalk, soft to firm	0.8+	5.1

GRADING		Depth below surface (m)		Percentages						
Mean for deposit percentages				Fines			Sand		Gravel	
Fines	Sand	Gravel		- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
3	61	36	1.5-2.5	2	15	21	7	25	30	0
			2.5-3.5	1	44	25	4	10	16	0
			3.5-4.3	5	37	25	9	8	16	0
			<b>Mean</b>	<b>3</b>	<b>30</b>	<b>24</b>	<b>7</b>	<b>15</b>	<b>21</b>	<b>0</b>

TL 87 SW 26 8281 7098 Culford Park Block G  
 Surface level 31.0 m (102 ft)  
 Water not struck  
 October 1980  
 Overburden 8.2 m  
 Mineral 5.1 m  
 Bedrock 1.0 m+

LOG		Thickness	Depth
Geological classification	Lithology	m	m
Soil	Soil on sandy clay, orange-brown, scattered pebbles	0.9	0.9
Boulder Clay	Sandy pebbly clay, moderate brown, abundant chalk and flint fragments. Becomes silty clay at 8.0 m	7.3	8.2
Glacial Sand and Gravel	'Clayey' pebbly sand with clay parting between 9.3 m and 10.3 m Gravel: fine some coarse, subangular patinated flint Sand: fine and medium, becoming predominantly fine below 11.3 m, mainly subrounded quartz some flint Fines: orange-brown, comprising sandy clay seam at 9.3 m to 10.3 m	5.1	13.3
Middle Chalk	Chalk rubble	1.0+	14.3

GRADING		Depth below surface (m)		Percentages						
Mean for deposit percentages				Fines			Sand		Gravel	
Fines	Sand	Gravel		- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
35	61	4	8.2-9.3	14	38	33	3	9	3	0
			9.3-10.3	Clay parting, assumed to comprise 100% fines						
			10.3-11.3	30	35	28	3	4	0	0
			11.3-12.3	16	68	9	2	4	1	0
			12.3-13.3	17	78	4	1	0	0	0
			<b>Mean</b>	<b>35</b>	<b>44</b>	<b>15</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>0</b>

TL 87 SW 27 8290 7056 Culford Park Block G  
 Surface level 28.4 m (93 ft)  
 Water struck at 22.4 m  
 October 1980  
 Overburden 0.6 m  
 Mineral 6.3 m  
 Bedrock 0.9 m+

LOG		Thickness	Depth
Geological classification	Lithology	m	m
Soil	Soil	0.6	0.6
Glacial Sand and Gravel	Sandy gravel, 'clayey' in upper 0.9 m Gravel: fine and coarse, subangular patinated and unpatinated flint with subrounded quartzite and quartz, traces of rounded chalk Sand: medium with fine and minor amount of coarse, subrounded quartz with subordinate subangular flint, rare chalk, locally cemented Fines: moderate yellowish brown, locally comprising thin pebbly clay lenses	6.3	6.9
Middle Chalk	Chalk, rubbly	0.9+	7.8

GRADING		Depth below surface (m)		Percentages						
Mean for deposit percentages				Fines			Sand		Gravel	
Fines	Sand	Gravel		- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
7	60	33	0.6-1.5	16	30	17	7	14	16	0
			1.5-2.5	9	7	28	7	27	22	0
			2.5-3.5	6	5	28	6	29	26	0
			3.5-4.4	4	5	45	4	18	24	0
			4.4-5.5	2	14	77	3	3	1	0
			5.5-6.0	3	12	71	3	5	6	0
			6.0-6.9*	5	19	40	4	13	19	0
			<b>Mean</b>	<b>7</b>	<b>13</b>	<b>42</b>	<b>5</b>	<b>16</b>	<b>17</b>	<b>0</b>

COMPOSITION		Percentages by weight in +4-16 mm fraction					
Depth below surface (m)		Flint			Quartz and quartzite		Others
		Black	Brown	Chalk			
0.6-4.4	43	19	8	20	10		
4.4-4.9	14	64	6	11	5		
<b>Mean</b>	<b>29</b>	<b>42</b>	<b>7</b>	<b>16</b>	<b>6</b>		

TL 87 SW 28 8206 7042 West Stow

Surface level 22.7 m (74 ft)  
Water struck at 19.5 m  
October 1980

Block G

Overburden 0.6 m  
Mineral 23.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Soil	Soil	0.6	0.6
River Terrace Deposits (First Terrace)	a Pebbly sand, gravel content increasing towards base Gravel: fine and coarse subangular patinated flint with subrounded quartz and quartzite Sand: fine and medium, mainly subrounded quartz with subangular flint; moderate yellowish brown fines	5.6	6.2
Glacial Sand and Gravel	b Sandy gravel, gravel content decreases below c17.2 m Gravel: fine and coarse subangular patinated flint with subrounded quartz and quartzite, minor amounts of chalk (up to c10%) and ironstone Sand: medium with coarse and fine, mainly subrounded quartz with subordinate patinated flint, minor amounts of chalk (up to c10%) Fines: moderate yellowish brown becoming rusty orange below c13 m	17.8+	24.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	3	79	18	0.6-1.5	3	40	42	5	9	1	0
				1.5-2.7	1	66	27	1	2	3	0
				2.7-3.2	2	41	34	8	14	1	0
				3.2-4.2*	4	36	40	5	8	7	0
				4.2-5.2*	3	43	22	4	13	15	0
				5.2-6.2*	3	25	33	6	16	17	0
				Mean	3	42	32	5	10	8	0
b	5	58	37	6.2-7.2*	3	17	25	7	18	30	0
				7.2-8.2*	1	7	19	13	28	32	0
				8.2-9.2*	0	7	29	18	21	25	0
				9.2-10.2*	1	4	15	13	42	25	0
				10.2-11.2*	3	5	21	16	31	24	0
				11.2-12.2*	1	4	22	16	30	27	0
				12.2-13.2*	1	10	14	6	23	43	3
				13.2-14.2*	3	13	45	13	11	15	0
				14.2-15.2*	7	8	24	13	25	23	0
				15.2-16.2*	13	17	21	11	20	18	0
				16.2-17.2	No grading data available						
				17.2-18.2*	9	37	44	7	3	0	0
				18.2-19.2*	15	44	35	4	2	0	0
				19.2-20.2*	7	23	49	12	6	3	0
				20.2-21.2*	2	9	32	13	17	27	0
				21.2-22.2*	5	19	42	14	12	8	0
				22.2-23.2	6	30	45	7	5	7	0
				23.2-24.0	7	33	34	5	7	14	0
				Mean	5	17	30	11	18	19	trace
a+b	4	64	32	Mean	4	23	32	9	16	16	0

COMPOSITION

	Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
		Flint		Chalk	Quartz and quartzite	Others
		Black	Brown			
a	0.6-4.2	80	45	15	0	0
	4.2-6.2	16	67	4	11	2
	Mean	48	36	10	6	trace
b	6.2-12.2	29	57	8	6	0
	12.2-13.2	4	57	21	14	4
	13.2-24.0	12	42	21	18	7
	Mean	15	52	17	13	3

TL 87 SW 29 8384 7400 Jerry's Old Plantation, Wordwell

Block H

Surface level c50.0 m (c165 ft)  
Water not struck  
October 1980

Overburden 0.3 m  
Mineral 2.2 m  
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
Cover Sand	'Clayey' pebbly sand Gravel: fine and coarse, subangular flint Sand: fine some medium subrounded quartz; pale orange fines	2.2	2.5
Upper Chalk	Chalk, soft	0.5+	3.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
	21	70	9	0.3-1.3	16	60	19	1	2	2	0
				1.3-2.5	26	44	15	2	2	11	0
				Mean	21	51	17	2	2	7	0

TL 87 SW 30 8362 7263 Deal Furze, Culford

Block H

Surface level c50.0 m (c165 ft)  
Water not struck  
October 1980

Overburden 0.2 m  
Mineral 1.5 m  
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy topsoil	0.2	0.2
Cover Sand	'Very clayey' pebbly sand Gravel: fine and coarse, subangular patinated flint	1.5	1.7



Sand: fine, subordinate medium, subrounded  
quartz rare chalk  
Fines: orange-brown, silty and chalky

Upper Chalk Chalk, firm 0.8+ 2.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
39	55	6	0.2-1.7	39	39	14	2	2	4	0

**TL 87 SW 31 8389 7160 Balloon Barn near Culford Block H**

Surface level 43.8 m (144 ft) Overburden 0.3 m  
Water not struck Mineral 8.9 m  
October 1980 Bedrock 1.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.3	0.3
Glacial Sand and Gravel	'Clayey' gravel, fines content decreases towards base, becomes more gravelly towards base Gravel: fine and coarse, subangular patinated flint, minor amounts of chalk increasing towards base Sand: coarse with medium, coarsening towards base, subrounded quartz with subordinate subangular flint Fines: moderate yellowish brown, silty and chalky	8.9	9.2
Upper Chalk	Chalk, putty-like	1.4+	10.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
14	42	44	0.3-1.4	25	38	18	3	4	12	0
			1.4-2.4	23	15	20	12	15	15	0
			2.4-3.0	12	6	10	17	33	22	0
			3.0-3.8	12	6	25	26	24	7	0
			3.8-4.5	14	6	33	28	16	3	0
			4.5-5.5	17	4	13	24	34	8	0
			5.5-6.5	16	4	10	16	32	22	0
			6.5-7.5	0	5	11	17	36	31	0
			7.5-8.5	5	3	8	23	37	24	0
			8.5-9.2	9	2	5	13	27	38	6
			<b>Mean</b>	<b>14</b>	<b>10</b>	<b>15</b>	<b>17</b>	<b>26</b>	<b>18</b>	<b>trace</b>

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint		Chalk	Quartz and quartzite	Others
	Black	Brown			
0.3-3.0	30	51	9	8	2
3.0-5.5	37	44	9	5	5
5.5-9.2	8	57	22	8	5
<b>Mean</b>	<b>25</b>	<b>51</b>	<b>13</b>	<b>7</b>	<b>4</b>

**TL 87 SW 32 8306 7109 Brockley near Culford Block H**

Surface level c33.0 m (c110 ft) Waste 4.4 m  
Water not struck Bedrock 1.1 m+  
October 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.3	0.3
Cover Sand	Sand: fine, subrounded quartz; moderate brown fines	0.3	0.6
Head	Pebbly clay, moderate brown, slightly sandy, contains mostly flint fragments	3.8	4.4
Upper Chalk	Chalk, rubbly	1.1+	5.5

**TL 87 SW 33 8394 7012 Culford Block G**

Surface level 28.0 m (92 ft) Overburden 0.9 m  
Water not struck Mineral 1.0 m  
October 1980 Waste 18.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.9	0.9
River Terrace Deposits (Second Terrace)	'Clayey' pebbly sand Gravel: fine and coarse, subangular patinated flint Sand: fine and medium, mainly subrounded quartz; orange-brown fines	1.0	1.9
Glacial Silt	Sandy clay, orange-brown, abundant flint pebbles	0.3	2.2
	Silty sandy clay, olive grey weathered at top, abundant chalk fragments	17.8+	20.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages									
Fines	Sand	Gravel		Fines	Sand	Gravel							
				-½	+½ - ¾	+¾ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm			
16	72	12	0.9-1.9	16	37	32	3	5	7	0			

**TL 87 SW 34 8489 7390 Sandy Barracks, Wordwell Block H**  
 Surface level c60.0 m (c197 ft) Waste 9.0 m  
 Water not struck Bedrock 0.5 m+  
 October 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.4	0.4
Cover Sand	Sand: fine, subrounded quartz; orange fines	0.4	0.8
Boulder Clay	Sandy silty clay, orange-brown laminated, traces of carbonaceous material	4.0	4.8
	Sandy pebbly clay, moderate yellowish brown, abundant chalk fragments, sandy seams in places, becomes very chalky below c 7.7 m	4.2	9.0
Upper Chalk	Chalk, soft	0.5+	9.5

**TL 87 SW 35 8458 7273 The Severals, Culford Block H**  
 Surface level c60.0 m (c197 ft) Overburden 0.3 m  
 Water not struck Mineral 2.9 m  
 October 1980 Waste 0.8 m  
 Bedrock 3.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
Cover Sand	'Very clayey' pebbly sand Gravel: fine to coarse, subangular patinated flint Sand: fine with medium, mainly subrounded quartz; orange-brown fines	2.9	3.5
Boulder Clay	Sandy clay, moderate yellowish brown, abundant chalk fragments, thin sand seam at base	0.8	4.0
Upper Chalk	Chalk, soft and soliflucted at top, firm below 7.0 m	3.5+	7.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages									
Fines	Sand	Gravel		Fines	Sand	Gravel							
				-½	+½ - ¾	+¾ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm			
27	55	18	0.3-1.3	28	42	17	2	6	5	0			
			1.3-2.3	25	34	19	4	11	7	0			
			2.3-3.2	30	29	15	2	7	15	2			
			<b>Mean</b>	<b>27</b>	<b>35</b>	<b>17</b>	<b>3</b>	<b>8</b>	<b>9</b>	<b>1</b>			

**COMPOSITION**

Depth below surface (m)	Percentages by weight in +4-16 mm fraction				
	Flint			Quartz and quartzite	Others
	Black	Brown	Chalk		
0.3-3.2	18	71	1	9	1

**TL 87 SW 36 8448 7146 Brockley, north of Culford Block H**  
 Surface level 41.4 m (136 ft) Overburden 0.4 m  
 Water not struck Mineral 1.6 m  
 October 1980 Bedrock 0.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy silty soil, some pebbles	0.4	0.4
Cover Sand	'Clayey' sandy gravel Gravel: fine and coarse, subangular flint with subrounded quartzite Sand: fine to medium, mainly subrounded quartz, some subangular flint; orange-brown fines	1.6	2.0
Upper Chalk	Chalk, soft	0.8+	2.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages									
Fines	Sand	Gravel		Fines	Sand	Gravel							
				-½	+½ - ¾	+¾ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm			
16	57	27	0.4-1.4	16	35	12	5	14	18	0			
			1.4-2.0	16	23	41	3	5	12	0			
			<b>Mean</b>	<b>16</b>	<b>30</b>	<b>23</b>	<b>4</b>	<b>11</b>	<b>16</b>	<b>0</b>			

**TL 87 SW 37 8426 7052 North-east of Culford Block G**  
 Surface level c31.0 m (c100 ft)  
 Water not struck  
 October 1980  
 Overburden 0.6 m  
 Mineral 2.2 m  
 Waste 0.2 m  
 Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.6	0.6
Cover Sand	Pebbly sand Gravel: fine and coarse subangular flint with subrounded quartz Sand: medium with fine, subrounded quartz some subangular flint; orange-brown fines	2.2	2.8
Boulder Clay	Pebbly sandy clay, reddish brown	0.2	3.0
Upper Chalk	Chalk, soft to firm	0.6+	3.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
9	76	15	0.6-1.6	8	24	47	6	8	7	0
			1.6-2.8	10	29	42	4	7	8	0
			<b>Mean</b>	<b>9</b>	<b>27</b>	<b>44</b>	<b>5</b>	<b>7</b>	<b>8</b>	<b>0</b>

**TL 87 NW 8 8036 7976 Old Elveden Slip, Elveden Block**  
 Surface level c38.0 m (c125 ft)  
 Water struck at c32.5 m  
 September 1980  
 Waste 12.3 m  
 Bedrock 1.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.3	0.3
Cover Sand	'Clayey' pebbly sand Gravel: fine some coarse, mainly subangular patinated flint Sand: fine and coarse, subrounded quartz and subangular patinated flint; yellowish orange fines	0.5	0.8
Boulder Clay	Pebbly clay, moderate yellowish brown, mainly subangular flint pebbles, becomes less pebbly but more sandy and silty with depth	6.7	7.5
	Chalky pebbly clay, orange-grey, stiff, abundant sand to pebble-sized chalk and patinated flint, some mudstone fragments	4.8	12.3
Upper Chalk	Chalk rubble	1.1+	13.4

**TL 87 NW 9 8110 7962 West of Elveden Block**  
 Surface level c38.0 m (c125 ft)  
 Water not struck  
 September 1980  
 Overburden 0.3 m  
 Mineral 1.9 m  
 Bedrock 0.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.3	0.3
Cover Sand	'Very clayey' sandy gravel Gravel: fine to cobble, patinated and unpatinated flint, traces of chalk Sand: fine with medium subrounded quartz with subangular patinated flint, traces of chalk; moderate brown fines	1.9	2.2
Upper Chalk	Chalk, firm	0.5+	2.7

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
20	57	23	0.3-1.3	18	47	17	3	6	9	0
			1.3-2.2	23	30	12	3	7	13	12
			<b>Mean</b>	<b>20</b>	<b>39</b>	<b>15</b>	<b>3</b>	<b>6</b>	<b>11</b>	<b>6</b>

**TL 87 NW 10 8041 7757 Hall Heath, Elveden Block**  
 Surface level 44.0 m (144 ft)  
 Water not struck  
 September 1980  
 Overburden 0.3 m  
 Mineral 0.8 m  
 Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
Cover Sand	'Very clayey' pebbly sand Gravel: fine and coarse, mainly chalk, greyish orange fines Sand: fine some medium, mainly quartz with chalk; greyish orange fines	0.8	1.1
Upper Chalk	Chalk, firm	0.7+	1.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
35	56	9	0.3-1.1	35	44	10	2	4	5	0

**TL 87 NW 11 8040 7670 Weatherhill Heath, Icklingham** **Block**  
 Surface level c52.0 m (c170 ft) Overburden 0.4 m  
 Water not struck Mineral 1.3 m  
 September 1980 Bedrock 0.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy pebbly soil	0.4	0.4
Cover Sand	'Very clayey' pebbly sand Gravel: fine and coarse, mainly subrounded chalk, traces of angular flint Sand: fine with medium, subrounded quartz and chalk, rare angular flint; greyish orange fines	1.3	1.7
Upper Chalk	Chalk, rubbly	0.8+	2.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
25	70	5	0.4-0.8	15	59	18	2	3	3	0
			0.8-1.7	30	50	13	2	4	1	0
			<b>Mean</b>	<b>25</b>	<b>53</b>	<b>15</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>0</b>

**TL 87 NW 13 8410 7940 Thetford Heath near Elveden** **Block**  
 Surface level c29.0 m (c95 ft) Waste 12.4 m  
 Water struck at 16.6 m Bedrock 0.4+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil	0.3	0.3
Cover Sand	Sand: fine and medium, subrounded chalk; moderate yellowish brown fines	0.4	0.7
Boulder Clay	Chalky pebbly clay, dark olive grey, stiff, decalcified in upper 1 m. Abundant sand to pebble-sized chalk and flint	10.9	11.6
	Silty clay, moderate brown	0.8	12.4
Upper Chalk	Chalk, rubbly	0.4+	12.8

**TL 87 NW 12 8290 7869 Elveden Park** **Block**  
 Surface level c33.0 m (c110 ft) Overburden 0.3 m  
 Water not struck Mineral 1.5 m  
 September 1980 Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
Soil	Sandy soil, some pebbles	0.3	0.3
Glacial Sand and Gravel	'Very clayey' pebbly sand Gravel: fine and coarse, subangular flint traces of chalk Sand: fine with medium, subrounded quartz with subangular flint, traces of chalk; greyish orange fines	1.5	1.8
Upper Chalk	Chalk, putty-like	0.6+	2.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
35	58	7	0.3-1.8	35	39	16	3	5	2	0

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