

The sand and gravel resources of the country around Great Dunmow, Essex

Description of 1:25 000 resource sheet TL 62

C. W. Thomas

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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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.

This report describes the sand and gravel resources of the country around and north-east of Great Dunmow, Essex, shown on the accompanying 1:25 000 resource map TL 62. The survey was conducted by Mr C. W. Thomas, assisted by Mr P. M. Hopson during the drilling and sampling programme; Mr Thomas compiled the report. The work is based on a geological survey at the 1:10 560 scale by Mr. R. D. Lake, Mr S. R. Mills and Dr D. A. Wilson in 1975 and 1979.

Mr W. Pierce (Land Agent) was responsible for negotiating access to land for drilling. The ready cooperation of landowners and tenants in this work is gratefully acknowledged.

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MAP

The sand and gravel resources of the country around Great Dunmow, Essex **in pocket**

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The sand and gravel resources of the country around Great Dunmow, Essex

Description of 1:25 000 resource sheet TL 62

C. W. THOMAS

SUMMARY

The geological maps of the Institute of Geological Sciences, pre-existing borehole information, and 98 boreholes drilled for the Industrial Minerals Assessment Unit form the basis of the assessment of the sand and gravel resources of the country around and north-east of Great Dunmow, Essex.

All the deposits in the area 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 8 resource blocks, containing between 1.1 and 12.8 km² of potentially workable sand and gravel. For each block the geology of the deposits is described, and the mineral-bearing area, the mean thicknesses 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 62 SE 37). 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 two elements alone (e.g. SE 37).

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).

Bibliographical reference

THOMAS, C. W. 1982. The sand and gravel resources of the country around Great Dunmow, Essex: description of 1:25 000 resource sheet TL 62. *Miner. Assess. Rep. Inst. Geol. Sci.*, No 109.

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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' level "for which tonnage and grade 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" (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 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 1/16 mm, 1/4 mm, 1 mm, 4 mm, 16 mm, 64 mm has been adopted. The boundaries between fines (that is, the clay and silt fractions) and sand, and between sand and gravel material, are placed at 1/16 mm and 4 mm respectively (see Appendix C).

The volume and other characteristics are assessed within resource blocks, each of which, ideally, contains

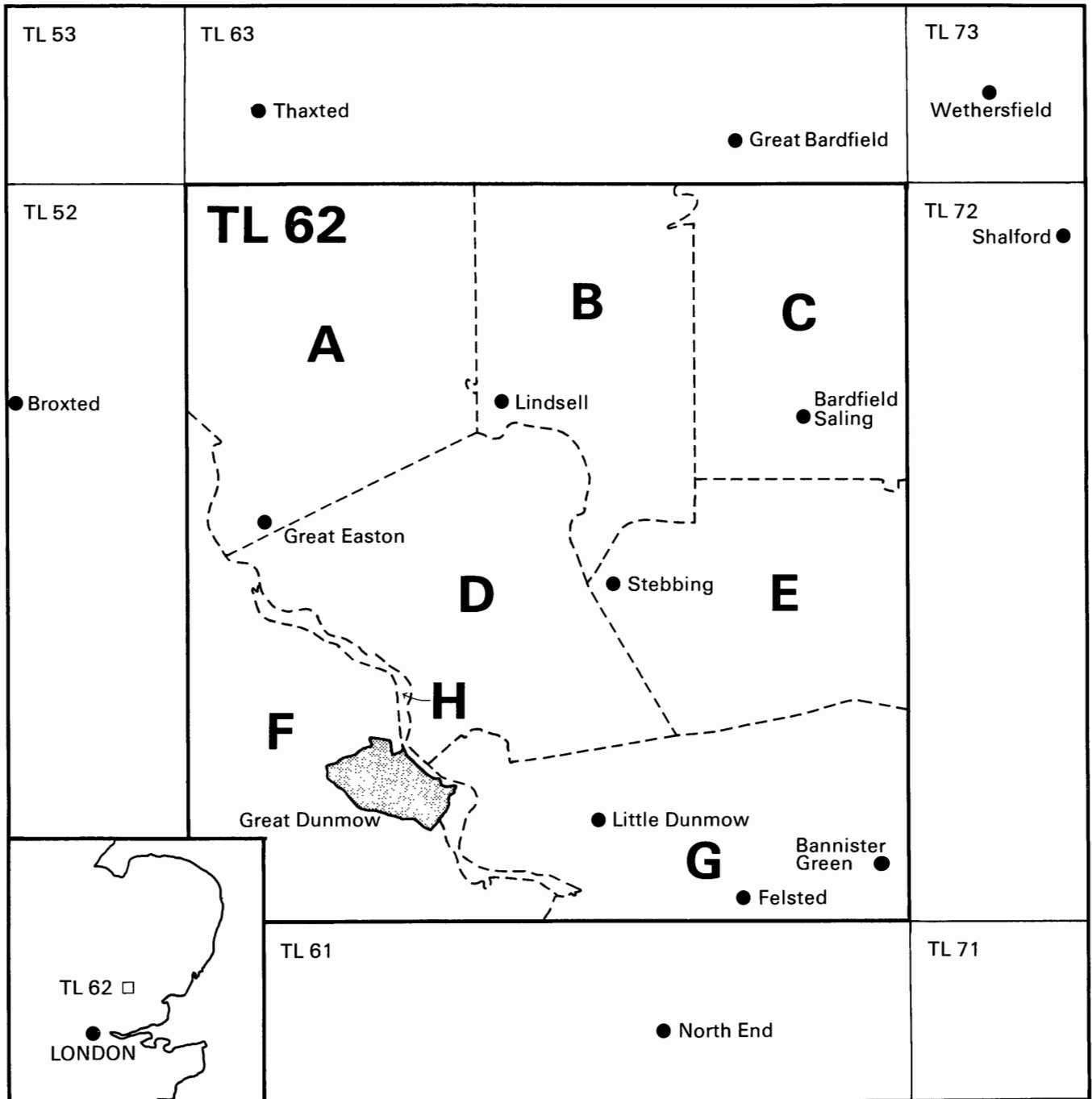


Figure 1 Sketch map of the location of sheet TL 62, showing the resource block boundaries.

approximately 10 km² 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

The resource sheet covers 100 km² of country around and north-west of Great Dunmow, Essex. Great Dunmow is situated some 18 km north-north-west of Chelmsford, the county town of Essex, and 50 km north-east of London; it is the largest urban centre in the district and

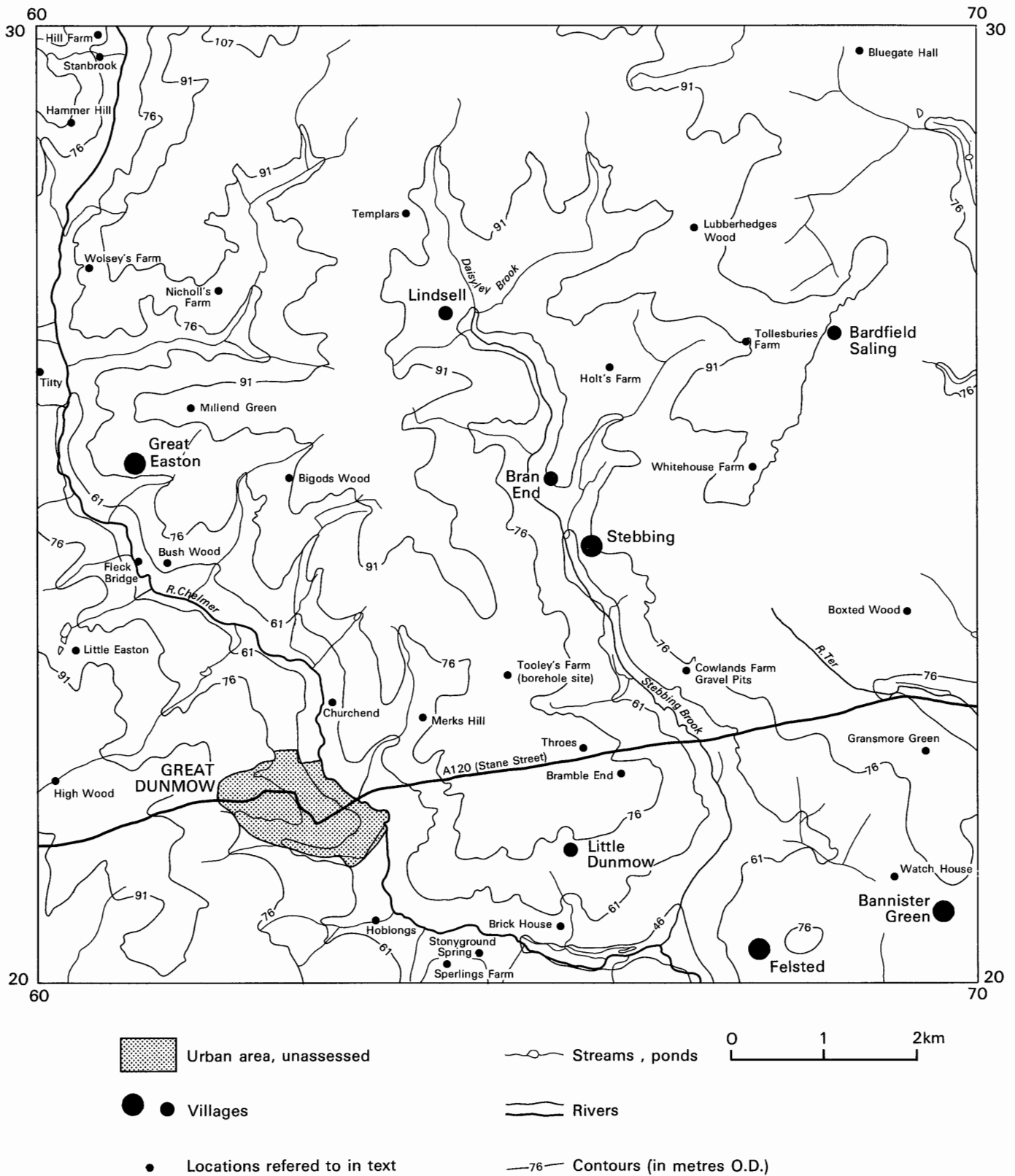


Figure 2 Sketch map of the topography of sheet TL 62, showing places mentioned in the text.

covers an area of 1.2 km². The rest of the area is largely given over to large-scale arable farming on the heavy soils derived from the Boulder Clay; there is also some dairy farming and minor forestry.

The only active mineral working in the resource sheet area is at Cowlands Farm Gravel Pit [699 233], south of Stebbing, where sand and gravel is dug intermittently; this pit was formerly more extensively worked, but it is now largely overgrown or flooded.

TOPOGRAPHY

Boulder Clay covers much of the area of the resource sheet, and forms an undulating plateau which has subsequently been dissected. The plateau is highest in the north and south-west, at about 100 m above OD, falling gently to about 60 m above OD in the south-east.

The River Chelmer, Stebbing Brook and their tributaries, the headwaters of the River Ter and several

small unnamed streams drain the area towards the south and east. The valleys are incised into the drift and, in the case of the larger streams, into bedrock, which crops out on the lower valley sides.

GEOLOGY

Pleistocene and Recent fluvial deposits rest upon a gently undulating and dissected surface of Tertiary bedrock. Over most of the sheet area the bedrock is London Clay. However, Woolwich and Reading Beds have been proved to subcrop beneath Boulder Clay in the north-west around Stanbrook [607 297] and beneath fluvial deposits near Fleck Bridge, in IMAU borehole SW 80 [6107 2439]. In IMAU borehole NW 8 [6069 2993], Thanet Beds and Upper Chalk were also proved beneath Woolwich and Reading Beds; they will not be considered further in this report.

Usually the succession of Pleistocene deposits (Table 1) is simple, with Boulder Clay resting upon sand and gravel deposits; exceptionally, Boulder Clay rests directly upon bedrock in the valleys of the River Chelmer and Stebbing Brook and in places east of Felsted [677 203].

Four sand and gravel deposits are recognised: Glacial Sand and Gravel, Kesgrave Sands and Gravels (gravel), Kesgrave Sands and Gravels (sand) and Red Crag.

A distinctive layer of rubification and clay enrichment is found at Cowlands Farm Gravel Pits [669 233], and in a few boreholes east of that locality; this overlies the gravel of the Kesgrave Sands and Gravels and is equated with the 'Rubified Sol Lessivé' of Rose and Allen (1977).

Head occurs extensively in the river and stream valleys, blanketing the underlying deposits.

The River Chelmer, Stebbing Brook and the headwaters of the River Ter each have deposits of alluvial silt and sand and gravel, but only the River Chelmer has terraces associated with it. The minor streams have patches of Alluvium in places, but generally they flow over deposits of Head.

SOLID

Woolwich and Reading Beds The Woolwich and Reading Beds are known only from boreholes in this district. IMAU borehole NW 8 [6069 2993] proved four metres of the deposit beneath Boulder Clay. The boundary with the London Clay subcrops in the area around Stanbrook [607 297] and is thought to extend some distance down the valley of the River Chelmer. Woolwich and Reading Beds were also penetrated in IMAU borehole SW 80 [6107 2439], but information from this borehole is inadequate to enable the subcrop of the deposit to be accurately delineated in this area.

The deposit comprises dry, hard, often waxy clays which are sometimes silty or sandy. They are vividly coloured and usually mottled, varying from dusky yellowish green through yellow and brown with grey to green, red and black. They contain red sandy ironstone nodules in places.

London Clay The London Clay forms extensive but discontinuous outcrops on the lower slopes of the valley sides; from borehole evidence it is also known to be present at depth over much of the district.

The London Clay consists in this district of silty clay with pockets of olive green fine sand and is usually micaceous. It also contains, in the zone of weathering, sporadic calcareous ('race') and pyritic nodules, selenite crystals, comminuted shell debris and crustacean remains. Typically, it is dark grey to greyish black in colour, weathering yellowish brown in the uppermost few centimetres. The London Clay may also be bioturbated at the interface with overlying deposits, as, for instance in IMAU borehole NE 13 [6610 2642] at Holt's Farm,

Table 1 Geological sequence.

DEPOSIT	LITHOLOGY
Recent and Pleistocene	
Alluvium	Sandy clay, silt and peat, overlying sand and gravel in places
Peat	Very dark brown to greyish brown silty and clayey peat
River Terrace Deposits	
First Terrace	Sandy to 'clayey' gravels, containing flint and quartz
Undifferentiated	Sandy gravels with flint and quartz, and a few silty layers
Head	Sandy silt to silty clay
Boulder Clay	Stiff, silty clay and silt, rarely sandy; with chalk and flint pebbles
Glacial Sand and Gravel	Pebbly sand and sandy gravel, often 'clayey' or 'very clayey', containing flint and quartz, and often chalk
Rubified Sol Lessivé	Grey and red smooth clay, silty or sandy in places and often gravel-rich towards the base
Kesgrave Sands and Gravels (gravel)	Pebbly sand to sandy gravel with some clayey silt, pale yellow or orange to pale grey
Kesgrave Sands and Gravels (sand)	Fine, micaceous, yellow or pale grey sand, with thin silty clay seams
Red Crag	Sand, often pebbly, ironstained or glauconitic; pebbles dominantly of well rounded flints
Eocene	
London Clay	Dark grey silty clay, weathering brown
Palaeocene	
Woolwich and Reading Beds	Multicoloured, stiff waxy clays with fine sands and silts
Thanet Beds	Fine silty glauconitic sands
Upper Cretaceous	
Upper Chalk	Soft white limestone with flint seams

where burrows infilled with Red Crag sand were recorded.

Red Crag A deposit of Red Crag age and lithology has been proved to occur widely beneath both Kesgrave Sands and Gravels and Glacial Sand and Gravel (see sections on the resource map). However, in this district Red Crag has not been found at the surface. The deposit exceeds 12 m in thickness in the extreme north-eastern corner of the sheet, for example in IMAU borehole NE 25 [6972 2959], but it thins to the west and south as the London Clay surface rises and is only found in small patches in the area immediately north and west of Great Dunmow, as recorded, for example, in IMAU boreholes SW 76 [6067 2340] and SW 78 [6099 2101].

The deposit typically consists of pebbly sands. Shell debris, consisting mainly of molluscan material, including bivalves and gastropods, is locally very abundant. Shelly sands are invariably found in the lowest few metres of the deposit. The microfauna, which is

dominated by foraminifera and some ostracods, is consistent with a Lower Pleistocene age.

Usually the Red Crag has a strong orange-brown colour, but it may be olive green to dark green at depth as demonstrated by IMAU borehole NE 21 [6807 2837]. The variable oxidation state of the iron compounds and the presence or absence of glauconite in the deposit are considered to be responsible for this variation in colour, the orange-brown deposits being highly oxidised and the green relatively unoxidised. Oxidised iron compounds are often sufficiently abundant to form thin layers of 'iron-pan' within the Red Crag sediments.

The occurrence of the green and shelly deposits is restricted to the north-eastern part of the district where the Red Crag is thickest and lies in a shallow north-eastwards-trending trough in the London Clay surface (see diagram on the resource map). It is considered that the green deposits represent the original unoxidised Red Crag, which was presumably laid down under mildly reducing conditions.

DRIFT

Kesgrave Sands and Gravels This formation, which is exposed on the flanks of valleys and which has been proved to be very extensive beneath the Boulder Clay cover, constitutes the bulk of the mineral present in the district. It consists of two distinct lithologies: fine, pale grey to yellow sands containing thin seams of clay, and sandy gravels which are characteristically quartz-rich in the gravel fraction. Seams and lenses of silty clay up to 0.8 m thick, as seen for example in IMAU borehole SW 87 [6270 2058], occur in the sandy gravels also.

In the north, the fine sands predominate with patchy pebbly sand and sandy gravel at the top of the succession, as demonstrated by IMAU boreholes NW 21 [6259 2957], NE 19 [6877 2945] and NE 10 [6652 2953]. However, towards the south, in the area around Stebbing, the pebbly sand and sandy gravel becomes thicker as proved by IMAU boreholes NE 14 [6686 2585] and SE 33 [6623 2434]. South of Stebbing, the gravels replace the fine sands and rest directly upon Red Crag or on London Clay. Between Little Dunmow [656 215] and Felsted [677 204], and around Great Easton [697 255] the deposit is often very thin and found discontinuously, in small patches.

The Kesgrave Sands and Gravels were formerly thought to be outwash gravels deposited in front of an advancing Pleistocene (Anglian) ice-sheet. More recently, however, they have been considered to be periglacial (Beestonian) proto-Thames fluvial gravels, deposited in a braided stream environment (Rose and Allen, 1977). The fine sands are here considered as a distinct deposit, unrelated to the sandy gravels. The sands lie stratigraphically beneath the sandy gravels and there is great disparity between the grain-size distributions of the two lithologies. These facts are considered to indicate that the sands are older than and of different provenance from the sandy gravels, and may be of estuarine or shallow marine origin. Similar observations have been made by Hopson (in press), Marks and Merritt (1981), and Marks and Murray (1981).

Rubified Sol Lessivé The Rubified Sol Lessivé consists of strongly reddened, grey-mottled clay or sandy clay and clayey sand, often becoming gravel-rich towards the base. It is considered to be a palaeosol developed on top of the exposed Kesgrave Sands and Gravels (Beestonian) surface during the Cromerian stage (Rose and Allen, 1977). This deposit was recorded in IMAU boreholes NW 25 [6285 2506], SE 32 [6697 2467], SE 37 [6707 2371] and SE 42 [6870 2209] and from Cowlands Farm Gravel Pits, [669 233] where it is extensively developed and is up to approximately 1.5 m thick. In sections at Cowlands Farm Gravel Pits, the palaeosol is disturbed and involuted, a feature attributed by Rose and Allen to cryoturbation.

Glacial Sand and Gravel The Glacial Sand and Gravel is typically a 'clayey' to 'very clayey' sandy gravel. This deposit is not widespread in the district and is mapped at the surface only in a few scattered localities for example, around Bluegate Hall [688 298] and Hammer Hill, [604 290]. Moreover, it was recorded only in isolated boreholes. Where the Glacial Sand and Gravel occurs beneath Boulder Clay, it may rest upon Kesgrave Sands and Gravels as, for example, in IMAU borehole SW 93 [6456 2420], on Red Crag, (for example, IMAU borehole NW 18 [6146 2598]) or upon London Clay (for example IMAU borehole SW 81 [6151 2317]). It was also recorded resting upon the Rubified Sol Lessivé in IMAU boreholes SE 37 [6707 2371] and SE 42 [6870 2209] and may lie within Boulder Clay, as in IMAU borehole NW 9 [6051 2946].

The deposit sometimes has a gravel composition similar to that of the Kesgrave Sands and Gravels but its generally 'clayey' and poorly sorted nature indicates a glacial origin. This similarity of composition is probably the result of mixture of the two deposits by periglacial processes as, for example, in IMAU boreholes NW 32 [6377 2772] and NE 21 [6807 2837]. The deposit is generally only one or two metres in thickness but, exceptionally, as in IMAU boreholes SW 81 [6151 2317] and SW 84 [6190 2170], 4.7 m of Glacial Sand and Gravel is developed beneath Boulder Clay.

Only in IMAU borehole NW 9, where it is 2.5 m thick, was any significant thickness of Glacial Sand and Gravel proved within the Boulder Clay. Elsewhere such occurrences are restricted to thin (0.5 m), often water-charged, beds of chalk gravel, as, for example, in IMAU borehole NW 27 [6393 2805].

Boulder Clay The Boulder Clay is predominantly grey to very dark grey in colour. However, it is usually weathered to a variety of yellowish browns and browns at the surface and at the base where it rests upon sand and gravel deposits. The weathered zones usually extend to three or four metres below the surface and up to 1.5 m upward from the base of the deposit.

With increasing depth the weathered Boulder Clay becomes mottled pale grey around unleached chalk pebbles. The weathered zone at the base is often very sandy and pebbly. The junction between the Boulder Clay and the Glacial Sand and Gravel is usually gradational, whereas that with the Kesgrave Sands and Gravels is sharp and well-defined.

Various clasts are present in the Boulder Clay: chalk, which occurs as sand-sized pellets, pebbles, cobbles and soft, putty-like masses, is the commonest rock type. The chalk is generally abundant, but may be much reduced in quantity in the dark grey clays that rest directly upon London Clay, occurring only as sand-sized pellets, as recorded in IMAU borehole NW 19 [6135 2541]. Other clasts include angular flint and rare, black, finely divided paper shales, quartz, quartzite, sandstone, limestone and rotted pyrite nodules, together with some comminuted shell debris. Within the Boulder Clay, interlaminated fine silty sands and clayey sandy silts occur. They vary in colour from yellowish brown to grey and pale olive, and contain sand-sized pellets and fine pebbles of chalk. These silts are usually only between one and two metres thick as, for example, in IMAU boreholes NE 12 [6686 2757] and NE 17 [6758 2677], although exceptionally, in IMAU borehole SE 43 [6846 2120], the glacial silts were proved to be more than 15 m thick.

In places the Boulder Clay is water-charged at several levels; these sub-artesian water occurrences are frequently associated with thin (0.5 m) layers of Glacial Sand and Gravel, as, for example, in IMAU borehole NW 27 [6393 2805].

Head This soliflucted periglacial deposit is widespread along the bottoms of the river and stream valleys. Typically it is yellowish brown silty and sandy clay with patches of carbonaceous debris. It is sporadically pebbly

and in IMAU borehole SE 27 [6593 2293] a thin gravel composed dominantly of angular flint was found. The Head deposits are up to 2 m in thickness.

River Terrace Deposits, Undifferentiated River gravels with beds of sandy, clayey and sometimes peaty silts were found beneath Alluvium along the valley of the River Chelmer from Fleck Bridge [610 245] to Brick House [656 206]. These deposits were proved in three IMAU boreholes and they range in thickness from 6.8 m in borehole SW 91 [6377 2176] to 14.7 m in borehole SW 80 [6107 2439]. The latter record shows an exceptional thickness for the area and is believed to represent an accumulation of deposits in an overdeepened channel.

The gravels are predominantly composed of angular flint (80 per cent).

First Terrace Only the River Chelmer has developed mappable river terraces. These are designated First Terrace and are present at Churchend [630 230], south-east of Hoblongs [636 207] and north-east of Stonyground Spring [647 203], where IMAU boreholes SW 86 [6291 2312] and SW 92 [6381 2060] proved 3.7 m and 1.9 m of respectively, terrace material. The deposits are sandy and 'clayey' gravels with angular flint being the dominant constituent of the pebbles.

Peat Peat was recorded in only one IMAU borehole, NW 11 [6050 2809], where 3.8 m of clayey and silty carbonaceous debris with layers of abundant comminuted shell material was found beneath Alluvium.

Alluvium The Alluvium is mapped as a continuous deposit in the valleys of the River Chelmer, Stebbing Brook and the River Ter, with smaller discontinuous patches occurring in the valleys of minor streams. It comprises yellowish brown and grey silty and sandy clays with rare flint and quartz pebbles. It ranges from soft to firm and may contain plant remains such as roots and reed stems, and was found to be between about 1 m and 2.5 m in thickness in IMAU boreholes NW 11 [6050 2809], SW 80 [6107 2439] and SW 91 [6377 2176].

COMPOSITION OF THE SAND AND GRAVEL DEPOSITS

Five formations contain potentially workable sand and gravel: Red Crag, Kesgrave Sands and Gravels, Glacial Sand and Gravel, Undifferentiated River Terrace Deposits and First Terrace. For the purposes of this report the Undifferentiated River Terrace and First Terrace deposits are considered together under the term River Terrace Deposits. The composition of the +8-16 mm fraction is summarised in Table 3 and the overall grading for these formations is shown in Table 2.

Red Crag The mean grading of the Red Crag is pebbly sand (Table 2) although it grades as sand in some boreholes. The sand fraction comprises mainly subrounded to well rounded quartz grains with some fragments of flint, ironstone, shell debris and grains of glauconite. Typically the grain-size distribution is bimodal.

The gravel fraction is dominated by well rounded flint (75 per cent) with angular flint (12 per cent) and quartz (9 per cent), with some quartzite, and trace amounts of ironstone, sandstone, phosphatic nodules, shell debris, igneous and metamorphic rocks. Although some masses of clayey silt occur, the fines content is generally low and was never found to exceed 10 per cent in any borehole.

Kesgrave Sands and Gravels The Kesgrave Sands and Gravels have an overall mean grading of pebbly sand (Table 2), but are either sand or gravel-rich, the latter ranging from pebbly sand to gravel.

The sand lithology in the north is composed of sub-angular to subrounded quartz with some mica, typically the grain-size distribution is strongly unimodal and in some cases more than 80 per cent may be retained on either the 1/4 mm or the 1/8 mm aperture sieve.

The rare pebbles that the sands contain consist of angular to subangular flint and a little quartz. Only trace amounts of +8-16 mm material occur in the sand lithology and hence no attempt has been made to give compositional data for this lithology (it should be noted that the data shown in Table 3 apply only to the gravel lithology). Thin laminae of clay occur throughout the sands, but the fines are generally low and only rarely exceed 10 per cent.

Table 2 Summary of the grading characteristics of each deposit.

Deposit	Mean grading percentage						
	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel	Cobbles
	-1/16 mm	+1/16 -1/4 mm	+1/4 -1 mm	+1 -4 mm	+4 -16 mm	+16 -64 mm	+64 mm
Red Crag	4	28	47	14	5	2	-
Kesgrave Sands and Gravels	7	19	48	8	10	8	-
Glacial Sand and Gravel	16	11	33	10	17	12	1
River Terrace Deposits	7	4	26	14	30	19	-

Table 3 Composition of the fine gravel (+8-16 mm) of the sand and gravel deposits.

Deposit	Percentage by weight									
	Flint		Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Phosphatic & Fossil Debris	Others
	Ang	WR								
Red Crag	12	75	9	2	trace	-	-	1	trace	trace
Kesgrave Sands and Gravels	22	37	30	10	1	trace	-	trace	-	trace
Glacial Sands and Gravels	36	26	17	6	2	11	2	trace	trace	trace
River Terrace Deposits	59	22	10	4	1	3	1	trace	trace	trace

To the south, within the gravelly Kesgrave lithology, the pebbly sand and sandy gravel categories predominate but the gravel category is rare. Within the gravelly lithology the sand fraction is coarser-grained than in the Kesgrave sand lithology. The sand is composed of subangular to subrounded quartz with some flint.

The gravel fraction comprises well rounded flint (37 per cent), quartz (30 per cent) and angular flint (22 per cent), with quartzite (10 per cent), some sandstone (1 per cent) and trace amounts of chalk, ironstone, igneous and metamorphic rocks. The high quartz content is characteristic of the gravel-rich lithology. Thin silty clay seams are present in places but the fines content is generally low and rarely exceeds 10 per cent.

Glacial Sand and Gravel The mean particle size distribution of the deposit as a whole (Table 2) indicates that it is 'clayey' sandy gravel, although samples from boreholes range from 'clayey' sand to gravel. This deposit is characteristically more 'clayey' than any of the other potentially workable formations in the area.

The sand fraction is composed mainly of angular to subrounded quartz with angular to subangular flint. The sand sometimes contains abundant chalk, especially near the Glacial Sand and Gravel/Boulder Clay interface.

The gravel fraction is dominated by angular flint (36 per cent) and well rounded flint (26 per cent), with quartz (17 per cent), chalk (11 per cent) and quartzite (6 per cent) as well as some sandstone and limestone, and trace amounts of ironstone, fossil debris and igneous and metamorphic rocks (Table 3).

River Terrace Deposits Although they are of limited extent compared with other potentially workable sand and gravel deposits in the area, the River Terrace Deposits, which occur extensively in the Chelmer valley, have the highest gravel content and grade as gravel (Table 2).

The sand fraction comprises angular to subrounded flint and quartz with some chalk and a trace of ironstone.

The gravels are predominantly of angular flint (59 per cent) with well rounded flint (22 per cent) and quartz (10 per cent), some quartzite, chalk, sandstone and limestone and trace amounts of ironstone, fossil debris and igneous and metamorphic rocks. The fines content is generally low, although, exceptionally, in IMAU borehole SW 92 [6381 2060] clay- and silt-grade material comprises 16 per cent of the deposit.

PHYSICAL AND MECHANICAL PROPERTIES OF THE SAND AND GRAVEL DEPOSITS

The four deposits that comprise the potentially workable mineral resources in the district have been tested for their mechanical properties in accordance with the British Standard 812, parts 2 and 3 (British Standards

Institution, 1975). The following tests were done on the +10 mm -14 mm gravel fraction of each deposit: Aggregate Impact Value, 10 per cent fines, Relative Density and Water Absorption. The samples used were sieved and bulked by deposit from previously oven-dried material. The results quoted for the Kesgrave Sands and Gravels apply only to the gravel lithology since the sand lithology contains insufficient material in the +10 mm -14 mm fraction. The results are summarised in Table 4.

THE MAP

The sand and gravel resource map 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 was surveyed recently at the scale of 1:10 560. 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.

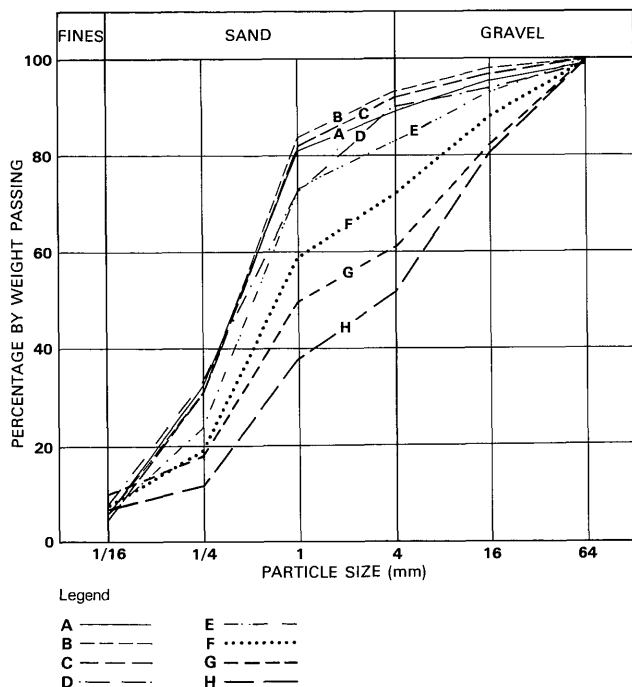
Borehole data, which include the stratigraphic relations, thicknesses and mean particle size distribution of the sand and gravel samples collected during the assessment survey, are also shown on the map.

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, or almost continuous, 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.

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

Table 4 Results of aggregate tests.

Deposit	A.I.V.	10% Fines	Relative Density (Oven Dried) (g/cm ³)	Relative Density (Saturated and Surface Dried) (g/cm ³)	Apparent Relative Density (g/cm ³)	Water Absorption (%Dry Mass)
Red Crag	20	260	2.53	2.58	2.65	1.80
Kesgrave Sands and Gravels	23	240	2.54	2.57	2.61	1.13
Glacial Sand and Gravel	25	200	2.48	2.54	2.63	2.40
River Terrace Deposits	23	220	2.56	2.56	2.63	1.56



Block	Percentage by weight passing					
	1/16 mm	1/4 mm	1 mm	4 mm	16 mm	64 mm
A	6	32	81	89	95	99
B	6	31	84	93	98	100
C	5	31	82	92	97	100
D	8	33	72	85	94	99
E	5	24	73	83	93	100
F	8	19	59	72	88	100
G	10	18	50	61	82	100
H	7	12	38	52	81	100

Figure 3 Particle-size distribution for the assessed thickness of mineral in resource blocks A to H.

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

Table 5 The sand and gravel resources of sheet TL 62: summary of statistical assessments.

Block	Area		Mean thickness		Volume of mineral			Mean grading percentages		
	Block km ²	Mineral km ²	Over- burden m	Mineral m	Million m ³	Limits at the 95% confidence level		Fines -1/16 mm	Sand +1/16-4 mm	Gravel +4 mm
						±%	±Million m ³			
A	16.6	12.8	7.2	8.9	113.9	27	30	6	83	11
B	12.2	12.0	10.8	10.5	126.0	22	27	6	87	7
C	12.1	12.1	5.7	16.9	204.5	13	26	5	87	8
D	15.4	12.0	6.9	8.7	104.4	22	23	8	77	15
E	12.4	11.3	6.6	9.9	116.8	13	14	5	78	17
F	13.6	9.2	3.8	4.3	39.6	31	12	8	64	28
G	15.4	7.9	5.7	4.3	34.0	32	11	10	51	39
H	1.1	1.1	1.5	4.3	4.7	39	2	7	45	48
Total	98.9	78.4	8.5	8.5	666.4	12	82	7	71	22

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 zigzag 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 5. Fuller grading particulars are shown in Figure 4 and Tables 6 to 13.

Accuracy of the results For each of the blocks, 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 13 per cent and 39 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 (666.4 million m³) can be estimated to limits of ±12 per cent at the 95 per cent probability level by a calculation based on the data from 92 sample points spread across the 8 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 RESOUCE BLOCKS

The area of sheet TL 62 (excluding the urban area of Great Dunmow) has been divided into eight resource blocks. Blocks A to G contain Red Crag, Kesgrave Sands and Gravels and Glacial Sand and Gravel Deposits,

Table 6 Data from IMAU boreholes: Block A.

Borehole	Recorded thickness (m)		Mean grading percentage					
	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
NW 8		absent						
NW 9	1.5	+3.5	13	7	19	15	26	20
NW 10	3.1	10.7	6	36	54	2	1	1
NW 11		absent						
NW 12		absent						
NW 14	3.8	7.1	8	23	49	8	7	5
NW 15	4.7	10.8	7	26	63	3	1	0
NW 16	7.7	6.7	5	31	50	8	3	3
NW 17		absent						
NW 18	15.3	3.1	4	24	42	13	10	7
NW 19		absent						
NW 21	15.7	+9.3	8	23	66	3	0	0
NW 22	14.3	12.1	6	32	57	4	1	0
NW 23	1.5	7.5	5	40	42	8	3	2
NW 24	18.5	3.2	2	13	57	15	8	5
NW 27		absent						
NW 28	12.2	12.5	6	31	40	9	9	5

Table 7 Data from IMAU boreholes: Block B.

Borehole	Recorded thickness (m)		Mean grading percentage					
	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
NW 26	12.7	+4.5	9	31	59	1	0	0
NW 31	14.5	11.5	6	18	67	7	1	1
NW 32	5.6	11.5	6	29	44	12	7	2
NE 6	17.6	+7.4	6	22	71	1	0	0
NE 7	12.8	+12.2	7	36	53	3	1	0
NE 8	12.2	+13.0	6	25	50	13	4	2
NE 9	2.4	10.9	7	30	38	16	7	2
NE 10	3.2	12.8	5	34	52	5	3	1
NE 11	13.0	16.2	3	19	49	13	9	7
NE 12	16.1	+9.0	5	14	61	8	7	5
NE 13	10.8	15.6	4	22	51	15	7	1
NE 14	10.0	12.4	5	19	43	12	14	7

whereas block H contains fluvial deposits of the River Chelmer. The areas, volume estimates and mean grading results for the blocks, and the data from individual boreholes in each block are summarised in Tables 5 and 6 to 13 respectively. The mean gradings for the blocks are shown graphically in Figure 3.

Block A

This block covers the north-west corner of the sheet, extending as far south as Tilty [600 265] and Great Easton [607 255] and as far east as Lindsell [643 271]. Patches of Glacial Sand and Gravel and more continuous spreads of Kesgrave Sands and Gravels crop out in the River Chelmer valley and extend beneath the Boulder Clay to the west. To the east, IMAU boreholes have proved Red Crag beneath Kesgrave Sands and Gravels but it has not been possible to separate these formations at outcrop.

Both mineral and overburden are thickest in the north and east of the block; 15.7 m of overburden, consisting predominantly of Boulder Clay, was proved in IMAU borehole NW 21 [6259 2957] overlying at least 9.3 m of sand and gravel.

Mineral is thin or absent beneath overburden in the Chelmer valley, from Great Easton to Millend Green (IMAU borehole NW 24 [6240 2608]) and around Templars

(IMAU borehole NW 27 [6393 2805]). In the area from Wolsey's Farm (IMAU borehole NW 12 [6083 2741]) to Nicholl's Farm (IMAU borehole NW 17 [6191 2722]) the base of the Boulder Clay cuts down through the Kesgrave Sands and Gravels into the bedrock.

The mean gravel content of the mineral deposits for the whole block is low (<1 per cent), sand being the dominant resource. The more gravelly deposits occur where the Glacial Sand and Gravel is thick, for example in borehole NW 9 [6051 2946] (Tables 5 and 6). The mean grading for the block is fines 6 per cent, sand 83 per cent and gravel 11 per cent.

Block B

This block extends from Lindsell [643 271] in the west to the eastings grid line 67 in the east, and from the northern margin of the sheet as far south as Bran End [654 253]. The bulk of the sand and gravel, which includes Red Crag, Kesgrave Sands and Gravels and patchy Glacial Sand and Gravel (IMAU borehole NW 32) lies beneath Boulder Clay, except along the Daisley Brooks and Stebbing Brook where mineral crops out. Virtually the whole area has potentially workable sand and gravel deposits except for an area east of Templars [640 280], where overburden is excessive, and in the valley of Stebbing Brook south of Bran End [654 253],

where Alluvium rests upon London Clay. The Boulder Clay is thickest in the north; in IMAU borehole NE 6 [6536 2953] it reaches 17.6 m, but thins towards the valleys. Mineral, however, is consistently 10 m or more in thickness over the whole block.

The mean grading for the block is fines 6 per cent, sand 87 per cent and gravel 7 per cent. As in Block A, sand is the dominant resource, gravel being less abundant overall, although it formed 16 per cent, 12 per cent and 21 per cent respectively in IMAU boreholes NE 11 [6652 2837], NE 12 [6686 2757] and NE 14 [6686 2585] (Tables 5 and 7).

Block C

The whole of block C, which occupies the north-eastern corner of the sheet as far south as Bardfield Saling [686 263], contains potentially workable sand and gravel deposits. These deposits are mostly overlain by Boulder Clay, apart from a small area of Kesgrave Sands and Gravels south of Bluegate Hall [687 293], and outcrops restricted to the minor stream valleys which have cut through the thin cover of overburden.

This block contains the thickest mineral found in the district: both the Kesgrave Sands and Gravels and the Red Crag reach their maximum thickness in this area where they infill a shallow north-eastward-trending trough in the London Clay surface (see diagram on the border of the resource map).

The Boulder Clay is thickest in the area near Tollesburies Farm where IMAU borehole NE 17

[6758 2677] proved 9.9 m, but thins to about 4 or 5 m or less to the north-east; the mean thickness is 5.7 m. Mineral, however, varies from 13.7 m in the south, in IMAU borehole NE 23 [6859 2620] to at least 23.6 m in the north-east, in IMAU borehole NE 25 [6972 2959], which did not reach the base of the sand and gravel, (see Tables 5 and 8). The mean grading is fines 5 per cent, sand 87 per cent, gravel 8 per cent.

Block D

the block occupies a roughly central position on the sheet, extending from Lindsell in the north to Great Dunmow in the south and between the Chelmer on the west and Stebbing Brook on the east. Sand and gravel deposits crop out discontinuously along the valley sides of minor tributaries of the River Chelmer and Stebbing Brook and in small isolated patches in the area south-east of Great Easton. Although most of the sand and gravel in the block is potentially workable, occurrences along the western margin between Bigod's Wood [627 253] and Merks Hill [641 228] and the eastern margin between Throes [658 225] and Bran End [654 253] are impersistent or underlie excessive overburden (see p. 1 for limiting criteria).

The thickest overburden occurs in the north: IMAU boreholes NW 29 [6324 2617] and NW 30 [6390 2515] proved 15.5 m and 16.3 m respectively. In the central southern area of the block, around Tooley's Farm, the recorded thickness of mineral ranges from 4.4 m in IMAU borehole SW 90 [6357 2311] to a maximum of

Table 8 Data from IMAU boreholes: Block C.

Borehole	Recorded thickness (m)		Mean grading percentage					
	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
NE 15	14.5	4.5	11	31	49	6	2	1
NE 16	7.6	17.7	5	24	47	11	10	3
NE 17	10.4	17.7	3	24	45	19	5	4
NE 19	0.3	23.8	6	30	50	9	3	2
NE 20	6.4	+18.6	5	19	50	11	9	6
NE 21	5.3	19.3	7	18	53	11	6	5
NE 22	9.8	14.2	3	17	58	14	6	2
NE 23	4.9	13.7	4	20	67	4	3	2
NE 25	5.4	+23.6	6	21	61	7	3	2
NE 26	5.1	15.3	4	33	41	16	4	2
NE 27	5.8	+20.0	5	43	44	6	2	0
NE 28	3.0	15.1	5	28	58	6	2	1

Table 9 Data from IMAU boreholes: Block D.

Borehole	Recorded thickness (m)		Mean grading percentage					
	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
NW 20		absent						
NW 25	7.2	9.8	9	42	33	7	6	3
NW 29	15.5	9.9	7	27	45	7	8	6
NW 30	16.3	7.8	6	25	48	9	7	5
NW 33	8.0	10.5	6	1	52	12	10	8
NW 34	10.4	7.1	4	21	26	23	12	4
SW 85	0.8	7.5	6	47	33	10	3	1
SW 89	1.7	5.7	16	18	35	16	10	5
SW 90	2.4	4.4	13	20	45	12	8	2
SW 93	10.0	12.1	9	31	33	11	10	6
SW 94	1.5	14.9	10	19	36	14	14	7
SE 26	0.2	7.8	8	29	30	13	8	12
SE 27	0.6	0.5	19	6	17	9	22	27
SE 28	9.7	6.8	6	14	39	21	14	6

Table 10 Data from IMAU boreholes: Block E.

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
NE 18	11.4	13.6	4	18	34	9	19	16
NE 24	9.0	9.8	3	19	45	8	13	12
NE 29	2.8	11.2	6	21	60	5	5	3
SE 32	4.7	11.0	4	32	54	6	3	1
SE 33	1.3	10.3	7	21	45	11	10	6
SE 35	13.0	6.0	5	20	54	12	7	2
SE 36	1.0	9.8	5	14	48	14	14	5
SE 37	4.7	9.2	11	18	52	11	6	2
SE 41	3.5	10.5	4	8	41	10	21	16
SE 45	5.5	10.5	5	23	57	9	4	2
SE 46	9.3	8.4	7	21	50	7	9	6
SE 47	12.8	8.2	5	12	49	12	14	8

Table 11 Data from IMAU boreholes: Block F.

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
NW 13	4.0	1.8	19	7	39	12	16	7
SW 75	2.0	3.1	11	10	29	12	23	15
SW 76	2.0	5.5	5	18	50	10	10	7
SW 77	15.2	1.1	5	28	59	4	2	2
SW 78	7.7	6.1	4	19	40	14	15	8
SW 79	0.9	1.0	16	18	45	12	7	2
SW 81	7.3	4.7	8	10	42	11	13	16
SW 82	5.8	5.2	5	17	32	20	14	12
SW 83	10.4	4.4	3	7	42	13	16	19
SW 84	0.9	8.7	10	7	30	15	25	13
SW 87	1.4	4.5	4	6	36	10	25	19
SW 88	1.6	3.3	5	6	51	12	17	9

14.9 m in IMAU borehole SW 94 [6500 2321]. Both mineral and overburden thin towards the valleys.

The mean grading for the block is fines 8 per cent, sand 77 per cent and gravel 15 per cent. Although the sand grades predominate, the higher proportion of gravel, compared with ground to the north, reflects the stronger development of the gravelly lithology of the Kesgrave Sands and Gravels in this block.

Block E

This block is bounded by Stebbing Brook in the west and the map border in the east; it extends north to Bardfield Saling and south to the A120 (Stane Street). Except in the valley of Stebbing Brook, where London Clay bedrock, Head and Alluvium crop out, this block contains widespread potentially workable sand and gravel deposits which are mainly concealed beneath Boulder Clay. Sand and gravel has been worked at Cowlands Farm Gravel Pits [669 233] but they are now little used. It is estimated that about 0.2 million m³ of mineral has been removed from an area extending to about 5 hectares.

Sand and gravel crops out continuously along the east side of Stebbing Brook valley and in a small patch of ground north-west of Hall Farm [700 258]. The Boulder Clay overburden reaches a maximum proved thickness of 13.0 m in IMAU borehole SE 35 [6799 2486]; the area of thickest Boulder Clay cover extends over the central part of the block from Whitehouse Farm (IMAU borehole NE 18 [6762 2540] to Boxted Wood SE 47 [6922 2389]), and the Boulder Clay thins to the north-east and south-west and is generally less than 5.5 m thick (IMAU

borehole SE 45 [6918 2496]). The mean thickness of the overburden for the block as a whole is 6.6 m (Table 5). Recorded mineral thickness varies from 6.0 m (IMAU borehole SE 35 [6799 2486]) to 13.6 m (IMAU borehole NE 18 [6762 2540]), but is generally between 8 m and 10 m thick. The calculated mean thickness for the block, based on 12 sample points, is 9.9 m. The gravels of the Kesgrave Sands and Gravels are more abundant in this block than in blocks A, B, C and D but sand is still the dominant resource. Block E has a mean grading of fines 5 per cent, sand 78 per cent and gravel 17 per cent (see Tables 5 and 10).

Block F

Block F occupies the south-west part of the resource sheet area. The north-eastern boundary extends from Tilty [600 625] in the north to the area around Sperlings Farm [643 202], skirting around the unassessed area of Great Dunmow.

Potentially workable sand and gravel occurs over a large part of the block but is mostly covered by Boulder Clay; small discontinuous outcrops of mineral are present, mainly along the tributary valleys of the River Chelmer. Alluvium, Head and Boulder Clay resting upon London Clay, as well as outcropping London Clay, comprise the barren ground in the valley of the River Chelmer, whilst in the west, southward of High Wood (IMAU borehole SW 77 [6023 2212]) mineral is thin or absent beneath thick overburden.

The Boulder Clay has a maximum recorded thickness of 15.2 m in IMAU borehole SW 77 but is proved to be

Table 12 Data from IMAU boreholes: Block G.

Borehole	Recorded thickness (m)		Mean grading percentage					
	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
SW 96	1.8	2.5	5	10	45	8	18	14
SE 29	11.7	8.5	5	5	32	17	24	17
SE 30	7.6	1.4	9	7	45	16	19	4
SE 34	7.7	8.0	6	6	38	14	23	13
SE 38	0.9	4.2	8	9	31	12	27	13
SE 39	0.3	1.0	20	5	7	6	28	34
SE 40	1.8	2.0	18	11	46	9	10	6
SE 42	4.0	4.8	14	12	33	8	14	19
SE 43	6.0	1.7	3	4	38	13	25	27
SE 44	5.2	4.0	3	7	25	13	21	21
SE 48	8.3	3.2	16	11	32	7	17	17
SE 49	7.2	6.1	4	6	37	13	24	16
SE 50		absent						
SE 51		absent						

Table 13 Data from IMAU boreholes: Block H.

Borehole	Recorded thickness (m)		Mean grading percentage					
	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
SW 80	1.8	6.2	2	3	22	15	34	24
SW 86	1.7	3.7	7	7	29	11	29	17
SW 91	2.2	6.8	2	4	32	16	27	19
SW 92	0.8	1.1	16	5	22	10	30	17
SE 31	2.5	6.8	7	4	25	18	28	18

much thinner elsewhere (Table 11). South of Great Dunmow and around Little Easton the overburden is generally less than 2 m thick, as in IMAU boreholes SW 87 [6270 2058], SW 88 [6209 2054], SW 75 [6057 2407] and SW 76 [6067 2340]. The mineral ranges between 1.0 m (IMAU borehole SW 79 [6045 2039]) and 8.7 m (IMAU borehole SW 84 [6190 2170]) and has a mean thickness of 4.3 m.

The gravel fraction is much more abundant in the mineral of this block due to the present of both thick Glacial Sand and Gravel as proved in IMAU boreholes SW 81 [6151 2317] and SW 84, and the gravel lithology of the Kesgrave Sands and Gravels. Overall, the mineral in Block F has a mean grading of fines 8 per cent, sand 64 per cent gravel 28 per cent (see Tables 5 and 11).

Block G

Slightly more than half the area of this block which extends south from the A120 road (Stane Street) to the southern boundary of the sheet and as far west as Great Dunmow, contains potentially workable sand and gravel. Small discontinuous outcrops of sand and gravel occur along the margins of the mineral-bearing areas, but, elsewhere in the district, the bulk of the sand and gravel lies beneath Boulder Clay.

The Alluvium, Head and Boulder Clay, which contain no potentially workable sand and gravel, as well as the London Clay bedrock form the barren ground in the valleys. However, in the areas around Bramble End [662 222] and around Bannister Green [698 201] and Watch House [691 211] a thin layer of sand and gravel occurs in places beneath excessive overburden. Some small patches of outcropping sand and gravel are present in the Chelmer valley south and east of Brick House [655 206] but these were not assessed.

Three areas of potentially workable sand and gravel can be defined. Around Little Dunmow overburden ranges in thickness from 1.8 m in IMAU borehole SW 96

[6417 2140], to 11.7 m in IMAU borehole SE 29 [6553 2184], and is thickest north and east of that village. Mineral also is thickest in this area, being 8 m and 8.5 m thick in IMAU boreholes SE 29 and SE 34 [6638 2193] respectively. It thins to the west to 2.5 m in IMAU borehole SW 96.

West of Gransmore Green [695 224] overburden is generally thinner, ranging from 0.9 m in IMAU borehole SE 38 [6760 2227], to 9.8 m in borehole SE 9 just south of Gransmore Green at [6957 2219]. Mineral thicknesses range from 3.2 m in IMAU borehole SE 48 [6909 2264] to 6.1 m in IMAU borehole SE 49 [6931 2189].

In the area around Felsted overburden varies from 0.3 m in IMAU borehole SE 39 [6767 2119] to 5.2 m in IMAU borehole SE 44 [6840 2033], and appears to thicken to the south. Mineral thicknesses range from 1.0 m in IMAU borehole SE 39 to 4.5 m in borehole SE 14 A [6788 2059].

With the exception of the fluvial deposits in block H, the deposits in block G are the most gravel-rich in the district, with a gravel content of 39 per cent. In this block the gravel lithology of the Kesgrave Sands and Gravels has totally replaced the sand lithology. The Red Crag is absent and the mineral belongs entirely to the Kesgrave Sands and Gravels and the Glacial Sand and Gravel; it has a mean grading of fines 10 per cent, sand 51 per cent and gravel 39 per cent (see Tables 5 and 12).

Block H

Block H encompasses the fluvial deposits of the River Chelmer between Fleck Bridge [610 245] in the north and Brick House [656 206]. The block contains potentially workable deposits of sand and gravel throughout except in an area of made ground extending to about two hectares just west of IMAU borehole SE 31 [6518 2042]. The bulk of the mineral is concealed beneath Alluvium, but that comprising the First Terrace (Table 1) is exposed.

The overburden, consisting of Alluvium, Head and simply soil and subsoil, ranges in thickness from 0.8 m in IMAU borehole SW 92 [6381 2060] to 2.5 m in IMAU borehole SE 31 and has a mean thickness of 1.5 m. Mineral varies in thickness from 1.1 m (IMAU borehole SW 92 to 3.7 m (IMAU borehole SW 86 [6291 2312]) in the deposits mapped as First Terrace; and from 1.3 m (borehole SW 1 [6309 2213]) to 6.8 m (IMAU borehole SW 91 [6377 2176]) in the Undifferentiated River Terrace Deposits that underlie alluvial overburden. Although its area is considered small for a meaningful assessment (see Appendix B, note 12), block H has been assessed separately because of the different origin, grading and composition of these fluvial deposits. The assessment has been made using 5 IMAU and 5 ancillary boreholes.

The mean grading for the block is fines 7 per cent, sand 45 per cent and gravel 48 per cent.

REFERENCES

- ALLEN, V. T. 1936. Terminology of medium-grained sediments. **Rep. Natl. Res. Council., Washington, 1935-1936, App. 1, Rep. Comm. Sediment.,** 18-47.
- ARCHER, A. A. 1969. Background and problems of an assessment of sand and gravel resources in the United Kingdom. **Proc. 9th Commonw. Min. & Metall. Congr., 1969, Vol. 2: Mining and petroleum geology,** 495-508.
- 1970a. Standardisation of the size classification of naturally occurring particles. **Geotechnique,** Vol. 20, 103-107.
- 1970b. Making the most of metrication. **Quarry Managers' J.,** Vol. 54, No. 6, 223-227.
- ATTERBERG, A. 1905. Die rationelle Klassifikation der Sande und Kiese. **Chem. Z.,** Vol. 29, 195-198.
- BRITISH STANDARDS INSTITUTION. 1967. **B.S.1377: Methods of testing soils for civil engineering purposes.** (London: British Standards Institution.)
- BUREAU OF MINES AND GEOLOGICAL SURVEY. 1948. Pp. 14-17 in **Mineral resources of the United States.** (Washington, DC: Public Affairs Press.)
- HARRIS, P. M., THURRELL, R. G., HEALING, R. A., and ARCHER, A. A. 1974. Aggregates in Britain. **Proc. R. Soc., Ser. A,** Vol. 339, 329-353.
- HOPSON, P. M. (in press). The sand and gravel resources of the country around Sudbury, Suffolk. Description of 1:25 000 resource sheet TL 84. **Miner. Assess. Rep. Inst. Geol. Sci.;**
- HULL, J. H. 1981. Methods of calculating the volume of resources of sand and gravel. **Appendix** (pp. 192-193) to **THURRELL, R. G.** 1981. Quarry resources and reserves: the identification of bulk mineral resources: the contribution of the Institute of Geological Sciences. **Quarry Management,** for March 1981, 181-193.
- LANE, E. W., and others. 1947. Report of the sub-committee on sediment terminology. **Trans. Am. Geophys. Union,** Vol. 28, 936-938.
- MARKS, R. J. and MERRITT, J. W. 1981. The Sand and gravel resources of the country north-east of Halstead, Essex. Description of 1:25 000 resource sheet TL 83. **Miner. Assess. Rep. Inst. Geol. Sci.,** No 68.
- and Murray, D. W. 1981. The sand and gravel resources of the country around Sible Hedingham, Essex. Description of 1:25 000 resource sheet TL 73. **Miner. Assess. Rep. Inst. Geol. Sci.,** No 82.
- PETTIJOHN, F. J. 1957. **Sedimentary rocks.** 2nd edition. (London: Harper and Row.)
- ROSE, J and ALLEN, P. 1977. Middle Pleistocene stratigraphy in south-east Suffolk. **Q.J. Geol. Soc. London,** Vol. 133, 83-102.
- THURRELL, R. G. 1971. The assessment of mineral resources with particular reference to sand and gravel. **Quarry Managers' J.,** Vol. 55, 19-25.
- 1981. Quarry resources and reserves: the identification of bulk mineral resources: the contribution of the Institute of Geological Sciences. **Quarry Management,** for March 1981, 181-193.
- TWENHOFEL, W. H. 1937. Terminology of the fine-grained mechanical sediments. **Rep. Natl. Res. Council., Washington, 1936-37, App. 1, Rep. Comm. Sediment.,** 81-104.
- UDDEN, J. A. 1914. Mechanical composition of elastic sediments. **Bull. Geol. Soc. Am.,** Vol. 25, 655-744.
- WENTWORTH, C. K. 1922. A scale of grade and class terms for elastic sediments. **J. Geol.,** Vol. 30, 377-392.
- 1935. The terminology of coarse sediments. **Bull. Natl. Res. Council. Washington,** No. 98, 225-246.
- WILLMAN, H. B. 1942. Geology and mineral resources of the Marseilles, Ottawa and Streator quadrangles. **Bull. Illinois State Geol. Surv.,** No. 66, 343-344.

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.

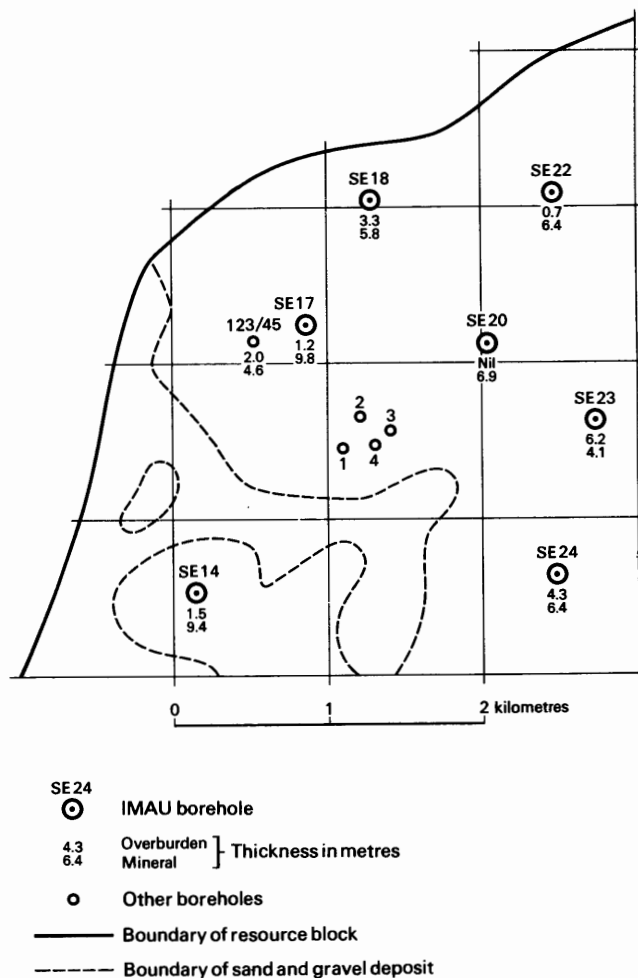
The drilling machine employed should be capable of providing a continuous sample representative of all unconsolidated deposits, so that the in-situ grading can be determined, if necessary, to a depth of 30 m (100 ft) at a diameter of about 200 mm (8 in), beneath different types of overburden. It should 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.



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 km², 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

$$\pm (t/\sqrt{n}) \times S_{\bar{l}_m} \text{ or as a percentage}$$

$$\pm (t/\sqrt{n}) \times S_{\bar{l}_m} \times (100/\bar{l}_m) \text{ per cent, where } t \text{ is}$$

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:

<i>n</i>	<i>t</i>	<i>n</i>	<i>t</i>
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

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

and when *n* is greater than 20, as

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

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 km² and 2 km², 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 km².

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 km²
Mineral: 8.32 km²

Mean thickness
Overburden: 2.5 m
Mineral: 6.5 m

Volume
Overburden: 21 million m³
Mineral: 54 million m³

Confidence limits of the estimate of mineral volume at the 95 per cent probability level: ± 20 per cent
That is, the volume of mineral (with 95 per cent probability): 54 ± 11 million m³

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 $\frac{1}{16}$ 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
$\frac{1}{16}$ 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

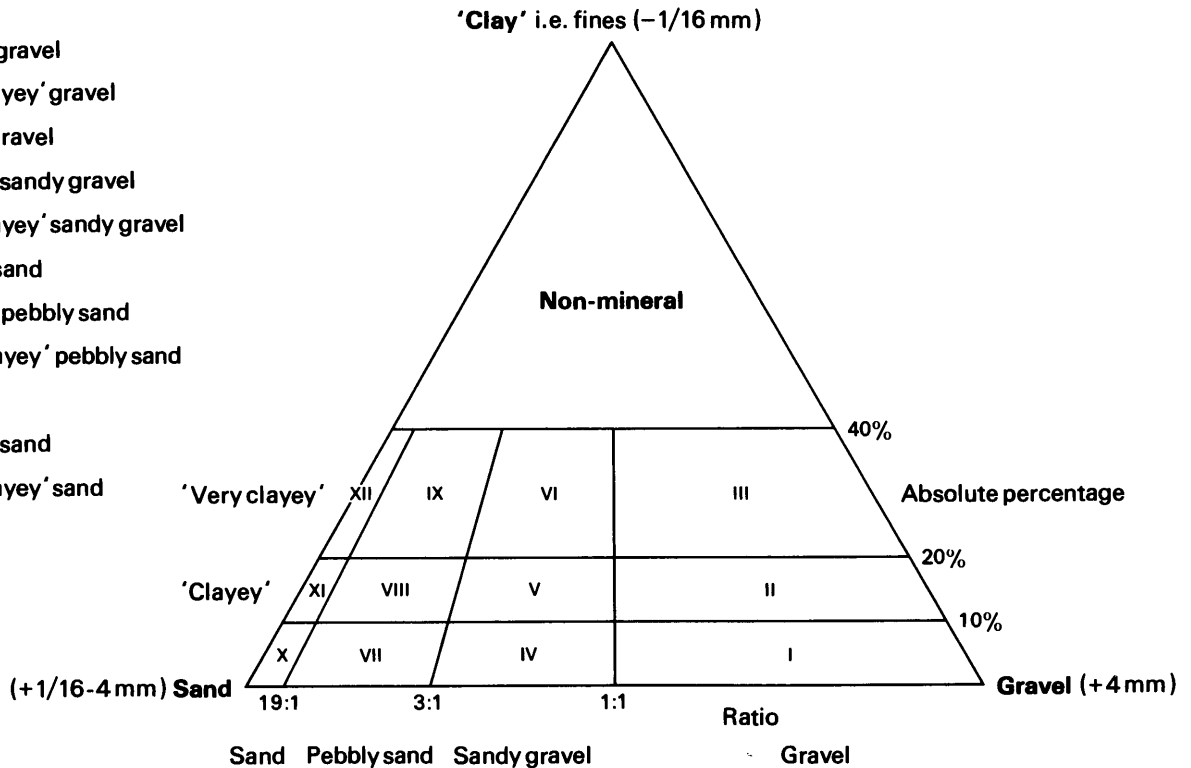


Diagram showing the descriptive categories used in the classification of sand and gravel

APPENDIX D

EXPLANATION OF THE BOREHOLE RECORDS

Annotated fictitious example

CK 66 NW 5¹ 6191 6962² Northfields³

Surface level (+49.7 m) ±163 ft⁴
 Water struck at +45.9 m⁵
 October 1972⁶

Block B

Overburden ⁷ 2.8 m
 Mineral 5.4 m
 Waste 1.1 m
 Mineral 1.4 m
 Bedrock 0.7 m+⁸

LOG

Geological classification	Lithology ⁹	Thickness m	Depth m
	Soil	0.2	0.2
Alluvium	Clay, silty, dark brown	2.6	2.8
River Terrace Deposits	a 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	1.1	9.3
Glacial Sand and Gravel	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

GRADING¹⁰

	Mean for deposit percentages			Depth below ¹¹ 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
a	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
				Mean	5	5	28	13	25	22	2
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
				Mean	5	77	17	1	0	0	0
a+b	5	56	39	Mean	5	20	26	10	20	17	2

COMPOSITION¹²

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
Mean	35	4	51	3	7

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

Unless otherwise stated the borehole was drilled by a shell and auger rig using 152 mm diameter casing. 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 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) and coarse and cobble gravel ($+16$ 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.

11 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.

12 Composition

Details of the composition of selected samples or groups of samples may be given. Where appropriate the calculated weighted mean composition of groups of samples may be quoted.

APPENDIX E
INDUSTRIAL MINERALS ASSESSMENT UNIT BOREHOLE RECORDS

TL 62 NW 8	6069 2993	Hill Farm, Thaxted	Block A	
Surface level +83.1 m			Overburden	24.0 m
Water struck at +51.8 m			Bedrock	7.6 m+
June 1980				
LOG				
Geological classification	Lithology	Thickness m	Depth m	
	Soil	0.9	0.9	
Boulder Clay	Clay, yellowish brown and grey mottled, chalky with some flint, stiff, dry	2.1	3.0	
	Clay, dark greyish brown and grey mottled, chalky with some flint, dry	3.0	6.0	
	Clay, very dark grey, lightening to grey with depth, chalky with some flint, occasional yellowish-brown staining, stiff, dry	18.0	24.0	
Woolwich and Reading Beds	Clay, hard and silty, dark yellowish brown with greenish grey and white flecking with some reddish brown colouration	1.3	25.3	
	Clay, silty, black with red flecking and yellowish brown patches	0.5	25.8	
	Clay, silty, becoming more silty with depth, very dusky yellowish brown with very dark greenish grey, red, and very dark red flecking	1.0	26.8	
	Clay, silty, dusky yellowish green and dark red mottled; green becomes paler with depth, while red becomes brown-red then yellow-olive and, in part, moderate olive brown	1.2	28.0	
Thanet Sand	Very fine silty sand, green and black speckled, glauconitic	0.8	28.8	
	Clay, hard, silty, flaky, greenish brown	0.2	29.0	
	Sand, silty and fine with some clay, dark purplish grey	2.3	31.3	
Upper Chalk	Chalk, soft, white with chalk rubble	0.3+	31.6	
TL 62 NW 9 6051 2946 Buckingham's Farm Block A				
Surface level +91.3 m			Overburden	1.5 m
Water struck at 88.3 m, +84.3 m, +78.3 m, +76.3 m			Mineral	2.5 m
June 1980			Waste	11.7 m
			Mineral	1.0 m+
LOG				
Geological classification	Lithology	Thickness m	Depth m	
	Soil	0.2	0.2	
Boulder Clay	Clay, strong brown, pebbles of angular flint, progressively more sandy	0.5	0.7	
	Clay, brownish yellow, very sandy and silty, many chalk pebbles and pellets	0.8	1.5	

Glacial Sand and Gravel	a 'Clayey' gravel Sand: medium with coarse and fine, quartz and chalk with some flint Gravel: fine with coarse and some cobble, subangular to subrounded chalk and angular flint with some quartz, sandstone, limestone, ironstone, phosphatic nodules and shell debris with a trace of quartzite	2.5	4.0
Boulder Clay	Clay, silty, brownish yellow, pebbles of chalk and some flint, firm becoming stiff	0.8	4.8
	Clay, silty, grey, pebbles of chalk and some flint, becoming stiff	1.5	6.3
	Chalk pug, white, soft, wet	2.0	8.3
	Clay, silty, dark grey, chalk and black shale pebbles, stiff to hard	7.4	15.7
Glacial Sand and Gravel	b 'Clayey' sandy gravel, yellowish brown Sand: coarse with medium and fine, angular flint and rounded chalk with some quartz Gravel: fine with coarse, angular flint with chalk, well rounded flint, sandstone, limestone, ironstone, phosphatic nodules, fossil debris and a trace of quartz	1.0+	16.7

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
a	15	40	45	1.5-2.5 2.5-3.5* 3.5-4.0*	16 14 15	10 6 6	22 17 16	12 14 12	27 23 25	13 24 26	0 2 0
				Mean	15	8	19	13	24	20	1
b	10	46	44	15.7-16.7*	10	6	19	21	25	19	0
a+b	13	41	46	Mean	13	7	19	15	26	20	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
1.5-4.0	37	0	2	trace	1	50	4	2	2	2
15.7-16.7	54	5	trace	0	4	18	8	2	4	5

TL 62 NW 10 6030 2878 Folly Mill Lane Block A

Surface level +86.6 m
Water struck at +78.6 m
June 1980

Overburden 3.1 m
Mineral 9.7 m
Waste 1.0 m
Mineral 1.0 m
Bedrock 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, silty, strong brown, firm, many flint pebbles	0.9	1.3
	Clay, silty, yellowish brown streaked brownish yellow, chalk and some flint pebbles	1.8	3.1
Kesgrave Sands and Gravels	Sand, pebbly with depth, yellowish red in upper 0.6 m then pale yellow, strong brown from 11.0 m, thin clay laminae throughout Sand: medium and fine with a trace of coarse, subrounded to rounded quartz with some mica Gravel: fine with a trace of coarse, mainly angular flint with some quartz	9.7	12.8
	Clay, silty, fine sandy, yellowish brown	1.0	13.8
	Pebbly sand, with thin silty clay laminae Sand: medium with fine and a trace of coarse, mainly quartz with some angular flint Gravel: fine with some coarse, mainly angular flint with some well rounded flint, quartz and quartzite and a trace of sandstone, shale and ironstone	1.0	14.8
London Clay	Clay, very silty, fine sandy, yellowish brown	1.2	16.0
	Clay, silty and very fine sandy, comminuted shell debris, firm, very dark grey	0.5+	16.5

GRADING

Mean for deposit percentages			Depth below surface (m)	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
6	92	2	3.1-4.1	11	41	47	1	0	0	0
			4.1-5.1	9	24	66	1	0	0	0
			5.1-6.1	8	24	67	1	0	0	0
			6.1-7.1	8	26	65	1	0	0	0
			7.1-8.0	9	57	33	1	0	0	0
			8.0-9.0*	6	33	59	2	0	0	0
			9.0-10.0*	3	34	60	1	1	1	0
			10.0-11.0*	3	29	65	2	1	0	0
			11.0-12.0*	4	53	42	1	0	0	0
			12.0-12.8*	3	65	27	5	0	0	0
			13.8-14.8*	5	22	60	4	3	6	0
			Mean	6	36	54	2	1	1	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R							
3.1-14.8	Very small sample								

TL 62 NW 11 6050 2809 North of Wolsey's Farm, Great Easton Block A

Surface level +64.9 m
Water struck at +61.3 m
June 1980

Waste 6.9 m
Bedrock 2.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Alluvium	Clay, silty with fine sand, very dark greyish brown, plant debris	0.9	1.2
Peat	Peat, clayey, silty, very dark brown, fibrous plant debris	3.5	4.7
	Peat, clayey, silty layers of comminuted shell debris, very dark grey	0.3	5.0
	Silt, clayey with fine sand, dark grey, carbonaceous material and shell fragments, soft	1.0	6.0
Undifferentiated River Terrace Deposits	Silt, clayey with fine sand, laminated, small angular flint and chalk pebbles, grey	0.8	6.8
	Gravel, grey Sand: coarse, angular flint and chalk with some medium and fine flint and quartz Gravel: fine with a trace of coarse, angular flint and rounded chalk with a trace of quartz	0.1	6.9
London Clay	Clay, silty, dark greyish brown, many small race nodules, some grey streaking	2.1	9.0
	Clay, silty, very sandy, pyritous, olive grey	0.5+	9.5

TL 62 NW 12 6083 2741 Wolsey's Farm, Great Easton Block A

Surface level +88.6 m
Water struck at +81.5 m and +78.0 m
June 1980

Waste 10.8 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, silty, dark brown to brown, dry, friable, pebbles of flint and some chalk	0.5	0.7
	Clay, silty, grey mottled brown, firm to stiff with pebbles of chalk, some flint and a trace of quartz, some black paper shale	3.3	4.0
	Clay, silty, dark grey, pebbles and pellets of chalk with some flint and black shale	1.0	5.0
	Chalk pug and rubble	0.5	5.5
	Clay, silty, dark grey, pebbles and pellets of chalk with some flint and black shale	0.5	6.0
	Clay, silty, becomes dark yellowish brown and fissured	3.0	9.0
	Clay, silty, greyish brown becoming dark greyish brown: from 9.3 m mottled yellowish brown, and friable from 10.2 m	1.6	10.6

Glacial Sand and Gravel	Gravel, yellowish brown Gravel: coarse with fine and some cobbles, well rounded flint with quartz, quartzite, and angular flint with some chalk and a trace of ironstone Sand: medium with some fine and coarse, subangular to subrounded quartz with angular flint, some ironstone and chalk	0.2	10.8
London Clay	Clay, silty, strong brown, firm	0.5	11.3
	Clay, silty, very dark grey, firm to stiff, greenish black fine sand in pockets	0.2+	11.5

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	
6	37	57	10.6-10.8*	6	9	22	6	20	29	8

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
10.6-10.8	9	51	24	12	0	3	0	1	0	0

TL 62 NW 13	6003 2639	Tilty, Great Easton	Block F	
Surface level +77.1 m			Overburden	4.0 m
Water struck at +71.5 m			Mineral	1.8 m
June 1980			Bedrock	0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, very pebbly, sandy, flints to cobble size	0.2	0.4
	Clay, sandy, silty, yellowish brown, pebbles of flint and quartz with a trace of chalk	1.6	2.0
	Clay, silty, yellowish brown, chalk and some flint pebbles	2.0	4.0
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine with coarse, angular flint and chalk, with well rounded flint and quartzite, with some quartz and limestone and a trace of fossil debris, sandstone and ironstone Sand: medium with coarse and fine, subrounded to well rounded quartz	1.8	5.8
London Clay	Clay, silty, very dark grey, micaceous	0.5+	6.3

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	
19	58	23	4.0-5.0	20	7	28	14	22	9	0
			5.0-5.8	19	7	52	9	9	4	0
			Mean	19	7	39	12	16	7	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
4.0-5.8	33	16	3	7	trace	38	1	trace	trace	0

TL 62 NW 14	6098 2581	Great Easton School	Block A	
Surface level +87.8 m			Overburden	3.8 m
Water struck at +79.2 m			Mineral	7.1 m
June 1980			Bedrock	0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.2	0.2
Boulder Clay	Clay, sandy, silty, brown, chalk increasing with depth, with some flint	3.6	3.8
Kesgrave Sands and Gravels	a 'Clayey' sandy gravel, heavily ironstained in upper 0.4 m, yellowish brown Gravel: fine and coarse, well rounded flint, quartz with angular flint and quartzite. Also some chalk Sand: medium with fine and coarse, subrounded to rounded quartz and some angular flint	2.8	6.6
? Red Crag	b Sand, brown becoming dark orange-brown towards the base, pebbly towards base Sand: medium and fine with some coarse, subrounded to rounded quartz with some angular flint Gravel: fine and coarse, well rounded and angular flint	4.3	10.9
London Clay	Clay, silty, rare mica flakes, fine sand in pockets, dark grey	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	
a	11	63	26	3.8-4.8	14	8	60	7	9	2	0
				4.8-5.8	10	12	39	10	16	13	0
				5.8-6.6	7	8	34	9	18	24	0
				Mean	11	10	44	9	14	12	0
b	7	90	3	6.6-7.6	9	34	51	3	2	1	0
				7.6-8.6	12	28	52	7	1	0	0
				8.6-9.6*	5	32	47	10	4	2	0
				9.6-10.9*	3	30	57	8	2	0	0
				Mean	7	31	52	7	2	1	0
a+b	8	80	12	Mean	8	23	49	8	7	5	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
3.8-6.6	22	36	31	8	2	1	0	0	0	0
6.6-10.9	Very small sample									

TL 62 NW 15	6136 2943	Dovehouse Farm, Thaxted	Block A	
Surface level +89.4 m			Overburden	4.7 m
Water struck at +76.4 m			Mineral	10.8 m
June 1980			Bedrock	1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, silty, yellowish brown mottled brownish yellow, pebbles of chalk and some flint, some thin, medium to coarse, chalky sand bands throughout	1.1	1.4
	Clay, silty, to very silty, grey streaked brown becoming darker grey, rounded chalk and some angular flint pebbles with cobbles of chalk and claystone	1.4	2.8
	Clay, fine sandy, silty, yellowish brown becoming mottled pale grey from 3.0 m. Fine pebbles of chalk and some flint	1.9	4.7
Kesgrave Sands and Gravels	a Sand, medium with fine and some coarse, subangular to subrounded quartz with some flint	8.3	13.0
Red Crag	b Sand, medium and fine with some coarse, subrounded quartz with some flint, trace of ironstone, brownish yellow. A few pebbles of well rounded with angular flint and some quartz	2.5	15.5
London Clay	Clay, fine sandy, silty, ochre and grey brown, firm	0.2	15.7
	Clay, fine sandy, silty, micaceous with pyrite and some faint lamination in part, dark greenish grey	0.8+	16.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages								
	Fines	Sand	Gravel		Fines			Gravel					
					-1/8"	+1/8" - 1/4"	+1/4" - 1/2"	+1/2" - 3/4"	+3/4" - 1"	+1" - 1 1/2"	+1 1/2" - 2"	+2" - 4"	
a	8	92	0	4.7-5.7	8	21	71	0	0	0	0	0	0
				5.7-6.7	11	23	63	2	1	0	0	0	
				6.7-7.7	11	43	46	0	0	0	0	0	
				7.7-8.7	9	28	62	1	0	0	0	0	
				8.7-9.8	8	17	74	1	0	0	0	0	
				9.8-10.8	6	12	78	3	0	1	0	0	
				10.8-11.8	7	15	72	5	1	0	0	0	
				11.8-13.0	8	32	58	2	0	0	0	0	
				Mean	8	24	66	2	0	0	0	0	0
				b	3	94	3	13.0-14.0*	4	25	55	11	4
14.0-15.0*	3	37	49					8	2	1	0	0	
15.0-15.5*	3	33	59					4	1	0	0	0	
Mean	3	32	54					8	2	1	0	0	
a+b	7	92	1	Mean	7	26	63	3	1	0	0		

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
4.7-13.0	Very small sample									
13.0-15.5	Very small sample									

TL 62 NW 16	6198 2781	Graces Farm, Great Easton	Block A	
Surface level +90.3 m			Overburden	7.7 m
Water struck at +81.6 m			Mineral	6.7 m
June 1980			Bedrock	0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.4	0.4
Boulder Clay	Clay, silty, brown and grey mottled, chalky	1.6	2.0
	Clay, silty, dark grey mottled dark greyish brown becomes less strongly mottled and more brown with depth to 5.0 m	3.0	5.0
	Clay, silty, dark grey and chalky	1.4	6.4
	Clay, sandy, silty, brownish yellow, brown and grey. Sand, chalk and flint	1.3	7.7
Glacial Sand and Gravel	a 'Clayey' pebbly sand, with clay patches and chalk pug in veins Sand: medium with fine and some coarse, angular to subangular quartz with some flint and chalk Gravel: coarse and fine, angular flint with chalk, limestone, well rounded flint and quartz and with some sandstone and ironstone	2.0	9.7
Kesgrave Sands and Gravels	b Sand medium and fine with coarse, quartz with some flint and opaque minerals, greyish yellowish brown	2.0	11.7
Red Crag	c Pebbly sand, strong orange-brown in colour with iron-cemented sand and ironpan fragments Sand: medium and fine with coarse, subangular to subrounded quartz and some flint Gravel: fine with some coarse, well rounded and angular flint with quartz, some quartzite and sandstone, and a trace of ironstone and pyritised material	2.7	14.4
London Clay	Clay, silty, grey-black	0.4+	14.8

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	
a	11	74	15	7.7-8.7	17	9	49	6	7	12	0	
				8.7-9.7*	5	36	44	4	3	8	0	
				Mean	11	22	47	5	5	10	0	
b	3	97	0	9.7-10.7*	4	38	53	5	0	0	0	
				10.7-11.7*	3	49	39	9	0	0	0	
				Mean	3	43	47	7	0	0	0	
c	3	92	5	11.7-12.7*	5	27	53	12	3	0	0	
				12.7-13.7*	2	28	53	12	5	0	0	
				13.7-14.4*	3	34	46	10	2	5	0	
				Mean	3	29	51	12	4	1	0	
a+b+c	5	89	6	Mean	5	31	50	8	3	3	0	

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
7.7-8.7	63	8	6	0	3	11	8	1	0	0
8.7-9.7	Very small sample									
9.7-11.7	No +8-16 material									
11.7-14.4	Very small sample									

TL 62 NW 17 6191 2722 Nicholl's Farm, Great Easton

Surface level +86.5 m
Water not struck
June 1980

Block A
Waste Bedrock 13.0 m
6.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	1.8	1.8
Boulder Clay	Clay, silty, olive-brown and grey mottled, chalky with some flint, brown patches	1.8	3.6
	Clay, silty, grey, chalky, black paper-shale and greensand erratics	9.4	13.0
London Clay	Clay, silty with some fine sand, very dark blackish brown and black, carbonaceous plant material	6.0+	19.0

TL 62 NW 18 6146 2598 Old Mill, Great Easton

Surface level +96.7 m
Water struck at +81.4 m
June 1980

Block A

Overburden 15.3 m
Mineral 3.1 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Boulder Clay	Clay, fine sandy, silty, yellowish brown with chalk and flint pebbles; becomes mottled yellowish brown and grey at about 1 m	0.4	1.0
	Clay, silty, olive brown and grey to about 5.0 m	4.0	5.0
	Clay, silty, grey mottled and streaked olive-brown becoming dark grey from 6.4 m	10.3	15.3
Glacial Sand and Gravel	a Sandy gravel with some brown clay masses Gravel: coarse and fine with some cobble, angular and well rounded flint with quartzite and quartz some chalk and limestone and a trace of sandstone, ironstone, fossil debris and igneous and metamorphic Sand: medium with fine and coarse, quartz with some flint	1.1	16.4
Red Crag	b Pebbly sand, yellowish brown becoming more pebbly with depth Sand: medium and fine with coarse, subangular to subrounded quartz and some flint, also some opaque grains Gravel: fine and coarse, well rounded flint with angular flint, quartz and quartzite and a trace sandstone and ironstone	2.0	18.4
London Clay	Clay, silty, very dark brown and micaceous, becoming grey-black with depth	0.6+	19.0

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	5	59	36	15.3-16.4*	5	13	36	10	17	15	4	
b	3	90	7	16.4-17.4*	3	36	54	6	1	0	0	
				17.4-18.4*	2	25	39	22	10	2	0	
				Mean	3	31	45	14	6	1	0	
a+b	4	79	17	Mean	4	24	42	13	10	6	1	

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
15.3-16.4	30	38	8	16	1	3	2	1	1	trace
16.4-17.4	Very small sample									
17.4-18.4	24	58	11	6	1	0	0	trace	0	0

TL 62 NW 19 6135 2541 East of the Rectory, Great Easton Block A
 Surface level +81.2 m Waste 7.5 m
 Water not struck Bedrock 11.5 m+
 June 1980

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, yellowish brown and grey mottled, chalky	2.5	2.8
	Clay, olive-grey and grey mottled, chalky	0.7	3.5
	Clay, olive-grey and grey with dark brown weathering patches	1.3	4.8
	Clay, silty, very dark grey, progressively less chalk and flint	2.7	7.5
London Clay	Clay, silty, micaceous, very dark grey to black, laminated in part	11.5+	19.0

TL 62 NW 20 6192 2504 New Farm, Great Easton Block D
 Surface level +83.5 m Waste 19.3 m
 Water struck at +74.3 m Bedrock 0.7 m+
 June 1980

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, yellowish brown and light grey mottled, becoming grey and olive brown, chalky, some flint	1.6	2.0
	Clay, dark grey, chalky with some flint, firm	7.2	9.2
	Chalk, rubble and sand, water-charged	1.8	11.0
	Clay, dark grey, chalky with some flint, firm	4.8	15.8
	Clay, silty, dark greyish brown, chalky	0.7	16.5
	Clay, silty, dark and very dark grey, chalky	1.0	17.5
	Clay, silty, dark brown with dark grey mottling, chalk and flint pebbles and some quartz and some fine sand	1.8	19.3
London Clay	Clay, silty, sandy, micaceous, very dark brown then very dark grey	0.7+	20.0

TL 62 NW 21 6259 2957 Plummer Wood, Thaxted Block A
 Surface level +102.7 m Overburden 15.7 m
 Water struck at +79.4 m Mineral 9.3 m+
 May 1980

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Boulder Clay	Clay, silty, yellowish brown mottled grey with chalk pebbles and pellets, becomes dark greyish brown and dark grey with occasional brown streaks, from 15.3 m weathered yellowish brown	15.2	15.7
Kesgrave Sands and Gravels	a Sand, medium with fine and a trace of coarse, subangular quartz, pale to moderate orange, a trace of fine gravel present; angular flint and quartz	5.0	20.7
Red Crag	b Sand, medium and fine with some coarse, rounded quartz sand, occasionally silty and micaceous with some grey-brown clay laminae, very strong orange-brown	4.3+	25.0

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
a	6	94	0	15.7-16.7	8	17	74	1	0	0	0
				16.7-17.7	5	19	76	0	0	0	0
				17.7-18.1	5	15	79	1	0	0	0
				18.1-19.7	7	18	74	1	0	0	0
				19.7-20.7	6	29	64	1	0	0	0
				Mean	6	20	73	1	0	0	0
b	9	90	1	20.7-21.7	7	22	63	7	1	0	0
				21.7-22.7	7	17	70	5	1	0	0
				22.7-23.7*	7	29	62	2	0	0	0
				23.7-25.0*	16	33	44	6	1	0	0
				Mean	9	26	59	5	1	0	0
a+b	8	92	0	Mean	8	23	66	3	0	0	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the ++8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
Ang. W R									
15.7-20.7									
20.7-25.0									

Very small sample
 Very small sample

TL 62 NW 22 6290 2812 Avesey Wood, Great Easton Block A
 Surface level +98.9 m Overburden 14.3 m
 Water struck at +80.9 m Mineral 12.1 m
 May 1980 Bedrock 0.1 m+

TL 62 NW 23 6280 2749 Dovehouse Farm, Great Easton Block A
 Surface level +84.8 m Overburden 1.5 m
 Water struck at +81.3 m Mineral 7.5 m
 May 1980 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Boulder Clay	Clay, silty, grey mottled dark brown, much chalk as pebbles and pellets, becoming grey at 2.0 m	1.4	2.0
	Clay, silty, becomes grey-brown then grey and brown mottled, chalky	3.0	5.0
	Clay, silty, grey, chalky	9.3	14.3
Kesgrave Sands and Gravels	Sand, pale creamy-white, clay contaminated	0.3	14.6
	a 'Clayey' sand, medium and fine with a trace of creamy-white to pale orange, thin clay laminae throughout, micaceous, silty	4.4	19.0
Red Crag	b Sand, with a few clay laminae, becoming slightly pebbly with depth, trace of fossil debris Sands: medium and fine with some coarse, subangular to rounded quartz, orange becoming more strongly orange with depth Gravel: a little fine with a trace of coarse, dominantly well rounded flint with some angular flint and quartz	7.4	26.4
London Clay	Clay, silty, dark grey, black	0.1+	26.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages							
	Fines	Sand	Gravel		percentages							
					- $\frac{1}{2}$	+- $\frac{1}{4}$	+-1	+1-4	+4-16	+16-64	+64 mm	
a	10	90	0	14.6-15.6	11	30	59	0	0	0	0	0
				15.6-16.6	10	45	45	0	0	0	0	0
				16.6-17.6	16	60	23	1	0	0	0	0
				17.6-18.0	9	26	60	5	0	0	0	0
				18.0-19.0*	5	24	69	1	1	0	0	0
				Mean	10	38	51	1	0	0	0	0
b	3	96	1	19.0-20.0*	4	38	54	4	0	0	0	0
				20.0-21.0*	2	18	69	10	1	0	0	0
				21.0-22.0*	5	21	72	2	0	0	0	0
				22.0-23.0*	3	40	55	2	0	0	0	0
				23.0-24.0*	2	37	51	8	2	0	0	0
				24.0-25.0*	2	26	68	3	1	0	0	0
				25.0-26.0*	3	24	62	7	3	1	0	0
				26.0-26.4*	3	27	57	8	2	3	0	0
				Mean	3	29	62	5	1	0	0	0
a+b	6	93	1	Mean	6	32	57	4	1	0	0	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
14.6-19.0	Very small sample								
19.0-26.4	Very small sample								

LOG

Geological classification	Lithology	Thickness m	Depth m
Kesgrave Sands and Gravels	Soil, clay, silt, and fine sand, dark brown becoming yellowish brown, becomes more silty and sandy with depth, some pebbles of angular flint and quartzite. Some iron stained patches and dendritic manganese stains on grains	1.5	1.5
	a Sand, slightly 'clayey' at top with occasional clay laminae and pebbles of angular and well rounded flint and quartz, slightly micaceous Sand: medium and fine with a trace of coarse, angular to sub-rounded quartz, yellowish brown	4.5	6.0
Red Crag	b Pebbly sand, strong orange-brown in colour - heavily iron stained. Some cobble flint (well rounded) at base Sand: medium and fine with some coarse, subangular to subrounded and rounded quartz with some flint and opaque grains Gravel: a little fine with a trace of coarse, dominantly well rounded flint with some angular flint, quartz and quartzite	3.0	9.0
London Clay	Clay, silty, grey-black	0.5+	9.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					- $\frac{1}{2}$	+- $\frac{1}{4}$	+-1	+1-4	+4-16	+16-64	+64 mm
a	6	93	1	1.5-2.5	9	75	13	3	0	0	0
				2.5-3.5	8	45	43	4	0	0	0
				3.5-4.0	10	57	28	4	1	0	0
				4.0-5.0*	4	49	45	2	0	0	0
				5.0-6.0*	2	35	56	4	1	2	0
				Mean	6	52	38	3	0	1	0
b	2	88	10	6.0-7.0*	1	18	52	17	8	4	0
				7.0-8.0*	2	20	56	15	5	2	0
				8.0-9.0*	4	26	44	15	8	3	0
				Mean	2	21	51	16	7	3	0
a+b	5	90	5	Mean	5	40	42	8	3	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
1.5-6.0	Very small sample								
6.0-9.0	Very small sample								

TL 62 NW 24 6240 2608 Neville's Farm, Millend Green

Block A

Surface level +96.6 m
Water struck at +78.1 m
June 1980

Overburden 18.5 m
Mineral 3.2 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.7	0.7
	Silt, black, organic, ?pond deposits	0.3	1.0
Boulder Clay	Clay, sandy, silty, yellowish brown mottled grey with dark reddish-brown veining, chalky, becomes brown and pale brown, soft and chalky, then dark grey- brown with depth, with chalk rubble	3.0	4.0
	Clay, silty, very dark grey, chalky	14.5	18.5
Kesgrave Sands and Gravels	Pebbly sand, becomes progressively more pebbly with depth, orange-brown to greenish grey Sand: medium with coarse and fine, subangular to rounded quartz with some flint and opaque grains Gravel: fine and coarse, well rounded and angular flint with some quartz and quartzite, also a trace of chalk at top	3.2	21.7
London Clay	Clay, silty, dark grey-black	0.5+	22.2

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	
2	85	13	18.5-19.5*	4	10	61	12	4	9	0
			19.5-20.5*	2	10	61	16	11	0	0
			20.5-21.7*	1	17	50	17	10	5	0
			Mean	2	13	57	15	8	5	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
18.5-21.7	Very small sample								

TL 62 NW 25 6285 2506 Bigods Wood, Great Dunmow

Block D

Surface level +91.3 m
Water struck at +78.7 m
June 1980

Overburden 7.2 m
Mineral 9.8 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, silty, very pale and yellowish brown, becomes mottled grey-brown from about 5 m, abundant chalk pebbles and pellets	6.9	7.1
? Rubified Sol Lessivé	Clay, smooth, rubified, mottled light grey and red, dendritic manganese staining, some occasional chalk pellets	0.1	7.2
Kesgrave Sands and Gravels	a 'Clayey' pebbly sand, pebbly and generally more 'clayey' at top, becoming more sandy and cleaner with depth, occasional clay laminae, also micaceous, pale yellow to strong reddish brown Sand: fine and medium with coarse, subangular to sub-rounded quartz with some flint Gravel: fine and coarse, well rounded flint and quartz with angular flint and quartzite and a trace of sandstone	7.4	14.6
Red Crag	b Sand, medium and fine with coarse, quartz, orange with iron staining, a few pebbles of well rounded flint, angular flint and some quartz and quartzite	2.4	17.0
London Clay	Clay, silty, dark grey-black	0.5+	17.5

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		
a	11	79	10	7.2-8.2	20	8	34	9	17	12	0
				8.2-9.4	10	6	55	14	11	4	0
				9.4-10.2	11	42	44	1	2	0	0
				10.2-11.4	8	36	29	6	13	8	0
				11.4-12.4	10	89	1	0	0	0	0
				12.4-12.6	12	81	6	1	0	0	0
				12.6-13.6*	9	75	14	2	0	0	0
				13.6-14.6*	6	57	31	5	1	0	0
				Mean	11	44	29	6	6	4	0
				b	4	93	3	14.6-15.6*	2	36	44
15.6-16.6*	4	40	45					10	1	0	0
16.6-17.0*	7	39	42					10	2	0	0
Mean	4	38	44					11	3	0	0
a+b	9	82	9	Mean	9	42	33	7	6	3	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
7.2-9.4	12	49	29	10	trace	0	0	0	0
9.4-10.2	Very small sample								
10.2-11.4	26	35	31	8	0	0	0	0	trace
11.4-14.6	Very small sample								
14.6-17.0	Very small sample								

TL 62 NW 26 6403 2902 Duckend Farm, Lindsell

Block B

Surface level +97.4 m
Water struck at +80.2 m
August 1980

Overburden 12.7 m
Mineral 4.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.4	0.4
Boulder Clay	Clay, silty, grey mottled yellowish brown, chalky from 2.1 m, becomes dark greyish brown then grey from about 5 m	9.7	10.1
	Chalk, rafted mass of very soft pug chalk, then brown soft clay	2.6	12.7
Kesgrave Sands and Gravels	Sand: medium and fine with a trace of coarse, subangular to subrounded quartz, yellow to brownish yellow, a few subangular to subrounded flint and quartz pebbles	4.5+	17.2

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
9	91	0	12.7-13.7	9	22	68	1	0	0	0
			13.7-14.7	7	12	80	1	0	0	0
			14.7-15.2	8	25	66	1	0	0	0
			15.2-16.2	11	63	25	1	0	0	0
			16.2-17.2	9	39	51	1	0	0	0
			Mean	9	31	59	1	0	0	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
12.7-17.2	No +8-16 mm material								

TL 62 NW 27 6393 2805 Templars, Lindsell

Block A

Surface level +93.4 m
Water struck at +77.1 m
May 1980

Waste 19.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, brownish yellow and then yellowish brown and grey mottled, stiff and dry	3.6	4.0
	Sand, fine, silty with some clay, yellowish, chalky throughout	0.2	4.2
	Clay, silty, grey, chalky, stiff	8.8	13.0
	Clay, silty, light grey, becoming softer	3.3	16.3
	Chalk, rubble gravel, water-charged	0.4	16.7
	Clay, silty, grey, firm	2.3 +	19.0

TL 62 NW 28 6335 2715 Gallow Wood, Lindsell

Block A

Surface level +97.3 m
Water struck at +80.3 m
May 1980

Overburden 12.2 m
Mineral 12.5 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Boulder Clay	Clay, silty, light yellowish brown mottled light olive grey, chalky, becomes darker brown and grey	5.5	6.0
	Clay, silty, grey, some greyish brown patches, chalk cobbles and masses	2.2	8.2
	Clay, silty, alternating layers of orange fine sandy silts and grey clays	0.8	9.0
	Clay, silty, greyish brown with reddish tinge	1.3	10.3
	Clay, silty, reddened and weathered with dendritic manganese staining, contains some fine sand	0.7	11.0
	Clay, silty, heavily weathered yellowish brown, becomes very friable and sandy, much chalk, silty clay patches, very soft	1.2	12.2
Glacial Sand and Gravel	a 'Very clayey' sandy gravel, dry with silty and clayey layers, orange-brown Gravel: fine and coarse with a trace of cobble, angular flint and chalk with rounded flint, quartz and quartzite and some sandstone, limestone, fossil debris and igneous and metamorphic Sand: medium with coarse and fine-angular to subrounded quartz, flint and chalk	2.0	14.2

Kesgrave Sands and Gravels	b	Pebbly sand: very tightly packed gravelly deposit at top 2 m becoming more sandy with depth, orange brown and orange Sand: medium and fine with coarse, subangular to subrounded quartz and flint Gravel: fine and coarse, angular and well rounded flint and quartz with quartzite and some sandstone, a trace of igneous and metamorphic	7.8	22.0
Red Crag	c	Pebbly sand, orange-brown Sand: medium and fine with coarse, subrounded to rounded quartz with flint, some opaque grains and mica Gravel: fine with some coarse, dominantly well rounded flint with angular flint and quartz and a trace of sandstone, quartzite and lightly cemented iron pan	2.7	24.7
London Clay		Clay, silty, very dark brown, then black	0.7+	25.4

TL 62 NW 29 6324 2617 Dow Wood, Great Easton Block D

Surface level +99.8 m
Water struck at +80.4 m
June 1980

Overburden 15.5 m
Mineral 9.9 m
Bedrock 0.3 m+

LOG		Geological classification	Lithology	Thickness m	Depth m
			Soil	0.2	0.2
		Boulder Clay	Clay, silty, yellowish brown and grey, chalky from about 1 m, manganese stained patches. Becomes darker in colour with depth from about 3.5 m	4.0	4.2
			Clay, silty, olive-grey to grey, with abundant chalk, becoming more grey with depth	6.1	10.3
			Clay, silty, yellowish brown	1.0	11.3
			Clay, silty, grey with yellowish brown patches	4.2	15.5
		Kesgrave Sands and Gravels	a Pebbly sand, orange-brown, reddened in places, deposit becomes finer with depth, gravel content concentrated in top 4 m Sand: medium and fine with coarse, subangular to subrounded quartz and some flint Gravel: fine and coarse, well rounded flint and quartz with angular flint and quartzite and a trace of ironstone, igneous and metamorphic	9.0	24.5
		? Red Crag	b Pebbly sand, orange-brown Sand: fine and medium with coarse, subrounded quartz Gravel: coarse and fine, well rounded flint with some angular flint, quartz and quartzite	0.9	25.4
		London Clay	Clay, silty, dark grey-black	0.3+	25.7

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages									
	Fines	Sand	Gravel		Fines			Sand			Gravel			
					-1	+1/4 - 1/2	+1/2 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm			
a	22	44	34	12.2-13.2	19	6	24	11	23	15	2			
				13.2-14.2	25	8	27	13	30	7	0			
				Mean	22	7	25	12	22	11	1			
b	4	85	11	14.2-15.2	9	4	47	19	17	4	0			
				15.2-16.2	5	5	34	14	23	19	0			
				16.2-17.0	5	21	46	6	11	11	0			
				17.0-18.0*	3	54	42	1	0	0	0			
				18.0-19.0*	3	57	39	1	0	0	0			
				19.0-20.0*	2	66	32	0	0	0	0			
				20.0-21.0*	3	43	49	4	1	0	0			
				21.0-22.0*	3	40	52	4	1	0	0			
				Mean	4	37	42	6	7	4	0			
c	2	89	9	22.0-23.0*	3	33	43	14	7	0	0			
				23.0-24.0*	2	34	34	19	9	2	0			
				24.0-24.7*	3	37	37	16	8	1	0			
				Mean	2	35	38	16	8	1	0			
a+b+c	6	80	14	Mean	6	31	40	9	9	5	0			

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
12.2-14.2	31	21	10	8	2	25	1	0	trace	2
14.2-17.0	33	29	27	8	3	0	0	0	0	trace
17.0-22.0	Very small sample									
22.0-24.7	Very small sample									

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages									
	Fines	Sand	Gravel		Fines			Sand			Gravel			
					-1	+1/4 - 1/2	+1/2 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm			
a	7	79	14	15.5-16.5	7	5	48	14	19	7	0			
				16.5-17.5	4	7	53	10	15	11	0			
				17.5-18.5	6	5	45	16	19	9	0			
				18.5-19.5	30	2	25	10	24	9	0			
				19.5-20.5*	4	18	73	4	1	0	0			
				20.5-21.5*	3	38	50	3	1	5	0			
				21.5-22.5*	6	44	45	2	0	3	0			
				22.5-23.5*	2	57	40	1	0	0	0			
				23.5-24.5*	2	60	37	1	0	0	0			
				Mean	7	26	46	7	9	5	0			
b	4	79	17	24.5-25.4*	4	39	34	6	6	11	0			
a+b	7	79	14	Mean	7	27	45	7	8	6	0			

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
15.5-19.5	19	44	27	10	0	0	0	trace	0	trace
19.5-23.5	Very small sample									
23.5-24.5	2	93	2	3	0	0	0	0	0	0

TL 62 NW 30 6390 2515 Ridley Wood, Great Dunmow

Surface level +94.3 m
Water level not recorded
June 1980

Block D

Overburden 16.3 m
Mineral 7.8 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Boulder Clay	Clay, silty, brownish yellow mottled light grey, becomes darker with depth, chalk pellets and pebbles	6.1	6.7
	Clay, silty, dark grey mottled dark brown	6.8	13.5
	Clay, sandy, silty, yellowish brown, contorted, becoming more sandy and pebbly with depth	1.8	15.3
	Very sandy interlaminated silt and clay	1.0	16.3
Glacial Sand and Gravel	a 'Very clayey' pebbly sand, contains soft clay and silt laminae Sands: medium with fine and coarse, subangular to subrounded quartz Gravel: fine and coarse, angular flint, quartz and well rounded flint with chalk, limestone and trace sandstone, ironstone, fossil debris, igneous and metamorphic	0.5	16.8
Kesgrave Sands and Gravels	b Pebbly sand, orange-brown Sands: medium with fine and coarse, subangular to subrounded quartz and some flint Gravel: coarse and fine, well rounded flint and quartz with quartzite and angular flint and a trace of sandstone	1.9	18.7
Red Crag	c Pebbly sand, slight iron staining, orange-brown Sands: medium and fine with coarse, subrounded quartz sand Gravel: fine with a trace of coarse, well rounded flint with quartz, some angular flint and a trace of sandstone and ironstone	5.4	24.1
London Clay	Clay, silty, dark grey-black	0.4+	24.5

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
a	35	55	10	16.3-16.8	35	18	31	6	8	2	0
b	7	73	20	16.8-17.7	7	7	32	13	27	14	0
				17.7-18.7	6	17	76	1	0	0	0
				Mean	7	12	54	7	13	7	0
c	3	88	9	18.7-19.7	2	14	46	5	11	22	0
				19.7-20.7	6	24	55	9	5	1	0
				20.7-21.7	4	31	55	8	2	0	0
				21.7-22.7	2	43	41	10	4	0	0
				22.7-23.7	3	42	40	13	2	0	0
				23.7-24.1	5	19	48	18	10	0	0
Mean	3	30	49	9	5	4	0				
a+b+c	6	82	12	Mean	6	25	48	9	7	5	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
16.3-16.8	Very small sample								
16.8-17.7	15	36	29	19	1	0	0	0	0
17.7-18.7	Very small sample								
18.7-19.7	19	42	25	14	0	0	0	0	0
19.7-24.1	Very small sample								

TL 62 NW 31 6473 2904 Bustard Green, Lindsell

Surface level +99.5 m
Water struck at +79.5 m
May 1980

Block B

Overburden 14.5 m
Mineral 11.5 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, silty, dark yellowish to yellowish brown mottled grey, chalk and quartzite pebbles, firm	4.9	5.2
	Clay, silty, dark grey, becoming soft from about 7 m to 7.5 m	3.2	8.4
	Clay, sandy, silty, yellowish brown with some grey laminae, chalky with some flint pebbles, becomes more sandy and silty	1.6	10.0
	Clay, silty, laminated and soft, dark greyish brown, becomes very dark greyish brown silt, soft and damp	1.2	11.2
	Silt, clay, stiff, bluey-black	0.4	1.6
	Clay, silty, grey, chalky	2.7	14.3
	Clay, silty, brown, weathered	0.2	14.5
Kesgrave Sands and Gravels	a Sand, medium with fine and a trace of coarse, subangular to rounded quartz, occasional clay laminae and a few flint pebbles, yellow to strong orange	8.5	23.0
Red Crag	b Pebbly sand, strong orange-brown in colour with ironpan and iron staining Sand: medium with coarse and fine subrounded to rounded quartz Gravel: fine and coarse well rounded flint with some angular flint, ironstone and ironpan, quartz and quartzite	3.0	26.0
London Clay	Clay, silty, black	0.2+	26.2

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines			Gravel			
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
a	7	93	0	14.5-15.5	4	8	86	1	1	0	0
				15.5-16.5	7	11	81	1	0	0	0
				16.5-17.5	5	9	82	4	0	0	0
				17.5-18.5	7	12	80	1	0	0	0
				18.5-19.5	9	35	56	0	0	0	0
				19.5-20.0	2	21	76	1	0	0	0
				20.0-21.0*	7	25	67	1	0	0	0
				21.0-22.0*	9	30	60	1	0	0	0
				22.0-23.0*	7	30	59	4	0	0	0
				Mean	7	20	72	1	0	0	0
b	3	88	9	23.0-24.0*	3	18	62	13	4	0	0
				24.0-25.0	3	11	55	25	4	2	0
				25.0-26.0*	3	11	44	26	5	9	2
				Mean	3	13	54	21	5	3	1
a+b	6	92	2	Mean	6	18	67	7	1	1	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
14.5-23.0	Very small sample									
23.0-26.0	Very small sample									

TL 62 NW 32 6377 2772 Daisley Road, Lindsell

Block B

Surface level +93.2 m	Overburden	5.6 m
Water struck at +81.4 m	Mineral	2.0 m
May 1980	Waste	1.0 m
	Mineral	9.5 m
	Bedrock	0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.6	0.6
Boulder Clay	Clay, silty, yellowish brown, brownish yellow mottled grey abundant chalk pebbles and pellets	5.0	5.6
Glacial Sand and Gravel	a 'Clayey' sandy gravel: grey and yellowish brown clay matrix, strong orange colour developed from about 6 m, becomes less 'clayey' downwards Gravel: fine with coarse well rounded flint, quartz, angular flint and quartzite with some chalk and sandstone Sand: medium with coarse and some fine, angular flint and quartz	2.0	7.6
	Clay, silt and fine sandy, yellowish brown	1.0	8.6
Kesgrave Sands and Gravels	b Sand; medium and fine with some coarse subangular to subrounded quartz, pale yellow to strong orange at depth, a few angular and well rounded flint, quartz and quartzite pebbles	5.0	13.6

Red Crag

e Sand; medium and fine with coarse subrounded to rounded quartz, very strongly ironstained, very strong orange, a few fine with coarse pebbles of well rounded and angular flint with some quartz, quartzite and ironstone 4.5 18.1

London Clay

Clay, silty, black 0.4+ 18.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines			Gravel			
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
a	15	49	36	5.6-6.6	20	4	33	19	21	3	0
				6.6-7.6	9	5	23	15	33	15	0
				Mean	15	5	27	17	27	9	0
b	6	93	1	8.6-9.6	7	48	43	2	0	0	0
				9.6-10.6	4	29	56	8	3	0	0
				10.6-11.6	5	12	52	30	1	0	0
				11.6-12.6*	8	44	47	1	0	0	0
				12.6-13.6*	4	25	67	2	2	0	0
				Mean	6	32	52	9	1	0	0
c	3	93	4	13.6-14.6*	2	58	36	3	1	0	0
				14.6-15.6*	4	44	34	17	1	0	0
				15.6-16.6*	2	24	47	16	8	3	0
				16.6-17.6	No grading data available						
				17.6-18.1*	3	19	60	16	2	0	0
				Mean	3	39	41	13	3	1	0
a+b+c	6	85	9	Mean	6	29	44	12	7	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
5.6-7.6	24	38	26	9	2	1	0	0	0	0

TL 62 NW 33 6482 2624 Lashley Hall, Lindsell

Block D

Surface level +81.7 m
Water struck at +70.4 m
May 1980

Overburden 8.0 m
Mineral 10.5 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, silty, very dark greyish brown mottled grey, chalk pebbles and pellets, rare sandstone and shale fragments, becomes dark grey at about 4 m. At about 6 m, fissured with orange staining	6.8	7.0
	Clay, silty, pale yellowish brown with orange-brown staining, becomes very clayey sand with chalk and flint pebbles from 8 m	1.3	8.3
Glacial Sand and Gravel	a 'Clayey' sandy gravel Gravel: coarse and fine angular and well rounded flint with quartz, quartzite and chalk, some sandstone and limestone and a trace of ironstone, igneous and metamorphic Sand: medium with coarse and some fine subangular to subrounded quartz and flint	2.0	10.3
Kesgrave Sands and Gravels	b Sand: medium with fine and some coarse subangular to subrounded quartz, pale yellow to orange, clay laminae occur throughout, a few pebbles of angular and well rounded flint, quartz and quartzite	3.0	13.3
Red Crag	c Pebbly sand, orange to strong orange Sand: medium with coarse and fine subangular to rounded quartz with some opaque material Gravel: fine and coarse well rounded flint with angular flint, quartz and some quartzite and a trace of ironstone and fossil debris	5.2	18.5
London Clay	Clay, brown, sandy and silty, then silty and very dark grey	0.6+	19.1

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Gravel						
					- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
a	14	47	39	8.3-9.3	19	6	31	10	16	18	0
				9.3-9.7	11	4	32	8	18	27	0
				9.7-10.3	7	6	32	11	25	19	0
				Mean	14	5	32	10	19	20	0
b	6	94	0	10.3-11.3	7	8	83	1	1	0	0
				11.3-12.3*	7	8	84	1	0	0	0
				12.3-13.3*	6	10	81	3	0	0	0
				Mean	6	9	83	2	0	0	0
c	3	77	20	13.3-14.3*	2	10	41	11	18	18	0
				14.3-15.3*	6	10	47	11	14	12	0
				15.3-16.3*	3	20	42	16	12	7	0
				16.3-17.3*	2	17	36	32	11	2	0
				17.3-18.3*	3	28	35	27	6	1	0
				18.3-18.5	No grading data available						
				Mean	3	17	41	19	12	8	0
a+b+c	6	76	18	Mean	6	12	52	12	10	8	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat.	Others
	Ang.	W R							nodules	
8.3-10.3	39	26	16	7	3	7	2	trace	0	trace
10.3-13.3	No +8-16 mm material									
13.3-18.5	10	77	11	2	0	0	0	trace	trace	0

TL 62 NW 34 6450 2511 Leaslands Spring, Stebbing

Block D

Surface level +86.8 m
Water struck at +78.3 m
May 1980

Overburden 10.4 m
Mineral 7.1 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, silty, yellowish brown mottled grey and light grey, chalk pebbles and pellets; becomes grey at 2.8 m with occasional brown patches	8.3	8.5
	Chalk and silt rubble band, some fine sand, water-charged	0.1	8.6
	Clay, silty, grey	1.8	10.4
Kesgrave Sands and Gravels	a Sandy gravel Gravel: fine and coarse well rounded flint with angular flint and quartz and a trace of quartzite, igneous and metamorphics Sand: medium with coarse and fine angular to subrounded quartz and some flint	1.6	12.0
Red Crag	b Pebbly sand; strong orange with slight greenish tinge at base Sand: medium with coarse and fine subangular to rounded quartz Gravel: fine and some coarse well rounded flint with some angular flint and quartz	5.5	17.5
London Clay	Clay, silty, black	0.5+	18.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Gravel						
					- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
a	6	61	33	10.4-10.9*	3	3	22	10	29	33	0
				10.9-12.0*	7	9	38	26	17	3	0
				Mean	6	7	33	21	20	13	0
b	4	85	11	12.0-13.0*	8	45	20	18	7	2	0
				13.0-14.0*	4	13	47	27	8	1	0
				14.0-15.0*	3	12	53	27	5	0	0
				15.0-17.0*	2	23	33	26	12	4	0
				17.0-17.5*	2	40	22	22	13	1	0
				Mean	4	25	36	24	9	2	0
a+b	4	80	16	Mean	4	21	36	23	12	4	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W	R							
10.4-10.9	20	33	33	14	trace	trace	0	0	0	trace
10.9-12.0	Very small sample									
12.0-17.5	Very small sample									

TL 62 NE 6	6536 2953	Markwood Farm, Little Bardfield	Block B
Surface level +102.1 m			Overburden 17.6 m
Water struck at +78.8 m			Mineral 7.4 m+
June 1980			

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown, brownish yellow mottled light grey silty with chalk pebbles and some angular flint, becomes olive grey and grey mottled from 4 m and olive grey from 6 m	6.8	7.0
	Clay, dark grey to grey with olive-brown mottling, silty with chalk pebbles and some angular flint	10.6	17.6
Kesgrave Sands and Gravels	Sand, pale yellow becoming pale yellowish brown, rare fine subangular to subrounded flint pebbles in lowest metre, some silty and clayey lenses Sand: medium with fine and some coarse subangular to subrounded quartz	7.4+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	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
6	94	0	17.6-18.6	12	15	72	1	0	0	0
			18.6-19.6	4	13	83	0	0	0	0
			19.6-20.6	4	8	87	1	0	0	0
			20.6-21.6	7	11	80	2	0	0	0
			21.6-22.6	No grading data available						
			22.6-23.3	6	50	43	1	0	0	0
			23.3-24.3*	5	42	52	1	0	0	0
			24.3-25.0*	4	22	69	5	0	0	0
			Mean	6	22	71	1	0	0	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W	R							
17.6-25.0	No +8-16 mm material									

TL 62 NE 7	6551 2900	Brazenhead Farm, Lindsell	Block B
Surface level +97.5 m			Overburden 12.8 m
Water struck at +89.5 m and +83.3 m			Mineral 12.2 m+
May 1980			

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, light grey mottled yellowish brown, silty with rounded chalk pellets and pebbles, becomes more dark brown and grey in colour from 3 m	3.6	4.0
	Chalk, mass of chalk rubble and soft damp putty chalk	1.8	5.8
	Clay, bluish grey, silty, chalk pellets	1.7	7.5
	Clay, grey with ochre brown staining	0.7	8.2
	Silt, yellowish brown, very wet, clayey, sandy with chalk pellets, slurred	0.3	8.5
	Silt, bluish black, laminated	1.1	9.6
	Silt, very dark blackish brown, poorly laminated, becoming more dry	0.9	10.5
	Clay, grey, silty, chalk pellets and pebbles	2.3	12.8
Kesgrave Sands and Gravels	a Sand, orange-brown to pale greyish orange, some small lenses of silty clay; rare pebbles of fine with some coarse angular to well rounded flint and quartz Sand: medium and fine with some coarse subangular to sub-rounded quartz	10.2	23.0
Red Crag	b Pebbly sand, strong orange-brown colour, Sand: medium and fine with coarse subrounded to rounded quartz Gravel: fine well rounded to angular flint and rounded quartz	2.0+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	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
a	8	91	1	12.8-14.0	13	34	51	2	0	0
				14.0-15.0*	13	16	70	1	0	0
				15.0-16.0*	10	17	72	1	0	0
				16.0-17.0*	9	25	64	1	1	0
				17.0-18.0*	12	52	35	1	0	0
				18.0-19.0*	7	58	34	1	0	0
				19.0-20.0*	4	51	44	1	0	0
				20.0-21.0*	3	38	58	1	0	0
				21.0-22.0*	5	36	58	1	0	0
				22.0-23.0*	4	43	40	5	5	3
				Mean	8	37	53	1	1	0
b	3	92	5	23.0-24.0*	3	31	46	15	5	0
				24.0-25.0*	3	33	45	13	6	0
				Mean	3	32	46	14	5	0
a+b	7	92	1	Mean	7	36	53	3	1	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
12.8-23.0	Very small sample								
23.0-25.0	Very small sample								

TL 62 NE 8	6566 2739	Pratts Farm, Lindsell	Block B	
Surface level +91.0 m			Overburden	12.2 m
Water struck at +78.0 m			Mineral	13.0 m+
June 1980				

Geological classification	Lithology	Thickness	Depth
		m	m
	Soil	0.2	0.2
Boulder Clay	Clay, brownish yellow mottled light grey and very pale brown, silty, soft, damp, abundant chalk pellets and pebbles, occasional manganese staining. Becoming light yellowish brown to 6.0 m. Occasional silt erratics, yellowish grey. At 5.4 m, conspicuous reddish brown layer, silty, about 0.05 m thick	5.8	6.0
	Clay, dark grey, silty, chalk pellets and pebbles and some angular flint	5.5	11.5
	Clay, olive-grey, silty	0.2	11.7
	Clay, yellowish brown, silty, weathered	0.5	12.2
Kesgrave Sands and Gravels	a 'Clayey' pebbly sand, grey silt and clay lenses present throughout, micaceous, sand yellow in colour Sand: medium and fine with coarse subangular to subrounded quartz Gravel: coarse and fine angular and well rounded flint and quartz	4.0	16.2
Red Crag	b Pebbly sand, yellowish to orange-brown becoming darker with depth, fragments of iron-cemented sand, micaceous Sand: medium with fine and coarse, subangular to rounded quartz Gravel: fine with coarse well rounded flint with rounded quartz, angular flint and quartzite	9.0+	25.2

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
a	12	83	5	12.2-13.2	3	7	63	8	8	11	0
				13.2-14.2*	13	56	29	2	0	0	0
				14.2-15.2*	16	41	39	4	0	0	0
				15.2-16.2*	15	34	46	5	0	0	0
				Mean	12	34	44	5	2	3	0
b	4	91	5	16.2-17.2*	7	21	50	8	8	6	0
				17.2-18.2*	4	20	66	8	2	0	0
				18.2-19.2*	3	30	56	7	2	2	0
				19.2-20.2*	2	32	40	22	4	0	0
				20.2-21.2*	4	24	55	13	4	0	0
				21.2-22.2*	3	19	56	13	6	3	0
				22.2-23.2*	4	15	49	26	6	0	0
				23.2-24.2*	4	18	47	27	3	1	0
				24.2-25.2*	5	15	52	23	3	0	2
				Mean	4	21	54	16	4	1	0
a+b	6	88	6	Mean	6	25	50	13	4	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
12.2-16.2	Very small sample								
16.2-17.2	10	67	16	7	0	0	0	0	0
17.2-25.2	Very small sample								

TL 62 NE 9	6559 2553	Hornsea Farm, Stebbing	Block B	
Surface level +79.5 m			Overburden	2.4 m
Water struck at +70.3 m			Mineral	10.9 m
July 1980			Bedrock	0.5 m+

Geological classification	Lithology	Thickness	Depth
		m	m
	Soil and made ground	1.2	1.2
Boulder Clay	Clay, pale yellowish brown, silty, sandy, chalk pellets and chalk putty layers	1.2	2.4
Kesgrave Sands and Gravels	a Sand, orange-brown slightly micaceous, rare fine subangular to rounded flint pebbles Sand: fine and medium with some coarse subangular to rounded quartz	4.0	6.4
Red Crag	b Pebbly sand, orange-brown becoming darker with depth and with fragments of iron-cemented sand; becomes green and glauconitic with abundant shell debris from 13 m; maybe silty and micaceous Sand: medium and coarse with fine rounded quartz Gravel: fine with coarse well rounded flint with angular flint and quartz ironstone and shell debris and trace quartzite. Very large flint at 13.3 m	6.9	13.3
London Clay	Clay, grey, silty	0.5+	13.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages								
	Fines	Sand	Gravel		percentages								
					Fines			Sand			Gravel		
	-#	+# -1/2	+1/2 -1		+1 -4	+4 -16	+16 -64	+64 mm					
a	9	91	0	2.4-3.4	11	17	69	3	0	0	0		
				3.4-4.4	10	64	24	2	0	0	0		
				4.4-5.4	10	70	20	0	0	0	0		
				5.4-6.4	7	31	56	4	2	0	0		
				Mean	9	47	42	2	0	0	0		
b	5	81	14	6.4-7.4	7	31	42	13	6	1	0		
				7.4-8.4	8	23	39	22	8	0	0		
				8.4-9.2	9	22	33	23	10	3	0		
				9.2-10.2*	4	13	30	28	21	4	0		
				10.2-11.2*	4	18	29	31	14	4	0		
				11.2-12.2*	3	24	42	23	7	1	0		
				12.2-13.3*	4	12	41	23	14	6	0		
				Mean	5	20	38	23	11	3	0		
a+b	7	84	9	Mean	7	30	38	16	7	2	0		

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
2.4-6.4	Very small sample									
6.4-9.2	Very small sample									
9.2-12.2	10	74	5	trace	0	0	0	6	0	5
12.2-13.3	Very small sample									

TL 62 NE 10 6652 2953 Charity Farm, Little Bardfield

Block B

Surface level +87.1 m	Overburden	3.2 m
Water struck at +78.3 m June 1980	Mineral	12.8 m
	Bedrock	0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	1.0	1.0
Boulder Clay	Clay, yellowish brown mottled light grey silty with very abundant chalk pebbles and pellets. Becomes paler with depth, some manganiferous staining at base	2.2	3.2
Kesgrave Sands and Gravels	a Sand, yellow and orange some iron staining and iron cemented layers. Slightly micaceous Sand: medium and fine with some coarse subangular to subrounded quartz	8.6	11.8
Red Crag	b Pebbly sand, dark orange-brown color with abundant gravel at depth Sand: medium and fine with coarse subangular to subrounded quartz Gravel: fine and coarse well rounded flint with quartz and angular flint	4.2	16.0
London Clay	Clay, dark grey, silty smooth	0.4+	16.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages								
	Fines	Sand	Gravel		percentages								
					Fines			Sand			Gravel		
	-#	+# -1/2	+1/2 -1		+1 -4	+4 -16	+16 -64	+64 mm					
a	6	94	0	3.2-4.2	5	23	72	0	0	0	0		
				4.2-5.2	4	37	59	0	0	0	0		
				5.2-6.2	4	23	71	2	0	0	0		
				6.2-7.2	5	24	69	2	0	0	0		
				7.2-8.2	7	31	61	1	0	0	0		
				8.2-8.8	7	26	64	2	1	0	0		
				8.8-9.8*	10	38	51	1	0	0	0		
				9.8-10.8*	5	53	40	1	1	0	0		
				10.8-11.8*	6	48	44	1	1	0	0		
				Mean	6	34	59	1	0	0	0		
	b	4	84	12	11.8-12.8*	2	40	46	6	4	2	0	
				12.8-13.8*	7	45	33	9	4	2	0		
				13.8-14.8*	6	38	32	16	6	2	0		
				14.8-16.0*	2	14	35	24	15	10	0		
				Mean	4	33	37	14	8	4	0		
a+b		5	91	4	Mean	5	34	52	5	3	1	0	

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
3.2-11.8	Very small sample									
11.8-14.8	Very small sample									
14.8-16.0	7	83	10	0	0	0	0	0	0	0

TL 62 NE 11 6652 2837 Frenches Farm, Great Bardfield

Block B

Surface level +94.5 m	Overburden	13.0 m
Water struck at +81.5 m June 1980	Mineral	16.2 m
	Bedrock	0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, yellowish brown mottled light grey silty, with chalk pebbles	4.6	5.0
	Clay, pale brown soft, damp, very rich in chalk pebbles	0.5	5.5
	Clay, dark greyish brown mottled grey and greyish olive weathered at top, chalk less abundant, becomes grey to dark grey with depth	6.8	12.3
	Clay, dark greyish brown, silty, sandy with some angular flint	0.7	13.0

Kesgrave Sands and Gravels	a Sandy Gravel Gravel: fine and coarse with a trace of cobble well rounded flint and quartz with angular flint and quartzite and a trace of sandstone and chalk Sand: medium and fine with coarse angular to sub-rounded quartz and some flint	6.0	19.0
Red Crag	b Pebbly sand, strong orange-brown with some iron cemented material becomes green from 28.8 m glauconitic with blue green silty clay masses Sand: medium with fine and coarse angular to rounded flint with quartz and some cemented sand and ironpan	10.2	29.2
London Clay	Clay, grey black, soapy, smooth, with involuted sand just below surface	0.4+	29.6

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
a	3	65	32	13.0-14.0*	12	4	22	8	25	29	0
				14.0-15.0*	3	4	57	9	17	10	0
				15.0-16.0*	2	5	67	11	13	1	1
				16.0-17.0*	0	3	31	9	24	33	0
				17.0-18.0*	0	12	41	6	19	21	1
				18.0-19.0*	3	73	20	3	1	0	0
				Mean	3	17	41	7	16	16	0
b	3	91	6	19.0-20.0*	2	20	59	17	2	0	0
				20.0-21.0*	2	19	64	13	2	0	0
				21.0-22.0*	3	28	58	7	3	1	0
				22.0-23.0*	4	22	49	14	10	1	0
				23.0-24.0*	1	22	50	16	8	3	0
				24.0-25.0*	2	29	40	18	6	5	0
				25.0-26.0*	3	19	34	38	5	1	0
				26.0-27.0*	2	18	52	19	7	2	0
				27.0-28.0*	3	20	67	10	0	0	0
				28.0-29.2*	3	15	56	17	3	6	0
				Mean	3	21	53	17	4	2	0
a+b	3	81	16	Mean	3	19	49	13	9	7	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
13.0-18.0	16	47	26	11	trace	trace	0	0	0	0
18.0-19.0	Very small sample									
19.0-29.2	Very small sample									

TL 62 NE 12	6686 2757	Lubberhedges Wood, Stebbing	Block B
Surface level +95.4 m Water struck at +79.3 m June, 1980			Overburden 16.1 m Mineral 9.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Clay, yellowish brown mottled light grey becoming more grey with depth, chalk pellets and pebbles	4.2	4.2
	Clay, grey, olive grey, chalk pellets and pebbles and some flint	4.2	8.4
	Silt, grey, sandy, soft, infrequent chalk and flint pebbles, faintly laminated	2.3	10.7
	Clay, grey, silty, becomes weathered yellowish brown with less chalk from 15.8 m	5.4	16.1
Kesgrave Sands and Gravels	a Pebbly Sand Sand: medium with fine and coarse subangular to subrounded quartz and some flint Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite and a trace of sandstone	8.0	24.1
Red Crag	b Sand, rare pebbles of well rounded flint and some quartz Sand: medium with fine and coarse subangular to rounded quartz	1.0+	25.1

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
a	6	80	14	16.1-17.1*	10	3	59	13	12	3	0
				17.1-18.1*	1	4	37	18	23	17	0
				18.1-19.1*	2	28	47	7	10	6	0
				19.1-20.1*	3	24	40	11	12	10	0
				20.1-21.1*	5	18	62	3	5	7	0
				21.1-22.1*	3	20	65	5	2	5	0
				22.1-23.1*	21	6	72	1	0	0	0
				23.1-24.1*	1	12	86	1	0	0	0
				Mean	6	14	58	8	8	6	0
b	2	96	2	24.1-25.1*	2	11	78	7	2	0	0
a+b	5	83	12	Mean	5	14	61	8	7	5	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
16.1-17.1	Very small sample									
17.1-20.1	15	45	33	7	trace	0	0	0	0	0
20.1-24.1	Very small sample									
24.1-25.1	Very small sample									

TL 62 NE 13 6610 2642 Holts Farm, Stebbing

Surface level +90.0 m
Water struck at +75.7 m
June 1980

Block B

Overburden 10.8 m
Mineral 15.6 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, yellowish brown, brownish yellow mottled grey, silty damp, abundant chalk pellets and pebbles and some soft putty chalk masses	6.0	6.4
	Clay, grey mottled olive grey yellowish brown becoming dark grey with depth silty, less abundant chalk	3.1	9.5
	Clay, dark greyish brown, silty, becoming sandy and weathered small chalk pellets	0.3	9.8
Kesgrave Sands and Gravels	Silt sandy, laminated, pale greyish yellow to orange	1.0	10.8
	a Pebbly sand, yellow orange to very pale grey Sand: medium with fine and coarse angular to rounded quartz and some flint Gravel: fine with coarse well rounded and angular flint with quartz, quartzite and some sandstone	8.5	19.3
Red Crag	b Pebbly sand, very dark greenish black glauconitic, with some mica and abundant shell debris Sand: medium and fine with coarse angular to well rounded quartz with some flint shell debris and glauconite Gravel: fine with coarse well rounded flint with angular flint and quartz	7.1	26.4
London Clay	Clay, brown and grey silty, bioturbated	0.2+	26.6

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					-1 $\frac{1}{16}$	+1 $\frac{1}{16}$ -1 $\frac{1}{4}$	+1 $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	5	86	9	10.8-11.8	12	35	47	2	4	0	0
				11.8-12.8	5	11	78	2	2	2	0
				12.8-13.8	4	9	62	9	15	1	0
				13.8-14.3	16	5	56	12	10	1	0
				14.3-15.3*	6	6	47	12	22	7	0
				15.3-16.3*	5	38	50	5	2	0	0
				16.3-17.3*	3	25	57	10	3	2	0
				17.3-18.3*	2	22	65	10	1	0	0
				18.3-19.3*	1	22	50	18	5	4	0
				Mean	5	20	57	9	7	2	0
b	3	90	7	19.3-20.3*	2	34	24	27	13	0	0
				20.3-21.3*	2	39	25	26	6	2	0
				21.3-22.3*	2	33	33	21	11	0	0
				22.3-23.3*	2	28	41	22	4	3	0
				23.3-24.3*	4	13	66	15	1	1	0
				24.3-25.3*	4	13	59	20	4	0	0
				25.3-26.4*	4	13	53	24	6	0	0
				Mean	3	25	43	22	6	1	0
a+b	4	88	8	Mean	4	22	51	15	7	1	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
10.8-12.8	Very small sample								
12.8-13.8	28	41	20	9	2	0	0	0	0
13.8-14.3	Very small sample								
14.3-15.3	32	28	20	18	2	0	0	0	0
15.3-19.3	Very small sample								
19.3-22.3	16	75	9	0	0	0	0	0	0
22.3-26.4	Very small sample								

TL 62 NE 14 6686 2585 New Barn, Stebbing

Surface level +87.6 m
Water struck at +81.6 m
June 1980

Block B
Overburden 10.0 m
Mineral 12.4 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.8	0.8
Boulder Clay	Clay, pale yellowish brown mottled light grey, becomes darker with depth, silty, abundant chalk pellets and pebbles	4.2	5.0
	Clay, grey dark grey, silty, small chalk pellets and soft masses of putty chalk	4.8	9.8
	Clay, orange brown, very sandy with rounded flint and quartz	0.2	10.0
Kesgrave Sands and Gravels	a Sandy Gravel Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite with trace sandstone and chalk Sand: medium and coarse with some fine subangular to subrounded quartz	5.0	15.0
Red Crag	b Sand, orange-brown, then green from 22.4 m Sand: medium and fine with coarse subangular to rounded quartz with some flint	7.4	22.4
London Clay	Clay, dark grey, silty, smooth, stiff	0.3+	22.7

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages									
	Fines	Sand	Gravel		Fines			Sand				Gravel		
					-10	+10-20	+20-40	+4-16	+16-64	+64 mm	+4-16	+16-64	+64 mm	
a	4	50	46	10.0-11.0*	5	3	31	16	34	11	0			
				11.0-12.0*	4	2	22	13	37	22	0			
				12.0-13.0*	2	2	29	19	30	18	0			
				13.0-14.0*	4	3	38	24	26	5	0			
				14.0-15.0*	5	21	16	13	22	23	0			
				Mean	4	6	27	17	30	16	0			
b	5	92	3	15.0-16.0*	7	35	40	13	5	0	0			
				16.0-17.0*	9	13	69	8	1	0	0			
				17.0-18.0*	4	17	64	7	7	1	0			
				18.0-19.0*	4	53	40	2	1	0	0			
				19.0-20.0*	4	34	58	3	1	0	0			
				20.0-21.0*	5	30	53	11	1	0	0			
				21.0-22.0*	3	19	57	14	2	5	0			
				22.0-22.4*	6	21	58	11	3	1	0			
				Mean	5	28	56	8	2	1	0			
a+b	5	74	21	Mean	5	19	43	12	14	7	0			

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
10.0-15.0	14	40	35	11	trace	trace	0	0	0	trace
15.0-22.4	Very small sample									

TL 62 NE 15 6781 2974 Great Bardfield

Block C

Surface level +86.6 m
Water struck at +75.1 m
August 1980

Overburden 4.5 m
Mineral 14.5 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, dark brown becoming stong brown, silty, some manganiferous staining	1.0	1.4
	Clay, yellowish brown to brownish yellow with some grey mottling and chalk pellets and pebbles	3.1	4.5
Kesgrave Sands and Gravels	a 'Clayey sand', white to yellow-orange with fairly abundant small grey clay lenses Sand: medium and fine with some coarse subangular to rounded quartz with some flint	8.0	12.5
Red Crag	b Pebbly sand, strong-orange brown colour with some iron cemented sand Sand: medium with fine and coarse subangular to rounded quartz and some flint Gravel: fine and coarse well rounded flint with angular flint some quartz and ironstone	6.5	19.0
London Clay	Clay, dark grey silty	0.4+	19.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages									
	Fines	Sand	Gravel		Fines			Sand				Gravel		
					-10	+10-20	+20-40	+4-16	+16-64	+64 mm	+4-16	+16-64	+64 mm	
a	15	85	0	4.5-5.5	21	46	33	0	0	0	0			
				5.5-6.5	5	28	67	0	0	0	0			
				6.5-7.5	6	42	51	1	0	0	0			
				7.5-8.5	7	14	77	1	1	0	0			
				8.5-9.5	8	13	67	12	0	0	0			
				9.5-10.5	7	22	69	1	1	0	0			
				10.5-11.5	24	47	27	1	1	0	0			
				11.5-12.5*	15	36	49	0	0	0	0			
				Mean	15	36	48	1	0	0	0			
b	4	87	9	12.5-13.5*	5	21	70	3	1	0	0			
				13.5-14.5*	4	16	71	8	1	0	0			
				14.5-15.5*	4	20	57	12	2	5	0			
				15.5-16.5*	3	24	40	21	12	0	0			
				16.5-17.5*	3	34	27	21	13	2	0			
				17.5-18.5*	3	11	52	21	9	4	0			
				18.5-19.0*	3	7	63	8	8	11	0			
				Mean	4	20	53	14	6	3	0			
a+b	11	86	3	Mean	11	31	49	6	2	1	0			

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
4.5-12.5	Very small sample									
12.5-16.5	Very small sample									
16.5-17.5	6	87	6	0	0	0	1	0	0	
17.5-18.5	Very small sample									
18.5-19.0	9	88	1	0	0	0	2	0	0	

TL 62 NE 16 6728 2883 Bushett Farm, Great Bardfield

Block C

Surface level +99.3 m
Water struck at +97.3 m and +84.7 m
June 1980

Overburden 7.6 m
Mineral 17.7 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, olive yellowish brown, silty, fine sandy, some angular flints, weathered shot through with plant roots	1.8	2.0
	Clay, pale yellowish brown, silty, chalk and angular flint pebbles soft at 2 m due to water	3.0	5.0
	Clay, grey to dark and olive grey, silty, chalk and angular flint pebbles, becomes lighter grey with depth	2.4	7.4
	Clay, brown, sandy, flint and chalk pebbles some manganiferous staining	0.2	7.6

Kesgrave Sands and Gravels	a	Sandy gravel, 'clayey' in uppermost 1 m Gravel: fine with coarse well rounded flint and quartz with angular flint, quartzite and trace of sandstone Sand: medium with coarse and fine subangular to subrounded quartz and some flint	7.0	14.6
Red Crag	b	Sand, brownish yellow with greenish tinge to 25.0 m then strong greenish olive, occasional pebbly layers, well rounded Sand: medium with coarse and fine subangular to rounded quartz	10.7	25.3
London Clay		Clay, grey, silty	0.6+	25.9

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
a	8	67	25	7.6-8.6	21	24	34	9	9	3	0
				8.6-9.6	8	8	44	16	24	0	0
				9.6-10.6	6	7	74	6	7	0	0
				10.6-11.6	5	5	68	11	10	1	0
				11.6-12.6	4	5	54	14	18	5	0
				12.6-13.6	6	5	29	10	31	19	0
				13.6-14.6	6	4	26	18	33	13	0
				Mean	8	8	47	12	19	6	0
b	4	92	4	14.6-15.6*	2	47	48	3	0	0	0
				15.6-16.6*	4	39	55	2	0	0	0
				16.6-17.6*	2	20	58	7	6	7	0
				17.6-18.6*	4	30	52	10	3	1	0
				18.6-19.6*	3	63	25	7	2	0	0
				19.6-20.6*	3	36	39	14	7	1	0
				20.6-21.6*	4	33	39	15	8	1	0
				21.6-22.6*	5	32	44	15	4	0	0
				22.6-23.6*	4	40	39	12	4	1	0
				23.6-25.0*	7	19	54	19	1	0	0
				25.0-25.3*	No grading data available						
				Mean	4	35	46	11	3	1	0
a+b	5	82	13	Mean	5	24	47	11	10	3	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
7.8-9.6	26	37	28	8	1	0	0	0	0	
9.6-11.6	Very small sample									
11.6-14.6	14	52	25	9	trace	0	0	0	0	
14.6-25.3	Very small sample									

TL 62 NE 17 6758 2677 Tollesburies Farm, Stebbing **Block C**
 Surface level +91.5 m Overburden 10.4 m
 Water struck at +87.5 m and +78.5 m Mineral 17.7 m
 June 1980 Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.5	0.5
Boulder Clay	Clay, yellowish brown mottled grey, light grey, silty, small angular chalk pebbles and some flint	3.5	4.0
	Silt, yellowish to light yellowish brown, very clayey damp laminated, little chalk	1.5	5.5
	Clay, grey dark grey, silty, hard, much fine chalk pellets and one or two large chalk cobbles, becomes sandy from 10.2	4.9	10.4
Kesgrave Sands and Gravels	a Pebbly sand, becomes less pebbly with depth, some small lenses of clayey silt at depth, becomes greenish Sand: medium with fine and coarse angular to rounded quartz with some flint and a trace of chalk in uppermost metre Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite and a trace of chalk	7.0	17.4
Red Crag	b Pebbly sand, pale yellow becoming strong orange micaceous becomes green at 24.3 m and then shelly from 26.4 m Sand: medium fine and coarse angular to rounded quartz and some flint and shell debris Gravel: fine and coarse well rounded flint with angular flint and quartz and friable lithified sediment and shell debris	10.7	28.1
London Clay	Clay, black silty	0.1+	28.2

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
a	4	80	16	10.4-11.4	4	4	35	12	25	20	0
				11.4-12.4	3	4	46	11	17	19	0
				12.4-13.4	5	4	77	9	3	2	0
				13.4-14.4*	5	9	72	6	2	6	0
				14.4-15.4*	7	21	69	3	0	0	0
				15.4-16.4*	3	29	66	1	1	0	0
				16.4-17.4*	No grading data available						
				Mean	4	12	61	7	8	8	0
b	3	91	6	17.4-18.4*	2	18	59	14	4	3	0
				18.4-19.4*	2	22	66	7	1	2	0
				19.4-20.4*	1	27	55	9	4	4	0
				20.4-21.4*	1	40	32	13	8	6	0
				21.4-22.4*	4	48	26	16	5	1	0
				22.4-23.4*	3	27	29	37	4	0	0
				23.4-24.4*	4	17	24	51	4	0	0
				24.4-25.4*	4	28	26	40	2	0	0
				25.4-26.4*	4	50	18	24	4	0	0
				26.4-27.4*	3	28	26	41	2	0	0
				27.4-28.1*	3	37	25	26	7	2	0
				Mean	3	31	35	25	4	2	0
a+b	3	88	9	Mean	3	24	45	19	5	4	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
10.4-17.4	Very small sample									
17.4-28.1	Very small sample									

TL 62 NE 18 6762 2540 Whitehouse Farm, Stebbing Block E

Surface level +92.4 m
Water struck at +80.0 m
June 1980

Overburden 11.4 m
Mineral 13.6 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.8	0.8
Boulder Clay	Clay, brownish yellow mottled light olive grey, silty with chalk pellets and pebbles	7.0	7.8
	Clay, very pale brown becoming light yellowish brown, soft becoming stiff, very chalky, becoming less so with depth	2.8	10.6
	Clay, olive grey mottled dark grey with small chalk pellets	0.8	11.4
Kesgrave Sands and Gravels	a Sandy gravel, 'clayey' at top becoming more gravel rich with depth. Orange-brown colour increases with depth Gravel: fine and coarse with a trace of cobble well rounded flint and quartz with angular flint and quartzite and a trace of sandstone Sand: medium with fine and coarse subangular subrounded quartz and some flint	8.0	19.4
Red Crag	b Pebbly sand, micaceous, becoming green at 21.5 m Sand: medium and fine with coarse quartz some shell debris and glauconite with depth Gravel: fine and coarse well rounded flint with quartz and angular flint and a trace of quartzite ironstone and fossil debris	5.6	25.0
London Clay	Clay, grey black, smooth	0.4+	25.4

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
a	5	52	43	11.4-12.4	15	32	51	1	1	0	0
				12.4-13.4*	10	17	59	2	5	7	0
				13.4-14.4*	6	5	15	9	35	30	0
				14.4-15.4*	1	3	26	11	31	28	0
				15.4-16.4*	1	3	30	13	29	22	2
				16.4-17.4*	1	2	27	11	30	27	2
				17.4-18.4*	1	3	31	13	29	23	0
				18.4-19.4*	2	6	30	13	31	18	0
				Mean	5	9	34	9	24	19	0
b	3	80	17	19.4-20.4*	No grading data available						
				20.4-21.4*	2	54	29	10	2	3	0
				21.4-22.4*	3	31	56	5	4	1	0
				22.4-23.4*	2	31	27	12	14	14	0
				23.4-24.4*	4	27	31	7	15	16	0
				24.4-25.0*	No grading data available						
				Mean	3	36	36	8	9	8	0
a+b	4	61	35	Mean	4	18	34	9	19	16	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
11.4-13.4	Very small sample									
13.4-19.4	16	37	35	10	trace	0	0	0	0	2
19.4-22.4	Very small sample									
22.4-25.0	6	85	6	trace	0	0	0	trace	trace	3

TL 62 NE 19 6877 2945 Bluegate Hall Farm, Great Bardfield Block C

Surface level +83.5 m
Water struck at +73.7 m
August 1980

Overburden 0.3 m
Mineral 23.8 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Kesgrave Sands and Gravels	a 'Clayey' pebbly sand, yellow-brown becoming very much less 'clayey' from 3.8 m, gravel rich from 2.8 m to 4.8 m Sand: medium and fine with some coarse subangular to subrounded quartz with some flint Gravel: coarse and fine with a trace of cobble, well-rounded flint and quartz with angular flint and quartzite and a trace of sandstone	12.5	12.8
Red Crag	b Pebbly sand, orange-brown becoming dark orange-brown from 22.5 m, micaceous, shell debris from 22.5 m Sand: medium and fine with coarse subangular to rounded quartz with some shell debris and flint Gravel: fine with coarse wellrounded and angular flint and quartz with fragments of lithified clay masses and some ironstone and shell debris	11.3	24.1
London Clay	Clay, dark grey, smooth	0.3+	24.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- ³ / ₁₆	+ ¹ / ₁₆ - ¹ / ₄	+ ¹ / ₄ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	10	85	5	0.3-0.8	31	26	40	2	1	0	0
				0.8-1.8	16	31	52	1	0	0	0
				1.8-2.8	17	15	44	7	6	11	0
				2.8-3.8	14	9	50	9	7	11	0
				3.8-4.8	7	20	42	7	10	12	2
				4.8-5.8	8	23	63	2	3	1	0
				5.8-6.8	8	31	61	0	0	0	0
				6.8-7.8	6	55	39	0	0	0	0
				7.8-8.8	7	51	42	0	0	0	0
				8.8-9.8	7	24	67	2	0	0	0
				9.8-10.8*	No grading data available						
				10.8-11.8*	4	26	66	3	1	0	0
				11.8-12.8*	3	74	22	1	0	0	0
				Mean	10	32	50	3	2	3	0
b	2	93	5	12.8-13.8*	3	16	62	15	3	1	0
				13.8-14.8*	3	19	45	24	9	0	0
				14.8-15.8*	4	49	33	11	3	0	0
				15.8-16.8*	2	37	42	13	5	1	0
				16.8-17.8*	2	46	40	10	2	0	0
				17.8-18.8*	1	48	42	7	2	0	0
				18.8-19.8*	2	30	56	7	4	1	0
				19.8-20.8*	3	14	63	13	5	2	0
				20.8-22.0*	3	12	67	17	1	0	0
				22.0-22.8*	2	15	62	19	2	0	0
				22.8-23.8*	2	15	55	23	3	2	0
				23.8-24.1*	4	13	63	16	3	1	0
				Mean	2	27	51	15	4	1	0
a+b	6	89	5	Mean	6	30	50	9	3	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
0.3-1.8	Very small sample									
1.8-2.8	33	40	27	0	0	0	0	0	0	0
2.8-3.8	Very small sample									
3.8-4.8	24	40	26	10	trace	0	0	0	0	0
4.8-12.8	Very small sample									
12.8-24.1	Very small sample									

TL 62 NE 20

6810 2865

Coney Green, Great Bardfield

Block C

Surface level +88.6 m
Water struck at +77.2 m
June 1980

Overburden 6.4 m
Mineral 18.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown flecked grey, chalk and some flint pebbles	6.2	6.4
Kesgrave Sands and Gravels	a Pebbly sand, 'clayey' in places, gravel-rich from 9.4 m to 13.4 m, some small clay lenses and some mica Sand: medium with fine and coarse angular to subrounded quartz and some flint Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite with a trace of sandstone	12.0	18.4
Red Crag	b Pebbly sand, pale yellow becoming strong orange in colour, from 23.2 m becomes green, glauconitic, with fragments of lithified sediment and shell debris Sand: medium and fine with coarse angular to rounded quartz and some flint Gravel: fine and coarse well rounded flint with angular flint and quartz and some quartzite and a trace of ironstone	6.6+	25.0

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
a	5	80	15	6.4-7.4	10	10	69	7	4	0	0
				7.4-8.4	4	11	59	8	11	7	0
				8.4-9.4	5	6	73	7	7	2	0
				9.4-10.4	11	13	42	7	14	13	0
				10.4-11.4	11	13	19	9	29	19	0
				11.4-12.4*	1	6	36	12	27	18	0
				12.4-13.4*	2	9	54	8	16	11	0
				13.4-14.4*	2	24	69	4	1	0	0
				14.4-15.4*	4	12	82	2	0	0	0
				15.4-16.4*	2	11	84	2	1	0	0
				16.4-17.4*	5	30	63	1	1	0	0
				17.4-18.4*	4	55	33	7	1	0	0
				Mean	5	17	57	6	9	6	0
b	3	81	16	18.4-19.4*	3	40	32	12	8	5	0
				19.4-20.4*	1	20	46	23	6	4	0
				20.4-21.4*	4	12	35	23	13	13	0
				21.4-22.4*	2	18	41	23	10	6	0
				22.4-23.4*	No grading data available						
				23.4-24.4*	4	21	37	19	11	8	0
				24.4-25.0*	9	37	23	17	8	6	0
				Mean	3	24	37	20	9	7	0
a+b	5	80	15	Mean	5	19	50	11	9	6	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
6.4-9.4	Very small sample									
9.4-13.4	14	46	28	12	trace	0	0	0	0	
13.4-14.4	Very small sample									
14.4-15.4	25	29	26	16	1	0	0	0	3	
15.4-18.4	Very small sample									
18.4-20.4	Very small sample									
20.4-21.4	8	85	5	2	0	0	0	0	0	
21.4-22.4	Very small sample									
22.4-24.4	10	82	4	3	0	0	0	1	0	
24.4-25.0	Very small sample									

TL 62 NE 21 6807 2837 Coney Green, Great Bardfield

Block C

Surface level +86.6 m
 Water struck at +79.3 m
 July 1980

Overburden 5.3 m
 Mineral 19.3 m
 Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown to brownish yellow, silty with fine sand towards base, chalk pebbles and pellets abundant	5.1	5.3
Glacial Sand and Gravel	a 'Clayey' sandy gravel Gravel: fine and coarse quartz, with angular and well rounded flint, quartzite and limestone Sand: medium with coarse and fine angular to subrounded quartz and some flint	1.0	6.3
Kesgrave Sands and Gravels	b Pebbly sand, greenish tinge Sand: medium with fine and coarse subangular to subrounded quartz Gravel: fine and coarse well rounded flint quartz and angular flint with quartzite	9.0	15.3
Red Crag	c Pebbly sand, greenish tinge with some glauconite coats on flint pebble indentation. Green shelly and glauconitic from 20.3 m Sand: medium and fine with coarse subrounded to rounded quartz and some glauconite Gravel: fine and coarse well rounded flint with angular flint and quartz, some fragments of lithified sediment and shell debris	9.3	24.6
London Clay	Clay, dark blackish grey, silty	0.4+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines		Sand		Gravel		Gravel				
	-#				-#	+# -#	+# -1	+1 -4	+4 -16	+16 -64	+64 mm
a	15	59	26	5.3-6.3	15	5	45	9	13	13	0
b	4	89	7	6.3-7.3	5	5	51	16	18	5	0
				7.3-8.3*	2	8	54	8	18	10	0
				8.3-9.3*	3	21	74	2	0	0	0
				9.3-10.3*	6	20	73	1	0	0	0
				10.3-11.3*	8	39	52	1	0	0	0
				11.3-12.3*	4	27	65	4	0	0	0
				12.3-13.3*	6	15	76	2	1	0	0
				13.3-14.3*	3	22	70	4	1	0	0
				14.3-15.3*	3	25	60	9	3	0	0
				Mean	4	20	64	5	5	2	0
c	3	92	5	15.3-16.3*	3	30	49	15	2	1	0
				16.3-17.3*	3	31	40	23	3	0	0
				17.3-18.3*	2	33	59	5	1	0	0
				18.3-19.3*	4	28	40	26	2	0	0
				19.3-20.3*	2	31	40	18	5	4	0
				20.3-21.3*	3	22	54	16	5	0	0
				21.3-22.3*	3	15	55	20	7	0	0
				22.3-23.3*	6	10	54	22	2	6	0
				23.3-24.6*	3	14	56	19	4	4	0
				Mean	3	24	50	18	3	2	0
a+b+c	7	82	11	Mean	7	18	53	11	6	5	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
5.3-6.3	23	22	36	13	0	0	6	0	0	0
6.3-8.3	27	36	31	6	0	0	0	0	0	0
8.3-15.3	Very small sample									
15.3-24.6	Very small sample									

TL 62 NE 22 6862 2702 Bardfield Saling

Block C

Surface level +90.2 m
 Water struck at +78.2 m
 July 1980

Overburden 9.8 m
 Mineral 14.2 m
 Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, light olive brown, silty, chalk and flint pebbles	0.4	0.6
	Clay, brownish yellow and yellowish brown mottled light grey, silty, small rounded chalk pellets and pebbles, becomes brown and light olive-grey with some grey mottling from 3.0 m	3.1	3.7
	Clay, grey to dark grey and dark greyish brown-olive brown, chalk and some flint pebbles	5.5	9.2
	Clay, greyish white, very sandy, some quartz flint and chalk pebbles	0.6	9.8

Kesgrave Sands and Gravels	a	Pebbly sand, becoming less pebbly with depth, pale yellow Sand: medium with coarse and fine angular to subrounded quartz and some flint Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite and some sandstone	5.0	14.8
Red Crag	b	Pebbly sand, strong orange-brown in colour with some iron cemented sediment, becomes green at 20.5 m with abundant shell debris Sand: medium with fine and coarse subangular to rounded quartz and some flint and shell debris Gravel: fine and coarse rounded to well rounded flint, quartz, and some iron-cemented sediment	9.2	24.0
London Clay		Clay, dark grey, silty, smooth	0.4+	24.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages										
	Fines	Sand	Gravel		Fines			Gravel							
					-16	+16 -1/4	+1/4 -1	+1 -4	+4 -16	+16 -64	+64 mm				
a	4	82	14	9.8-10.8	6	4	54	17	14	5	0				
				10.8-11.8	5	3	44	30	16	2	0				
				11.8-12.8*	1	4	47	23	15	10	0				
				12.8-13.8*	2	9	72	12	3	2	0				
				13.8-14.8*	5	26	67	2	0	0	0				
				Mean	4	9	56	17	10	4	0				
				Mean	3	91	6	14.8-15.8*	2	7	82	6	3	0	0
b	3	91	6	15.8-16.8*	3	22	69	3	3	0	0				
				16.8-17.8*	2	11	80	6	1	0	0				
				17.8-18.8*	3	10	64	10	5	8	0				
				18.8-19.8*	3	23	52	14	7	1	0				
				19.8-20.8*	3	44	40	12	1	0	0				
				20.8-21.8*	4	45	39	9	3	0	0				
				21.8-22.8*	2	30	44	15	8	1	0				
				22.8-24.0*	2	6	53	29	7	3	0				
				Mean	3	22	57	12	4	2	0				
				Mean	3	89	8	Mean	3	17	58	14	6	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
9.8-10.8	15	38	38	5	4	0	0	0	0	0
10.8-11.8	Very small sample									
11.8-12.8	19	36	32	13	0	0	0	0	0	0
12.8-14.8	Very small sample									
14.8-24.0	Very small sample									

TL 62 NE 23	6859 2620	Gentleman's Farm, Bardfield Saling	Block C
Surface level +85.8 m			Overburden 4.9 m
Water struck at +77.4 m			Mineral 13.7 m
July 1980			Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown, silty, rare flints and rotted siltstone erratic	0.7	0.9
	Clay, pale brown and brownish yellow, abundant chalk pellets and pebbles, sandy from about 4.2 m	4.0	4.9
Kesgrave Sands and Gravels	a Pebbly sand, pale greyish to orange-brown Sand: medium with fine and coarse angular to subrounded quartz with some flint Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite and a trace of sandstone	9.5	14.4
Red Crag	b Sand, strong orange-brown, contains shell debris from 16.4 m, some iron-cemented sediment Sand: medium and fine with some coarse quartz and some shell debris	4.2	18.6
London Clay	Clay, dark grey, smooth	0.3+	18.9

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages										
	Fines	Sand	Gravel		Fines			Gravel							
					-16	+16 -1/4	+1/4 -1	+1 -4	+4 -16	+16 -64	+64 mm				
a	5	87	8	4.9-5.9	7	11	73	7	2	0	0				
				5.9-6.9	8	8	74	5	4	1	0				
				6.9-7.9	5	8	45	7	20	15	0				
				7.9-8.4	2	7	41	13	18	19	0				
				8.4-9.4*	4	13	70	9	3	1	0				
				9.4-10.4*	5	16	72	6	1	0	0				
				10.4-11.4*	3	15	75	6	1	0	0				
				11.4-12.4*	4	17	72	5	2	0	0				
				12.4-13.4*	4	19	75	2	0	0	0				
				13.4-14.4*	6	15	78	1	0	0	0				
				Mean	5	13	68	6	5	3	0				
				b	3	97	0	14.4-15.4*	4	27	66	2	1	0	0
								15.4-16.4*	2	30	67	1	0	0	0
16.4-17.4*	3	35	60					1	1	0	0				
17.4-18.6*	2	44	53					1	0	0	0				
Mean	3	35	61					1	0	0	0				
Mean	4	91	5					Mean	4	20	67	4	3	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
4.9-7.9	Very small sample									
7.9-9.4	20	38	29	13	trace	0	0	0	0	0
9.4-14.4	Very small sample									
14.4-18.6	No +8-16 mm material									

TL 62 NE 24 6843 2504 Badoocks, Stebbing

Block E

Surface level +87.3 m
Water struck at +79.3 m
July 1980

Overburden 9.0 m
Mineral 9.8 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Clay, brown, soft, damp	6.5	6.5
	Clay, grey	2.5	9.0
Kesgrave Sands and Gravels	a Sandy gravel Gravel: coarse and fine well rounded flint and quartz with angular flint and quartzite and a trace of sandstone Sand: medium with coarse and fine	5.0	14.0
Red Crag	b Sand, occasional pebbles Sand: medium and fine with coarse	4.8	18.8
London Clay	Clay, dark grey, silty	0.4+	19.2

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		
a	3	52	45	9.0-10.0*	7	7	20	10	28	28	0	
				10.0-11.0*	3	3	29	11	26	28	0	
				11.0-12.0*	2	2	32	12	25	27	0	
				12.0-13.0*	3	3	74	11	6	3	0	
				13.0-14.0*	2	2	30	13	26	27	0	
			Mean	3	3	38	11	22	23	0		
b	4	92	4	14.0-15.0*	4	15	57	10	10	4	0	
				15.0-16.0*	6	32	59	3	0	0	0	
				16.0-17.0*	3	44	50	3	0	0	0	
				17.0-18.0*	3	58	38	1	0	0	0	
				18.0-18.8*	1	18	74	4	3	0	0	
			Mean	4	34	54	4	3	1	0		
a+b	3	72	25	Mean	3	19	45	8	13	12	0	

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W	R							
9.0-14.0	18	42	39	trace	0	0	0	1	0	trace
14.0-18.8	Very small sample									

TL 62 NE 25 6972 2959 Great Lodge Farm, Great Bardfield

Block C

Surface level +86.0 m
Water struck at +70.4 m
July 1980

Overburden 5.4 m
Mineral 23.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, very pale brown, abundant chalk debris	0.9	1.3
	Chalk white, soft, putty chalk with harder pieces	1.2	2.5
	Clay, very pale brown, abundant chalk debris	2.9	5.4
Kesgrave Sands and Gravels	a Pebbly sand, 'clayey' in uppermost metre becoming very much less 'clayey' with depth, gravel-rich in uppermost 3 metres Sand: medium fine with some coarse subangular to subrounded quartz with some flint Gravel: fine and coarse angular flint, quartz and well rounded flint with quartzite and some sandstone	11.0	16.4
Red Crag	b Sand, orange-brown becoming stronger with depth, fragmented iron-cemented sediment present from 23.4 m and shell debris from 26.4 m Some fine with coarse well rounded and angular flint and quartz pebbles present Sand: medium with fine and coarse subrounded to rounded quartz with some flint and shell debris	12.6+	29.0

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		
a	9	85	6	5.4-6.4	30	10	38	6	9	7	0	
				6.4-7.4	7	4	45	12	17	15	0	
				7.4-8.4	6	5	69	6	7	7	0	
				8.4-9.4	6	12	81	1	0	0	0	
				9.4-10.4	4	16	79	1	0	0	0	
				10.4-11.4	5	14	78	2	1	0	0	
				11.4-12.4	8	15	75	2	0	0	0	
				12.4-13.4	14	22	63	1	0	0	0	
				13.4-14.4	5	18	75	2	0	0	0	
				14.4-15.4	4	26	68	2	0	0	0	
				15.4-16.4*	8	62	29	1	0	0	0	
				Mean	9	19	63	3	3	3	0	
	b	3	93	4	16.4-17.4*	4	51	32	8	2	3	0
					17.4-18.4*	4	26	62	7	1	0	0
					18.4-19.4*	6	20	65	6	2	1	0
				19.4-20.4*	2	20	55	12	10	1	0	
				20.4-21.4*	2	17	79	2	0	0	0	
				21.4-22.4*	3	20	76	1	0	0	0	
				22.4-23.4*	2	28	65	4	1	0	0	
				23.4-24.4*	3	17	62	13	3	2	0	
				24.4-25.4*	2	17	52	20	9	0	0	
				25.4-26.4*	5	24	59	9	3	0	0	
				26.4-27.4*	4	12	59	24	1	0	0	
				27.4-28.4*	4	14	64	17	1	0	0	
				28.4-29.0*	3	19	73	5	0	0	0	
				Mean	3	22	61	10	3	1	0	
a+b		6	89	5	Mean	6	21	61	7	3	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
5.4-7.4	30	28	28	13	1	0	0	0	0	0
7.4-16.4	Very small sample									
16.4-29.0	Very small sample									

TL 62 NE 26 6957 2841 Park Hall, Great Bardfield

Block C

Surface level +80.0 m
Water struck at +74.9 m
July 1980

Overburden 5.1 m
Mineral 15.3 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, strong brown becoming yellowish brown, clayey and silty with some sand and some subangular to subrounded flint and quartz pebbles	2.0	2.0
Boulder Clay	Clay, yellowish brown mottled light grey, abundant chalk debris, becomes more grey with depth to 4.9 m and then brown, sandy	3.1	5.1
Kesgrave Sands and Gravels	a Pebbly sand, 'clayey' and gravel-rich in uppermost metre becomes very much less 'clayey' and gravel-rich with depth Sand: medium and fine with coarse subangular to subrounded quartz with some flint Gravel: coarse and fine angular and well rounded flint with quartz some quartzite and ironstone	8.0	13.1
Red Crag	b Pebbly sand, strong orange-brown, very abundant fragmented iron-cemented sediment from 15.1 m to 16.1 m and shell debris from 15.1 m Sand: fine, medium and coarse subangular to rounded quartz with some flint and shell debris Gravel: fine and a trace of coarse well rounded flint and quartz with iron-cemented sediment and shell debris	7.3	20.4
London Clay	Clay, dark grey, smooth, silty	0.4+	20.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					-1/2	+1/2 -1/4	+1/4 -1	+1 -4	+4 -16	+16 -64	+64 mm
a	5	89	6	5.1-6.1*	15	9	26	4	10	34	2
				6.1-7.1*	2	15	78	4	1	0	0
				7.1-8.1*	8	49	40	2	1	0	0
				8.1-9.1*	3	10	75	11	1	0	0
				9.1-10.1*	2	11	74	11	2	0	0
				10.1-11.1*	3	44	50	3	0	0	0
				11.1-12.1*	2	61	34	2	1	0	0
				12.1-13.1*	2	82	15	1	0	0	0
				Mean	5	35	49	5	2	4	0
b	3	90	7	13.1-14.1*	3	44	23	27	3	0	0
				14.1-15.1*	3	24	26	38	8	1	0
				15.1-16.1*	4	17	30	37	12	0	0
				16.1-17.1*	2	31	29	31	7	0	0
				17.1-18.1*	2	29	23	38	8	0	0
				18.1-19.1*	5	42	29	20	4	0	0
				19.1-20.1*	5	36	42	12	5	0	0
				20.1-20.4*	3	25	32	31	9	0	0
				Mean	3	32	29	29	7	0	0
a+b	4	90	6	Mean	4	33	41	16	4	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
5.1-6.1	49	31	15	4	0	0	0	1	0	0
6.1-13.1	Very small sample									
13.1-20.4	Very small sample									

TL 62 NE 27 6916 2815 Foxes Wood, Great Bardfield

Block C

Surface level +84.7 m
Water struck at +74.7 m
July 1980

Overburden 5.8 m
Mineral 20.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown and brownish grey mottled, faintly laminated	0.7	0.9
	Clay, yellow and brownish yellow mottled light grey, silty, moderately abundant chalk pellets and pebbles	4.9	5.8
Kesgrave Sands and Gravels	a Sand, 'clayey' in uppermost metre, becoming less 'clayey' with depth, rare subangular to subrounded flint and quartz pebbles Sand: medium and fine with some coarse subangular to subrounded quartz and some flint	11.0	16.8
Red Crag	b Sand, strong brown in colour then greyish green from 22 m, shell debris present from 24.8 m, rare subrounded to rounded flint pebbles Sand: fine and medium with coarse subrounded to rounded quartz with some shell debris at depth	9.0+	25.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{2}$	+\mathbf{\frac{1}{2}}-\mathbf{\frac{1}{4}}	+\mathbf{\frac{1}{4}}-\mathbf{1}	+1-4	+4-16	+16-64	+64 mm
a	7	92	1	5.8-6.8	26	19	36	5	11	3	0
				6.8-7.8	12	28	57	1	2	0	0
				7.8-8.8	12	83	5	0	0	0	0
				8.8-9.8	12	63	24	1	0	0	0
				9.8-10.8	3	20	75	1	1	0	0
				10.8-11.8*	4	45	50	1	0	0	0
				11.8-12.8*	3	32	64	1	0	0	0
				12.8-13.8*	0	11	84	4	1	0	0
				13.8-14.8*	1	14	79	4	1	1	0
				14.8-15.8*	1	15	81	3	0	0	0
				15.8-16.8*	2	19	71	7	1	0	0
				Mean	7	32	57	3	1	0	0
b	3	94	3	16.8-17.8*	5	34	53	6	2	0	0
				17.8-18.8*	3	32	52	9	2	2	0
				18.8-19.8*	2	62	33	2	1	0	0
				19.8-20.8*	2	66	31	1	0	0	0
				20.8-21.8*	2	80	15	3	0	0	0
				21.8-22.8*	2	89	8	1	0	0	0
				22.8-23.8*	3	92	5	0	0	0	0
				23.8-24.8*	4	37	23	27	7	2	0
				24.8-25.8*	1	21	39	34	3	2	0
				Mean	3	56	29	9	2	1	0
a+b	5	93	2	Mean	5	43	44	6	2	0	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
5.8-6.8	12	27	48	13	trace	0	0	0	0	0
6.8-16.8	Very small sample									
16.8-25.8	Very small sample									

TL 62 NE 28 6953 2750 Four Elms, Bardfield Saling

Block C

Surface level +84.2 m
Water struck at +77.2 m
July 1980Overburden 3.0 m
Mineral 15.1 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	1.3	1.3
Boulder Clay	Clay, brownish yellow mottled light grey with rounded chalk pellets and pebbles, erratic of dark red, fine sand-stone. At 2.9 m becomes very pale brown flint and quartz pebbles sandy	1.7	3.0
Kesgrave Sands and Gravels	a Sand, pale greyish yellow to brownish yellow with greenish tinge at depth. Gravel-rich at top, fine and coarse flint and quartz Sands: medium and fine with some coarse subangular to subrounded quartz with some flint	11.0	14.0

Red Crag

b Pebbly sand, dark orange-brown, shell debris present abundant between 15.0 m and 16.0 m
Sand: medium and fine with coarse subangular to rounded quartz with some comminuted shell debris
Gravel: fine with coarse well rounded flint with quartz and some shell debris

4.1 18.1

London Clay

Clay, dark grey to black, silty smooth

0.4+ 18.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{2}$	+\mathbf{\frac{1}{2}}-\mathbf{\frac{1}{4}}	+\mathbf{\frac{1}{4}}-\mathbf{1}	+1-4	+4-16	+16-64	+64 mm
a	6	92	2	3.0-4.0	14	8	59	3	5	11	0
				4.0-5.0	7	21	72	0	0	0	0
				5.0-6.0	10	16	72	2	0	0	0
				6.0-7.0	9	43	48	0	0	0	0
				7.0-8.0*	13	31	54	1	1	0	0
				8.0-9.0*	4	22	73	1	0	0	0
				9.0-10.0*	2	18	79	1	0	0	0
				10.0-11.0*	2	28	68	2	0	0	0
				11.0-12.0*	3	37	56	3	1	0	0
				12.0-13.0*	2	77	19	2	0	0	0
				13.0-14.0*	1	30	68	1	0	0	0
				Mean	6	30	60	2	1	1	0
b	3	91	6	14.0-15.0*	2	26	65	6	1	0	0
				15.0-16.0*	4	19	45	22	8	2	0
				16.0-17.0*	4	22	44	21	9	0	0
				17.0-18.1*	2	24	49	23	2	0	0
				Mean	3	23	50	18	5	1	0
a+b	5	92	3	Mean	5	28	58	6	2	1	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
3.0-14.0	Very small sample									
14.0-18.1	Very small sample									

TL 62 NE 29 6949 2851 Taborsfield Cottage, Bardfield Saling

Block E

Surface level +84.5 m
Water struck at +78.5 m
July 1980Overburden 2.8 m
Mineral 11.2 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	1.2	1.2
Boulder Clay	Clay, yellowish brown, silty, sandy, becomes more chalk-rich with depth, small chalk pellets, also some flint and quartz pebbles very sandy from 2 m	1.6	2.8

Kesgrave Sands and Gravels	a 'Clayey' pebbly sand, red with grey flecks in uppermost metre becoming yellowish brown with depth, becomes less 'clayey' and less gravel-rich with depth Sand: medium with fine and coarse subangular to rounded quartz with some flint Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite	5.0	7.8
Red Crag	b Sand, yellowish brown to brownish yellow, micaceous Sand: medium and fine with some coarse subrounded to rounded quartz	6.2	14.0
London Clay	Clay, yellowish brown, silty smooth	0.2	14.2
	Clay, dark grey, silty smooth	0.2+	14.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		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					
a	11	73	16	2.8-3.8	18	11	48	5	10	8	0
				3.8-4.8	12	8	27	12	25	16	0
				4.8-5.8	13	7	46	12	15	7	0
				5.8-6.8*	8	42	49	1	0	0	0
				6.8-7.8*	6	17	76	1	0	0	0
			Mean	11	17	50	6	10	6	0	
b	3	96	1	7.8-8.8*	3	13	81	2	1	0	0
				8.8-9.8*	2	11	77	9	1	0	0
				9.8-10.8*	4	23	71	2	0	0	0
				10.8-11.8*	2	28	68	2	0	0	0
				11.8-12.8*	2	45	50	2	1	0	0
				12.8-14.0*	2	28	66	3	1	0	0
				Mean	3	25	68	3	1	0	0
a+b	6	86	8	Mean	6	21	60	5	5	3	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
2.8-3.8	Very small sample								
3.8-4.8	16	38	31	15	0	0	0	0	0
4.8-7.8	Very small sample								
7.8-14.0	Very small sample								

TL 62 SW 75	6057 2407	Little Easton Village Hall	Block F
Surface level +79.6 m			Overburden 2.0 m
Water struck at +74.7 m			Mineral 3.1 m
June 1980			Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, yellowish brown, silty, sandy, many angular flint pebbles with some quartz and quartzite	0.4	0.7
	Clay, yellowish brown, silty stiff	0.6	1.3
	Clay, yellowish brown, silty pebbles of chalk and some flint firm to stiff	0.7	2.0

Glacial Sand and Gravel	'Clayey' sandy gravel, yellowish brown Gravel: fine and coarse angular flint with well rounded flint quartz and chalk with some quartzite sandstone and ironstone and a trace of limestone and fossil debris Sand: medium with coarse and fine, angular flint and quartz	3.1	5.1
London Clay	Clay, yellowish brown, with mica and some pyrite nodules silty	1.0	6.1
	Clay, very dark grey, with mica and pyrite nodules silty	0.2+	6.3

GRADING

Mean for deposit percentages	Depth below surface (m)	percentages								
		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	51	38	2.0-3.0	14	6	17	12	33	18	0
			3.0-4.0	9	5	40	18	19	9	0
			4.0-5.1*	9	18	33	6	16	18	0
			Mean	11	10	29	12	23	15	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
2.0-5.1	55	18	11	4	3	6	trace	7	trace
									1

TL 62 SW 76	6067 2340	Bourchiers Chapel, Little Easton	Block F
Surface level +87.5 m			Overburden 2.0 m
Water struck at +81.6 m			Mineral 5.5 m
June 1980			Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown, pebbles of flint and chalk, firm	1.8	2.0
Kesgrave Sands and Gravels	a Pebbly sand, becomes more sandy with depth to 6.0 m Sand: medium with fine and coarse subrounded to rounded quartz with some angular flint and a trace of dark minerals Gravel: fine and coarse well rounded and angular flint and quartz with quartzite and some sandstone	4.0	6.0
Red Crag	b Pebbly sand Sand: medium and fine with coarse subrounded to rounded quartz with some angular flint Gravel: fine with coarse well rounded flint and quartz with some angular flint and quartzite	1.5	7.5
London Clay	Clay yellowish brown, silty, firm to stiff	0.5	8.0
	Clay, very dark grey, silty with pyrite nodules, stiff	0.4+	8.4

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
a	6	74	20	2.0-3.0	12	6	41	11	17	13	0
				3.0-4.0	6	8	36	11	22	17	0
				4.0-5.0	5	21	61	3	4	6	0
				5.0-6.0	3	23	72	1	1	0	0
				Mean	6	15	52	7	11	9	0
b	3	85	12	6.0-7.0*	2	27	40	20	10	1	0
				7.0-7.5*	3	25	44	13	9	6	0
				Mean	3	27	40	18	9	3	0
a+b	5	78	17	Mean	5	18	50	10	10	7	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
2.0-4.0	29	35	25	8	3	trace	0	0	0	trace
4.0-6.0	Very small sample									
6.0-7.5	Very small sample									

TL 62 SW 77 6023 2212 High Wood, Little Easton

Block F

Surface level +97.4 m
Water struck at +95.7 m, +91.4 m, +88.2 m and +82.2 m
July 1980

Overburden 15.2 m
Mineral 1.1 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, dark yellowish brown, soft, silty with chalk pellets and pebbles	0.4	0.6
	Clay, dark yellowish brown mottled pale grey and grey silty and firm with chalk pellets	1.1	1.7
	Silt, dark yellowish brown, clayey and fine sandy with medium to coarse sand sized chalk pellets. Streaked grey along roots, soft with some race nodules	1.6	3.3
	Clay, dark grey, stiff, silty pellets and pebbles of chalk with rare flint. Chalk very abundant from 4.0 m, clay very friable	2.7	6.0
	Silt, dark grey soft, clayey and fine sandy rare chalk pebbles	0.6	6.6
	Clay, dark grey to greyish brown, silty with pebbles and pellets of chalk with some flint and black and red shale	2.6	9.2

Sandy gravel, fine chalk and flint gravel with some quartz sand 0.1 9.3

Clay, very dark grey to black, silty, stiff and waxy with fine chalk pellets and pebbles and rare black shale and quartz 5.4 14.7

Clay, dark yellowish brown, very sandy pebbly and silty. Flint and quartz pebbles with medium to coarse quartz sand 0.5 15.2

Kesgrave Sands and Gravels Sand, medium and fine with a trace of coarse subangular to subrounded quartz with some flint 1.1 16.3

London Clay Clay, dark yellowish brown silty and firm 0.2 16.5

Clay, very dark grey, silty stiff to hard micaceous with race nodules 0.3+ 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
	5	91	4	15.2-16.3*	5	28	59	4	2	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
15.2-16.3	Very small sample									

TL 62 SW 78 6099 2101 Butleys Lane, Great Dunmow

Block F

Surface level +91.3 m
Water struck at +82.8 m
July 1980

Overburden 7.7 m
Mineral 6.1 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Boulder Clay	Clay, yellowish brown, silty with pellets and pebbles of chalk and some flint, becomes mottled grey from 0.9 m	1.7	1.8
	Silt, dark yellowish brown, streaked grey along roots, silty and fine sandy	0.3	2.1
	Clay, dark yellowish brown mottled light grey becoming darker grey and mottled greyish brown with depth silty with pellets and pebbles of chalk and some flint. Erratic of striated crinoidal limestone at 2.6 m. Becomes more firm with depth	3.6	5.7
	Clay, dark to very dark grey with depth silty with abundant chalk pellets and a trace of flint and black shale stiff becoming hard	1.8	7.5
	Clay, dark brown, silty with flint pebbles and fine chalk pellets	0.2	7.7

Kesgrave Sands and Gravels	a Sandy gravel 'clayey' in uppermost metre, yellow brown Gravel: fine and coarse well rounded flint and quartz with angular flint and some quartzite and sandstone and a trace of chalk Sand: medium and fine with coarse angular to subrounded quartz with angular flint	3.7	11.4
Red Crag	b Pebbly sand, orange-brown in colour Sand: medium and fine with coarse subrounded to rounded quartz Gravel: fine and coarse well rounded flint with angular flint and quartz and some ironstone and quartzite	2.4	13.8
	Clay, very dark greyish brown, silty with pockets of olive coloured sand, pyrite nodules and mica	0.7+	14.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{4}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	6	67	27	7.7-8.7	11	9	23	14	31	12	0
				8.7-9.7*	3	8	48	9	14	18	0
				9.7-10.4*	4	22	41	12	11	10	0
				10.4-11.4*	3	33	50	4	6	4	0
				Mean	6	18	39	10	16	11	0
b	2	82	16	11.4-12.4*	2	20	42	15	13	8	0
				12.4-13.4*	2	19	40	22	15	2	0
				13.4-13.8*	3	25	38	27	6	1	0
				Mean	2	21	41	20	12	4	0
a+b	4	73	23	Mean	4	19	40	14	15	8	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
7.7-11.4	23	37	33	5	2	trace	0	0	0	0
11.4-13.8	25	61	10	1	0	0	0	3	0	0

TL 62 SW 79	6045 2039	Newlands Farm, Little Canfield	Block F
Surface level +84.5 m			Overburden 0.9 m
Water not struck			Mineral 1.0 m
July 1980			Bedrock 5.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, sandy, very pebbly; sand medium and fine with some coarse quartz and flint; with pebbles of quartz and flint	0.5	0.9
Kesgrave Sands and Gravels	'Clayey' pebbly sand yellowish red Sands: medium with fine and coarse rounded to angular flint and some rounded quartz Gravel: fine with coarse well rounded to angular flint and quartz	1.0	1.9

London Clay	Clay, yellowish brown streaked light brownish grey silty with race nodules, firm becoming stiff	4.4	6.3
	Clay, dark brown, silty micaceous with race nodules comminuted shell debris	1.0+	7.3

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
16	75	9	0.9-1.9	16	18	45	12	7	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
0.9-1.9	Very small sample									

TL 62 SW 80	6107 2439	West of Butcher's Pasture, Little Easton	Block H
Surface level +56.5 m			Overburden 1.8 m
Water struck at +54.9 m, +44.5 m and +41.5 m			Mineral 5.2 m
June 1980			Waste 9.5 m
			Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Alluvium	Clay, yellowish brown silty and fine sandy with pebbles of angular flint, soft, becomes very wet from 1.6 m	1.3	1.8
Undifferentiated River Terrace Deposits	a Gravel, 'clayey' in uppermost 0.1 m pale yellowish brown Gravel: fine and coarse angular flint with well rounded flint and quartz and some chalk, quartzite and sandstone with a trace of limestone ironstone and fossil debris Sand: medium and coarse with fine angular flint with rounded chalk and some subrounded quartz and a trace of ironstone	5.2	7.0
	Silt, dark olive grey, clayey with occasional shells and shell fragments and some carbonaceous material	3.5	10.5
	Clay, olive with yellowish red flecking laminated silty and firm, contains plant and comminuted shell debris, dry	4.9	11.9
	Gravel, thin chalk and flint gravel	0.1	12.0
	Peat, dark reddish brown, clayey with twig fragments and shell debris	0.5	12.5
	Silt, pale grey fine sandy with fine and medium sand-sized chalk pellets and rare angular flint pebbles	2.5	15.0

b Gravel	1.0	16.0	Gravel: fine and coarse angular flint with well rounded flint and quartz and some chalk quartzite and sandstone with a trace of limestone, ironstone and fossil debris Sand: medium and coarse with fine angular flint and rounded chalk and some subrounded quartz and a trace of ironstone
Silt, dark grey with dark yellowish brown flecking fine sandy and clayey with pockets of dark greenish grey fine glauconitic sand	0.3	16.3	
Cravel	0.2	16.5	Gravel: fine and coarse angular flint with well rounded flint and quartz and some chalk quartzite and sandstone with a trace of limestone ironstone and fossil debris Sand: medium and coarse with fine angular flint and rounded chalk and some subrounded quartz and a trace of ironstone
Woolwich and Reading Beds	0.5+	17.0	Clay, mottled red, greenish black, yellowish brown and greenish grey, packed with sandy ironstone nodules

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Sand			
					- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	2	39	59	1.8-2.8*	2	2	12	11	31	42	0
				2.8-3.8*	1	2	21	14	37	25	0
				3.8-4.8*	2	3	25	14	32	24	0
				4.8-5.8*	2	4	25	17	34	18	0
				5.8-7.0*	2	3	26	15	32	22	0
				Mean	2	3	22	14	33	26	0
b	5	48	47	15.0-16.0*	5	3	24	21	35	12	0
a+b	2	40	58	Mean	2	3	22	15	34	24	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
1.8-7.0	58	24	9	3	2	4	trace	trace	trace	trace
15.0-16.0	67	10	9	3	3	7	1	0	trace	trace

TL 62 SW 81 6151 2317 North East of Ravens Farm, Little Easton

Block F

Surface level +73.1 m
Water struck at +65.8 m
June 1980

Overburden 7.3 m
Mineral 4.7 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m

Boulder Clay	1.0	1.3	Clay, dark yellowish brown, silty pebbles and pellets of chalk and some flint firm
	2.8	4.1	Clay, dark yellowish brown mottled grey silty with pebbles of chalk and some flint and quartz and pockets of rotten pyrite nodules
	2.7	6.8	Clay, dark grey, silty with pebbles of chalk and flint
	0.5	7.3	Silt, dark yellowish brown, silty and fine sandy
Glacial Sand and Gravel	4.7	12.0	Sandy gravel becomes more gravel-rich with depth with silty clay seam developed between 8.3 m and 10.3 m Gravel: fine and coarse with a trace of cobble angular flint and well-rounded flint quartz and subangular chalk with some limestone fossil and phosphatic debris quartzite and sandstone with a trace of ironstone Sand: medium with coarse and fine angular flint and subrounded chalk with quartz and a trace of ironstone
London Clay	0.6+	12.6	Clay, dark greyish brown, stiff to very hard and waxy, a trace of pyrite nodules with some mica

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Sand			
					- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
	8	63	29	7.3-8.3*	9	6	51	11	13	10	0
				8.3-9.3*	7	19	55	8	6	5	0
				9.3-10.3*	16	11	37	10	13	13	0
				10.3-11.3*	4	7	28	14	19	25	3
				11.3-12.0*	5	8	24	15	18	26	4
				Mean	8	10	42	11	13	15	1

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
7.3-12.6	40	23	19	2	1	9	3	trace	2	1

TL 62 SW 82 6193 2257 South of Newton Hall, Great Dunmow

Surface level +87.7 m
Water struck at +80.4 m
June 1980

Block F

Overburden 5.8 m
Mineral 5.2 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, light yellowish brown, silty with some pebbles of flint and rare chalk	0.5	0.8
	Clay, light yellowish brown, mottled light grey, silty with pebbles of chalk and a trace of flint	3.7	4.5
	Clay, dark grey silty with pebbles and pellets of chalk with some flint and a trace of quartz and black paper shales	1.1	5.6
	Clay, dark brown, silty with chalk pellets	0.2	5.8
Glacial Sand and Gravel	a 'Clayey' sand, brown Sand: medium and fine with a trace of coarse predominantly subrounded quartz with some angular flint and a trace of ironstone	0.3	6.1
Kesgrave Sands and Gravels	b Sandy gravel, becomes more gravel-rich at depth and more micaceous yellowish brown Gravel: fine and coarse well rounded flint with angular flint and rounded quartz and quartzite and some sandstone Sand: medium with coarse and fine subrounded quartz with some angular flint	3.2	9.3
Red Crag	c Pebbly sand, orange-brown Sand: medium and coarse with fine, subrounded to rounded quartz with a trace of ironstone Gravel: fine and coarse well rounded flint with angular flint ironstone and rounded quartz and a trace of sandstone	1.7	11.0
London Clay	Clay, dark yellowish brown, silty, fine sandy stiff	0.4	11.4
	Clay, dark grey, silty waxy fine sandy and micaceous	0.2+	11.6

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					-1/8	+1/8 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
a	16	82	2	5.8-6.1	16	34	47	1	1	1	0
b	6	62	32	6.1-7.1	13	22	19	12	22	12	0
				7.1-7.3	5	7	23	11	24	30	0
				7.3-8.3*	2	5	47	16	17	13	0
				8.3-9.3*	2	16	33	20	14	15	0
				Mean	6	14	32	16	18	14	0
c	2	82	16	9.3-10.3*	2	18	29	37	5	9	0
				10.3-11.0*	2	23	37	20	11	7	0
				Mean	2	20	32	30	8	8	0
				a+b+c	5	69	26	Mean	5	17	32

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W	R							
5.8-6.1	Very small sample									
6.1-9.3	24	42	25	8	1	0	0	0	0	trace
9.3-10.3	Very small sample									
10.3-11.0	20	58	9	0	trace	0	0	13	0	0

TL 62 SW 83 6133 2219 South of Hoglands Wood, Great Dunmow

Surface level +93.7 m
Water struck at +87.9 m and +83.3 m
June 1980

Block F

Overburden 10.4 m
Mineral 4.4 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, light olive brown becomes mottled light greyish brown. From 2.2 m becomes very dark greyish brown mottled light grey silty with pellets and pebbles of chalk and some angular flint	6.1	6.5
	Clay, grey to very dark grey and then very dark greyish brown from 9.5 m silty stiff becoming hard, pellets and pebbles of chalk with rare flints and black shale fragments	3.7	10.2
	Clay, dark yellowish brown, silty and sandy with pockets of medium grained sand, stiff	0.2	10.4
Kesgrave Sands and Gravels	Sandy gravel, pebbly sand at top and gravel from 12.4 m to 14.4 m uppermost 0.2 m medium grained 'clayey' sand Gravel: coarse and fine well rounded flint and rounded quartz with angular flint quartzite and sandstone with a trace of ironstone Sand: medium with coarse and fine subrounded quartz and angular flint with a trace of ironstone and mica at depth	4.4	14.8
London Clay	Clay, strong brown, silty and stiff	0.2	15.0
	Clay, dark grey silty stiff waxy micaceous with some pyritised wood fragments	0.2+	15.2

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					-1/8	+1/8 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
a	3	62	35	10.4-11.4*	6	4	56	12	9	10	3
				11.4-12.4*	3	6	27	15	22	27	0
				12.4-13.4*	2	4	35	12	22	25	0
				13.4-14.4*	1	7	44	15	17	16	0
				14.4-14.8*	3	23	49	10	8	7	0
				Mean	3	7	42	13	16	18	1

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
10.4-14.8	22	38	30	8	2	0	0	trace	0	0

TL 62 SW 84 6190 2170 Stagg's Farm, Great Dunmow

Block F

Surface level +85.1 m	Overburden	0.9 m
Water struck at +78.6 m	Mineral	8.7 m
July 1980	Bedrock	0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, dark yellowish brown, silty, stiff with pebbles of chalk and some angular flint	0.7	0.9
Glacial Sand and Gravel	a 'Clayey' sandy gravel, becomes less 'clayey' and more sandy with depth, yellowish to orange-brown Gravel: fine and coarse well rounded flint and rounded quartz with angular flint and quartzite and some sandstone Sand: medium with coarse and fine subangular to subrounded quartz and some angular flint	4.7	5.6
Kesgrave Sands and Gravels	b Sandy gravel, becoming more gravel-rich and less 'clayey' with depth, uppermost 0.3 m 'clayey' medium to fine quartz sand Gravel: fine and coarse well rounded flint and rounded quartz with angular flint and quartzite and some sandstone Sand: medium and coarse with some fine, subangular quartz with some flint	4.0	9.6
London Clay	Clay, dark yellowish brown, silty firm to stiff Clay, dark grey, silty, stiff and micaceous	0.7+	10.3

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand	Gravel			mm	
			- $\frac{1}{2}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64	mm	
a	16	52	32	0.9-1.9	23	8	19	10	22	18	0
				1.9-2.9	18	7	43	12	16	4	0
				2.9-3.9	13	7	26	10	24	20	0
				3.9-4.6	11	5	31	14	30	9	0
				4.6-5.6	12	9	45	16	14	4	0
				Mean	16	7	33	12	21	11	0
b	3	52	45	5.6-6.1	8	5	25	14	33	15	0
				6.1-7.1*	1	16	21	17	32	13	0
				7.1-8.1*	2	3	31	18	30	15	1
				8.1-9.1*	2	3	27	21	30	14	3
				9.1-9.6*	3	5	22	22	27	21	0
				Mean	3	7	26	19	29	15	1
a+b	10	52	38	Mean	10	7	30	15	25	13	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
0.9-5.6	21	44	27	6	2	0	0	0	0	trace
5.6-9.6	15	44	31	8	2	0	0	0	0	0

TL 62 SW 85 6285 2465 Bigods Hall, Great Dunmow

Block D

Surface level +86.5 m	Overburden	0.8 m
Water struck at +82.0 m	Mineral	7.5 m
June 1980	Bedrock	0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.8	0.8
Kesgrave Sands and Gravels	a Sand, strong orange-brown in uppermost part becoming pale orange-brown with depth to 3.6 m; from 3.6 m dark orange-brown in colour. Sand contains a trace of pebbles of angular to rounded flint Sand: fine and medium with coarse subangular to rounded quartz	5.7	6.5
Red Crag	b Pebbly sand, strong orange-brown in colour with a greenish tinge at the base Sand: medium and fine with coarse subangular to rounded quartz Gravel: fine with coarse well rounded flint with angular flint and some quartz	1.8	8.3
London Clay	Clay, dark grey, silty smooth	0.5+	8.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand	Gravel			mm	
				- $\frac{1}{2}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64	mm
a	7	92	1	0.8-1.8	11	63	21	1	2	2	0
				1.8-2.8	7	90	3	0	0	0	
				2.8-3.6	6	75	15	4	0	0	
				3.6-4.5	8	22	50	20	0	0	
				4.5-5.5*	6	16	54	22	2	0	
				5.5-6.5*	2	50	43	4	1	0	
Mean	7	52	31	9	1	0					
b	3	85	12	6.5-7.5*	2	41	46	7	4	0	0
				7.5-8.3*	3	17	31	27	16	6	0
				Mean	3	30	39	16	9	3	0
a+b	6	90	4	Mean	6	47	33	10	3	1	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
0.8-6.5	Very small sample									
6.5-7.5	Very small sample									
7.8-8.3	14	81	5	0	0	0	0	0	0	0

TL 62 SW 86 6291 2312 St. Mary's Church, Great Dunmow

Block H

Surface level +55.6 m
Water struck at +50.9 m
July 1980

Overburden 1.7 m
Mineral 3.7 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Head	Clay, dark yellowish brown, silty, fine sandy, becoming very sandy and pebbly with depth angular flint pebbles	1.3	1.7
First Terrace	Sandy gravel, 'very clayey' in uppermost metre and 'clayey' from 4.0 m to 4.7 m Gravel: fine and coarse angular flint with well rounded flint and some quartz quartzite and sandstone Sand: medium with coarse and fine subrounded to rounded quartz and angular flint	3.7	5.4
London Clay	Clay, dark grey, silty fine sandy with comminuted shell debris, pyrite nodules and pockets of dark olive fine sand	1.1+	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	
7	47	46	11	6	27	11	29	16	0	
			6	6	28	8	36	16	0	
			10	10	39	9	24	8	0	
			2	6	25	18	22	27	0	
			7	7	29	11	29	17	0	

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
1.7-5.4	68	21	5	3	3	0	0	0	0	trace

TL 62 SW 87 6270 2058 Clapton Hall, Great Dunmow

Block F

Surface level +71.9 m
Water struck at +69.1 m
July 1980

Overburden 1.4 m
Mineral 0.6 m
Waste 0.8 m
Mineral 3.9 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, dark yellowish brown, silty, sandy with abundant chalk and flint pebbles	0.6	0.6
	Clay, yellowish brown mottled grey, silty, very sandy and pebbly, with pebbles of flint and quartz firm to stiff	0.8	1.4
Kesgrave Sands and Gravels	a Sandy gravel,'clayey' in this 0.6 m light yellowish grey Gravel: fine and coarse with a trace of cobble well rounded flint rounded quartz and angular flint with quartzite and a trace of sandstone Sand: medium with coarse and fine subrounded quartz and some flint	0.6	2.0
	Clay, very dark grey, silty very sandy with small subrounded flint fragments soft	0.8	2.8
	b Sandy gravel, slightly 'clayey' in uppermost 0.2 m Gravel: fine and coarse with a trace of cobble well rounded flint rounded quartz and angular flint with quartzite and a trace of sandstone Sand: medium with coarse and fine subrounded quartz and some flint	3.9	6.7
London Clay	Clay, yellowish brown, silty firm becoming stiff	0.4	7.1
	Clay, dark greyish brown, silty micaceous stiff	0.3+	7.4

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	
a	22	53	25	1.4-2.0	22	16	28	9	20	5	0
b	1	52	47	2.8-3.8*	2	7	33	9	27	22	0
				3.8-4.8*	1	3	34	9	30	23	0
				4.8-5.8*	1	4	39	13	22	18	3
				5.8-6.7*	1	3	43	12	23	18	0
				Mean	1	4	37	11	26	20	1
a+b	4	52	44	Mean	4	6	36	10	25	18	1

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
1.4-2.0	30	41	21	8	trace	0	0	0	0	0
2.8-6.7	26	30	30	13	1	0	0	0	0	trace

TL 62 SW 88 6209 2054 Trutons, Great Dunmow

Surface level +78.9 m
Water struck at +76.4 m
July 1980

Block F

Overburden 1.6 m
Mineral 3.3 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Head	Clay, yellowish brown, silty, becoming sandy with depth. Trace of pebbles of rounded flint and fine chalk	1.3	1.6
Kesgrave Sands and Gravels	Sandy gravel, 'clayey' in top metre Gravel: fine and coarse angular flint well-rounded flint and rounded quartz with quartzite and some sandstone Sand: medium with coarse and fine subrounded quartz and some angular flint	3.3	4.9
London Clay	Clay, yellowish brown, silty firm to stiff	0.7	5.6
	Clay, dark grey, silty stiff and micaceous	0.4+	6.0

GRADING

Mean for deposit percentages			Depth below surface (m)	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	
5	69	26	13	10	60	6	9	2	0	
			1	6	59	11	13	10	0	
			2	4	40	16	26	12	0	
			1	4	35	16	26	18	0	
			Mean	5	6	51	12	17	9	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
1.6-2.5	Very small sample								
2.5-4.9	36	25	26	9	3	0	0	0	1

TL 62 SW 89 6334 2392 Marks, Great Dunmow

Surface level +79.1 m
Water struck at +74.8 m
July 1980

Block D

Overburden 1.7 m
Mineral 5.7 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, brown, silty, firm	0.3	0.5
	Clay, yellowish brown becoming mottled grey silty pebbles of chalk and flint soft	1.2	1.7
Kesgrave Sands and Gravels	'Very clayey' pebbly sand, becomes less 'clayey' with depth beyond 5.3 m yellowish brown, becoming strong brown Sand: medium and coarse with fine rounded to subrounded quartz with some flint Gravel: fine and coarse angular and well rounded flint and rounded quartz with quartzite and some sandstone and a trace of ironstone	5.7	7.4
London Clay	Clay, yellowish brown, silty	0.1	7.5
	Clay, dark grey, micaceous silty with pyrite nodules stiff	0.4+	7.9

GRADING

Mean for deposit percentages			Depth below surface (m)	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	
16	69	15	30	32	25	3	5	5	0	
			20	23	23	13	15	6	0	
			12	7	39	15	15	12	0	
			34	4	30	11	11	10	0	
			3	22	46	24	5	0	0	
			0	16	45	30	9	0	0	
			Mean	16	18	35	16	10	5	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
1.7-2.7	Very small sample								
2.7-5.3	31	30	28	9	2	0	0	trace	0
5.3-7.4	Very small sample								

TL 62 SW 90 6357 2311 Crouches Farm, Great Dunmow

Surface level +75.8 m
Water struck at +70.8 m
July 1980

Block D

Overburden 2.4 m
Mineral 4.4 m
Bedrock 0.5 m+

TL 62 SW 91 6377 2176 Dunmow Park, Great Dunmow

Surface level +49.2 m
Water struck at +47.0 m
July 1980

Block H

Overburden 2.2 m
Mineral 6.8 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Boulder Clay	Clay, dark yellowish brown and grey, silty and very sandy with pebbles of flint quartz and some chalk stiff	0.8	1.4
	Clay, very silty, pockets of sand and angular to well rounded flint and rare quartz pebbles	1.0	2.4
Kesgrave Sands and Gravels	a 'Clayey' pebbly sand, becomes slightly less 'clayey' with depth Sand: medium with coarse and fine rounded quartz and angular flint Gravel: fine with coarse well rounded flint and quartz with angular flint and quartzite and a trace of sandstone	1.7	4.1
Red Crag	b 'Clayey' pebbly sand, becoming less 'clayey' and more pebbly with depth Sand: medium and fine with coarse rounded quartz with some ironstone Gravel: fine with coarse well rounded flint with some angular flint and rounded quartz	2.7	6.8
London Clay	Clay, yellowish brown, silty sandy	0.2	7.0
	Clay, dark grey silty, micaceous with comminuted shell debris and pyrite nodules	0.3+	7.3

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages								
	Fines	Sand	Gravel		percentages								
					Fines	Sand	Gravel			mm			
-16	+16-4	+4-1	+1-4	+4-16	+16-64	+64							
a	17	67	16	2.4-3.1	20	5	28	15	24	8	0		
				3.1-4.1	15	14	51	15	3	2	0		
				Mean	17	10	42	15	12	4	0		
b	10	84	6	4.1-5.1	15	18	53	10	4	0	0		
				5.1-6.1*	9	34	47	7	3	0	0		
				6.1-6.8*	7	29	38	14	9	3	0		
				Mean	10	27	47	10	5	1	0		
a+b	13	77	10	Mean	13	20	45	12	8	2	0		

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
2.4-3.1	17	41	29	9	trace	0	0	0	0	4
4.1-6.8	Very small sample									

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Alluvium	Clay, strong brown, silty, firm with rootlets	0.3	0.7
	Clay, dark yellowish brown mottled light and bluish grey silty, sandy, rare angular flint pebbles	1.5	2.2
Undifferentiated River Terrace Deposits	Sandy gravel, silty and 'clayey' in uppermost 0.3 m with fine sandy silt seams from 8.2 m. Dark greenish brown to grey Gravel: fine and coarse angular flint with well rounded flint and quartz some quartzite limestone and chalk and a trace of fossil debris and sandstone Sand: medium and coarse with fine angular flint with rounded quartz and some ironstone	6.8	9.0
London Clay	Clay, greyish brown, silty, fine sandy, soft to firm, micaceous with disseminated pyrite	0.5+	9.5

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		percentages						
				Fines	Sand	Gravel			mm	
-16	+16-4	+4-1	+1-4	+4-16	+16-64	+64				
2	52	46	2.2-3.2*	4	5	26	12	24	29	0
			3.2-4.2*	2	4	35	18	18	23	0
			4.2-5.2*	2	3	32	17	33	13	0
			5.2-6.2*	1	4	41	17	22	15	0
			6.2-7.2*	1	4	36	17	29	13	0
			7.2-8.2*	3	4	29	17	32	15	0
			8.2-9.0*	2	2	23	12	35	26	0
			Mean	2	4	32	16	27	19	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
2.2-9.0	62	21	10	4	trace	1	2	0	trace	trace

TL 62 SW 92 6381 2060 Hoblongs Bridge, Great Dunmow

Block H

Surface level +50.2 m
Water not struck
July 1980

Overburden 0.8 m
Mineral 1.1 m
Bedrock 5.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Alluvium	Clay, dark yellowish brown silty fine sandy, firm	0.6	0.8
First Terrace	'Clayey' gravel, dark brown Gravel: fine and coarse angular flint with well rounded flint and rounded quartz with some quartzite Sand: medium and coarse with fine angular to subangular quartz and flint	1.1	1.9
London Clay	Clay, yellowish brown, silty, firm becoming stiff Clay, grey brown becoming dark grey, silty with pockets of dark olive green sand, micaceous with race and pyrite nodules	1.4	3.3

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
16	37	47	0.8-1.9	16	5	22	10	30	17	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W	R							
0.8-1.9	56	23	17	4	0	0	0	0	0	0

TL 62 SW 93 6456 2420 Dunmow Farm, Great Dunmow

Block D

Surface level +92.1 m
Water struck at +75.1 m
June 1980

Overburden 10.0 m
Mineral 12.1 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Boulder Clay	Clay, yellowish brown and brown with light grey mottling with chalk and flint pebbles firm to soft Clay, pale brown, silty, soft much chalk Clay, dark greyish brown, silty, firm Clay, strong brown, very sandy, very stiff and hard some angular to rounded flint and chalk pebbles, becomes grey and red banded clay	4.5 7.0 1.5 1.5	5.0 7.0 8.5 10.0

Glacial Sand and Gravel

a 'Very clayey' sandy gravel, less 'clayey' continuation of above clay, softer and much more gravel-rich
Gravel: fine and coarse angular and well rounded flint and quartz with quartzite, some chalk and sandstone
Sand: medium with coarse and fine angular to subangular quartz and flint

2.0 12.0

Kesgrave Sands and Gravels

b Pebbly sand, yellowish brown
Sand: fine and medium with coarse angular to subrounded quartz and flint
Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite and a trace of sandstone

4.2 16.2

Red Crag

c Pebbly sand, strong orange-brown
Sand: medium and fine with coarse subangular to subrounded quartz
Gravel: fine and coarse well rounded flint with angular flint and rounded quartz and some ironstone

5.9 22.1

London Clay

Clay, brown, becoming dark grey, silty, smooth

0.4+ 22.5

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
a	25	38	37	10.0-11.0 11.0-12.0 Mean	30 23 25	7 9 8	15 26 21	9 8 9	23 22 23	16 12 14	0 0 0
b	9	71	20	12.0-13.0 13.0-14.2 14.2-15.2 15.2-16.2 Mean	6 16 6 6 9	7 5 89 59 38	37 31 4 28 25	6 17 1 5 8	24 17 0 2 11	20 14 0 0 9	0 0 0 0 0
c	4	89	7	16.2-17.0 17.0-19.0* 19.0-20.0* 20.0-21.0* 21.0-22.1* Mean	5 5 5 2 2 4	30 39 32 31 27 33	44 45 55 31 30 41	17 9 7 22 24 15	4 2 1 12 9 5	0 0 0 2 8 2	0 0 0 0 0 0
a+b+c	9	75	16	Mean	9	31	33	11	10	6	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W	R							
10.0-12.0	31	34	26	8	trace	1	0	0	0	trace
12.0-14.2	13	50	27	10	trace	0	0	0	0	trace
14.2-16.2	Very small sample									
16.2-22.1	Very small sample									

TL 62 SW 94 6500 2321 Tooley's Farm, Great Dunmow

Surface level +88.1 m
Water struck at +72.6 m
July 1980

Block D

Overburden 1.5 m
Mineral 0.5 m
Waste 4.6 m
Mineral 14.4 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Boulder Clay	Clay, yellowish brown, silty, angular flint pebbles	0.2	0.3
	Clay, yellowish brown becoming mottled grey from 1.0 m silty pebbles of chalk flint and rare quartz. Shelly limestone erratic at 0.8 m	1.2	1.5
Glacial Sand and Gravel	a 'Clayey sandy' gravel, yellowish brown Gravel: fine with coarse angular flint and well rounded flint with quartz and quartzite and some sandstone chalk and ironstone Sand: medium with coarse and fine angular quartz and some angular flint	0.5	2.0
Boulder Clay	Clay, light yellowish brown, silty, with chalk and some flint pebbles	3.1	5.1
	Clay, grey mottled brown, silty, pebbles of flint and chalk firm to stiff	0.3	5.4
	Clay, dark to very dark grey, silty with pebbles of chalk and flint and some black shale	1.2	6.6
Kesgrave Sands and Gravels	b 'Clayey' sandy gravel, becomes more gravel-rich with depth Gravel: fine and coarse well rounded flint and rounded quartz with angular flint and quartzite and some sandstone Sand: medium and fine with coarse subangular to rounded quartz and some angular flint	7.9	14.5
Red Crag	c Pebbly sand, 'clayey' in uppermost 1 m, most gravel-rich at base orange-brown Sand: medium and fine with coarse subrounded to rounded quartz and some flint Gravel: fine with coarse well rounded flint with some angular flint quartz and ironstone	6.5	21.0
London Clay	Clay, yellowish brown, silty	0.3	21.3
	Clay, dark grey, silty, micaceous, with pyrite nodules, stiff and waxy	0.5+	21.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand	Gravel				
-10	+10-30	+30-60	+60-100	+1-4	+4-16	+16-64	+64 mm				
a	17	53	30	2.0-3.0	17	7	34	12	23	7	0
b	12	59	29	6.6-7.1	21	7	67	4	1	0	0
				7.1-7.8	16	7	57	9	5	6	0
				7.8-8.8	19	5	24	15	28	9	0
				8.8-9.8	13	5	30	15	24	13	0
				9.8-11.0	8	5	19	13	26	29	0
				11.0-12.0	17	73	9	1	0	0	0
				12.0-12.5	13	53	19	2	4	6	3
				12.5-13.5	9	6	24	21	30	10	0
				13.5-14.5	5	5	36	18	20	16	0
				Mean	12	17	30	12	18	11	0
c	6	86	8	14.5-15.5	12	32	40	8	6	2	0
				15.5-16.5*	7	23	56	8	6	0	0
				16.5-17.5*	4	17	59	10	7	3	0
				17.5-18.5*	4	21	47	21	7	0	0
				18.5-19.5*	2	16	45	32	5	0	0
				19.5-20.0*	4	26	39	23	8	0	0
				20.0-21.0*	6	32	38	12	11	1	0
				Mean	6	24	46	16	7	1	0
a+b+c	10	69	21	Mean	10	19	36	14	14	7	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
2.0-3.0	42	28	18	7	2	2	0	1	0	trace
6.6-7.8	Very small sample									
7.8-11.0	25	38	28	9	trace	0	0	0	0	trace
11.0-12.5	Very small sample									
12.5-14.5	17	44	25	11	3	0	0	0	0	0
14.5-21.0	Very small sample									

TL 62 SW 96 6417 2140 Bumpstead Hill Wood, Great Dunmow

Block G

Surface level +67.2 m
Water struck at +64.3 m
July 1980

Overburden 1.8 m
Mineral 2.5 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, dark yellowish brown, silty, fine sandy with pellets of angular chalk and some angular flint	1.5	1.8
Kesgrave Sands and Gravels	Sandy gravel, yellow brown becoming orange-brown Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite and a trace of sandstone and ironstone Sand: medium with fine and coarse subangular to subrounded quartz with some angular flint	2.5	4.3
London Clay	Clay, yellowish brown becoming brownish grey silty	0.7	5.0
	Clay, dark grey, silty, some very fine sand micaceous	0.3+	5.3

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
5	63	32	1.8-2.8	8	9	31	10	21	21	0
			2.8-3.8*	4	11	56	8	15	6	0
			3.8-4.3*	1	9	47	7	20	16	0
			Mean	5	10	45	8	18	14	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
1.8-4.3	22	34	33	11	trace	0	0	trace	0	0

TL 62 SE 26 6538 2429 Fir Wood, Stebbing

Block D

Surface level +72.4 m
Water struck at +70.2 m
June 1980

Overburden 0.2 m
Mineral 7.8 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Kesgrave Sands and Gravels	a 'Clayey' sandy gravel, brown Gravel: coarse and fine angular and well rounded flint with quartz and quartzite and some sandstone Sand: medium and coarse with fine angular to subrounded quartz	3.0	3.2
Red Crag	b Sand, strong brown, some 'clayey' lenses rare subangular to rounded flint pebbles Sand: fine and medium with coarse subangular to subrounded quartz	4.8	8.0
London Clay	Clay, dark grey, silty	0.5+	8.5

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	
a	10	47	43	0.2-1.2	11	3	16	11	19	40	0
				1.2-2.2*	11	4	19	10	20	32	4
				2.2-3.2*	9	23	39	15	5	9	0
				Mean	10	10	25	12	15	27	1
b	6	90	4	3.2-4.2*	7	38	39	13	1	2	0
				4.2-5.2*	6	36	41	11	4	2	0
				5.2-6.2*	4	26	46	16	8	0	0
				6.2-7.2*	8	42	32	15	3	0	0
				7.2-8.0*	6	60	18	15	1	0	0
				Mean	6	40	36	14	3	1	0
a+b	8	72	20	Mean	8	29	30	13	8	11	1

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
0.2-3.2	37	36	18	7	2	0	0	0	0	0
3.2-8.0	Very small sample									

TL 62 SE 27 6593 2293 Brookend Farm, Little Dunmow

Block D

Surface level +64.2 m
Water not struck
July 1980

Overburden 0.6 m
Mineral 0.5 m
Waste 1.4 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
	Soil, very pebbly angular flint pebbles	0.2	0.6
Head	'Clayey' gravel Gravel: coarse and fine angular flint with well rounded flint, quartz and quartzite with some chalk and limestone Sand: medium and coarse with fine angular flint and quartz	0.5	1.1
	Clay, purplish grey mottled orange-brown, very silty fine sandy micaceous soft carbonaceous debris	1.4	2.5
London Clay	Clay, dark grey mottled yellow-brown, silty some fine sand some large selenite crystals in uppermost metre	1.0	3.5
	Clay, dark grey, soft to firm bioturbated and highly micaceous	1.0+	4.5

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
19	32	49	0.6-1.1	19	6	17	9	22	27	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
0.6-1.1	51	25	14	5	0	4	1	0	0	0

TL 62 SE 28 6502 2257 Homelye Farm, Little Dunmow

Surface level +85.7 m
Water struck at +78.7 m +74.6 m
July 1980

Block D

Overburden 9.7 m
Mineral 6.8 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.3	0.3
Boulder Clay	Clay, yellowish brown, silty some angular flint pebbles	0.1	0.4
	Clay, yellowish brown becoming mottled grey with depth and greyish brown from 3.0 m. Pebbles of chalk flint, quartz and quartzite	3.7	4.1
	Clay, light yellowish brown, silty pockets of orange-brown fine sand, soft between 6.8 m and 7.5 m	4.1	8.2
	Clay, greyish brown stiff, silty pebbles of chalk some flint quartz and black shale, becomes dark brown from 9.5 m	1.5	9.7
Kesgrave Sands and Gravels	a 'Clayey' sandy gravel, becomes less 'clayey' with depth yellowish brown Gravel: fine and coarse angular and well rounded flint with quartz and quartzite and trace sandstone and chalk Sand: medium and coarse with fine angular to rounded quartz and flint with some ironstone	2.4	12.1
Red Crag	b Pebbly, orange to yellowish brown Sand: medium and coarse with fine angular to rounded quartz flint and some ironstone Gravel: fine with coarse well rounded flint with angular flint and quartz with some quartzite	4.4	16.5
London Clay	Clay, yellowish brown, silty, stiff	0.3	16.8
	Clay, dark grey, silty, micaceous	0.2+	17.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					-16	+16 -14	+14 -11	+11 -4	+4 -16	+16 -64	+64 mm
a	10	54	36	9.7-10.7	14	10	19	14	28	15	0
				10.7-11.1	9	9	23	12	29	18	0
				11.1-12.1*	7	2	42	24	19	6	0
				Mean	10	7	29	18	24	12	0
b	3	86	11	12.1-13.1*	4	20	31	34	9	2	0
				13.1-14.1*	1	13	56	19	10	1	0
				14.1-15.1*	3	22	48	17	6	4	0
				15.1-16.1*	2	12	47	24	12	3	0
				16.1-16.5*	8	26	30	24	11	1	0
				Mean	3	17	46	23	9	2	0
a+b	6	74	20	Mean	6	14	39	21	14	6	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
9.7-12.1	37	33	21	9	trace	trace	0	0	trace	0
12.1-14.1	12	78	6	4	0	0	0	0	0	0
14.1-15.1	Very small sample									
15.1-16.5	20	73	6	1	0	0	0	0	0	0

TL 62 SE 29 6553 2184 Little Dunmow

Surface level +79.4 m
Water struck at +74.4 m
July 1980

Block G

Overburden 11.7 m
Mineral 8.5 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown mottled grey becomes strong brown then grey with depth, silty, pebbles and pellets of chalk and pebbles of flint, quartz and quartzite, firm to stiff	4.8	5.0
	Sand, medium and fine with some coarse subangular to subrounded quartz with angular flint	0.1	5.1
	Clay, grey to dark grey, silty, pellets and pebbles of chalk and pebbles of flint quartz and black shale, stiff to hard	6.6	11.7
Glacial Sand and Gravel	Sandy gravel, 'clayey' in uppermost metre, dark yellowish brown becomes less 'clayey' with depth with occasional thin lenses of silty clay brown Gravel: fine and coarse well rounded and angular flint with quartz and quartzite and some chalk and sandstone with a trace of ironstone and fossil debris Sand: medium with coarse and fine angular to subrounded quartz and flint and some subrounded chalk	8.5	20.2
London Clay	Clay, brown, silty micaceous	0.2	20.4
	Clay, dark brownish grey, silty with race and pyrite nodules, mica and comminuted shell debris	0.2+	20.6

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					-16	+16 -14	+14 -11	+11 -4	+4 -16	+16 -64	+64 mm
	5	54	41	11.7-12.9*	17	7	20	11	22	23	0
				12.9-13.9*	6	7	32	15	18	20	2
				13.9-14.9*	4	11	40	10	20	15	0
				14.9-15.9*	5	6	44	17	20	8	0
				15.9-16.9*	2	2	35	19	21	21	0
				16.9-17.9*	2	4	33	24	28	9	0
				17.9-18.9*	2	2	18	11	31	36	0
				18.9-19.9*	1	2	33	30	30	4	0
				19.9-20.2*	2	3	37	22	28	8	0
				Mean	5	5	32	17	24	17	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
11.7-20.2	28	35	22	8	2	5	trace	trace	trace	0

TL 62 SE 30 6589 2096 Tile End, Little Dunmow Block G

Surface level +65.4 m	Overburden	7.6 m
Water struck at +56.8 m	Mineral	1.4 m
July 1980	Bedrock	0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, yellowish brown mottled light grey becomes darker with depth, silty pellets and pebbles of chalk with some flint, quartz and quartzite and trace fossil debris; firm becoming stiff	5.5	5.8
	Clay, silty chalk pellets and pebbles with some pebbles of flint, black shale, quartz and fossil debris, at base about 0.05 m of yellowish brown laminated grey brown silt	1.8	7.6
Glacial Sand and Gravel	Sandy gravel Gravel: fine with coarse angular and well rounded flint with quartz and limestone some chalk, and and quartzite and a trace of sandstone and fossil debris Sand: medium with coarse and fine angular to rounded quartz flint some ironstone and fossil debris	1.4	9.0
London Clay	Clay, dark brownish grey, waxy, pyrite and rare nodules and comminuted shell debris, very stiff to hard	0.9+	9.9

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	68	23	7.6-8.6	10	8	53	13	13	3	0
			8.6-9.0*	6	5	28	22	34	5	0
			Mean	9	7	45	16	19	4	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
7.6-9.0	35	31	19	4	trace	5	6	0	trace	trace

TL 62 SE 31 6518 2042 Brickhouse Farm, Little Dunmow Block H

Surface level +45.2 m
Water struck at +42.7 m and +39.9 m
July 1980

Overburden	2.5 m
Mineral	1.0 m
Waste	1.8 m
Mineral	5.8 m
Bedrock	2.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Alluvium	Clay, strong brown, silty, fine sandy, a trace of quartz and flint pebbles soft to firm	1.6	2.0
	Clay, light greenish grey, silty, fine sandy, pebbles of flint very soft	0.2	2.2
	Clay, dark grey, silty very sandy soft	0.3	2.5
Undifferentiated River Terrace Deposits	Sandy gravel, 'clayey' in uppermost 0.3 m Gravel: fine and coarse angular flint with well rounded flint quartz chalk and quartzite with some limestone and sandstone with a trace of ironstone and fossil debris Sand: medium and coarse with fine angular to subrounded flint and quartz	1.0	3.5
	Silt, very clayey fine sandy, rare fine flint pebbles, micaceous pyritous, grey	1.0	4.5
	Clay, very silty, some fine sand, pyritous soft, dark grey	0.8	5.3
	Sandy gravel, yellowish to light yellowish brown, 'very clayey' from 9.3 m to 10.3 m Gravel: fine and coarse angular flint with well rounded flint quartz chalk and quartzite with some limestone and sandstone with a trace of ironstone and fossil debris Sand: medium and coarse with fine angular to subrounded flint and quartz	5.8	11.1
London Clay	Clay, dark grey, silty, fine sandy, pyrite nodules, comminuted shell debris and pockets of olive green sand bioturbated	2.6+	13.7

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
7	47	46	2.5-3.5*	1	7	31	11	23	27	0
			5.3-6.3*	1	3	25	20	33	18	0
			6.3-7.3*	2	5	22	17	27	27	0
			7.3-8.3*	1	2	27	25	29	16	0
			8.3-9.3*	5	2	19	21	33	20	0
			9.3-10.3*	33	2	17	13	24	11	0
			10.3-11.1*	4	6	38	23	22	7	0
			Mean	7	4	25	18	28	18	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
2.5-3.5	54	25	16	5	0	0	0	0	trace	trace
5.3-11.1	50	24	12	6	1	6	1	trace	trace	0

TL 62 SE 32 6697 2467 Lucas Farm, Stebbing

Block E

Surface level +86.2 m
Water struck at +76.6 m
August 1980

Overburden 4.7 m
Mineral 11.0 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, strong brown, angular and subangular coarse flint, some manganese staining	0.7	0.9
	Clay, yellowish brown with occasional light grey mottling abundant chalk pellets and pebbles	2.1	3.0
	Clay, yellowish brown, sandy, chalky, stiff	0.2	3.2
Rubified Sol Lessivé	Clay, red, strong brown streaked light grey, very sandy subangular to subrounded flint from 4.1 m to 4.3 m	1.5	4.7
Kesgrave Sands and Gravels	a Pebbly sand, 'clayey' and gravel-rich in uppermost metre becoming less 'clayey' and less gravel-rich with depth yellowish brown to brownish yellow, waste parting between 6.7 m and 7.7 m silty clay Sand: subangular to rounded quartz with some flint Gravel: fine with coarse subangular to rounded flint and quartz with some quartzite	5.0	9.7
Red Crag	b Sand, orange-brown, becoming darker to olive brown from 12.7 m, rare fine well rounded flint and some quartz pebbles Sand: medium and fine with coarse subangular to subrounded quartz with some flint and a trace of shell debris	6.0	15.7
London Clay	Clay, dark greyish black, smooth, waxy	0.3+	16.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand			Gravel		
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm	
a	8	85	7	4.7-5.7	11	20	49	6	10	4	0
				5.7-6.7	7	14	68	2	4	5	0
				7.7-8.7	9	17	64	7	3	0	0
				8.7-9.7	6	23	57	10	4	0	0
				Mean	8	18	61	6	5	2	0
b	2	97	1	9.7-10.7*	1	14	69	14	2	0	0
				10.7-11.7*	1	11	69	15	4	0	0
				11.7-12.7*	4	26	69	1	0	0	0
				12.7-14.7*	2	70	27	1	0	0	0
				14.7-15.7*	1	58	33	6	2	0	0
				Mean	2	41	50	6	1	0	0
a+b	4	92	4	Mean	4	32	54	6	3	1	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
4.7-9.7	Very small sample								
9.7-15.7	Very small sample								

TL 62 SE 33 6623 2434 Town Farm, Stebbing

Block E

Surface level +79.5 m
Water struck at +71.8 m
July 1980

Overburden 1.3 m
Mineral 10.3 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	1.3	1.3
Kesgrave Sands and Gravels	a Sandy gravel, some clay-rich lenses sand yellowish brown Gravel: fine and coarse angular flint well rounded flint and quartz with quartzite and some sandstone and trace chalk Sand: medium with coarse and fine subangular to rounded quartz	5.4	6.7
Red Crag	b Sand, orange-brown becoming stronger with depth, rare fine rounded flint pebbles Sand: medium and fine with coarse subangular to rounded quartz	4.9	11.6
London Clay	Clay, black, silty	0.2+	11.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand			Gravel		
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm	
a	9	62	29	1.3-2.3	5	6	60	13	10	6	0
				2.3-3.3	13	5	55	7	11	9	0
				3.3-4.3	9	6	28	10	27	20	0
				4.3-5.3	8	7	25	10	32	18	0
				5.3-5.7	6	8	25	9	29	23	0
				5.7-6.7	12	20	55	10	3	0	0
				Mean	9	9	43	10	18	11	0
b	5	93	2	6.7-7.7	11	33	46	9	1	0	0
				7.7-8.7*	5	38	41	15	1	0	0
				8.7-9.7*	5	50	33	11	1	0	0
				9.7-10.7*	3	35	47	12	3	0	0
				10.7-11.6*	3	17	58	15	6	1	0
				Mean	5	35	46	12	2	0	0
a+b	7	77	16	Mean	7	21	45	11	10	6	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
1.3-5.7	32	30	26	10	2	trace	0	0	trace
5.7-6.7	Very small sample								
6.7-11.6	Very small sample								

TL 62 SE 34 6638 2193 Blatches, Little Dunmow Block G
 Surface level +78.4 m Overburden 7.7 m
 Water struck at +67.8 m Mineral 8.0 m
 August 1980 Bedrock 0.6 m+

TL 62 SE 35 6799 2486 Badocks Farm, Stebbing Block E
 Surface level +86.8 m Overburden 13.0 m
 Water struck at +73.8 m Mineral 6.0 m
 July 1980 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, yellowish brown mottled light grey chalk pellets and pebbles erratic of oolitic limestone. Becomes light grey with depth darkening from 2 m	1.9	2.3
	Clay, yellowish brown mottled light grey silty	1.2	3.5
	Clay, olive to dark olive grey, silty some chalk pebbles and pellets	3.6	7.4
	Clay, dark grey, silty, some chalk pebbles and pellets, erratic of black shale	3.6	7.4
	Clay, yellowish brown becoming strong brown, silty very sandy some fine with some coarse subangular to subrounded quartz and flint pebbles and chalk pellets	0.3	7.7
Kesgrave Sands and Gravels	Sandy gravel, 'clayey' in uppermost 2 metres becoming less 'clayey' with depth to 14.6 m then 'clayey' to 15.6 m Sand yellowish to pale yellowish brown Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite with a trace of sandstone and ironstone Sand: medium with coarse and fine subangular to rounded quartz and flint	8.0	15.7
London Clay	Clay, brown, silty, smooth	0.2	15.9
	Clay, dark grey, smooth, race nodules	0.4+	16.3

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	
6	58	36	7.7-8.7	10	8	22	14	32	14	0
			8.7-9.7	12	9	38	15	24	2	0
			9.7-10.6	8	6	43	19	20	4	0
			10.6-11.6*	4	12	44	12	19	9	0
			11.6-12.6*	1	4	50	17	19	9	0
			12.6-13.6*	1	3	31	13	30	22	0
			13.6-14.6*	1	3	38	15	29	14	0
			14.6-15.7*	10	4	33	12	14	27	0
			Mean	6	6	38	14	23	13	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W R								
7.7-15.7	25	36	29	10	trace	0	0	trace	0	trace

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	1.1	1.1
Boulder Clay	Clay, yellowish brown to brownish yellow mottled grey silty, chalk pellets pebbles	5.9	7.0
	Chalk, white rubble	0.4	7.4
	Clay, greyish brown becoming grey, dark grey at 10 m and olive grey at 12 m	5.6	13.0
Kesgrave Sands and Gravels	a Sandy gravel, sand greyish white Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite some sandstone and a trace of phosphatic nodule Sand: medium and coarse with fine quartz	1.0	14.0
Red Crag	b Sand, slightly 'clayey' in uppermost 2 metres becoming less clayey with depth occasional rounded flint pebbles throughout with gravel-rich layer in bottom-most metre brown to dark grey Sand: medium with fine and coarse quartz	5.0	19.0
London Clay	Clay, dark grey, smooth	0.5+	19.5

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	
a	9	61	30	13.0-14.0*	9	6	38	17	22	8	0
b	4	92	4	14.0-15.0*	8	30	53	8	1	0	0
				15.0-16.0*	8	23	58	9	2	0	0
				16.0-17.0*	5	27	52	12	4	0	0
				17.0-18.0*	2	19	66	12	1	0	0
				18.0-19.0*	0	14	58	11	10	7	0
			Mean	4	23	58	11	3	1	0	
a+b	5	86	9	Mean	5	20	54	12	7	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W R								
13.0-14.0	23	32	28	15	2	0	0	0	trace	0
14.0-19.0	Very small sample									

TL 62 SE 36 6797 2505 Yew Tree Farm, Stebbing

Surface level +80.4 m
Water struck at +77.4 m
July 1980

Block E

Overburden 1.0 m
Mineral 9.8 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	1.0	1.0
Kesgrave Sands and Gravels	a Sandy gravel, 'clayey' uppermost 1 metre becoming less 'clayey' with depth sand yellowish grey Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite and some sandstone Sand: medium with coarse and fine, quartz	7.0	8.0
Red Crag	b Pebbly sand, becoming less pebbly with depth, orange brown Sand: medium, fine and coarse quartz Gravel: fine and coarse well rounded flint with quartz angular flint and some quartzite	2.8	10.8
London Clay	Clay, dark grey, smooth	0.4 m+	

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
a	7	69	24	1.0-2.0	13	6	50	10	15	6	0
				2.0-3.0	11	4	43	13	20	9	0
				3.0-4.0*	8	5	42	10	23	12	0
				4.0-5.0*	8	3	62	12	6	9	0
				5.0-6.0*	2	5	39	12	36	6	0
				6.0-7.0*	1	5	56	14	19	5	0
				7.0-8.0*	3	27	68	2	0	0	0
				Mean	7	8	51	10	17	7	0
b	3	87	10	8.0-9.0*	3	28	45	7	14	3	0
				9.0-10.0*	3	23	36	28	7	3	0
				10.0-10.8*	2	37	25	31	5	0	0
				Mean	3	29	36	22	8	2	0
a+b	5	76	19	Mean	5	14	48	14	14	5	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
1.0-2.0	Very small sample								
2.0-4.0	21	35	34	8	2	0	0	0	trace
4.0-5.0	Very small sample								
5.0-7.0	20	34	34	10	2	0	0	0	0
7.0-8.0	No +8-16 material								
8.0-9.0	11	69	17	3	0	0	0	0	0
9.0-10.8	Very small sample								

TL 62 SE 37 6707 2371 Oakfield, Stebbing

Surface level +85.1 m
Water struck at +72.1 m
July 1980

Block E

Overburden 4.7 m
Mineral 1.4 m
Waste 1.3 m
Mineral 7.8 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, yellowish brown with some grey mottling small chalk pellets	4.3	4.7
Glacial Sand and Gravel	a 'Clayey' pebbly sand, less 'clayey' with depth Sand: medium with fine and coarse angular to subangular quartz with some flint Gravel: fine and coarse well rounded flint quartz and angular flint with quartzite and a trace of ironstone	1.4	6.1
Rubified Sol Lessivé	Clay, light grey, pale yellow-reddish yellow to red, smooth soapy silty in places with occasional fine chalk sand strongest red colouration at base	1.3	7.4
Kesgrave Sands and Gravels	b 'Clayey' sand, reddened in uppermost metre, yellowish red becoming reddish yellow with depth. Clay at depth confined to small lenses occasional rare flint and quartz pebbles Sand: medium with fine and coarse subangular to rounded quartz with some flint	4.0	11.4
Red Crag	c Pebbly sand, dark orange-brown Sand: medium and fine with coarse subangular to rounded quartz Gravel: fine with coarse well rounded flint and quartz	3.8	15.2
London Clay	Clay, grey, silty, smooth	0.8+	16.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
a	16	64	20	4.7-5.7	20	10	47	8	11	4	0
				5.7-6.1	12	12	36	13	18	9	0
				Mean	16	11	43	10	14	6	0
b	11	88	1	7.4-8.4	12	16	66	2	2	2	0
				8.4-9.4	11	15	72	1	1	0	0
				9.4-10.4	11	10	77	2	0	0	0
				10.4-11.4	10	16	53	19	2	0	0
				Mean	11	14	68	6	1	0	0
c	8	85	7	11.4-12.4	8	18	49	19	5	1	0
				12.4-13.0	7	21	54	12	4	2	0
				13.0-14.0*	13	26	41	15	5	0	0
				14.0-15.2*	3	37	30	22	8	0	0
				Mean	8	27	40	18	6	1	0
b+c	9	88	3	Mean	9	20	56	12	3	0	0
a+b+c	11	81	8	Mean	11	18	52	11	6	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
4.7-6.1	26	35	30	9	0	0	0	trace	0	0
7.4-11.4	Very small sample									
11.4-15.2	Very small sample									

TL 62 SE 38 6760 2227 Seward's Hall Farm, Felsted

Block G

Surface level +67.9 m
Water struck at +63.5 m
August 1980

Overburden 0.9 m
Mineral 4.2 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown silty becoming sandy with depth; angular to subrounded flint and quartz pebbles	0.7	0.9
Kesgrave Sands and Gravels	Sandy gravel, 'clayey' in uppermost metre, becoming gravel-rich with depth sand greyish yellow Gravel: fine and coarse well rounded flint, quartz and angular flint with quartzite and a trace of ironstone Sand: medium with coarse and fine angular to subrounded quartz and some flint	4.2	5.1
London Clay	Clay, brown, smooth stiff	0.5	5.6
	Clay, very dark grey, stiff	0.3+	5.9

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
8	52	40	0.9-1.9	11	14	47	9	14	5	0
			1.9-2.9	9	9	27	12	25	18	0
			2.9-4.4	7	5	19	15	39	15	0
			4.4-5.1*	2	5	11	16	40	26	0
			Mean	8	9	31	12	27	13	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
0.9-5.1	25	38	26	11	trace	0	0	0	0	0

TL 62 SE 39 6767 2119 Virginia Cottages, Felsted

Block G

Surface level +61.6 m
Water struck at +59.2 m
August 1980

Overburden 0.3 m
Mineral 1.0 m
Waste 1.1 m
Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.3	0.3
Glacial Sand and Gravel	'Very clayey' gravel, yellowish brown mottled light grey becoming more grey with depth Gravel: coarse and fine angular and well rounded flint with quartz some quartzite and trace sandstone Sand: medium, coarse and fine, angular flint and quartz	1.0	1.3
Boulder Clay	Clay, light grey mottled yellowish brown, occasional pebbly layers of angular to well rounded flint	1.1	2.4
London Clay	Clay, yellowish to strong brown, stiff smooth waxy	0.2	2.6
	Clay, dark greyish brown	1.9+	4.5

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
20	18	62	0.3-1.3	20	5	7	6	28	32	2

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
0.3-1.3	48	34	14	4	trace	0	0	0	0	trace

TL 62 SE 40 6735 2009 Felsted

Surface level +60.0 m
Water struck at +57.1 m
August, 1980

Block G

Overburden 1.8 m
Mineral 2.0 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, yellowish and olive brown mottled grey, soft, silty, chalk pellets. Becomes softer and more silty, some flint and chalk pebbles	1.5	1.8
Kesgrave Sands and Gravels	'Clayey' pebbly sand, very 'clayey' in uppermost metre becoming less 'clayey' with depth, yellowish brown Sand; medium with fine and coarse subangular to subrounded quartz and flint Gravel; fine and coarse quartz and well rounded flint with angular flint, some quartzite and sandstone and trace chalk		2.0
London Clay	Clay, brown, smooth, waxy, gradually becomes dark grey, with race nodules present	2.0+	5.8

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			-1/8	+1/8 - 1/4	+1/4 - 1/2	+1/2 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
18	66	16	29	16	36	5	10	4	0	
			7	6	55	14	10	8	0	
			Mean	18	11	46	9	10	6	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
1.8-3.8	25	25	43	4	3	trace	0	0	0	0

TL 62 SE 41 6812 2338 Stebbing Green, Stebbing

Surface level +79.1 m
Water struck at +73.6 m
July, 1980

Block E

Overburden 3.5 m
Mineral 10.5 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown mottled light grey, silty	0.8	1.0
	Clay, yellowish brown mottled light grey, occasional red flecking, sandy, pebbles of flint and quartz	2.5	3.5
Kesgrave Sands and Gravels	Sandy gravel, 'clayey' in uppermost 2 m becoming very much less 'clayey' from 5.5 m, sand orange-brown to greyish yellow Gravel; fine and coarse with a trace of cobble quartz, angular and well rounded flint with quartzite and trace sandstone Sand; medium with coarse and fine angular to rounded quartz with some flint	10.5	14.0
London Clay	Clay, yellowish brown, silty, becoming darker greyish brown	0.5	14.5
	Clay, dark grey, silty	0.2+	14.7

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			-1/8	+1/8 - 1/4	+1/4 - 1/2	+1/2 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
4	59	37	12	8	26	11	24	19	0	
			19	20	45	3	7	6	0	
			4	11	19	9	39	18	0	
			2	9	52	12	20	5	0	
			0	5	60	8	13	14	0	
			1	3	32	14	26	24	0	
			0	3	31	21	32	13	0	
			1	2	24	12	28	33	0	
			0	1	42	13	26	17	1	
			2	12	64	4	4	12	2	
			3	15	72	2	4	4	0	
			Mean	4	8	41	10	21	16	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
3.5-14.0	29	27	30	14	trace	0	0	0	0	trace

TL 62 SE 42 6870 2209 Prince's Halfyards, Felsted

Block G

Surface level +75.4 m
Water struck at +68.7 m
August 1980

Overburden 4.0 m
Mineral 1.2 m
Waste 0.6 m
Mineral 3.6 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish to dark yellowish brown, silty sandy with angular flint and some quartz pebbles; with small chalk pellets	3.8	4.0
Glacial Sand and Gravel	a 'Very clayey' sandy gravel, yellowish brown Gravel: coarse and fine quartz well rounded and angular flint with some sandstone and quartzite Sand: medium and fine with coarse quartz with some flint	1.2	5.2
Rubified Sol Lessivé	Clay, grey and brown with red flecking smooth, sandy in places contains rounded flint and quartz pebbles	0.6	3.8
Kesgrave Sands and Gravels	b Sandy gravel, occasional 'clayey' lenses Gravel: coarse and fine well rounded flint quartz and angular flint with quartzite Sand: medium with coarse and fine angular to subrounded quartz	3.6	9.4
London Clay	Clay, yellowish brown, silty	0.2	9.6
	Clay, dark grey, smooth	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
a	30	49	21	4.0-5.2	30	20	25	4	10	11	0
b	9	54	37	5.8-6.7	16	7	32	10	11	24	0
				6.7-7.7*	3	10	37	9	18	23	0
				7.7-8.7*	10	14	35	8	12	21	0
				8.7-9.4*	5	5	43	10	20	17	0
				Mean	9	9	36	9	15	22	0
a+b	14	53	33	Mean	14	12	33	8	14	19	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
4.0-5.2	27	30	39	1	3	0	0	0	0	0
5.8-9.4	27	33	30	10	0	0	0	0	0	trace

TL 62 SE 43 6846 2120 Chaffix Farm, Felsted

Block G

Surface level +61.7 m
Water struck at +55.9 m
August 1980

Overburden 6.0 m
Mineral 1.7 m
Waste 15.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, yellowish brown light olive brown angular flints	0.4	0.7
	Clay, yellowish brown mottled light grey, some chalk and angular flint pebbles	0.3	1.0
	Clay, grey mottled dark greyish brown, reduced chalk debris, dark grey from 2.0 m	4.7	5.7
	Clay, yellowish brown, silty some chalk and flint pebbles	0.3	6.0
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse angular and well rounded flint, with quartz and quartzite some chalk and limestone and a trace of sandstone and fossil debris Sand: medium with coarse and fine subangular to subrounded quartz and flint with some chalk	1.7	7.7
Glacial Silt	Silt, yellowish brown, clayey soft, occasional flint pebbles	1.1	8.8
	Silt, grey to light olive grey, soft to firm small chalk pellets	3.2	12.0
	Silt, yellowish brown, laminated with chalk pellets	0.8	12.8
	Silt, grey clay rich laminae chalk pellets	10.2+	23.0

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
	3	55	42	6.0-7.0*	2	2	40	13	19	24	0
				7.0-7.7*	5	8	34	12	24	17	0
				Mean	3	4	38	13	21	21	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
6.0-7.7	34	31	16	14	trace	3	2	0	trace	0

TL 62 SE 44 6840 2033 Jolly Boys Lane, Felsted

Block G

Surface level +73.5 m
Water struck at +67.3 m
August 1980

Overburden 5.2 m
Mineral 4.0 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, strong brown silty stiff some angular to subangular flint pebbles	0.3	0.6
	Clay, brownish yellow, silty stiff, chalk pellets and pebbles	1.1	1.7
	Clay, very pale brown abundant chalk debris	0.8	2.5
	Clay, light yellowish brown silty chalk pebbles	0.6	3.1
	Chalk, white rubble	0.1	3.2
	Clay, light yellowish brown, silty, chalk pebbles	1.4	4.6
	Clay, yellowish brown, sandy, silty pebbles of subangular to subrounded flint and quartz with some chalk	0.6	5.2
Kesgrave Sands and Gravels	Gravel, Sand: medium and coarse with fine subangular to rounded quartz with some flint brown to strong brown Gravel: coarse and fine angular and well rounded flint with quartz and quartzite and trace sandstone	4.0	9.2
London Clay	Clay, brown smooth	0.8	10.0
	Clay, grey smooth	0.3+	10.3

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	
3	45	52								
			5.2-6.2	7	6	24	12	22	29	0
			6.2-7.2*	1	3	29	13	24	30	0
			7.2-8.2*	3	6	18	15	27	31	0
			8.2-9.2*	1	13	28	13	25	20	0
			Mean	3	7	25	13	25	27	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others	
	Ang.	W	R							
5.2-9.2	31	31	25	13	trace	0	0	0	0	trace

TL 62 SE 45 6918 2496 St Andrew's Field Aerodrome, Gt. Saling

Block E

Surface level +85.7 m
Water struck at +78.7 m
July 1980

Overburden 5.5 m
Mineral 10.3 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.7	0.7
Boulder Clay	Clay, yellowish brown silty	0.9	1.6
	Clay, grey mottled light grey, chalk pebbles and pellets, very sandy from 3.6 m some flint and quartz pebbles,	3.9	5.5
Kesgrave Sands and Gravels	a Pebbly sand, strong brown to yellowish brown, occasional 'clayey' lenses Sand: medium and fine with coarse angular to subrounded quartz and some flint Gravel: fine and coarse well rounded flint and quartz with angular flint and quartzite	18.5	14.0
Red Crag	b Sand, orange-brown with slight greenish tinge, rare subangular to rounded flint and quartz pebbles Sand: medium with fine and coarse subangular to rounded quartz	1.8	15.8
London Clay	Clay, dark grey, silty	0.4+	16.2

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	5	89	6	5.5-6.5	7	16	56	8	8	5	0
				6.5-7.0	14	43	39	2	2	0	0
				7.0-8.0*	9	60	24	3	4	0	0
				8.0-9.0*	5	22	43	9	12	9	0
				9.0-10.0*	3	19	61	8	6	3	0
				10.0-11.0*	2	14	71	11	1	1	0
				11.0-12.0*	3	21	62	11	3	0	0
				12.0-13.0*	3	26	59	11	1	0	0
				13.0-14.0*	2	18	69	9	2	0	0
				Mean	5	25	56	8	4	2	0
b	3	93	4	14.0-15.0*	2	15	72	9	2	0	0
				15.0-15.8*	3	13	62	15	4	3	0
				Mean	3	14	67	12	3	1	0
a+b	5	89	6	Mean	5	23	57	9	4	2	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction								
	Flint	Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W	R						
5.5-8.0	Very small sample								
8.0-9.0	18	41	35	6	0	0	0	0	0
9.0-14.0	Very small sample								
14.0-15.8	Very small sample								

TL 62 SE 46 6983 2419 St. Andrew's Field Aerodrome, Great Saling

Block E

Surface level +82.2 m
Water struck at +72.9 m
July 1980

Overburden 9.3 m
Mineral 8.7 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay	Clay, yellowish brown mottled grey, pebbly and sandy abundant chalk pellets and pebbles; soft disturbed	6.0	6.0
	Clay, greyish brown becoming very dark grey with depth, some chalk pellets and pebbles	3.3	9.3
Kesgrave Sands and Gravels	Pebbly sand, 'very clayey' in uppermost metre, becoming more gravel-rich with depth, greyish brown to pale yellowish brown. Clay seam from 16.2 m to 16.5 m Sand: medium and fine with coarse angular to rounded quartz and some flint Gravel: fine and coarse angular flint quartz and well rounded flint with quartzite and some ironstone sandstone and a trace of fossil debris	8.7	18.0
London Clay	Clay, brown, silty	0.2	18.2
	Clay, dark grey, very stiff	0.5+	18.7

GRADING

Mean for deposit percentages			Depth below surface (m)	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	78	15	9.3-10.2*	37	16	23	5	9	7	3
			10.2-11.2*	5	8	68	8	9	2	0
			11.2-12.2	2	22	64	3	3	6	0
			12.2-13.2*	2	31	65	1	1	0	0
			13.2-14.2*	3	31	63	2	1	0	0
			14.2-15.2*	2	32	43	4	9	10	0
			15.2-16.2*	3	19	52	8	11	7	0
			16.5-17.2*	6	17	30	10	21	16	0
			17.2-18.0*	7	6	29	23	22	13	0
			Mean	7	21	50	7	9	6	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
9.3-11.2	34	22	13	8	0	0	0	23	trace	0
11.2-14.2	Very small sample									
14.2-18.0	25	29	28	16	trace	0	0	0	0	2

TL 62 SE 47 6922 2389 Boxted Wood, Great Saling

Block E

Surface level +83.6 m
Water struck at +74.6 m
July 1980

Overburden 12.8 m
Mineral 8.2 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	1.3	1.3
Boulder Clay	Clay, yellowish brown becoming mottled grey with pebbles of chalk	4.7	6.0
	Clay, grey, silty with chalk as pellets and pebbles and concentrated in putty chalk masses	3.5	9.5
	Clay, brown, sandy silty with pebbles of flint and quartz becomes more sandy with depth	3.3	12.8
Kesgrave Sands and Gravels	Pebbly sand, 'clayey' in uppermost and bottom-most metre Sand: medium with fine and coarse quartz and some flint, yellow to pale greyish yellow Gravel: fine and coarse angular and well rounded flint and quartz with quartzite and a trace of sandstone	8.2	21.0
London Clay	Clay, brown, silty smooth	0.4	21.4
	Clay, dark grey smooth	0.1+	21.5

GRADING

Mean for deposit percentages			Depth below surface (m)	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
5	73	22	12.8-13.2*	28	23	35	4	7	3	0
			13.2-14.2*	4	12	48	6	20	10	0
			14.2-15.2*	2	29	66	2	1	0	0
			15.2-16.2*	2	17	62	6	7	6	0
			16.2-17.2*	2	3	42	23	24	6	0
			17.2-18.2*	0	2	40	20	24	14	0
			18.2-19.2*	1	4	45	16	15	19	0
			19.2-20.2*	3	4	56	16	9	12	0
			20.2-21.0*	16	20	46	8	10	0	0
			Mean	5	12	49	12	14	8	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartz-ite	Sand-stone	Chalk	Lime-stone	Iron-stone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
12.8-13.2	Very small sample									
13.2-14.2	39	22	23	16	trace	0	0	0	0	0
14.2-15.2	Very small sample									
15.2-20.2	29	31	31	9	trace	0	0	0	0	0
20.2-21.0	Very small sample									

TL 62 SE 48 6909 2264 Straits Farm, Felsted

Block G

Surface level +79.6 m
Water struck at +70.1 m
July 1980

Overburden 8.3 m
Mineral 3.2 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Boulder Clay	Clay, yellowish brown to brownish yellow mottled grey silty	4.9	5.0
	Clay, dark yellowish brown, silty	0.4	5.4
	Clay, dark grey silty	1.4	6.8
	Clay, yellowish brown silty fine sandy some chalk pellets and angular flint pebbles; becomes more sandy with depth	1.5	8.3
Glacial Sand and Gravel	a 'Very clayey' pebbly sand, dark yellowish brown Sand: medium and fine with coarse quartz and some flint Gravel: fine with coarse well rounded flint with angular flint quartz and quartzite some chalk and sandstone and a trace of ironstone	1.0	9.3
Kesgrave Sands and Gravels	b Gravel, some 'clayey' lenses yellowish brown, sand yellowish Gravel: coarse and fine well rounded flint quartz and angular flint with quartzite and some sandstone Sand: medium with fine and coarse subangular quartz	2.2	11.5
London Clay	Clay, brown, smooth, stiff	0.4	11.9
	Clay, dark grey, stiff	0.4+	12.3

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand			Gravel		
				- $\frac{1}{2}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm	
a	37	55	8	8.3-9.3	37	22	30	3	6	2	0
b	7	46	47	9.3-10.3*	15	12	37	10	14	12	0
				10.3-11.5*	0	3	25	8	30	34	0
				Mean	7	7	30	9	23	24	0
a+b	16	50	34	Mean	16	11	32	7	17	17	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
8.3-9.3	17	59	15	6	1	2	0	trace	0	0
9.3-11.5	27	33	29	10	1	0	0	0	0	trace

TL 62 SE 49 6931 2189 Gransmore Green, Felsted

Block G

Surface level +77.5 m
Water struck at +69.6 m
July 1980

Overburden 7.2 m
Mineral 6.1 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Boulder Clay	Clay, pale brownish to brownish yellow mottled light grey becomes slightly darker with depth, silty, abundant shale pellets and pebbles	4.9	5.2
	Clay, very dark grey, with chalk pellets and some pebbles	1.0	6.2
	Clay, yellowish brown and grey, very silty very sandy one or two flint pebbles	1.0	7.2
Glacial Sand and Gravel	a 'Very clayey' pebbly sand strong brown Sand: medium and fine with some coarse quartz Gravel: fine and coarse flint and quartz	0.7	7.9
Kesgrave Sands and Gravels	b Sandy gravel, with a clay seam from 10.0 m to 10.3 m Gravel: fine and coarse with a trace of cobble well rounded flint and quartz with angular flint and quartzite and a trace of sandstone Sand: medium with coarse and fine angular to subrounded quartz and some flint	5.4	13.3
London Clay	Clay, brown, silty soft	0.4	13.7
	Clay, grey silty	0.2+	13.9

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand			Gravel		
				- $\frac{1}{2}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm	
a	21	73	6	7.2-7.9	21	22	48	3	3	3	0
b	1	54	45	7.9-8.9*	3	4	26	15	29	22	1
				8.9-10.0*	2	4	25	13	32	24	0
				10.3-11.3*	0	4	16	12	37	31	0
				11.3-12.3*	1	6	46	17	22	8	0
				12.3-13.3*	0	3	64	14	14	5	0
				Mean	1	4	36	14	27	18	0
a+b	4	56	40	Mean	4	6	37	13	24	16	0

COMPOSITION

Depth below surface (m)	Percentage by weight in the +8-16 mm fraction									
	Flint		Quartz	Quartzite	Sandstone	Chalk	Limestone	Ironstone	Fossil debris/Phosphat. nodules	Others
	Ang.	W R								
7.2-7.9	Very small sample									
7.9-13.3	25	33	28	14	trace	0	0	0	0	trace

TL 62 SE 50 6958 2129 Watch House Green, Felsted

Block G

Surface level +76.9 m
Water not struck
August 1980

Waste 11.1 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay	Clay, yellowish brown, brownish yellow and yellow, very abundant chalk pebbles and pellets and in dry uncohesive masses; silty	5.6	5.8
	Clay, dark grey, small chalk pellets and pebbles	3.7	9.5
	Clay, dark greyish brown, sandy, silty pebbles of angular to subangular flint, quartz and chalk	1.6	11.1
London Clay	Clay, dark grey stiff silty	0.6+	11.7

TL 62 SE 51 6913 2026 Bannister Green, Felsted

Block G

Surface level +65.3 m
Water not struck
August 1980

Waste 5.0 m
Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Boulder Clay	Clay, yellowish brown, some greenish grey patches, silty some flint and chalk pebbles present; becomes brownish grey and sandy, with some flint and quartz pebbles from 1.6 m, then more 'clayey' from 1.8 m to 2.0 m	1.6	2.0
	Clay, dark yellowish brown streaked grey, smooth waxy	3.0	5.0
London Clay	Clay, dark greyish brown silty stiff, shell debris and crustacean fragment	2.3+	7.3

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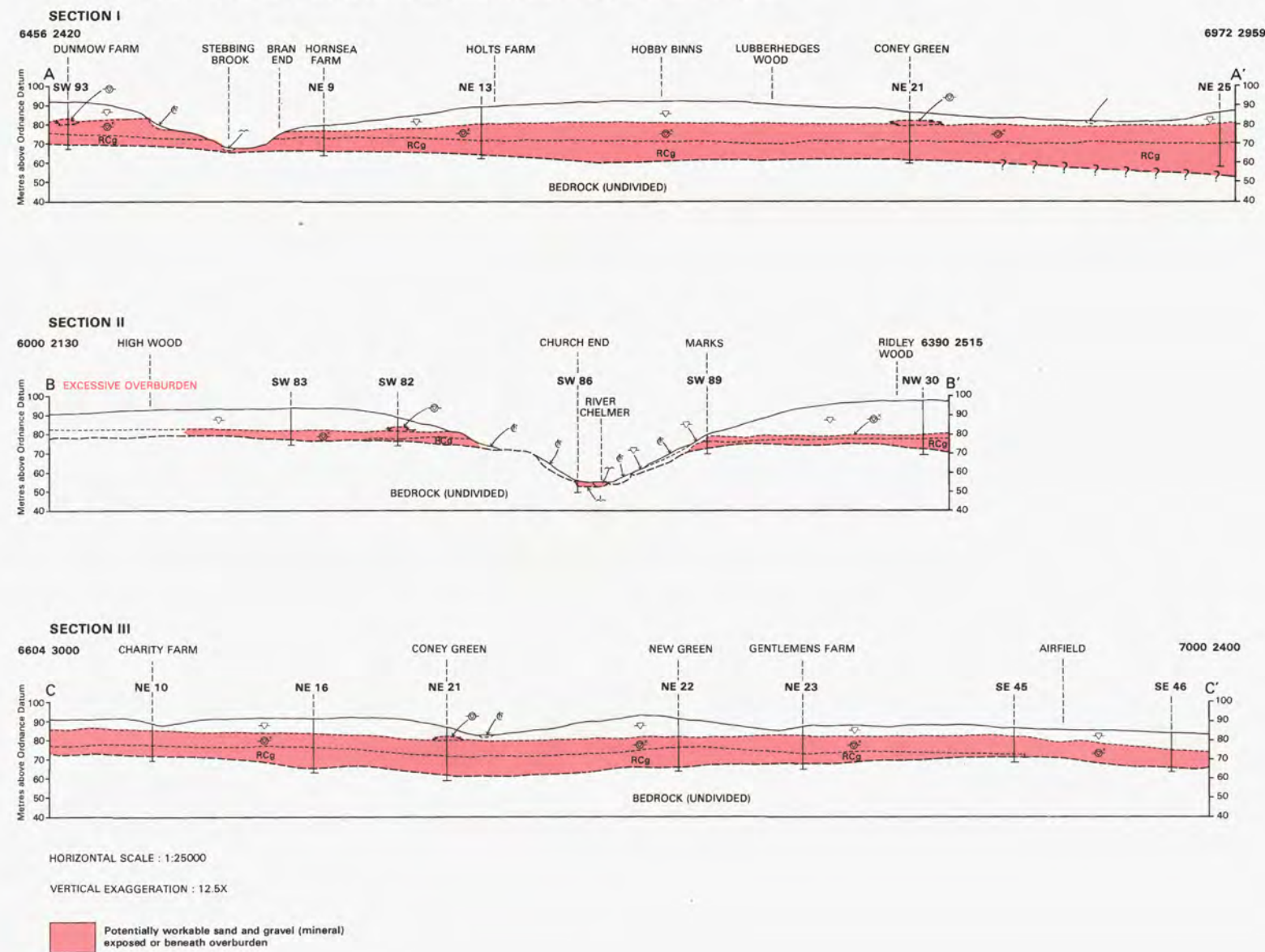
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ORDNANCE SURVEY
SHEET TL 62
PROVISIONAL EDITION

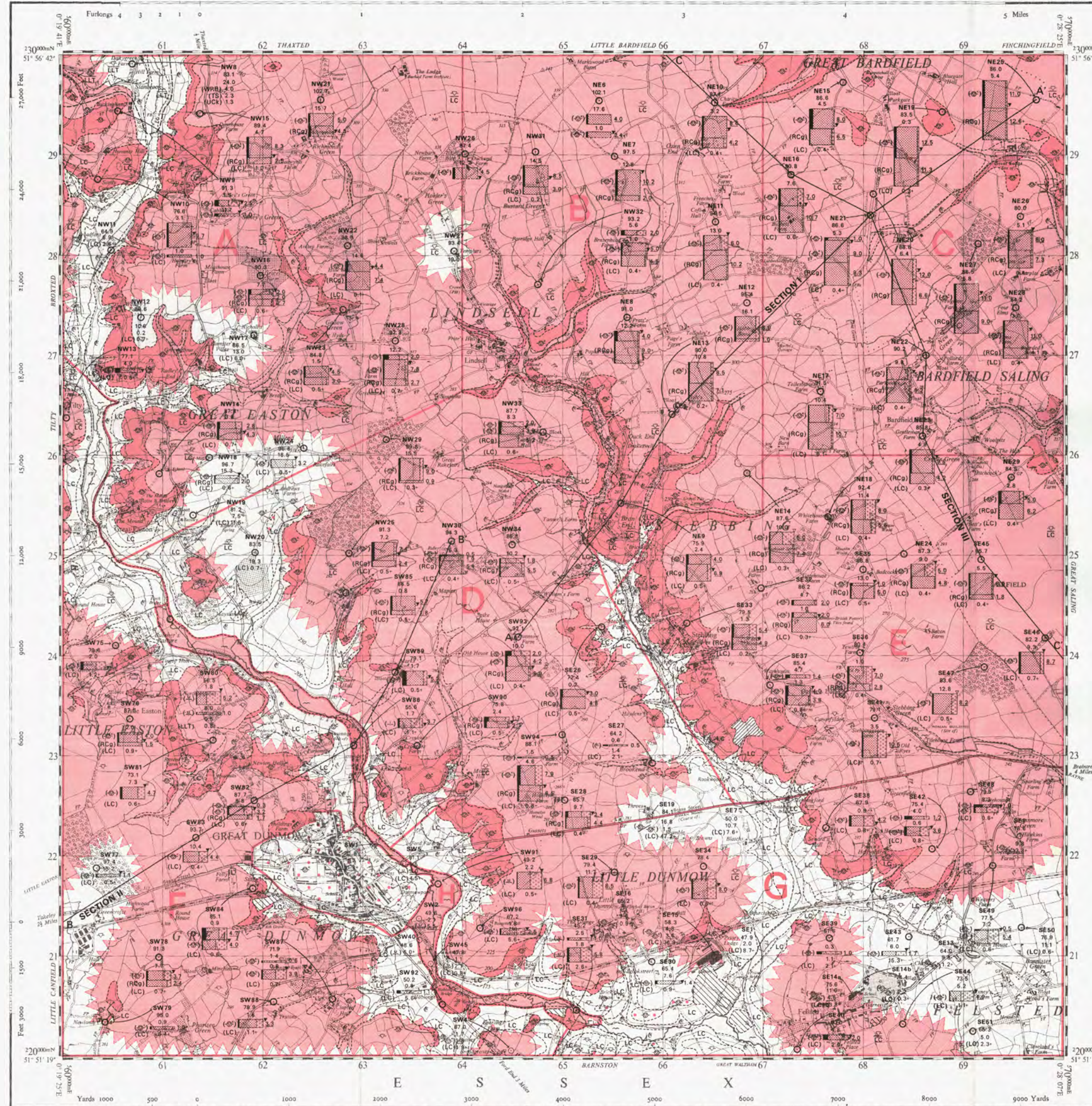
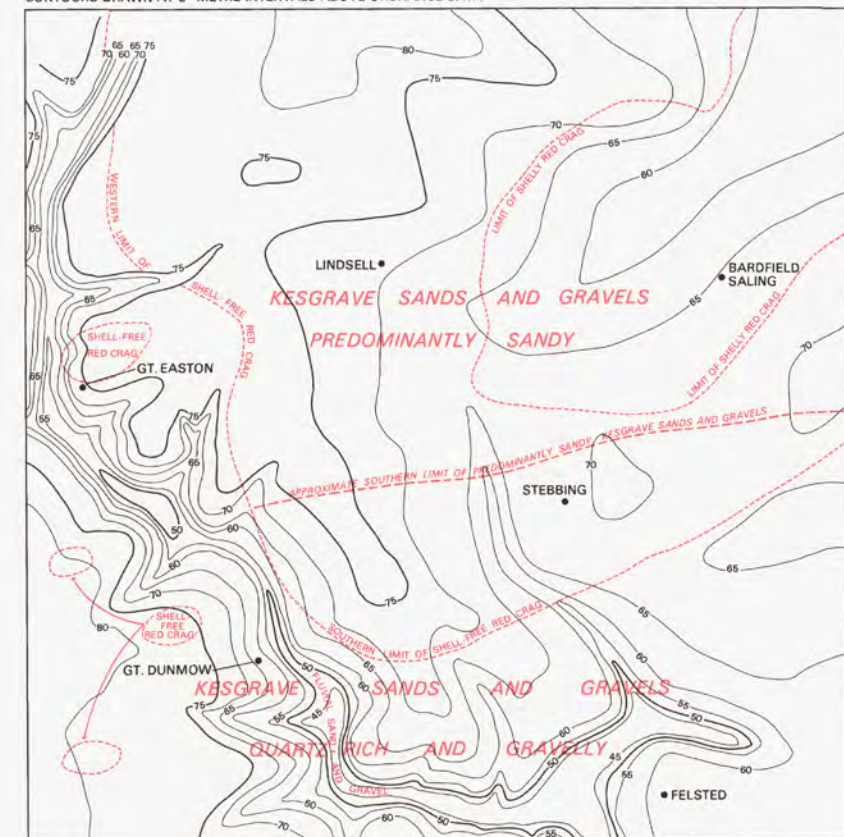
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This map should be read in conjunction with the accompanying Report which contains details of the assessment of the resources.

GENERALISED CROSS SECTIONS SHOWING THE GENERAL RELATIONSHIPS OF THE DRIFT DEPOSITS.



CONTOUR MAP OF BEDROCK SURFACE with notes on the distribution of lithologies in the Red Crag and Kesgrave Sands and Gravels.
CONTOURS DRAWN AT 5-METRE INTERVALS ABOVE ORDNANCE DATA



EXPLANATION OF SYMBOLS AND ABBREVIATIONS

- DRIFT**
- Alluvium - sandy clay, silt and peat overlying sand and gravel in places. A-66
 - First Terrace - sandy to 'clayey' gravels containing flint and quartz. 1T-37
 - Undifferentiated River Terrace Deposits - sandy gravels with flint and quartz and a few silty layers. UT-9
 - Head - sandy silt to silty clay. H-44
 - Boulder Clay - stiff chalky clay with silt rarely sandy, with chalk and flint pebbles. BC-41
 - Glacial Sand and Gravel - pebbly sand, sandy gravel and gravel, often 'clayey' or 'very clayey', containing flint, quartz and often chalk. GS-73
 - Kesgrave Sands and Gravels - sand to sandy quartz - rich gravels. K-8
- SOLID**
- Red Crag - sand, often pebbly. Ironstained or glauconitic. Pebbles dominantly well-rounded flints (ground in boreholes only).
 - London Clay - dark grey silty clay, weathering brown.
 - Woolwich and Reading Beds - multi-coloured stiff waxy clays with fine sands and silts.
 - Thanet Sands - fine, silty glauconitic sands.
 - Upper Chalk - soft white limestone, with flint seams.
- BOUNDARY LINES**
- Geological boundary, Drift
 - Geological boundary, Solid
 - Inferred boundary between recognised categories of deposits
 - Resource Block boundary
 - Broken lines denote uncertainty
- BOREHOLE DATA**
- SITE LOCATIONS**
- Industrial Minerals Assessment Unit (I.M.A.U.) Boreholes
 - Other Boreholes
- I.M.A.U. BOREHOLES**
- Borehole Registration Number
 - Borehole Site
 - Grading Diagram
 - Waste
 - Geological Classification
- OTHER BOREHOLES**
- CATEGORIES OF DEPOSITS**
- Exposed Mineral CAT-E6
 - Continuous or almost continuous spreads of mineral beneath overburden CAT-C1
 - Sand and gravel not assessed (exposed and beneath overburden) CAT-N3
 - Sand and gravel absent or not potentially workable CAT-A4
- RESOURCE BLOCKS**
- For the purpose of assessment the mineral is divided into Resource Blocks (see Report). Each is designated by a letter.
- Detailed records may be consulted on application to the Head, Industrial Minerals Assessment Unit, Institute of Geological Sciences, Keyworth, Nottingham NG12 5GG.

The representation on this map of a Road, Track, or Footpath, is no evidence of the existence of a right of way.

Geological lines from a six-inch survey by R.D. Lake, S.P. Mills and G.A. Wilson, 1978-79. W.A. Read and R.A. Baxby, District Geologists. Sand and Gravel survey by C.W. Thomas and P.M. Hoggan, 1980. R.D. Thwaites, Head, Industrial Minerals Assessment Unit. 1:25000 Sand and Gravel Resource Sheet published 1982. G.M. Brown, D.Sc., F.R.S., Director, Institute of Geological Sciences.

The GRID lines on this sheet are at 1 Kilometre intervals. Heights are in feet above Mean Sea Level of Newlyn.

Compiled from 6" sheets last fully revised 1915-19. Other partial systematic revision 1946-53 has been incorporated.

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