NATURAL ENVIRONMENT RESEARCH COUNCIL

BRITISH GEOLOGICAL SURVEY

The sand and gravel resources of the country around Harleston and Bungay, Norfolk and Suffolk. Description of 1:25 000 resource sheets comprising parts of TM27, 28, 38 and 39

C. A. Auton, A. N. Morigi and D. Price with a contribution by M. R. Clarke

Bibliographic reference

AUTON, C. A., MORIGI, A. N. and PRICE, D. 1985. The sand and gravel resources of the country around Harleston and Bungay, Norfolk and Suffolk. Description of 1:25 000 resource sheets comprising parts of TM 27, 28, 38 and 39. (Keyworth: British Geological Survey)

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Production of this report was supported by the Department of the Environment.

KEYWORTH: BRITISH GEOLOGICAL SURVEY 1985

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, systematic surveys began in 1968. The work was financed by the Department of the Environment and undertaken with the co-operation of the sand and gravel industry.

In 1982, the Department of the Environment commissioned an investigation to provide a locational, qualitative and quantitative assessment of sand and gravel resources in the country around Harleston (Norfolk) and Bungay (Suffolk). This report presents the results of the investigation, which was carried out by C. A. Auton, assisted by M. R. Clarke and A. R. Clayton. The work is based on geological surveys carried out by A. Horton, T. E. Lawson and C. J.Wilcox in 1980. The report has been compiled largely by A. N. Morigi and D. Price.

Mr J. D. Burnell, ISO (Land Agent) negotiated access to land for drilling. The ready co-operation of land owners and tenants is gratefully acknowledged.

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The sand and gravel resources of the country around Harleston and Bungay.

EXECUTIVE SUMMARY

Introduction

1. This report presents the results of an investigation commissioned by the Department of the Environment in 1982 to provide a locational, qualitative and quantitative (to the 'indicated' level) assessment of sand and gravel resources contained in part of the Waveney valley and adjacent areas.

2. The district lies within the East Anglia region, where demand for sand and gravel is thought likely to remain relatively bouyant and which is a potential source of aggregate supply for parts of the South East Region. Sand and gravel has been extracted in numerous places within the district but past and present workings are concentrated around Bungay, at Homersfield and south of Harleston.

Geology

3. A geological resurvey of the district was carried out in 1980 by BGS staff in order to provide a sound basis for the investigation, and the results of this resurvey are incorporated in the 1:25 000 sand and gravel rescources sheets which accompany this report.

4. Within the district, Chalk and Crag are overlain by a complex sequence of drift deposits consisting largely of till and glacial, fluvio-glacial and fluvial sand and gravel. The geological sequence is tabulated and briefly described (Table 1; pp 3-8).

5. The principal potential sand and gravel resources are found (a) within the Beccles Beds, which lie between the Crag and the Lowestoft Till, (b) within glacial deposits which fill channels cut into older sediments, and (c) in more recent accumulations which form river terraces in the Waveney valley. The nature of each potential resource is described (pp 8-11).

Method

6. Shell and auger boreholes at 132 sites form the basis of the assessment of the resources. They were supplemented by 22 power auger holes, which did not provide material suitable for grading. Additionally, 49 resistivity soundings were made, largely to provide information about overburden to mineral ratios.

7. Some 1600 samples were graded; they range in composition from 'very clayey' sand to gravel. Physical and mechanical properties of coarse aggregates from a variety of sources have been determined (Table 2).

8. The information derived from the investigation is summarised on two 1:25 000 scale resources sheets.

Resources assessment

9. All the deposits in the district that might potentially be workable have been investigated and a simple statistical method has been used to estimate the volumes of the resources. The mineral bearing ground, which constitutes about 80 per cent of the total area of the district, has been divided for assessment purposes into 11 resource blocks containing between 8.0 and 17.5 km of sand and gravel (Table 3; pp.11-19). Mean thicknesses of potentially workable sand and gravel in the blocks range from 7.5 to 13.2 m but overburden thicknesses are also generally high, averaging 3.2 m to 11.8 m except in the Waveney valley.

10. The mean gravel content of the potentially workable deposits within the resource blocks ranges from 9 to 39 per cent; in about half the mineral bearing area it averages less than 15 per cent.

11. The total volume of potentially workable sand and gravel in the district is estimated at 1550 million m $\pm$8 per cent. About two-thirds of this volume underlies overburden that is more than 6 m thick; most of this part of the deposit has a mean gravel content of less than 20 per cent. River terrace deposits in the Waveney valley and underlying channel-filling glacial sand and gravel are likely to give the highest coarse-aggregate yields per unit area.

12. It must be pointed out that the estimated total volume bears no simple relationship to the amount that could be extracted in practice because no account has been taken of factors such as roads, villages or areas of high agricultural or landscape value.

The sand and gravel resources of the country around Harleston and Bungay, Norfolk and Suffolk.

Description of 1:25 000 resource sheets including parts of TM 27, 28, 38 and 39

Notes

Each borehole registered with the Survey is identified by a four-element code (e.g. TM 27 NW 10). 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 first element, TM, is normally omittted.

All National Grid references in this publication lie within the 100-km square TM unless otherwise stated. Grid references are given to eight figures, accurate to within 10 m, or to six-figures for less precise locations, for example farms.

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 a 0.063 mm mesh B.S. sieve) 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 about 19 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.

Crag that is not thought to be potentially workable may, together with Chalk, be 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, ¼ 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 grade 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 approximately 10 km^2 of sand and gravel. No account is

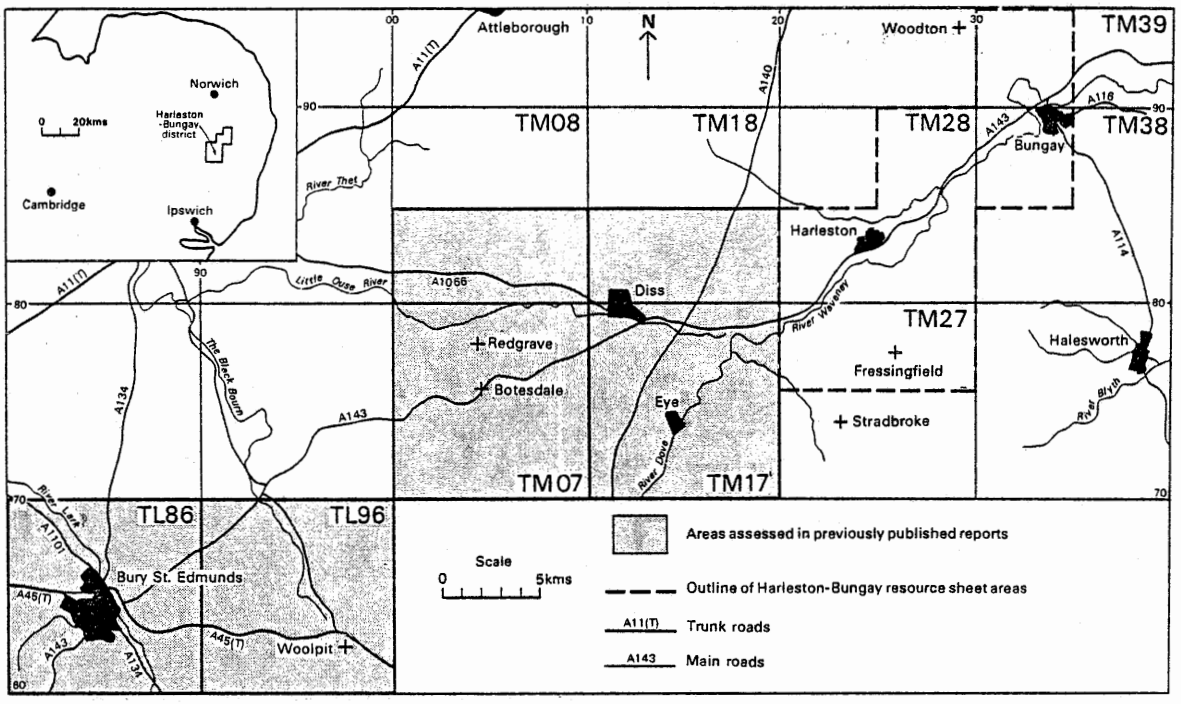


Figure 1 The location of the Harleston-Bungay district and its relationship to adjacent, previously assessed areas.

taken of any factors, for example roads, villages or land of high agricultural or landscape value, which might stand in the way of sand and gravel being exploited, although towns are excluded. The estimated total volume therefore bears no simple relationship to the amount that could be extracted in practice.

It must be emphasised that the assessment applies to the resource block as a whole: valid conclusions cannot be drawn about mineral in parts of a block, except in the immediate vicinity of the actual sample points.

DESCRIPTION OF THE DISTRICT

General

This survey covers 175 km^2 of ground around the market towns of Harleston, in Norfolk, and Bungay, in Suffolk. It is the third in a series of studies commissioned by the Department of the Environment to assess the sand and gravel resources in and around the valley of the River Waveney and follows previous assessment studies of the adjoining Redgrave and Diss areas (Auton, 1982; Wilcox and Stanczyszyn, 1983) as shown in Figure 1.

The district encompasses the Waveney valley from the village of Brockdish to the village of Broome, and adjacent areas. The River Waveney forms the county boundary between Norfolk and Suffolk hereabouts. Much of the countryside is in agricultural use. Dairy farming is concentrated on the low-lying ground of the valley floors whereas arable farming is dominant on the higher ground.

Some 80 per cent of the district is identified as containing gravel and/or sand which might, in the long term, prove protentially workable for aggregate. Past and present workings are mainly concentrated in the Waveney valley around Bungay, at Homersfield and south of Harleston.

Topography

The principal topographical feature is the valley of the River Waveney (Figure 2) which crosses the district from south-west to north-east. The main north-bank tributaries of the Waveney are Broome Beck, which flows south-eastwards from Hedenham to join the river just beyond the eastern margin of the district, and the stream which flows eastwards through Starston. South of the River Waveney, the main tributaries are The Beck, which flows westward from St Cross South Elmham, and the unnamed stream which flows north from Wingfield to join the Waveney north-west of Weybread. The ground rises steeply away from the river and stream valleys to form gently undulating plateaux which rise to 49 m OD in the north of the area and 54 m OD in the south.

Table 1 Geological succession

DRIFT	
Recent and Pleistocene	Blown Sand
	Peat
	Alluvium
	Cover Sand
	River Terrace Deposits
	Head
	Head Gravel
	Boulder Clay: Lowestoft Till
	Glacial Laminated Deposits and Glacial Silt
	Glacial Sand and Gravel
	Channel Fill Deposits
	Beccles Beds:
	'Glacial' Beds
	Mendham Beds
	Starston Till
	Pebbly Series
	Ingham Sand and Gravel
	Kesgrave Sands and Gravels
	Westleton Beds
SOLID	
Pleistocene	Crag
Cretaceous	Upper Chalk

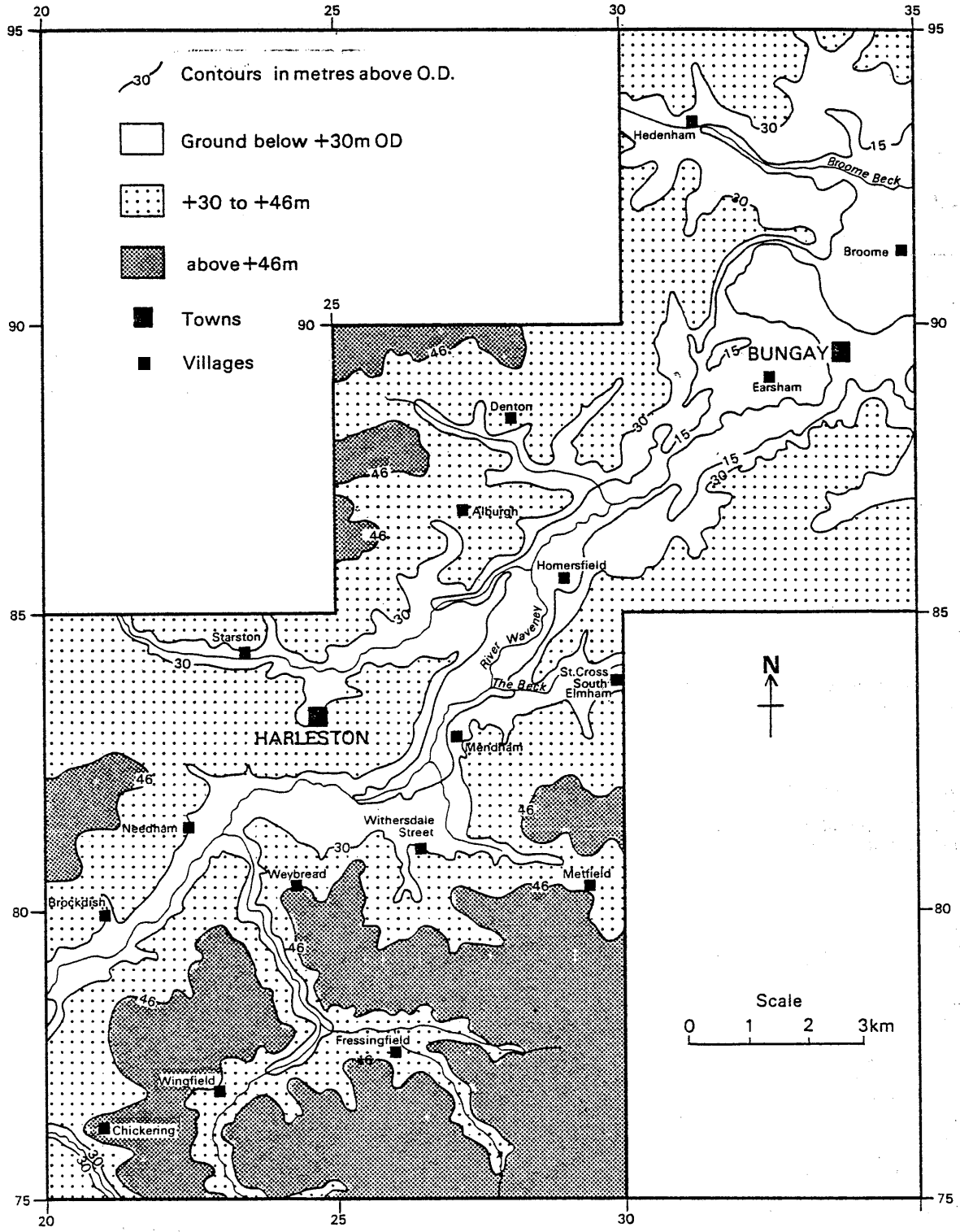


Figure 2 Topography of the district.

Geology

The north-eastern part of the district (principally sheets TM38 and 39) were first geologically surveyed at the scale of one inch to one mile by Reid in 1875-79, and the results published as part of the Old Series One-Inch Geological Sheet 66SE in 1881 and in the accompanying descriptive memoir (Woodward, 1881). The western part (principally sheets TM27 and 28) was first surveyed at the one-inch scale by W. H. Dalton, F. J. Bennett and W. Whitaker in 1879-81, and published as part of the Old Series One-Inch Geological Sheet 50 NE in 1884; the descriptive memoir by Whitaker and Dalton was published in 1887.

The district was resurveyed at the scale of 1:10 560 for the purpose of this assessment by A. Horton, T. E. Lawson and C. J. Wilcox in 1980. Detailed notes on many aspects of the geology of the district are available (Horton, 1982; Lawson, 1982; Wilcox and Horton, 1982). The geological succession is summarised in Table 1 and described briefly below.

SOLID

Upper Chalk

The Upper Chalk, which consists of massively-bedded, soft white limestone with sporadic layers of nodular

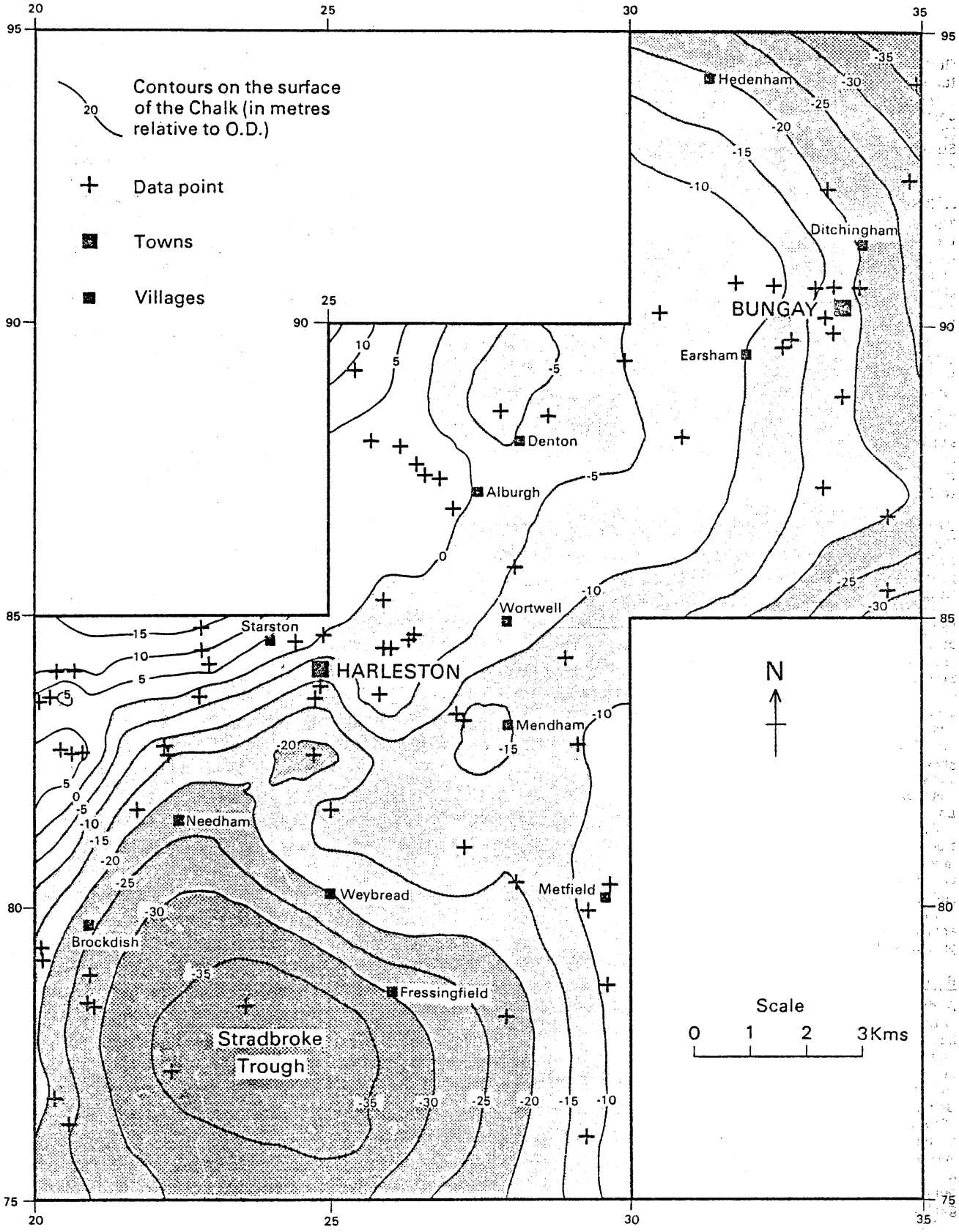


Figure 3 Computer-contoured map of the surface of the Chalk.

flint, is concealed by Pleistocene and Recent sediments. Its upper surface, which is an unconformity, slopes down from about 15 m above OD north of Harleston to 35 m below OD east of Bungay, but is very irregular (Figure 3). South of Harleston, a depression known as the Stradbroke Trough (Nottcutt, 1978) reaches a depth of more than 35 m below OD.

Crag

The Crag underlies the drift deposits throughout much of the area but is largely absent in the north-west. Its limits as shown on the resource map are based on assessment borehole data and are largely conjectural. The Crag rests unconformably on the Upper Chalk, filling depressions in its surface and reaching a thickness of at least 60 m in the Stradbroke Trough.

The Crag was deposited in an open shallow marine, estuarine or tidal flat environment. It consists mainly of sand with some laminae of clay and silt and, locally, lenses of gravel. Below the water table the Crag has a greyish-green colour because of the presence of glauconite, and is commonly shelly. Above the water table, the sands are decalcified, commonly iron-stained and range in colour from yellow to orange-brown. Iron released by the oxidation of glauconite may have been redistributed to form thin layers of iron pan.

DRIFT

The complex drift succession of the district has been built up in a wide range of environments. Although, in places, what are believed to be beach gravels overlie the Crag, the lowest parts of the Beccles Beds are for the most part of fluviatile origin and accumulated under temperate to near glacial conditions. With deterioration of the climate, ice advanced across the region and, at its probable maximum extent, deposited the impersistent Starston Till. Melting and retreat of the ice produced the outwash sands and pebbly sand of the upper part of the Beccles Beds. During a further glacial episode, deep channels were cut in front of or beneath the advancing ice. These were subsequently filled by glacial sand and gravel with subordinate clays and silts, and, in places, outwash was deposited beyond the confines of the channels. Over-riding ice emplaced the widespread Lowestoft Till.

Climate ameliorated for a period, allowing the formation of organic deposits, but then deteriorated once more. The river terraces are though to have accumulated under cold conditions, probably as outwash from snowfields during further glacial episodes.

Head and blown sand were formed in a periglacial environment but the alluvium and related peats are products of the current temperate climate.

Beccles Beds

A diverse suite of sands, gravels and clays which postdates the shelly Crag and pre-dates the Lowestoft Till has been given the informal name 'Beccles Beds' (Wilcox and Horton, 1982). These deposits are widespread beneath the Lowestoft Till and crop out in the valleys of the River Waveney and its tributaries. Included in the Beccles Beds are several distinct lithological units (Table 1) that have been recognised in many assessment boreholes. With the exception of the oldest, the Westleton Beds, which have a shallow marine origin, they are terrestrial deposits — the lower part of the sequence being fluviatile in character and the upper part glacigenic.

The Westleton Beds are gravels containing abundant rounded black flint pebbles derived from Lower London Tertiary strata and are believed to be beach-plain deposits (Hey, 1967). The overlying pebbly sands and sandy gravels are similar to, and are correlated with, the Kesgrave Sands and Gravels which occur widely in Essex, Suffolk and Norfolk. The gravel is mainly of subangular flint pebbles but is rich in quartz and grey quartzite; it has a 'bleached' appearance. The top 1 to 2 m of the deposit is often clayey and may be coloured reddish orange to moderate red. This zone of reddening and clay enrichment is interpreted as representing a pre-glacial soil horizon (palaeosol) which equates with the Valley Farm Rubified Sol Lessive of Rose and Allen (1977). The Kesgrave Sands and Gravels are considered by many authors to be periglacial braided-stream sediments deposited by an ancestral River Thames (Rose and others, 1976; Rose and Allen, 1977; Hey, 1980). However, this interpretation is contested by Lake and others (1977) and Wilson and Lake (1983), who do not recognise the zone of reddening and clay enrichment as a palaeosol and believe the whole terrestrial sequence to be part of a glacigenic suite.

Iron-stained sandy gravels rich in liver-coloured, well-rounded 'Bunter' quartzite pebbles were encountered in three assessment boreholes north of the River Waveney. They are correlated with the Ingham Sand and Gravel which has been proved in several BGS boreholes between Bury St. Edmunds and Redgrave and is exposed in a pit near Ingham. Hey (1980) suggested that these and other quartzite-rich gravels in this area were deposited by a tributary of the braided-stream system which laid down the Kesgrave Sands and Gravels. However, Clarke and Auton (1982) consider these 'Bunter'-rich gravels to represent a separate fluvial event. The stratigraphical relationship between the Ingham Sand and Gravel and the Kesgrave Sands and Gravels is equivocal, but in borehole 28 SW 29 the former appear to overlie the latter.

The Pebbly Series formerly embraced all sands and gravels younger than the shelly Crag and older than the Norwich Brickearth, which is the probable equivalent of the Starston Till (e.g. Whitaker and Dalton, 1887). Its use here is restricted to that part of the former Pebbly Series which succeeds the Westleton Beds, Kesgrave Sands and Gravels and Ingham Sand and Gravel. As thus defined, the Pebbly Series comprises pebbly sands and sandy gravels similar in composition to the underlying deposits. However, generally, the gravel is coarser, the flint pebbles more angular, and the proportion of quartz and quartzite slightly lower. These deposits were proved in assessment boreholes throughout the area and appear to form a continuous, or almost continuous, unit with an average thickness of about 6 m and a maximum thickness (in borehole 28 SW 55) of 16.6 m. Their origin is still under investigation but they are probably in part fluvial and in part fluvio-glacial.

Overlying the Pebbly Series, and up to 13.9 m thick (borehole 38 NW 43), are fine- and medium-grained quartz sands with scattered flint pebbles. They were found in boreholes between Flixton Park and Ilketshall St Margaret, and between Harleston Common and Redenhall. Isolated occurences have also been proved in boreholes at Ditchingham, Denton and Wingfield. These sands are comparable to those in the type section of the Mendham Beds at Mendham Pit [2716 8245], which are interpreted as distal fluvio-glacial outwash (Lawson, 1982).

The uppermost unit of the Beccles Beds, here informally named the Beccles 'Glacial' Beds, comprises pebbly sands which are widespread throughout the district and reach a maximum thickness of 11.9 m in borehole 27 NW 24, near Weybread. The fine gravel fraction consists predominantly of angular flint, but includes subordinate rounded flint, quartz and quartzite; it often contains chalk pebbles which, in rare cases, may account for about 50 per cent of the gravel (e.g. in borehole 28 SW 52). Angular chalk grains are also present in the coarse sand fraction.

Thin clays and silts occur throughout the Beccles Beds but only one is of regional significance. This is the Starston Till which, at its type section [2427 8444], is described by Lawson (1982) as "light brown compact

clayey sand and sandy clay containing rare scattered chalk pebbles, commoner fine flint gravel, with scattered shell fragments (probably derived Norwich Crag shells) and blocks and irregular lobes of clean sand and chalky sand, probably incorporated whilst frozen". It is also commonly finely laminated. The till is impersistent. Small outcrops are found around the 30 m contour on the valley sides of tributaries of the Waveney at Denton and Starston, and it has been identified in some boreholes, for example 27 NE 8 and 28 SW 43, where it reaches thicknesses of 6.8 m and 3.7 m respectively. The Startson Till, where present, generally separates the Pebbly Series from the overlying units of the Beccles Beds. However, this is not always the case as it also occurs within the upper part of the Pebbly Series (e.g. in borehole 28 SE 33), in the lower part of the Mendham Beds (e.g. in borehole 39 SW 51) and in Beccles 'Glacial' Beds (borehole 39 SW 52), thus reflecting the complex interaction of processes at the time of deposition. Up to three 'leaves' of the Starston Till are thought to exist in places, complicating matters further. The origin of this till is uncertain. It has been variously described as a lodgement till, as a flow till or as being in part water-lain (Horton, 1982). It is considered to be the lateral equivalent of the Norwich Brickearth (Wilcox and Horton, 1982).

Organic deposits have been found within the Beccles Beds by a number of assessment boreholes, notably those at Hospital Farm (28 NE 25), Needham (28 SW 45) and Fressingfield (27 NE 9). At Hospital Farm, 6.1 m of peat and silt lie between Crag and thin Beccles 'Glacial' Beds overlain by Starston Till; they include pollen and insects and are thought to represent a cool temperate interglacial episode (Taylor and Coope, *in press*).

Channel Fill Deposits and Glacial Drift, Undifferentiated

These deposits comprise complex, variable sequences of boulder clay, glacial sand and gravel, and clay or silt that fill channels (buried valleys) cut down through the Beccles Beds into the Crag and, locally, slightly into the Chalk (as, for example, in borehole 38 NW 32). The present-day drainage pattern appears to be virtually coincident with a network of these ancient valleys; thus, boreholes sited on alluvium or river terraces frequently encountered underlying channel-fill deposits.

The channel-fills are usually buried beneath younger drift deposits but in places they are found at the surface. In the valley of Broome Beck, the sand and gravel that occupies one of the channels is sufficiently extensive to be mapped as a distinct and persistent lithology; it is shown on the resource map as 'Glacial Sand and Gravel'. However, within the same channel east of Spinks Hill [348 930], the infill is more variable; the laterial extent of individual lithologies cannot be delineated and they are, therefore, shown on the map as 'Glacial Drift, Undifferentiated'. Glacial Sand and Gravel on the sides of the Waveney valley is also believed to comprise, at least in part, channel-fill.

Forty-five assessment boreholes penetrated channel-fill deposits, proving thicknesses of up to 23.2 m (borehole 27 NW 13) and averaging 19.1 m. Consisting very largely of sand and gravel, these deposits are believed to be glacial in origin and are shown as such on the resource sheets. In Appendix D, however, they are grouped with related strata as 'Channel Fill Deposits'. The boulder clay within the channels resembles the Lowestoft Till.

Humic silts are present in places within the channel-filling sequences, as in borehole 27 NW 13 south of Depperhaugh.

Glacial Sand and Gravel

As well as forming the major part of the channel-filling sequences described above, glacial sand and gravel is widely but impersistently distributed within and beneath the Lowestoft Till. Thick deposits underlie the till north of the Waveney between Brockdish and Earsham, for example, where borehole 28 SW 36 proved 10.8 m of sand and gravel beneath 14.2 m of boulder clay. South of the Waveney, deposits mapped as Glacial Sand and Gravel are generally less than 2 m thick, but between Weybread and Wingfield thick drift deposits, including several metres of sand and gravel, fill a depression in the Crag surface.

Glacial Sand and Gravel ranges in composition from sand to gravel but typically comprises coarse, ill-sorted sandy gravel or pebbly sand with scattered cobbles. The gravel consists mainly of angular flint and frequently contains a high proportion of chalk pebbles; the sand is mainly medium-grained and comprises quartz and flint.

Glacial Laminated Deposits and Glacial Silt

Glacial silt occurs only locally at the surface and is mapped as 'Glacial Laminated Deposits'. The most notable outcrops are those around Hedenham in the Broome Beck valley, and in the tributary valleys near Withersdale Street. However, boreholes show that silt is commonly found within boulder clay sequences and also with boulder clay and glacial sand and gravel filling buried channels. It is extremely variable in thickness; it occurs commonly as thin 'partings' only tens of centimetres thick but occasionally as thick deposits, as for example in borehole 28 NE 19 which did not reach the base of the silt after penetrating it for 8.2 m. The silt is generally olive grey but weathers to yellowish brown. It is often finely laminated, sometimes with thin sand laminae, and may be sandy, clayey or micaceous.

Boulder Clay

The thick Chalky Boulder Clay, or Lowestoft Till, covers much of the district and forms the undulating plateaux. It is a dark olive grey, highly consolidated, clay or silty clay with scattered pebbles and cobbles of chalk and flint, and sporadic clasts of vein quartz, quartzite, limestone and black (Jurassic) mudstone. Commonly, the uppermost metre is decalcified to a moderate yellowish brown sandy clay, and a weathered zone passes downwards through mottled light grey and moderate brown clay to a depth of approximately 4 m.

Similar boulder clay also occurs at a lower level beneath the valleys, where it appears to occur within the glacial sequences filling the buried channel system already described. A different boulder clay, the Starston Till, has been described as a component of the Beccles Beds.

Head Gravel

Isolated spreads of Head Gravel overlying boulder clay are mapped near the margins of the plateaux and, locally, boreholes sited in the valleys have encountered the deposit. The maximum recorded thickness is 3.7 m (borehole TM 27 NE 5). Head gravel is commonly a sandy, sometimes clayey, gravel including angular cobbles of flint and some rounded quartzite pebbles. It may be an early post-glacial fluviatile sediment which has incorporated some of the underlying deposits as a result of disturbance caused by freezing and thawing (cryoturbation) (Horton, 1982).

Head

Head occurs on the lower slopes and on the floors of the upper reaches of small tributary valleys, where it has accumulated by the processes of hillwash and solifluxion. It is usually an ill-sorted deposit with a lithology that tends to reflect that of upslope materials from which it has been derived. Sandy or silty clay with abundant angular flint pebbles is most common but, in a few boreholes, very clayey pebbly sand or sandy gravel was encountered. Chalk is generally absent. Borehole

39 SW 50 found 6.7 m of Head but it seldom exceeds a thickness of 2 m.

River Terrace Deposits

Spreads of river terrace deposits occur along the Waveney valley, both at the margins of the floodplain and as 'islands' above the level of the alluvium. They are particularly extensive around Shotford Heath and downstream of Wortwell, reaching a width of more than 1 km near Bungay. First, Second and Third terraces, in ascending order of level, have been recognised.

The deposits, proved in 29 assessment boreholes, are between 0.4 m and 4.4 m thick, and average 2 m. They range from 'clayey' sand to gravel and are generally coarser downstream from Wortwell. The gravel fraction is composed mainly of angular flint pebbles. In places it is difficult to distinguish between terrace deposits and underlying glacial sand and gravel, although the latter usually contains a higher proportion of chalk pebbles.

Organic deposits were recorded beneath terrace sands and gravels in the Waveney valley, and in the course of the assessment a peat was observed beneath First Terrace deposits in a temporary pit section [327 899] near to the line of the Bungay by-pass. This peat has been radiocarbon dated at 11 210 years before present and yields a fauna, mainly beetles, adapted to a cold climate (Taylor and Coope, *in press*).

Cover Sand

Discontinuous spreads of cover sand overlie the Lowestoft Till, commonly occurring in pockets known to local farmers as 'gaults'. They are generally less than 1 m thick and comprise yelowish brown pebbly sand, often 'very clayey', containing scattered angular pebbles of flint. Because it is thin and discontinuous, cover sand has been neither mapped nor assessed.

Alluvium

Alluvium is widespread in the valleys of the area. It is generally a mottled grey and brown clay and is often silty or sandy; it is locally intercalated with thin lenses of peat and shelly clay. The alluvium averages less than one metre in thickness although a maximum of 2.5 m has been recorded.

Peat

Extensive spreads of peat are found on much of the floodplain of the River Waveney. They are commonly around a metre thick, but as much as 2.7 m have been recorded in boreholes. The peat passes beneath, and may interdigitate with, the alluvium.

Blown Sand

Blown Sand of Devensian age has been mapped at Outney

Table 2 Physical and mechanical properties of the aggregate

Deposit	Aggregate Crushing Value	Aggregate Impact Value	Apparent Relative Density	Relative density		Water absorption (% of dry mass)
				oven-dried basis	saturated and surface dried bases	
SHEET 1						
Channel-fill (Waveney valley)	18.0	28.1	2.64	2.61	2.62	0.6
Pebbly Series	15.0	22.6	2.63	2.59	2.61	0.6
Kesgrave Sands and Gravels	15.0	23.0	2.62	2.58	2.60	0.6
SHEET 2						
Channel-fill (Waveney valley)	16.0	25.4	2.63	2.57	2.59	0.8
Pebbly Series	15.0	24.0	2.65	2.59	2.62	0.8
Ingham Sand and Gravel	15.0	24.2	2.64	2.57	2.60	1.0
Kesgrave Sands and Gravels	16.0	22.8	2.63	2.59	2.61	0.6
River Terrace Deposits	16.0	23.2	2.63	2.56	2.59	1.1
Head Gravel	*	*	2.56	2.47	2.51	1.5
Glacial Sand and Gravel	16.0	24.6	2.63	2.54	2.57	1.3
COMBINED SHEETS						
Channel-fill:						
Waveney tributaries	16.0	25.5	2.64	2.57	2.59	1.1
Chalk-rich deposits	*	31.6	2.66	2.33	2.45	5.1
Beccles 'Glacial' Beds	16.0	25.4	2.62	2.54	2.57	1.4
Westleton Beds	14.0	22.6	2.61	2.55	2.58	0.9
Crag	*	22.2	2.63	2.58	2.55	1.3

* insufficient material for test

Common, Bungay [325 905], where fine- to medium-grained sands with rare flint pebbles form ridges and arcuate dunes (Wilcox and Horton, 1982).

COMPOSITION OF THE SAND AND GRAVEL DEPOSITS

Potentially workable deposits are found within the Crag, Beccles Beds, Glacial Sand and Gravel, Head and Head Gravel, and River Terrace Deposits.

Descriptions of the sand and gravel deposits based on visual inspection and accompanied by sample gradings and lithological analyses are given in Appendix D. Grading data for each deposit are summarised in Figures 4 and 5. The results of mechanical and physical tests which were carried out according to BS 812 (British Standards Institution, 1975) on aggregates from several different sources are shown in Table 2.

Crag

Much of the Crag, especially below the water-table, contains abundant glauconite which renders it unsuitable for many applications. This part of the Crag is not considered as 'mineral' for the purposes of this assessment. Additionally, Crag with an undesirably high proportion of shell debris may be deemed not to be potentially workable. Nevertheless, a number of boreholes have encountered Crag deposits without these deleterious components and these have been included in the assessment. They have a mean grading of 10 per cent fines, 87 per cent sand and 3 per cent gravel, but consist mostly of sand, 'clayey' sand or 'very clayey' sand. Gravel is uncommon, although a few boreholes found pebbly sand and two, namely 28 NE 32 and 28 SW 48, proved sandy gravel and gravel, respectively. The 8 to 16 mm fraction of the latter comprises mainly rounded and angular flint, with a little quartz and quartzite; it also contains 14 per cent of shell debris and iron pan. Crag sand is composed of roughly equal amounts of fine-and medium-grained subrounded quartz, with some mica. Fines occur as thin partings of silt and clay which are found at intervals throughout the sequence.

Beccles Beds

Potentially workable deposits within these beds are thick, extensive and diverse in composition. They have a mean grading of 8 per cent fines, 76 per cent sand and 16 per cent gravel, and a range in grain size that encompasses all grades of mineral. An analysis of the 8 to 16 mm fraction shows that the main constituents are flint, quartz and quartzite. The relative proportions of these vary throughout the sequence but, generally, rounded flint, quartz and quartzite are predominant near the base, while angular flint increases in abundance towards the top. The various components of the Beccles Beds are described below.

Westleton Beds These deposits have a mean grading of 5 per cent fines, 55 per cent sand and 40 per cent gravel. They range in composition from 'clayey' pebbly sand to gravel. The gravel fraction usually includes roughly equal proportions of fine and coarse pebbles. It is characterised by black rounded and angular flint but may also include up to about 10 per cent each of quartz and quartzite. The sand consists mainly of medium-grained subrounded quartz and flint. The fines are generally disseminated throughout the deposit.

Kesgrave Sands and Gravels Most boreholes penetrating this unit encountered pebbly sand or sandy gravel, which in some cases contained up to 21 per cent of fines, but borehole 27 NE 10 found gravel and borehole 38 SW 44 proved 'clayey' sand. The mean grading of all samples collected is 8 per cent fines, 72 per cent sand and 20 per cent gravel.

The gravel fraction, which comprises similar amounts of fine and coarse pebbles, is composed of about 40 per cent angular flint and up to 30 per cent rounded flint, together with roughly equal amounts of quartz and quartzite. Pebbles of igneous rocks may be present in small amounts. Traces of chalk are also present locally. Other minor components include silicified limestone, chert and sandstone. The sand, which is mainly medium-grained, generally consists of subrounded quartz with some angular flint. The fines derive from thin beds of silty clay which occur throughout the unit.

Ingham Sand and Gravel Only two boreholes proved these 'Bunter'-quartzite-rich deposits to be potentially workable. They comprise 'clayey' sandy gravel in borehole 28 SW 39, with a grading of 13 per cent fines, 57 per cent sand and 30 per cent gravel. In borehole 28 SW 48 they have a grading of 1 per cent fines, 45 per cent sand and 54 per cent gravel. In the former borehole the gravel is mainly fine whereas in the latter the fraction contains equal proportions of fine and coarse pebbles. The 8 to 16 mm fraction comprises mainly angular flint and 'liver-coloured' quartzite, together with about 20 per cent of quartz; rounded flint is a minor constituent. The sand consists of iron-stained medium-grained quartz and flint.

Pebbly Series These extensive deposits have a mean grading of 7 per cent fines, 69 per cent sand and 24 per cent gravel. They range in composition from sand to gravel, with up to 21 per cent of fines in places. Flint is usually the major component of the gravel fraction. In most cases it is angular rather than rounded, but in some boreholes, e.g. 28 SE 37, the proportion of rounded flint is almost equal to, or even greater than, that of the angular variety. Quartz and quartzite are also major constituents and in boreholes 28 NE 30 and SW 45 they are more abundant than flint. The sand consists of medium-grained subrounded quartz and flint.

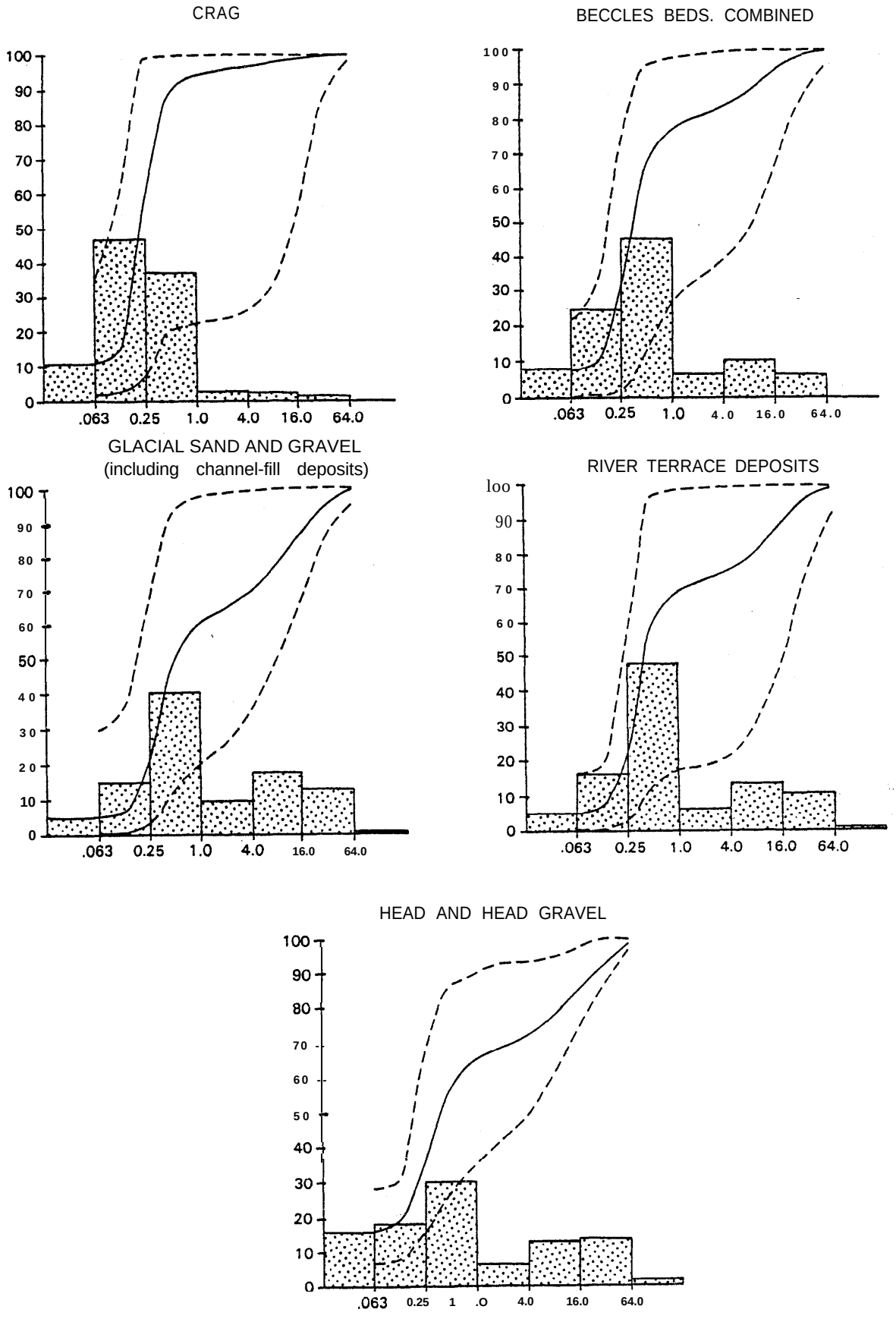
Mendham Beds Predominantly sand with scattered pebbles of flint, these deposits have a mean grading of 8 per cent fines, 91 per cent sand and 12 per cent gravel. In two boreholes, namely 28 NE 23 and 38 NW 38, parts are 'very clayey'. The sand comprises fine- and medium-grained, subangular to subrounded quartz.

Beccles 'Glacial' Beds These glacial deposits are similar to the underlying Pebbly Series but are generally finer and contain a higher percentage of angular flint. Where potentially workable, their mean grading is 8 per cent fines, 82 per cent sand and 10 per cent gravel. The range of sediments includes sand and sandy gravel but pebbly sand is most common. Locally, e.g. in borehole 28 SW 52, the deposits are 'clayey' but generally the fines content is low.

On average, about half the gravel fraction is angular flint. Rounded flint usually amounts to less than 10 per cent of the clasts although, exceptionally, it accounts for 20 per cent of the 8 to 16 mm fraction in borehole 27 NE 5. The combined quartz and quartzite content varies from zero to 45 per cent but is commonly about 20 per cent. Unlike the Pebbly Series, the Beccles 'Glacial' Beds frequently contain chalk fragments. These generally account for less than 5 per cent of the clasts but boreholes 27 NW 16 and 28 SW 52 encountered deposits which contain 26 and 51 per cent, respectively, of chalk gravel. Minor constituents include limestone, Jurassic mudstone, igneous rock, iron pan and shells.

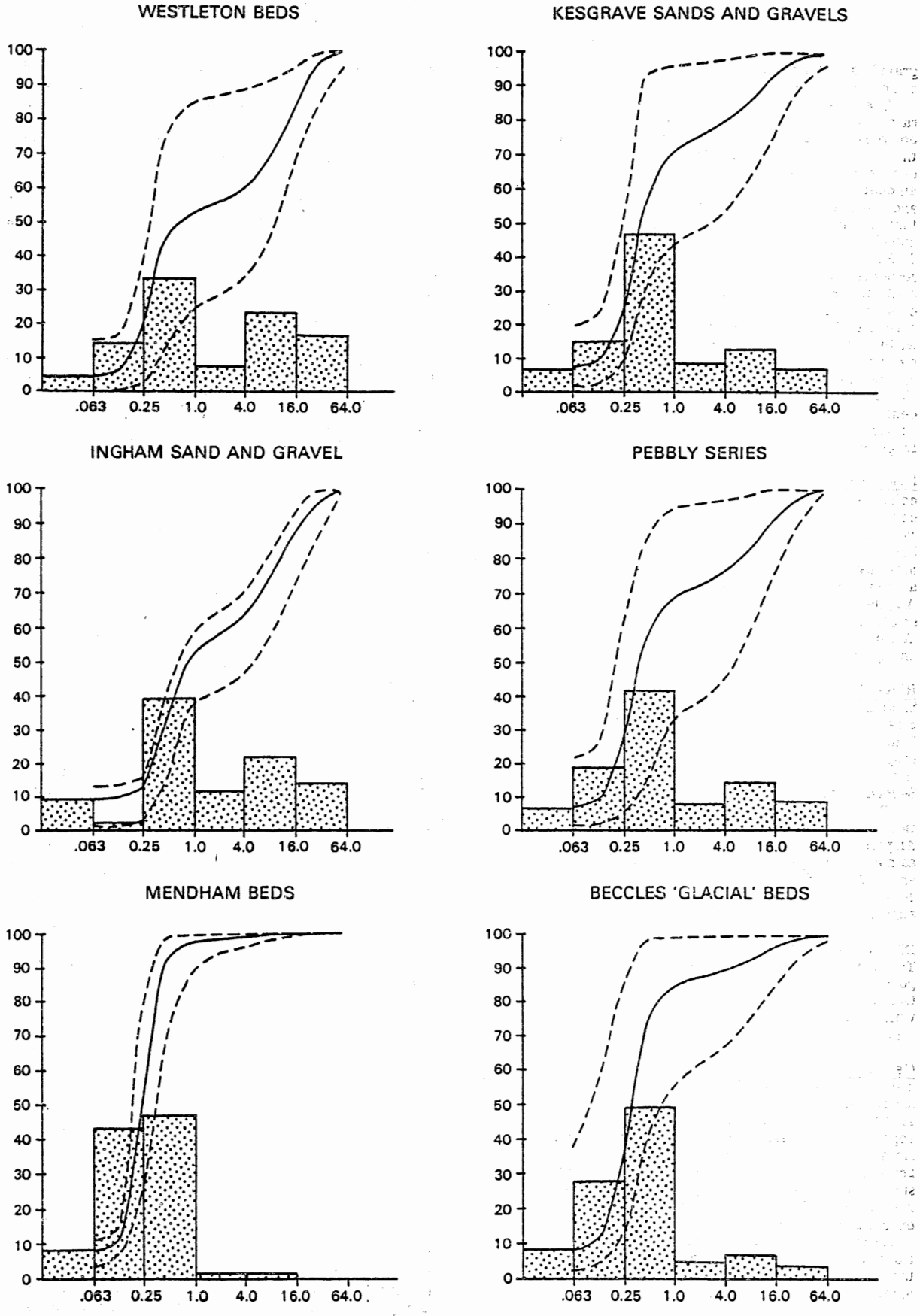
The sand is mainly medium-grained and consists of subangular quartz, with some coarse angular chalk and flint.

Glacial Sand and Gravel (including channel-fill deposits) Mineral classified thus ranges from 'very clayey' sand through pebbly sand and sandy gravel, to gravel; sandy gravel is most common. Exceptionally, glacial sand and gravel in borehole 39 SW 56 yielded 65 per cent of



The histograma (shaded) represent the amount of material in each sieve fraction; the dashad lines represent the range in particle size, and the solid lines the cumulative mean particle size distribution for each deposit.

Figure 4 The grading characteristics of **the sand** and gravel deposits proved in assessment boreholes.



The histograms (shaded) represent the amount of material in each sieve fraction; the dashed lines represent the range in particle size, and the solid lines the cumulative mean particle size distribution for each deposit.

Figure 5 The grading characteristics of the sand and gravel components of the Beccles Beds.

gravel, and boreholes 28 SW 39 and 38 NW 33 both contained more than 25 per cent of fines.

The gravel comprises fine and coarse pebbles with rare cobbles. There is considerable variation in composition but, usually, sharp angular flint clasts are the major component. Rounded flint, quartz and quartzite pebbles are commonly present in lesser amounts, although in a few boreholes (e.g. 28 SE 30, 36 and 39) the combined percentage of these is larger than that of angular flint. Chalk fragments may also be abundant; thus, samples from boreholes 28 SW 37 and 27 NE 12 contain 34 and 17 per cent of chalk respectively (within the 8 to 16 mm fraction), but 10 per cent or less is more common. Many of the deposits contain small amounts of limestone and a deposit in borehole 27 NW 13 contains 13 per cent of this lithology within the 8 to 16 mm fraction. Igneous and metamorphic rocks, mudstone, shell debris and ironstone are generally present only in minor amounts but, exceptionally, these may account for as much as about 20 per cent of the gravel. The mainly medium-grained sand comprises angular to subrounded flint and quartz, with fragments of chalk.

Head and Head Gravel The mean grading of samples collected from these deposits is 16 per cent fines, 56 per cent sand and 28 per cent gravel. Individual deposits range from 'very clayey' pebbly sand to 'clayey' gravel but pebbly sand and sandy gravel, commonly 'clayey', are most usual. The gravel fraction comprises roughly equal amounts of fine and coarse pebbles and some cobbles. Angular flint is the main component, although there are small amounts of rounded flint, quartz and quartzite. The mainly medium-grained sand consists of angular flint and quartz.

River Terrace Deposits
Sand and gravel in these deposits has a mean grading of 5 per cent fines, 70 per cent sand and 25 per cent gravel. Sandy gravel is most common but individual deposits range from 'clayey' sand to gravel. Third Terrace deposits are frequently coarser than those of the First and Second terraces.

The gravel fraction comprises roughly equal proportions of fine and coarse pebbles; cobbles are uncommon. Angular flint is the main component and may comprise as much as 95 per cent of the fraction; quartz, quartzite and rounded flint usually account for less than 25 per cent. The sand is mainly medium-grained and consists of angular to subrounded quartz and flint.

DESCRIPTION OF THE RESOURCES MAP

The sand and gravel resource sheets are 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 Survey's field staff. The geological boundaries are the best interpretation of the information available at the time of survey. However, local irregularities and discrepancies may be revealed as new evidence from boreholes and excavations becomes available.

Borehole data, which include the stratigraphic relations, thicknesses and mean particle size distributions 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 average less than 1 m in thickness, and areas where it is judged to be present in continuous (or almost continuous) spreads beneath overburden.

Areas where bedrock crops out, where boreholes indicate absence of sand and gravel beneath cover and where sand and gravel beneath cover is interpreted to be not potentially workable are uncoloured on the map; where appropriate, the relevant criterion is noted. In such cases it has been assumed that mineral is absent except in infrequent and relatively minor patches that can neither be outlined nor assessed quantitatively in the context of this survey. Areas of unassessed sand and gravel, for example in built-up areas, are indicated by a red stipple.

The area of the mineral-bearing ground is measured, where possible, from the mapped geological boundary lines. The whole of this area is considered as mineral-bearing, even though it may include small areas where sand and gravel is not present or is not potentially workable. Inferred boundaries have been inserted to delimit areas where sand and gravel beneath cover is interpreted to be not potentially workable or absent. Such boundaries (for which a distinctive 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 results of the assessment are summarised in Table 3; separate assessments are given for drift sand and gravel only and for drift and Crag combined.

Accuracy of results For the 11 resource 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 14 per cent and 45 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 K. The total volume (1550 million m^3) can be estimated to limits of ± 8 per cent at the 95 per cent probability level by a calculation based on the data from 167 sample points spread across the 11 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 exisiting buildings and roads) on the use of the land for mineral working.

NOTES ON THE RESOURCE BLOCKS

For assessment purposed the mineral-bearing part of the district has been divided into 11 resource blocks. Beccles Beds and glacial channel-fill deposits north of the Waveney valley and depicted on Sheet 1 of the resources map are encompassed by blocks A, B and C; block A includes a major buried channel containing thick sand and gravel, and older potentially workable deposits to the north of it. The predominantly fluvial and glacial deposits of the Waveney valley are divided into two blocks, D and H; they are approximately equal in area

Table 3 The sand and gravel resources of the district

Block	Area		Mean thickness			Volume of sand and gravel			Mean grading percentage		
	Block	Mineral	Over-burden	Mineral	Waste		Limits at the 95% probability level		Fines	Sand	Gravel
	km^2	km^2	m	m	m	$m^3 \times 10^6$	± %	± $m^3 \times 10^6$	$-\frac{1}{16}$ mm	$+\frac{1}{16}$–4 mm	+4 mm
a) Within drift deposits only											
A	14.3	13.1	3.2	10.0	0.8	131	45	59	7	69	24
B	8.0	8.0	8.8	11.4	1.4	91	26	24	7	78	15
C	8.9	8.9	9.2	7.5	2.3	67	23	15	6	65	29
D	11.6	11.1	0.7	8.6	0.5	96	23	22	2	57	41
E	15.5	15.5	10.6	11.7	0.1	181	29	53	6	84	10
F	11.2	11.2	9.4	10.4	1.3	117	45	53	9	69	22
G	14.6	13.5	5.7	13.1	2.2	177	21	37	7	74	19
H	11.9	10.4	1.1	12.2	0.6	127	14	18	4	57	29
I	13.5	13.5	11.8	9.6	0.4	130	35	46	8	78	14
J	17.0	17.0	9.4	7.3	1.8	124	33	41	11	71	18
K	17.5	17.5	11.5	8.2	0.8	144	37	53	9	75	16
A–K	**144.0**	**139.7**	**7.7**	**9.9**	**1.1**	**1385**	**9**	**125**			
b) Within drift deposits and Crag combined											
A	14.3	13.1	3.2	11.4	0.8	149	37	55	8	72	20
B	8.0	8.0	8.8	12.0	1.4	96	28	27	6	80	14
C	8.9	8.9	9.2	7.5	2.3	67	23	15	6	65	29
D	11.6	11.1	0.7	9.2	0.5	102	19	19	2	59	39
E	15.5	15.5	10.6	12.3	0.1	191	28	54	7	84	9
F	11.2	11.2	9.4	11.2	1.3	125	43	54	9	71	20
G	14.6	13.5	5.7	13.2	2.2	178	21	37	7	74	19
H	11.9	10.4	1.1	12.4	0.6	129	14	18	4	57	29
I	13.5	13.5	11.8	10.9	0.4	147	32	47	9	79	12
J	17.0	17.0	9.4	10.1	1.8	171	27	46	10	76	14
K	17.5	17.5	11.5	11.1	0.8	194	27	52	10	78	12
A–K	**144.0**	**139.7**	**7.7**	**11.1**	**1.1**	**1550**	**8**	**124**			

Table 4 Block A: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Over-burden	Waste part-ings	Mineral	Fines	Sand			Gravel		
	m	m	m	$-\frac{1}{16}$ mm	Fine $+\frac{1}{16}$–$\frac{1}{4}$ mm	Medium $+\frac{1}{4}$–1 mm	Coarse +1–4 mm	Fine +4–16 mm	Coarse +16–64 mm	Cobble +64 mm
39 SW 36	10.5	1.1	8.8	16	24	46	6	6	2	0
39 SW 37	5.4	1.2	10.9	3	21	40	8	16	11	1
39 SW 40	0.1	2.6	17.6	5	15	34	10	23	13	0
39 SW 42	(15.0		2.8	11	10	68	3	4	4	0)*
39 SW 43	4.0	0.7	14.3	10	21	61	4	4	trace	0
39 SW 47	1.2	0.9	18.6	7	12	49	8	12	11	1
39 SW 50	0.4	4.2	8.2	9	16	43	5	14	12	1
39 SW 52	13.6	1.0	10.9	7	27	58	3	4	1	0
39 SW 53	0.6	0.1	2.9	10	8	39	17	19	7	0

* Data within brackets relate to sand and gravel too thin or deeply buried to conform to the definition of mineral given on page 1.

and, as a consequence, the boundary between the two blocks does not conicide with that between the two resource sheets. Block E includes the predominantly sandy Beccles Beds in the area south of the Waveney valley shown on Sheet 1.

Blocks F and G largely comprise Beccles Beds and ill-defined glacial channel-fill north of the Waveney valley, in the area depicted on Sheet 2. Blocks I, J and K, south of the Waveney, include Beccles Beds, channel-fill and Crag.

The resource blocks south of the Waveney valley are larger than might be thought desirable elsewhere, but the nature of the terrain and of the mineral does not justify further subdivision.

Block A (Table 4)

Glacial sand and gravel crop out in the southern part of this block in the sides of Broome Beck valley. They appear to pre-date the Lowestoft Till and to fill a channel cut into the Beccles Beds. The latter are present in places in the valley, but for the most part lie to the north beneath till. They thin northwards and, with increasing topographic elevation, the till thickens in this direction; as a result, a small area on the northern margin of the block is barren.

The glacial channel-fill deposits consist mostly of pebbly sand and sandy gravel, including chalk in places, with minor partings of till. They may be at least 16.8 m thick locally. They have been proved by a group of unsampled shallow boreholes at Hedenham and in deeper holes (39 SW 10, 40 and 47) to the east. Samples from two of the deeper boreholes range in composition from 'clayey' sand to sandy gravel and have a mean grading of 9 per cent fines, 71 per cent sand and 20 per cent gravel. Thin pebbly sand and sandy gravel found in borehole 39 SW 53 are also believed to have a glacial origin.

Beccles Beds lie mostly beneath overburden which has been proved up to 13.6 m but probably reaches something in excess of 19 m and the limit for 'mineral' adopted in this study. They range widely in composition from 'clayey' sand to gravel. Mean gravel content in individual boreholes ranges from 4 per cent to 48 per cent; fines generally account for between 1 per cent and 7 per cent of the deposit but in borehole 39 SW 36 average 20 per cent.

'Clayey' to 'very clayey' sandy gravel and pebbly sand near surface in boreholes 39 SW 47 and 50 have been classified as Head.

Combined drift mineral deposits may be up to at least 25 m thick and have a mean grading of 7 per cent fines, 69 per cent sand and 24 per cent gravel. Their volume is estimated as 131 million m^3 ±45 per cent.

Crag encountered in three of the boreholes is deemed to be potentially workable. It consists for the most part of sand, but in borehole 39 SW 37 the lower part included some flint pebbles and iron pan, and graded as pebbly sand and sandy gravel. When these deposits are included in the calculations the mean mineral thickness becomes 11.4 m, volume 149 million m^3 ±37 per cent and the mean grading 8 per cent fines, 72 per cent and and 20 per cent gravel.

Block B (Table 5)

This resource block comprises mineral bearing ground to the north of the Waveney between Earsham and Ditchingham. Potentially workable drift sand and gravel is included wholly within the Beccles Beds; possibly workable Crag has been recorded in two boreholes.

The Beccles Beds are found at surface in narrow ribbons along the valley side but they are for the most part concealed. The western limit of the block coincides with an inferred boundary marking the approximate

Table 5 Block B: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
	m	m	m	-1/16 mm	Fine +1/16-1/4 mm	Medium +1/4-1 mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
28 NE 30	13.2	4.2	7.1	9	20	49	5	10	7	0
38 NW 31	4.0	3.1	15.5	7	31	46	5	7	4	0
39 SW 38	13.4	0.5	10.4	2	15	47	11	17	8	0
39 SW 44	13.1	0.4	6.9	6	15	59	5	11	4	0
39 SW 48	5.4	1.9	15.7	5	30	52	5	6	2	0
39 SW 51	0.3	1.3	20.2	5	37	36	5	10	7	0
39 SW 57	13.0	2.1	9.9	14	44	37	1	3	1	0

Table 6 Block C: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
	m	m	m	-1/16 mm	Fine +1/16-1/4 mm	Medium +1/4-1 mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
28 NE 23	14.5	1.3	9.2	14	62	22	1	1	trace	0
28 NE 26	1.1	8.9	10.0	2	7	41	14	19	16	1
28 NE 31	3.2		5.2	2	4	32	20	29	13	0
28 NE 33	1.6	3.3	5.9	2	6	29	14	27	21	1

position where overburden is conjectured to reach the limit set in defining mineral for the purpose of this assessment. The overburden consists of boulder clay; up to 18.3 m have been proved in the block and it averages 8.8 m.

The drift sand and gravel ranges in proved thickness from 6.7 to 18.2 m, with a mean of 11.6 m. It is very variable in composition. Sands with a mean gravel content of only about 3 per cent account for a little over half the mineral proved by assessment boreholes. More pebbly deposits, up to 8.8 m thick and with a mean grading of about 4 per cent fines, 66 per cent sand and 30 per cent gravel, generally underlie the sands; they are mainly assigned to the Pebbly Series and the gravel consists of angular to well rounded flint with rounded quartz and quartzite.

Boreholes 39 SW 48 and 51 found orange to light brown Crag sands, 3.7 m and 2.0 m thick, respectively.

Waste partings were encountered in all the assessment bores, totalling up to 4.2 m in individual holes; the average recorded thickness for the block is 1.4 m.

Mineral is estimated to have a total volume of 96 million m^3 ±28 per cent. Of this total only about 40 million m^3 contains more than 15 per cent gravel.

Block C (Table 6)

This block is the continuation of block B and its northern and western limits are at the inferred boundary marking the approximate position where overburden is believed to reach the limiting thickness set in defining 'mineral'. Only four assessment boreholes were drilled within the block as now defined but they are supplemented by a number of pre-existing borehole records.

Beccles Beds crop out on the valley sides but for the most part sand and gravel is concealed. Overburden comprises boulder clay with subordinate Head; it ranges up to 18.3 m in proved thickness and average 9.2 m.

Deposits which have been classified as channel-fill were penetrated by boreholes 28 NE 26 and 33. They mainly comprise gravel and sandy gravel with a mean grading of 2 per cent fines, 57 per cent sand and 39 per cent gravel. The gravel fraction consists of angular to rounded pebbles of flint, rounded pebbles of quartz and quartzite and scattered chalk clasts. Sandy gravel 5.2 m thick in borehole 28 NE 31 could also be channel-fill and a buried valley might be postulated to run east-southwards to join the Waveney channel near Dentonwash Farm. Elsewhere sand and gravel appear to belong to the Beccles Beds. In borehole 28 NE 23 they comprise 2.4 m of 'very clayey' sand and pebbly sand separated by 1.3 m of pebbly clay from a further 6.8 m of mainly 'clayey' sand. Sandy gravel close to the surface in boreholes 28 NE 26 and 33 may represent head.

Mineral within the block is estimated to have a mean thickness of 7.5 m and a volume of 67 million m^3 ±23 per cent.

Block D (Table 7)

This block encompasses the Waveney valley around Bungay and as far west as the 30 eastings grid line. Potentially workable sands and gravels comprise alluvium, river terrace deposits and underlying sediments which appear to be of glacial origin and to fill a channel which is more or less coincident with the present valley. Additionally, Beccles Beds (Kesgrave Sands and Gravels) underlie the glacial sand and gravel in places in the southern part of the block (boreholes 38 NW 83 and 35).

Proved drift mineral thicknesses range from 1.6 m to as high as 17.7 m. The deposits consist mostly of gravel and sandy gravel although beds of sand were met in boreholes 38 NW 33 and 35 and 39 SW 49. Mean gravel contents of individual boreholes range from 27 to 59 per cent and average 41 per cent. Pebbles consist mainly of flint with quartz and quartzite; chalk was noted in places in half the boreholes drilled for the assessment but accounts for only a small proportion of the gravel fraction. Fines content is low, averaging only 2 per cent.

The drift sand and gravel has a mean proved thickness of 8.6 m. It has been extracted from about 0.4 km^2 of the block; the volume remaining is estimated as 96 million m^3 ± 23 per cent. Crag deemed to be potentially workable was found in three boreholes. Its inclusion in the resource calculations brings the mean mineral thickness to 9.2 m and the estimated volume to 102 million m^3 ± 19 per cent.

Overburden is for the most part thin, only having been found to exceed 1.0 m in the south of the block and just to the north of Bungay; it averages 0.7 m. Clayey and sandy silt 5.4 m thick separated the lowest 8.5 m of mineral from the overlying resources in borehole 38 NW 32. Waste partings, 2.0 m and 1.4 m thick respectively, were also encountered in boreholes 38 NW 33 and 39 SW 54.

Block E (Table 8)

The potentially workable sand and gravel of this block belongs almost exclusively to the Beccles Beds. Except for a narrow outcrop along the side of the Waveney valley, they are completely covered by boulder clay which together with soil and other minor deposits has a

Table 7 Block D: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
	m	m	m	−1/16 mm	Fine +1/16–1/4 mm	Medium +1/4–1 mm	Coarse +1–4 mm	Fine +4–16 mm	Coarse +16–64 mm	Cobble +64 mm
38 NW 32	0.1	5.5	17.7	3	9	46	10	17	15	0
38 NW 33	0.3	2.0	10.9	5	12	46	7	15	14	1
38 NW 35	0.1		11.0	2	15	41	11	22	9	0
38 NW 36	0.2		6.4	2	5	50	12	22	9	0
38 NW 37	3.4		4.3	1	9	43	10	23	14	0
38 NW 40	0.9		8.3	2	7	25	14	29	21	2
38 NW 41	0.7		14.3	1	4	30	16	30	19	trace
38 NW 45	1.6		8.4	2	35	40	5	10	8	trace
38 NW 49	1.1		9.1	2	9	32	13	26	15	3
38 NW 51	0.8		7.8	2	9	36	12	24	17	trace
39 SW 45	0.8		10.6	2	7	43	12	22	14	trace
39 SW 46	0.1		7.1	2	4	29	16	27	21	1
39 SW 49	0.1		8.5	3	5	21	14	31	26	trace
39 SW 54	0.4	1.4	9.0	2	6	44	8	21	19	0
39 SW 55	0.4		7.6	2	23	29	12	16	18	trace
39 SW 56	0.8		3.7	6	7	19	13	37	17	1

Table 8 Block E: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
	m	m	m	$-\frac{1}{16}$ mm	Fine $+\frac{1}{16}-\frac{1}{4}$ mm	Medium $+\frac{1}{4}-1$ mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
38 NW 34	12.3		12.7+	9	25	58	3	4	1	0
38 NW 38	9.6		18.9+	7	21	55	6	8	3	0
38 NW 39	18.4		6.6+	6	45	45	2	2	0	0
38 NW 43	8.0		20.4+	6	27	55	4	5	3	0
38 NW 44	13.7	0.1	12.2	5	34	41	3	12	5	0
38 NW 46	0.1		17.9	8	41	27	7	11	6	0
38 NW 47	12.1	0.7	14.6+	8	39	46	2	3	2	0
38 NW 48	15.8		6.4	11	30	43	3	8	5	0
38 NW 50	13.6		11.4	6	40	52	1	1	0	0

Table 9 Block F: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
	m	m	m	$-\frac{1}{16}$ mm	Fine $+\frac{1}{16}-\frac{1}{4}$ mm	Medium $+\frac{1}{4}-1$ mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
27 NW 10	2.5	8.3	14.2	10	14	54	6	10	5	1
28 SW 36	14.2		10.8	7	18	41	7	15	11	1
28 SW 37	10.7	0.1	9.5	15	36	38	5	5	1	0
28 SW 38	13.7		5.5	10	14	38	10	17	10	1
28 SW 39	12.0	1.8	12.3	14	7	50	9	14	6	0
28 SW 40	(23.5		1.3	3	9	29	15	24	17	3)*
28 SW 41	(15.6		0.8	6	43	49	1	1	0	0)
28 SW 45	1.1	4.8	19.1	4	17	48	8	13	10	trace
28 SW 60	17.8		8.2	4	17	48	6	11	13	1

* Data within brackets relate to sand and gravel too thin or deeply buried to conform to the definition of mineral given on page 1.

mean proved thickness of 10.6 m. Borehole 38 NW 42 found till to a depth of 24.2 m, too thick for underlying sand and gravel to be considered workable. The area of barren ground cannot be delineated but the findings of this borehole have been taken into account in assessing the resources.

About 60 per cent of the deposits classed as potentially workable consist of sand, with little or no gravel and commonly 'clayey' (the Mendham Beds). These sands generally overlie the gravel-bearing sediments and if they were classed as overburden rather than mineral, most of the block would be considered to be barren. Only along and close to the Beccles Beds outcrop are the gravels likely to prove attractive.

The sands are up to at least 13.7 m thick and average 8.3 m. Proved thicknesses of pebbly sands and sandy gravels range upwards to 9.8 m, with a mean of 5.0 m, and their mean grading is 4 per cent fines, 72 per cent sand and 24 per cent gravel. Total thicknesses of drift sand and gravel range up to greater than 20.4 m and average 11.7 m. The estimated volume of drift mineral within the block is 181 million $m^3 \pm 29$ per cent.

Crag which might be considered workable was encountered in two holes (38 NW 44 and 46). If this is included in the assessment, the mineral's mean thickness becomes 12.3 m and its estimated volume 191 million $m^3 \pm 28$ per cent.

Block F (Table 9)

Sand and gravel deposits in this block vary markedly in genesis, thickness and depth of burial. They are almost entirely concealed by overburden and their geology is, therefore, difficult to elucidate. The deposits appear to comprise glacial sand and gravel, including channel-fill, and many of the components of the Beccles Beds. Potentially workable Crag was encountered in three boreholes.

Boreholes 28 SW 40 and 41, not adjacent, found sand and gravel too thin and at too great a depth to constitute mineral; the extent of barren ground around the holes cannot be delimited but the findings are taken into account in assessing the resources. Elsewhere, proved thicknesses of drift sand and gravel range from 5.5 m to as high as 23.2 m (water borehole 28 SW 8). Most of the mineral proving holes yielded pebbly sands or sandy gravels, and the mean grading for potentially workable drift in the block is 9 per cent fines, 68 per cent sand and 23 per cent gravel. About one-third of the gravel fraction in borehole 28 SW 37 consisted of chalk but elsewhere this rock type is absent or present in very small amounts.

Overburden consists mainly of boulder clay; it varies markedly and rapidly in thickness. For example, in borehole 28 SW 60, near Skeatsmore House, it measured 17.8 m but in borehole 28 SW 8, only 250 m distant and

Table 10 Block G: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
	m	m	m	-1/16 mm	Fine +1/16-1/4 mm	Medium +1/4-1 mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
28 SW 42	2.3	0.3	13.4	10	33	46	4	4	3	trace
28 SW 43	3.0	3.9	8.1	3	20	60	5	7	5	0
28 SW 44	17.3		6.3	5	19	46	8	16	6	0
28 SW 47	10.6	3.0	11.4	5	31	56	3	4	1	0
28 SW 48	1.4	5.0	15.1	10	36	19	6	13	16	trace
28 SW 49	6.6	0.9	18.5	10	45	36	2	4	3	0
28 SW 52	0.6	5.5	20.5	9	16	37	8	14	15	1
28 SW 53	0.5	17.2	7.3	7	21	39	6	16	11	trace
28 SW 57	4.3	0.2	21.2	8	11	41	8	17	15	1
28 SW 59	1.1		9.7	3	8	33	11	24	20	1
28 SE 25	2.7		22.3	5	24	46	7	11	7	trace
28 SE 26	9.5		15.5	6	37	48	3	4	2	0
28 SE 27	11.5		13.5	8	49	33	2	5	3	0
28 SE 33	6.6	2.3	16.1	7	36	42	6	7	2	0
28 SE 48	2.8		9.8	3	13	52	7	14	10	1
28 SE 50	9.4		8.4	No data available						
28 SE 51	6.3		7.4	No data available						

Table 11 Block H: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
	m	m	m	-1/16 mm	Fine +1/16-1/4 mm	Medium +1/4-1 mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
27 NW 11	0.6		10.2	9	28	39	7	9	7	1
27 NW 14	0.6		17.6	3	5	49	10	18	15	trace
27 NW 17	1.1		11.3+	1	4	50	10	20	15	trace
27 NW 28	0.9		12.4	6	29	41	7	12	4	1
28 NE 16	0.4		10.2	2	3	29	17	31	18	0
28 NE 17	0.6	1.3	11.5	3	6	35	13	27	15	1
28 NE 18	4.1		4.7	1	4	46	8	21	20	0
28 NE 24	0.3		12.8	2	9	50	10	17	11	1
28 NE 32	0.2	0.6	20.5	6	29	41	7	12	4	1
28 SW 46	2.5		6.0	2	5	59	13	14	7	trace
28 SW 50	0.6		13.9	3	13	54	7	13	10	trace
28 SW 54	3.0	0.1	8.2	3	26	38	6	14	11	2
28 SE 30	1.2	2.2	11.7	2	10	38	13	26	11	trace
28 SE 32	0.4		15.4	5	14	46	9	14	12	trace
28 SE 34	0.6		10.7	3	10	46	9	15	17	trace
28 SE 35	2.5		10.0	2	11	58	7	14	8	0
28 SE 36	0.9	0.4	14.7	2	19	39	7	18	14	1
28 SE 38	0.5	9.2	14.9	9	15	44	9	13	10	0
28 SE 39	0.7	1.4	14.2	2	13	40	9	20	16	trace

at a site only about 3 m lower in elevation, it was only 1.8 m thick. Proved thicknesses generally exceed 10 m and average about 9.4 m.

Potentially workable drift sand and gravel have a mean proved thickness of 10.4 m and an estimated volume of 117 million m^3 ±45 per cent; if the barren ground around boreholes 28 SW 40 and 41 were to be delimited, the confidence limits would be reduced to 33 per cent. When mineral Crag is included, the mean thickness is increased to 11.2 m and the estimate of volume becomes 125 million m^3 ±43 per cent; however, mean gravel content is reduced slightly.

Block G (Table 10)

Although Beccles Beds and Glacial Sand and Gravel crop out in places on the sides of the Waveney valley and its tributaries, mineral in this block lies mostly below boulder clay overburden. It shows considerable variation in thickness, grading and genesis: most of the sand and gravel types known in the district appear to be represented.

Boreholes 28 SW 59 and 28 SE 48, sited on the floor of the minor valley north of Harleston, found 9.7 m and 9.8 m, respectively, of sandy gravel. Other boreholes on the sides of the valley or just outside it, at and downstream from Starston, proved sandy gravels up to 10.4 m thick at corresponding levels but overlain by sands, pebbly sands and boulder clay totalling up to about 20 m. Borehole 28 SE 25 also encountered gravel, immediately below 2.7 m of overburden. The gravel fractions of these deposits consist mostly of flint with some quartzite and quartz and traces of chalk. The lowest 1.5 m of gravel in borehole 28 SW 48, comprising for the most part rounded glauconite-coated black flint, subangular black flint and shelly iron pan, have been classified as Crag.

East of Harleston, boreholes have shown the presence of pebbly sand overlying sand with scattered silt and clay partings and overlain by overburden of the order of 10 m thick. In contrast, just to the south of Harleston, borehole 28 SW 57 penetrated a total of 21.2 m of mineral with only two thin waste partings and overlain by only 4.7 m of overburden; the mineral consists mainly of gravel, partly 'clayey', and pebbly sand. West and northwest of Harleston, overburden up to 17.3 m thick is underlain by sand, pebbly sand and sandy gravel up to 18.5 m thick.

Mineral within the block has an estimated mean thickness of 13.2 m, a volume of 178 million m^3 ±21 per cent and a mean grading of 7 per cent fines, 74 per cent sand and 19 per cent gravel.

Proved overburden thicknesses range from 0.5 m to 17.3 m, and average 5.7 m. Half the assessment boreholes included waste partings; one of them, in borehole 28 SW 53, was 16.5 m thick.

Block H (Table 11)

This block encloses the Head and Recent fluvial deposits of the Waveney valley not included in Block D, together with underlying glacial channel-fill deposits and, less commonly, Beccles Beds and Crag. Though geologically similar to Block D, the resources are somewhat more variable in composition and have a generally lower gravel content.

Resources identified as First or Second Terrace on the geological map are up to 4.0 m thick; they consist mainly of sand or pebbly sand but in borehole 28 SW 54 First Terrace deposits yielded 79 per cent of gravel. Third Terrace deposits seem rather variable; borehole 28 NE 24, north of Wortwell, recorded 3.4 m of sand but sand and gravel have been observed in a pit close by and borehole 28 NE 17, some 1.5 km distant on the opposite side of the river, passed through 1.1 m of sandy gravel with a mean pebble content of 38 per cent.

Potentially workable channel-fill deposits are found throughout the block and range from 4.5 m to 14.0 m in thickness. They consist mainly of sandy gravel and pebbly sand; mean gravel contents of individual boreholes range from 19 per cent to 52 per cent and the average for the deposit in this block is 33 per cent. In the majority of boreholes the gravel included some chalk. Beccles Beds sandy gravel and pebbly sand were penetrated by boreholes 28 NE 17 and 24 and 28 SE 32, and they have been exploited along with overlying fluvial deposits and glacial channel-fill at Homersfield.

Total proved mineral thicknesses range from 6.0 m to 20.5 m and average 12.2 m. Sand and gravel has been extracted from about 1.5 km^2, mainly at Homersfield and south of Harleston. The estimated volume remaining in the block is 129 million m^3 ±14 per cent.

Overburden has been proved to be up to 4.1 m thick; it averages only 1.3 m but is commonly thinner than 1.0 m. It consists of soil, peat and alluvial silt and clay.

Table 12 Block I: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
	m	m	m	$-\frac{1}{16}$ mm	Fine $+\frac{1}{16}$-$\frac{1}{4}$ mm	Medium $+\frac{1}{4}$-1 mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
28 SE 37	13.0	0.8	11.2	15	44	30	3	5	3	0
28 SE 40	0.6		25.7+	6	31	43	7	9	4	0
28 SE 41	9.9		14.5	3	20	55	4	10	8	0
28 SE 42	17.0	0.2	8.8+	15	21	44	7	9	4	0
28 SE 43	0.4		19.4	9	52	25	2	6	5	1
28 SE 44	17.4	1.3	8.3+	11	16	48	7	8	10	0
28 SE 45			Absent							
28 SE 46	10.4	1.7	12.9+	7	39	39	4	8	3	0
28 SE 47	1.2		12.3	3	35	47	5	6	4	0
28 SE 49	16.4		8.6+	15	24	49	4	6	2	0
28 SE 53	11.7		4.6+	No data available						
28 SE 54	14.9		4.8+	No data available						
28 SE 55	14.0	0.1+	4.7+	No data available						
28 SE 56	11.9	0.1	4.2+	No data available						
28 SE 57	10.6		8.9+	No data available						
28 SE 58	16.8		2.8+	No data available						
28 SE 60	11.9	1.2	11.9+	10	25	45	5	10	5	0

Waste partings, up to 2.2 m thick, are recorded by five boreholes but the mean thickness of waste for the block is only 0.3 m.

Block I (Table 12)

Sand and gravel within this block consists for the most part of Beccles Beds, including possible representatives of Kesgrave Sands and Gravels and Westleton Beds. They crop out in the valleys of the Waveney and its tributaries but lie mainly beneath the Lowestoft Till. Overburden ranges in thickness from 0.4 m to the limit imposed by the definition of 'mineral'; provings average 12.2 m. In general thicknesses tend to increase with ground elevation. Supposed channel-fill glacial sand and gravel proved in the valley of The Beck by borehole 28 SE 47 probably have limited extent, but similar deposits encountered by boreholes 28 SE 4 and 55 suggest the presence of a buried channel running west-north-westwards across the block. Potentially workable Crag, mainly sand, was proved by assessment boreholes 28 SE 37, 43 and 53 and possibly one or two other boreholes, but over much of the block this deposit is probably too deep to be classed as mineral.

Sand and gravel and overburden range widely in thickness. North of Middleton Hall, 25.7 m of sand and gravel have been found beneath only 0.6 m of overburden (borehole 28 SE 40), but only about 1250 m to the east borehole 28 SE 45 was drilled to 21 m entirely in boulder clay. (The area of barren ground around the latter proving cannot be delineated but the finding has been taken into account in assessing the resources of the block).

Potentially workable drift sand and gravel deposits probably average at least 9.6 m. Several assessment boreholes were stopped at the limiting depth for mineral and other boreholes have found considerable thicknesses below this depth. Six of the assessment boreholes were drilled using a power auger and did not yield suitable samples for grading. Graded deposits consist largely of pebbly sand but some boreholes (28 SE 41, 43 and 60) include bands of gravel. The mean pebble content of individual boreholes ranges from 8 to 31 per cent, and mean fines from 3 to 15 per cent. The mean grading of the drift deposits is 8 per cent fines, 78 per cent sand and 14 per cent gravel.

The estimated volume of potentially workable drift deposits is 130 million m^3 ±35 per cent. The estimate for drift and Crag combined is 147 million ±32 per cent.

Block J (Table 13)

The mineral in this block consists mainly of Beccles Beds but there is potentially workable Crag in the north and towards the south. Though Beccles Beds crop out in places on the valley sides, the sand and gravel is almost entirely concealed beneath boulder clay. The southern boundary of the block coincides with an inferred boundary which has been drawn to indicate the conjectural line along which overburden reaches its limiting thickness. Proved overburden thicknesses average 9.4 m.

The sands and gravels show considerable variation, both laterally and vertically. Drift mineral is up to at least 16.6 m thick and varies in composition from 'very clayey' sand to gravel, with about 40 per cent of the deposits yielding less than 10 per cent of pebbles. Six of the assessment boreholes were drilled using a power auger and did not yield samples suitable for grading. Results from the other assessment boreholes show mean pebble contents of individual boreholes ranging from 4 per cent to 47 per cent but the gravel is commonly concentrated in the upper parts. Fines content is relatively high in places but averages only 11 per cent. Drift sand and gravel was not encountered in borehole 27 NE 24.

Borehole 28 SE 28 in the north and several boreholes in the south of the block found potentially workable Crag, but it consists of gravel-free sand. Although up to 14.0 m have been encountered, the main provings have been in the valleys; on higher ground much of the Crag which might otherwise have been workable may lie deeper than the limit of 25 m imposed by the definition of mineral accepted for this survey, and overburden to sand and gravel ratios will be less favourable.

The estimated volume of mineral within the drift deposits is 124 million m^3 ±33 per cent, and the mean grading is 11 per cent fines, 71 per cent sand and 18 per cent gravel. When Crag is included, the estimate rises to 171 million m^3 ±27 per cent and the mean grading becomes 10 per cent fines, 76 per cent sand and 14 per cent gravel.

Table 13 Block J: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage							
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel			
	m	m	m	−1/16 mm	Fine +1/16–1/4 mm	Medium +1/4–1 mm	Coarse +1–4 mm	Fine +4–16 mm	Coarse +16–64 mm	Cobble +64 mm
27 NW 22	1.7		23.3	7	54	34	3	2	trace	0
27 NW 23	17.4	0.8	7.3+	11	24	53	6	5	1	0
27 NW 24	13.1		11.9+	9	31	45	6	7	2	0
27 NW 32	6.6		5.9+	No data available						
27 NE 5	2.8	7.9	14.8+	10	30	39	5	9	6	1
27 NE 6	17.7	0.4	6.9+	13	20	39	7	12	9	trace
27 NE 8	15.8	0.5	6.3	15	13	42	6	13	11	0
27 NE 10	10.0	2.8	12.0+	7	17	63	3	6	4	0
27 NE 23	15.2	0.1+	5.8+	No data available						
27 NE 24	16.5		5.4+	No data available						
27 NE 26	18.4		1.7+	No data available						
27 NE 27	6.1		4.1+	No data available						
27 NE 33	2.3	1.2	14.3	7	59	23	2	4	5	trace
28 SW 55	8.4		16.6+	14	23	28	8	15	11	1
28 SW 58	3.3		5.7	8	25	47	4	9	7	trace
28 SE 28	9.3	3.9	11.3	9	34	38	6	8	5	0
28 SE 29	0.5	12.0	12.1+	9	15	40	9	18	9	trace
28 SE 31	0.5		7.6	9	9	75	1	4	2	0
28 SE 52	13.7		4.3+	No data available						

Table 14 Block K: data from assessment boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Waste partings	Mineral	Fines	Sand			Gravel		
					Fine	Medium	Coarse	Fine	Coarse	Cobble
	m	m	m	$-\frac{1}{16}$ mm	$+\frac{1}{16}-\frac{1}{4}$ mm	$+\frac{1}{4}$-1 mm	+1-4 mm	+4-16 mm	+16-64 mm	+64 mm
27 NW 12	8.5		16.5+	7	15	71	5	2	trace	0
27 NW 13	0.8	4.3	19.9+	6	24	27	10	19	14	0
27 NW 15	18.2		6.8+	11	43	33	4	6	3	0
27 NW 16	8.6		16.4+	10	45	34	5	5	1	0
27 NW 18	7.6	1.1	18.3	7	23	54	6	7	3	0
27 NW 19	15.4	4.1+	5.5+	7	25	37	8	15	8	0
27 NW 20	16.1	0.4	8.5+	10	36	47	3	3	1	0
27 NW 25	0.3		12.5	7	36	45	3	6	3	0
27 NW 26	14.3	1.7	9.0+	12	38	35	10	3	2	0
27 NW 27	19.4		5.6+	12	16	51	8	9	4	0
27 NW 29	10.7	0.7	5.9	8	16	59	7	8	2	0
27 NW 30	13.7	1.0	10.3	22	51	18	4	4	1	0
27 NW 31	Abandoned at 16.2 m without proving sand and gravel									
28 SW 51	(20.3		4.7+	15	19	38	7	13	8	0)*

* Data within brackets relate to sand and gravel too thin or deeply buried to conform to the definition of mineral given on page 1.

Block K (Table 14)

Beccles Beds and Glacial Sand and Gravel, together with potentially workable Crag which in places underlies them, constitute the mineral of this block. They are for the most part concealed by overburden, and, indeed, in borehole 28 SW 51 the Beccles Beds were too deeply buried to be potentially workable. The area of barren ground around the hole cannot be delimited but the finding is taken into account in assessing the resources. Resistivity sounding 27 NW R2 suggests the absence of sand and gravel to a depth of 26.5 m but borehole 27 NW 7, only about 250 m away, indicates the presence of potentially workable Beccles Beds and Crag. In the middle part of the block, around boreholes 27 NW 6 and 27, overburden slightly exceeds the limiting thickness but because the sand and gravel extends well below 25 m it is included in the assessment.

Drift sand and gravel ranges from 2.4 m to 19.9 m in proved thickness but in places it would be too thin to be classified as mineral were it not for the underlying Crag. It consists mostly of pebbly sand and sandy gravel. Mean gravel yields from individual boreholes range from 5 to 33 per cent but average only 16 per cent. Much of the gravel occurs filling a channel crossing the extreme south-west of the district; in the remainder of the block pebble content probably averages only about 12 per cent. The drift sands and gravels are commonly 'clayey', with fines content averaging 9 per cent.

The resource block encompasses part of the Stradbroke Trough and includes thick Crag deposits. However, over much of the area these are too deep to be deemed potentially workable. In places glauconite and shell content will also render them unsuitable as a resource. Where potentially workable they comprise partly 'clayey' yellow and orange sands.

The drift mineral has an estimated volume of 144 million m^3 ±37 per cent and a mean grading of 9 per cent fines, 75 per cent sand and 16 per cent gravel. The inclusion of Crag brings the volume to 194 million m^3 ±27 per cent and the mean grading to 9 per cent fines, 79 per cent sand and 12 per cent gravel.

CONCLUSIONS

Mineral, as defined on page 1 of this report, is present beneath some 140 km of the district; it is up to 25 m thick and occupies a volume of approximately 1500 million m^3. However, a large proportion of this material is likely to prove unattractive to the sand and gravel industry, at least in the short term. About two thirds of the potentially workable sand and gravel is to be found in areas where overburden thicknesses average more than 6 m, and most of this has a mean gravel content of less than 20 per cent. Of the resource blocks described above, only A, D and H encompass mineral with a mean gravel content of 20 per cent or more and overlain by overburden averaging less than 6 m. Thus the valleys of the Waveney and its tributary Broome Beck appear to present the best prospects for the sand and gravel industry. It is not a coincidence that the major areas of extraction lie within the Waveney valley.

Nevertheless, elsewhere within the district there are limited areas, mainly in the minor valleys, that might repay further investigation. For example: the valley south-east of Denton and its tributary, where boreholes 28 NE 31 and 33 have proved gravel at not too great a depth; the valley east of Starston, on the floor of which boreholes 28 SW 59 and SE 48 found gravelly deposits beneath relatively thin overburden; and, finally, the valley crossing the south-west corner of the district near Chickering, which is underlain by glacial channel-fill.

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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.

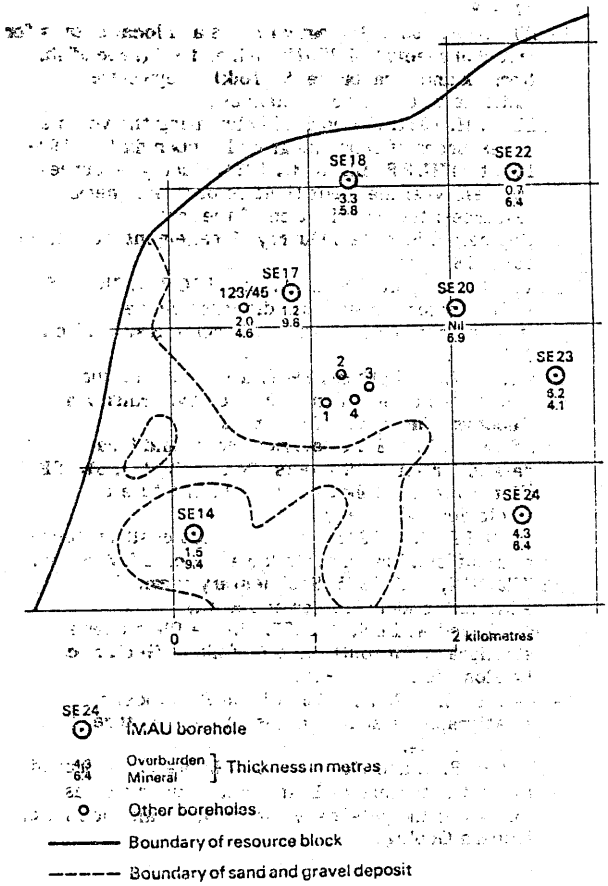
A reconnaissance of the ground is carried out to record any exposures and inquiries are made to ascertain what borehole information is available. Borehole sites are then selected to provide an even pattern of sample points at a density of approximately one per square kilometre. However, because broad 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.

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 D.



Example of resource block assessment: map of a fictitious block

APPENDIX B

STATISTICAL PROCEDURE

Statistical assessment

1 A statistical assessment is made of an area of mineral greater than 2 km^2, 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 $l_{m_1}, l_{m_2}, \ldots l_{m_n}$, then the best estimate of mean thickness, $\bar{l}_m$, is given by

$$\Sigma (l_{m_1} + l_{m_2} \ldots l_{m_n}) / n.$$

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_{m_1} to l_{m_n}.

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

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

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

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

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

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

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

$$L_{\bar{l}_m} \leq L_V \leq 1.05\, L_{\bar{l}_m}.$$

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

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

per cent,

and when n is greater than 20, as

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

per cent.

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

Inferred assessment

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

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

14 No assessment is attempted for an isolated area of mineral less than 0.25 km^2.

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 l_o	Overburden wl_o	Mineral l_m	Mineral wl_m	Remarks
SE 14	1	1.5	1.5	9.4	9.4	
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	IMAU
SE 23	1	6.2	6.2	4.1	4.1	boreholes
SE 24	1	4.3	4.3	6.4	6.4	
SE 17	½	1.2	1.6	9.8	7.2	
123/45	½	2.0		4.6		Hydrogeology Unit record
1	¼	2.7	2.6	7.3	5.8	Close group of four boreholes (commercial)
2	¼	4.5		3.2		
3	¼	0.4		6.8		
4	¼	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	$\lvert(wl_m - \overline{wl}_m)\rvert$	$(wl_m - \overline{wl}_m)^2$
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

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

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

$= 20.3$

≈ 20 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 (< ¼ 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 ¼ 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 ¼-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 (+¼ -¼ mm), medium (+¼ -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 D), the intercepts corresponding with the simple geometric scale ¼ mm, ½ mm, 1 mm, 4 mm, 16 mm and so on as required. Original sample grading curves are available for reference at the appropriate office.

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 constitutents 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: no 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
	Cobble		
64 mm		Coarse	Gravel
16 mm	Pebble		
		Fine	
4 mm			
		Coarse	
1 mm	Sand	Medium	Sand
¼ mm			
		Fine	
⅛ mm			
	Fines (silt and clay)		Fines

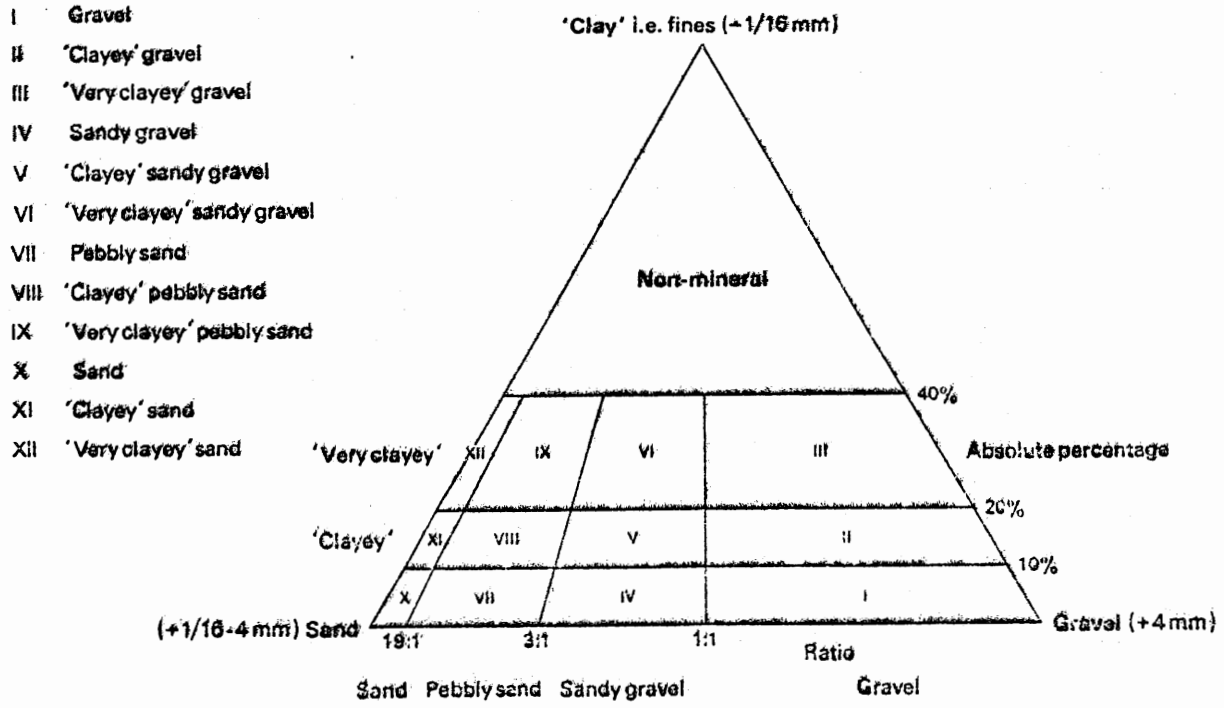


Diagram showing the descriptive categories used in the classification of sand and gravel

NATURAL ENVIRONMENT RESEARCH COUNCIL

BRITISH GEOLOGICAL SURVEY

The sand and gravel resources of the country around Harleston and Bungay, Norfolk and Suffolk. Description of 1:25 000 resource sheets comprising parts of TM27, 28, 38 and 39

VOLUME 2
Appendix D: Part 1; Assessment borehole and resistivity sounding records (Sheet 1)

Bibliographic reference

AUTON, C. A., MORIGI, A. N. and PRICE, D. 1985.
The sand and gravel resources of the country
around Harleston and Bungay, Norfolk and Suffolk.
Description of 1:25 000 resource sheets
comprising parts of TM 27, 28, 38 and 39.
(Keyworth: British Geological Survey)

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Production of this report was supported by the Department of the Environment.

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The views expressed in this report are not necessarily those of the Department of the Environment.

KEYWORTH: BRITISH GEOLOGICAL SURVEY 1985

ISBN: 0 85272 090 4

APPENDIX D: PART 1

ASSESSMENT BOREHOLE AND RESISTIVITY SOUNDING RECORDS (SHEET 1)

Explanation of the borehole records

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

1 Borehole Registration Number
Each assessment 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 TM 28.
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 NE 16.

Thus the full Registration Number is TM 28 NE 16.

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.

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, all boreholes were drilled by a shell and auger rig using 6-inch casing. The month and year of completion of the hole 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 sand and gravel has been graded 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), coarse and (+16-64 mm) and cobble gravel (+64 mm) are stated.

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

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

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

TM 28 NE 16[1] **2862 8598**[2] **Heath Farm, Homersfield**[3] **Block H**

Surface level +12.8 m[4]
Water struck at +10.1 m[5]
Shell and auger[6]
October 1982

Overburden[7] 0.4 m
Mineral 10.2 m
Bedrock 3.4 m+[8]

LOG

Geological classification	Lithology[9]	Thickness m	Depth m
	Soil, peaty, sandy	0.4	0.4
River Terrace Deposits	**a** Sand: medium; subrounded quartz; dark brown; scattered pebbles	0.4	0.8
Channel Fill Deposits	**b** Gravel, partly sandy Gravel: fine with coarse; angular flint with some rounded flint, quartz and quartzite and traces of igneous and metamorphic rocks and shell fragments Sand: medium with coarse; subangular to subrounded quartz and flint	9.8	10.6
Crag	**c** Sand, silty, greenish grey, glauconitic; bivalve fragments	2.1	12.7
	Silt and clay, sandy, dark greenish grey; scattered shell fragments	1.3+	14.0

GRADING[10]

	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	8	88	4	0.4-0.8	8	15	71	2	1	3	0
b	1	47	52	0.8-1.8	5	7	28	13	22	25	0
				1.8-2.7	3	4	33	17	30	13	0
				2.7-3.7	1	4	41	10	26	18	0
				3.7-4.7	1	1	18	19	42	19	0
				4.7-5.7	0	2	24	27	37	10	0
				5.7-6.7	1	2	21	21	49	6	0
				6.7-7.7	1	3	25	21	31	19	0
				7.7-8.7	0	3	15	13	34	35	0
				8.7-9.7	0	2	28	18	27	25	0
				9.7-10.6	2	2	38	13	30	15	0
				Mean	**1**	**3**	**27**	**17**	**33**	**19**	**0**
c	26	65	9	10.6-12.7	26	12	49	4	7	2	0
a+b	**2**	**49**	**49**	**Mean**	**2**	**3**	**29**	**17**	**31**	**18**	**0**

COMPOSITION[11]

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	2.7-3.7	58	13	9	17	0	0	2	1
	3.7-4.7	57	10	12	13	0	0	0	8
	4.7-5.7	52	11	17	16	0	0	1	3
	8.7-9.7	48	14	9	23	0	0	3	3
	9.7-10.6	39	14	15	28	0	0	0	4*

* including shell

TM 28 NE 17 **2916 8550** **West of Thicket Wood, Homersfield** **Block H**

Surface level +21.9 m
Water struck at +11.3 m
Shell and auger
November 1982

Overburden	0.6 m
Mineral	1.1 m
Waste	0.1 m
Mineral	4.5 m
Waste	1.2 m
Bedrock	4.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, sandy	0.6	0.6
River Terrace Deposits	**a** Sandy gravel Gravel: fine and coarse, with cobbles; angular flint with some quartzite and a little rounded flint, quartz and igneous/metamorphic rock Sand: mainly medium; angular quartz and flint; strong orange	1.1	1.7
	Clay, sandy and silty, pebbly, dark yellowish brown	0.1	1.8

Channel Fill Deposits	**b** Gravel Gravel: mainly fine; angular flint with a little quartzite, quartz and rounded flint and traces of chalk and igneous/metamorphic rock Sand: medium with coarse; angular quartz and flint; strong orange to yellow brown		4.5	6.3
	Clay, silty, sandy; scattered chalk granules and flint pebbles		1.2	7.5
Beccles Beds (Kesgrave Sands and Gravels)	**c** Sandy gravel Gravel: mainly fine; angular flint with quartzite and some quartz and rounded flint; trace of igneous/metamorphic rock Sand: mainly medium; subangular quartz; yellow brown to yellowish grey		5.9	13.4
Crag	**d** Sand, fine, silty, glauconitic, dusky yellowish green		4.6+	18.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	3	59	38	0.6-1.7	3	5	43	11	16	14	8
b	3	45	52	1.8-2.8	3	5	35	12	31	14	0
				2.8-3.8	3	4	19	16	41	17	0
				3.8-4.8	4	4	24	19	32	17	0
				4.8-5.8	2	2	22	17	33	24	0
				5.8-6.3	4	4	21	18	36	17	0
				Mean	**3**	**4**	**25**	**16**	**34**	**18**	**0**
c	2	60	38	7.5-8.4	4	9	41	9	23	14	0
				8.4-9.5	3	9	42	7	22	17	0
				9.5-10.5	4	12	48	7	23	6	0
				10.5-11.0	2	6	43	9	27	13	0
				11.0-12.2	1	5	42	13	24	15	0
				12.2-13.4	2	7	31	16	27	17	0
				Mean	**2**	**8**	**41**	**11**	**24**	**14**	**0**
d	10	90	0	13.4-15.0	10	82	7	1	0	0	0
				15.0-17.0	8	87	4	1	0	0	0
				17.0-18.0	13	79	5	1	2	0	0
				Mean	**10**	**84**	**5**	**1**	**trace**	**0**	**0**
a+b+c	3	**54**	**43**	**Mean**	**3**	**6**	**35**	**13**	**27**	**15**	**1**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.6-1.7	67	4	5	15	0	0	4	5
	1.8-2.8	76	5	4	12	0	0	0	3
	2.8-3.8	82	2	3	11	0	0	trace	2
	3.8-4.8	77	5	9	7	0	0	1	1
	4.8-5.8	81	1	6	7	1	0	2	2
	5.8-6.3	81	3	6	9	0	0	0	1
	Mean	**79**	**3**	**6**	**9**	**trace**	**0**	**1**	**2**
c	7.5-8.4	43	16	12	27	0	0	1	1
	8.4-9.5	49	19	12	18	0	0	1	1
	9.5-10.5	47	13	11	28	0	0	0	1
	10.5-11.0	40	12	20	26	0	0	0	2
	11.0-12.2	35	16	20	27	0	0	0	2
	12.2-13.4	40	6	19	29	0	0	1	5
	Mean	**43**	**13**	**16**	**26**	**0**	**0**	**trace**	**2**

TM 28 NE 18 **2956 8675** **South-east of Low Farm, Denton** **Block H**

Surface level +9.8 m
Water struck at +6.9 m
Shell and auger
October 1982

Overburden 4.1 m
Mineral 4.7 m
Bedrock 3.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.4	0.4
Alluvium	Clay, silty and sandy, mainly bluish grey	2.3	2.7
Peat	Peat, with shell fragments near top	1.4	4.1
Channel Fill Deposits	**a** Sandy gravel Gravel: fine and coarse; subangular to subrounded flint with some well rounded quartzite; chalk below 6.1 m Sand: mainly medium; subangular to subrounded quartz with some flint and, below 6.1 m, chalk	4.7	8.8
Crag	**b** Sand, medium-grained, greenish grey, glauconitic; shell fragments; thin clay bands	2.6	11.4
	Clay, silty, greenish grey, glauconitic	0.6+	12.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	1	58	41	4.1-5.1	3	4	28	6	25	34	0
				5.1-6.1	0	7	62	6	9	16	0
				6.1-7.1	1	4	52	9	25	9	0
				7.1-8.1	0	3	34	13	29	21	0
				8.1-8.8	0	6	51	8	18	17	0
				Mean	**1**	**4**	**46**	**8**	**21**	**20**	**0**
b	9	91	0	8.8-11.4	9	19	70	2	0	0	0

TM 28 NE 19 **2536 8773** **North of Coldham Hall, Redenhall with Harleston**

Surface level +48.7 m
Water encountered at +47.9 m and in sand seams
Shell and auger

Waste 23.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Rubble etc	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, mainly sandy, mottled pale yellow brown and grey to 4.9 m, olive grey below; pebbles and sand-grade grains of flint and chalk (scattered to 6.4 m, abundant below)	13.6	14.0
Glacial Sand and Gravel	'Clayey' sandy gravel, predominantly flint and chalk; thin clay bands	1.2	15.2
Glacial Silt	Silt, clayey, olive grey, soft	8.2+	23.4

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
19	45	36	14.0-15.2	19	12	24	9	16	20	0

TM 28 NE 20 2505 8611 Norwich Lodge, Redenhall with Harleston

Surface level +48.5 m
Water struck at +46.8 m
Shell and auger
January 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, firm to stiff, silty to sandy near top and base, mainly olive grey but mottled with brown near top and brown to reddish brown near base; pebbles and sand-grade grains of flint and chalk abundant from 2.5 to 22.2 m	23.0	23.4
Glacial Sand and Gravel	Pebbly sand: pebbles (predominantly chalk) in quartz and flint sand matrix	1.6+	25.0+

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
8	76	16	23.4-25.0	8	27	44	5	12	4	0

TM 28 NE 21 2657 8617 Souths, Alburgh

Surface level +36.3 m
Water struck at +29.3 m (perched)
Shell and auger
February 1983

Waste 25.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, pebbly	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, firm to stiff, mottled brown and yellowish brown to 3.7 m, olive grey below; sand-grade grains and pebbles of chalk and flint abundant below 3.7 m; scattered thin sand seams	14.9+	15.4
	Clay, very sandy; sand-grade flint and, less commonly, chalk; pebbles of flint and igneous/metamorphic rock and some quartz	10.3+	25.7

TM 28 NE 22 **2697 8696** **Red House, Alburgh**

Surface level +41.0 m
Water struck at +35.0 m
Shell and auger
February 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.6	0.6
Boulder Clay (Lowestoft Till)	Clay, partly sandy, firm to stiff, mottled yellowish brown to 2.0 m, olive grey below; sand and pebble grade chalk and flint abundant from 2.0 m to 5.5 m, scattered below and above	17.7	18.3
Glacial Sand and Gravel	'Very clayey' sand, part pebbly, and sandy clay with scattered flint and chalk pebbles	6.7+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
44	50	6	21.0-23.2	40	42	10	4	3	1	0

TM 28 NE 23 **2824 8692** **Home Farm, Denton** **Block C**

Surface level +36.8 m
Water struck at +35.6 m (perched)
Shell and auger
February 1983

Overburden 14.5 m
Mineral 2.4 m
Waste 1.3 m
Mineral 6.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, sandy and mottled yellowish brown and pale olive to 3.5 m, olive grey below; abundant sand to pebble sized flint and, below 3.5 m, chalk clasts; scattered flint and dark mudstone cobbles	14.1	14.5
Beccles Beds ('Glacial')	**a** 'Very clayey' sand on pebbly sand Gravel: mainly fine; angular to subrounded flint with rounded quartz and quartzite; traces of chalk Sand: mainly fine; subangular to subrounded quartz and flint; traces of chalk Fines: disseminated and in thin seams	2.4	16.9
(?Starston Till)	Clay, sandy, light brown; scattered pebbles of flint, quartz and quartzite	1.3	18.2
(Mendham Beds)	**b** Sand, mainly 'clayey': mainly fine; subangular to subrounded flint with quartz; greyish orange	6.8+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	22	72	6	14.5-16.5	25	60	13	0	1	1	0
				16.5-16.9	6	10	51	12	18	3	0
				Mean	**22**	**51**	**19**	**2**	**4**	**2**	**0**
b	11	88	1	18.2-20.2	10	71	19	0	0	0	0
				20.2-22.2	12	69	19	0	0	0	0
				22.2-24.2	12	62	26	0	0	0	0
				24.2-25.0	6	52	37	2	3	0	0
				Mean	**11**	**65**	**23**	**trace**	**1**	**0**	**0**
a+b	**14**	**85**	**1**	**Mean**	**14**	**62**	**22**	**1**	**1**	**trace**	**0**

TM 28 NE 24 **2775 8534** **Wortwell Park Farm, Wortwell** **Block H**

Surface level +18.6 m
Water struck at +10.6 m
Shell and auger
February 1983

Overburden 0.3 m
Mineral 12.8 m
Bedrock 3.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and pebbly	0.3	0.3
River Terrace Deposits	**a** Sand: medium; subrounded quartz and subangular flint; brown; scattered flint and quartz pebbles	3.4	3.7
Channel Fill Deposits on Beccles Beds (Pebbly Series)	**b** Gravel, part sandy, and pebbly sand Gravel: fine with coarse, cobbles near base; subangular to subrounded flint with rounded quartz and quartzite; slight trace of chalk in upper part Sand: mainly medium; subangular to subrounded quartz and flint; slight trace of chalk in places	9.4	13.1
Crag	**c** Sandy gravel (? contamination from above) on 'very clayey' sand; abundant shell fragments below 14 m	3.9+	17.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	2	97	1	0.3-2.3	2	15	81	1	1	0	0
				2.3-3.7	2	16	78	2	1	1	0
				Mean	**2**	**16**	**80**	**1**	**1**	**trace**	**0**
b	2	59	39	3.7-4.7	4	8	37	10	25	16	0
				4.7-5.7	2	11	55	14	15	3	0
				5.7-6.7	2	21	64	5	7	1	0
				6.7-7.7	6	14	60	5	9	6	0
				7.7-8.7	1	4	50	19	19	7	0
				8.7-9.7	1	2	27	13	28	29	0
				9.7-11.0	1	2	28	18	29	21	1
				11.0-12.0	0	2	28	19	32	19	0
				12.0-13.1	2	2	7	16	38	29	6
				Mean	**2**	**7**	**39**	**13**	**23**	**15**	**1**
c	32	57	11	13.1-14.0	5	42	4	5	18	24	2
				14.0-17.0	41	46	9	2	2	0	0
				Mean	**32**	**47**	**8**	**2**	**6**	**5**	**trace**
a+b	**2**	**69**	**29**	**0.3-13.1**	**2**	**9**	**50**	**10**	**17**	**11**	**1**

TM 28 NE 25 **2538 8918** **Hospital Farm, Alburgh**

Surface level +44.0 m
Water struck at +17.3 m and +11.0 m
Shell and auger
August 1983

Waste 33.0 m
Bedrock 3.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Clayey flint gravel fill	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, stiff, mottled olive grey and olive brown to 4.0 m, olive grey below pebbles; and cobbles of chalk and flint	18.5	19.0
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey; scattered black flint, quartzite and vein quartz pebbles	7.7	26.7
('Glacial')	**a** Gravel Gravel: fine and coarse; angular and rounded flint, with some rounded quartzite and vein quartz Sand: mainly medium; angular quartz and flint, with a trace of chalk; olive grey	0.2	26.9
(undivided)	Silt, stiff, dusky yellowish brown to olive black; large fragments of wood; fossils including pollen, beetles and other insects	1.2	28.1
	Peat, hard, friable, greyish brown	1.1	29.2
	Silt, clayey, becoming sandy below 31.9 m, olive grey to olive black; scattered plant fragments	3.8	33.0
Crag	**b** Sand, pebbly in lower part Gravel: mainly fine; angular and well rounded black flint, with some vein quartz and chalk at the base Sand: mainly fine; rounded quartz and shell fragments, with some chalk; olive brown	1.5	34.5
Upper Chalk	Chalk, hard, white	2.0+	36.5

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	6	46	48	26.7-26.9	6	11	22	13	25	23	0
b	5	84	11	33.0-33.8	4	82	12	2	0	0	0
				33.8-34.5	6	47	15	8	16	8	0
				Mean	**5**	**66**	**13**	**5**	**7**	**4**	**0**

TM 28 NE 26 **2664 8847** **Payneshill Farm, Denton** **Block C**

Surface level +26.1 m
Water struck at +24.6 m (perched) and +15.4 m
Shell and auger
September 1983

Overburden	1.1 m
Mineral	1.2 m
Waste	8.4 m
Mineral	8.1 m
Waste	0.5 m
Mineral	0.7 m
Bedrock	3.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Head	Soil, silty, on brown and orange clayey silt	1.1	1.1
	a Sandy gravel Gravel: fine and coarse; angular flint with trace of quartz Sand: medium; angular quartz with some angular flint; moderate yellow brown	1.2	2.3
	Silt, part sandy, olive grey, orange and yellow brown, poorly laminated	1.7	4.0
	Silt, sandy to clayey, pebbly, mottled grey and orange	1.2	5.2
Boulder Clay (Lowestoft Till)	Clay, silty and sandy, mainly dusky yellowish brown to chocolate brown; very few pebbles	4.4	9.6
	Silt, clayey, organic, dusky yellow brown, olive grey and brownish black; 0.1 m sand and peaty plant debris at base	1.1	10.7
Channel Fill Deposits	**b** Pebbly sand on gravel Gravel: fine with coarse; angular flint with some rounded flint, quartz, quartzite, chalk and shell debris; glauconite coating on some flints between 14.0 and 15.6 m Sand: mainly medium; angular quartz and flint with some chalk and shell debris	8.1	18.8
	Silt, hard, dark greenish grey, laminated; fine sand partings	0.5	19.3
	c Sandy gravel with clayey silt; dark greenish grey Gravel: fine and coarse; well rounded flint, quartz and quartzite	0.7	20.0
Crag	**d** Very clayey sand, olive grey to greenish olive grey, glauconitic	2.6	22.6
Upper Chalk	Chalk, soft to hard, white	1.2+	23.8

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	7	68	25	1.1-2.3	7	9	53	6	12	13	0
b	1	62	37	10.7-12.0	4	16	71	5	4	0	0
				12.0-14.0	1	5	56	20	15	3	0
				14.0-15.6	0	3	29	19	27	22	0
				15.6-16.8	0	2	20	20	38	20	0
				16.8-17.8	1	2	35	13	22	27	0
				17.8-18.8	1	1	27	13	21	35	2
				Mean	**1**	**5**	**41**	**16**	**21**	**16**	**trace**
c	9	52	39	19.3-20.0	9	32	15	5	13	17	9
d	28	69	3	20.0-22.6	28	24	40	5	3	0	0
a+b+c	**2**	**62**	**36**	**Mean**	**2**	**7**	**41**	**14**	**19**	**16**	**1**

TM 28 NE 27 2738 8976 Mill Farm, Denton

Surface level +45.9 m
Water not encountered
Shell and auger
July 1983

Waste 25.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark yellowish brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, variably silty to 7.0 m, waxy below, mainly olive grey but mottled with brown and orange near top; abundant chalk pebbles, flint pebbles	16.7	17.0
	Silt, mainly sandy, light olive grey; bands of chalky sand	1.0	18.0
	Clay, silty and sandy, interlaminated with clay and sandy silt in top 1.5 m, greyish brown to brownish grey; sand-grade chalk and scattered pebbles of flint and quartz but almost pebble-free in parts	7.1+	25.1

TM 28 NE 28 2818 8914 Sidge's Lane, Denton

Surface level +44.5 m
Water not encountered
Shell and auger
July 1983

Waste 25.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark yellowish brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty to 2.7 m, waxy below, light olive grey to moderate olive brown; chalk pebbles abundant; flint pebbles abundant from 0.6 to 2.7 m, scattered below	3.5	3.7
	Clay, waxy to silty, olive grey; chalk pebbles and scattered flint and shelly mudstone pebbles	13.3	17.0
	Clay, silty and sandy, brownish grey to dark greyish brown; scattered flint and chalk pebbles	8.2+	25.2

TM 28 NE 29 **2902 8940** **High Green Farm, Denton**

Surface level +40.4 m
Water not encountered
Shell and auger
August 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, silty	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, waxy near top, part silty, olive grey with olive brown mottling near top; abundant chalk pebbles, scattered flint pebbles and sparse black mudstone pebbles	18.8	19.0
	Clay, sandy and silty, greyish brown to brownish grey; almost pebble-free in places but scattered flint pebbles and sand-grade chalk	2.2	21.2
	Silt, slightly sandy, laminated, light olive grey	0.1	21.3
Glacial Sand and Gravel	Pebbly sand and sandy gravel with bands of dusky yellow clay in lower part	3.7+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
6	65	29	21.3-23.0	4	9	74	5	7	1	0
			23.0-25.0	7	6	31	10	27	19	0
			Mean	**6**	**8**	**49**	**8**	**18**	**11**	**0**

TM 28 NE 30 **2958 8810** **North of Denton Lodge, Earsham** **Block B**

Surface level +35.8 m
Water struck at +11.3 m
Shell and auger
July 1983

Overburden	13.2 m
Mineral	5.3 m
Waste	4.2 m
Mineral	1.8 m
Waste	1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and rubble	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, silty to sandy, mainly shades of grey; abundant chalk including beds of chalk rubble from 1.9 to 4.1 m; flint pebbles - abundant near base	12.9	13.2
Beccles Beds ('Glacial')	**a** Sand, mostly pebbly Gravel: fine and coarse; angular and rounded flint and rounded quartz with sparse chalk Sand: mainly medium; rounded quartz with chalk	5.3	18.5
(Starston Till)	Clay, silty and sandy, yellowish brown to dusky brown; flint and quartz pebbles; coarse-sand and pebble grade chalk to 21.0 but almost chalk free below	4.2	22.7

(Pebbly Series)	b Gravel with thin silt bands, especially near top Gravel: fine with coarse; well rounded quartzite and angular flint with quartz and some rounded flint and traces of igneous/metamorphic rock	1.8	24.5
	Silt, clayey, slightly laminated, brown at top but passing down into olive grey	0.9	25.4
	c Gravel	0.6+	26.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	9	86	5	13.2-15.2	9	38	52	1	0	0	0
				15.2-17.2	12	19	58	3	4	4	0
				17.2-18.5	6	18	67	3	5	1	0
				Mean	**9**	**26**	**58**	**2**	**3**	**2**	**0**
b	9	38	53	22.7-23.7	12	5	22	13	31	17	0
				23.7-24.3	6	3	23	12	29	27	0
				24.3-24.5	1	2	12	16	31	38	0
				Mean	**9**	**4**	**21**	**13**	**30**	**23**	**0**
c	4	34	62	25.4-26.0	4	6	18	10	31	31	0
a+b	**9**	**74**	**17**	**Mean**	**9**	**20**	**49**	**5**	**10**	**7**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	23.7-24.3	33	8	22	34	0	0	1	2

TM 28 NE 31 **2894 8764** **East Wood, Denton** **Block C**

Surface level +15.7 m
Water struck at +12.5 m
Shell and auger
July 1983

Overburden	3.2 m
Mineral	5.2 m
Bedrock	5.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, greyish brown	0.3	0.3
Alluvium	Silt, sandy and clayey, yellowish brown; sparse pebbles	0.8	1.1
Head	Silty clay on sandy clayey silt, moderate yellowish brown to strong orange, poorly laminated in lower part; scattered flint and quartz pebbles	2.1	3.2
Beccles Beds (Pebbly Series)	a Sandy gravel; scattered thin silt bands near top Gravel: mainly fine; angular flint with rounded flint and quartzite and some quartz Sand: medium with coarse; angular flint and quartz; mainly strong orange	5.2	8.4
Crag	b Sand, glauconitic, with olive grey silt bands below 10 m; iron pan fragments to 10.4 m, bivalve and micaceous siltstone fragments below	5.8+	14.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	2	56	42	3.2-4.2	3	4	34	23	26	10	0
				4.2-5.2	2	1	17	17	28	35	0
				5.2-6.2	1	2	49	25	21	2	0
				6.2-7.2	0	1	27	20	37	15	0
				7.2-8.4	2	10	34	16	31	7	0
				Mean	**2**	**4**	**32**	**20**	**29**	**13**	**0**
b	18	73	9	8.4-10.4	8	43	44	2	2	1	0
				10.4-14.0	24	32	26	5	12	1	0
				Mean	**18**	**37**	**32**	**4**	**8**	**1**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	5.2-6.2	57	17	8	12	0	0	0	6
	6.2-7.2	42	22	14	17	0	0	0	5
	7.2-8.4	46	18	8	22	0	0	0	6
	Mean	**47**	**19**	**11**	**18**	**0**	**0**	**0**	**5**

TM 28 NE 32 **2681 8504** **Jubilee Covert, Wortwell** **Block H**

Surface level +26.3 m
Water struck at +13.8 m
Shell and auger
September 1983

Overburden	0.2 m
Mineral	4.6 m
Waste	0.2 m
Mineral	0.9 m
Waste	0.4 m
Mineral	15.0 m
Bedrock	3.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dusky brown, pebbly	0.2	0.2
Channel Fill Deposits	**a** Sandy gravel, 'clayey' near top, on 'clayey' sand Gravel: mainly fine; angular to subrounded flint with some quartzite Sand: medium with fine and some coarse; angular flint with some subangular quartz; yellowish brown to orange brown	4.6	4.8
	Silt, pebbly, faintly laminated, moderate yellow brown	0.2	5.0
	b Sandy gravel with thin silt bands Gravel: mainly fine; angular to subrounded flint Sand: as above	0.9	5.9
	Silt, clayey, very finely laminated, strong orange to brownish grey	0.4	6.3
	c Sand, mainly pebbly, 'clayey' in upper part Gravel: fine with coarse, cobbles near top; angular flint and rounded quartzite Sand: medium and fine; angular to rounded quartz with some flint; moderate yellow to strong orange and yellow brown	8.2	14.5

	d Sandy gravel, 'very clayey' from 16.5 to 18.0 m Gravel: mainly fine; angular flint and well rounded quartzite and quartz; some rounded flint near base Sand: mainly medium; mainly angular to subangular quartz with angular flint; yellowish brown to olive grey	5.5	20.0
Beccles Beds (Westleton Beds)	e Gravel Gravel: fine and coarse; well rounded black flint with some quartz and shell fragments Sand: mainly medium; mainly well rounded quartz and flint with some shell debris; olive grey	1.3	21.3
Crag	f Shelly gravel with some thin silt bands	1.4	22.7
	Silt, sandy, olive grey	2.3+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	10	65	25	0.2-1.2	11	15	20	15	26	13	0
				1.2-1.6	9	12	16	13	33	17	0
				1.6-2.9	4	30	21	11	26	8	0
				2.9-4.8	13	26	45	7	9	0	0
				Mean	**10**	**24**	**31**	**10**	**19**	**6**	**0**
b	11	57	32	5.0-5.9	11	19	30	8	20	12	0
c	7	87	6	6.3-7.3	11	10	54	9	8	5	3
				7.3-9.3	10	45	33	1	2	5	4
				9.3-11.3	9	68	20	2	1	0	0
				11.3-12.5	4	18	68	5	5	0	0
				12.5-14.5	2	31	65	1	1	0	0
				Mean	**7**	**39**	**45**	**3**	**3**	**2**	**1**
d	10	57	33	14.5-16.5	1	9	44	12	19	15	0
				16.5-18.0	32	3	31	12	16	6	0
				18.0-19.0	2	7	45	17	21	8	0
				19.0-20.0	2	4	25	20	37	12	0
				Mean	**10**	**6**	**37**	**14**	**22**	**11**	**0**
e	trace	39	61	20.0-21.3	trace	2	25	12	27	30	4
f	2	60	38	21.3-22.7	2	4	43	13	19	19	0
a-e	**8**	**70**	**22**	**Mean**	**8**	**24**	**38**	**8**	**14**	**7**	**1**

TM 28 NE 33 **2815 8746** **Trunch House, Denton** **Block C**

Surface level +18.7 m
Water struck at +16.7 m
Shell and auger
September 1983

Overburden	1.6 m
Mineral	1.2 m
Waste	3.3 m
Mineral	4.7 m
Bedrock	3.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, yellow brown	0.3	0.3
Alluvium	Clay, silty to sandy, mottled orange and moderate brown; black carbonaceous fragments below 0.8 m	1.3	1.6
Head	**a** 'Clayey' sandy gravel Gravel: mainly coarse; angular flint Sand: mainly medium; angular quartz and flint; moderate brown	1.2	2.8
Channel Fill Deposits	Silt and silty clay, laminated near top; dark yellow brown to greyish brown; scattered pebbles	3.3	6.1
	b Gravel, partly sandy Gravel: fine and coarse; angular and rounded flint and rounded quartz and quartzite; with scattered chalk below 9.1 m Sand: mainly medium; subangular quartz with chalk and some flint; shell fragments near base; pale yellowish brown	4.7	10.8
Crag	Sand, fine, greyish olive; scattered phosphatic grains and traces of glauconite	3.2+	14.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	12	61	27	1.6-2.8	12	19	39	3	7	20	0
b	2	49	49	6.1-7.1	1	2	7	7	38	45	0
				7.1-8.1	3	3	29	13	35	17	0
				8.1-9.1	2	8	55	13	14	5	3
				9.1-10.1	2	14	33	17	20	14	0
				10.1-10.8	1	3	19	21	29	25	2
				Mean	**2**	**6**	**29**	**14**	**27**	**21**	**1**
c	5	95	0	10.8-14.0	5	82	13	0	0	0	0
a+b	**4**	**51**	**45**	**Mean**	**4**	**9**	**30**	**12**	**23**	**21**	**1**

TM 38 NW 31 **3070 8948** **Earsham Park, Earsham** **Block B**

Surface level +27.2 m
Water struck at +10.0 m
Shell and auger
August 1983

Overburden	4.0 m
Mineral	4.3 m
Waste	2.2 m
Mineral	5.8 m
Waste	0.6 m
Mineral	3.8 m
Waste	0.3 m
Mineral	1.6 m
Bedrock	2.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark and yellowish brown, sandy	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty, stiff, moderate brown at top, mottled light olive brown and light olive grey below; abundant rounded chalk pebbles and scattered angular flint pebbles	3.8	4.0
Beccles Beds ('Glacial')	**a** Sand, with scattered silt bands: fine and medium; well rounded quartz and chalk; pale yellow to greyish yellow	4.3	8.3
(Starston Till)	Clay, very sandy, firm, laminated in upper part, moderate brown; sparse angular flint pebbles, scattered coarse-sand grade chalk	2.2	10.5
('Glacial')	**b** Sand: fine and medium; subangular to subrounded quartz; some angular flint pebbles, scattered calcareous fragments; greyish orange to brownish orange	5.8	16.3
(Starston Till?)	Clay, sandy, silty, firm, moderate brown; angular flint and rounded flint, quartz and quartzite pebbles	0.6	16.9
(Pebbly Series)	**c** Pebbly sand on basal gravel Gravel: fine and medium; angular flint with rounded quartz and quartzite Sand: mainly medium; subrounded to subangular quartz with some flint and quartzite near base; brownish orange to moderate brown	3.8	20.7
	Silt, clayey and sandy in part, bluish olive grey; scattered flint and quartzite pebbles	0.3	21.0

	d Clayey sandy gravel on pebbly sand Gravel: mainly fine; angular flint with some quartz Sand: medium with fine and coarse; angular to subangular quartz with some quartzite; olive brown with slight greenish tinge at base	1.6	22.6
Crag	**e** Sand, micaceous, olive grey	2.4+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	10	89	1	4.0-6.0	15	64	21	0	0	0	0
				6.0-8.3	7	31	60	1	1	0	0
				Mean	**10**	**46**	**42**	**1**	**1**	**0**	**0**
b	6	92	2	10.5-12.5	9	57	30	1	3	0	0
				12.5-14.5	5	27	66	1	1	0	0
				14.5-16.3	3	13	76	3	4	1	0
				Mean	**6**	**33**	**57**	**2**	**2**	**trace**	0
c	3	68	29	16.9-17.9	3	17	54	8	13	5	0
				17.9-18.9	1	18	58	6	12	5	0
				18.9-19.9	7	23	41	6	10	13	0
				19.9-20.7	2	3	10	17	38	30	0
				Mean	**3**	**16**	**43**	**9**	**17**	**12**	**0**
d	7	65	28	21.0-22.0	10	6	28	20	25	11	0
				22.0-22.6	4	33	40	7	7	9	0
				Mean	**7**	**16**	**34**	**15**	**18**	**10**	**0**
e	8	92	0	22.6-25.0	8	47	45	trace	trace	0	0
a-d	**7**	**82**	**11**	**Mean**	**7**	**31**	**46**	**5**	**7**	**4**	**0**

TM 38 NW 32 **3093 8804** **Earsham Park Farm, Earsham** **Block D**

Surface level +17.0 m
Water struck at +9.3 m
Shell and auger
June 1983

Overburden	0.1 m
Mineral	9.3 m
Waste	0.1 m
Mineral	1.6 m
Waste	5.4 m
Mineral	8.5 m
Bedrock	1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, sandy; scattered flint pebbles	0.1	0.1
River Terrace Deposits	**a** Sandy gravel, 'clayey' at top Gravel: fine with coarse; subangular to subrounded flint with subrounded quartzite and some well rounded flint Sand: mainly medium; subangular to subrounded quartz with some flint; light to dark brown	2.8	2.9

Channel Fill Deposits	**b** Sandy gravel; 0.1 m bright orange silt at 7.8 m Gravel: fine and coarse; subangular to subrounded flint with some subrounded to well rounded quartzite and well rounded flint Sand: mainly medium; subangular to subrounded quartz with some flint	6.5	9.4
	Silt, sandy and clayey, medium dark grey; some broken bivalve shells, scattered fine sand partings	5.4	14.8
	c Sandy gravel and pebbly sand Gravel: fine and coarse; subangular to subrounded flint with some subrounded to well rounded quartzite; chalk scattered to 22.0 m, abundant below Sand: mainly medium; subangular to subrounded quartz with some flint and chalk (abundant near base); yellow orange to medium and olive grey	8.5	23.3
Upper Chalk	Chalk, soft, white	1.4+	24.7

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	53	42	0.1-0.9	10	20	32	6	13	19	0
				0.9-1.9	3	5	38	14	21	19	0
				1.9-2.9	2	4	28	16	34	16	0
				Mean	**5**	**9**	**31**	**13**	**24**	**18**	**0**
b	4	61	35	2.9-3.8	2	4	53	9	18	14	0
				3.8-4.8	1	6	42	6	12	33	0
				4.8-5.8	4	5	25	9	25	32	0
				5.8-7.0	4	13	36	9	24	14	0
				7.0-7.7	5	20	67	4	4	0	0
				7.8-8.8	5	11	50	5	15	14	0
				8.8-9.4	4	11	63	5	9	8	0
				Mean	**4**	**10**	**44**	**7**	**17**	**18**	**0**
c	3	69	28	14.8-15.8	5	17	32	8	19	19	0
				15.8-16.8	3	8	37	11	20	21	0
				16.8-17.8	9	15	58	5	5	8	0
				17.8-18.8	2	8	65	4	8	13	0
				18.8-20.0	2	6	55	11	15	11	0
				20.0-21.0	1	7	49	18	19	6	0
				21.0-22.0	1	8	47	18	16	10	0
				22.0-23.3	1	2	44	18	20	15	0
				Mean	**3**	**9**	**48**	**12**	**15**	**13**	**0**
a+b+c	**3**	**65**	**32**	**Mean**	**3**	**9**	**46**	**10**	**17**	**15**	**0**

TM 38 NW 33 **3051 8641** **Flixton Park, Flixton** **Block D**

Surface level +15.9 m
Water struck at +9.5 m
Shell and auger
July 1983

Overburden	0.3 m
Mineral	4.4 m
Waste	2.0 m
Mineral	6.5 m
Bedrock	4.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy	0.3	0.3
River Terrace Deposits	**a** Sandy gravel and gravel Gravel: fine with coarse, cobbles from 2.5 to 3.5 m; subangular to subrounded flint with some subrounded to well rounded quartz and quartzite and well rounded flint Sand: mainly medium; subangular to subrounded quartz with some flint	4.4	4.7
Channel Fill Deposits	Clay, silty to very sandy, mainly very dark brown and grey; scattered flint pebbles, wood fragments near base	2.0	6.7
Beccles Beds (Kesgrave Sands and Gravels	**b** Pebbly sand and partly sandy gravel, 'clayey' at top Gravel: mainly coarse; subangular to subrounded flint with some well rounded flint, quartzite and quartz Sand: mainly medium; subangular to subrounded quartz; mainly yellow orange to orange brown	4.3	11.0
Crag	**c** Sand: mainly medium; quartz with some ironpan; thin silty clay laminae; few pebbles	2.2	13.2
	d Sand, glauconitic, dusky yellow green; abundant shell debris	4.8+	18.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	3	51	46	0.3-1.3	8	9	42	9	19	13	0
				1.3-2.5	1	5	50	12	15	17	0
				2.5-3.5	2	3	28	12	31	17	7
				3.5-4.7	3	3	21	12	38	23	0
				Mean	**3**	**5**	**35**	**11**	**26**	**18**	**2**
b	4	66	30	6.7-8.0	10	25	51	6	6	2	0
				8.0-9.0	1	5	29	5	18	42	0
				9.0-10.0	2	4	45	7	17	25	0
				10.0-11.0	3	18	63	3	5	8	0
				Mean	**4**	**14**	**47**	**5**	**12**	**18**	**0**
c	9	89	2	11.0-13.2	9	23	64	2	1	1	0
d	11	88	1	13.2-15.0	8	35	54	2	1	0	0
				15.0-18.0	13	27	56	3	1	0	0
				Mean	**11**	**30**	**55**	**3**	**1**	**0**	**0**
a-c	5	65	30	**Mean**	**5**	**12**	**46**	**7**	**15**	**14**	**1**

TM 38 NW 34 **3040 8513** **Coronation Wood, St. Cross, South Elmham** **Block E**

Surface level +38.0 m
Water not encountered
Shell and auger
July 1983

Overburden 12.3 m
Mineral 12.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.1	0.1
Boulder Clay (Lowestoft Till)	Clay, silty, firm, mottled yellowish brown and medium dark grey near top, mainly bluish grey below; abundant subrounded chalk pebbles and scattered subangular flints; 0.1 m orange sand at 0.8 m	12.2	12.3
Beccles Beds (Mendham Beds on Pebbly Series)	Sand, 'clayey' at top and 'very clayey' from 18.3 to 20.3 m, pebbly towards base Gravel: mainly fine; subangular to subrounded flint with some subrounded quartz and quartzite Sand: mainly medium; subangular to subrounded quartz with some flint; chalky coatings from 16.3 to 18.3 m; greyish orange to pale orange	12.7+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
9	86	5	12.3-14.3	13	24	59	2	2	0	0
			14.3-16.3	5	24	66	2	3	0	0
			16.3-18.3	5	32	63	0	0	0	0
			18.3-20.3	25	41	32	1	1	0	0
			20.3-22.3	5	27	62	2	2	2	0
			22.3-25.0	5	9	56	9	16	5	0
			Mean	**9**	**25**	**58**	**3**	**4**	**1**	**0**

TM 38 NW 35 **3169 8931** **New Plantation, Earsham** **Block D**

Surface level +14.3 m
Water struck at +6.3 m
Shell and auger
June 1983

Overburden 0.1 m
Mineral 11.0 m
Bedrock 7.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, dark brown	0.1	0.1
River Terrace Deposits	**a** Gravel and pebbly sand Gravel: mainly fine; angular flint with some rounded flint, quartz and quartzite and a little silicified limestone Sand: medium; subangular to subrounded quartz; greyish brown to yellowish orange	1.9	2.0
Channel Fill Deposits	**b** Sand: fine, subangular to subrounded quartz; few subrounded flint pebbles	2.3	4.3

Beccles Beds (Kesgrave Sands and Gravels)	c	Gravel, partly sandy and with 1.6 m fine sand near top Gravel: mainly fine; subangular to well rounded flint with some quartz and quartzite and a little silicified limestone; shell fragments at 10.6 m Sand: medium with fine and coarse; subangular to subrounded quartz with flint	6.8	11.1
Crag		Clay interbedded with sand, mainly bluish grey; shell fragments	7.6+	18.7

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	2	64	34	0.1-1.0	5	6	27	11	34	17	0
				1.0-2.0	1	4	69	6	13	7	0
				Mean	**2**	**5**	**51**	**8**	**23**	**11**	**0**
b	1	97	2	2.0-3.0	1	9	86	2	1	1	0
				3.0-4.3	0	20	79	1	0	0	0
				Mean	**1**	**15**	**81**	**1**	**1**	**1**	**0**
c	3	58	39	4.3-5.2	6	7	19	14	34	20	0
				5.2-6.8	3	55	42	0	0	0	0
				6.8-8.0	5	8	14	16	48	9	0
				8.0-9.0	2	5	19	27	32	15	0
				9.0-10.0	2	2	21	18	36	21	0
				10.0-11.1	2	6	31	19	34	8	0
				Mean	**3**	**17**	**26**	**15**	**28**	**11**	**0**
a+b+c	**2**	**67**	**31**	**0.1-11.1**	**2**	**15**	**41**	**11**	**22**	**9**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	1.0-2.0	54	15	16	10	0	0	0	5*
c	6.8-8.0	38	25	16	16	0	0	trace	5*

* Including silicified limestone

TM 38 NW 36 **3197 8878** **Church Farm, Earsham** **Block D**

Surface level +8.8 m
Water struck at +4.8 m
Shell and auger
August 1983

Overburden	0.2 m
Mineral	6.4 m
Bedrock	4.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy	0.2	0.2
River Terrace Deposits	**a** Sandy gravel Gravel: mainly fine; subangular to rounded flint with rounded to well rounded quartz and quartzite Sand: mainly medium; subangular to subrounded quartz with some flint; moderate brown	1.5	1.7
Channel Fill Deposits	**b** Pebbly sand and gravel Gravel: mainly fine; subangular to subrounded flint with some rounded quartz and quartzite Sand: medium; subangular to rounded quartz with some flint and, from 5.0 to 6.0 m, chalk and shell debris; mainly moderate yellowish brown	4.9	6.6
Crag	**c** Sand, 'clayey' to 'very clayey', glauconitic, greyish olive green	4.4+	11.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	3	49	48	0.2-1.7	3	3	29	17	32	16	0
b	2	73	25	1.7-2.7	1	11	74	3	8	3	0
				2.7-4.0	1	8	67	7	14	3	0
				4.0-5.0	3	5	55	15	19	3	0
				5.0-6.0	1	2	43	16	27	11	0
				6.0-6.6	1	2	25	18	38	16	0
				Mean	**2**	**6**	**56**	**11**	**19**	**6**	**0**
c	21	79	0	6.6-9.0	19	69	8	3	1	0	0
				9.0-11.0	24	66	9	1	0	0	0
				Mean	**21**	**68**	**9**	**2**	**trace**	**0**	**0**
a+b	**2**	**67**	**31**	**0.2-6.6**	**2**	**5**	**50**	**12**	**22**	**9**	**0**

TM 38 NW 37 **3106 8773** **Marsh Plantation, Flixton** **Block D**

Surface level +8.8 m
Water struck at +5.4 m
Shell and auger
July 1983

Overburden 3.4 m
Mineral 4.3 m
Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat and silty clay	3.4	3.4
Channel Fill Deposits	**a** Sandy gravel Gravel: mainly fine; subangular to subrounded flint with some subrounded to well rounded quartz and quartzite; chalk increasing with depth Sand: mainly medium; subangular to subrounded quartz and flint with chalk increasing with depth	4.3	7.7
Crag	**b** Sand with silty clay bands, glauconitic, medium greyish green; scattered broken bivalves	2.3+	10.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	1	62	37	3.4-4.4	3	10	48	7	18	14	0
				4.4-5.4	0	9	46	11	23	11	0
				5.4-6.4	0	10	48	10	18	14	0
				6.4-7.4	0	7	40	12	26	15	0
				7.4-7.7	0	3	17	13	46	21	0
				Mean	**1**	**9**	**43**	**10**	**23**	**14**	**0**
b	33	61	6	7.7-10.0	33	46	8	7	6	0	0

TM 38 NW 38 **3196 8684** **Wood Farm, Flixton** **Block E**

Surface level +34.1 m
Water struck at +8.6 m
Shell and auger
June 1983

Overburden 9.6 m
Mineral 18.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and clayey	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, firm, partly silty, orange and grey mottled in upper part, medium grey below; scattered flint pebbles; chalk pebbles more abundant with depth; thin sand partings near base	9.4	9.6
Beccles Beds (Mendham Beds)	**a** Sand, 'very clayey' from 15.0 to 17.0 m: mainly medium, subangular to subrounded quartz; scattered flint pebbles, especially towards base	10.1	19.7

(Pebbly Series)	**b** Pebbly sand with sandy gravel at base Gravel: mainly fine; subangular to subrounded flint with some subrounded to rounded quartz and quartzite Sand: medium; subangular to subrounded quartz; pale yellowish orange	4.0	23.7
(Kesgrave Sands and Gravels)	**c** Sandy gravel and pebbly sand Gravel: mainly fine; subangular to subrounded flint with subrounded to rounded quartz, quartzite and well rounded flint (in lower part) Sand: mainly medium; subangular to subrounded quartz with some flint in places	4.8+	28.5

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	10	89	1	9.6-10.6	7	61	32	0	0	0	0
				10.6-11.6	5	49	45	1	0	0	0
				11.6-13.0	6	16	75	2	1	0	0
				13.0-14.0	5	15	80	0	0	0	0
				14.0-15.0	7	22	69	1	1	0	0
				15.0-16.0	40	39	21	0	0	0	0
				16.0-17.0	21	25	54	0	0	0	0
				17.0-18.0	9	63	28	0	0	0	0
				18.0-19.0	3	14	77	2	4	0	0
				19.0-19.7	3	12	80	2	3	0	0
				Mean	**10**	**32**	**56**	**1**	**1**	**0**	**0**
b	3	84	13	19.7-20.7	5	14	63	7	11	0	0
				20.7-21.7	3	21	69	1	3	3	0
				21.7-22.7	3	9	74	5	7	2	0
				22.7-23.7	3	9	51	11	17	9	0
				Mean	**3**	**13**	**65**	**6**	**9**	**4**	**0**
c	2	65	33	23.7-24.7	4	10	40	14	26	6	0
				24.7-25.5	4	9	35	13	27	12	0
				25.5-26.5	1	7	54	15	16	7	0
				26.5-27.5	0	3	34	13	32	18	0
				27.5-28.5	2	3	42	31	18	4	0
				Mean	**2**	**6**	**42**	**17**	**24**	**9**	**0**
a-c	**7**	**82**	**11**	**9.6-28.5**	**7**	**21**	**55**	**6**	**8**	**3**	**0**

TM 38 NW 39 **3176 8553** **Bush Meadow, Flixton** **Block E**

Surface level +38.4 m
Water not encountered
Shell and auger
July 1983

Overburden 18.4 m
Mineral 6.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, sandy and silty, mainly medium grey, dark grey and bluish grey; subrounded chalk and subangular flint pebbles; bands of chalky rubble from 2.6 to 2.8 m and from 12.0 to 14.0 m; 0.1 m sand at 1.3 m and 0.5 m sand at 16.9 m	18.2	18.4
Beccles Beds (Mendham Beds)	Sand: fine and medium; subangular to subrounded quartz with a little flint; pale yellowish brown; few pebbles	6.6+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
6	92	2	18.4-20.4	6	58	33	1	2	0	0
			20.4-22.4	6	40	48	3	3	0	0
			22.4-25.0	7	38	53	2	0	0	0
			Mean	**6**	**45**	**45**	**2**	**2**	**0**	**0**

TM 38 NW 40 3268 8927 Rectory, Earsham Block D

Surface level +8.1 m
Water struck at +5.7 m
Shell and auger
June 1983

Overburden	0.9 m
Mineral	8.3 m
Bedrock	4.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Clayey flinty gravel and brick	0.9	0.9
River Terrace Deposits	**a** Sandy gravel Gravel: fine and coarse; subangular to subrounded flint with well rounded to subrounded quartzite and quartz Sand: mainly medium; subangular to subrounded quartz with subangular flint; greyish orange	1.0	1.9
Channel Fill Deposits	**b** Gravel, sandy at top and base Gravel: fine and coarse; angular flint with rounded flint, some quartz and quartzite, a little silicified limestone and traces of chalk and igneous and metamorphic rocks Sand: medium with coarse; subangular to subrounded quartz and flint; pale yellow-brown to strong orange brown	7.3	9.2
Crag	**c** 'Clayey' sand: fine to medium; subangular to subrounded quartz; greenish to bluish grey; shell fragments and siltstone and flint pebbles	4.3+	13.5

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	2	52	46	0.9-1.9	2	5	36	11	22	24	0
b	2	47	51	1.9-2.9	1	5	32	20	30	10	2
				2.9-3.9	1	1	22	16	36	21	3
				3.9-4.9	1	1	18	9	31	40	0
				4.9-5.9	2	3	33	11	22	29	0
				5.9-6.9	1	1	22	16	38	19	3
				6.9-7.9	2	2	22	18	29	22	5
				7.9-9.2	4	31	20	15	20	7	3
				Mean	**2**	**8**	**24**	**15**	**28**	**21**	**2**
c	12	87	1	9.2-10.2	12	75	12	1	0	0	0
				10.2-13.5	13	7	76	2	2	0	0
				Mean	**12**	**23**	**62**	**2**	**1**	**0**	**0**
a+b	**2**	**46**	**52**	**0.9-9.2**	**2**	**7**	**25**	**14**	**29**	**21**	**2**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	2.9-3.9	52	26	10	7	0	0	0	5*
	3.9-4.9	39	20	15	20	0	0	2	4*
	4.9-5.9	46	22	15	16	1	0	0	0
	5.9-6.9	54	18	12	12	0	0	0	4*
	6.9-7.9	64	11	11	9	0	0	1	4
	7.9-9.2	56	13	12	12	0	0	0	7
	Mean	**51**	**19**	**13**	**13**	**trace**	**0**	**trace**	**4**
c	10.2-13.5	18	0	0	0	0	0	0	82**

* Including silicified limestone
** Siltstone and shell

TM 38 NW 41 **3296 8847** **Stow Fen, Bungay** **Block D**

Surface level +7.2 m
Water struck at +7.3 m
Shell and auger
July 1983

Overburden 0.7 m
Mineral 14.3 m
Bedrock 3.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, peaty, sandy, dark brown, and grey and orange clay	0.7	0.7
River Terrace Deposits	**a** Sandy Gravel Gravel: fine and coarse; subangular flint and subrounded to well rounded quartz and quartzite Sand: mainly medium; subangular to subrounded quartz with flint; greyish yellowish brown	2.0	2.7
Channel Fill Deposits	**b** Gravel, partly sandy Gravel: fine with coarse; subangular to well rounded flint and subrounded to well rounded quartz and quartzite; chalk, some cobble-size, below 5.7 m Sand: medium with coarse; subangular to subrounded quartz, flint and chalk	12.3	15.0
Crag	**c** Sand, glauconitic, medium greenish grey	3.5+	18.5

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	2	58	40	0.7-1.7	4	11	34	5	21	25	0
				1.7-2.7	1	11	43	11	23	11	0
				Mean	**2**	**11**	**39**	**8**	**22**	**18**	**0**
b	1	48	51	2.7-3.7	1	6	27	10	23	33	0
				3.7-4.7	0	2	9	18	40	31	0
				4.7-5.7	1	2	14	17	36	30	0
				5.7-6.7	1	2	20	15	43	19	0
				6.7-7.7	0	1	35	20	26	18	0
				7.7-8.7	1	1	34	21	31	12	0
				8.7-9.7	0	1	23	14	40	22	0
				9.7-10.7	2	2	42	14	26	14	0
				10.7-11.7	2	4	44	14	26	8	2
				11.7-12.7	1	1	20	25	38	15	0
				12.7-13.7	1	2	23	24	33	17	0
				13.7-15.0	2	6	41	15	25	11	0
				Mean	**1**	**3**	**28**	**17**	**32**	**19**	**trace**
c	5	94	1	15.0-16.0	3	12	78	6	1	0	0
				16.0-18.5	5	6	86	2	1	0	0
				Mean	**5**	**8**	**83**	**3**	**1**	**0**	**0**
a+b	1	50	49	**0.7-15.0**	**1**	**4**	**30**	**16**	**30**	**19**	**trace**

TM 38 NW 42 **3322 8648** **Upland Hall Farm, Bungay** **Block E**

Surface level +27.8 m
Water struck at +3.6 m
Shell and auger
July 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, dark yellowish brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, silty, firm to hard, mainly olive grey; abundant angular to subangular chalk and angular flint pebbles; bands of chalk gravel below 14.5 m	17.3	17.6
	Silt, olive grey; 0.1 m olive grey pebbly clay at 18.9 m	1.9	19.5
	Clay, firm, olive grey; chalk and flint pebbles	4.7	24.2
Beccles Beds ('Glacial')	Sand, silty, olive grey; scattered pebbles	0.8+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
	18	82	0	24.2-25.0	18	63	19	0	0	0	0

TM 38 NW 43 **3351 8803** **Upland Hall, Bungay** **Block E**

Surface level +34.5 m
Water struck at +7.5 m
Shell and auger
July 1983

Overburden 8.0 m
Mineral 20.4 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Soil, clayey, with brick rubble	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, part silty, mottled orange and grey to 3.5 m, mainly medium to dark bluish grey below; scattered chalk and flint pebbles	7.7	8.0
Beccles Beds (Mendham Beds)	**a** Sand 'very clayey' at top: mainly medium; subangular to subrounded quartz; greyish orange; chalk coating on grains in places; scattered pebbles	13.7	21.7
(Pebbly Series)	**b** Pebbly sand and sandy gravel Gravel: mainly fine; angular flint with rounded flint, quartz and quartzite, traces of chalk, igneous and metamorphic rocks, silicified limestone and ironstone Sand: medium; subangular to subrounded quartz with flint	6.7	28.4
Crag	**c** Sand, light olive grey to greyish green	1.8+	30.2

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	7	92	1	8.0-9.0	30	42	22	2	3	1	0
				9.0-11.0	7	49	44	0	0	0	0
				11.0-13.0	11	38	51	0	0	0	0
				13.0-15.0	4	38	57	1	0	0	0
				15.0-17.0	3	25	71	0	1	0	0
				17.0-19.0	4	34	62	0	0	0	0
				19.0-20.7	4	30	63	1	2	0	0
				20.7-21.7	6	34	56	1	2	1	0
				Mean	**7**	**36**	**55**	**1**	**1**	**trace**	**0**
b	3	74	23	21.7-22.9	4	19	71	2	3	1	0
				22.9-23.9	4	7	45	11	20	13	0
				23.9-24.9	3	6	52	11	17	11	0
				24.9-25.9	4	6	58	13	18	1	0
				25.9-26.9	3	8	72	6	7	4	0
				26.9-27.5	0	5	50	14	24	6	0
				27.5-28.4	0	11	36	9	20	24	0
				Mean	**3**	**10**	**55**	**9**	**15**	**8**	**0**
c	2	98	0	28.4-29.4	2	46	52	0	0	0	0
				29.4-30.2	1	46	53	0	0	0	0
				Mean	**2**	**46**	**52**	**0**	**0**	**0**	**0**
a+b	**6**	**86**	**8**	**8.0-28.4**	**6**	**27**	**55**	**4**	**5**	**3**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8–16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	19.0–21.7	51	11	20	18	0	0	0	0
b	22.9–23.9	51	20	12	13	0	0	2	2
	23.9–24.9	46	17	14	17	0	0	trace	6*
	24.9–25.9	66	9	11	9	trace	0	trace	5*
	25.9–26.9	57	6	22	11	0	0	0	4
	26.9–27.5	36	18	17	21	0	0	0	8*
	27.5–28.4	29	23	22	14	0	0	trace	12*
	Mean	**44**	**18**	**16**	**15**	**trace**	**0**	**1**	**6**

* Including silicified limestone and ironstone

TM 38 NW 44 **3366 8543** **St. Peter's Hall, South Elmham** **Block E**

Surface level +38.8 m
Water not encountered
Shell and auger
July 1983

Overburden	13.7 m
Mineral	2.6 m
Waste	0.1 m
Mineral	9.6 m
Bedrock	1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made Ground		0.2
Boulder Clay (Lowestoft Till)	Clay, partly silty, olive grey mottled with olive brown to 2.4 m; flint and chalk pebbles and scattered black mudstone pebbles; 0.2 m yellowish orange sand at 1.4 m and 0.4 m sandy silt at 7.7 m	13.5	13.7
Beccles Beds (Pebbly Series)	**a** Sand with bands of gravel Gravel: mainly fine; rounded quartzite and flint with some quartz Sand: medium; subangular quartz with some flint and traces of chalk; calcareous; pale yellowish brown	2.6	16.3
	Silt, laminated, greyish yellow green, moderate brown and dark yellow orange	0.1	16.4
	b Gravel and pebbly sand Gravel: mainly fine; subrounded to well rounded flint with some subrounded to well rounded quartz and quartzite and subangular flint Sand: mainly medium; subangular to subrounded quartz with flint in upper part; yellowish grey	7.2	23.6
Crag	**c** Sand: fine; subangular to subrounded quartz; pale yellow; some pale grey clay laminae	2.4	26.0
	Silty clay and sand interbedded, bluish grey to medium grey	1.0+	27.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	4	83	13	13.7-15.7	5	18	56	6	11	4	0
				15.7-16.3	3	16	69	3	6	3	0
				Mean	**4**	**17**	**61**	**5**	**10**	**3**	**0**
b	5	71	24	16.4-17.4	7	12	18	11	36	16	0
				17.4-18.0	6	9	24	9	31	21	0
				18.0-19.0	5	15	61	2	8	9	0
				19.0-20.0	6	12	53	4	19	6	0
				20.0-21.0	4	16	58	3	13	6	0
				21.0-22.0	4	22	59	2	10	3	0
				22.0-23.6	6	44	39	1	7	3	0
				Mean	**5**	**21**	**46**	**4**	**16**	**8**	**0**
c	6	94	0	23.6-26.0	6	89	5	trace	0	0	0
a+b	**5**	**74**	**21**	**Mean**	**5**	**20**	**50**	**4**	**14**	**7**	**0**

TM 38 NW 45 **3466 8970** **Staithe, Bungay** **Block D**

Surface level +3.2 m
Water struck at +1.1 m
Shell and auger
June 1983

Overburden	1.6 m
Mineral	8.4 m
Bedrock	1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Soil on peat with thin beds of gravel	1.6	1.6
Channel Fill Deposits	a Sandy gravel Gravel: fine with coarse; angular flint with some rounded flint, quartz and quartzite Sand: mainly medium; subangular to rounded quartz and flint	6.0	7.6
Crag	b Sand: mainly fine; subangular to subrounded quartz; greyish orange	2.4	10.0
	c Sand, mainly greenish grey to greyish green	1.3+	11.3

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
a	2	71	27	1.6-2.5	3	12	56	5	16	8	0
				2.5-3.6	2	11	50	8	17	12	0
				3.6-4.6	4	45	31	5	13	2	0
				4.6-5.6	0	20	40	6	16	18	0
				5.6-6.8	1	12	37	10	19	18	3
				6.8-7.6	3	38	50	4	4	1	0
				Mean	**2**	**22**	**42**	**7**	**15**	**11**	**1**
b	3	97	0	7.6-10.0	3	67	30	0	0	0	0
c	4	96	0	10.0-11.3	4	62	34	0	0	0	0
a+b	**2**	**80**	**18**	**1.6-10.0**	**2**	**35**	**40**	**5**	**10**	**8**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.9-2.5	69	13	9	8	0	0	0	1
	2.5-3.6	70	10	6	8	0	0	0	6
	5.6-6.8	55	16	11	12	0	0	0	6*

* Including silicified limestone

TM 38 NW 46 **3465 8861** **Duke's Farm, Bungay** **Block E**

Surface level +17.9 m
Water struck at +7.2 m
Shell and auger
June 1983

Overburden 0.1 m
Mineral 17.9 m
Bedrock 3.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, dark brown	0.1	0.1
Beccles Beds (Mendham Beds)	**a** Sand: mainly fine; subangular to subrounded quartz; light brown to strong yellow orange	3.8	3.9
(Pebbly Series)	**b** Gravel and sandy gravel Gravel: mainly fine; subrounded to well rounded flint and quartzite with some subangular flint Sand: mainly medium; subangular to subrounded quartz and flint	8.8	12.7
Crag	**c** 'Clayey' to 'very clayey' sand: fine, subangular to subrounded quartz; reddish to 13.5 m, yellow orange below; slightly laminated in upper part	5.3	18.0
	d 'Clayey' sand, fine-grained, glauconitic, light olive grey to bluish grey	3.0+	21.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	3	97	0	0.1-1.1	4	81	15	0	0	0	0
				1.1-2.1	3	34	61	1	1	0	0
				2.1-3.9	3	71	25	1	0	0	0
				Mean	**3**	**64**	**32**	**1**	**trace**	**0**	**0**
b	3	64	33	3.9-5.3	4	15	48	7	14	12	0
				5.3-6.3	3	16	38	10	14	19	0
				6.3-7.3	4	7	36	14	25	14	0
				7.3-8.3	4	5	50	15	23	3	0
				8.3-9.3	3	4	48	21	19	5	0
				9.3-10.3	6	6	46	16	21	5	0
				10.3-10.8	2	5	33	15	33	12	0
				10.8-11.8	1	7	27	14	34	17	**0**
				11.8-12.7	2	21	18	16	26	17	0
				Mean	**3**	**10**	**40**	**14**	**22**	**11**	**0**
c	20	80	0	12.7-15.0	18	80	1	1	0	0	0
				15.0-18.0	23	75	1	1	0	0	0
				Mean	**20**	**78**	**1**	**1**	**0**	**0**	**0**
d	17	83	0	18.0-21.0	17	75	8	trace	0	0	0
a+b	**3**	**73**	**24**	**0.1-12.7**	**3**	**26**	**37**	**10**	**16**	**8**	**0**
a+b+c	**8**	**75**	**17**	**0.1-18.0**	**8**	**41**	**27**	**7**	**11**	**6**	**0**

TM 38 NW 47 **3407 8756** **Three Ash Farm, Bungay** **Block E**

Surface level +37.4 m
Water not encountered
Shell and auger
June 1983

Overburden	12.1 m
Mineral	13.5 m
Waste	0.7 m
Mineral	1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Soil and brick rubble	0.7	0.7
Boulder Clay (Lowestoft Till)	Clay, firm, silty, mottled grey and orange in upper part, medium to dark grey below; chalk pebbles and coarse-sand grade chalk; scattered flint pebbles	11.4	12.1
Beccles Beds (Mendham Beds)	**a** Sand, 'clayey' near top and base; fine and medium; subangular to subrounded quartz; pale greyish orange to very pale orange	7.9	20.0
(Pebbly Series)	**b** Pebbly sand, 'clayey' near top Gravel: fine and coarse; flint and quartz Sand: mainly medium; subangular to subrounded quartz with some flint; greyish orange	5.6	25.6
	Clay, sandy, soft, laminated	0.7	26.3
	c 'Clayey' sand: mainly fine; subangular to subrounded quartz	1.1+	27.4

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	9	91	0	12.1-14.0	13	46	41	0	0	0	0
				14.0-16.0	6	34	59	1	0	0	0
				16.0-18.0	6	41	52	0	1	0	0
				18.0-20.0	10	50	40	0	0	0	0
				mean	**9**	**42**	**49**	**trace**	**trace**	**0**	**0**
b	6	84	10	20.0-22.0	10	50	32	2	4	2	0
				22.0-24.0	4	12	66	4	8	6	0
				24.0-25.6	3	29	52	5	6	5	0
				Mean	**6**	**30**	**50**	**4**	**6**	**4**	**0**
c	12	86	2	26.3-27.4	12	65	21	trace	2	0	0
a+b	**8**	**87**	**5**	**12.1-25.6**	**8**	**37**	**48**	**2**	**3**	**2**	**0**
a+b+c	**8**	**87**	**5**	**Mean**	**8**	**39**	**46**	**2**	**3**	**2**	**0**

TM 38 NW 48 **3426 8601** **The Elms, St. Margaret, Ilkeshall** **Block E**

Surface level +43.4 m
Water not encountered
Shell and auger
July 1983

Overburden 15.8 m
Mineral 6.4 m
Bedrock 5.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, dark brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty, mainly medium dark grey but mottled near top; chalk pebbles and scattered flint pebbles	15.6	15.8
Beccles Beds ('Glacial')	**a** 'Clayey' to 'very clayey' sand: fine and medium; subangular to subrounded quartz with chalk; pale yellowish brown; scattered pebbles	4.0	19.8
(Kesgrave Sands and Gravels)	**b** Sandy gravel Gravel: fine and coarse; subangular to well rounded flint and rounded quartz and quartzite Sand: mainly medium; subangular to subrounded quartz with some flint; light olive grey	2.4	22.2
Crag	Silt, greenish grey, micaceous	0.1	22.3
	c Sand, 'clayey' in upper part: fine, subangular quartz with some mica; pale greenish grey to yellow grey	5.0+	27.3

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
a	15	83	2	15.8-17.8	10	51	37	1	1	0	0
				17.8-19.8	19	31	46	2	2	0	0
				Mean	**15**	**41**	**41**	**1**	**2**	**0**	**0**
b	5	61	34	19.8-20.8	6	16	30	6	20	22	0
				20.8-22.2	5	10	51	7	18	9	0
				Mean	**5**	**12**	**42**	**7**	**19**	**15**	**0**
c	12	88	0	22.3-23.3	11	84	3	1	1	0	0
				23.3-25.3	14	84	1	0	0	0	0
				25.3-27.3	8	91	1	0	0	0	0
				Mean	**11**	**88**	**1**	**trace**	**trace**	**0**	**0**
a+b	**11**	**76**	**13**	**15.8-22.2**	**11**	**30**	**43**	**3**	**8**	**5**	**0**

TM 38 NW 49 **3167 8809** **Sycamore Pollard, Flixton** **Block D**

Surface level +8.1 m
Water struck at +7.0 m
Shell and auger
September 1983

Overburden	1.1 m
Mineral	9.1 m
Bedrock	1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Alluvium	Soil, peaty, brown, on mottled clayey silt	1.1	1.1
	a Sand: mainly medium; well rounded quartz; olive brown; scattered flint pebbles; sparse 1-cm peaty silt bands	1.4	2.5
Channel Fill Deposits	**b** Gravel, partly sandy Gravel: mainly fine, some cobbles in lower part; rounded and angular flint with some rounded quartz, quartzite and chalk (abundant in lower part); traces of igneous rock, limestone and shell debris	7.7	10.2
Crag	Silt, greenish olive grey, with abundant bivalve fragments	1.8+	12.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	5	94	1	1.1-2.5	5	31	62	1	1	trace	0
b	1	48	51	2.5-3.5	0	12	31	7	28	22	0
				3.5-4.5	2	11	49	7	21	10	0
				4.5-5.5	0	10	19	19	28	24	0
				5.5-6.5	1	2	16	17	39	22	3
				6.5-7.5	1	2	16	18	47	11	5
				7.5-9.0	1	1	24	17	27	24	6
				9.0-10.2	2	3	35	17	26	12	5
				Mean	**1**	**6**	**27**	**15**	**30**	**13**	**3**
a+b	**2**	**54**	**44**	**1.1-10.2**	**2**	**9**	**32**	**13**	**26**	**15**	**3**

TM 38 NW 50 **3097 8544** **Halesworth Lodge, Flixton** **Block E**

Surface level +39.0 m
Water not encountered
Shell and auger
September 1983

Overburden 13.6 m
Mineral 11.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made Ground	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, silty to waxy, mainly olive grey but mottled with brown near top; angular flint and rounded chalk and black mudstone pebbles; scattered angular flint cobbles	13.1	13.4
	Silt, olive grey; some chalk pebbles and coarse-sand grade chalk	0.2	13.6
Beccles Beds (Mendham Beds)	Sand: medium and fine; subangular to rounded quartz with chalk and some flint; prominent bands of charcoal and silt fragments from 19.0 to 19.2 m; scattered flint and quartz pebbles	11.4+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
6	93	1	13.6-16.0	8	46	46	0	0	0	0
			16.0-18.0	6	22	65	4	3	0	0
			18.0-20.0	4	43	50	1	2	0	0
			20.0-22.0	7	50	42	1	0	0	0
			22.0-24.0	4	28	66	1	1	0	0
			24.0-25.0	6	65	29	0	0	0	0
			Mean	**6**	**40**	**52**	**1**	**1**	**0**	**0**

TM 38 NW 51 **3291 8977** **Roaring Arch Bridge, Earsham** **Block D**

Surface level +5.4 m
Water struck at +3.7 m
Shell and auger
September 1983

Overburden 0.8 m
Mineral 7.8 m
Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Alluvium	Soil on mottled olive brown and moderate brown silt with gastropods; 0.1 m peat at base	0.8	0.8
River Terrace Deposits	**a** Sandy gravel Gravel: fine and coarse; angular flint with some rounded flint, quartz, quartzite and, below 1.8 m, chalk Sand: mainly medium; subangular quartz with some flint and, below 1.8 m, chalk; olive grey	2.0	2.8

Channel Fill Deposits	**b** Pebbly sand and gravel Gravel: fine with coarse; angular flint with some rounded flint, quartz, quartzite and chalk; glauconite coating on some flint pebbles at top Sand: mainly medium, angular; quartz and flint with chalk; shell fragments from 6.5 to 8.0 m	5.8	8.6
Crag	Silt, greenish olive grey, with abundant bivalve fragments	0.3	8.9
	c Sand, greyish olive green, shelly, with glauconite	0.7	9.6
	Silt, greyish olive green, with bivalve fragments	0.4+	10.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	2	63	35	0.8-1.8	3	12	47	6	16	16	0
				1.8-2.8	1	11	41	8	19	20	0
				Mean	**2**	**12**	**44**	**7**	**17**	**18**	**0**
b	2	55	43	2.8-4.0	2	17	46	15	13	7	0
				4.0-5.5	2	3	41	18	30	6	0
				5.5-6.5	2	2	24	17	27	27	1
				6.5-8.0	2	6	22	9	30	31	0
				8.0-8.6	4	14	25	11	33	13	0
				Mean	**2**	**8**	**33**	**14**	**26**	**17**	**trace**
c	8	86	6	8.9-9.6	8	19	61	6	6	0	0
a+b	**2**	**57**	**41**	**0.8-8.6**	**2**	**9**	**36**	**12**	**24**	**17**	**trace**

TM 39 SW 36 **3105 9407** **Wood Farm, Hedenham** **Block A**

Surface level +34.3 m
Water struck at +16.5 m
Shell and auger
July 1983

Overburden	10.5 m
Mineral	1.1 m
Waste	0.2 m
Mineral	3.9 m
Waste	0.9 m
Mineral	3.8 m
Bedrock	4.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, yellowish brown	0.9	0.9
Boulder Clay	Clay, silty and sandy, olive grey to moderate brown, faintly laminated near base; chalk pebbles abundant to 8.0 m, scattered below; scattered flint pebbles, traces of shell fragments, sparse volcanic pebbles and scattered quartz and quartzite from 8.0 to 9.8 m	9.6	10.5
Beccles Beds (Kesgrave Sands and Gravels)	**a** 'Very clayey' sand: mainly medium; rounded quartz; olive brown to dusky yellow; scattered flint and quartz pebbles; bands of silt	1.1	11.6
(Palaeosol)	Silt, sandy and clayey, salmon pink to orange brown and dusky yellow	0.2	11.8
(Kesgrave Sands and Gravels)	**b** 'Clayey' pebbly sand Gravel: mainly fine; angular and rounded flint and quartzite with quartz and some igneous/metamorphic rock; traces of shell and iron pan Sand: mainly medium; angular to rounded quartz	3.0	14.8

Crag	**c** Sand: fine; well rounded quartz, yellowish grey to orange	0.9	15.7
	Silt, sandy, interlaminated with silty clay, pale olive to dark orange	0.9	16.6
	d Sand, commonly 'clayey' to 'very clayey', pebbly in places Gravel: mainly fine; subangular to rounded flint, and shell debris Sand: fine to medium; rounded to well rounded quartz with some mica Fines: clayey silt bands	3.8	20.4
	e Sand, olive grey to olive black, glauconitic; shell fragments, scattered flint pebbles	4.6+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	39	56	3	10.5-11.6	39	16	40	2	3	0	0
b	13	68	19	11.8-12.8	9	7	44	18	21	1	0
				12.8-13.8	12	3	46	15	16	8	0
				13.8-14.8	20	7	53	8	5	7	0
				Mean	**13**	**6**	**49**	**13**	**14**	**5**	**0**
c	8	92	0	14.8-15.7	8	14	77	1	0	0	0
d	13	84	3	16.6-17.2	32	66	2	0	0	0	0
				17.2-17.8	6	28	46	5	10	5	0
				17.8-19.0	12	40	46	1	1	0	0
				19.0-20.4	8	45	45	1	1	0	0
				Mean	**13**	**44**	**39**	**1**	**2**	**1**	**0**
e	12	86	2	20.4-21.4	8	48	41	0	1	2	0
				21.4-23.5	18	40	40	1	1	0	0
				23.5-25.0	6	28	51	9	6	0	0
				Mean	**12**	**38**	**45**	**3**	**2**	**trace**	**0**
a-d	**16**	**76**	**8**	**Mean**	**16**	**24**	**46**	**6**	**6**	**2**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	11.8-12.8	29	19	15	26	0	0	7	4
	12.8-13.8	26	27	21	25	0	0	0	1
	Mean	**28**	**27**	**18**	**25**	**0**	**0**	**3**	**2**
e	23.5-25.0	16	0	0	0	0	0	0	84*

* Shell and iron pan

TM 39 SW 37 **3016 9318** **South-west of Hill House Farm, Hedenham** **Block A**

Surface level +27.6 m
Water struck at +16.9 m
Shell and auger
August 1983

Overburden	5.4 m
Mineral	2.2 m
Waste	1.2 m
Mineral	8.7 m
Bedrock	6.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, moderate brown	0.4	0.4
	Silt, sandy, finely laminated, yellowish grey, orange and yellowish brown	5.0	5.4
Beccles Beds (Kesgrave Sands and Gravels)	**a** Gravel on pebbly sand Gravel: fine and coarse with some cobbles; angular flint with some quartzite, quartz and rounded flint Sand: mainly medium; angular flint and quartz; moderate brown	2.2	7.6
	Silt, very sandy, faintly laminated; scattered pebbles	1.2	8.8
(Westleton Beds)	**b** Gravel, sandy near base Gravel: mainly fine; well rounded flint with occasional quartz Sand: mainly fine and medium; rounded quartz; greyish yellow	2.9	11.7
Crag	**c** Sand: fine; rounded quartz with some mica; orange; scattered pebbles	2.3	14.0
	d Pebbly sand and sandy gravel Gravel: fine and coarse; well rounded flint with some iron pan and subangular to subrounded flint Sand: fine and medium; rounded to well rounded quartz with some flint; 'blood red' and orange	3.5	17.5
	e Sand, olive grey to greyish olive green, glauconitic; scattered shell debris	6.5+	24.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	6	63	31	5.4-6.4	6	5	25	11	20	27	6
				6.4-7.6	6	12	56	12	10	1	3
				Mean	**6**	**9**	**43**	**11**	**14**	**13**	**4**
b	3	47	50	8.8-10.0	4	15	18	10	41	12	0
				10.0-10.7	3	15	13	7	36	26	0
				10.7-11.7	1	29	24	7	23	16	0
				Mean	**3**	**20**	**19**	**8**	**33**	**17**	**0**
c	3	96	1	11.7-12.7	2	29	64	3	2	0	0
				12.7-14.0	3	20	73	2	1	1	0
				Mean	**3**	**24**	**70**	**2**	**1**	**trace**	**0**
d	3	72	25	14.0-15.0	1	15	60	6	9	9	0
				15.0-16.0	2	21	26	13	24	14	0
				16.0-17.5	4	44	25	7	7	13	0
				Mean	**3**	**29**	**35**	**8**	**13**	**12**	**0**
e	7	92	1	17.5-20.0	4	63	30	2	1	0	0
				20.0-22.0	9	79	11	1	0	0	0
				22.0-24.0	7	49	39	4	1	0	0
				Mean	**7**	**63**	**27**	**2**	**1**	**0**	**0**
a-d	**3**	**69**	**28**	Mean	**3**	**21**	**40**	**8**	**16**	**11**	**1**

TM 39 SW 38 **3068 9209** **Durrant's Farm, Hedenham** **Block B**

Surface level +34.8 m
Water struck at +14.6 m
Shell and auger
August 1983

Overburden	13.4 m
Mineral	3.6 m
Waste	0.5 m
Mineral	6.8 m
Bedrock	1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, dark yellowish brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty and sandy, mainly olive grey; chalk pebbles, scattered flint pebbles and sparse bivalve shells	13.2	13.4
Beccles Beds ('Glacial')	**a** Pebbly sand Gravel: mainly fine; angular flint with some rounded flint Sand: medium with fine; well rounded quartz with traces of flint	3.6	17.0
	Silt, finely laminated, moderate yellow brown; scattered carbonaceous fragments	0.5	17.5
(Pebbly Series)	**b** Pebbly sand and sandy gravel Gravel: mainly fine; rounded flint with quartz, quartzite and angular flint Sand: medium; angular to rounded quartz with angular flint	6.8	24.3
Crag	**c** Sand, glauconitic and shelly, olive grey; sparse flint pebbles	1.5+	25.8

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	2	92	6	13.4-15.4	2	31	57	4	4	2	0
				15.4-17.0	2	45	40	5	7	1	0
				Mean	**2**	**37**	**50**	**5**	**5**	**1**	**0**
b	1	64	35	17.5-19.5	2	4	61	11	16	6	0
				19.5-20.2	2	6	61	12	16	3	0
				20.2-21.2	0	5	41	17	28	9	0
				21.2-22.2	1	2	33	26	25	13	0
				22.2-23.2	1	2	28	12	28	29	0
				23.2-24.3	2	6	42	8	28	14	0
				Mean	**1**	**4**	**46**	**14**	**23**	**12**	**0**
c	6	91	3	24.3-25.8	6	16	73	2	**0**	3	0
a+b	**2**	**73**	**25**	**Mean**	**2**	**15**	**47**	**11**	**17**	**8**	**0**

TM 39 SW 39 **3018 9049** **Hall Farm, Earsham**

Surface level +35.4 m
Water struck at +13.1 m
Shell and auger
August 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty, firm to very hard, mainly olive grey; chalk and flint pebbles	13.3	13.5
	Sand, fine, moderate olive brown	0.3	13.8
(? Starston Till)	Clay, firm, silty and sandy, very dark yellowish brown; scattered flint and quartz pebbles, chalk pebbles near top; thin sand partings near top and at 17.7 m	6.3	20.1
Beccles Beds (Pebbly Series)	Sandy gravel Gravel: fine with coarse; well rounded to angular flint, quartz and quartzite Sand: mainly medium; angular to subangular quartz with some flint; yellowish brown	4.9+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
2	58	40	20.1-21.1	5	7	34	11	30	13	0
			21.1-22.3	3	5	32	15	26	19	0
			22.3-23.3	2	6	48	14	16	12	2
			23.3-24.3	1	4	37	12	23	23	0
			24.3-25.0	1	3	42	17	26	11	0
			Mean	**2**	**5**	**39**	**14**	**24**	**16**	**trace**

TM 39 SW 40 **3163 9291** **Hedenham Park, Hedenham** **Block A**

Surface level +25.7 m
Water struck at +14.2 m
Shell and auger
August 1983

Overburden	0.1 m
Mineral	3.4 m
Waste	2.6 m
Mineral	14.2 m
Bedrock	4.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy	0.1	0.1
Channel Fill Deposits	a Sandy gravel Gravel: fine and coarse; angular to subrounded flint with some quartz and quartzite; traces of pale sandstone and red brown siltstone/mudstone Sand: mainly medium; subangular to subrounded quartz	3.4	3.5
	Silt, sandy, dark yellowish brown; small angular flint and quartzite fragments; sand partings; ?organic patches	2.6	6.1

	b 'Clayey' pebbly sand and sandy gravel Gravel: mainly fine; angular to subrounded flint with quartz and quartzite Sand: fine and medium; subangular to subrounded quartz	2.9	9.0
	c Pebbly sand Gravel: as above Sand: as above, with some coarse flint; pale yellowish orange	2.5	11.5
Beccles Beds (Pebbly Series)	**d** Gravel, sandy in places Gravel: mainly fine; subangular to well rounded flint with some quartz and quartzite; slight trace of ironstone Sand: mainly medium; subangular to subrounded quartzite	7.8	19.3
	e Pebbly sand; fractions as above	1.0	20.3
Crag	**f** Pebbly sand with greenish grey silty partings from 22.0 to 23.7 m Gravel: mainly fine; rounded to well rounded flint with shell fragments (increasing with depth) and ironstone Sand: medium with fine; subangular to subrounded quartz; dark yellowish orange	4.7+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	6	55	39	0.1-0.8	9	7	15	12	29	28	0
				0.8-1.8	6	22	32	8	18	14	0
				1.8-2.8	7	10	44	13	12	14	0
				2.8-3.5	4	7	34	9	28	18	0
				Mean	**6**	**12**	**33**	**10**	**21**	**18**	**0**
b	15	61	24	6.1-7.0	16	41	17	8	15	3	0
				7.0-8.0	14	25	25	6	15	15	0
				8.0-9.0	14	22	31	8	16	9	0
				Mean	**15**	**29**	**25**	**7**	**15**	**9**	**0**
c	4	88	8	9.0-10.0	6	15	73	2	2	2	0
				10.0-11.5	3	13	66	7	8	3	0
				Mean	**4**	**14**	**69**	**5**	**6**	**2**	**0**
d	1	46	53	11.5-12.5	2	7	41	11	23	16	0
				12.5-13.5	2	11	34	16	27	10	0
				13.5-14.5	0	5	23	13	42	17	0
				14.5-15.5	2	6	18	13	41	20	0
				15.5-16.5	1	8	17	15	37	22	0
				16.5-17.5	0	10	16	14	39	21	0
				17.5-18.5	2	7	23	14	41	13	0
				18.5-19.3	1	8	34	11	32	14	0
				Mean	**1**	**8**	**25**	**13**	**36**	**17**	**0**
e	2	92	6	19.3-20.3	2	40	49	3	5	1	0
f	4	89	7	20.3-21.7	5	33	58	2	2	0	0
				21.7-23.7	3	17	56	12	10	2	0
				23.7-25.0	5	35	45	10	2	3	0
				Mean	**4**	**27**	**54**	**8**	**5**	**2**	**0**
a-e	5	**59**	**36**	**Mean**	**5**	**15**	**34**	**10**	**23**	**13**	**0**

TM 39 SW 41 **3113 9095** **North of Rough Plantation, Earsham**

Surface level +36.5 m
Water struck at +11.3 m
Shell and auger
August 1983

Waste 25.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, silty	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, firm, silty, mainly olive grey but mottled near top; chalk and flint pebbles and scattered cobbles; one large chamositic oolite pebble	14.8	15.3
Beccles Beds ('Glacial')	**a** 'Very clayey' fine sand, olive grey	1.6	16.9
(? Starston Till)	Clay, silty and sandy, brownish grey to dusky yellow brown, oxidised at base; flint and quartz pebbles, trace of angular green volcanic pebbles	6.8	23.7
	Silt, sandy, faintly laminated, brownish grey; ? organic partings	0.3	24.0
(Pebbly Series)	**b** Sandy gravel with bands of pebbly silty clay near base	1.6+	25.6

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	39	61	0	15.3-16.9	39	47	14	0	0	0	0
b	5	48	47	24.0-25.0	6	4	23	15	36	16	0
				25.0-25.6	4	7	35	14	23	17	0
				Mean	**5**	**5**	**28**	**15**	**31**	**16**	**0**

TM 39 SW 42 **3212 9474** **Frog's Hall Farm, Hedenham** **Block A**

Surface level +38.1 m
Traces of water at +14.5 m
Shell and auger
August 1983

Waste 25.0 m

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made Ground	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, partly silty, mainly olive grey to brownish grey; pebbles and grains of chalk and flint; sand laminae below 11.5 m	14.6	15.0
Beccles Beds (Pebbly Series)	**a** Sand; pebbles in upper part, 'clayey' near base Gravel: fine and coarse, subrounded to well rounded; quartzite, quartz and flint Sand: medium; subangular to subrounded quartz; light olive grey	2.8	17.8

	Silt, sandy, laminated, moderate yellowish brown and light greenish grey	0.3	18.1
Crag	**b** Sand, light brown and light greenish grey; scattered quartzite pebbles near top; thin laminated clay bands from 21.1 to 23.1 m	6.9+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	11	81	8	15.0-16.0	8	8	60	4	9	11	0
				16.0-17.0	8	6	79	3	3	1	0
				17.0-17.8	19	19	59	2	1	0	0
				Mean	**11**	**10**	**68**	**3**	**4**	**4**	**0**
b	10	89	1	18.1-19.1	9	11	74	2	3	1	0
				19.1-21.1.	7	20	70	1	1	1	0
				21.1-23.1	16	63	18	1	2	0	0
				23.1-25.0	7	42	51	0	0	0	0
				Mean	**10**	**37**	**51**	**1**	**1**	**trace**	**0**

TM 39 SW 43 **3261 9411** **Tindall Wood, Ditchingham** **Block A**

Surface level +28.8 m
Water struck at +13.4 m
Shell and auger
August 1983

Overburden	4.0 m
Mineral	0.8 m
Waste	0.4 m
Mineral	4.5 m
Waste	0.3 m
Mineral	9.0 m
Bedrock	3.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate yellowish brown	0.4	0.4
Head	Clay, pebbly, moderate brown; pebbles and cobbles of flint	0.6	1.0
Boulder Clay	Clay, silty, orange to moderate brown; scattered flint pebbles; chalk pebbles in upper part, sand grade chalk below; 0.2 m sand at base	2.6	3.6
Beccles Beds (Palaeosol)	Clay, sandy and silty, and sandy silt, hard, pale olive with light brown streaks; abundant white quartzite and quartz pebbles and scattered chalk and flint pebbles	0.4	4.0
	a 'Clayey' sand: mainly medium, well rounded quartz; scattered flint and quartz pebbles; abundant silty lumps	0.8	4.8
	Sandy clay and clayey pebbly sand, pale olive and pink; abundant flint and quartzite pebbles	0.4	5.2
(Kesgrave Sands and Gravels)	**b** Pebbly sand Gravel: mainly fine; rounded to well rounded white quartzite, flint and quartz with some angular flint Sand: medium, subangular to rounded quartz; yellow	4.5	9.7
Crag	Silt, clayey, interlaminated with sand, moderate olive brown	0.3	10.0

e Sand, partly 'clayey' and 'very clayey': mainly medium, rounded to well rounded quartz; scattered flint pebbles; thin silt bands; olive brown to orange	9.0	19.0
d Sand, olive grey to dark greenish grey, glauconitic; thin clay bands	3.0+	22.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	15	81	4	4.0-4.8	15	22	56	3	4	0	0
b	6	83	11	5.2-6.2	7	9	66	9	9	0	0
				6.2-8.2	4	7	73	7	8	1	0
				8.2-9.7	8	5	70	3	10	4	0
				Mean	**6**	**7**	**70**	**6**	**9**	**2**	**0**
c	12	86	2	10.0-12.0	8	25	63	2	2	0	0
				12.0-14.0	33	42	23	1	1	0	0
				14.0-15.4	5	8	79	5	3	0	0
				15.4-17.4	3	23	65	6	3	0	0
				17.4-19.0	10	38	48	3	1	0	0
				Mean	**12**	**28**	**55**	**3**	**2**	**0**	**0**
d	18	82	0	19.0-22.0	18	37	45	0	0	0	0
a+b	**7**	**84**	**9**	**Mean**	**7**	**9**	**70**	**5**	**8**	**1**	**0**
a+b+c	**10**	**86**	**4**	**Mean**	**10**	**21**	**61**	**4**	**4**	**trace**	**0**

TM 39 SW 44 **3183 9205** **Aldercarr Green, Ditchingham** **Block B**

Surface level +31.7 m
Water struck at +12.3 m
Shell and auger
August 1983

Overburden	13.1 m
Mineral	1.0 m
Waste	0.4 m
Mineral	5.9 m
Bedrock	4.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate yellow brown	0.2	0.2
Boulder Clay	Clay, partly waxy, partly silty, mainly olive grey; abundant chalk pebbles, scattered flint and mudstone pebbles; 0.4 m sandy silt at 5.8 m	6.4	6.6
	Clay, silty, dark yellowish brown; scattered flint and quartz pebbles but almost pebble-free in places; sand grade chalk above 8.0 m	6.2	12.8
Beccles Beds (Palaeosol)	Pebbly clay/clayey gravel, orange, yellow and olive brown; pebbles of flint, quartz, quartzite and red-stained friable sandstone	0.3	13.1
	a 'Clayey' pebbly sand Gravel: mainly fine; rounded quartzite with some quartz and angular flint Sand: mainly medium, subrounded quartz; light olive grey	1.0	14.1

	Clay, pebbly, sandy, dark orange brown	0.4	14.5
(Kesgrave Sands and Gravels)	**b** 'Clayey' sand: medium and fine; subrounded quartz with traces of mica; scattered flint, quartz and quartzite pebbles; thin clayey silt bands	0.8	15.3
(Westleton Beds)	**c** Pebbly sand, 'clayey' at top, on sandy gravel Gravel: mainly fine; well rounded black flint from 15.3 to 15.8 m, angular flint, quartz and quartzite Sand: mainly medium; well rounded quartz with some angular flint near base; greyish yellow to brownish orange	5.1	20.4
Crag	**d** Shelly sand with flint and some quartz pebbles, orange	4.6+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	12	71	17	13.1-14.1	12	2	61	8	11	6	0
b	15	83	2	14.5-15.3	15	33	48	2	2	0	0
c	4	79	17	15.3-16.3	11	21	46	3	9	10	0
				16.3-18.3	2	10	81	2	3	2	0
				18.3-19.4	4	24	61	4	6	1	0
				19.4-20.4	1	8	25	17	38	11	0
				Mean	**4**	**14**	**60**	**5**	**12**	**5**	**0**
d	2	79	19	20.4-21.4	2	3	22	37	26	10	0
				21.4-23.0	3	8	45	29	15	0	0
				23.0-25.0	2	16	49	20	11	2	0
				Mean	**2**	**10**	**42**	**27**	**16**	**3**	**0**
a+b+c	**6**	**79**	**15**	**Mean**	**6**	**15**	**59**	**5**	**11**	**4**	**0**

TM 39 SW 45 **3185 9069** **Valley Farm, Earsham** **Block D**

Surface level +5.1 m
Water struck at +4.3 m
Shell and auger
August 1983

Overburden	0.8 m
Mineral	10.6 m
Bedrock	4.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Alluvium	Soil, brown, peaty, on clayey silt and peat	0.8	0.8
Channel Fill Deposits	**a** Gravel, sandy gravel and pebbly sand Gravel: mainly fine; angular to well rounded flint with quartz and quartzite; chalk increasingly common with depth; shell fragments below 6.0 m; scattered charcoal from 5.0 to 6.0 m Sand: mainly medium; subangular to rounded quartz with flint and some chalk	10.6	11.4
Crag	**b** Sand, silty, glauconitic, olive grey; flint cobbles at base	1.9	13.3
Upper Chalk	Chalk, mainly soft, white to light grey	2.8+	16.1

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	2	62	36	0.8-1.8	2	9	44	15	20	10	0
				1.8-2.8	2	8	51	8	19	12	0
				2.8-3.8	1	3	31	12	30	23	0
				3.8-5.0	2	9	49	15	18	7	0
				5.0-6.0	7	38	50	2	3	0	0
				6.0-7.0	2	2	63	10	19	4	0
				7.0-8.0	1	4	68	12	15	0	0
				8.0-9.0	1	1	35	14	26	20	3
				9.0-10.0	0	1	26	13	39	21	0
				10.0-11.4	1	1	15	16	27	39	1
				Mean	**2**	**7**	**43**	**12**	**22**	**14**	**trace**
b	22	68	10	11.4-13.3	22	16	45	7	4	6	0

TM 39 SW 46 **3248 9065** **Outney Common, Bungay** **Block D**

Surface level +7.9 m
Water struck at +6.5 m
Shell and auger
August 1983

Overburden	0.1 m
Mineral	7.1 m
Bedrock	9.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, sandy	0.1	0.1
Blown Sand on River Terrace Deposits and Channel Fill Deposits	**a** Gravel, partly sandy; thin sand at top Gravel: fine with coarse, cobbles from 4.5 to 5.5 m; flint, mainly angular, with quartz and quartzite, traces of shell fragments near base Sand: mainly medium; angular quartz and flint with traces of chalk; dusky brown to yellowish brown	7.1	7.2
Crag	**b** Sand, very silty, glauconitic, greyish olive green	2.8	10.0
	Silt, sandy, laminated, greyish olive green	4.7	14.7
	c Sand, shelly, glauconitic, greyish olive green	14.7	15.6
Upper Chalk	Chalk, hard, white to pale grey	1.1+	16.7

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	2	49	49	0.1-0.4	5	25	68	2	0	0	0
				0.4-1.5	6	5	52	11	17	9	0
				1.5-2.5	1	2	26	15	29	27	0
				2.5-3.5	1	1	19	19	37	23	0
				3.5-4.5	0	1	17	14	39	29	0
				4.5-5.5	0	1	35	17	22	20	5
				5.5-6.5	1	2	21	22	29	25	0
				6.5-7.2	1	8	22	21	27	21	0
				Mean	**2**	**4**	**29**	**16**	**27**	**21**	**1**
b	20	79	1	7.2-10.0	20	55	21	3	1	0	0
c	6	77	17	14.7-15.6	6	17	50	10	6	7	4

TM 39 SW 47 **3313 9303** **Tindall Hall, Ditchingham** **Block A**

Surface level +22.1 m
Water struck at +9.9 m
Shell and auger
August 1983

Overburden	1.2 m
Mineral	5.0 m
Waste	0.9 m
Mineral	13.6 m
Bedrock	2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, yellowish brown	0.5	0.5
Head	Sandy silt with scattered angular flint pebbles	0.7	1.2
	a 'Very clayey' pebbly sand Gravel: mainly coarse; angular flint Sand: mainly medium, angular quartz and flint	0.9	2.1
Channel Fill Deposits	**b** Sand, pebbly near base, 'clayey' near top and base Gravel: fine and coarse; angular to well rounded flint with some chalk Sand: medium; subangular to subrounded quartz with some chalk; yellowish orange	4.1	6.2
	Clay, silty and sandy, dusky yellow to moderate yellow brown; pebbles of chalk and flint	0.9	7.1
	c Sandy gravel and mainly pebbly sand, 'clayey' at top Gravel: fine and coarse, cobbles near top; angular to well rounded flint with chalk and some quartz and quartzite Sand: medium; angular to rounded quartz with some chalk; yellowish brown	7.4	14.5
Beccles Beds (Pebbly Series)	**d** Sandy gravel Gravel: fine and coarse; angular to well rounded flint with quartz and quartzite Sand: mainly medium; angular to rounded quartz with flint; yellowish to orange brown	6.2	20.7
Crag	**e** Sand, very silty, greyish olive green	2.8+	23.5

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	23	62	15	1.2-2.1	23	19	39	4	5	10	0
b	9	86	5	2.1-3.1	10	6	77	4	2	1	0
				3.1-5.1	7	16	71	2	2	2	0
				5.1-5.6	8	23	67	1	1	0	0
				5.6-6.2	16	12	46	7	11	6	2
				Mean	**9**	**14**	**69**	**3**	**3**	**2**	**trace**
c	8	70	22	7.1-8.6	14	5	41	3	10	18	9
				8.6-10.0	7	6	72	5	8	2	0
				10.0-12.2	9	29	61	0	1	0	0
				12.2-13.5	4	17	42	7	20	10	0
				13.5-14.5	1	7	37	7	19	29	0
				Mean	**8**	**15**	**51**	**4**	**10**	**10**	**2**
d	2	58	40	14.5-15.5	0	4	41	18	25	12	0
				15.5-16.5	2	8	45	14	20	11	0
				16.5-18.0	4	14	39	10	21	12	0
				18.0-19.5	2	1	27	19	23	26	2
				19.5-20.7	0	2	35	19	25	19	0
				Mean	**2**	**6**	**36**	**16**	**23**	**17**	**trace**
e	15	85	0	20.7-23.5	15	27	55	3	0	0	0
a-d	**7**	**69**	**24**	**Mean**	**7**	**12**	**49**	**8**	**12**	**11**	**1**

TM 39 SW 48 **3322 9182** **All Hallows Farm, Ditchingham** **Block B**

Surface level +28.6 m
Water struck at +8.6 m
Shell and auger
August 1983

Overburden	5.4 m
Mineral	3.6 m
Waste	1.6 m
Mineral	1.5 m
Waste	0.2 m
Mineral	1.8 m
Waste	0.1 m
Mineral	8.8 m
Bedrock	3.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, dark yellowish brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, mainly silt, pale brown to olive grey; abundant chalk pebbles and scattered flints; thin bed of sand at 3.2 m	5.1	5.4
Beccles Beds ('Glacial')	**a** Sand, 'clayey' in upper part: mainly fine, well rounded quartz; yellowish orange to yellowish brown	3.6	9.0
(? Starston Till)	Clay and silt, greyish orange to moderate yellow brown; scattered flint, quartz and chalk pebbles	1.6	10.6

(Pebbly Series)	**b** Sand, greyish orange to yellow brown; mainly medium subangular quartz with some flint; scattered quartzite pebbles	1.5	12.1
	Silt, sandy, greyish orange to yellow brown	0.2	12.3
	c 'Clayey', sand, yellow brown; mainly medium, subangular quartz	1.8	14.1
	Silt, very sandy, yellowish brown	0.1	14.2
	d Pebbly sand and sandy gravel Gravel: mainly fine; angular to well rounded flint with rounded quartz and quartzite and slight trace of micro-granite Sand: medium; subangular quartz with some flint; light brown to dark orange	5.1	19.3
Crag	**e** Sand, yellowish orange: mainly medium, well rounded quartz; traces of flint pebbles and shells	3.7	23.0
	f Sand, fine to medium, micaceous, light brown to orange brown; shell fragments	3.0+	26.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	9	91	0	5.4-7.4	11	78	10	1	0	0	0
				7.4-9.0	6	57	37	0	0	0	0
				Mean	**9**	**68**	**22**	**1**	**0**	**0**	**0**
b	4	92	4	10.6-12.1	4	35	53	4	4	0	0
c	11	88	1	12.3-14.1	11	20	66	2	1	0	0
d	4	72	24	14.2-16.2	3	7	70	7	10	3	0
				16.2-17.8	6	8	51	11	20	4	0
				17.8-19.3	3	6	38	12	24	17	0
				Mean	**4**	**7**	**55**	**10**	**17**	**7**	**0**
e	4	96	0	19.3-21.0	6	24	68	1	1	0	0
				21.0-23.0	2	33	63	2	0	0	0
				Mean	**4**	**29**	**66**	**1**	**trace**	**0**	**0**
f	3	97	0	23.0-25.0	4	29	66	1	0	0	0
				25.0-26.0	2	70	28	0	0	0	0
				Mean	**3**	**43**	**53**	1	**0**	**0**	**0**
a-e	5	**87**	**8**	**Mean**	**5**	**30**	**52**	**5**	**6**	**2**	**0**

TM 39 SW 49 **3303 9017** **Pest House, Bungay** **Block D**

Surface level +12.2 m
Water struck at +4.6 m
Shell and auger
August 1983

Overburden 0.1 m
Mineral 8.5 m
Bedrock 3.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, brown	0.1	0.1
River Terrace Deposits on Channel Fill Deposits	**a** Sandy, dusky brown, peaty: mainly fine, well rounded quartz	0.6	0.7
	b Gravel Gravel: fine and coarse; angular to well rounded flint with some rounded quartz and quartzite Sand: fine and coarse; angular quartz and flint; yellowish brown	7.9	8.6
Crag	**c** Sand, shelly, mainly glauconitic, olive brown to greyish olive	3.4+	12.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	6	94	0	0.1-0.7	6	20	73	1	0	0	0
b	3	36	61	0.7-1.7	7	9	23	12	28	21	0
				1.7-2.7	2	2	14	21	38	23	0
				2.7-3.7	3	3	19	19	33	21	2
				3.7-4.7	2	2	17	15	35	29	0
				4.7-5.7	4	3	17	18	34	24	0
				5.7-6.7	3	2	18	17	29	31	0
				6.7-7.6	4	2	15	11	32	33	3
				7.6-8.6	0	5	14	9	33	39	0
				Mean	**3**	**4**	**17**	**15**	**32**	**28**	**1**
c	7	83	10	8.6-9.6	5	7	51	24	13	0	0
				9.6-11.0	7	13	51	17	10	2	0
				11.0-12.0	8	38	40	9	5	0	0
				Mean	**7**	**19**	**47**	**17**	**9**	**1**	**0**
a+b	**3**	**40**	**57**	**0.1-8.6**	**3**	**5**	**21**	**14**	**31**	**26**	**trace**

TM 39 SW 50 **3352 9417** **East of Ivy Farm, Thwaite** **Block A**

Surface level +20.2 m
Water struck at +18.7 m
Shell and auger
September 1983

Overburden	0.4 m
Mineral	2.5 m
Waste	4.2 m
Mineral	5.7 m
Bedrock	2.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, dark yellowish brown	0.4	0.4
Head	**a** 'Clayey' gravel, mainly sandy Gravel: coarse with fine, cobbles near top; angular to well rounded flint with some quartz and quartzite Sand: medium; angular flint and quartz; orange to yellow brown	2.5	2.9
	Silt, pebbly, very sandy, orange brown to brown	4.2	7.1
Beccles Beds (Pebbly Series)	**b** Pebbly sand and sandy gravel, 'very clayey' near top Gravel: mainly fine; angular flint with rounded flint and some rounded quartz and quartzite Sand: medium; subangular to subrounded quartz with some angular flint	5.7	12.8
Crag	**c** Sand, glauconitic, olive green; some flint pebbles near top	2.2+	15.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	13	41	43	0.4-1.2	13	5	12	6	15	38	11
				1.2-2.9	18	9	34	5	18	16	0
				Mean	**16**	**8**	**28**	**5**	**17**	**23**	**3**
b	5	75	20	7.1-8.3	22	21	43	3	11	0	0
				8.3-10.0	1	16	35	10	21	17	0
				10.0-12.0	1	20	63	3	7	6	0
				12.0-12.8	1	20	64	5	8	2	0
				Mean	**5**	**19**	**51**	**5**	**12**	**8**	**0**
c	7	84	9	12.8-15.0	7	53	29	2	4	5	0
a+b	**9**	**64**	**27**	**Mean**	**9**	**16**	**43**	**5**	**14**	**12**	**1**

TM 39 SW 51 **3389 9193** **Holly Hill Lodge, Ditchingham** **Block B**

Surface level +22.0 m
Water struck at +5.5 m
Shell and auger
July 1983

Overburden	0.3 m
Mineral	2.2 m
Waste	1.1 m
Mineral	7.2 m
Waste	0.1 m
Mineral	4.9 m
Waste	0.1 m
Mineral	5.9 m
Bedrock	3.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, very sandy, yellowish brown	0.3	0.3
Beccles Beds (Mendham Beds)	**a** Sand, with thin silty bands: mainly fine; rounded to well rounded quartz; orange brown to yellowish brown; sparse flint pebbles	2.2	2.5
	Silt, clayey, finely laminated, brown to yellow brown	0.2	2.7
(Starston Till)	Silt, sandy and clayey, poorly laminated, moderate to yellow brown; sparse chalk and flint pebbles	0.9	3.6
	b Sand, partly 'clayey', pebbly near base Gravel: mainly fine; angular flint with some rounded quartz or quartzite Sand: fine in upper part, medium below; well rounded quartz; greyish orange to yellow brown	7.2	10.8
	Silt, sandy and clayey, laminated, orange brown	0.1	10.9
(Pebbly Series)	**c** Sandy gravel Gravel: fine with coarse; angular flint with rounded flint and some rounded quartz and quartzite Sand: mainly medium; subangular to rounded quartz with some angular flint; yellowish brown	4.9	15.8
	Silt, sandy, brown and olive grey, laminated	0.1	15.9
	d Sandy gravel Gravel: fine and coarse; angular to rounded flint with rounded quartz and quartzite Sand: mainly medium; rounded to angular quartz and angular flint; brown to orange brown	3.9	19.8
Crag	**e** Sand: fine; well rounded quartz with some mica; orange to light brown	2.0	21.8
	f Sand, fine, glauconitic, olive brown to greyish green	3.2+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	10	89	1	0.3-1.3	13	57	30	0	0	0	0
				1.3-2.5	8	52	38	1	1	0	0
				Mean	**10**	**53**	**35**	**1**	**1**	**0**	**0**
b	7	89	4	3.6-5.6	4	61	35	0	0	0	0
				5.6-7.6	11	59	30	0	0	0	0
				7.6-9.2	8	37	54	1	0	0	0
				9.2-10.8	3	10	64	6	12	5	0
				Mean	**7**	**43**	**44**	**2**	**3**	**1**	**0**
c	4	58	38	10.9-12.5	5	22	37	6	17	13	0
				12.5-13.5	4	12	33	12	28	11	0
				13.5-14.5	3	5	29	11	25	27	0
				14.5-15.8	4	7	35	16	27	11	0
				Mean	**4**	**12**	**35**	**11**	**23**	**15**	**0**
d	3	62	35	15.9-16.5	7	16	47	8	15	7	0
				16.5-17.5	1	2	37	12	21	27	0
				17.5-18.8	1	4	38	12	26	19	0
				18.8-19.8	3	36	38	5	6	12	0
				Mean	**3**	**13**	**40**	**9**	**18**	**17**	**0**
e	3	97	0	19.8-21.8	3	95	2	0	0	0	0
f	5	95	0	21.8-23.0	4	94	2	0	0	0	0
				23.0-25.0	5	91	2	1	1	0	0
				Mean	**5**	**92**	**2**	**1**	**trace**	**0**	**0**
a-e	**5**	**78**	**17**	**Mean**	**5**	**37**	**36**	**5**	**10**	**7**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
c	14.5-15.8	50	22	8	13	0	0	1	6
d	16.5-17.5	42	30	13	7	0	0	2	6*

* Mainly silicified limestone

TM 39 SW 52 **9478 9445** **South of Oakland Farm, Broome** **Block A**

Surface level +32.7 m
Water struck at +8.2 m
Shell and auger
August 1983

Overburden	13.6 m
Mineral	6.2 m
Waste	0.5 m
Mineral	3.7 m
Waste	0.5 m
Mineral	1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, pebbly	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, partly silty to sandy, mainly olive grey to dark grey, hard in places; many pebbles of chalk and scattered flint pebbles	13.4	13.6
Beccles Beds ('Glacial')	**a** Sand, mainly pebbly, 'clayey' at top Gravel: mainly fine; subrounded to rounded flint with some rounded to well rounded quartz and quartzite Sand: mainly medium; subangular to subrounded quartz; greyish yellow	6.2	19.8
(? Starston Till)	Clay, sandy and silty, moderate yellowish brown; flint, quartz and quartzite pebbles	0.5	20.3
('Glacial')	**b** Sand, moderate yellowish brown: medium; subangular to subrounded quartz; scattered pebbles in lower part	3.7	24.0
(Starston Till)	Clay, sandy, yellowish brown; quartz, quartzite and flint pebbles	0.5	24.5
(Pebbly Series)	**c** Pebbly sand Gravel: fine; subangular to rounded flint with rounded to well rounded quartz and quartzite Sand: mainly medium, subangular to subrounded quartz	1.0+	25.5

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	8	85	7	13.6-15.6	11	28	61	0	0	0	0
				15.6-17.6	6	43	41	4	5	1	0
				17.6-19.8	8	18	52	8	8	6	0
				Mean	**8**	**29**	**52**	**4**	**5**	**2**	**0**
b	5	94	1	20.3-22.3	6	33	61	0	0	0	0
				22.3-24.0	4	13	79	1	3	0	0
				Mean	**5**	**24**	**69**	**1**	**1**	**0**	**0**
a+b+c	**7**	**88**	**5**	**Mean**	**7**	**27**	**58**	**3**	**4**	**1**	**0**

TM 39 SW 53 **3453 9266** **New Covert, Broome** **Block A**

Surface level +19.2 m
Water struck at +4.2 m
Shell and auger
September 1983

Overburden	0.6 m
Mineral	0.8 m
Waste	0.1 m
Mineral	2.1 m
Waste	20.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, dark yellowish brown	0.6	0.6
Channel Fill Deposits	**a** Pebbly 'clayey' sand with silt bands Gravel: fine and coarse; angular flint Sand: medium; rounded quartz with traces of chalk	0.8	1.4
	Silt, very sandy, dark orange to orange brown; abundant chalk grains	0.1	1.5
	b Sandy gravel Gravel: fine; angular flint with sparse rounded quartz Sand: medium with coarse; angular quartz and flint with traces of chalk	2.1	3.6
	Silt, greyish orange to dusky yellow, laminated, calcareous in places near top; 0.1 m chalky clay at top; 0.2 m fine sand at 4.9 m	8.0	11.6
	Clay, olive grey to olive black; scattered flint and black mudstone pebbles	3.4	15.0
	c Sandy gravel: fine, mainly chalk gravel in buff to yellowish brown sand	2.5	17.5
	Clay, mainly olive grey; chalk, flint and black mudstone pebbles; bands of chalk gravel; 0.3 m chalk raft at 21.3 m	5.3	22.8
	d Pebbly sand, very silty, light olive grey	1.1	23.9
	Clay, silty and sandy, greyish brown to brownish grey	0.1+	24.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	17	72	11	0.6-1.4	17	16	51	5	6	5	0
b	6	64	30	1.5-2.5	7	6	42	14	24	7	0
				2.5-3.6	6	3	34	27	23	7	0
				Mean	**6**	**4**	**39**	**21**	**23**	**7**	**0**
c	4	58	38	15.0-16.0	6	8	27	19	27	13	0
				16.0-17.5	3	7	35	19	23	13	0
				Mean	**4**	**7**	**32**	**19**	**25**	**13**	**0**
d	22	66	12	22.8-23.9	22	30	32	4	10	2	0
a+b	**10**	**64**	**26**	**Mean**	**10**	**8**	**39**	**17**	**19**	**7**	**0**

TM 39 SW 54 **3412 9158** **Little House, Ditchingham** **Block D**

Surface level +9.4 m
Water struck at +4.4 m
Shell and auger
July 1983

Overburden	0.4 m
Mineral	4.7 m
Waste	1.4 m
Mineral	4.3 m
Bedrock	4.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, greyish brown	0.4	0.4
River Terrace Deposits	**a** Pebbly sand Gravel: fine; well rounded flint, quartz and quartzite and angular flint Sand: medium; subangular to rounded quartz with some flint	1.8	2.2
Channel Fill Deposits	**b** Sandy gravel on gravel Gravel: fine and coarse; angular flint with some rounded flint and well rounded quartz and quartzite Sand: medium; subangular to subrounded quartz with some flint	2.9	5.1
	Clay and silt, orange brown to olive grey, laminated; scattered quartz and quartzite pebbles in top 0.4 m (? contamination from above)	1.4	6.5
	c Gravel, sandy in upper part, with thin bands of silt and clay Gravel: fine and coarse; angular flint with rounded flint and some quartz and quartzite; traces of green volcanic rock Sand: medium; angular to subangular quartz with angular flint	4.3	10.8
Crag	**d** Sand, very silty, glauconitic and micaceous, greyish green; silt bands and shell fragments in lower part	4.2+	15.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	1	79	20	0.4-0.8	2	5	63	11	13	6	0
				0.8-2.2	1	7	61	11	15	5	0
				Mean	**1**	**7**	**61**	**11**	**15**	**5**	**0**
b	2	47	51	2.2-3.2	0	9	45	3	24	19	0
				3.2-4.2	2	7	39	7	25	20	0
				4.2-5.1	2	4	17	9	27	41	0
				Mean	**2**	**7**	**34**	**6**	**25**	**26**	**0**
c	2	57	41	6.5-8.0	4	7	51	7	16	15	0
				8.0-9.0	2	3	60	6	7	22	0
				9.0-10.0	1	4	25	14	37	19	0
				10.0-10.8	3	5	32	9	25	26	0
				Mean	**2**	**5**	**43**	**9**	**21**	**20**	**0**
d	21	79	0	10.8-12.8	21	67	10	2	0	0	0
				12.8-15.0	21	65	13	1	0	0	0
				Mean	**21**	**65**	**12**	**2**	**0**	**0**	**0**
a+b	**1**	**10**	**39**	**0.4-5.1**	**1**	**7**	**45**	**8**	**21**	**18**	**0**
a+b+c	**2**	**58**	**40**	**Mean**	**2**	**6**	**44**	**8**	**21**	**19**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	3.2-4.2	58	13	13	14	0	0	0	2
	4.2-5.1	53	16	11	19	0	0	0	1
	Mean	**54**	**15**	**12**	**18**	**0**	**0**	**0**	**1**
c	6.5-8.0	69	21	1	3	0	0	0	6*
	10.0-10.8	35	27	12	16	0	0	3	7

* Including silicified limestone

TM 39 SW 55 3367 9070 Mill House, Ditchingham Block D

Surface level +5.7 m
Water struck at +3.9 m
Shell and auger
August 1983

Overburden 0.4 m
Mineral 7.6 m
Bedrock 12.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made Ground (sand and gravel)	0.4	0.4
River Terrace Deposits	**a** Gravel Gravel: fine with coarse; angular to well rounded flint with rounded quartz and quartzite Sand: medium with coarse; subangular quartz with some flint; moderate brown	1.6	2.0
Crag	**b** Sandy gravel and pebbly sand Gravel: coarse with fine; shells and flint pebbles (increasing with depth) Sand: fine and coarse; subrounded to well rounded quartz with some flint and shell debris	6.0	8.0
	c Sand, fine, glauconitic, mainly greyish olive green to olive grey	5.0	13.0
	Silt, sandy and clayey, greyish olive green to olive grey	7.0+	20.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	4	37	59	0.4-1.4	4	6	17	15	33	25*	0
				1.4-2.0	4	5	18	14	31	28	0
				Mean	**4**	**6**	**17**	**14**	**33**	**26**	**0**
b	2	70	28	2.0-2.8	3	35	56	3	2	1	0
				2.8-4.2	2	42	24	13	12	7	0
				4.2-6.0	1	19	21	17	15	27	0
				6.0-8.0	2	22	36	10	9	19	2
				Mean	**2**	**28**	**30**	**12**	**11**	**16**	**1**
c	12	86	2	8.0-10.0	14	37	44	3	2	0	0
				10.0-12.0	10	29	55	3	3	0	0
				12.0-13.0	12	56	30	1	1	0	0
				Mean	**12**	**38**	**45**	**3**	**2**	**0**	**0**
a+b	**2**	**64**	**34**	**0.4-8.0**	**2**	**23**	**29**	**12**	**16**	**18**	**trace**

* Some flint broken by drilling

TM 39 SW 56 **3452 9055** **Alme Bridge, Ditchingham** **Block D**

Surface level +3.9 m
Water struck at +1.7 m
Shell and auger
August 1983

Overburden	0.8 m
Mineral	3.7 m
Bedrock	3.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and silty pebbly clay	0.8	0.8
River Terrace Deposits on Channel Fill Deposits	**a** Gravel, sandy and 'clayey' near top Gravel: mainly fine; subangular to well- rounded flint with rounded to well-rounded quartz and quartzite; traces of grey muddy limestone below 3.2 m Sand: medium with coarse; subangular to rounded quartz with angular flint	3.7	4.5
Crag	**b** Sand, 'clayey' to 'very clayey', with bands of greenish grey silt; some flint pebbles and shell debris	3.0+	7.5

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	6	39	55	0.8-2.2	14	13	25	8	19	21	0
				2.2-3.2	2	3	15	16	45	16	3
				3.2-4.5	1	3	17	15	49	15	0
				Mean	**6**	**7**	**19**	**13**	**37**	**17**	**1**
b	21	73	6	4.5-6.0	17	57	15	3	4	4	0
				6.0-7.5	25	27	42	2	4	0	0
				Mean	**21**	**43**	**28**	**2**	**4**	**2**	**0**

TM 39 SW 57 **3114 9043** **America Wood, Earsham** **Block B**

Surface level +36.2 m
Water not encountered
Shell and auger
September 1983

Overburden	13.0 m
Mineral	3.2 m
Waste	1.6 m
Mineral	1.2 m
Waste	0.5 m
Mineral	5.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, yellow brown, peaty and sandy	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, partly silty, mainly olive grey to olive brown; many pebbles of chalk and scattered pebbles of flint and black mudstone	12.7	13.0
Beccles Beds ('Glacial')	**a** 'Clayey' to 'very clayey' sand: fine; quartz with rounded chalk; yellowish brown	3.2	16.2
	Silt, sandy, poorly laminated; scattered flint pebbles, shell fragments and charcoal	0.6	16.8
(Starston Till)	Clay, sandy and silty, pale yellowish brown; scattered flint and chalk pebbles	1.0	17.8
('Glacial')	**b** Sand: medium with fine; well rounded quartz with sparse flint and traces of chalk; yellowish brown	1.2	19.0
	Silt, laminated, buff to yellowish brown	0.5	19.5
	c Sandy, 'very clayey' near top, pebbly at base Gravel: mainly fine; rounded and angular flint with some quartz and quartzite Sand: fine to medium; well rounded quartz; slightly calcareous; yellowish brown	5.5+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	23	77	0	13.0-15.0	18	61	21	0	0	0	0
				15.0-16.2	31	54	14	1	0	0	0
				Mean	**23**	**58**	**18**	**1**	**0**	**0**	**0**
b	5	95	0	17.8-19.0	5	41	53	1	0	0	0
c	11	81	8	19.5-21.5	20	50	29	0	1	0	0
				21.5-23.0	4	29	66	1	0	0	0
				23.0-25.0	6	26	45	3	15	5	0
				Mean	**11**	**36**	**43**	**2**	**6**	**2**	**0**
a+b+c	**14**	**82**	**4**	**Mean**	**14**	**44**	**37**	**1**	**3**	**1**	**0**

Shallow resistivity survey: method and results

During the course of the sand and gravel survey, 49 resistivity depth soundings were carried out to provide information about the lateral variation of overburden and the underlying mineral resources. The resistivity data were collected by the Offset-Wenner technique, using the multicore cable described by Barker (1981) and an ABEM SAS 300 digital Terrameter. The field data were processed on a Research Machines 380Z microcomputer using the interactive interpretation procedure developed by BGS during work in the Redditch-Solihull area (Clarke and others, 1982) and more fully described by Clarke and Finch (*in press*). The geological and lithological interpretations are presented together with the computer-generated geo-electric model in the resistivity sounding logs appended below.

A number of general conclusions can be drawn from the results of the survey. Within this field area, the principal overburden comprises boulder clay with interpreted resistivity values ranging from about 12 to 25 ohm m. However, at some sites, for example TM 28 NE R1, an upper weathered part of the boulder clay can be recognised in the geo-electric model, with interpreted resistivity values of about 20-25 ohm m. Glacial silts are commonly found within the glacial sequence, and in this area are interpreted as being present where values of about 50-75 ohm m are recorded (as in the sounding at site TM 28 SW RES 5). Thick and extensive sandy deposits forming part of the Beccles Beds, known from the detailed field mapping of the area, can also be recognised in the resistivity logs, where values of about 150 ohm m are typical. At many sites the interface between the boulder clay and the underlying sandy strata is marked by a zone, about 4 m thick, with high interpreted resistivity (about 400 ohm m). This may in places represent the quartz-rich Kesgrave Sands and Gravels or flint-rich glacial sand and gravel. Finally, the extensive river terrace deposits at Homersfield and Flixton show abnormally high interpreted resistivity values (at sites TM 38 NW R2a, b and c) ranging from 1209 to 1819 ohm m. These high values may have been caused by the low water-table conditions existent at Flixton Park due, in part, to the time of survey (June) but also to the de-watering of nearby pits.

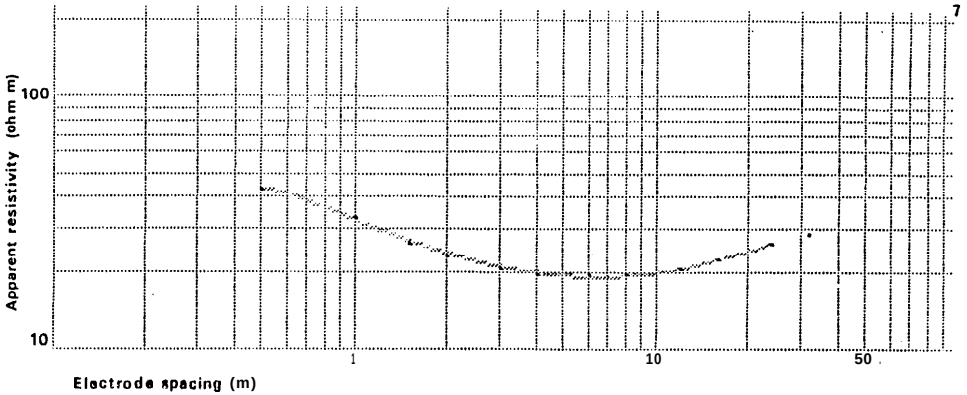
Explanation of the records

The numbered paragraphs below correspond to the annotations on the first record.

1. The resistivity site is registered in a similar manner to the assessment boreholes. The site number has the form 'Rn'; where more than one sounding has been made at a site, the registration number is suffixed by the letters a, b, c etc.
2. The position of the site is generally referred to the nearest named locality on the 1:25 000 map. The grid reference, accurate to 10 m, is also given.
3. Surface levels have been estimated in relation to spot heights or contours on the appropriate six-inch or 1:10 000 map.
4. The date of the sounding is given.
5. The general resource evaluation is presented in a similar manner to that for assessment boreholes; generally, no thickness is given for the lowest layer because the junction with the underlying deposit is undefined.
6. The resistivity log is derived from the computer-generated model which best fits the field data. The lithological interpretation and geological classification are based upon knowledge of local geology and correlation with nearby boreholes.
7. The results plotted are those used in the computer modelling. The field data, generally gathered at electrode spacings of 0.5, 1, 2, 4, 8, 16, 32 and 64 m, and intermediate values obtained by computer processing of this data are shown. The curve represents the computer-generated model.

TM 28 NE R1[1] 2520 8768 **near Mill Farm, Harleston**[2]

Surface level: c. + 48 m[3] Waste 13.4 m+[5]
May 1983[4]

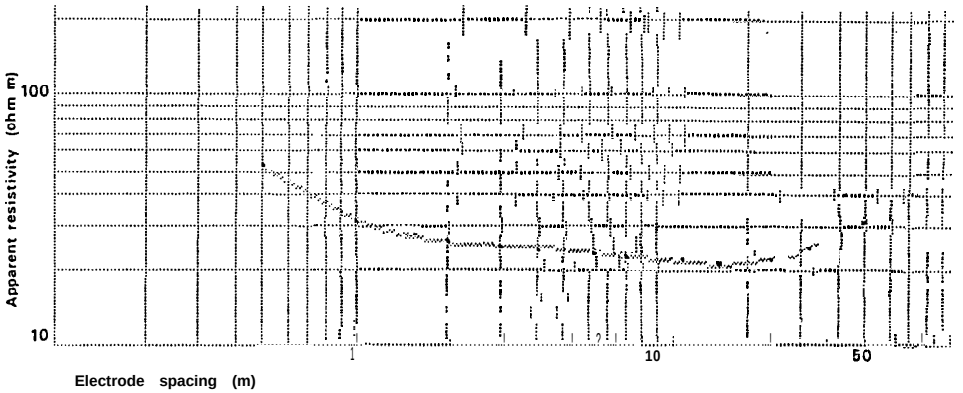


Interpretation[6]

Geological classification	Li thology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty, clayey	51	0.5	0.5
Boulder Clay	Clay, silty (weathered)	26	**1.0**	**1.5**
	Clay, silty, firm	18	11.9	13.4
	Silt, clayey	41		

TM 28 **NE R2** 2543 8707 **ColdhamHall, Harleston**

Surface level: c. **+46** m Waste 24.7 mt
August 1982

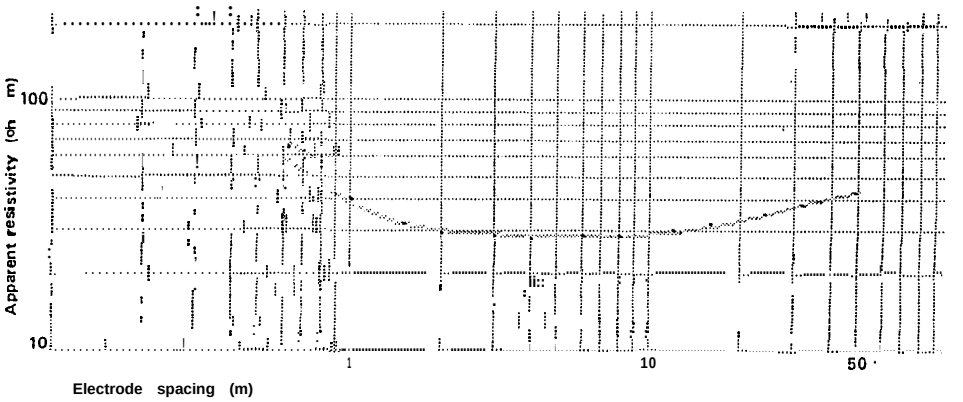


Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; clay, sandy	74	0.4	0.4
Boulder Clay	Clay, silty (weathered)	25	7.3	7.7
	Clay, silty, firm	16	17.0	24.7
	Silt	63		

TM 28 NE R3 2688 8924 **near Hangmans Hill, Denton**

Surface level: c. **+43** m Waste 16.7 mt
August 1982



Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; clay, sandy	94	0.4	0.4
Boulder Clay	Clay, silty (weathered)	28	3.7	4.1
	Clay, silty	27	12.6	16.7
	Silt	52		

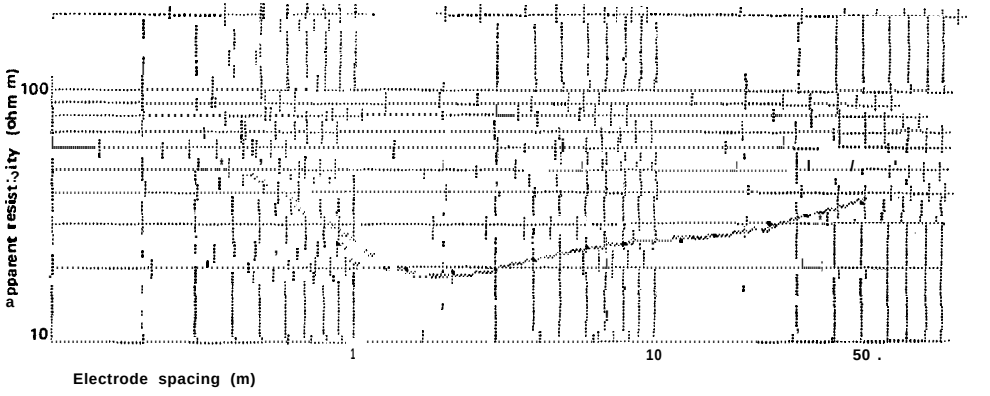
TM 28 NE R4 2714 8656 **near Ivy Cottage, Alburgh**

Surface level: c. +38 m
August 1982

Waste 18.6 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; clay, sandy	67	0.4	0.4
Boulder Clay	Clay, silty	15	1.8	2.2
	Clay, silty	29	7.4	9.6
	Clay, silty, firm	20	9.0	18.6
	Silt	52		



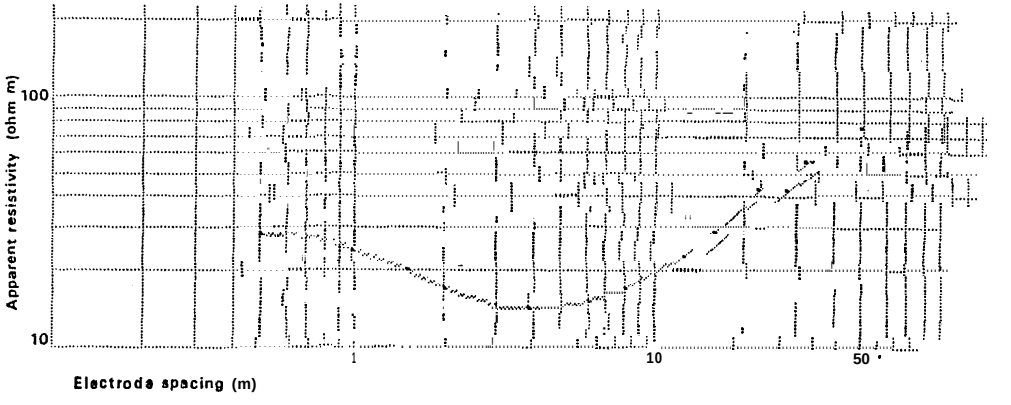
TM28NER.5 2813 8690 **Home Farm, Denton** Block C

Surface level: c. +37 m
May 1983

Overburden 9.7 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; clay, silty	27	0.4	0.4
Boulder Clay	Clay, silty (weathered)	42	0.3	0.7
	Clay, silty, firm	12	9.0	9.7
Beccles Beds	Sandy gravel	410		



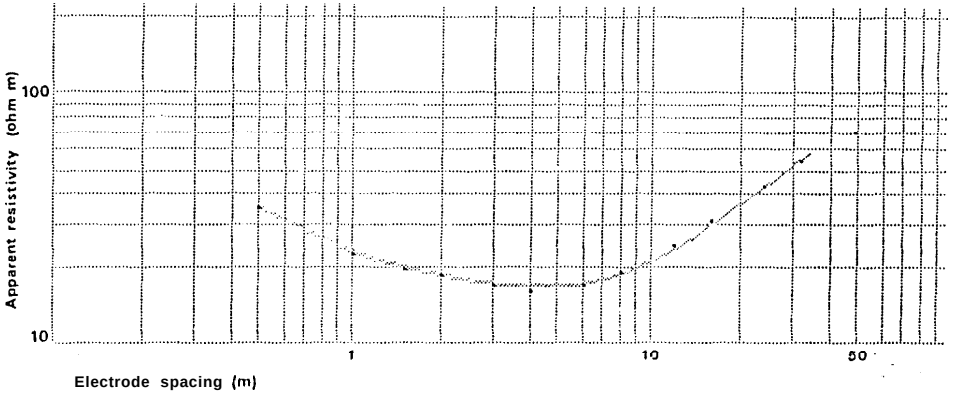
TM 28 NE R6 2873 8698 **Denton House, Denton** **Block C**

Surface level: c. +34 m
August 1982

Overburden 11.3 m
Mineral -

Interpretation

Geological classification	Lithoiogy	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; clay, silty	51	0.3	0.3
Boulder Clay	Clay, silty	20	1.2	1.5
	Clay, silty, firm	15	9.8	11.3
Beccles Beds	Sandy gravel	400		



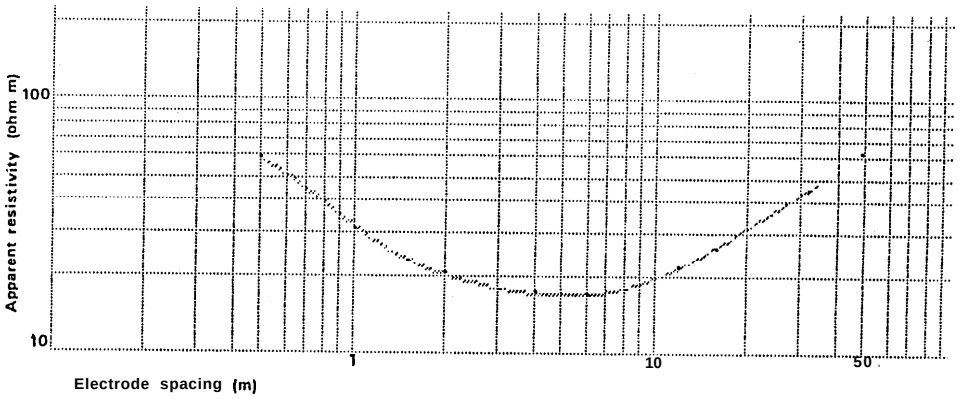
TM 38 NW Rla 3013 8866 **near Park Farm Cottage, Earsham** Block B

Surface level: c. +35 m
September 1983

Overburden 11.7 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	77	0.4	0.4
Boulder Clay	Clay, silty (weathered)	21	1.3	1.7
	Clay, silty	15	10.0	11.7
?Beccles Beds	Sand	146		



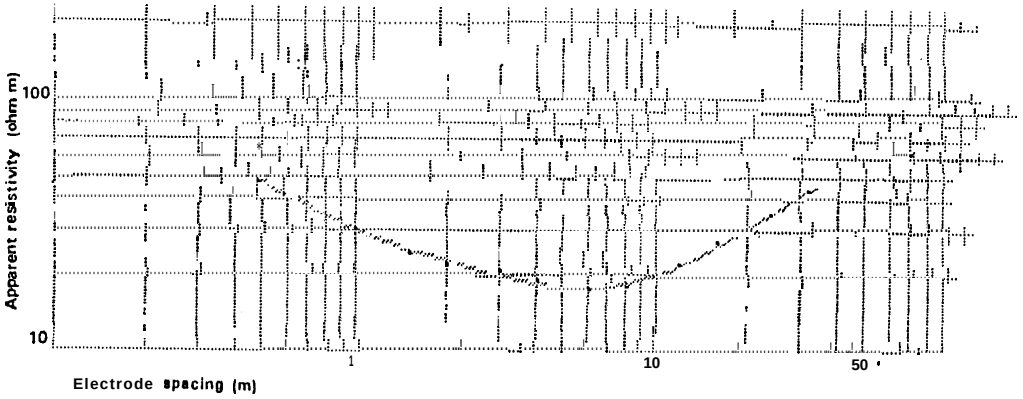
TM 38 **NW** Rlb 3013 8866 **near Park Farm Cottage, Earsham** **Block** B

Surface level: c. +35 m
September 1983

Overburden **12.9 m**
Mineral

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	72	0.3	0.3
Boulder Clay	Clay, silty (weathered)	26	1.3	**1.6**
	Clay, silty, firm	16	11.3	**12.9**
?Beccles Beds	Sand	147		



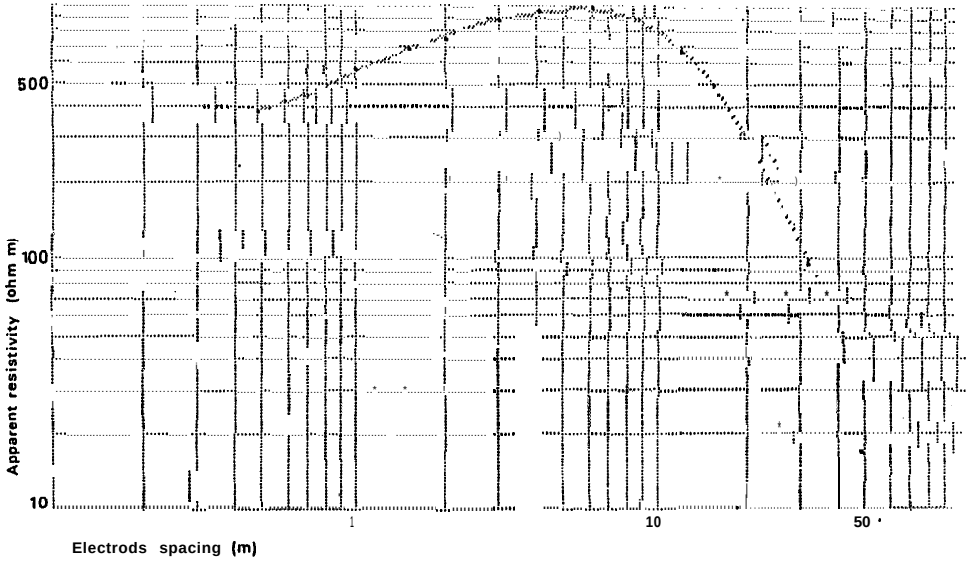
TM 38 NW 2a 3056 8657 Flixton Park, Flixton Block D

Surface level: c. +20 m
June 1983

Overburden 0.6 m
Mineral 8.3 m+

Interpre ta tion

Geological classification	Li thology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, pebbly	322	0.6	0.6
River Terrace Deposits	Sandy gravel	1209	8.3	8.9
?Crag	Sand, silty	48	-	-



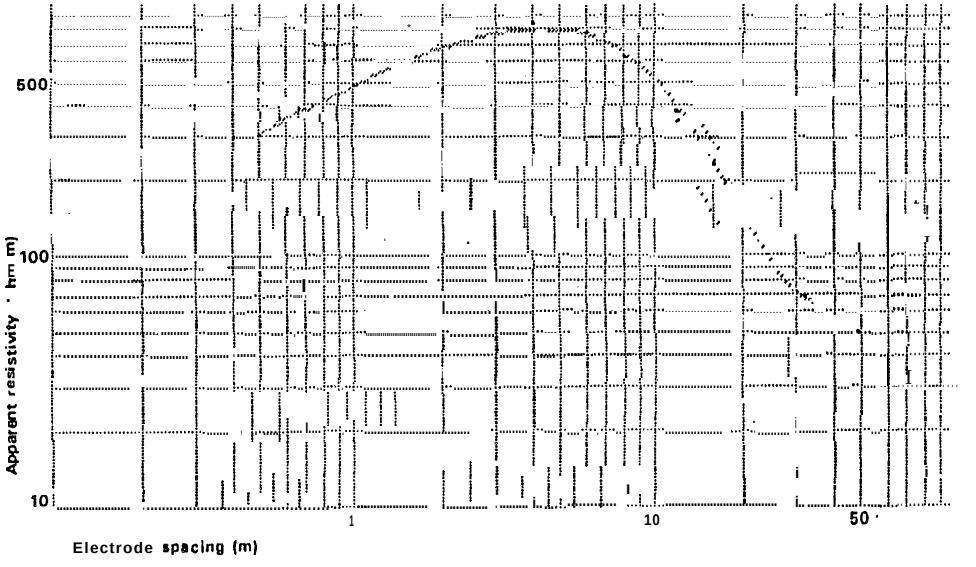
TM 38 NW R2b 3073 8663 Flixton Park, Flixton Block D

Surface level: c. +20 m
June 1983

Overburden 0.4 m
Mineral 5.9 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	178	0.1	0.1
	Soil, sandy, pebbly	242	0.3	0.4
River Terrace Deposits	Sandy gravel	1046	5.9	6.3
?Crag	Sand, silty	56		



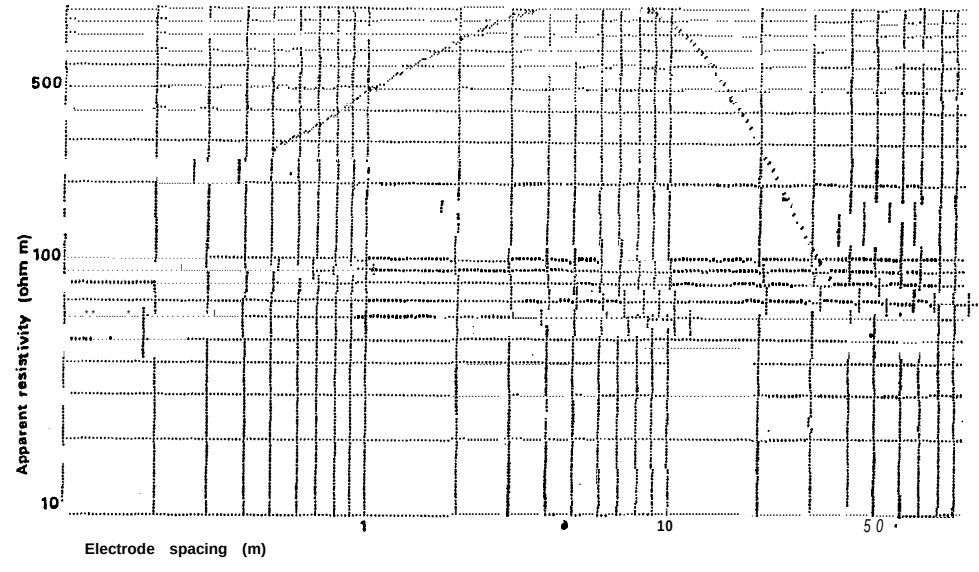
TM 38 NW **R2c** **3085 8685** **Flixton Park, Flixton** **Block D**

Surface level: c. +20 m
June 1983

Overburden 0.5 m
Mineral 5.7 m+

Interpretation

Geological classification	Li thology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Sail, sandy, *pebbly*	451	0.1	0.1
	Soil, sandy, silty	**185**	0.4	0.5
River Terrace Deposits	Sandy gravel	1819	5.7	6.2
?Creg	Sand, silty	*60*		



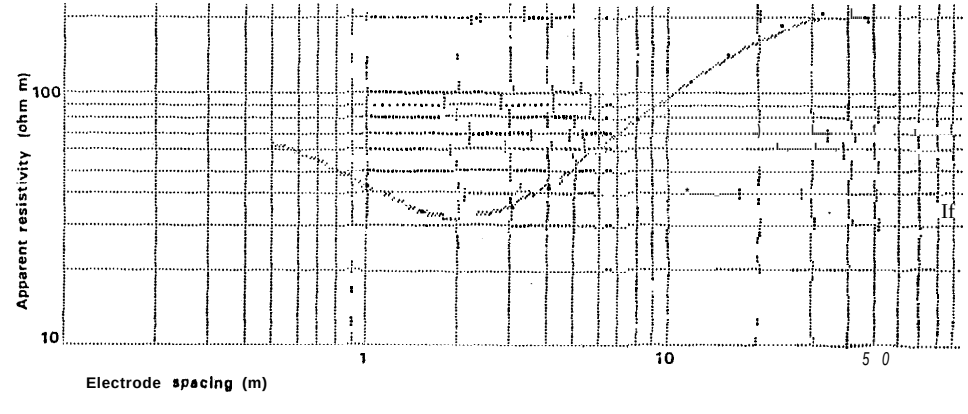
TM **38** NW 3a **3125 8646** **Flixton** Mink **Farm, Flixton** **Block E**

Surface level: c. +20 *m*
September 1983

Overburden *3.5* **m**
Mineral 9.2 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	**75**	0.5	0.5
Boulder Clay	Clay, silty (weathered)	25	3.6	3.5
Ceccles Beds	Sandy gravel	1235	9.2	12.7
	Sand	93		



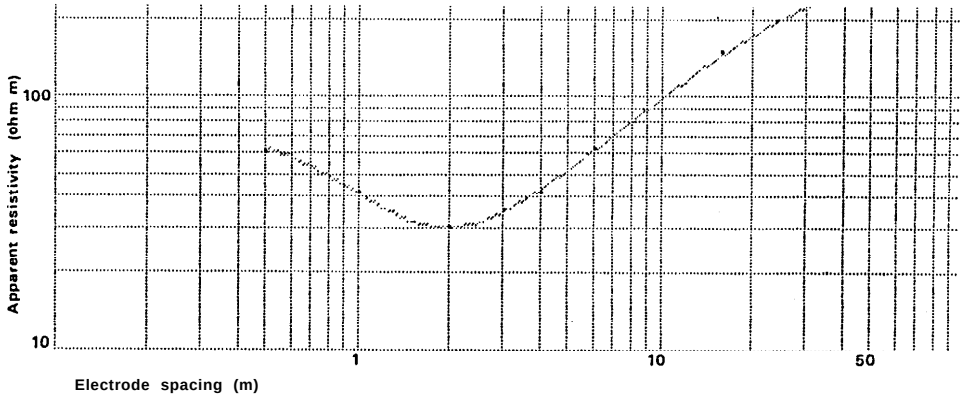
TM 38 NW 3b 3125 8646 Flixton Mink Farm, Flixton **Block E**

Surface level: c. +20 m
September 1983

Overburden 3.2 m
Mineral 10.9 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	72	0.5	0.5
Boulder Clay	Clay, silty (weathered)	22	2.6	3.2
Beccles Beds	Sandy gravel	1640	10.9	14.1
	Sand	154		



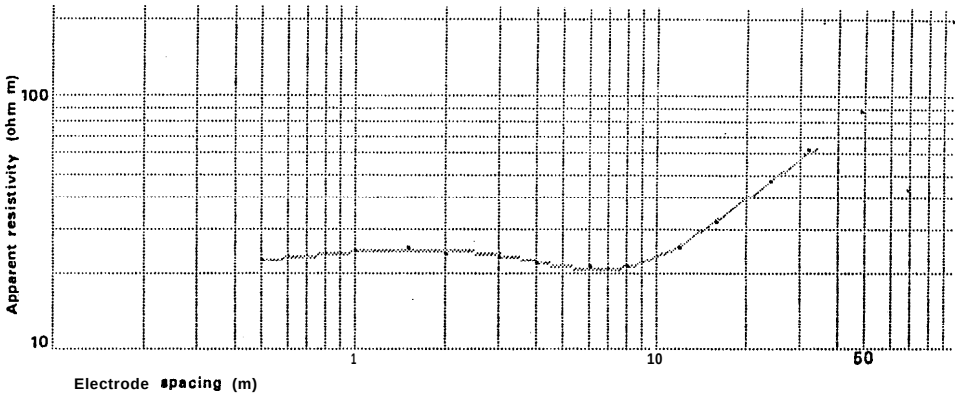
TM 38 NW R4a 32718689 Flixton Airfield, **Flixton** **Block E**

Surface level: c. +32 m
May 1983

Overburden 10.4 m
Mineral -

interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	21	0.4	0.4
Boulder Clay	Clay, silty (weathered)	27	2.5	2.9
	Clay, silty, firm	14	7.5	10.4
Beccles Beds	Sandy gravel	404		



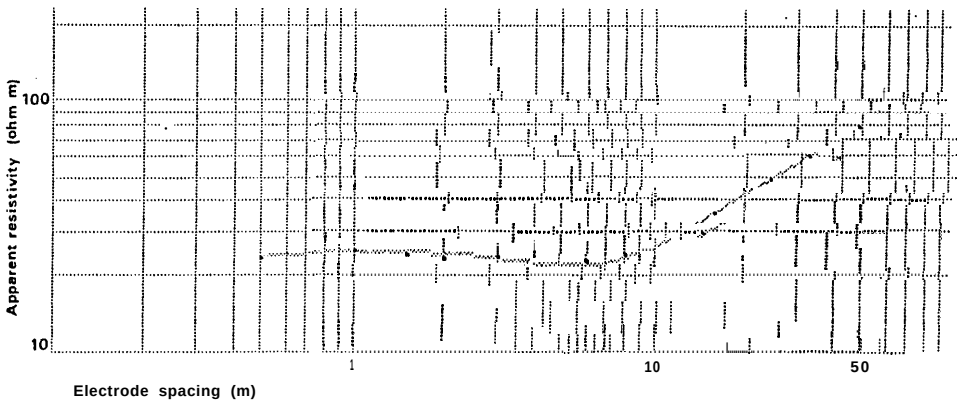
TM 38 NW R4b 3269 8702 **Flixton Airfield, Flixton** **Block E**

Surface level: c. +32 m
May 1983

Overburden 10.3 m
Mineral 4.0 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	24	0.4	0.4
Boulder Clay	Clay, silty (weathered)	25	2.0	2.4
	Clay, silty	17	7.9	10.3
Beccles Beds	Sandy gravel	401	4.0	14.3
	Sand	150		



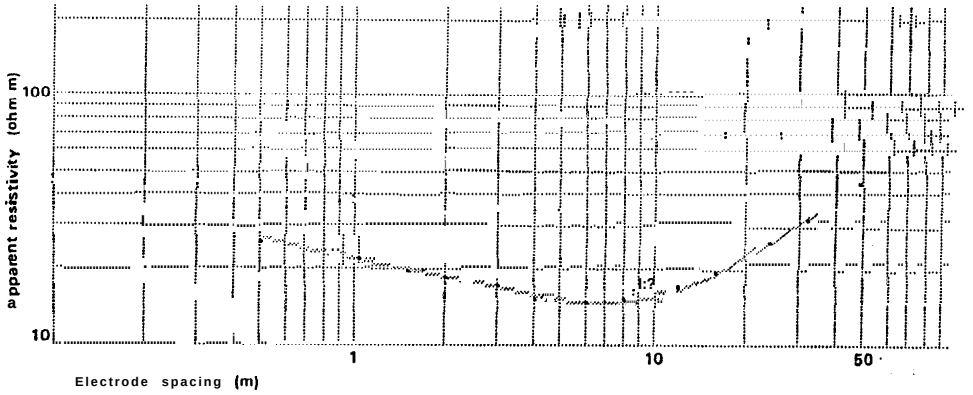
TM 38 NW R5 3242 8540 near **Retreat Farm, Flixton** **Block E**

Surface level: c. +38 m
May 1983

Overburden 15.5 m
Mineral 4.0 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	32	0.3	0.3
Boulder Clay	Clay, silty (weathered)	20	1.7	2.0
	Clay, silty, firm	13	13.5	15.5
? Beccles Beds	Sandy gravel	393	4.0	19.5
Beccles Beds	Sand	145		



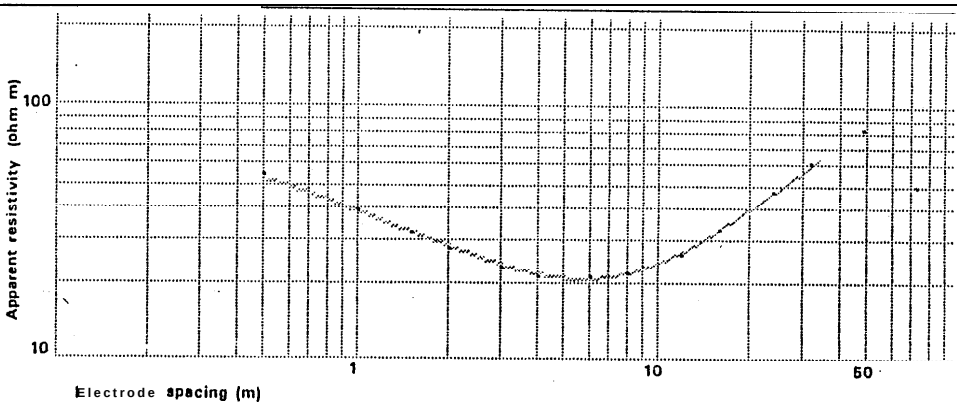
TM 38 NW R6 **34118684** **near Hill Front House, Bungay** **Block E**

Surface level: c. +30 m
May 1983

Overburden 12.2 m
Mineral -

interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	60	0.4	0.4
Boulder Clay	Clay, silty (weathered)	32	1.2	1.6
	Clay, silty	18	10.6	12.2
?Beccles Beds	Sandy gravel	309	-	



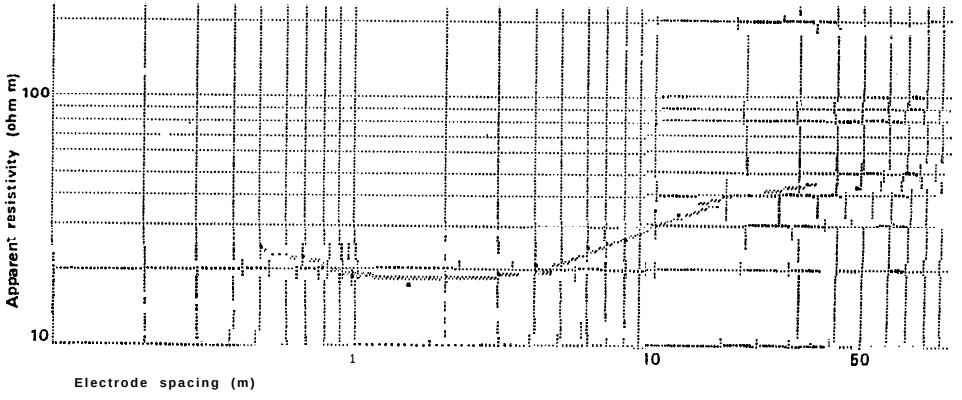
TM **39 SW Rla** **3057 9488** near **Wash Lane, Hedenham** **Block A**

Surface level: c. +40 m
September 1983

Waste **23.4 m**

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	50	0.1	0.1
	Soil; silty clay	29	0.2	0.3
Boulder Clay	Clay, silty	18	5.1	5.4
Glacial Silt	Silt	58	18.1	23.4
?Crag	Sand, silty	40		



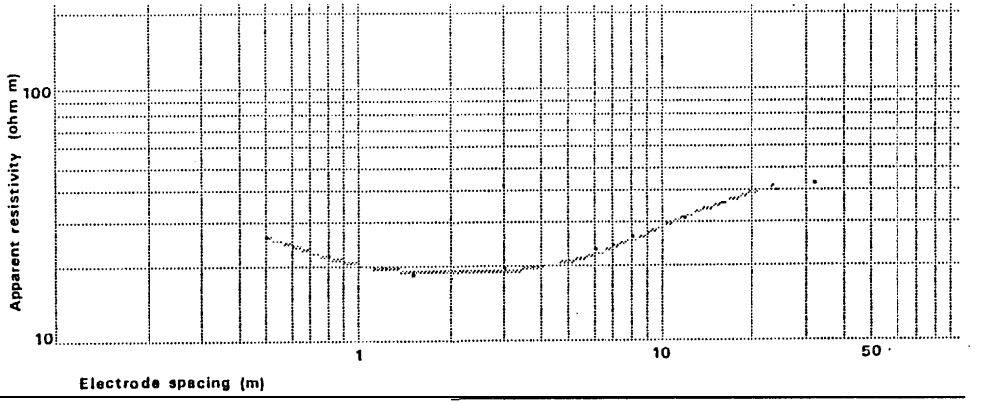
TM 39 SW R1b **3057 9488** **near Wash Lane, Hedenham** **Block A**

Surface level: c. +40 m
September 1983

Waste 25.6 m

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	36	0.3	0.3
Boulder Clay	Clay, silty	18	5.9	6.2
Glacial Silt	Silt	63	19.4	25.6
?Crag	Sand, silty	39	-	-



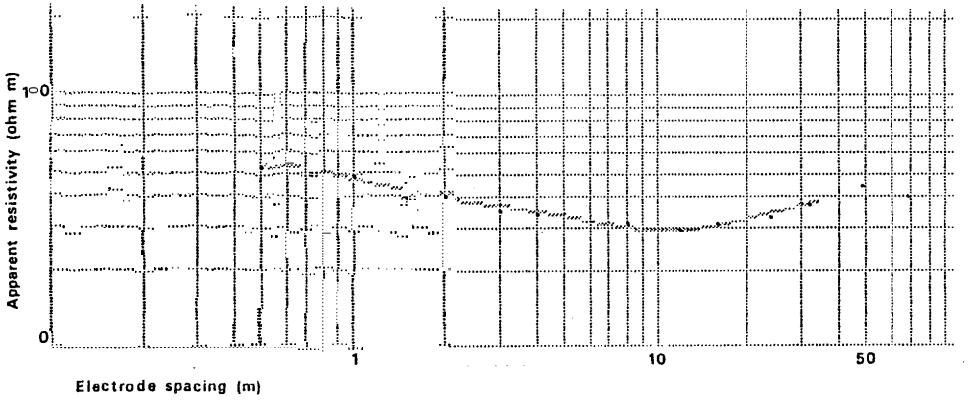
TM 39 SW R2a **3057 9114** **near Whitehouse Lane, Hendenham**

Surface level: c. +36 m
September 1983

Waste 11.7 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	39	0.1	0.1
Boulder Clay	Clay, silty (weathered)	62	0.4	0.5
	Silt	37	4.1	4.6
	Clay, silty	21	7.1	11.7
	Silt	48	-	-



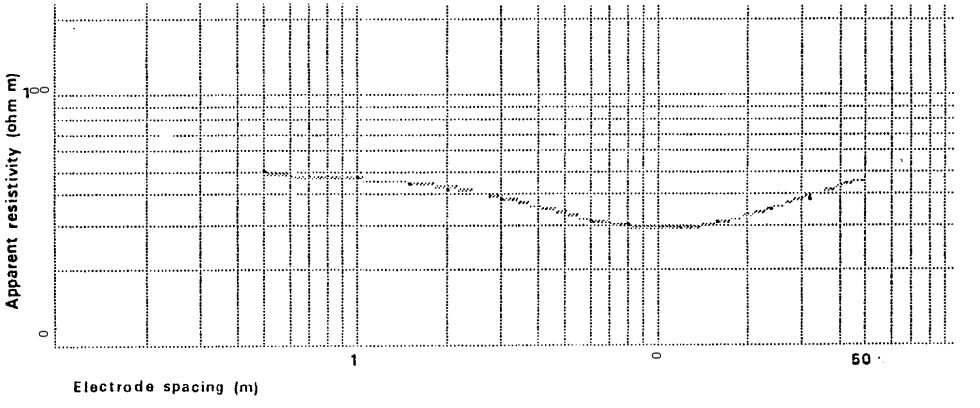
TM 39 SW R2b **3057 9114** **near Whitehouse Lane, Hedenham**

Surface level: c. +36 m
September 1983

Waste 15.3 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	64	0.1	0.1
Boulder Clay	Clay, silty (weathered)	47	1.9	2.0
	Silt	30	3.3	5.3
	Clay, silty	24	10.0	15.3
	Silt	60	-	-



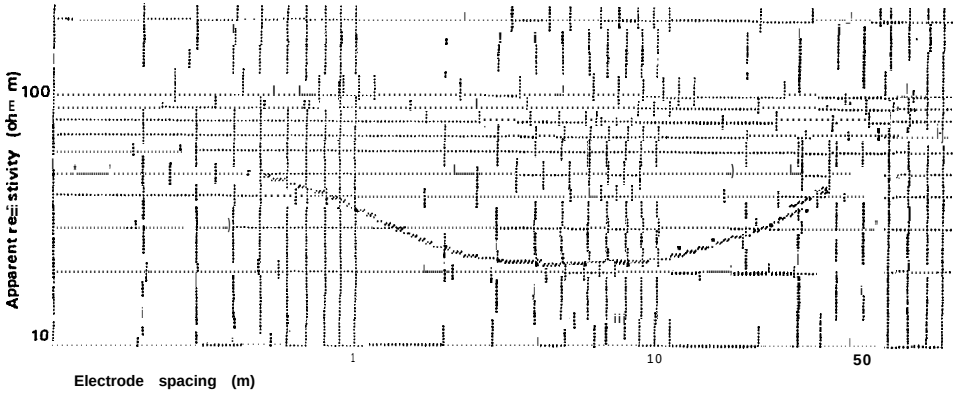
TM 39 SW R3a **3358 9465** **near Thwaite St Mary, Thwaite** **Block A**

Surface level: c. +30 m
September 1983

Overburden 16.5 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	53	0.6	0.6
Boulder Clay	Clay, silty	21	15.9	16.5
Beccles Beds	Sand	73		



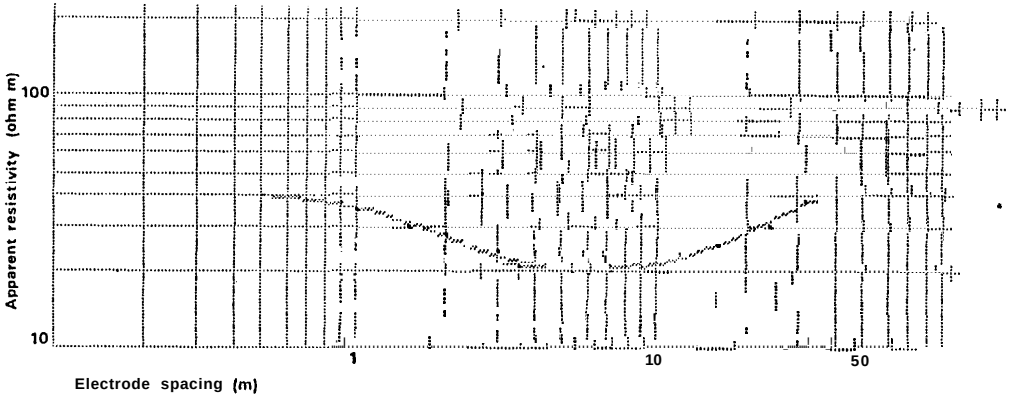
TM 39 **SW R3b** **3358 9465** **near Thwait St Mary, Thwaite** **Block A**

Surface level: c. +30 m
September 1983

Overburden 14.3 m
Minerai -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	60	0.1	0.1
Boulder Clay	Clay, silty (weathered)	39	1.0	1.1
	Clay, silty	19	13.2	14.3
Beccles Beds	Sand	74		



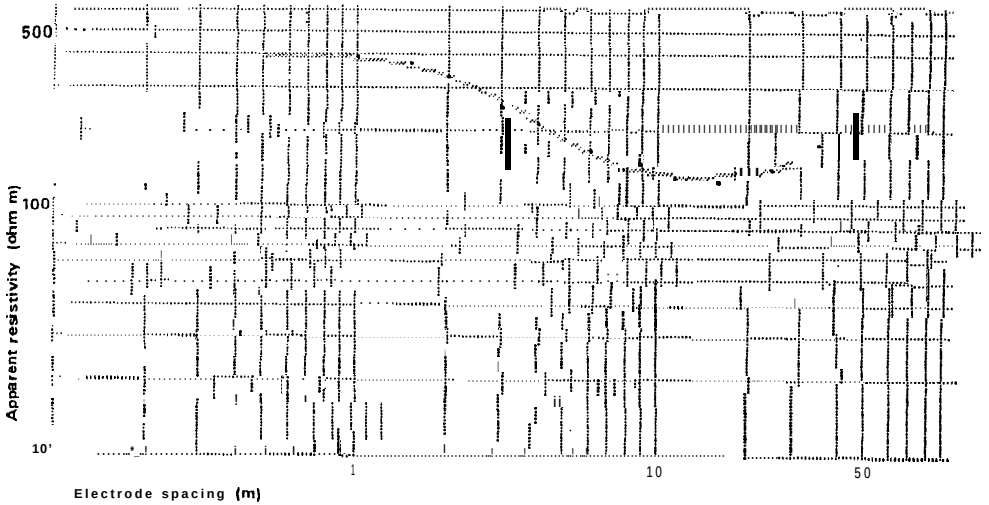
TM 39 **SW R4a** 3446 9326 **near St Michael's Church, Broome** **Block A**

Surface level: c. **+20 m**
September 1983

Mineral 28.5 **m+**

Interpretation

Geological classification	**Lithoiogy**	Resistivity (ohm m)	Thickness (m)	Depth (m)
Glacial Sand and Gravel and Beccles Beds	Sandy gravel	399	2.1	**2.1**
	Sand	**125**	26.4	28.5
	Sandy gravel	248	-	



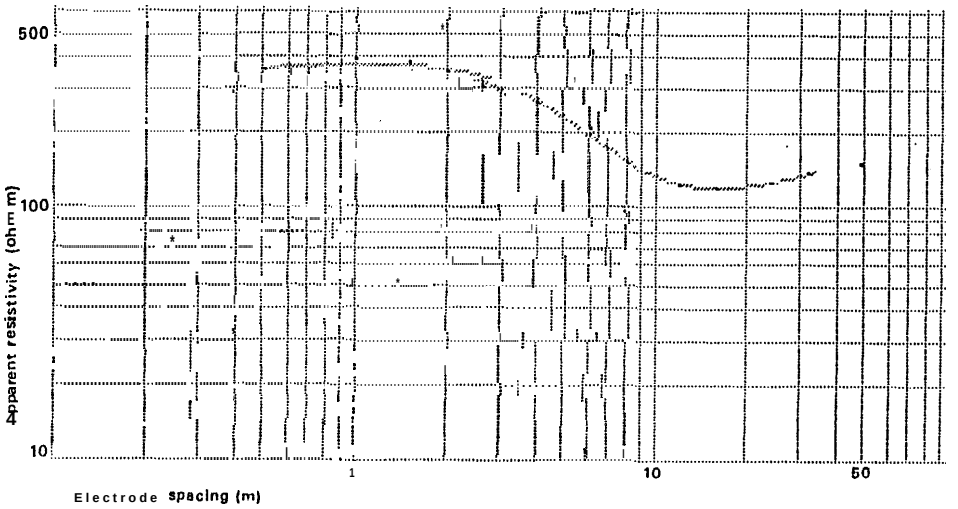
TM 39 **SW R4b** 3446 9326 **near St Michael's Church, Broome** **Block A**

Surface level: c. **+20 m**
September 1983

Overburden **0.1 m**
Mineral 26.4 **m+**

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	**Thickness** (m)	Depth (m)
	Soil, sandy, pebbly	245	**0.1**	**0.1**
Glacial Sand and Gravel and Beccles Beds	Sandy gravel	388	2.9	3.0
	Sand	**107**	23.5	26.5
	Sandy gravel	255		



NATURAL ENVIRONMENT RESEARCH COUNCIL

BRITISH GEOLOGICAL SURVEY

The sand and gravel resources of the country around Harleston and Bungay, Norfolk and Suffolk. Description of 1:25 000 resource sheets comprising parts of TM27, 28, 38 and 39

VOLUME 3
Appendix D: Part 2; Assessment borehole and resistivity sounding records (Sheet 2)

Bibliographic reference

AUTON, C. A., MORIGI, A. N. and PRICE, D. 1985.
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(Keyworth: British Geological Survey)

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Production of this report was supported by the Department of the Environment.

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The views expressed in this report are not necessarily those of the Department of the Environment.

KEYWORTH: BRITISH GEOLOGICAL SURVEY 1985

ISBN 0 85272 090 4

APPENDIX D: PART 2

ASSESSMENT BOREHOLE AND RESISTIVITY SOUNDING RECORDS (SHEET 2)

Explanation of the borehole records

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

1 Borehole Registration Number
Each assessment 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 TM 27.
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 10.

Thus the full Registration Number is TM 27 NW 10.

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.

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, all boreholes were drilled by a shell and auger rig using 6-inch casing. The month and year of completion of the hole 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 sand and gravel has been graded 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), coarse and (+16-64 mm) and cobble gravel (+64 mm) are stated.

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

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

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

TM 27 NW 10[1] **2055 7989**[2] **South of The Grange, Brockdish**[3] **Block F**

Surface level +40.8 m[4]
Water struck at +23.8 m[5]
Shell and auger[6]
October 1982

Overburden[7]	2.5 m
Mineral	3.0 m
Waste	8.3 m
Mineral	11.2 m+[8]

LOG

Geological classification	Lithology[9]	Thickness m	Depth m
	Soil, sandy, brown	0.6	0.6
Cover Sand	**a** 'Very clayey' pebbly sand, moderate yellowish brown	0.4	1.0
Boulder Clay (Lowestoft Till)	Clay, silty, sandy, mainly olive grey but brown at top and base; scattered subangular flint pebbles at the top; abundant rounded chalk and angular flint pebbles below 1.6 m	1.5	2.5
Glacial Sand and Gravel	**b** Sandy Gravel Gravel: fine with coarse and some cobbles; angular flint with some rounded chalk, vein quartz, quartzite, rounded flint and limestone Sand: mainly medium; subangular quartz and angular flint; orange brown	3.0	5.5
Boulder Clay (Lowestoft Till)	Clay, sandy; orange brown and with quartz sand partings and angular flint pebbles to 7.7 m; medium grey, with abundant rounded chalk pebbles below 7.7 m	8.3	13.8
Beccles Beds (Kesgrave Sands and Gravels)	**c** 'Clayey' pebbly sand Gravel: mainly fine; subangular flint with rounded white quartzite; some rounded flint, vein quartz and igneous and metamorphic rocks Sand: mainly medium; subrounded quartz and flint; orange	5.2	19.0
Crag	**d** Sand: mainly medium, rounded quartz; dark yellow; scattered pebbles of flint and quartzite to 22.0 m	6.0+	25.0

GRADING[10]

	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	36	59	5	0.6-1.0	36	9	49	1	2	3	0
b	8	53	39	2.5-3.5	5	3	24	11	25	25	7
				3.5-4.5	8	6	33	10	26	14	3
				4.5-5.5	10	5	62	7	13	3	0
				Mean	**8**	**4**	**40**	**9**	**22**	**14**	**3**
c	15	64	21	13.8-15.0	27	4	37	6	16	10	0
				15.0-16.0	13	5	70	6	5	1	0
				16.0-17.0	23	4	45	7	13	4	4
				17.0-18.0	4	4	47	16	18	11	0
				18.0-19.0	7	12	44	13	20	4	0
				Mean	**15**	**5**	**50**	**9**	**14**	**6**	**1**
d	8	91	1	19.0-20.0	10	10	65	9	5	1	0
				20.0-22.0	10	33	53	2	2	0	0
				22.0-24.0	6	29	65	0	0	0	0
				24.0-25.0	5	24	71	0	0	0	0
				Mean	**8**	**26**	**63**	**2**	**1**	**trace**	**0**
b+c	12	60	28	**Mean**	**12**	**5**	**46**	**9**	**17**	**9**	**2**
b+c+d	10	74	16	**Mean**	**10**	**14**	**54**	**6**	**10**	**5**	**1**

COMPOSITION[11]

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	2.5-3.5	49	5	12	11	19	2	0	2
	3.5-4.5	59	5	8	10	11	1	0	6
	4.5-5.5	66	0	8	16	5	3	0	2
	Mean	**56**	**4**	**10**	**11**	**14**	**2**	**0**	**3**
c	13.8-15.0	34	17	21	27	1	0	0	0
	15.0-17.0	42	8	14	33	0	0	1	2
	17.0-18.0	38	12	18	22	0	0	8	2
	18.0-20.0	38	21	11	28	0	0	0	2
	Mean	**37**	**15**	**16**	**27**	**trace**	**0**	**3**	**2**

TM 27 NW 11 **2029 7856** **Monk's Hall, Syleham** **Block H**

Surface level +21.1 m
Water struck at +19.3 m
Shell and auger
October 1982

Overburden 0.6 m
Mineral 10.2 m
Bedrock 3.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and humic	0.6	0.6
River Terrace Deposits	**a** Pebbly sand Gravel: coarse and fine; angular flint with rounded flint Sand: medium and fine; subrounded quartz with some chalk at the base; strong yellow	4.0	4.6
Channel Fill Deposits	**b** Sandy gravel with 'very clayey' pebbly sand from 6.0 to 7.8 m Gravel: fine with coarse, some cobbles near top; angular flint with some rounded flint, vein quartz and quartzite; some chalk, limestone, siltstone and shell above 6.0 m Sand: mainly medium; subangular quartz with some angular flint; chalk to 7.8 m; olive grey	6.2	10.8
Crag	**c** Sand, with bivalve shells, greenish olive grey; some glauconite	3.0+	13.8

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	6	89	5	0.6-1.8	7	60	32	1	0	0	0
				1.8-2.8	4	38	46	1	3	8	0
				2.8-4.6	7	37	49	3	2	2	0
				Mean	**6**	**43**	**44**	**2**	**2**	**3**	**0**
b	11	65	24	4.6-5.6	4	10	31	11	13	25	6
				5.6-6.0	6	11	30	9	19	25	0
				6.0-7.8	29	32	29	4	4	2	0
				7.8-9.0	4	12	50	14	17	3	0
				9.0-10.0	1	16	47	11	22	3	0
				10.0-10.8	1	11	32	19	23	14	0
				Mean	**11**	**18**	**36**	**11**	**14**	**9**	**1**
c	5	94	1	10.8-11.8	5	45	43	6	1	0	0
				11.8-12.8	6	23	60	10	1	0	0
				12.8-13.8	5	26	57	10	2	0	0
				Mean	**5**	**32**	**53**	**9**	**1**	**0**	**0**
a + b	**9**	**74**	**17**	**0.6-10.8**	**9**	**28**	**39**	**7**	**9**	**7**	**1**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	1.8-2.8	86	14	0	0	0	0	0	0
b	4.6-5.6	65	3	9	9	7	3	1	3*
	5.6-6.0	68	3	7	10	4	4	0	4*
	6.0-9.0	58	13	10	12	0	0	0	7
	9.0-10.0	55	16	18	4	0	0	0	7
	10.0-10.8	46	16	18	12	0	0	1	7
	Mean	**59**	**10**	**13**	**9**	**2**	**1**	**trace**	**6**

* including Shell and Siltstone

TM 27 NW 12 **2056 7746** **Little Green Farm, Syleham** **Block K**

Surface level +41.1 m
Water Struck at c. +21.4 m
Shell and auger
October 1982

Overburden 8.5 m
Mineral 16.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, moderate brown	0.1	0.1
Boulder Clay (Lowestoft Till)	Clay, mainly stiff and olive black but soft and mottled at top and brown towards the base; abundant pebbles of subangular chalk, angular flint and black (Jurassic) mudstone; scattered angular chalk cobbles; scattered vein quartz pebbles towards the base	8.4	8.5
Beccles Beds (Kesgrave Sands and Gravels)	**a** Pebbly sand; partings of pale orange silt to 10.5 m Gravel: mainly fine; subangular flint with vein quartz, white quartzite and rounded flint Sand: mainly medium; rounded quartz with some angular quartz; greyish orange, becoming pale greyish yellow below 12.5 m	7.3	15.8
Crag	**b** Sand, with thin beds of laminated silt, from 15.8 m to 17.8 m and from 18.8 m to 19.7 m: mainly medium well rounded quartz with some mica; a trace of glauconite below 23.7 m; strong orange	9.2+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	7	87	6	8.5-9.5	7	2	36	42	10	3	0
				9.5-10.5	7	32	55	2	3	1	0
				10.5-11.5	6	20	58	7	7	2	0
				11.5-12.5	5	8	81	4	2	0	0
				12.5-13.8	5	16	74	3	2	0	0
				13.8-14.8	7	5	67	13	8	0	0
				14.8-15.8	12	10	71	4	3	0	0
				Mean	**7**	**13**	**64**	**10**	**5**	**1**	**0**
b	8	92	0	15.8-16.8	10	18	72	0	0	0	0
				16.8-17.8	7	16	77	0	0	0	0
				17.8-18.8	9	10	81	0	0	0	0
				18.8-19.7	14	20	66	0	0	0	0
				19.7-21.7	7	13	80	0	0	0	0
				21.7-23.7	7	24	69	0	0	0	0
				23.7-25.0	6	16	78	0	0	0	0
				Mean	**8**	**17**	**0**	**0**	**0**	**0**	
a + b	**7**	**91**	**2**	**8.5-25.0**	**7**	**15**	**71**	**5**	**2**	**trace**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	8.5-9.5	31	23	34	12	0	0	0	trace
	9.5-12.5	43	10	22	25	0	0	0	0
	13.8-14.8	39	25	17	19	0	0	0	0
	Mean	**37**	**17**	**27**	**19**	**0**	**0**	**0**	**trace**

TM 27 NW 13 **2080 7562** **South of the Depperhaugh, Hoxne** **Block K**

Surface level +29.6 m
Water struck at + 27.1 m
Shell and auger
January 1983

Overburden	0.8 m
Mineral	1.0 m
Waste	0.2 m
Mineral	1.9 m
Waste	4.1 m
Mineral	17.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.3	0.3
Alluvium	Silt, sandy, becoming clayey with depth, moderate brown	0.5	0.8
River Terrace Deposits	**a** 'Clayey' sand: medium with fine; subrounded quartz with some angular flint; pale yellowish brown	1.0	1.8
Channel Fill Deposits	Silt, clayey and sandy, laminated, dark grey	0.2	2.0
	b Gravel Gravel: coarse and fine; angular flint with some rounded flint, vein quartz and quartzite Sand: mainly medium; angular quartz and angular flint; orange brown	1.9	3.9
	Silt and peat, humic, soft, becoming clayey below 6.1 m, dusky brown; sparse angular flint pebbles; fossils, including beetles and fish scales	4.1	8.0
	c Sandy gravel: thin partings of humic silt containing fossils (Coleoptera, Hymenoptera, Tipulidae, Hemiptera, caddis-fly larvae and mites) from 16.5 m to 22.0 m Gravel: fine and coarse; angular flint with subangular (Jurassic) limestone; sparse rounded quartzite, vein quartz, chalk, igneous rock and rounded flint Sand: mainly medium and fine with some coarse; angular flint and quartz with some rounded white limestone; olive grey	17.0+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
					Fines	Sand			Gravel		
	Fines	Sand	Gravel		$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	16	84	0	0.8-1.8	16	31	51	2	trace	0	0
b	3	37	60	2.0-3.0	2	6	19	5	28	40	0
				3.0-3.9	4	10	28	7	28	23	0
				Mean	**3**	**8**	**23**	**6**	**28**	**32**	**0**
c	5	63	32	8.0-9.0	4	8	18	10	36	24	0
				9.0-10.0	4	11	30	12	27	16	0
				10.0-11.0	3	8	21	10	31	27	0
				11.0-12.0	4	14	35	15	20	12	0
				12.0-13.0	2	7	15	9	28	39	0
				13.0-14.0	2	7	20	19	28	24	0
				14.0-15.0	2	9	20	17	27	25	0
				15.0-16.0	4	18	28	14	20	16	0
				16.0-17.0	5	16	17	14	29	19	0
				17.0-18.0	3	23	26	15	21	12	0
				18.0-20.0	5	35	35	10	13	2	0
				20.0-22.0	3	46	32	10	8	1	0
				22.0-25.0	13	52	27	6	2	0	0
				Mean	**5**	**2b**	**26**	**11**	**19**	**13**	**0**
a+b+c	**6**	**61**	**33**	**Mean**	**6**	**24**	**27**	**10**	**19**	**14**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	2.0-3.0	81	6	6	3	0	0	1	3
	3.0-3.9	85	6	3	3	0	trace	1	2
	Mean	**83**	**6**	**4**	**3**	**0**	**trace**	**1**	**3**
c	8.0-9.0	78	1	2	2	0	12	2	3
	10.0-11.0	77	0	1	6	trace	13	0	3
	11.0-12.0	80	0	4	2	2	11	0	1
	12.0-13.0	64	3	3	6	2*	18	0	4**
	Mean	**75**	**1**	**2**	**4**	**1**	**13**	**1**	**3**

* including red chalk
** including shell

TM 27 NW 14 **2124 7942** **South of Brockdish** **Block H**

Surface level +19.3 m
Water struck at +16.7 m
Shell and auger
October 1982

Overburden	0.6 m
Mineral	17.6 m
Bedrock	2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, humic	0.6	0.6
River Terrace Deposits	**a** Sand, black: mainly medium; subangular and subrounded quartz; pebbles of angular flint and rounded vein quartz at the top	3.6	4.2
Channel Fill Deposits	**b** Sandy gravel Gravel: fine and coarse, with some cobbles in upper part; angular flint with some quartzite, vein quartz, chalk, rounded flint and limestone Sand: mainly medium; subangular quartz with angular flint and some chalk; light brown, becoming grey at base	14.0	18.2
Crag	**c** Pebbly sand, dark greenish grey, with some glauconite, shell debris, phosphate and flint pebbles	2.8+	21.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	9	87	4	0.6-1.6	18	7	60	3	4	8	0
				1.6-2.6	7	7	85	1	0	0	0
				2.6-4.2	5	12	81	1	1	0	0
				Mean	**9**	**9**	**76**	**2**	**2**	**2**	0
b	2	57	41	4.2-5.2	1	5	63	5	10	16	0
				5.2-6.2	2	3	51	6	25	10	3
				6.2-7.2	0	4	33	7	23	30	3
				7.2-8.2	1	2	23	10	30	34	0
				8.2-9.2	0	3	31	11	29	24	2
				9.2-10.2	1	3	35	8	19	34	0
				10.2-11.2	2	4	55	8	16	15	0
				11.2-12.2	3	5	55	14	19	4	0
				12.2-13.2	2	4	47	14	16	17	0
				13.2-14.2	2	4	37	32	11	14	0
				14.2-15.0	3	7	49	16	14	11	0
				15.0-17.0	4	8	33	16	25	14	0
				17.0-18.2	2	5	31	17	35	10	0
				Mean	**2**	**4**	**40**	**13**	**22**	**18**	**1**
c	3	92	5	18.2-19.5	2	19	63	8	7	1	0
				19.5-21.0	3	29	59	8	1	0	0
				Mean	**3**	**24**	**60**	**8**	**4**	**1**	**0**
a+b	**3**	**64**	**33**	**0.6-18.2**	**3**	**5**	**49**	**10**	**18**	**15**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.6-1.6	92	0	8	0	0	0	0	0
b	4.2-5.2	61	0	2	18	8	1	0	10
	5.2-6.2	64	2	4	12	10	3	0	5
	17.0-18.2	49	6	12	17	6	trace	0	10
c	18.2-19.5	16	0	10	6	0	0	0	68*

* shell and phosphate

TM 27 NW 15 **2163 7787** **Great Green, Syleham** **Block K**

Surface level +50.0 m
Water struck at +48.0 m
Shell and auger
January 1983

Overburden 18.2 m
Mineral 6.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, silty, mottled light olive brown and light olive grey to 3.2 m, olive grey below; abundant chalk and angular flint pebbles; scattered black (Jurassic) mudstone pebbles above 6.0 m; sand partings near top, silt partings and beds of chalk gravel below 8.0 m	16.4	16.8
	Sand, silty, laminated, dark yellowish brown	0.2	17.0
	Clay, silty and sandy, interlaminated with beds of quartz sand and yellowish brown silt; moderate yellowish brown; scattered pebbles of chalk and flint	1.2	18.2
Beccles Beds ('Glacial')	**a** Sandy gravel interbedded with clayey pebbly sand Gravel: mainly fine, angular flint and rounded chalk with some quartzite and vein quartz Sand: medium and fine, subangular to well rounded quartz with some flint and chalk; some mica towards base; yellowish brown	4.8	23.0
Crag	**b** Sand, fine, yellowish grey; bed of clayey silt from 23.7 to 23.8 m	2.0+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	12	76	12	18.2-20.2	11	28	52	4	4	1	0
				20.2-21.5	7	12	35	13	21	12	0
				21.5-23.0	18	53	23	3	3	0	0
				Mean	**12**	**31**	**39**	**6**	**8**	**4**	**0**
b	7	93	0	23.0-25.0	7	73	20	0	0	0	0
a+b	**11**	**80**	**9**	**18.2-25.0**	**11**	**43**	**33**	**4**	**6**	**3**	**0**

TM 27 NW 16 **2140 7599** **Stud Farm, Hoxne** **Block K**

Surface level +44.8 m
Water struck at +25.0 m
Shell and auger
December 1982

Overburden 8.6 m
Mineral 16.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and clayey, dark yellowish brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy, becoming silty, from 3.0 m to 4.0 m; mottled at top, olive grey below; abundant subangular chalk pebbles and sparse black (Jurassic) mudstone pebbles; thin silt at 0.8 m	8.3	8.6
Beccles Beds ('Glacial')	**a** Pebbly sand Gravel: mainly fine; angular flint with subangular chalk; some vein quartz, quartzite and limestone Sand: mainly medium; subangular quartz with some chalk; greyish orange	3.4	12.0
(Pebbly Series)	**b** Pebbly sand; with silty clay partings Gravel: mainly fine; angular flint with vein quartz and quartzite; some rounded flint and a trace of chalk Sand: mainly medium; subangular quartz with some angular flint and a trace of chalk; dark yellowish orange, becoming moderate brown at the base	4.3	16.3
Crag	**c** 'Clayey' sand, interlaminated with sandy silt at the top and the base: fine; well rounded quartz with some mica; a trace of glauconite from 16.3 m to 17.0 m and below 21.0 m; yellowish grey, becoming light olive grey with depth	8.7+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	8	79	13	8.6-10.0	8	24	55	6	7	0	0
				10.0-12.0	9	17	48	10	13	3	0
				Mean	**8**	**20**	**51**	**8**	**11**	**2**	**0**
b	8	77	15	12.0-14.0	3	12	66	7	10	2	0
				14.0-15.0	8	7	40	15	20	10	0
				15.0-16.3	14	10	52	14	7	3	0
				Mean	**8**	**10**	**56**	**11**	**11**	**4**	**0**
c	12	88	0	16.3-18.0	19	50	29	1	1	0	0
				18.0-19.8	12	86	2	0	0	0	0
				19.8-21.0	8	83	9	0	0	0	0
				21.0-23.0	8	77	15	0	0	0	0
				23.0-25.0	10	65	25	0	0	0	0
				Mean	**12**	**72**	**16**	**trace**	**trace**	**0**	**0**
a+b+c	**10**	**84**	**6**	**8.6-25.0**	**10**	**45**	**34**	**5**	**5**	**1**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	8.6-10.6	49	0	12	0	33	0	0	6
	10.0-12.0	50	0	5	7	23	9	0	6
	Mean	**50**	**0**	**7**	**5**	**26**	**6**	**0**	**6**
b	12.0-14.0	64	12	19	4	0	0	0	1
	14.0-15.0	42	9	24	22	1	0	0	2
	15.0-16.3	59	0	11	27	0	0	0	4
	Mean	**52**	**8**	**20**	**18**	**trace**	**0**	**0**	**2**

TM 27 NW 17 **2199 7997** **South of Highgate Farm, Brockdish** **Block H**

Surface level +18.9 m
Water struck at +17.5 m
Shell and auger
October 1982

Overburden 1.1 m
Mineral 11.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat, dark brown; scattered angular flint pebbles	1.1	1.1
Channel Fill Deposits	Sandy gravel Gravel: fine and coarse; angular flint with some quartzite, vein quartz, rounded flint and igneous and metamorphic rock; chalk above 8.1 m and limestone above 5.1 m Sand: mainly medium; subangular quartz and flint; some subangular chalk above 9.1 m; orange brown greyish yellow to 2.1 m, orange brown below	11.3+	12.4
	Borehole abandoned because of boulder obstruction		

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
1	64	35	1.1-2.1	3	8	51	4	12	22	0
			2.1-3.1	2	6	69	5	10	8	0
			3.1-4.1	2	5	83	5	5	0	0
			4.1-5.1	1	9	75	4	6	5	0
			5.1-6.1	1	4	54	6	12	19	4
			6.1-7.1	2	2	68	9	14	5	0
			7.1-8.1	1	3	42	9	27	18	0
			8.1-9.1	1	3	31	9	33	23	0
			9.1-10.1	1	3	34	17	27	18	0
			10.0-11.1	1	1	25	17	33	23	0
			11.1-12.1	1	1	15	20	40	23	0
			12.1-12.4	2	4	23	15	26	30	0
			Mean	**1**	**4**	**50**	**10**	**20**	**15**	**trace**

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
1.1-2.1	96	0	0	2	1	0	0	1
2.1-3.1	70	3	3	13	5	3	3	0
3.1-5.1	82	0	2	7	7	2	0	0
5.1-6.1	77	2	4	8	8	0	0	1
6.1-7.1	74	9	6	4	1	0	2	4
7.1-8.1	57	7	9	16	4	0	1	6*
8.1-9.1	49	13	21	16	0	0	trace	1
9.1-10.1	59	10	8	15	0	0	1	7
10.1-11.1	53	9	16	19	0	0	2	1
11.1-12.1	57	8	13	14	0	0	3	5
12.1-12.4	68	5	12	10	0	0	trace	5
Mean	**60**	**8**	**12**	**14**	**1**	**trace**	**1**	**4**

* including shell

TM 27 NW 18 2209 7852 **North of Oak Pollard, Wingfield** **Block K**

Surface level +42.2 m
Water struck at +20.1 m
Shell and auger
January 1983

Overburden	7.6 m
Mineral	10.2 m
Waste	1.1 m
Mineral	6.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and sandy, greyish brown	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, stiff, silty below 2.8 m; orange brown, olive grey, dark grey and olive brown to 2.8 m, olive grey below; subangular to rounded chalk and angular flint pebbles	6.9	7.3
Chalk raft	Chalk, hard, greyish yellow	0.3	7.6
Beccles Beds ('Glacial')	**a** Pebbly sand Gravel: mainly fine; angular flint with quartzite, vein quartz and rounded flint; some chalk to 12.0 m Sand: mainly medium; angular quartz and flint; some angular chalk to 14.0 m; moderate yellowish brown	10.2	17.8
	Silt, laminated, brownish grey and moderate yellowish brown; quartz sand partings	1.1	18.9
	b Sand, pebbly below 22.1 m; charcoal fragments at the base Gravel: mainly fine; angular flint with rounded white quartzite, vein quartz and some chalk Sand: mainly medium; subangular and subrounded quartz with some angular chalk and mica; pale to moderate olive brown	6.1+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	9	79	12	7.6-8.6	7	12	54	7	12	8	0
				8.6-10.0	5	9	48	15	14	9	0
				10.0-12.0	7	18	42	13	15	5	0
				12.0-14.0	5	10	65	7	9	4	0
				14.0-17.0	12	39	44	2	2	1	0
				17.0-17.8	22	66	12	0	0	0	0
				Mean	**9**	**25**	**47**	**7**	**8**	**4**	**0**
b	4	90	6	18.9-21.0	6	6	88	0	0	0	0
				21.0-22.1	4	41	55	0	0	0	0
				22.1-24.1	3	19	61	4	8	5	0
				24.1-25.0	3	34	45	6	9	3	0
				Mean	**4**	**21**	**67**	**2**	**4**	**2**	**0**
a+b	**7**	**83**	**10**	**Mean**	**7**	**23**	**54**	**6**	**7**	**3**	**0**

TM 27 NW 19 **2317 7948** **Upper Weybread, Weybread** **Block K**

Surface level +46.2 m
Water struck at + 26.4 m
Shell and auger
January 1983

Overburden	15.4 m
Mineral	4.4 m
Waste	3.9 m
Mineral	1.1 m
Waste	0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate brown	0.3	0.3
Made Ground	Clay, silty, with chalk pebbles	1.4	1.7
Boulder Clay (Lowestoft Till)	Clay, waxy, mottled olive grey and moderate olive brown; pebbles of chalk, flint and black (Jurassic) mudstone	3.1	4.8
	Clay, silty and waxy, firm, olive grey; pebbles of chalk, flint and black mudstone; occasional cobbles of rounded chalk below 10.3 m; a bed of very clayey chalk gravel near the base	10.6	15.4
Glacial Sand and Gravel	a Sandy gravel: flint, chalk, quartz and quartzite pebbles in brownish grey sand	4.4	19.8
Glacial Silt	Silt; sandy, becoming clayey with depth, olive grey	3.9	23.7
?Beccles Beds	b Pebbly sand: flint, quartz, quartzite and chalk pebbles in brownish olive grey sand	1.1	24.8
(Starston Till)	Clay, silty and sandy, dark brown; scattered rounded pebbles of black flint; coarse-sand grade chalk	0.2+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	8	68	24	15.4-17.0	8	11	42	9	20	10	0
				17.0-18.0	6	10	41	11	18	14	0
				18.0-18.9	8	15	42	9	17	9	0
				18.9-19.8	11	60	26	1	2	0	0
				Mean	**8**	**22**	**38**	**8**	**15**	**9**	**0**
b	5	76	19	23.7-24.8	5	35	30	11	13	6	0
a+b	**7**	**70**	**23**	**Mean**	**7**	**25**	**37**	**8**	**15**	**8**	**0**

TM 27 NW 20 **2318 7772** **Bleach Green Farm, Wingfield** **Block K**

Surface level +51.2 m
Water struck at +49.7 m
Shell and auger
January 1983

Overburden 16.1 m
Mineral 4.2 m
Waste 0.4 m
Mineral 4.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, silty, becoming waxy below 3.0 m, mottled light grey and light olive brown to 1.6 m, olive grey below; pebbles of chalk and flint, with some flint cobbles near the top	5.5	5.8
Glacial Silt	Silt, laminated, olive grey	2.2	8.0
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy, bluish olive grey; pebbles of angular chalk and flint; silt partings	8.1	16.1
Glacial Sand and Gravel	**a** 'Clayey' pebbly sand Gravel: mainly fine; angular flint with some subrounded chalk Sand: mainly medium subangular quartz with some fine subrounded chalk and a trace of flint; pale yellowish brown	4.2	20.3
Glacial Silt	Silt, laminated, olive grey; quartz sand partings	0.4	20.7
Beccles Beds ('Glacial')	**b** Sand: mainly medium; subrounded quartz with a trace of chalk; dusky yellow; scattered angular flint pebbles	2.4	23.1
Crag	**c** Sand: mainly fine, well rounded quartz; light olive grey	1.9+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	13	82	5	16.1-18.1	15	28	50	3	4	0	0
				18.1-20.3	12	19	58	5	4	2	0
				Mean	**13**	**23**	**55**	**4**	**4**	**1**	**0**
b	7	89	4	20.7-23.1	7	26	58	5	3	1	0
c	7	93	0	23.1-25.0	7	75	18	0	0	0	0
a+b+c	**10**	**86**	**4**	**Mean**	**10**	**36**	**47**	**3**	**3**	**1**	**0**

TM 27 NW 21 2294 7509 Rattlerow Hill, Stradbroke

Surface level +47.7 m
Water struck at +26.7 m
Shell and auger
January 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, moderate brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, silty, mottled light olive grey and light olive brown at top, olive grey below; abundant rounded chalk and angular flint pebbles; occasional chalk and cementstone cobbles; thin silty sand at 1.0 m	14.3	14.6
Glacial Sand and Gravel	**a** Sand and silt; scattered pebbles of angular flint and chalk, yellowish brown	0.8	15.4
Beccles Beds (Starston Till)	Clay, silty and sandy, dusky yellowish brown; scattered flint pebbles and coarse-sand grade chalk	1.5	16.9
(Kesgrave Sands and Gravels)	**b** Sandy gravel, with silt partings	1.6	18.5
Crag	**c** Sand, 'very clayey' at top, mainly dark olive green	6.5+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	41	56	3	14.6-15.4	41	34	19	3	3	0	0
b	9	67	24	16.9-18.5	9	14	41	12	17	7	0
c	8	80	0	18.5-19.0	20	47	31	1	1	0	0
				19.0-21.0	7	67	25	1	0	0	0
				21.0-23.0	9	86	5	0	0	0	0
				23.0-25.0	6	66	28	0	0	0	0
				Mean	**8**	**72**	**20**	**trace**	**trace**	**0**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	16.9-18.5	38	18	15	25	0	0	2	2

TM 27 NW 22 2318 7663 College Farm, Wingfield Block J

Surface level +33.0 m
Water struck at +24.0 m
Shell and auger
January 1983

Overburden 1.7 m
Mineral 23.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate brown	0.3	0.3
Alluvium	Silt, sandy, moderate brown	1.4	1.7
Beccles Beds (Mendham Beds)	**a** Sand; scattered pebbles of angular flint, rounded vein quartz and quartzite Sand: mainly medium, subrounded quartz; mottled pale yellow and orange to 7.0 m, pale yellowish brown and light olive grey below	9.3	11.0
Crag	**b** Sand: mainly fine; well rounded quartz with some mica; greyish orange to dusky yellow	14.0+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	8	88	4	1.7-3.7	7	19	67	5	2	0	0
				3.7-5.7	4	18	71	5	2	0	0
				5.7-7.0	5	10	73	7	5	0	0
				7.0-9.0	7	19	58	11	4	1	0
				9.0-11.0	17	20	45	10	7	1	0
				Mean	**8**	**18**	**63**	**7**	**4**	**trace**	**0**
b	7	93	0	11.0-13.0	8	62	29	1	0	0	0
				13.0-15.0	5	91	4	0	0	0	0
				15.0-17.0	13	83	4	0	0	0	0
				17.0-19.0	4	91	5	0	0	0	0
				19.0-21.0	1	95	4	0	0	0	0
				21.0-23.0	8	59	32	1	0	0	0
				23.0-25.0	10	57	33	0	0	0	0
				Mean	**7**	**77**	**16**	**trace**	**0**	**0**	**0**
a+b	**7**	**91**	**2**	**1.7-25.0**	**7**	**54**	**34**	**3**	**2**	**trace**	**0**

TM 27 NW 23 **2383 7592** **Galloping Hall, Wingfield** **Block J**

Surface level +50.3 m
Water not struck
Shell and auger
January 1983

Overburden	17.4 m
Mineral	1.4 m
Waste	0.8 m
Mineral	5.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and sandy, greyish brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, sandy and silty, orange brown; scattered angular flint pebbles: a bed of silty fine sand with flint pebbles at the base	0.7	0.9
	Clay, silty to waxy, olive grey, mottled with olive brown at the top; abundant rounded chalk and angular flint pebbles; scattered chalk cobbles below 13.0 m	15.1	16.0
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey; scattered pebbles of vein quartz, black flint (rounded) and green volcanic rock; sparse sand grade chalk	1.4	17.4
(Palaeosol)	**a** 'Very clayey' pebbly sand Gravel: mainly fine; subangular flint, well rounded flint, white quartzite and vein quartz Sand: mainly medium; subangular quartz with some angular flint; mottled light olive grey and orange brown	1.4	18.8
	Clay, silty and sandy, firm, mottled greyish red, light greenish grey and bluish grey	0.8	19.6
(Kesgrave Sands and Gravels)	**b** Pebbly sand on sandy gravel Gravel: mainly fine; subangular flint with rounded flint, vein quartz and quartzite Sand: mainly medium, becoming finer at the base; well rounded quartz; pale yellow to brownish orange	5.9+	25.5

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	31	57	12	17.4-18.8	31	12	30	15	11	1	0
b	6	89	5	19.6-20.6	8	39	51	1	1	0	0
				20.6-22.6	4	16	75	3	2	0	0
				22.6-24.7	5	25	60	6	4	0	0
				24.7-25.5	10	48	14	5	13	10	0
				Mean	**6**	**27**	**58**	**4**	**4**	**1**	**0**
a+b	**11**	**83**	**6**	**Mean**	**11**	**24**	**53**	**6**	**5**	**1**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	17.4-18.8	30	29	25	16	0	0	trace	0

TM 27 NW 24 **2474 7992** **Potter Farm, Weybread** **Block J**

Surface level +47.7 m
Water not struck
Shell and auger
January 1983

Overburden 13.1 m
Mineral 11.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Concrete rubble and flint	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty and sandy, mottled orange brown and light grey; abundant rounded chalk pebbles; a bed of clayey quartz sand at the base	0.9	1.1
	Clay, waxy, becoming silty from 4.0 m to 7.0 m, mottled yellowish brown and olive brown at the top, olive grey below; scattered chalk and flint pebbles	12.0	13.1
Beccles Beds ('Glacial')	Sand, pebbly to 21.1 m Gravel: mainly fine; subangular flint with rounded flint, chalk, vein quartz and quartzite Sand: mainly medium and fine; rounded quartz with some angular flint and a trace of chalk; moderate yellowish brown	11.9+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
9	82	9	13.1-15.1	8	13	53	12	13	1	0
			15.1-17.1	9	12	56	9	11	3	0
			17.1-19.1	10	35	42	5	6	2	0
			19.1-21.1	5	17	53	9	12	4	0
			21.1-23.1	8	52	38	1	1	0	0
			23.1-25.0	16	57	27	0	0	0	0
			Mean	**9**	**31**	**45**	**6**	**7**	**2**	**0**

TM 27 NW 25 **2402 7878** **North of Dale Bridge, Wingfield** **Block K**

Surface level +26.0 m
Water struck at +21.1 m
Shell and auger
January 1983

Overburden 0.3 m
Mineral 12.5 m
Bedrock 3.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and sandy, moderate brown; scattered pebbles of flint and vein quartz	0.3	0.3
Glacial Sand and Gravel	a Pebbly sand Gravel: mainly fine; angular orange flint with some vein quartz Sand: mainly medium; angular quartz and angular flint; orange brown	6.6	6.9

Crag	b Sand: mainly fine and medium; rounded quartz with a trace of phosphate; strong orange; beds of pale grey and orange silt and some iron pan	5.9	12.8
	c Pebbly sand, dark greenish grey, glauconitic, thin beds of limestone from 14.4 m to 15.4 m	3.6+	16.4

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	8	75	17	0.3-2.0	10	25	43	5	11	6	0
				2.0-4.0	12	25	40	6	8	9	0
				4.0-4.9	4	18	71	2	2	3	0
				4.9-6.9	4	19	49	6	17	5	0
				Mean	**8**	**22**	**48**	**5**	**11**	**6**	**0**
b	6	94	0	6.9-8.0	3	46	49	1	1	**0**	0
				8.0-10.0	6	39	54	1	0	0	0
				10.0-12.8	6	64	28	1	1	0	0
				Mean	**6**	**52**	**41**	**1**	**trace**	**0**	**0**
c	6	89	5	12.8-14.4	7	39	44	5	4	1	0
				14.4-15.4	5	27	50	11	7	0	0
				15.4-16.4	5	25	58	9	3	0	0
				Mean	**6**	**32**	**49**	**8**	**4**	**1**	**0**
a+b	7	**84**	9	**0.3-12.8**	**7**	**36**	**45**	**3**	**6**	**3**	**0**

TM 27 NW 26 **2420 7781** **Abbey Farm, Wingfield** **Block K**

Surface level +46.2 m
Water not struck
Shell and auger
January 1983

Overburden	14.3 m
Mineral	5.8 m
Waste	1.7 m
Mineral	3.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		0.7	0.7
Boulder Clay (Lowestoft Till)	Clay, silty and sandy, laminated, light olive grey; rounded chalk pebbles; a bed of silty quartz sand with flint pebbles at the base	0.6	1.3
	Clay, stiff, silty near top and base, mainly waxy, mainly olive grey; pebbles of chalk, flint and, near top and base, vein quartz	13.0	14.3
Beccles Beds ('Glacial' on Mendham Beds)	a Pebbly sand on sand Gravel: mainly fine; angular flint, with rounded quartz and chalk Sand: mainly medium; subangular quartz, with a trace of chalk; moderate yellowish brown	5.8	20.1
(Starston Till)	Clay, silty and sandy, brown to brownish grey; scattered rounded vein quartz and angular flint pebbles	1.7	21.8
Crag	b 'Very clayey' sand, mainly fine; well rounded quartz with some mica and a trace of glauconite; dusky yellow; silty clay partings	3.2+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	7	86	7	14.3-15.5	9	21	58	7	5	0	0
				15.5-16.5	8	21	58	7	6	0	0
				16.5-18.5	6	11	63	5	6	9	0
				18.5-20.1	6	22	72	0	0	0	0
				Mean	**7**	**18**	**64**	**4**	**4**	**3**	**0**
b	23	77	0	21.8-23.0	31	62	6	0	1	0	0
				23.0-25.0	18	82	0	0	0	0	0
				Mean	**23**	**74**	**3**	**0**	**trace**	**0**	**0**
a+b	**12**	**83**	**5**	**Mean**	**12**	**38**	**35**	**10**	**3**	**2**	**0**

TM 27 NW 27 2337 7855 North of Earsham Street, Wingfield

Surface level +52.6 m
Water struck at c. +36.6 m
Shell and auger
January 1983

Overburden 19.4 m
Mineral 5.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate brown	0.6	0.6
Boulder Clay (Lowestoft Till)	Clay, silty to 4.0 m, waxy, mottled light grey, orange and olive brown to 2.1 m, mainly olive grey below; mainly scattered rounded and angular chalk and angular flint pebbles; angular flint and chalk cobbles below 14.0 m	18.8	19.4
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: mainly fine; rounded chalk and angular flint with some vein quartz and quartzite Sand: mainly medium; subangular quartz with rounded chalk and angular flint; olive grey	5.6+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
	12	75	13	19.4-21.0	12	19	60	4	4	1	0
				21.0-23.0	9	10	46	14	16	5	0
				23.0-25.0	14	19	49	5	7	6	0
				Mean	**12**	**16**	**51**	**8**	**9**	**4**	**0**

TM 27 NW 28 **2098 7882** **Manor House, Syleham** **Block H**

Surface level +23.1 m
Water struck at +20.0 m
Shell and auger
February 1983

Overburden 0.9 m
Mineral 12.4 m
Bedrock 9.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and sandy, greyish brown; scattered pebbles of angular flint and vein quartz	0.9	0.9
Glacial Sand and Gravel	**a** Pebbly sand Gravel: fine and coarse; rounded and angular flint with some vein quartz Sand: medium and fine; subrounded quartz; strong orange to moderate yellowish brown	3.2	4.1
	b Sandy gravel Gravel: mainly fine, some cobbles to 5.1 m; angular flint with some rounded flint and vein quartz Sand: mainly medium; subangular quartz with some angular flint; orange brown	2.0	6.1
Beccles Beds (Kesgrave Sands and Gravels)	**c** Pebbly sand; cobbles of rounded flint and quartzite to 7.2 m Gravel: mainly fine, with cobbles near top; subangular flint with rounded flint, quartzite and vein quartz Sand: mainly medium, with some fine; rounded quartz with a trace of flint; yellowish brown	7.2	13.3
Crag	d 'Very clayey' sand, dark greenish grey, glauconitic, with beds of laminated clayey silt and scattered shells	9.0+	22.3

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
a	6	82	12	0.9-2.0	8	36	46	2	4	4	0
				2.0-3.1	4	39	46	1	3	7	0
				3.1-4.1	4	36	42	2	11	5	0
				Mean	**6**	**37**	**44**	**1**	**6**	**6**	**0**
b	6	62	32	4.1-5.1	8	20	31	7	21	10	3
				5.1-6.1	3	12	35	17	26	7	0
				Mean	**6**	**16**	**34**	**12**	**23**	**8**	**1**
c	7	77	16	6.1-7.2	7	42	28	7	10	1	5
				7.2-9.4	12	49	38	1	0	0	0
				9.4-10.4	6	20	29	13	28	4	0
				10.4-11.5	1	7	46	16	20	10	0
				11.5-13.3	4	17	53	11	13	2	0
				Mean	**7**	**29**	**40**	**8**	**12**	**3**	**1**
d	21	78	1	13.3-14.3	11	65	23	1	0	0	0
				14.3-16.3	12	59	27	1	1	0	0
				16.3-18.8	35	37	24	2	2	0	0
				18.8-22.3	19	37	36	6	2	0	0
				Mean	**21**	**45**	**30**	**3**	**1**	**0**	**0**
a+b+c	**6**	**77**	**17**	**0.9-13.3**	**6**	**29**	**41**	**7**	**12**	**4**	**1**

TM 27 NW 29 **2271 7640** **Perry's Farm, Wingfield** **Block K**

Surface level +42.7 m
Water struck at +20.0 m
Shell and auger
February 1983

Overburden	10.7 m
Mineral	2.3 m
Waste	0.7 m
Mineral	3.6 m
Waste	6.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate brown	0.3	0.3
Boulder clay (Lowestoft Till)	Clay, waxy, olive grey, mottled with brown in upper part, becoming dark yellowish brown at base; chalk and flint pebbles	10.4	10.7
Channel Fill Deposits	**a** 'Clayey' sand with scattered pebbles of angular flint, rounded chalk and vein quartz: mainly medium; subangular quartz with some chalk; moderate yellowish brown	2.3	13.0
	Silt, clayey, firm, laminated, moderate yellowish brown, becoming brownish grey towards the base	0.7	13.7
	b Pebbly sand Gravel: mainly fine; rounded flint with vein quartz, chalk and quartzite and some angular flint Sand: mainly medium; subangular quartz with chalk and some angular flint; moderate yellowish brown	3.6	17.3
	Clay, silty and sandy, yellowish brown to brownish pink; well rounded flint, quartzite and chalk pebbles; scattered coarse-sand grade chalk	1.2	18.5
	Silt, clayey, laminated, olive grey to greenish black; quartz sand partings	5.5+	24.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	12	84	4	10.7-12.0	14	9	68	5	4	0	0
				12.0-13.0	8	21	61	5	4	1	0
				Mean	**12**	**14**	**65**	**5**	**4**	**trace**	**0**
b	6	81	13	13.7-15.0	8	11	49	11	14	7	0
				15.0-17.3	5	21	59	6	8	1	0
				Mean	**6**	**17**	**56**	**8**	**10**	3	**0**
a+b	**8**	**82**	**10**	**Mean**	**8**	**16**	**59**	**7**	**8**	**2**	**0**

TM 27 NW 30 **2039 7515** **Park Farm, Hoxne** **Block K**

Surface level +45.3 m
Water struck at +24.8 m
Shell and auger
February 1983

Overburden	13.7 m
Mineral	1.0 m
Waste	1.0 m
Mineral	9.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Brick and concrete rubble	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, silty, waxy, mainly olive grey but mottled at top and moderate brown at base; angular flint and mainly subangular chalk pebbles; 0.5 m 'clayey' pebbly sand at 1.5 m (a)	12.9	13.3
Beccles Beds (Starston Till)	Clay, silty and sandy, moderate brown to dark yellowish brown; scattered rounded quartzite, angular flint and vein quartz pebbles; coarse-sand grade chalk	0.4	13.7
(Kesgrave Sands and Gravels)	b 'Clayey' pebbly sand Gravel: mainly fine; subangular flint with rounded flint, vein quartz and white quartzite Sand: mainly medium; subangular quartz with some subangular flint; moderate yellow	1.0	14.7
(Palaeosol)	Clay, silty and sandy, mottled strong orange, yellow and grey; pebbles of vein quartz, quartzite and flint	1.0	15.7
	c 'Clayey' pebbly sand Gravel: mainly fine; subangular flint with rounded quartzite, vein quartz and well rounded flint Sand: mainly medium; angular quartz with some angular flint; mottled light grey, orange and reddish brown	2.2	17.9
Crag	d 'Very clayey' sand: mainly fine; well rounded quartz with some mica; greyish yellow	7.1+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	14	73	13	1.0-1.5	14	40	31	2	4	9	0
b	11	71	18	13.7-14.7	11	13	49	9	11	7	0
c	15	72	13	15.7-16.1	12	9	47	11	13	8	0
				16.1-17.1	13	4	65	11	7	0	0
				17.1-17.9	19	16	23	24	16	2	0
				Mean	**15**	**9**	**47**	**16**	**11**	**2**	**0**
d	26	73	1	17.9-20.0	30	64	2	1	3	0	0
				20.0-22.0	16	70	13	0	1	0	0
				22.0-23.0	30	69	1	0	0	0	0
				23.0-25.0	32	67	1	0	0	0	0
				Mean	**26**	**68**	**5**	**trace**	**1**	**0**	**0**
b+c	**30**	**56**	**14**	**Mean**	**30**	**9**	**39**	**8**	**9**	**5**	**0**
b+c+d	**22**	**73**	**5**	**Mean**	**22**	**51**	**18**	**4**	**4**	**1**	**0**

TM 27 NW 31 **2222 7582** **Chickering Farm, Wingfield** **Block K**

Surface level +48.0 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Waste 16.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Alluvium	Silt, soft, light brown	0.5	0.6
Boulder Clay	Clay, slightly silty, moderate olive brown with chalk and flint pebbles, becoming waxy, stiff and olive grey with depth; abundant chalk and angular flint pebbles below 3.0 m	15.6+	16.2
	(Borehole abandoned due to rig breakdown)		

TM 27 NW 32 **2484 7705** **South-west of West House Farm, Fressingfield** **Block J**

Surface level +37.4 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 6.6 m
Mineral 5.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.2	0.2
Alluvium	Clay, silty, interlaminated with clayey silt, mottled moderate brown and moderate olive brown	0.6	0.8
Channel Fill Deposits	Clay, waxy, moderate brown to moderate yellow brown; scattered chalk pebbles	0.7	1.5
	Silt, sandy towards the base, soft, light brown; sparse fine rounded chalk pebbles	3.1	4.6
	'Clayey' pebbly sand	0.9	5.5
	Silt, sandy, firm, light brown	1.1	6.6
Beccles Beds (Kesgrave Sands and Gravels)	'Clayey' pebbly sand, with thin beds of silt from 6.8 m to 10.0 m Gravel: subangular flint with rounded flint, vein quartz and quartzite Sand: medium and fine rounded quartz; dusky yellow to white	4.9	11.5
Crag	Sand: fine with some medium, well rounded quartz, with some mica; yellowish orange	1.0+	12.5

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
4.6-5.5	57	14	14	13	2	0	0	0
10.0-11.5	47	14	13	26	0	0	0	0

TM 27 NE 5 **2554 7995** **North of Rookery Farm, Weybread** **Block J**

Surface level +46.2 m
Water struck at +43.4 m
Shell and auger
November 1982

Overburden	2.8 m
Mineral	3.7 m
Waste	6.8 m
Mineral	7.2 m
Waste	1.1 m
Mineral	3.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, humic, dusky brown	0.4	0.4
Head	Clay, stiff, sandy and silty, mottled pale yellowish brown and orange; abundant angular, grey flint pebbles	2.4	2.8
Head Gravel	**a** Sandy gravel, with angular cobbles of grey and white flint Gravel: fine and coarse; angular grey and white flint with some quartzite and a trace of vein quartz Sand: fine and medium, with some coarse; subangular flint, with some subrounded quartz; moderate brown	3.7	6.5
Boulder Clay (Lowestoft Till)	Clay, stiff, mainly grey but brown near top and base; abundant pebbles and cobbles of chalk	6.8	13.3
Beccles Beds ('Glacial')	**b** Pebbly sand on gravel, with carbonaceous fragments Gravel: fine and coarse; angular flint with some quartzite, iron pan, ironstone and a trace of chalk Sand: medium with fine; subangular flint and quartz with a trace of chalk; strong yellowish orange to light brown	3.8	17.1
(Pebbly Series)	**c** 'Clayey' pebbly sand, with thin beds of clay above 19.1 m Gravel: fine; subangular and rounded flint with some vein quartz and quartzite Sand: medium with fine; subrounded quartz with some subangular flint; strongly yellowish orange	3.4	20.5
	Silty, light olive grey, in layers 1 cm to 5 cm thick, interbedded with moderate yellowish brown and red silty sand; scattered carbonaceous fragments	1.1	21.6
	'Clayey' pebbly sand, with beds of clayey silt to 23.5 m Gravel: coarse and fine; angular flint with quartzite and vein quartz and some rounded flint Sand: fine with medium, subrounded quartz; pale yellowish brown	3.9+	25.5

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	9	55	36	2.8-4.8	7	24	22	10	22	14	1
				4.8-6.0	10	29	16	7	17	16	5
				6.0-6.5	15	24	18	10	14	16	3
				Mean	**9**	**26**	**20**	**9**	**19**	**15**	**2**
b	8	77	15	13.3-15.3	8	32	46	5	6	3	0
				15.3-16.4	10	14	62	6	7	1	0
				16.4-17.1	5	6	32	9	18	30	0
				Mean	**8**	**22**	**49**	**6**	**8**	**7**	**0**
c	15	80	5	17.1-19.1	12	15	63	3	6	1	0
				19.1-20.5	18	19	62	1	0	0	0
				Mean	**15**	**17**	**61**	**2**	**4**	**1**	**0**
d	10	83	7	21.6-23.5	13	19	51	6	4	7	0
				23.5-25.5	8	75	12	1	2	2	0
				Mean	**10**	**49**	**31**	**3**	**3**	**4**	**0**
a+b	**9**	**65**	**26**	**Mean**	**9**	**24**	**33**	**8**	**14**	**11**	**1**
a-d	**10**	**74**	**16**	**Mean**	**10**	**30**	**39**	**5**	**9**	**6**	**1**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	2.8-4.8	94	1	1	1	1	0	0	2
	4.8-6.0	95	1	1	1	0	0	0	2
	6.0-6.5	93	0	trace	4	0	0	0	3
	Mean	**94**	**1**	**1**	**2**	**trace**	**0**	**0**	**2**
b	13.3-15.3	36	10	2	12	12	0	0	28*
	15.3-16.4	50	10	9	6	15	0	0	11
	16.4-17.1	59	22	10	4	2	1	0	2
	Mean	**57**	**20**	**8**	**5**	**4**	**1**	**0**	**5**
c	17.1-19.1	44	39	8	8	0	0	0	1
d	21.6-25.5	45	10	22	23	0	0	0	0

* mainly ironstone and iron pan

TM 27 NE 6 **2577 7870** **Vales Hall, Fressingfield** **Block J**

Surface level +48.4 m
Shell and auger
November 1982

Overburden	17.7 m
Mineral	3.3 m
Waste	0.4 m
Mineral	3.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, moderate brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, stiff, silty to waxy, mottled light olive brown and light olive grey to 4.0 m, olive grey below; abundant subrounded chalk pebbles to 4.0 m, scattered pebbles of angular flint and black (Jurassic) mudstone below	7.5	7.7
Glacial Silt	Silt, soft, olive grey	0.3	8.0
Boulder Clay (Lowestoft Till)	Clay, waxy, olive grey; flint and chalk pebbles	4.7	12.7
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey to dusky yellowish brown; scattered angular and rounded pebbles of flint and vein quartz; some coarse-sand grade chalk	3.6	16.3
(Palaeosol)	Clay, waxy and sandy, mottled light grey with dusky red and moderate reddish brown; pebbles of rounded flint and vein quartz	1.4	17.7
(Kesgrave Sands and Gravels)	**a** 'Very clayey' pebbly sand Gravel: fine and coarse; subangular and rounded flint with some vein quartz, quartzite and igneous and metamorphic rocks Sand: mainly medium, subrounded and subangular quartz with some coarse flint; moderate reddish brown	3.3	21.0
(?Palaeosol)	Clay, sandy, stiff, mottled moderate reddish brown and red	0.4	21.4
(?Westleton Beds)	**b** Sandy gravel Gravel: fine with coarse; subangular and well rounded black flint, with some vein quartz and quartzite Sand: fine with medium; subrounded quartz with some subangular flint; moderate yellowish brown	3.6+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	21	67	12	17.7-19.0	26	11	61	1	0	1	0
				19.0-20.0	13	6	58	5	9	7	2
				20.0-21.0	22	8	39	10	12	9	0
				Mean	**21**	**9**	**53**	**5**	**6**	**4**	**1**
b	7	63	30	21.4-22.5	10	70	19	1	0	0	0
				22.5-24.1	4	10	31	12	22	21	0
				24.1-25.0	7	21	17	14	32	9	0
				Mean	**7**	**30**	**24**	**9**	**18**	**12**	**0**
a+b	**13**	**66**	**21**	**Mean**	**13**	**20**	**39**	**7**	**12**	**9**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	19.0-20.0	39	27	12	15	0	0	4	3
	20.0-21.0	47	34	8	5	0	0	3	3
	Mean	**44**	**30**	**10**	**9**	**0**	**0**	**4**	**3**
b	22.5-24.1	40	38	10	12	0	0	0	0
	24.1-25.0	59	37	3	trace	0	0	0	1
	Mean	**51**	**37**	**6**	**6**	**0**	**0**	**0**	**trace**

TM 27 NE 7 **2502 7606** **Whitehouse Farm, Stradbroke**

Surface level +51.2 m
Shell and auger
December 1982

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, with flint pebbles	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, slightly sandy, mottled olive grey and moderate yellowish brown; scattered subangular, brown flint pebbles	1.1	1.5
Glacial Sand and Gravel	'Clayey' sand, with scattered angular flint pebbles Sand: medium and fine, subrounded quartz and subangular flint; orange brown	0.2	1.7
Boulder Clay (Lowestoft Till)	Clay, sandy, stiff, olive grey; abundant pebbles of chalk and scattered angular flint	14.8	16.5
Beccles Beds (Starston Till)	Clay, firm, dark brown at the top, becoming brownish black from 17.1 m to 19.6 m and dark yellowish brown below, sparse rounded vein quartz and flint pebbles, throughout; some coarse sand grade chalk from 16.5 m to 16.9 m and a bed of clayey quartz sand from 16.9 m to 17.1 m	4.0	20.5
(Kesgrave Sands and Gravels)	'Very clayey' pebbly sand Gravel: fine and coarse; subangular flint with rounded flint, vein quartz and quartzite; some igneous and metamorphic below 21.5 m Sand: mainly medium, subangular, quartz with some flint; pale yellowish brown	4.5+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
20	70	10	20.5-21.5	17	7	51	11	9	5	0
			21.5-23.0	22	12	46	4	10	6	0
			23.0-24.3	14	11	71	2	1	1	0
			24.3-25.0	31	24	32	7	3	3	0
			Mean	**20**	**13**	**52**	**5**	**6**	**4**	**0**

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
20.5-21.5	44	11	22	22	0	0	0	1
21.5-25.0	36	17	26	14	0	0	3	4
Mean	**41**	**14**	**24**	**18**	**0**	**0**	**1**	**2**

TM 27 NE 8 **2679 7934** **Safford's Farm, Weybread** **Block J**

Surface level +47.1 m
Water not struck
Shell and auger
January 1983

Overburden	15.8 m
Mineral	3.8 m
Waste	0.5 m
Mineral	2.5 m
Bedrock	2.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Bricks and rubble	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, firm, mottled moderate brown and pale yellowish brown; scattered chalk pebbles	1.2	1.6
Glacial Sand and Gravel	Sand; silty, with scattered chalk and subangular flint pebbles Sand: mainly medium, subangular flint	0.2	1.8
Boulder Clay (Lowestoft Till)	Clay, stiff, olive grey, becoming dusky brown with depth; abundant pebbles of chalk and some subangular flint	7.7	9.5
Beccles Beds (Starston Till)	Clay, sandy, dusky brown; vein quartz and angular flint pebbles and a trace of coarse-sand grade chalk	6.3	15.8
(Pebbly Series)	**a** 'Clayey' sandy gravel, with clay partings below 17.5 m Gravel: fine with coarse; subangular and subrounded flint with some vein quartz and quartzite Sand: mainly medium with some fine and coarse; subangular flint and rounded quartz; moderate to pale yellowish brown	3.8	19.6
(Starston Till)	Clay, sandy, moderate brown, with subangular flint and rounded vein quartz pebbles	0.5	20.1
(Pebbly Series)	**b** 'Clayey' sandy gravel Gravel: coarse and fine; subangular and subrounded flint, with some vein quartz and quartzite Sand: mainly medium, subrounded; quartz with some flint; pale yellowish brown	2.5	22.6
Crag	Clayey silt and sand, pale reddish brown	1.6	24.2
	c 'Very clayey' sand, light olive grey	0.8+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	18	59	23	15.8-16.5	21	12	38	8	13	8	0
				16.5-17.5	6	6	55	9	12	12	0
				17.5-18.4	15	8	45	6	18	8	0
				18.4-19.6	29	30	18	4	13	6	0
				Mean	**18**	**15**	**38**	**6**	**14**	**9**	**0**
b	10	64	26	20.1-21.3	11	12	36	6	14	21	0
				21.3-22.6	9	6	60	7	11	7	0
				Mean	**10**	**9**	**49**	**6**	**12**	**14**	**0**
c	25	75	0	24.2-25.0	25	74	1	0	0	0	0
a+b	**15**	**61**	**24**	**Mean**	**15**	**13**	**42**	**6**	**13**	**11**	**0**

TM 27 NE 9 **2672 7769** **The Hall, Fressingfield**

Surface level +45.1 m
Water not struck
Shell and auger
November 1982

Waste 23.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, sandy, moderate yellowish brown, with sparse chalk and flint pebbles	3.3	3.5
	Clay, stiff, olive black; abundant chalk and sparse black (Jurassic) mudstone pebbles	10.0	13.5
Beccles Beds (Starston Till)	Clay, sandy, firm, dark yellowish brown, with subangular grey flint pebbles and coarse sand grade chalk; a bed of clayey pebbly sand from 14.6 m to 14.9 m	8.3	21.8
	Clay, silty, peaty, dusky yellowish brown; fragments of wood and sparse well rounded black flint pebbles	0.2	22.0
	Peat with clay partings, becoming sandy below 22.2 m, very dusky red to dark yellowish brown; abundant wood fragments	0.5	22.5
(Westleton Beds)	'Clayey' sandy gravel with sparse wood fragments at the top Gravel: fine and coarse; well rounded black flint, with some subangular black flint, vein quartz and quartzite Sand: mainly medium, subrounded quartz with some coarse and fine subrounded black flint	0.9+	23.4

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
10	47	43	22.5-23.4	10	12	26	9	22	21	0

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
22.5-23.4	28	52	11	7	0	0	0	2

TM 27 NE 10 **2735 7630** **Hussey Green, Fressingfield** **Block J**

Surface level +41.6 m
Water struck at c +19.6 m
Shell and auger
October 1982

Overburden	10.0 m
Mineral	2.4 m
Waste	2.8 m
Mineral	9.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Alluvium	Clay, silty, mottled light olive grey and strong brown; sparse flint pebbles	1.2	1.5
Boulder Clay (Lowestoft Till)	Clay, stiff, medium grey, with rounded chalk and angular flint pebbles	6.5	8.0
	Clay, sandy and silty, olive grey; angular flint pebbles and coarse-sand grade chalk	2.0	10.0
Beccles Beds (Kesgrave Sands and Gravels)	**a** Gravel Gravel: fine and coarse; subangular and rounded flint, vein quartz and quartzite Sand: mainly medium, subangular and subrounded quartz; pale grey	2.4	12.4
Crag	Clay and silt, sandy, greenish grey to olive brown, with sparse vein quartz and quartzite pebbles to 14.5 m; a bed of clayey pebbly sand from 13.4 m to 13.8 m	2.8	15.2
	b Sand: mainly medium, subrounded quartz; pale yellow; sparse black flint pebbles	9.6+	24.8

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	8	45	47	10.0-11.0	7	7	28	10	27	21	0
				11.0-12.0	7	7	30	9	29	18	0
				12.0-12.4	10	5	34	10	24	17	0
				Mean	**8**	**7**	**29**	**9**	**28**	**19**	**0**
b	6	92	2	15.2-18.2	4	32	62	2	0	0	0
				18.2-19.0	8	25	66	1	0	0	0
				19.0-22.0	8	11	76	2	1	2	0
				22.0-24.8	7	13	80	0	0	0	0
				Mean	**6**	**19**	**72**	**1**	**1**	**1**	**0**
a+b	7	83	10	**Mean**	**7**	**17**	**63**	**3**	**6**	**4**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	10.0-11.0	34	24	27	10	0	0	1	4
	12.0-12.4	41	19	25	14	0	0	0	1

TM 27 NE 11 2672 7671 West of Broad Road, Fressingfield

Surface level 49.6 m
Water struck at +42.6 m and +40.4 m
Shell and auger
October 1982

Waste 19.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, firm, medium grey, mottled greenish grey and strong yellowish orange; thin beds of quartz sand, at the top; scattered rounded chalk and angular flint pebbles	6.8	7.0
Glacial Silt	Silt, medium dark grey	0.7	7.7
Boulder Clay (Lowestoft Till)	Clay, stiff, medium dark grey, with well rounded chalk and angular flint pebbles; a bed of dark grey silt from 9.2 m to 10.5 m	11.3+	19.0

TM 27 NE 12 2602 7515 Pear Tree Farm, Stradbroke

Surface level +51.1 m
Water not struck
Shell and auger
December 1982

Waste 23.0+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Bricks and rubble	0.2	0.2
	Soil, clayey and pebbly	0.3	0.5
Boulder Clay (Lowestoft Till)	Clay, sandy, mottled moderate yellowish brown and pale olive grey; flint and quartzite pebbles	0.9	1.4
Glacial Sand and Gravel	**a** 'Very clayey' pebbly sand Gravel: coarse and fine; angular flint with some rounded chalk Sand: mainly fine and medium; subrounded quartz and subangular flint; moderate orange brown	0.7	2.1
Boulder Clay (Lowestoft Till)	Clay, stiff, olive grey, with abundant chalk and sparse angular flint pebbles	17.1	19.2
Beccles Beds (Starston Till)	Clay, silty, firm, dusky yellowish brown; scattered vein quartz and subangular flint pebbles	0.9	20.1
(Pebbly Series)	**b** Sand with scattered pebbles of rounded vein quartz Gravel: mainly fine; rounded quartz and quartzite and subangular flint Sand: mainly medium; subrounded quartz and subangular flint; moderate to pale yellowish brown	2.9+	23.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	27	60	13	1.4-2.1	27	30	25	5	5	8	0
b	9	88	3	20.1-21.1	11	53	33	2	1	0	0
				21.1-22.2	12	54	31	2	1	0	0
				22.2-23.0	3	11	74	4	6	2	0
				Mean	**9**	**42**	**44**	**2**	**2**	**1**	**0**

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
1.4-2.1	83	0	0	0	17	0	0	0

TM 27 NE 13 2744 7850 North-west of Whittingham Hall, Fressingfield

Surface level +51.3 m
Water not struck
Shell and auger
December 1982

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, firm, mainly olive grey to medium dark grey; sandy and with scattered angular flint pebbles at the top, chalk pebbles and occasional angular flint pebbles below 1.1 m; some black (Jurassic) mudstone and well rounded quartzite pebbles near the base	16.7	17.0
Beccles Beds (Starston Till)	Clay, firm, sandy towards the base, dusky yellow brown to light olive brown; subangular and rounded vein quartz and quartzite pebbles; some coarse-sand grade chalk	5.0	22.0
(?Westleton Beds)	'Clayey' pebbly sand with thin beds of green silty clay Gravel: coarse with fine; well rounded black and brown flint and subangular grey flint; some vein quartz and quartzite from 22.0 m to 23.0 m Sand: mainly medium; subrounded quartz with some subangular flint; moderate yellowish brown	3.0+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
15	74	11	22.0-23.0	22	9	49	6	6	8	0
			23.0-24.0	12	9	70	3	2	4	0
			24.0-25.0	11	15	56	4	5	9	0
			Mean	**15**	**11**	**59**	**4**	**4**	**7**	**0**

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
24.0-25.0	41	59	0	0	0	0	0	0

TM 27 NE 14 2812 7657 West of Yewtree Farm, Fressingfield

Surface level +54.9 m
Water not struck
Shell and auger
December 1982

Waste 23.5+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, humic	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, slightly sandy, mottled moderate yellowish brown and yellowish grey; occasional subangular flint pebbles	0.9	1.2
Glacial Sand and Gravel	Sand, silty and clayey; mainly subangular flint; moderate brown	0.3	1.5
Boulder Clay (Lowestoft Till)	Clay, stiff, moderate brown to 4.0 m, medium dark grey below; scattered angular flint pebbles to 4.0 m, abundant chalk and flint pebbles below	22.0+	23.5

TM 27 NE 15 2876 7894 Wakelyns, Fressingfield

Surface level +53.3 m
Water struck at +39.1 m
Shell and auger
January 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Brick and concrete rubble	0.3	0.3
	Soil, sandy and silty, moderate brown	0.2	0.5
Boulder Clay (Lowestoft Till)	Clay, silty and slightly sandy, firm, mottled moderate olive brown and light olive grey, becoming darker with depth; abundant rounded chalk pebbles	3.2	3.7
	Clay, stiff, silty, becoming waxy below 14.4 m, olive grey; angular chalk, angular flint and occasional rounded vein quartz pebbles; beds of chalk and flint gravel from 14.2 m to 14.4 m and from 15.5 m to 15.7 m	15.3	19.0
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey to dusky brown; scattered pebbles of angular flint and well rounded black flint and vein quartz; some coarse-sand grade chalk	2.9	21.9
(Kesgrave Sands and Gravels)	a 'Very clayey' pebbly sand Gravel: fine with some coarse; subangular rounded flint, vein quartz and quartzite Sand: mainly medium, subangular quartz; moderate olive brown	0.9	22.8

Crag	b 'Clayey' sand with thin beds of olive grey silty clay Sand: fine with some medium; well rounded quartz with some mica and glauconite; dusky yellow to dark yellowish orange	2.2+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	20	66	14	21.9-22.8	20	17	43	6	9	5	0
b	11	89	0	22.8-24.0	11	71	18	0	0	0	0
				24.0-25.0	11	65	24	0	0	0	0
				Mean	**11**	**68**	**21**	**0**	**0**	**0**	0

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
21.9-22.8	44	29	11	16	0	0	0	0

TM 27 NE 16 **2980 7982** **Willows Farm, Metfield**

Surface level +48.0 m
Water not struck
Shell and auger
November 1982

Waste 23.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey and sandy, moderate brown	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, stiff, moderate brown to 2.5 m, olive grey below; abundant chalk pebbles and some grey subangular flint pebbles	19.1	19.5
Beccles Beds (Starston Till)	Clay, firm, olive grey to dusky yellowish brown, with coarse-sand grade chalk and flint	2.5	22.0
Crag	Clay, silty and sandy, olive grey to light olive brown; sparse angular flint pebbles	0.4	22.4
	'Very clayey' sand: mainly medium with some fine; rounded quartz, with a trace of mica	0.6+	23.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
	21	70	0	22.4-23.0	21	17	62	0	0	0	0

TM 27 NE 17 **2908 7726** **Gissing's Farm, Fressingfield**

Surface level +52.7 m
Water not struck
Shell and auger
November 1982

Waste 20.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey and sandy	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, slightly sandy, moderate yellowish brown to orange brown with subangular flint pebbles; some rounded chalk pebbles, near the top; a bed of clayey sand from 1.0 m to 1.3 m	3.3	3.5
	Clay, stiff, grey, with abundant chalk and some subangular flint pebbles	16.5+	20.0

TM 27 NE 18 **2937 7511** **Swan Green, Cratfield**

Surface level +55.3 m
Water not struck
Shell and auger
December 1982

Waste 27.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Bricks and rubble	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, slightly sandy, mottled moderate brown and pale yellowish brown; scattered pebbles of angular and subangular brown and grey flint	3.2	3.5
	Clay, stiff, olive grey to dark grey; abundant chalk pebbles; scattered subangular flint and black (Jurassic) mudstone pebbles	19.5	23.0
Beccles Beds (Starston Till)	Clay, firm, dusky brown; scattered rounded quartz and subangular brown and grey flint pebbles; a trace of coarse-sand grade chalk	2.8	25.8
(Pebbly Series)	Sand with occasional pebbles Gravel: fine; subrounded and subangular flint, quartz and quartzite Sand: medium and fine; rounded and subrounded quartz with some subangular flint; pale yellowish brown	1.2+	27.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
5	92	3	25.8–27.0	5	37	54	1	3	0	0

TM 27 NE 19 **2808 7752** **Woodlane, Fressingfield**

Surface level +44.5 m
Water struck at +25.7 m
Shell and auger
February 1983

Waste 18.7 m
Bedrock 6.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, moderate brown	0.2	0.2
Alluvium	Silt and clay, sandy, laminated, moderate brown; scattered angular, orange flint pebbles	1.1	1.3
Head	Clay, silty, very sandy at the base, mottled olive grey and light olive brown; occasional angular chalk and flint pebbles	0.4	1.7
Boulder Clay (Lowestoft Till)	Clay, waxy; mottled moderate olive brown to medium dark grey; scattered fine, rounded chalk pebbles, to c 4.0 m; pebbles of subangular chalk, angular flint, quartzite and black (Jurassic) mudstone towards the base	3.3	5.0
Glacial Silt	Silt, clayey, olive grey; interbedded with olive grey, waxy clay; chalk and flint pebbles towards the base	1.0	6.0
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy, olive grey, with angular pebbles and cobbles of chalk and sparse angular flint pebbles	8.8	14.8
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey to greyish brown; scattered angular flint and chalk pebbles; some white quartzite pebbles near the base	1.0	15.8
('Glacial')	**a** Pebbly sand Gravel: mainly fine; angular and rounded black flint, with some vein quartz and quartzite Sand: mainly medium, with some coarse and fine; subangular and subrounded quartz and some chalk; olive grey	2.2	18.0
(Starston Till)	Clay, silty, stiff, brownish grey, becoming black at the base, micaceous; scattered black flint pebbles	0.7	18.7
Crag	**b** 'Clayey' sand with thin beds of sandy silt from 20.8 m to 23.0 m; fine with some medium; rounded quartz with some mica and glauconite; olive grey to greenish black	6.3+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	9	84	7	15.8-16.8	8	16	59	6	8	3	0
				16.8-18.0	10	7	73	6	3	1	0
				Mean	**9**	**11**	**67**	**6**	**5**	**2**	**0**
b	19	80	1	18.7-20.8	22	40	31	5	2	0	0
				20.8-23.0	18	65	16	1	0	0	0
				23.0-25.0	18	64	18	0	0	0	0
				Mean	**19**	**56**	**22**	**2**	**1**	**0**	**0**

TM 27 NE 20 **2706 7568** **North of Lambert's Farm, Fressingfield**

Surface level +53.6 m
Water not struck
Shell and auger
February 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, moderate brown; scattered angular flint pebbles	0.2	0.2
Boulder Clay (Lowestoft Clay)	Clay, slightly silty, mottled light olive brown and light olive grey; thin beds of silty, fine sand near the top; abundant subrounded chalk pebbles	1.8	2.0
	Clay, waxy, olive grey; abundant subangular and rounded chalk pebbles, some angular flint, rounded vein quartz and black (Jurassic) mudstone pebbles	21.6	23.6
Glacial Sand and Gravel	'Very clayey' sand, interbedded with olive grey silt Sand: mainly fine, subrounded quartz, with some chalk; olive grey	1.1	24.7
	Silt, slightly sandy, poorly laminated; pale yellowish brown	0.3+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
30	70	0	23.6-24.7	30	67	3	trace	0	0	0

TM 27 NE 21 **2901 7807** **Home Farm, Fressingfield**

Surface level +52.9 m
Water not stuck
Shell and auger
February 1983

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and sandy; scattered angular flint pebbles	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, mainly silty and stiff, waxy from 1.5 to 3.8 m, mottled orange and dark yellowish brown at top, olive brown to olive grey below; pebbles (and scattered cobbles) of chalk below 1.4 m, scattered flint pebbles; olive grey sandy silt from 2.0 to 2.3 m	19.0	19.3
Beccles Beds (Starston Till)	Clay, silty and sandy, dark brown; sparse angular chalk granules and scattered angular flint pebbles	4.2	23.5
(Kesgrave Sands and Gravels)	'Clayey' pebbly sand Gravel: fine with coarse; subangular and well rounded flint, rounded quartzite and vein quartz Sand: mainly medium, subangular quartz; light olive brown	1.5+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
18	70	12	23.5-24.5	17	6	50	11	10	6	0
			24.5-25.0	20	6	58	8	6	2	0
			Mean	**18**	**6**	**54**	**10**	**8**	**4**	**0**

TM 27 NE 22 2980 7628 North Green Farm, Cratfield

Surface level +56.1 m
Water struck at +33.1 m
Shell and auger
February 1983

Waste 23.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and sandy, humic, moderate brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty, mottled light olive brown and light olive grey, with angular chalk and flint pebbles	1.2	1.4
Glacial Sand and Gravel	Sand, fine, very silty, with sparse angular flint pebbles; dark yellowish orange	0.3	1.7
Boulder Clay (Lowestoft Till)	Clay, firm, silty, olive grey, mottled dark olive brown and waxy in top 3.0 m; pebbles and cobbles of angular and rounded chalk throughout (iron-stained in top 3.0 m): some angular flint and black (Jurassic) mudstone pebbles	21.9	23.6
Glacial Silt	Silt, clayey and sandy, greyish brown	0.1+	23.7

TM 27 NE 23 2522 7944 West of Rookery Farm, Weybread **Block J**

Surface level +47.9 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 15.2 m
Mineral 5.8 m
Waste 0.1 m

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, mottled light olive brown and light olive grey, becoming olive grey to olive black with depth; abundant chalk pebbles at the top and with chalk, flint and black (Jurassic) mudstone pebbles below	c .12.7	c.13.0
	Clay, silty and sandy, brownish grey; scattered chalk pebbles	2.2	15.2

Beccles Beds	'Clayey' sandy gravel Gravel: fine with some coarse; angular flint with occasional rounded flint, chalk, vein quartz and quartzite and sandstone Sand: medium with fine and coarse; subangular quartz and flint; brownish grey	5.8	21.0
(?Starston Till)	Clay, sandy, brownish grey, with scattered well rounded chalk and angular flint pebbles (on bottom flights of the power auger)	0.1+	21.1

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
17.8-21.0	88	1	3	1	3	0	0	4*

* sandstone

TM 27 NE 24 **2538 7716** **South-east of West House Farm, Fressingfield** **Block J**

Surface level +47.1 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 16.5 m
Mineral 5.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		3.0	3.0
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy, olive grey to olive black, with fine subangular chalk and scattered angular flint pebbles	10.7	13.7
	Clay, soft, silty and sandy, light olive grey, with abundant rounded chalk and sparse fine angular flint pebbles	2.8	16.5
Crag	'Clayey' sand: fine, well rounded quartz with some mica; greyish yellow; 5 cm thick beds of silt from 16.5 to 18.5 m and near base	5.4+	21.9

TM 27 NE 25 **2606 7589** **Caterpole Corner, Fressingfield**

Surface level +52.5 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Waste 20.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.2	0.2
Cover Sand	Sand, silty, fine, dark yellowish orange	0.5	0.7
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy, olive grey, becoming olive black with depth; subangular chalk and scattered flint pebbles	16.1	16.8
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey to dusky brown; scattered rounded flint and vein quartz pebbles and sparse coarse-sand grade chalk	3.5+	20.3

TM 27 NE 26 **2675 7883** **East of Gooch's Farm, Fressingfield** **Block J**

Surface level +48.6 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 18.4 m
Mineral 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		2.0	2.0
Boulder Clay (Lowestoft Till)	Clay, silty, mottled olive grey and light olive brown, with subangular chalk pebbles	1.5	3.5
	Clay, olive grey, with abundant chalk pebbles at 5.5 m; olive black, with chalk, flint and black (Jurassic) mudstone pebbles below 7.0 m	9.7	13.2
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey to 16.5 m, dark brown below; scattered well rounded and angular flint pebbles and some coarse-sand grade chalk	5.2	18.4
	'Clayey' gravel Gravel: coarse and fine; angular flint with some well rounded flint, vein quartz and quartzite Sand: coarse, medium and fine; rounded quartz and flint; dark yellowish brown	1.7+	20.1

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
18.4-19.0	55	22	14	7	0	0	1	1
19.0-20.1	74	14	7	5	0	0	0	0
Mean	**63**	**19**	**10**	**6**	**0**	**0**	**1**	**1**

TM 27 NE 27 **2761 7551** **White Post Farm, Fressingfield** **Block J**

Surface level +51.2 m
Water struck at +45.1 m
B 30 Power Auger 115 mm diameter
July 1982

Overburden 6.1 m
Mineral 4.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Cover Sand	Sand, silty, dark orange	1.5	1.5
Boulder Clay (Lowestoft Till)	Clay, waxy, light olive brown, becoming olive grey with depth; angular chalk and flint pebbles	4.6	6.1
Channel Fill Deposits	'Clayey' sand: medium and fine, subangular quartz and flint with some chalk (poor sample recovery below the water table), olive grey becoming orange brown with depth	4.1+	10.2

TM 27 NE 28 **2815 7707** **Little Whittingham Green, Fressingfield**

Surface level +52.2 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Waste 19.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, silty, light olive brown, with subrounded chalk pebbles	1.0	1.5
	Clay, stiff, waxy, olive grey to olive black, with subangular and subrounded chalk pebbles and some flint and black (Jurassic) mudstone pebbles	10.8	12.3
Glacial Silt	Silt, soft, micaceous, olive grey	3.0	15.3
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy, olive grey, with chalk and flint pebbles	4.2+	19.5

TM 27 NE 29 **2800 7962** **Grove Cottage, Mendham**

Surface level +48.5 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Waste 22.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty	0.1	0.1
Boulder Clay (Lowestoft Till)	Clay, mottled moderate olive brown and light olive grey, with chalk and flint pebbles; passing down into silty olive grey clay with abundant chalk pebbles	10.9	11.0
Beccles Beds (Starston Till)	Clay, sandy and silty, brownish grey to greyish brown; scattered rounded and angular pebbles of flint and chalk in upper parts	8.0	19.0
	'Clayey' sandy gravel Gravel: fine with some coarse; angular flint with some rounded flint, vein quartz, quartzite and a trace of chalk Sand: coarse and meduium; angular flint and quartz; dark yellowish brown	1.0	20.0
	'Clayey' sand: fine with some medium, angular quartz and flint; light olive brown; occasional flint pebbles	2.2+	22.2

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
19.0-20.0	51	27	14	7	trace	0	0	1

TM 27 NE 30 **2830 7835** **Lawn Farm, Fressingfield**

Surface level +53.1 m
Water struck at +38.6 m
B 30 Power Auger 115 mm diameter
July 1982

Waste 21.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, waxy, olive grey, with scattered subangular chalk pebbles and sparse pebbles of flint (angular) and black Jurassic mudstone	14.3	14.5
Glacial Silt	Silt, soft, micaceous, olive grey	5.4	19.9
Boulder Clay (Lowestoft Till)	Clay, waxy, olive grey, with chalk and flint pebbles	0.7	20.6
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey to greyish brown, with sparse flint pebbles	0.8+	21.4

TM 27 NE 31 **2893 7604** **Chippenhall Green, Fressingfield**

Surface level +55.4 m
Water struck at c. +45.6 m
B 30 Power Auger 115 mm diameter
July 1982

Waste 20.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, moderate brown	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, silty, mottled light olive brown and light grey, becoming light olive grey, below 1.5 m and olive grey below 3.0 m; abundant fine chalk pebbles and scattered angular patinated flint pebbles	9.3	9.8
	Clay, waxy, olive grey, with chalk and flint pebbles; a bed of chalk gravel near the top	c .1.2	c.11.0
Glacial Silt	Silt, sandy, olive grey	7.3	18.3
Boulder Clay (Lowestoft Till)	Clay, waxy, stiff, olive black, with chalk and flint pebbles	1.8+	20.1

TM 27 NE 32 **2959 7785** **South-east of Home Farm, Fressingfield**

Surface level +54.0 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Waste 20.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.1	0.1
Boulder Clay (Lowestoft Till)	Clay, mottled light olive brown and light olive grey, with abundant rounded chalk pebbles	1.4	1.5
	Clay, olive grey, with chalk and occasional angular flint pebbles	1.5	3.0
	Clay, stiff, waxy, olive grey to olive black; pebbles of chalk, flint and black (Jurassic) mudstone	17.1+	20.1

TM 27 NE 33 **2532 7790** **North of West House Farm, Fressingfield** **Block J**

Surface level +28.5 m
Water struck at +25.9 m and +21.5 m
Shell and auger
October 1983

Overburden 2.3 m
Mineral 2.9 m
Waste 1.2 m
Mineral 11.4 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, dark yellowish brown	0.3	0.3
Alluvium	Clay, sandy and silty from 0.3 m to 0.8 m and from 2.0 m to 2.3 m, mottled orange brown and light olive grey	2.0	2.3
Glacial Sand and Gravel	**a** Sandy gravel with thin beds of clayey silt, flint cobbles below 3.3 m Gravel: coarse and fine; angular flint with some vein quartz and quartzite; some ironstone below 3.3 m Sand: medium, with some fine and coarse; angular quartz and flint; moderate yellow brown to moderate orange brown	2.9	5.2
Crag	Silt, clayey and sandy, laminated; strong orange	1.2	6.4
	b Sand: fine with some medium; well rounded quartz with some mica and traces of phosphate and glauconite; dusky yellow	11.4	17.8
	c Sand, dusky yellowish green, glauconitic	0.7+	18.5

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	7	49	44	2.3-3.3	6	18	38	5	18	15	0
				3.3-5.2	7	9	23	10	19	29	3
				Mean	**7**	**12**	**29**	**8**	**18**	**24**	**2**
b	7	93	0	6.4-8.3	21	27	51	1	0	0	0
				8.3-10.3	4	90	6	0	0	0	0
				10.3-12.3	4	84	12	0	0	0	0
				12.3-13.8	4	82	14	0	0	0	0
				13.8-15.8	5	73	22	0	0	0	0
				15.8-17.8	6	69	25	0	0	0	0
				Mean	**7**	**71**	**22**	**trace**	**trace**	**0**	**0**
c	6	94	0	17.8-18.5	6	52	42	0	0	0	0
a+b	**7**	**84**	**9**	**Mean**	**7**	**59**	**23**	**2**	**4**	**5**	**trace**

TM 28 SW 36 **2052 84.25** **Home Farm, Pulham St.Mary** **Block F**

Surface level + 43.1m
Water struck at + 24.6 m
Shell and auger
November 1982

Overburden 14.2 m
Mineral 10.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, moderate yellowish brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, silty, sandy towards the top, mottled strong orange, light olive brown and light olive grey to 1.9m; medium grey and olive grey from 1.9 m to base; scattered angular flint pebbles throughout, angular chalk pebbles below 1.6m, black (Jurassic) mudstone pebbles below 2.9 m; 0.3 m soft sandy laminated silt at 2.9 m	9.2	9.5
	Silt, soft, slightly micaceous, olive grey	2.8	12.3
	Clay, silty, olive grey, with subangular chalk and flint pebbles	1.9	14.2
Glacial Sand and Gravel	Sandy Gravel with thin beds of buff and light olive pebbly clay Gravel: fine and coarse with scattered quartzite cobbles in upper part; angular flint, quartzite and vein quartz with some rounded flint and igneous rock including porphyry and granite; traces of chalk and limestone	10.8+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
7	66	27	14.2-15.2	7	23	39	6	12	11	2
			15.2-16.2	7	21	38	7	15	12	0
			16.2-17.2	7	12	29	10	23	17	2
			17.2-18.2	9	8	26	13	24	20	0
			18.2-19.1	6	14	41	9	20	10	0
			19.1-20.2	4	16	38	7	19	12	4
			20.2-21.5	6	21	54	4	9	6	0
			21.5-23.0	8	27	58	2	3	2	0
			23.0-24.0	7	22	42	3	10	16	0
			24.0-25.0	6	14	36	8	21	15	0
			Mean	**2**	**18**	**41**	**7**	**15**	**11**	**1**

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
14.2-15.2	55	7	5	28	1	0	4	0
15.2-16.2	60	2	9	27	0	0	1	1
16.2-17.2	65	2	10	23	0	0	0	trace*
17.2-18.2	60	4	9	23	0	0	3**	1
18.2-19.1	71	2	10	23	0	0	3**	1
19.1-20.2	49	8	11	29	0	0	3**	trace
20.2-21.5	50	3	12	32	0	0	0	3
21.5-24.0	53	6	14	27	0	0	trace	0
24.0-25.0	50	5	12	29	0	1	1**	2
Mean	**57**	**4**	**10**	**26**	**trace**	**trace**	**2**	**1**

* shell
** including porphyry

TM 28 SW 37 **2003 8307** **North of Leist's Farm, Dickleburgh** **Block F**

Surface level +37.4m
Water struck at + 20.4m
Shell and auger
November

Overburden	10.7 m
Mineral	5.1 m
Waste	0.1 m
Mineral	4.4 m
Waste	4.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, dusky yellowish brown; scattered flint pebbles	0.4	0.4
? Alluvium	Silt, very clayey, stiff; finely laminated, mottled light olive brown and light brown, scattered angular flint pebbles	0.7	1.1
Channel Fill Deposits	Clay, stiff, waxy, olive grey; silty, mottled grey and brown to 4.0 m; pebbles and cobbles of chalk, patinated black and grey flint and some black (Jurassic) mudstone pebbles; 0.6 m 'clayey' sand at 2.1 m	9.6	10.7
	a 'Clayey' pebbly sand Gravel: mainly fine; angular flint and rounded chalk, with rounded flint, vein quartz, quartzite, limestone, black mudstone, shell and igneous and metamorphic rocks Sand: mainly medium, subangular quartz and chalk; olive grey	5.1	15.8
	Silt, sandy, soft, olive grey	0.1	15.9
	b 'Clayey' sand with thin partings of pebbly clay and sparse rounded chalk pebbles and charcoal fragments Sand: mainly fine, with some medium; well rounded quartz and some flint; olive grey	4.4	20.3
	Silt, clayey, stiff, dusky yellowish brown	3.4	23.7
	Clay and silt, sandy, olive grey; pebbles of angular flint, rounded flint and subangular chalk	1.3+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	13	76	11	10.7-11.7	18	19	37	8	14	4	0
				11.7-13.7	10	20	45	12	11	2	0
				13.7-15.8	14	30	47	5	4	0	0
				Mean	**13**	**24**	**44**	**8**	**9**	**2**	**0**
b	16	83	1	15.0-17.0	19	38	41	1	1	0	0
				12.0-18.0	17	38	42	2	1	0	0
				18.0-20.3	15	60	24	1	0	0	0
				Mean	**16**	**50**	**32**	**1**	**1**	**0**	**0**
a+b	15	29	6	**Mean**	15	36	38	5	5	1	0

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	10.7-11.7	55	4	4	5	25	2	1	4*
	11.7-13.7	35	1	4	6	45	4	2	3*
	13.7-15.8	31	0	0	8	11	0	0	0
	Mean	**48**	**2**	**4**	**6**	**34**	**2**	**1**	**3**

* including black mudstone and shell

TM 28 SW 38 **2039 3198** **Oliver's Wood, Dickleburgh** **Block F**

Surface level +47.5m
Water not struck
Shell and auger
November 1982

Overburden 13.7 m
Mineral 5.5 m
Waste 5.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate yellow brown	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, stiff, maily olive grey to light olive grey; abundant subangular chalk and angular flint pebbles: 0.2 m sandy olive grey silt at 9.5 m	13.2	13.7
Glacial Sand and Gravel	Sandy gravel, 'clayey' in upper part and with thin beds of olive grey sandy silt throughout Gravel: fine and coarse with some cobbles from 17 to 18.0 m; angular flint with rounded brown quartzite, some vein quartz and rounded flint and traces of chalk and limestone Sand: mainly medium; angular quartz and flint and a trace of chalk; olive brown	5.5	19.2
Boulder Clay (Starston Till)	Clay, silty and sandy, light grey to dark yellowish brown; angular patinated flint cobbles at top, scattered angular and well rounded black flint pebbles, some coarse sand grade chalk	5.8+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
10	62	28	13.7-15.0	15	21	37	6	12	9	0
			15.0-17.0	12	17	37	11	17	6	0
			17.0-18.0	7	9	35	13	20	10	6
			18.0-19.0	4	6	43	10	21	16	0
			19.-019.2	6	7	29	11	24	23	0
			Mean	**10**	**14**	**38**	**10**	**17**	**10**	**1**

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
13.7-15.0	58	3	13	23	2	0	0	1
15.0-17.0	58	8	8	24	0	0	2	0
17.0-18.0	56	2	8	31	0	1	1	1
18.0-19.0	58	8	6	26	trace	1	0	1
19.0-19.2	68	2	7	19	1	1	0	2
Mean	**60**	**4**	**8**	**25**	**1**	**1**	**trace**	**1**

TM 28 SW 39 **2026 8095** **Ingram's Lane, Brockdish** **Block F**

Surface level +47.6m
Water struck at + 39.4m
Shell and auger
October 1982

Overburden 12.0 m
Mineral 1.9 m
Waste 1.8 m
Mineral 12.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, moderate brown	0.2	0.2
?Channel Fill Deposits	Clay, silty at top and sandy in places, waxy from 1.2 to 4.3 m, stiff from 4.9 to 6.7 m, light olive grey and brown to olive black; angular to rounded pebbles of chalk, flint and dark grey to black mudstone; chalk boulders from 6.9 to 8.0 m; abundant coarse-sand grade chalk from 4.3 to 4.7 m	11.8	12.0
	a 'Very clayey' sand on sandy gravel Gravel: fine and coarse; angular flint with some quartzite, vein quartz and chalk Sand: mainly medium; angular quartz and flint with some chalk; yellowish brown	1.9	13.9
Beccles Beds (Starston Till)	Clay, silty and sandy, stiff; dusky yellowish brown, becoming darker with depth; scattered pebbles of black flint (rounded), vein quartz and quartzite; some coarse-sand grade chalk	1.8	15.7
(Ingham Sand and Gravel)	b 'Clayey' sandy gravel Gravel: fine, with some coarse; well rounded brown quartzite and angular brown flint with some rounded vein quartz and flint Sand: mainly medium; angular flint and quartz; strong brownish orange	7.3	23.0
(?Kesgrave Sands and Gravels)	c Pebbly sand, 'clayey' near base and with beds of orange and red, pebbly clay (?Paleosol) from 23.0m to 24.0m Gravel: mainly fine; subangular flint with well rounded white quartzite, vein quartz and some well rounded flint Sand: mainly medium; subangular and rounded quartz dusky yellow	2.5	24.5
Crag	d Sand, 'very clayey' near top, becoming less clayey with depth: medium, with some fine; well rounded quartz with some mica and glauconite; orange to pale yellow	2.5+	27.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	29	58	13	12.0-13.1	45	21	31	1	1	1	0
				13.1-13.9	9	4	41	16	16	14	0
				Mean	**29**	**14**	**37**	**7**	**7**	**6**	**0**
b	15	57	30	15.7-16.7	13	4	40	9	27	7	0
				16.7-17.7	15	2	42	10	23	8	0
				17.7-18.7	20	3	36	11	18	12	0
				18.7-19.7	10	4	47	13	21	5	0
				19.7-20.7	10	3	46	12	20	9	0
				20.7-21.7	8	2	40	18	21	11	0
				21.7-22.0	9	3	39	20	24	5	0
				Mean	**13**	**3**	**41**	**13**	**22**	**8**	**0**
c	7	73	20	22.0-23.0	4	3	67	12	12	2	0
				23.0-24.0	7	3	54	11	18	7	0
				24.0-24.5	12	4	49	11	15	9	0
				Mean	**7**	**3**	**59**	**11**	**15**	**5**	**0**
d	12	68	0	24.5-24.9	36	31	28	3	2	0	0
				24.9-25.9	11	7	82	0	0	0	0
				25.9-27.0	5	19	76	0	0	0	0
				Mean	**12**	**16**	**71**	**1**	**trace**	**0**	**0**
a+b+c	**14**	**61**	**25**	**Mean**	**14**	**5**	**45**	**11**	**18**	**7**	**0**
a-d	14	**66**	**20**	**Mean**	**14**	**7**	**50**	**9**	**14**	**6**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	13.1-13.9	77	0	8	12	2	0	0	1
b	15.7-16.7	28	0	28	43	0	0	0	1
	16.7-17.7	29	2	25	39	0	0	0	5
	17.7-18.7	32	3	16	44	0	0	0	5
	18.7-19.7	28	0	20	57	0	0	0	1
	19.7-20.7	41	2	16	39	0	0	0	2
	20.7-21.7	34	2	20	40	0	0	0	4
	21.7-22.0	35	3	12	48	0	0	0	2
	Mean	**33**	2	**20**	**42**	**0**	**0**	**0**	**3**
c	23.0-24.0	56	11	17	16	0	0	0	0
	24.0-24.5	34	5	26	29	0	0	0	6
	Mean	**46**	**8**	**21**	**22**	**0**	**0**	**0**	**3**

TM 28 SW 40 **2109 8334** **Rookery Farm, Pulham St.Mary** **Block F**

Surface level +42.2m
Water struck at +39.6m and +19.2m
Shell and auger
November 1982

Waste 24.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Clay, with angular flint rubble and bricks	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, slightly silty, mottled dark yellowish orange and light olive grey to 2.6m, waxy and olive grey below; abundant pebbles of chalk (rounded) and flint (angular), some black (Jurassic) mudstone pebbles, scattered angular flint cobbles near top; 0.5 m silt at 3.6 m and at base	23.0	23.5
Beccles Beds (Ingham Sand and Gravel)	Sandy gravel Gravel: fine and coarse with some cobbles, angular flint and rounded brown quartzite, with some vein quartz and rounded flint Sand: medium with some coarse and fine; rounded quartz with some angular flint and chalk	1.3+	24.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
3	53	44	23.5-24.8	3	9	29	15	24	17	1

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
23.5-24.8	43	3	13	38	0	0	0	3*

* mainly ironstone

TM 28 SW 41 **2147 8046** **West of Newditch Farm, Brockdish** **Block F**

Surface level +41.6m
Water not struck
Shell and auger
November 1982

Waste 24.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		0.6	0.6
Boulder Clay (Lowestoft Till)	Clay, silty, mottled moderate yellowish brown and medium light grey to 2.4 m, mainly olive grey to olive black below; abundant rounded chalk and angular flint pebbles, some sandstone pebbles below 6.0 m, sparse shell fragments near top; pebbles iron-stained near base	13.6	14.2
Beccles Beds (Starston Till)	Clay, sandy and silty, moderate to dark yellowish brown; rounded pebbles of chalk, vein quartz, quarzite and angular flint pebbles; thin beds of pebbly quartz sand near top	1.4	15.6
	Sand, moderate yellowish brown, traces of chalk in upper part	0.8	16.4
(Starston Till)	Clay, sandy and silty, friable pinkish orange brown to 17.8 m becoming greyish brown below; scattered pebbles of flint, vein quartz, and green volcanic rock	7.6+	24.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines	Sand			Gravel			
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm	
6	93	1	15.6-16.4	6	43	49	1	1	0	0	

TM 28 SW 42 **Crossingford Crossing, Pulham St.Mary** **Block G**

Surface level + 26.3m
Water struck at 24.1 m
Shell and auger
November 1982

Overburden	2.3 m
Mineral	2.9 m
Waste	0.1 m
Mineral	7.8 m
Waste	0.2 m
Mineral	2.7 m
Waste	2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, humic, dark brown	0.5	0.5
Alluvium	Clay, silty, moderate brown; scattered fine angular flint pebbles and gastropod shells	0.1	0.6
Peat	Peat, part silty brownish black; scattered flint pebbles and shell fragments	1.6	2.2

Alluvium	Silt, clayey and sandy, mottled orange and light olive brown scattered flint and quartz pebbles	0.1	2.3
Channel Fill Deposits	a Pebbly sand, 'clayey' near top Gravel: fine and coarse; angular flint with quartzite, vein quartz, rounded flint and chalk; some limestone and igneous and metamorphic rocks above 4.2m Sand: mainly medium; angular quartz and flint with a trace of chalk	2.9	5.2
	Silt, soft, brownish olive grey	0.1	5.3
	b Pebbly sand with cobbles of rounded black flint and brown quartzite from 8.7m to 10.7m Gravel: fine and coarse; angular flint with rounded quartzite and some vein quartz and rounded flint; sparse chalk pebbles below 10.7m Sand: mainly medium and fine; angular quartz and flint with some chalk; olive grey	7.8	13.1
	Silt, slightly sandy, light olive grey	0.2	13.3
	c 'Very clayey' sand with sparse chalk and flint pebbles Sand: mainly fine with some medium; angular quartz with a trace of chalk; light olive grey	2.7	16.0
	Silt, soft, becoming firm and clayey; laminated below 18.0 m, light olive grey	2.5+	18.5

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	8	84	8	2.3-3.2	18	19	50	2	4	7	0
				3.2-4.2	3	13	66	8	7	3	0
				4.2-5.2	3	16	74	4	3	0	0
				Mean	**8**	**16**	**63**	**5**	**5**	**3**	**0**
b	5	85	10	5.3-7.2	6	52	40	1	1	0	0
				7.2-8.7	4	24	58	4	7	3	0
				8.7-10.7	2	11	55	8	10	12	2
				10.7-12.7	8	42	40	4	5	1	0
				12.7-13.1	10	39	43	4	2	2	0
				Mean	**5**	**33**	**48**	**4**	**5**	**4**	1
c	27	72	1	13.3-16.0	27	49	21	2	1	0	0
a+b	**6**	**85**	**9**	**Mean**	**6**	**28**	**53**	**4**	**5**	**4**	**trace**
a+b+c	**10**	**63**	**7**	**Mean**	**10**	**53**	**46**	**4**	**4**	**3**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	2.3-4.2	58	8	10	14	5	2	2	1*
	4.2-5.2	46	0	13	37	4	0	0	0
	Mean	**57**	**7**	**10**	**16**	**5**	**2**	**2**	1
b	7.2-8.7	62	0	4	28	0	0	0	6
	8.7-10.7	57	0	6	31	0	0	3	3
	10.7-13.1	52	17	11	9	4	0	0	8*
	Mean	**56**	**3**	**6**	**28**	1	**0**	1	5

* including shell fragments

TM 28 SW 43 **2279 8478** **North of Streamlet Farm, Starston** **Block G**

Surface level +34.3
Water struck at +21.4 m
Shell and auger
November 1982

Overburden	3.0 m
Mineral	0.8 m
Waste	0.2 m
Mineral	5.2 m
Waste	3.7 m
Mineral	2.1 m
Waste	1.2 m
Bedrock	8.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, dark yellowish brown	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy, mottled olive grey and light brown; a bed of chalk cobbles at 2.7m; angular flint pebbles to 1.0m, abundant chalk pebbles below	2.5	3.0
Glacial Sand and Gravel	**a** Sandy gravel Gravel: fine and coarse; angular black flint, rounded brown flint, brown quartzite and some vein quartz Sand: mainly medium, subangular quartz; brownish orange	0.8	3.8
Boulder Clay (Lowestoft Till)	Clay, silty and sandy, mottled olive grey and moderate brown; abundant pebbles of chalk and rounded and angular flint	0.2	4.0
Beccles Beds ('Glacial')	**b** Pebbly sand Gravel: fine and coarse; angular flint and rounded quartzite with some vein quartz and rounded flint Sand: mainly medium subrounded quartz with some coarse flint; a trace of chalk above 7.0 m; pale to dark yellowish orange	5.2	9.2
(?Starston Till)	Clay, silty and sandy, light olive grey; occasional chalk and rounded and angular flint pebbles	3.7	12.9
('Glacial')	**c** Sand, with sparse angular flint and rounded vein quartz pebbles: mainly medium, subangular quartz; brownish orange	2.1	15.0
	Silt, clayey to sandy, with fine angular flint pebbles towards the base; light olive grey	1.2	16.2
Upper Chalk	Chalk, hard to 23.0 m, becoming soft below, white	8.8+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	4	71	25	3.0-3.8	4	17	48	6	15	10	0
b	2	83	15	4.0-6.0	3	17	59	6	9	6	0
				6.0-7.0	3	22	59	4	7	5	0
				7.0-9.2	2	15	58	8	9	8	0
				Mean	**2**	**17**	**60**	**6**	**9**	**6**	**0**
c	5	94	1	12.9-15.0	5	27	66	1	1	0	0
a+b+c	**3**	**85**	**12**	**Mean**	**3**	**20**	**60**	5	**7**	5	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	4.0-6.0	40	21	14	22	0	0	0	3
	6.0-7.0	40	0	18	40	0	0	0	2
	7.0-9.2	60	2	12	25	0	0	0	1
	Mean	**46**	**7**	**15**	**30**	**0**	**0**	**0**	**2**

TM 28 SW 44 **2236 8384** **Brickkiln Farm, Starston** **Block G**

Surface level +41.9m
Water struck at +21.4m
Shell and auger
December 1982

Overburden 17.3 m
Mineral 6.3 m
Waste 1.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, firm to very stiff, waxy below 3.2 m, mottled to 2.9 m, mainly dark grey below; chalk and flint pebbles, scattered cementstone cobbles; 0.3 m silt at 3.2 m	16.9	17.3
Beccles Beds ('Glacial')	Sandy gravel on pebbly sand Gravel: mainly fine with some coarse: angular and rounded flint, brown quartzite and vein quartz; some chalk, igneous and metamorphic rocks and black (Jurassic) mudstone near the top Sand: mainly medium; subrounded and angular quartz with some angular flint and a trace of chalk; yellowish brown, becoming olive grey, towards the base	6.3	23.6
	Silt, soft, laminated, light olive grey, interbedded with clay and sand	1.2	24.8
(Starston Till)	Clay, sandy and silty, firm, light olive grey to dark brown, scattered black flint pebbles and coarse-sand grade chalk	0.7+	25.5

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
5	73	22	17.3-18.3	7	16	38	11	22	6	0
			18.3-19.3	6	12	31	14	26	11	0
			19.3-20.0	7	7	26	15	31	14	0
			20.0-20.5	7	23	39	6	18	7	0
			20.5-22.0	3	24	60	3	6	4	0
			22.0-23.6	6	26	55	5	6	2	0
			Mean	**5**	**19**	**46**	**8**	**16**	**6**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
	17.3-18.3	59	5	8	11	2	0	2	13*

* including ironstone and black mudstone

TM 28 SW 45 **2227 8170** **South of Burnt House Lane, Needham** **Block F**

Surface level + 32.6m
Water struck at +25.6m
Shell and auger
November 1982

Overburden	1.1 m
Mineral	8.4 m
Waste	4.7 m
Mineral	3.4 m
Waste	0.1 m
Mineral	7.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and sandy, moderate brown; scattered angular flint pebbles	0.3	0.3
Head	Clay, sandy and silty, firm, dark yellowish brown; scattered angular grey flint and rounded vein quartz pebbles	0.8	1.1
Beccles Beds ('Glacial')	**a** Gravel, part sandy, on pebbly sand Gravel: fine and coarse, with some cobbles in upper part; angular flint, rounded brown and white quartzite, vein quartz and some rounded flint, chalk and limestone; traces of igneous and metamorphic rock Sand: mainly medium; angular and rounded quartz and flint with some mica; orange to moderate yellowish brown	8.4	9.5
(Starston Till)	Clay, silty and sandy, firm to soft, yellowish brown to dark brown (becoming darker with depth); abundant rounded chalk pebbles at top; scattered angular and rounded pebbles of flint, vein quartz and quartzite; some coarse-sand grade chalk	3.6	13.1
	Silt, sandy, laminated, moderate brown to dark olive grey; insect fossils including beetles and ichneuman flies from 13.7m to base	1.1	14.2
(Pebbly Series)	**b** Pebbly sand on gravel Gravel: fine and coarse; angular flint; rounded quartzite and quartz; some rounded flint and iron pan and traces of igneous rock Sand: mainly medium; angular to rounded quartz and flint; moderate yellowish brown to light greyish brown	3.4	17.6
	Silt, sandy, laminated, olive grey to black; fossils including beetles and ichneuman flies, mites and fish vertebrae	0.1	17.7
(Pebbly Series)	**c** Pebbly sand Gravel: mainly fine; angular flint, rounded quartz and quartzite with some rounded flint and igneous and metamorphic rocks Sand: mainly medium; subrounded quartz with some angular flint; strong orange	3.3	21.0
	d Sand: medium and fine; well rounded quartz; moderate brown; thin peaty silt with fossil beetles at 21.7 m	2.0	23.0
Crag	**e** Sand; fine and medium; well rounded quartz; strong orange	2.0+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	3	67	30	1.1-2.1	8	4	28	8	22	28	2
				2.1-3.1	4	4	48	7	14	19	4
				3.1-4.1	2	4	72	4	10	8	0
				4.1-5.1	2	3	31	11	27	24	2
				5.1-6.1	1	3	44	17	18	17	0
				6.1-7.0	2	3	56	13	17	9	0
				7.0-8.0	5	15	60	6	6	8	0
				8.0-9.5	4	38	41	7	8	2	0
				Mean	**3**	**11**	**47**	**9**	**15**	**14**	**1**
b	4	57	39	14.2-15.2	8	11	67	3	7	4	0
				15.2-16.2	2	8	42	7	23	18	0
				16.2-17.2	3	2	20	19	35	21	0
				17.2-17.6	1	3	27	10	27	32	0
				Mean	**4**	**6**	**41**	**10**	**23**	**16**	**0**
c	3	81	16	17.7-19.0	2	7	54	11	18	8	0
				19.0-21.0	3	11	66	10	9	1	0
				Mean	**3**	**10**	**61**	**10**	**12**	**4**	**0**
d	5	94	1	21.0-23.0	5	36	56	2	1	0	0
e	4	96	0	23.0-25.0	4	52	43	1	0	0	0
a+b	**4**	**64**	**32**	**Mean**	**4**	**10**	**45**	**9**	**17**	**14**	**1**
a-e	**4**	**73**	**23**	**Mean**	**4**	**17**	**48**	**8**	**13**	**10**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	1.1-2.1	59	4	10	22	0	0	1	4
	2.1-3.1	56	0	13	27	0	0	0	4
	3.1-4.1	56	9	13	22	0	0	0	0
	4.1-5.1	50	0	18	28	0	0	2	2
	5.1-6.1	58	4	15	21	0	0	trace	2
	6.1-7.1	58	5	15	16	0	0	1	5
	7.0-8.0	62	0	16	22	0	0	0	0
	8.0-9.0	76	2	5	12	2	1	0	2
	Mean	**57**	**3**	**13**	**23**	**trace**	**trace**	**1**	**3**
b	14.2-15.2	59	12	2	23	0	0	0	4*
	15.2-16.2	42	9	20	24	0	0	1	4
	16.2-17.2	36	9	21	29	0	0	trace	5*
	17.2-17.6	38	9	21	31	0	0	0	1*
	Mean	**40**	**9**	**19**	**28**	**0**	**0**	**trace**	4
c	17.7.19.0	30	1	23	40	0	0	3	3
	19.0-21	60	2	9	27	0	0	0	2
	Mean	**38**	**1**	**19**	**27**	**0**	**0**	**2**	**3**

* including iron pan

TM 28 SW 46 **2288 8145** **East of White House Farm, Needham** **Block H**

Surface level +18.6m
Water struck at 15.9m
Shell and auger
November 1982

Overburden 2.5 m
Mineral 6.0 m
Bedrock 2.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, humic, dusky brown	0.1	0.1
Peat	Peat, silty to slightly sandy, dusky brown to brownish black; abundant gastropod shells below 0.9m	2.1	2.2
?Alluvium	Silt, sandy, humic, laminated, mottled olive grey and dusky yellowish brown; scattered angular flint pebbles and wood fragments	0.3	2.5
Channel Fill Deposits	**a** Pebbly sand Gravel: fine with some coarse, cobbles from 3.2 to 4.2 m; angular flint with some rounded white quartzite, vein quartz, rounded flint and ironstone; a trace of igneous and metamorphic rocks and jasper	6.0	8.5
Crag	**b** Sand, greyish olive green, glauconitic, with thin beds of micritic limestone containing vertical sand-filled trace fossils (borings and burrows); some pebbles and cobbles of well rounded black flint below 10.5 m	2.7+	11.2

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	2	77	21	2.5-3.2	3	7	43	16	14	17	0
				3.2-4.2	1	6	33	25	17	16	2
				4.2-5.2	4	2	81	7	6	0	0
				5.2-6.2	2	4	75	8	10	1	0
				6.2-7.2	2	3	60	15	18	2	0
				7.2-8.5	1	6	56	10	18	9	0
				Mean	**2**	**5**	**59**	**13**	**14**	**7**	**trace**
b	3	93	4	8.5-10.5	2	21	75	1	0	1	0
				10.5-11.2	8	15	62	0	1	6	8
				Mean	**3**	**19**	**73**	**1**	**trace**	**2**	**2**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	2.5-3.2	59	6	16	15	0	0	1	3
	3.2-4.2	46	2	15	33	0	0	0	4
	4.2-6.2	50	2	18	25	0	0	0	5
	6.2-7.2	43	5	19	28	0	0	0	5*
	7.2-8.5	23	3	25	42	0	0	0	8*
	Mean	**45**	**4**	**18**	**28**	**0**	**0**	**trace**	**5**

* including ironstone

TM 28 SW 47 **2339 8483** **Starston Place, Starston** **Block G**

Surface level +41.1m
Water struck at 20.1m
Shell and auger
Decembr 1982

Overburden	10.6 m
Mineral	6.0 m
Waste	3.0 m
Mineral	5.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Sand, with brick, flint and quartzite rubble	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, silty, mottled light olive grey and moderate olive brown; scattered subangular chalk and angular flint pebbles	1.9	2.4
Glacial Silt	Silt, firm, moderate yellowish brown; some calcareous beds near the top; a bed of mottled light grey and yellowish brown silty clay, with chalk and flint pebbles, from 2.9m to 3.2m	1.7	4.1
Boulder Clay (Lowestoft Till)	Clay, silty, moderate brown and olive grey at the top; mottled olive grey below, becoming darker with depth, angular flint and subangular chalk pebbles; a bed of chalk cobbles at c.9.0m	6.5	10.6
Beccles Beds ('Glacial')	a Sandy gravel on pebbly sand Gravel: mainly fine; angular flint, with some rounded white quartzite, vein quartz, chalk, limestone, rounded flint and igneous and metamorphic rocks; a trace of shell Sand: mainly medium with some fine; subangular quartz with some coarse angular chalk and flint; yellowish orange to greyish orange	6.0	16.6
	Silt, laminated, becoming sandy towards the base; moderate brown to dusky yellow; calcareous at the top	0.4	17.0
(Starston Till)	Clay, silty, becoming sandy below 18.9m; calcareous in top 2m, buff, becoming greyish brown with depth; scattered rounded and angular black flint pebbles; some coarse-sand grade chalk	2.6	19.6
('Glacial')	b Sand: medium and fine; subangular quartz, with a trace of chalk; greyish yellow to pale yellowish brown; sparse angular flint pebbles	5.4+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	4	88	8	10.6-11.6	7	15	45	7	21	5	0
				11.6-13.4	3	25	64	4	4	0	0
				13.4-15.0	4	27	61	3	3	2	0
				15.0-16.6	5	20	63	5	7	0	0
				Mean	**4**	**23**	**61**	**4**	**7**	**1**	**0**
b	6	93	1	19.6-21.0	8	44	47	1	0	0	0
				21.0-23.0	6	60	31	2	1	0	0
				23.0-25.0	4	16	74	4	2	0	0
				Mean	**6**	**39**	**52**	**2**	**1**	**0**	**0**
a+b	5	**90**	5	**Mean**	5	31	56	3	4	1	0

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction .							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	10.6-11.6	52	2	8	17	6	9	1	5
	11.6-16.6	58	2	14	21	1	0	3	2*
	Mean	**54**	**2**	**9**	**18**	**4**	**7**	**2**	**4**

* including shell

TM 28 SW 48 **2289 8415** **Yewtree Farm, Starston** **Block G**

Surface level +29.6m
Water struck at + 26.1m
Shell and auger
December 1982

Overburden	1.4 m
Mineral	6.6 m
Waste	5.0 m
Mineral	8.5 m
Bedrock	2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, dark yellowish brown	0.5	0.5
Head	Clay, silty, stiff, mottled moderate brown and dark yellowish brown; scattered angular flint pebbles	0.9	1.4
Channel Fill Deposits	a 'Clayey' to 'very clayey' sand, silty, laminated: fine with some medium; subangular quartz; brownish orange to light olive brown; coarse subangular flint pebbles to 2.5m	6.6	8.0
	Silt, micaceous, olive grey; bed of dark brown waxy clay from 11.0m to 11.5m; bed of clayey chalk gravel at the base	4.5	12.5
	Clay, silty, stiff, olive grey; abundant subrounded chalk pebbles	0.5	13.0
	b Sandy gravel, with cobbles of rounded black flint and brown quartzite at the base Gravel: fine and coarse; angular flint with rounded brown quartzite, vein quartz, ironstone and rounded flint; some chalk, limestone and igneous and metamorphic rock Sand: medium with fine and coarse; subangular quartz, angular flint and chalk; olive grey	3.5	16.5
Beccles Beds (Ingham Sand and Gravel)	c Gravel, with some cobbles of well rounded black flint and brown quartzite below 18.0m Gravel: coarse and fine; angular flint and well rounded brown quartzite with some rounded flint and vein quartz Sand: mainly medium; angular quartz and flint with a trace of chalk; brown to olive brown	2.5	19.0
(Westleton Beds)	d Gravel; with well rounded black and grey flint cobbles Gravel: coarse and fine; well rounded black flint with subangular black and grey flint; some quartzite and vein quartz Sand: mainly medium; rounded quartz with some angular quartz and coarse angular black flint; olive brown	1.0	20.0
Crag	e Gravel Gravel: mainly coarse; well rounded glauconite-coated black flint, subangular black flint and shelly iron pan; some shell, vein quartz and quartzite Sand: fine and medium; rounded quartz and glauconite; some coarse shell; olive grey	1.5	21.5
Upper Chalk	Chalk; hard, white, with black flints	2.5+	24.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	19	80	1	1.4-2.5	21	60	11	0	0	8	0
				2.5-3.7	18	63	18	0	1	0	0
				3.7-5.7	11	74	15	0	0	0	0
				5.7-8.0	26	68	6	0	0	0	0
				Mean	**19**	**68**	**12**	**trace**	**trace**	**1**	**0**
b	6	59	35	13.0-14.5	11	37	28	7	12	5	0
				14.5-15.5	2	3	22	25	24	24	0
				15.5-16.5	1	6	27	17	21	27	1
				Mean	**6**	**18**	**26**	**15**	**18**	**17**	**trace**
c	1	45	54	16.5-18.0	1	2	45	9	16	27	0
				18.0-19.0	1	2	17	10	36	32	2
				Mean	**1**	**2**	**34**	**9**	**24**	**29**	**1**
d	2	38	60	19.0-20.0	2	3	23	12	28	29	1
e	2	24	74	20.0-21.0	1	6	6	3	31	53	0
				21.0-21.5	4	18	18	6	25	29	0
				Mean	**2**	**10**	**10**	**4**	**29**	**45**	**0**
b-e	3	40	51	13.0-21.5	3	10	25	11	23	27	1
a-e	10	61	29	Mean	10	36	19	6	13	16	trace

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	14.5-15.5	29	10	13	22	1	5	5	15*
	15.5-16.5	40	6	12	23	trace	0	4	15*
	Mean	**35**	**8**	**12**	**23**	**1**	**2**	**4**	**15**
c	16.5-18.0	46	2	23	27	0	0	0	3
	18.0-19.0	30	15	17	35	0	0	2	1
	Mean	**34**	**11**	**19**	**33**	**0**	**0**	**1**	**2**
d	19.0-20.0	24	47	10	17	0	0	trace	2
e	20.0-21.0	33	63	1	2	0	0	0	1
	21.0-1.5	23	25	5	trace	1	0	0	47**
	Mean	**30**	**53**	**2**	**1**	**trace**	**0**	**0**	**14**

* including ironstone, silicfied limestone and pyrite
** mainly shelly iron pan

TM 28 SW 49 **2319 8295** **Crane's Watering Farm, Starston** **Block G**

Surface level +40.6m
Water struck at +18.6m
Shell and auger
December 1982

Overburden	6.6 m
Mineral	9.0 m
Waste	0.9 m
Mineral	9.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, dark yellowish brown	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, firm, silty, mottled pale brown and orange to 3.0 m, dark grey below; a bed of silty fine sand from 1.6m to 1.9m; rounded chalk and angular flint pebbles	6.1	6.6
Beccles Beds ('Glacial')	**a** 'Clayey' sand; occasional angular flint and rounded chalk pebbles: thin beds of laminated, buff and orange, calcareous silt, from 10.2 m to 14.0 m; scattered charcoal fragments, below 9.0 m Sand: fine and medium; subrounded quartz with some chalk and angular flint; pale orange	8.0	14.6
	b 'Clayey' gravel, with a bed of buff silt, from 14.9 m to 15.0m Gravel: fine and coarse; angular flint, with rounded quartzite and some with quartz; coarse rounded flint, chalk, igneous and metamorphic rock, shell and ironstone Sand: fine and medium; angular quartz, flint and chalk; orange brown	1.0	15.6
	Silt, clayey, soft, greyish yellow	0.2	15.8
	c 'Clayey' sandy gravel with silt parting	0.4	16.2
(Starston Till)	Clay, sandy and silty; moderate yellowish brown; abundant rounded coarse-sand grade chalk: some pebbles of well rounded and angular flint	0.3	16.5
(Mendham Beds)	**d** Sand, fine and medium; rounded quartz with a trace of chalk; dark yellow and strong orange; scattered flint and quartz pebbles; some charcoal fragments and thin silt beds near base	8.8	25.3
(Pebbly Series)	e Sandy gravel Gravel: fine with some coarse; subangular flint with some rounded flint, vein quartz and quartzite Sand: mainly medium, with some fine and coarse; angular quartz, with some angular flint; moderate brown	0.7+	26.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	14	83	3	6.6-7.6	12	23	48	7	6	4	0
				7.6-9.6	10	30	50	5	4	1	0
				9.6-11.6	18	62	20	0	0	0	0
				11.6-14.0	16	68	16	0	0	0	0
				14.0-14.8	10	46	39	2	3	0	0
				Mean	**14**	**50**	**31**	**2**	**2**	**1**	**0**
b	11	37	52	14.6-15.6	11	12	15	10	26	26	0
c	17	45	38	15.8-16.2	17	21	17	7	20	18	0
d	6	93	1	16.5-18.5	9	80	11	0	0	0	0
				18.5-20.5	8	64	28	0	0	0	0
				20.5-22.0	4	32	63	0	1	0	0
				22.0-24.0	3	30	67	0	0	0	0
				24.0-25.3	4	39	51	2	3	1	0
				Mean	**6**	**49**	**43**	1	1	**trace**	0
e	2	67	31	25.3-26.0	2	17	40	10	21	10	0
a-e	**10**	**83**	**7**	**Mean**	**10**	**45**	**36**	**2**	**4**	**3**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	14.6-15.6	59	1	11	24	1	trace	2	2*
e	25.3-26.0	41	16	22	20	0	0	1	0

* shell and ironstone

TM 28 SW 50 **2324 8136** **Instead Hall Farm, Weybread** **Block H**

Surface level + 17.1m
Water struck at + 15.5m
Shell and auger
October 1982

Overburden 0.6 m
Mineral 13.9 m
Bedrock 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, humic, moderate brown	0.1	0.1
Peat	Peat, silty and sandy, with occasional angular flint pebbles; moderate brown	0.5	0.6
River Terrace Deposits	a Pebbly sand, 'clayey' in upper part Gravel: fine and coarse; angular flint with some quartzite, vein quartz and rounded flint Sand: mainly medium; rounded vein quartz and flint; pale yellowish brown	2.0	2.6

Channel Fill Deposits	**b** Sandy gravel and pebbly sand Gravel; fine and coarse with some cobbles, angular flint with some rounded flint, vein quartz, chalk and silicified limestone; sparse red chalk, jasper, limestone and shell Sand: mainly medium; angular flint and quartz; some rounded chalk; pale yellowish brown, becoming olive grey with depth	11.9	14.5
Crag	**c** Sand, glauconitic, greenish grey	2.5+	17.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	8	76	16	0.6-1.6	13	6	70	2	5	4	0
				1.6-2.6	4	5	66	3	10	10	2
				Mean	**8**	**6**	**67**	**3**	**8**	**7**	**1**
b	2	73	25	2.6-3.6	4	5	60	4	14	13	0
				3.6-4.6	2	3	50	6	24	15	0
				4.6-5.6	1	1	37	9	34	18	0
				5.6-6.6	2	3	60	9	20	6	0
				6.6-7.6	0	3	56	8	18	13	2
				7.6-8.6	2	2	57	9	20	10	0
				8.6-9.6	3	6	43	15	10	21	2
				9.6-10.6	0	8	56	12	9	15	0
				10.6-13.0	4	41	51	3	1	0	0
				13.0-14.0	4	21	34	15	12	14	0
				14.0-14.5	4	30	36	9	10	9	2
				Mean	**2**	**14**	**51**	**8**	**14**	**11**	**trace**
c	4	95	1	14.5-15.5	5	44	48	1	1	1	0
				15.5-17.0	3	32	65	0	0	0	0
				Mean	**4**	**37**	**57**	**1**	**1**	**trace**	**0**
a+b	**3**	**74**	**23**	**0.6-14.5**	**3**	**13**	**54**	**7**	**13**	**10**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.6-1.6	74	0	3	6	0	0	0	17
	1.6-2.6	81	4	4	9	0	0	1	1
	Mean	**79**	**3**	**4**	**8**	**0**	**0**	**1**	**5**
b	2.6-3.6	56	4	2	13	16	2	1	6
	3.6-4.6	58	10	6	8	13*	1	0	4**
	4.6-5.6	63	9	7	7	9	2	trace	3***
	5.6-6.6	59	8	10	10	7	trace	0	6***
	6.6-7.6	67	6	10	5	8	trace	0	4***
	7.6-8.6	59	14	10	7	3	3	trace	4***
	8.6-9.6	63	6	11	14	5	0	0	1
	9.6-10.6	76	8	12	3	0	0	0	1
	13.0-14.0	55	11	8	18	4	1	0	3
	14.0-14.5	51	6	16	9	1	0	0	7
	Mean	**61**	**9**	**8**	**9**	**8**	**1**	**trace**	**4**

* including red chalk ** including shell *** including silicified limestone

TM 28 SW 51 **2329 8037** **Instead Manor House, Weybread** **Block K**

Surface level +38.3 m
Water struck at +36.5 m
Shell and auger
October 1982

Waste 25.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, with scattered angular flint pebbles	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, sandy, pale to moderate reddish brown near top, olive grey below and darkening with depth, mainly firm; scattered flint pebbles to 3.4 m, abundant chalk and flint pebbles below; clayey pebbly sand partings throughout	19.9	20.3
Beccles Beds (Pebbly Series)	'Clayey' to 'very clayey' sandy gravel and pebbly sand Gravel: fine and coarse; subangular and rounded flint, some vein quartz and quartzite and a trace of chalk Sand: mainly medium; subangular flint with subrounded quartz and a trace of chalk; yellowish brown	4.7+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
15	64	21	20.3-22.1	21	16	26	7	17	13	0
			22.1-25.0	12	21	46	7	10	4	0
			Mean	**15**	**19**	**38**	**7**	**13**	**8**	**0**

TM 28 SW 52 **2458 8434** **South of Baker's Barn, Harleston** **Block G**

Surface level +33.4 m
Water struck at +17.8 m
Shell and auger
November 1982

Overburden	0.6 m
Mineral	2.9 m
Waste	2.2 m
Mineral	4.6 m
Waste	2.1 m
Mineral	2.6 m
Waste	0.6 m
Mineral	10.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, sandy; moderate brown	0.6	0.6
Head and Head Gravel	**a** 'Very clayey' pebbly sand on 'clayey' sandy gravel Gravel: coarse with fine; angular flint, with some quartz, quartzite, rounded flint and iron pan Sand: mainly medium; angular flint and angular quartz; brownish orange	2.9	3.5
Calcareous Tuffa	Calcite silt, very pale orange	0.1	3.6
? Glacial Laminated Deposits	Silt interlaminated with clay and sand	2.1	5.7

Beccles Beds ('Glacial')	**b** Pebbly sand Gravel: mainly coarse with some cobbles at c.7.0 m; angular flint with some quartzite, rounded flint and vein quartz Sand: medium; subangular quartz, with a trace of chalk; strong orange to pale yellow	4.6	10.3
(? Starston Till)	**c** 'Very clayey' sandy gravel, predominantly chalk	1.8	12.1
	Silt, sandy, light olive brown; sparse chalk pebbles	0.3	12.4
('Glacial')	**d** 'Very clayey' sandy gravel, with angular chalk cobbles at the base Gravel: fine with some coarse and chalk cobbles at base; angular chalk with angular flint; some angular shell and limestone Sand: medium with coarse; angular chalk with some angular flint; buff, becoming dusky brown to black at the base	2.6	15.0
(Starston Till)	Clay, sandy, silty, firm, moderate brown; scattered angular flint and rounded vein quartz pebbles, some coarse-sand grade chalk	0.6	15.6
(Pebbly Series)	**e** Sandy gravel Gravel: coarse and fine with some cobbles; angular flint, with some rounded brown quartzite, vein quartz, rounded flint and shell; traces of chalk, limestone and igneous and metamorphic rocks Sand: mainly medium; angular quartz with some angular flint and a trace of chalk; dark to moderate yellowish brown	10.4+	26.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	19	62	19	0.6-1.6	20	31	24	3	8	14	0
				1.6-2.6	24	28	32	5	8	3	0
				2.6-3.5	12	17	38	6	10	13	4
				Mean	**19**	**25**	**32**	**5**	**8**	**10**	**1**
b	7	82	11	5.7-6.7	10	35	49	1	1	4	0
				6.7-7.7	6	17	45	7	7	16	2
				7.7-10.0	6	26	56	3	4	5	0
				10.0-10.3	4	14	80	2	0	0	0
				Mean	**7**	**25**	**54**	**3**	**4**	**7**	**trace**
c	37	47	16	10.3-12.1	37	6	26	15	13	3	0
d	24	44	32	12.4-14.7	25	6	24	16	20	9	0
				14.7-15.0	12	4	11	12	20	28	13
				Mean	**24**	**6**	**23**	**15**	**20**	**11**	**1**
e	2	58	40	15.6-16.6	8	32	46	7	6	1	0
				16.6-18.0	2	29	46	2	6	15	0
				18.0-19.0	2	10	34	11	22	21	0
				19.0-20.0	2	5	30	8	23	32	0
				20.0-21.0	2	18	54	7	10	7	2
				21.0-22.0	1	11	36	9	19	24	0
				22.0-23.0	1	5	32	9	30	23	0
				23.0-24.0	2	2	26	13	24	33	0
				24.0-25.0	1	2	31	15	29	22	0
				25.0-26.0	1	3	22	19	25	25	5
				Mean	**2**	**12**	**36**	**10**	**19**	**20**	**1**
a+b+ d+e	**9**	**61**	**30**	**Mean**	**9**	**16**	**37**	**8**	**14**	**15**	**1**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	1.0-1.6	95	0	3	0	0	0	0	2
	1.6-2.6	86	0	8	6	0	0	0	0
	2.6-3.5	79	5	0	8	0	0	0	8*
	Mean	**86**	**2**	**4**	**5**	**0**	**0**	**0**	**3**
b	6.7-10.0	63	8	4	13	0	0	0	4
c	10.3-12.1	13	0	0	0	86	0	0	1**
d	12.4-14.7	23	0	0	1	68	trace	0	8**
	14.7-15.0	37	1	0	2	45	4	0	11**
	Mean	**34**	**1**	**0**	**1**	**51**	**3**	**0**	**10**
e	15.6-18.0	53	8	13	19	1	0	0	6
	18.0-19.0	46	8	14	28	0	0	1	3
	19.0-20.0	40	5	20	33	0	0	trace	2
	20.0-21.0	54	3	19	11	1	0	0	12**
	21.0-22.0	34	10	20	32	0	0	0	4
	22.0-23.0	33	17	23	23	1	0	0	3
	23.0-24.0	36	17	18	23	trace	1	0	5**
	24.0-25.0	48	17	10	21	0	0	0	4**
	25.0-26.0	39	7	19	32	0	0	0	3
	Mean	**40**	**11**	**18**	**27**	**trace**	**trace**	**trace**	**4**

* mainly iron pan ** including shell

TM 28 SW 53 **2425 8385** **North of Pleasure Farm, Harleston** **Block G**

Surface level +32.5 m
Water struck at +14.5 m
Shell and auger
December 1982

Overburden	0.5 m
Mineral	2.0 m
Waste	16.5 m
Mineral	1.9 m
Waste	0.7 m
Mineral	3.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, silty, moderate brown	0.5	0.5
Head	a 'Very clayey' pebbly sand Gravel: fine and coarse; angular flint with some rounded quartzite, vein quartz, rounded flint, iron pan and ironstone Sand: fine with some medium; subangular quartz; orange brown	2.0	2.5
	Clay, silty and sandy, orange brown; scattered angular patinated flint pebbles	0.4	2.9
Boulder Clay (Lowestoft Till)	Clay, firm, waxy, olive grey, silty at the top; pebbles of chalk (rounded), flint (angular) and black (Jurassic) mudstone; beds of dark olive grey sandy silt from 5.6 m to 5.8 m and from 9.0 m to 9.2 m	13.3	16.2
Beccles Beds (Starston Till)	Clay, silty and sandy, brownish grey; some coarse-sand grade chalk; scattered black flint and vein quartz pebbles	1.8	18.0
	Silt, sandy, olive grey	1.0	19.0

('Glacial')	b Pebbly sand Gravel: mainly coarse; rounded flint, vein quartz, chalk and angular flint Sand: mainly medium; subangular quartz with a trace of angular chalk	1.9	20.9
(Starston Till)	Clay, silty and sandy, dark greyish brown; scattered black angular flint, rounded vein quartz and green volcanic pebbles; some coarse-sand grade chalk	0.7	21.6
(Pebbly Series)	c Gravel; cobbles of angular patinated flint, well rounded black flint and brown quartzite, from 22.6 m to 23.6 m Gravel: fine with some coarse, cobbles from 22.6 to 23.6 m; angular flint with rounded brown quartzite, vein quartz, rounded flint and green volcanic pebbles; traces of chalk, limestone and shell Sand: mainly medium; angular quartz and flint with a trace of chalk; olive grey, becoming moderate brown with depth	3.4+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	21	71	8	0.5-1.5	18	39	30	3	5	5	0
				1.5-2.5	24	48	20	3	4	1	0
				Mean	**21**	**43**	**25**	**3**	**5**	**3**	**0**
b	4	90	6	19.0-20.9	4	29	60	1	2	4	**0**
c	1	48	51	21.6-22.6	1	5	27	14	29	24	0
				22.6-23.6	2	4	30	9	35	18	2
				23.6-25.0	1	4	42	8	29	16	0
				Mean	**1**	**4**	**34**	**10**	**31**	**19**	**1**
b+c	2	**64**	**34**	**Mean**	**2**	**13**	**44**	**7**	**20**	**14**	**trace**
a+b+c	7	**66**	**27**	**Mean**	**7**	**21**	**39**	**6**	**16**	**11**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.5-2.5	91	1	2	3	0	0	0	3*
c	21.6-22.6	41	13	17	23	0	trace	1	5
	22.6-23.6	35	9	19	28	trace	0	2	7
	23.6-25.0	27	19	12	35	0	0	2	5
	Mean	**35**	**13**	**17**	**27**	**trace**	**trace**	**2**	**6**

* ironstone and iron pan

TM 28 SW 54 **2478 8209** **North of Shotford Heath, Weybread** **Block H**

Surface level +14.9 m
Water struck at +11.9 m
Shell and auger
November 1982

Overburden	3.0 m
Mineral	7.2 m
Waste	0.1 m
Mineral	1.0 m
Bedrock	2.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, humic, dusky yellowish brown	0.4	0.4
Alluvium	Silt, slightly sandy, mottled orange and dark yellowish brown; sparse angular flint pebbles	0.3	0.7
Peat	Peat, fibrous, silty, with wood fragments towards the top, dusky yellowish brown to brownish black; sparse flint pebbles near base; 0.1 m silt and clay at 2.7 m	2.3	3.0
River Terrace Deposits	**a** Gravel Gravel: coarse with some fine and cobbles; angular patinated black flint with some brown quartzite, vein quartz, rounded flint, chalk, limestone and igneous and metamorphic rocks Sand: mainly medium; angular flint and quartz with a trace of chalk	1.0	4.0
Channel Fill Deposits	**b+c** Pebbly sand, 'clayey' towards base and with 0.1 m silt parting at 10.3 m Gravel: fine with some coarse, cobbles from 9.2 to 10.2 m; angular flint with some quartzite, vein quartz, rounded flint, chalk and limestone; wood from 7.0 to 10.2 m Sand: medium with some fine; rounded and subangular quartz with some angular flint and chalk; some glauconite and mica below 11.0 m	7.3	11.3
Crag	**d** Sand, greyish green, glauconitic; shells and phosphate and iron pan pebbles	2.9+	14.2

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	1	20	79	3.0-4.0	1	2	14	4	27	45	7
b	2	77	21	4.0-5.0	1	23	49	7	15	5	0
				5.0-6.0	1	20	48	7	17	5	2
				6.0-7.0	3	22	50	8	14	3	0
				7.0-9.2	2	39	45	4	7	3	0
				9.2-10.2	3	27	16	8	17	18	11
				Mean	**2**	**29**	**42**	**6**	**13**	**6**	**2**
c	12	70	18	10.3-11.3	12	33	33	4	11	7	0
d	4	92	4	11.3-13.0	4	58	35	1	2	0	0
				13.0-14.2	4	50	34	5	7	0	0
				Mean	**4**	**55**	**34**	**3**	**4**	**0**	**0**
a+b	**2**	**69**	**29**	**3.0-10.2**	**2**	**25**	**38**	**6**	**15**	**11**	**3**
b+c	**4**	**76**	**20**	**Mean**	**4**	**29**	**41**	**6**	**12**	**6**	**2**
a+b+c	**3**	**70**	**27**	**Mean**	**3**	**26**	**38**	**6**	**14**	**11**	**2**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	3.0-4.0	61	6	8	14	4	1	2	4*
b	4.0-5.0	79	1	3	9	7	0	0	1*
	5.0-6.0	59	8	9	7	14	2	0	1
	6.0-7.0	67	3	6	12	7	3	0	2
	7.0-9.2	72	7	7	6	1	6	0	1
	9.2-10.2	63	10	10	14	1	0	0	2
	Mean	**65**	**7**	**8**	**12**	**6**	**1**	**0**	**1**
c	10.3-11.3	55	5	4	16	0	1	0	19
d	13.0-14.2	0	0	0	0	0	0	0	100**

* including shell ** phosphate, iron pan and shell

TM 28 SW 55 **2454 8076** **The Grange, Weybread** **Block J**

Surface level +34.8 m
Water struck at +34.0 m and +16.9 m
Shell and auger
January 1983

Overburden 8.4 m
Mineral 16.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, sandy, firm, mottled moderate yelowish brown and yellowish grey; scattered flint pebbles	1.5	2.0
	Clay, stiff, olive grey, becoming moderate yellowish brown at the base; sand partings throughout; abundant rounded chalk and angular flint pebbles	6.4	8.4
Beccles Beds (Pebbly Series)	**a** 'Very clayey' sandy gravel on pebbly sand Gravel: fine and coarse with cobbles near top; angular flint with some rounded chalk, vein quartz and quartzite; a trace of shelly limestone Sand: mainly medium; subangular flint with some quartz and chalk; moderate brown	3.6	12.0
	b Sandy gravel Gravel: fine with coarse and some cobbles; subangular and rounded flint with some quartz and quartzite; a trace of chalk Sand: mainly medium; rounded quartz and subangular flint with a trace of chalk; moderate to greyish brown	5.0	17.0
	c 'Clayey' sand, pebbly near top and base Gravel: mainly fine; angular and subrounded flint, quartz and quartzite Sand: fine with some medium; subrounded flint and rounded quartz with a trace of chalk; moderate brown	6.1	23.1
(? Westleton Beds)	**d** Gravel Gravel: coarse and fine; well rounded black and grey flint with some subangular flint, vein quartz and quartzite Sand: mainly medium; subrounded black flint and rounded quartz; yellowish grey	1.9+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	18	60	22	8.4-10.1	30	13	18	7	13	13	6
				10.1-11.1	7	16	55	5	11	6	0
				11.1-12.0	7	22	55	5	5	6	0
				Mean	**18**	**16**	**38**	**6**	**10**	**9**	**3**
b	8	48	44	12.0-13.0	8	6	24	11	28	23	0
				13.0-14.0	8	5	32	13	26	14	2
				14.0-15.0	8	3	28	20	26	15	0
				15.0-16.0	9	4	18	23	35	11	0
				16.0-17.0	6	5	26	17	25	21	0
				Mean	**8**	**5**	**26**	**17**	**27**	**17**	**trace**
c	19	77	4	17.0-18.1	17	33	36	4	7	3	0
				18.1-20.1	24	46	29	1	0	0	0
				20.1-22.1	16	23	21	0	0	0	0
				22.1-23.1	17	36	27	5	10	5	0
				Mean	**19**	**48**	**27**	**2**	**3**	**1**	**0**
d	3	40	57	23.1-24.1	3	9	20	10	20	38	0
				24.1-25.0	4	5	21	14	30	26	0
				Mean	**3**	**7**	**21**	**12**	**25**	**32**	**0**
a-d	**14**	**59**	**27**	**8.4-25.0**	**14**	**23**	**28**	**8**	**15**	**11**	**1**

TM 28 SW 56 **2129 8208** **Priory Farm, Dickleburgh** **Block F**

Surface level +46.4 m
Water not struck
Shell and auger
December 1982

Overburden	11.2 m
Mineral	4.7 m
Waste	0.1 m
Mineral	4.4 m
Waste	4.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, dark yellowish brown	0.4	0.4
? Made Ground	Silt, sandy and clayey, mottled light olive grey and light olive brown; angular flint pebbles and coarse-sand grade chalk below 1.0 m	2.2	2.6
Boulder Clay (Lowestoft Till)	Clay, silty, stiff, olive grey to olive black; abundant subrounded chalk and angular patinated flint pebbles; scattered black (Jurassic) mudstone pebbles	8.6	11.2
Glacial Sand and Gravel	**a+b** Sandy gravel; 0.1 m silt at 16.0 m and thin silt laminae near base Gravel: fine and coarse with flint cobbles to 14.2 m; angular flint with rounded brown quartzite; some vein quartz, rounded flint and limestone; traces of chalk and shell Sand: mainly medium; angular flint and quartz; brownish orange	9.2	20.4
Beccles Beds (? Starston Till)	Clay, silty and sandy, pale yellowish brown, becoming light olive grey with depth; abundant coarse-sand grade chalk and scattered angular black flint pebbles	4.6+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	7	47	46	11.2-12.2	6	11	32	7	14	25	5
				12.2-13.2	7	12	27	10	21	21	2
				13.2-14.2	7	6	23	12	24	17	11
				14.2-15.2	8	8	25	16	28	15	0
				15.2-15.9	6	8	30	11	26	19	0
				Mean	**7**	**9**	**27**	**11**	**23**	**19**	**4**
b	6	67	27	16.0-17.0	5	11	39	10	20	15	0
				17.0-18.0	4	9	40	11	20	14	2
				18.0-19.0	9	8	41	12	20	10	0
				19.0-20.0	7	21	46	7	13	6	0
				20.0-20.4	10	66	19	2	3	0	0
				Mean	**6**	**17**	**41**	**9**	**17**	**10**	**trace**
a+b	7	**56**	**37**	**Mean**	**7**	**13**	**33**	**10**	**20**	**15**	**2**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	11.2-12.2	70	5	5	18	0	0	0	2
	12.2-13.2	72	1	6	16	0	2	1	2
	13.2-14.2	60	9	8	18	0	0	1	4*
	14.2-15.2	70	4	5	17	0	0	0	4
	15.2-15.9	56	2	12	24	trace	2	0	4
	Mean	**65**	**4**	**8**	**19**	**trace**	**1**	**trace**	**3**
b	16.0-17.0	55	trace	11	24	0	0	3	7
	17.0-18.0	58	3	9	29	0	0	0	1
	18.0-19.0	59	2	8	23	trace	0	0	8
	19.0-20.0	66	2	9	21	1	0	0	1
	Mean	**59**	**2**	**9**	**24**	**trace**	**0**	**1**	**5**

* including shell

TM 28 SW 57 **2420 8243** **Dove House, Redenhall with Harleston** **Block G**

Surface level +33.7 m
Water struck at +15.2 m
Shell and auger
December

Overburden	4.3 m
Mineral	8.5 m
Waste	0.1 m
Mineral	2.0 m
Waste	0.1 m
Mineral	10.7 m
Waste	0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and sandy, moderate to greyish brown; scattered angular flint pebbles	0.8	0.8
Head	Clay, silty, firm; mottled moderate brown and light brown: pebbles and cobbles of angular black and grey flint	1.2	2.0
	a 'Clayey' sandy gravel Gravel: fine with coarse; angular black and grey flint; sparse rounded flint and vein quartz Sand: mainly medium; angular flint, with some angular quartz; moderate brown	0.8	2.8

	Silt, sandy, firm, laminated; dark yellowish orange: scattered angular grey flint pebbles	1.5	4.3
Glacial Sand and Gravel	**b** 'Clayey' gravel Gravel: coarse and fine with some cobbles; well rounded black flint and angular patinated flint, with some rounded quartzite and vein quartz; some angular chalk below 7.0 m; trace of iron pan in lower part Sand: mainly medium; angular flint and quartz; some angular chalk below 8.0 m; yellowish brown to moderate brown	8.5	12.8
Boulder Clay (Lowestoft Till)	Clay, waxy, stiff, olive grey; abundant iron-stained well rounded chalk, vein quartz and subangular flint pebbles	0.1	12.9
Beccles Beds ('Glacial')	**c** 'Very clayey' sand: mainly fine, well rounded quartz; pale greyish orange and dusky yellow; scattered rounded black flint pebbles	2.0	14.9
	Silt, soft, poorly laminated, moderate yellowish brown to light brown	0.1	15.0
	d Sand with scattered charcoal fragments: mainly medium; rounded quartz, with a trace of angular flint; dark yellowish orange and moderate yellowish brown	3.5	18.5
(Kesgrave Sands and Gravels)	**e** Pebbly sand Gravel: mainly fine; subangular and well rounded flint, with rounded white quartzite and vein quartz Sand: mainly medium; rounded quartz with some angular flint; pale yellowish brown	3.5	22.0
(Westleton Beds)	**f** Gravel Gravel: fine and coarse; well rounded black flint with some subangular black flint; sparse vein quartz and quartzite Sand: mainly medium; rounded quartz with some subangular flint; a trace of glauconite towards the base; moderate yellowish brown	3.7	25.7
Crag	**g** Sand: medium and fine, glauconitic, greyish olive	0.6+	26.3

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
a	15	54	31	2.0-2.8	15	11	30	13	19	12	0
b	11	37	52	4.3-5.3	10	6	15	9	24	36	0
				5.3-6.3	11	7	17	10	21	28	6
				6.3-7.3	7	3	17	12	25	34	2
				7.3-8.0	12	1	20	13	29	19	6
				8.0-9.0	12	1	26	10	22	26	3
				9.0-10.0	12	3	30	10	23	22	0
				10.0-11.0	12	3	30	10	23	22	0
				11.0-12.0	12	2	32	9	28	15	2
				12.0-12.8	12	4	26	10	24	24	0
				Mean	**11**	**3**	**24**	**10**	**24**	**26**	**2**
c	20	77	3	12.9-14.0	19	58	16	2	4	1	0
				14.0-14.9	22	51	25	1	1	0	0
				Mean	**20**	**56**	**20**	**1**	**3**	**trace**	**0**
d	3	97	0	15.0-17.0	4	19	77	0	0	0	0
				17.0-18.5	2	11	87	0	0	0	0
				Mean	**3**	**16**	**81**	**trace**	**trace**	**0**	**0**
e	2	82	16	18.5-19.7	1	16	65	7	7	4	0
				19.7-21.0	2	9	60	14	12	3	0
				21.0-22.0	2	6	57	10	15	10	0
				Mean	**2**	**10**	**62**	**10**	**11**	**5**	**0**
f	1	42	57	22.0-23.0	1	2	29	8	35	25	0
				23.0-24.0	1	4	33	8	21	33	0
				24.0-25.0	1	3	22	9	37	28	0
				25.0-25.7	2	14	36	4	23	21	0
				Mean	**1**	**5**	**30**	**7**	**30**	**27**	**0**
g	5	95	0	25.7-26.3	5	41	54	trace	0	0	0
b-f	8	**59**	**33**	**Mean**	**8**	**11**	**41**	**7**	**17**	**15**	**1**

TM 28 SW 58 **2362 8057** **North-east of Instead Manor House, Weybread** **Block J**

Surface level +19.2 m
Water struck at 15.2 m
Shell and auger
February 1983

Overburden	3.3 m
Mineral	5.7 m
Waste	0.5 m
Bedrock	3.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.8	0.8
Alluvium	Silt, sandy, becoming clayey near the base, pebbly near the top; laminated; moderate brown, becoming brownish grey with humic fragments below 2.0 m	1.8	2.6
Peat	Peat, silty, dusky brown; abundant wood fragments	0.7	3.3
Channel Fill Deposits	a Pebbly sand on sandy gravel, with a bed of peat from 3.9 m to 4.0 m and humic fragments to 7.5 m Gravel: fine and coarse; angular flint and rounded chalk; some rounded flint, vein quartz and quartzite below 7.5 m Sand: mainly medium; subangular quartz with some angular flint and chalk below 7.5 m; olive brown to olive grey	5.7	9.0
	Clay, waxy, dusky yellowish brown; thin silty partings; scattered rounded pebbles of flint and vein quartz	0.5	9.5
Crag	b Sand: fine and medium, glauconitic greyish olive green; thin beds of siltstone near top	3.5+	13.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	8	76	16	3.3-4.0	17	38	39	2	2	2	0
				4.0-6.0	12	25	49	2	5	7	0
				6.0-7.5	2	30	55	3	7	3	0
				7.5-8.5	2	16	45	9	20	8	0
				8.5-9.0	4	12	32	8	23	19	2
				Mean	**8**	**25**	**47**	**4**	**9**	**7**	**trace**
b	8	90	2	9.5-10.0	16	44	24	4	4	1	7
				10.0-11.5	8	63	25	3	1	0	0
				11.5-13.0	4	33	58	4	1	0	0
				Mean	**8**	**47**	**39**	**4**	**1**	**trace**	**1**

TM 28 SW 59 **2415 8436** **South of Conifer Hill, Starston** **Block G**

Surface level +18.7 m
Water struck at +16.9 m
Shell and auger
February 1983

Overburden	1.1 m
Mineral	9.7 m
Bedrock	6.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown; scattered angular flint pebbles	0.3	0.3
Alluvium	Silt, sandy, laminated, moderate brown to olive brown; occasional angular orange flint pebbles	0.8	1.1
Chanell Fill Deposits	**a** Sandy gravel; cobbles of well rounded black flint and brown quartzite, from 3.8 m to 6.8 m; thin beds of olive grey silt towards the base Gravel: fine and coarse, with cobbles from 3.8 to 6.8 m; angular flint with rounded brown quartzite and rounded flint; some vein quartz Sand: mainly medium subangular quartz; some coarse and fine angular flint and angular quartz; a trace of mica near the base; orange brown, becoming pale yellowish brown below 7.8 m	9.7	10.8
Crag	Silt, sandy and clayey, micaceous, laminated, dark greenish grey to greyish black	4.2	15.0
	b 'Clayey' sand, dark greenish grey, glauconitic, with bivalve shells	2.0+	17.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	3	52	45	1.1-1.8	16	29	31	2	11	11	0
				1.8-2.8	2	9	26	11	29	23	0
				2.8-3.8	1	5	18	10	32	34	0
				3.8-4.8	1	2	27	24	28	15	3
				4.8-5.8	0	2	46	16	24	10	2
				5.8-6.8	2	2	30	11	26	27	2
				6.8-7.8	1	6	32	10	24	27	0
				7.8-8.8	0	4	49	9	17	21	0
				8.8-9.8	2	5	47	13	22	11	0
				9.8-10.8	7	24	26	5	18	20	0
				Mean	**3**	**8**	**33**	**11**	**24**	**20**	**1**
b	12	81	7	15.0-17.0	12	41	26	14	7	0	0

TM 28 SW 60 **2229 8284** **Skeatsmere House, Needham** **Block F**

Surface level +38.2 m
Water struck at +30.2 m and +19.0 m
Shell and auger
September 1983

Overburden 17.8 m
Mineral 8.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, pale yellowish brown	0.3	0.3
Cover Sand	**a** 'Very clayey' pebbly sand Gravel: fine, angular flint Sand: mainly fine, rounded quartz with some medium subangular quartz, moderate yellowish brown	0.3	0.6
? Glacial Laminated Deposits	Silt, clayey and sandy, mottled dark orange, light olive grey and light olive brown; black (? organic) fragments throughout; scattered angular black and grey flint pebbles	1.1	1.7
Boulder Clay (Lowestoft Till)	Clay, stiff and waxy to 4.2 m, silty below, mottled light olive brown and light olive grey to 2.5 m, olive grey to olive black below; pebbles of chalk and angular flint, throughout; black shelly (Jurassic) mudstone below 2.5 m; a bed of olive grey silt from 14.5 m to 15.0 m	15.1	16.8
Channel Fill Deposits	**b** Sandy gravel with cobbles of well rounded black flint	0.6	17.4
	Silt, soft, with faint lamination, greyish orange to moderate yellowish brown	0.4	17.8
	c Sandy gravel Gravel: fine and coarse, with scattered cobbles to 19.2 m; angular patinated flint with some vein quartz and brown quartzite Sand: mainly medium; subangular quartz; some coarse angular flint and rounded quartz; moderate yellowish brown	3.2	21.0
	d Pebbly sand with a bed of light olive grey calcareous silt from 21.8 m to 22.0 m; charcoal fragments below 23.0 m Gravel: coarse and fine; angular black flint and rounded vein quartz Sand: mainly medium; well rounded quartz and chalk; light olive grey	5.0+	26.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	23	68	9	0.3-0.6	23	45	20	3	8	1	0
b	6	55	39	16.8-17.4	6	7	38	10	23	11	5
c	4	53	43	17.8-19.2	8	6	31	10	23	19	3
				19.2-21.0	1	7	40	10	20	22	0
				Mean	**4**	**6**	**37**	**10**	**21**	**21**	**1**
d	4	83	13	21.0-23.0	9	18	62	5	5	1	0
				23.0-26.0	1	28	51	2	5	13	0
				Mean	**4**	**24**	**56**	**3**	**5**	**8**	**0**
c+d	4	71	25	17.8-26.0	4	17	48	6	11	13	1

TM 28 SE 25 **2527 8461** **North of Lushbush, Redenhall with Harleston** **Block G**

Surface level +33.6 m
Water struck at +15.8 m
Shell and auger
January 1983

Overburden 2.7 m
Mineral 22.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey; scattered flint pebbles	0.5	0.5
? Boulder Clay	Clay, firm, moderate yellowish brown; abundant subangular flint pebbles	2.2	2.7
Beccles Beds ('Glacial')	**a** Sandy gravel Gravel: fine and coarse; subangular and subrounded black flint with some rounded brown quartzite and vein quartz; a trace of chalk Sand: mainly medium; rounded quartz and subangular flint; a trace of chalk; strong orange brown	4.0	6.7
(Pebbly Series)	**b** Pebbly sand Gravel: mainly fine; rounded brown flint and subangular grey flint; some vein quartz and quartzite Sand: medium and fine; rounded quartz and subangular flint; a trace of chalk; moderate yellowish brown	12.0	18.7
	c Sandy gravel Gravel: fine and coarse; subangular and subrounded flint, with some rounded quartz and quartzite Sand: medium and fine; subrounded quartz with some subangular flint and a trace of chalk; pale yellowish brown	6.3+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	5	62	33	2.7-3.7	5	5	44	16	17	11	2
				3.7-4.7	5	6	28	13	28	17	3
				4.7-5.7	4	8	44	9	17	16	2
				5.7-6.7	5	12	57	8	12	6	0
				Mean	**5**	**8**	**43**	**11**	**18**	**13**	**2**
b	5	86	9	6.7-8.7	7	51	38	2	2	0	0
				8.7-9.7	4	21	49	10	10	6	0
				9.7-10.7	8	56	32	2	1	1	0
				10.7-11.7	4	40	51	2	3	0	0
				11.7-12.7	5	23	53	4	15	0	0
				12.7-14.7	6	26	63	2	2	1	0
				14.7-15.7	5	20	54	7	9	5	0
				15.7-16.7	3	12	69	6	9	1	0
				16.7-17.7	4	12	65	7	8	4	0
				17.7-18.7	2	21	47	7	12	11	0
				Mean	**5**	**30**	**52**	**4**	**6**	**3**	**0**
c	4	71	25	18.7-19.7	5	23	29	12	24	7	0
				19.7-20.7	2	15	41	9	19	14	0
				20.7-21.7	2	10	39	10	23	16	0
				21.7-22.7	1	8	47	9	17	18	0
				22.7-23.7	3	20	47	8	11	11	0
				23.7-25.0	7	60	30	2	1	0	0
				Mean	**4**	**24**	**39**	**8**	**15**	**10**	**0**
a+b+c	**5**	**77**	**18**	**2.7-25.0**	**5**	**24**	**46**	**7**	**11**	**7**	**trace**

TM 28 SE 26 **2596 8356** **Green Lane, Redenhall with Harleston** **Block G**

Surface level +38.0 m
Water not struck
Shell and auger
January 1983

Overburden 9.5 m
Mineral 15.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, moderate brown	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, sandy, firm, moderate yellowish brown; scattered subangular flint pebbles; a thin bed of clayey angular flint sand at the base	1.0	1.3
	Clay, stiff, waxy, silty and sandy, mottled moderate yellowish brown and pale olive grey to 4.2 m, olive grey below; pebbles of angular flint and vein quartz to 4.2 m, pebbles and cobbles of rounded chalk and angular flint below 4.2 m	8.2	9.5
Beccles Beds ('Glacial')	**a** Pebbly sand Gravel: fine with coarse; subangular flint with some rounded flint, vein quartz and quartzite; a trace of chalk Sand: mainly medium; subangular flint, with some rounded quartz and a trace of chalk; pale yellowish brown	5.0	14.5
(Mendham Beds)	**b** Sand with a thin bed of sandy clay at 17.3 m Sand: fine and medium rounded quartz; strong yellowish orange, becoming very pale yellowish brown with depth	8.0	22.5
(Pebbly Series)	**c** Pebbly sand Gravel: mainly fine; angular flint with vein quartz and quartzite; some rounded flint and a trace of chalk Sand: mainly medium; subrounded quartz and flint; pale yellowish brown	2.5+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	5	80	15	9.5-10.5	5	10	50	6	15	14	0
				10.5-11.5	1	31	46	9	10	3	0
				11.5-12.5	6	31	48	4	8	3	0
				12.5-13.5	3	7	59	10	13	8	0
				13.5-14.5	8	30	55	2	2	3	0
				Mean	**5**	**22**	**52**	**6**	**9**	**6**	**0**
b	7	93	0	14.5-15.5	7	39	53	0	1	0	0
				15.5-16.5	6	68	26	0	0	0	0
				16.5-17.5	14	55	29	1	1	0	0
				17.5-18.5	16	44	40	0	0	0	0
				18.5-19.5	7	44	49	0	0	0	0
				19.5-20.5	3	51	46	0	0	0	0
				20.5-21.5	3	59	38	0	0	0	0
				21.5-22.5	4	39	55	1	1	0	0
				Mean	**7**	**51**	**42**	**trace**	**trace**	0	**0**
c	3	91	6	22.5-23.5	3	28	60	3	4	2	0
				23.5-25.0	4	21	66	2	5	2	0
				Mean	**3**	**24**	**65**	**2**	**4**	**2**	**0**
a+b+c	**6**	**88**	**6**	**9.5-25.0**	**6**	**37**	**48**	**3**	**4**	**2**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
c	22.5-25.0	57	7	19	16	1	0	0	0

TM 28 SE 27 **2560 8272** **Mendham Lane, Redenhall with Harleston** **Block G**

Surface level +42.2 m
Water not struck
Shell and auger
January 1983

Overburden 11.5 m
Mineral 13.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey; scattered flint pebbles	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, firm to stiff, mottled moderate yellowish brown and light olive grey to 2.5 m; mainly dark to olive grey below but brown and friable at base; abundant pebbles of flint and chalk	11.3	11.5
Beccles Beds ('Glacial')	**a** Pebbly sand Gravel: mainly fine; subangular flint with rounded quartzite and vein quartz; some rounded flint, chalk and limestone to 13.5 m Sand: mainly medium; subangular flint with subrounded quartz and a trace of chalk	5.0	16.5
(Mendham Beds)	**b** Sand with scattered charcoal fragments and partings of laminated clay Sand: fine, with some medium; subrounded quartz with some subangular flint and a trace of chalk; greyish orange	8.5+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	6	75	19	11.5-13.5	6	25	44	4	13	8	0
				13.5-14.5	9	22	56	5	7	1	0
				14.5-15.5	7	12	36	10	22	13	0
				15.5-16.5	4	30	53	3	5	5	0
				Mean	**6**	**23**	**47**	**5**	**12**	**7**	**0**
b	9	91	0	16.5-17.5	5	72	22	1	0	0	0
				17.5-18.5	20	69	11	0	0	0	0
				18.5-19.5	13	70	17	0	0	0	0
				19.5-20.5	7	54	39	0	0	0	0
				20.5-21.5	8	46	46	0	0	0	0
				21.5-23.5	7	71	22	0	0	0	0
				23.5-25.0	5	67	26	0	1	1	0
				Mean	**9**	**65**	**26**	**trace**	**trace**	**trace**	**0**
a+b	8	84	8	11.5-25.0	8	49	33	2	5	3	0

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	11.5-13.5	53	4	23	13	4	2	0	1
	13.5-16.5	57	10	13	17	0	0	0	3
	Mean	**56**	**8**	**15**	**16**	**1**	**1**	**0**	**3**

TM 28 SE 28 **2517 8066** **Stubbing's Lane, Weybread** **Block J**

Surface level +44.1 m
Water not struck
Shell and auger
October 1982

Overburden	9.3 m
Mineral	8.4 m
Waste	3.8 m
Mineral	2.9 m
Bedrock	0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty and clayey; scattered flint pebbles	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, silty, olive brown to olive black, becoming orange brown at the base; pebbles of chalk, patinated flint, black (Jurassic) mudstone and vein quartz; cobbles of cementstone and limestone with ammonites from 6.0 to 7.5 m	8.9	9.3
Beccles Beds ('Glacial')	**a** Pebbly sand, with charcoal fragments Gravel: fine and coarse; angular flint with some quartzite, rounded flint, vein quartz, subrounded chalk and limestone; traces of igneous and metamorphic rocks and shell Sand: mainly medium; subrounded quartz with some angular flint and subrounded chalk; brownish orange to moderate yellowish brown	8.4	17.7
(Starston Till)	Clay and silt, with rounded black flint and vein quartz pebbles	0.1	17.8
(Pebbly Series)	**b** Gravel, including traces of chalk	0.4	18.2
Crag	Clay, silty, laminated, mottled dark grey and dark orange	0.8	19.0
	Silt, sandy, light grey, with partings of pale yellow, fine quartz sand; some mica	2.6	21.6
	c 'Clayey' sand with silty clay partings: fine, well rounded quartz, with some mica; dark yellowish orange	2.9	24.5
	Clay, silty and sandy, laminated, olive grey	0.2	24.7
	d 'Clayey' sand, pale olive, with silt partings	0.5+	25.2

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	8	76	16	9.3-10.3	6	17	45	7	15	10	0
				10.3-11.0	7	21	52	6	11	3	0
				11.0-11.9	7	14	58	10	9	2	0
				11.9-13.2	10	37	45	4	3	1	0
				13.2-15.0	9	16	53	8	9	5	0
				15.0-16.1	8	13	49	9	18	3	0
				16.1-16.8	6	8	39	17	7	23	0
				16.8-17.7	5	12	56	6	13	8	0
				Mean	**8**	**18**	**50**	**8**	**10**	**6**	**0**
b	6	45	49	17.8-18.2	6	7	25	13	28	21	0
c	12	88	0	21.6-23.6	11	83	6	0	0	0	0
				23.6-24.5	12	81	7	0	0	0	0
				Mean	**12**	**82**	**6**	**trace**	**trace**	**0**	**0**
d	12	88	0	24.7-25.2	12	81	7	trace	0	0	0
a+c	9	**78**	**13**	**Mean**	**9**	**34**	**38**	**6**	**8**	**5**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	9.3-10.3	70	1	4	12	6	4	1	2*
	10.3-11.0	78	0	3	11	7	0	0	1
	11.0-13.2	57	0	9	2	22	9	0	1*
	13.2-15.0	65	8	3	13	3	0	0	8
	15.0-16.1	66	5	8	11	4	0	1	5
	16.1-16.8	63	16	4	10	trace	0	1	6
	16.8-17.7	52	25	10	10	3	0	0	trace
	Mean	**65**	**9**	**6**	**10**	**5**	**2**	**trace**	3
b	17.8-18.2	60	27	4	6	trace	0	0	3

* mainly shell

TM 28 SE 29 **2508 8021** **Mill Lane, Weybread** **Block J**

Surface level +49.9 m
Water struck at +47.4 m and +35.9 m
Shell and auger
October 1982

Overburden	0.5 m
Mineral	2.7 m
Waste	12.0 m
Mineral	9.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty, dark yellowish brown; abundant coarse, angular grey flint pebbles	0.5	0.5
Head Gravel	**a** Gravel, 'very clayey' towards base, ironstained Gravel: fine and coarse with some cobbles; angular grey flint, with some subangular quartzite, rounded flint, vein quartz and sandstone Sand: mainly medium coarse; angular flint and angular quartz; orange brown	2.7	3.2
Boulder Clay (Lowestoft Till)	Clay, silty to 7.8 m, waxy below, stiff, mainly olive grey; angular chalk, angular flint and black (Jurassic) mudstone pebbles	12.0	15.2
Beccles Beds ('Glacial')	**b** Pebbly sand with thin beds of light grey silt and charcoal fragments Gravel: mainly fine; angular flint with some subrounded chalk, rounded flint, vein quartz and quartzite; limestone and shell from 17.2 to 21.2 m Sand: mainly medium; angular quartz and flint; a trace of chalk; moderate brown	7.4	22.6
(Westleton Beds)	**c** Gravel Gravel: mainly fine; well rounded and subangular black flint Sand: mainly fine and medium; rounded quartz with some mica; pale yellow to pale grey	2.0+	24.6

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	14	34	52	0.5-1.5	9	6	20	18	28	19	0
				1.5-2.0	7	5	14	14	35	22	3
				2.0-3.2	21	5	13	9	23	25	4
				Mean	**14**	**5**	**16**	**13**	**27**	**23**	**2**
b	8	81	11	15.2-17.2	6	14	57	10	12	1	0
				17.2-19.2	9	20	50	8	9	4	0
				19.2-21.2	11	22	50	7	9	1	0
				21.2-22.6	6	17	65	6	6	0	0
				Mean	**8**	**18**	**55**	**8**	**9**	**2**	**0**
c	5	35	60	22.6-23.6	8	21	10	9	35	17	0
				23.6-24.6	3	14	10	7	46	20	0
				Mean	**5**	**17**	**10**	**8**	**41**	**19**	**0**
a+b+c	**9**	**64**	**27**	**Mean**	**9**	**15**	**40**	**9**	**18**	**9**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.5-1.5	70	6	11	11	0	0	0	2
	1.5-2.0	69	6	8	13	0	0	1	3
	Mean	**70**	**6**	**9**	**13**	**0**	**0**	**trace**	**2**
b	15.2-17.2	61	3	7	8	15	0	0	6
	17.2-19.2	63	3	1	10	16	2	0	5
	19.2-21.2	53	0	4	6	22	2	0	13*
	21.2-22.6	69	12	14	3	2	0	0	0
	Mean	**60**	**4**	**6**	**7**	**15**	**1**	**0**	**7**
c	22.6-23.6	56	40	1	2	0	0	1	0
	23.6-24.6	52	44	2	1	0	0	trace	1
	Mean	**55**	**42**	**1**	**1**	**0**	**0**	**1**	**trace**

* mainly shell

TM 28 SE 30 **2605 8176** **Priory Farm, Mendham** **Block H**

Surface level +13.7 m
Water struck at +11.1 m
Shell and auger
October 1982

Overburden	1.2 m
Mineral	7.7 m
Waste	2.2 m
Mineral	4.0 m
Bedrock	2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.3	0.3
Alluvium	Clay and silt, sandy, moderate brown	0.9	1.2
River Terrace Deposits	**a** Sand: medium; rounded quartz, with some angular flint and mica; brownish grey; sparse flint pebbles and wood fragments	1.4	2.6
Channel Fill Deposits	**b** Gravel Gravel: mainly fine; angular flint with some vein quartz, quartzite, rounded flint, rounded white chalk, red chalk, shell, mudstone and sandstone; traces of jasper Sand: mainly medium; angular flint and quartz with some angular chalk; light olive grey	6.3	8.9
	Clay, olive grey; scattered angular chalk and flint pebbles	0.1	9.0
	c Gravel, including some pyrite	0.3	9.3
	Clay, stiff, waxy, olive grey; subrounded chalk and angular flint pebbles	1.8	11.1
	d Pebbly sand and sandy gravel; fragments of wood, at the top and at the base Gravel: mainly fine; rounded flint with subangular flint and some vein quartz and rounded quartzite; a trace of chalk and green volcanic rock Sand: mainly medium; rounded quartz with some angular flint; a trace of coarse angular chalk; olive grey	4.0	15.1
Crag	**e** Sand, glauconitic, with shells, iron pan and scattered flint and quartz pebbles	2.1+	17.2

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	7	92	1	1.2-2.6	7	7	84	1	1	0	0
b	1	44	55	2.6-3.6	1	1	22	12	38	26	0
				3.6-4.6	1	1	34	22	31	11	0
				4.6-5.6	2	1	28	19	35	15	0
				5.6-6.6	1	1	23	22	37	16	0
				6.6-7.6	1	1	22	18	40	18	0
				7.6-8.9	1	1	19	19	37	20	3
				Mean	**1**	**1**	**24**	**19**	**36**	**18**	**1**
c	1	36	63	9.0-9.3	1	1	16	19	44	19	0
d	3	75	22	11.1-13.0	3	38	26	10	18	5	0
				13.0-14.0	3	17	27	14	28	11	0
				14.0-15.1	4	3	79	8	6	0	0
				Mean	**3**	**24**	**41**	**10**	**17**	**5**	**0**
e	3	95	2	15.1-16.1	3	22	65	6	3	1	0
				16.1-17.2	2	64	31	2	1	0	0
				Mean	**3**	**44**	**47**	**4**	**2**	**trace**	**0**
a+b	**2**	**54**	**44**	**1.2-8.9**	**2**	**2**	**37**	**15**	**30**	**14**	**trace**
a+b+d	**2**	**61**	**37**	**Mean**	**2**	**10**	**38**	**13**	**26**	**11**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	3.6-4.6	65	12	10	7	1	0	0	5
	4.6-5.6	65	11	9	8	1	1	trace	5
	5.6-6.6	72	7	8	7	2	1	0	3
	6.6-7.6	70	7	6	10	4	trace	1	2
	7.6-8.9	62	8	11	8	4*	1	1	5**
	Mean	**67**	**9**	**9**	**8**	**3**	**trace**	**trace**	**4**
c	9.0-9.3	53	7	14	13	5*	1	3	4**
d	11.1-13.0	32	34	13	14	0	0	2	5
	13.0-14.0	27	39	13	12	0	0	1	8
	Mean	**28**	**39**	**13**	**12**	**0**	**0**	**1**	**7**
e	15.1-17.2	15	0	4	0	0	0	0	81***

* including red chalk ** including shell, mudstone and sandstone *** mainly iron pan and shell

TM 28 SE 31 **2630 8048** **Hulk's Grave, Mendham** **Block J**

Surface level +21.6 m
Water struck at +17.6 m
Shell and auger
October 1982

Overburden 0.5 m
Mineral 7.6 m
Bedrock 3.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, brown	0.5	0.5
River Terrace Deposits	**a** Sand with scattered pebbles of fine, angular flint and ironpan Sand: mainly medium, well rounded quartz; moderate brown	1.0	1.5
Beccles Beds (Pebbly Series)	**b** Sandy gravel Gravel: mainly fine; angular flint, with some well rounded flint, vein quartz and quartzite Sand: mainly medium; subangular quartz with angular flint; orange brown	1.5	3.0
	c 'Clayey' pebbly sand with silt partings to 3.3 m Gravel: fine and coarse; well rounded and angular flint with some rounded quartzite and vein quartz Sand: mainly medium; rounded quartz; light olive brown	1.0	4.0
Crag	**d** 'Clayey' sand: mainly medium; rounded quartz, with a trace of glauconite; olive brown	4.1	8.1
	e Sand, glauconitic, greyish olive green	3.9+	12.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	9	88	3	0.5-1.5	9	3	84	1	3	0	0
b	4	71	25	1.5-3.0	4	3	63	5	17	8	0
c	15	77	8	3.0-4.0	15	7	69	1	4	4	0
d	10	90	0	4.0-6.0	10	20	70	0	0	0	0
				6.0-8.1	10	8	82	0	0	0	0
				Mean	**10**	**14**	**76**	**0**	**0**	**0**	**0**
e	6	94	0	8.1-10.0	7	7	86	0	0	0	0
				10.0-12.0	5	11	84	0	0	0	0
				Mean	**6**	**9**	**85**	**0**	**0**	**0**	**0**
a-d	**9**	**85**	**6**	**0.5-8.1**	**9**	**9**	**75**	**1**	**4**	**2**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	1.5-3.0	71	7	9	6	0	0	1	7
c	3.0-4.0	31	34	10	16	0	0	0	9*

* mainly iron pan

TM 28 SE 32 **2741 8454** **Mill Hill, Wortwell** **Block H**

Surface level +20.7 m
Water struck at +12.2 m
Shell and auger
September 1982

Overburden 0.4 m
Mineral 15.4 m
Bedrock 5.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, moderate brown	0.4	0.4
River Terrace Deposits	**a** Sandy gravel Gravel: coarse and fine, with cobbles from 1.4 m to 2.4 m; angular flint with some rounded flint, vein quartz and quartzite Sand: fine and medium; subangular quartz and flint; dark orange	3.0	3.4
Channel Fill Deposits	**b** Sandy gravel and pebbly sand with scattered charcoal fragments in upper part Gravel: fine and corse; angular flint with some well rounded flint, vein quartz, quartzite and porphyry Sand: mainly medium, subangular quartz with some coarse angular flint; pale yellowish brown to dark orange	8.1	11.5
Beccles Beds (Kesgrave Sands and Gravels)	**c** Pebbly sand; cobbles of well rounded white quartzite at the base Gravel: fine and coarse, with cobbles near base; subangular flint with well rounded black flint, rounded vein quartz and white quartzite Sand: mainly medium; well rounded quartz with some subangular flint; pale brown	4.3	15.8
Crag	**d** 'Clayey' sand, orange to greyish olive green, glauconitic, with partings of olive green silt	2.0	17.8
	Silt, sandy and clayey, greyish olive green, with shell fragments and thin beds of micritic limestone	3.2+	21.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	7	65	28	0.4-1.4	12	54	22	2	6	4	0
				1.4-2.4	3	23	31	4	13	23	3
				Mean	**7**	**31**	**29**	**5**	**13**	**14**	**1**
b	6	67	27	3.4-4.4	6	5	34	9	26	20	0
				4.4-5.4	6	7	41	9	17	20	0
				5.4-6.4	4	10	34	11	26	15	0
				6.4-7.4	3	21	69	1	3	3	0
				7.4-8.5	5	15	76	2	2	0	0
				8.5-9.5	2	18	53	7	12	8	0
				9.5-10.5	18	6	32	10	21	13	0
				10.5-11.5	5	6	56	4	12	17	0
				Mean	**6**	**11**	**49**	**7**	**15**	**12**	**0**
c	2	75	23	11.5-12.5	5	11	51	6	11	16	0
				12.5-13.5	1	2	45	26	16	10	0
				13.5-14.5	0	11	51	16	11	11	0
				14.5-15.8	2	6	56	16	10	7	3
				Mean	**2**	**8**	**51**	**16**	**12**	**10**	**1**
d	10	90	0	15.8-17.8	10	25	63	2	0	0	0
a-c	**5**	**69**	**26**	**0.4-15.8**	**5**	**14**	**46**	**9**	**14**	**12**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.4-1.4	73	0	12	15	0	0	0	0
	1.4-2.4	90	2	4	4	0	0	0	0
	2.4-3.4	92	2	2	3	0	0	0	1
	Mean	**91**	**2**	**3**	**4**	**0**	**0**	**0**	**trace**
b	3.4-4.4	82	6	4	5	0	0	1*	2
	4.4-5.4	81	2	7	8	0	0	1*	1
	5.4-6.4	67	8	9	12	0	0	1*	3
	Mean	**75**	**6**	**7**	**9**	**0**	**0**	**1**	**2**
	8.5-9.5	48	11	13	16	0	0	3	9
	9.5-10.5	47	18	11	19	0	0	1	4
	10.5-11.5	42	10	16	26	0	0	0	6
	Mean	**47**	**15**	**12**	**19**	**0**	**0**	**1**	**6**
c	11.5-12.5	34	27	15	18	0	0	0	6
	12.5-13.5	46	24	15	15	0	0	0	1
	13.5-14.5	36	25	19	19	0	0	0	1
	19.5-15.8	36	16	13	18	2	0	0	15**
	Mean	**39**	**24**	**16**	**17**	**trace**	**0**	**0**	**4**

* mainly siltstone ** porphyry

TM 28 SE 33 **2668 8432** **Peartree Cottage, Wortwell** **Block G**

Surface level +29.1 m
Water struck at +13.1 m
Shell and auger
February 1983

Overburden	6.6 m
Mineral	13.9 m
Waste	2.3 m
Mineral	2.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.5	0.5
Boulder Clay (Lowestoft Till)	Clay, firm, moderate brown; abundant angular and subangular flint pebbles	3.4	3.9
	Clay, stiff, olive grey, becoming orange brown at the base; abundant chalk and flint pebbles	2.7	6.6
Beccles Beds ('Glacial', Mendham Beds and Pebbly Series)	**a** Sand and pebbly sand, 'clayey' at base Gravel: mainly fine; subrounded to angular flint; some rounded quartz towards base Sand: fine and medium; subangular to rounded quartz and subangular flint; a trace of chalk; orange brown to greyish orange	13.9	20.5
(? Starston Till)	Clay, silty, light olive grey; some coarse-sand grade angular flint and rounded vein quartz	2.3	22.8
(Pebbly Series)	**b** 'Clayey' sandy gravel Gravel: mainly fine; subangular flint, with traces of rounded vein quartz and chalk Sand: medium with fine and coarse; subangular flint with rounded quartz and traces of chalk; light olive grey	2.2+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	6	88	6	6.6-8.6	8	37	48	3	4	0	0
				8.6-9.6	4	22	61	4	5	4	0
				9.6-10.6	6	17	55	5	15	2	0
				10.6-11.6	4	10	55	10	15	6	0
				11.6-13.6	6	60	32	1	1	0	0
				13.6-15.6	4	58	37	1	0	0	0
				15.6-17.6	4	32	52	7	4	1	0
				17.6-18.6	5	34	47	7	5	2	0
				18.6-20.5	12	37	41	7	3	0	0
				Mean	**6**	**38**	**46**	**4**	**5**	**1**	**0**
b	14	52	34	22.8-23.8	21	26	9	5	23	16	0
				23.8-25.0	9	17	25	19	26	4	0
				Mean	**14**	**21**	**18**	**13**	**25**	**9**	**0**
a+b	**7**	**84**	**9**	**Mean**	**7**	**36**	**42**	**6**	**7**	**2**	**0**

TM 28 SE 34 **2725 8387** **East of Low Farm, Wortwell** **Block H**

Surface level +13.1 m
Water struck at +12.5 m
Shell and auger
October 1982

Overburden 0.6 m
Mineral 10.7 m
Bedrock 4.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, humic, moderate brown	0.6	0.6
River Terrace Deposits	**a** Pebbly sand Gravel: fine; angular flint with some rounded flint Sand: mainly fine, rounded quartz; pale brown	1.4	2.0
Channel Fill Deposits	**b** Sandy gravel with a thin bed of olive grey pebbly clay at 9.6 m Gravel: mainly coarse; angular flint with some rounded flint, chalk, vein quartz, quartzite, limestone and shell Sand: mainly medium; subangular quartz and angular flint with some chalk; yellowish grey	9.3	11.3
Crag	**c** Sand, glauconitic, greenish olive; scattered shells and occasional angular flint pebbles, above 13.0 m	4.2+	15.5

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	8	83	9	0.6-2.0	8	48	33	2	9	0	0
b	2	63	35	2.0-2.3	3	30	62	2	1	2	0
				2.3-3.3	1	7	70	5	9	8	0
				3.3-4.3	2	6	46	10	24	12	0
				4.3-5.3	3	2	44	14	14	23	0
				5.3-6.3	1	1	36	15	26	21	0
				6.3-7.3	2	2	24	12	24	36	0
				7.3-8.3	1	1	27	7	18	44	2
				8.3-9.8	1	1	42	12	22	22	0
				9.8-10.3	4	9	58	10	11	8	0
				10.3-11.3	3	7	87	1	0	2	0
				Mean	**2**	**4**	**49**	**10**	**16**	**19**	**trace**
c	4	96	0	11.3-12.3	5	6	87	1	0	1	0
				12.3-13.3	3	10	85	1	1	0	0
				13.3-14.3	4	5	90	1	0	0	0
				14.3-15.5	5	6	88	1	0	0	0
				Mean	**4**	**7**	**88**	**1**	**trace**	**trace**	**0**
a+b	**3**	**65**	**32**	**0.6-11.3**	**3**	**10**	**46**	**9**	**15**	**17**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.6-2.0	95	5	0	0	0	0	0	0
b	2.3-3.3	64	5	6	8	13	0	0	4*
	3.3-4.3	56	9	9	14	6	trace	trace	6
	4.3-5.3	45	28	7	13	2	1	1	3
	5.3-6.3	36	30	10	10	1	3	5	5*
	6.3-7.3	50	23	9	6	5	1	1	5*
	7.3-8.3	46	26	12	7	4	trace	trace	5
	8.3-9.3	61	11	9	13	4	0	trace	2
	9.3-9.8	47	12	11	6	7	1	0	16*
	9.8-10.3	60	4	5	16	7	0	5	3
	Mean	**51**	**18**	**9**	**10**	**5**	**1**	**1**	**5**

* including shell

TM 28 SE 35 **2695 8194** **Chestnut Lodge Farm, Mendham** **Block H**

Surface level +14.9 m
Water struck at c+12.0 m
Shell and auger
October 1982

Overburden 2.5 m
Mineral 10.0 m
Bedrock 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat; brownish black with silty clay partings	2.5	2.5
River Terrace Deposits	**a** Pebbly sand Gravel: fine and coarse, angular flint Sand: mainly medium, subrounded quartz	2.0	4.5
Channel Fill Deposits	**b** Sandy gravel Gravel: mainly fine; angular flint with some rounded flint, vein quartz, quartzite, chalk, limestone, shell and igneous Sand: mainly medium; subangular quartz and angular flint; some rounded quartz and chalk	8.0	12.5
Crag	**c** Sand, glauconitic; greyish olive green	2.5+	15.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	2	93	5	2.5-4.5	2	10	80	3	3	2	0
b	2	72	26	4.5-5.3	1	3	80	4	7	5	0
				5.3-6.3	1	9	40	7	25	18	0
				6.3-7.3	6	28	51	4	7	4	0
				7.3-9.3	2	14	66	7	10	1	0
				9.3-10.3	1	5	32	14	31	17	0
				10.3-11.3	2	3	29	11	31	24	0
				11.3-12.5	1	8	64	7	10	10	0
				Mean	**2**	**11**	**54**	**7**	**16**	**10**	**0**
c	4	96	0	12.5-15.0	4	71	24	1	trace	0	0
a+b	**2**	**76**	**22**	**2.5-12.5**	**2**	**11**	**58**	**7**	**14**	**8**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	4.5-5.3	72	13	0	12	3	0	0	0
	5.3-6.3	68	7	5	10	3	1	1	5*
	6.3-7.3	73	5	3	6	6	1	0	6
	7.3-9.3	79	3	3	5	5	0	0	5*
	9.3-10.3	66	5	12	6	2	2	3	4*
	10.3-11.3	41	23	10	10	5	0	0	11*
	11.3-12.5	39	28	5	4	7	4	0	13*
	Mean	**62**	**11**	**7**	**8**	**4**	**1**	**1**	**6**

* including shell

TM 28 SE 36 **2692 8128** **Withersdale Street, Mendham** **Block H**

Surface level +16.3 m
Water struck at c+14.3 m
Shell and auger
October 1982

Overburden	0.9 m
Mineral	12.2 m
Waste	0.4 m
Mineral	2.5 m
Bedrock	2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, silty	0.3	0.3
Alluvium	Clay, silty and sandy; dark brown	0.6	0.9
River Terrace Deposits	**a** Pebbly sand Gravel: fine and coarse; angular flint with rounded flint; some vein quartz and quartzite Sand: medium with fine; rounded quartz and flint	2.0	2.9
Channel Fill Deposits	**b** Pebbly sand on gravel Gravel: fine and coarse with cobbles below 6.0 m; angular flint with some quartzite, vein quartz, chalk and shell; traces of limestone and igneous and metamorphic rocks Sand: mainly medium; subangular quartz and angular flint; brown	10.2	13.1
	Clay, silty, olive grey; scattered rounded chalk and angular flint pebbles; a bed of laminated clayey silt from 13.3 m to 13.4 m	0.4	13.5
	c Pebbly sand with silty clay partings Gravel: coarse and fine; subangular flint with rounded flint and some vein quartz, quartzite, chalk and limestone Sand: mainly medium; subangular quartz with angular flint and rounded chalk; some glauconite towards the base; light olive brown	2.5	16.0
Crag	Clay, silty, laminated, pale olive to greyish black; scattered glauconite sand	0.1	16.1
	d Sand, dark greenish grey, glauconitic	1.9+	18.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	4	84	12	0.9-1.9	5	42	40	2	6	5	0
				1.9-2.9	2	23	62	1	6	6	0
				Mean	**4**	**32**	**51**	**1**	**6**	**6**	**0**
b	1	57	42	2.9-3.9	2	44	49	1	2	2	0
				3.9-4.9	3	40	50	1	2	4	0
				4.9-6.0	2	21	73	1	2	1	0
				6.0-7.0	0	3	23	16	23	30	5
				7.0-8.0	1	6	32	11	32	18	0
				8.0-9.0	1	3	29	8	26	31	2
				9.0-10.0	0	2	24	12	26	34	2
				10.0-11.0	0	1	22	17	42	18	0
				11.0-12.5	1	2	22	14	38	16	7
				12.5-13.1	1	3	23	15	42	16	0
				Mean	**1**	**12**	**35**	**10**	**23**	**17**	**2**
c	2	82	16	13.5-14.5	2	25	37	4	14	18	0
				14.5-16.0	3	42	50	1	2	2	0
				Mean	**2**	**35**	**45**	**2**	**7**	**9**	**0**
d	4	96	0	16.1-18.0	4	37	56	3	0	0	0
a+b	2	**62**	**36**	**0.9-13.1**	**2**	**16**	**38**	**8**	**20**	**15**	**1**
a+b+c	**2**	**65**	**33**	**Mean**	**2**	**19**	**39**	**7**	**18**	**14**	**1**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.9-1.9	63	22	3	8	0	0	0	4
	1.9-2.9	77	11	1	8	0	0	0	3
	Mean	**70**	**17**	**2**	**8**	**0**	**0**	**0**	**3**
b	2.9-6.0	71	12	2	13	0	0	0	2
	7.0-8.0	66	9	9	12	2	0	0	2
	8.0-9.0	61	5	14	14	2*	0	1	3**
	9.0-10.0	64	8	10	11	1	1	1	4**
	10.0-11.0	78	6	4	9	1	0	0	2**
	12.5-13.1	72	7	10	6	2	2	0	1
	Mean	**68**	**7**	**10**	**11**	**2**	**trace**	**trace**	**2**
c	13.5-14.5	49	29	10	7	3	0	0	2
	14.5-16.0	66	11	0	20	0	4	0	0
	Mean	**50**	**28**	**9**	**8**	**3**	**trace**	**0**	**2**

* including red chalk

** including shell

TM 28 SE 37 **2708 8026** **West of Thorpe Hall, Mendham** **Block I**

Surface level +45.5 m
Water not struck
Shell and auger
January 1983

Overburden 13.0 m
Mineral 7.1 m
Waste 0.8 m
Mineral 4.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty, mottled moderate yellowish brown, yellowish grey and strong brown; scattered chalk and flint pebbles	2.1	2.3
	Clay, stiff, dark grey, becoming orange brown below 10.5 m; abundant chalk and flint pebbles	10.7	13.0
Beccles Beds (Pebbly Series)	a 'Clayey' pebbly sand with clay partings below 17.4 m Gravel: fine and coarse; well rounded grey and black flint, subangular flint, vein quartz and quartzite Sand: mainly medium; subrounded quartz with some subangular flint; a trace of chalk above 16.4 m; pale yellowish brown to moderate brown	7.1	20.1
Crag	Clay, slightly sandy, stiff, dark grey; scattered fine subangular flint pebbles	0.8	20.9
	b 'Clayey' sand; interbedded with thin beds of silty clay and ironpan: fine quartz; strong orange; scattered pebbles of flint and vein quartz at the top	4.1+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	15	73	12	13.0-14.7	20	25	23	5	14	13	0
				14.7-16.4	21	51	24	2	2	0	0
				16.4-17.4	11	15	72	1	1	0	0
				17.4-18.4	12	19	54	6	6	3	0
				18.4-19.4	6	10	51	7	16	10	0
				19.4-20.1	8	16	70	2	4	0	0
				Mean	**15**	**26**	**43**	**4**	**7**	**5**	**0**
b	14	85	1	20.9-21.9	24	68	4	2	2	0	0
				21.9-22.9	17	74	5	2	2	0	0
				22.9-23.9	9	83	8	0	0	0	0
				23.9-25.0	8	86	6	0	0	0	0
				Mean	**14**	**78**	**6**	**1**	**1**	**0**	**0**
a+b	**15**	**77**	**8**	**Mean**	**15**	**44**	**30**	**3**	**5**	**3**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	13.0-14.7	42	31	18	7	trace	0	0	2
	17.4-18.4	14	42	34	10	0	0	0	0
	18.4-20.1	36	49	5	10	0	0	0	0
	Mean	**35**	**41**	**14**	**9**	**trace**	**0**	**0**	**1**

TM 28 SE 38 **2734 8306** **South of the Vicarage, Mendham** **Block H**

Surface level +29.9 m
Ground water conditions not recorded
Shell and auger
October 1982

Overburden	0.5 m
Mineral	1.4 m
Waste	0.3 m
Mineral	3.1 m
Waste	7.5 m
Mineral	8.4 m
Waste	1.8 m
Mineral	2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, brownish black	0.5	0.5
Head Gravel	**a** 'Clayey' sandy gravel Gravel: coarse and fine; angular grey flint with some rounded quartzite, vein quartz and rounded flint Sand: mainly medium, quartz; strong yellowish orange	1.4	1.9
Head	Clay, sandy and silty, laminated, moderate yellowish brown; scattered angular flint pebbles	0.3	2.2
Glacial Sand and Gravel	**b** 'Clayey' sandy gravel Gravel: coarse and fine; angular flint with some vein quartz, quartzite and rounded flint Sand: mainly medium; subangular quartz and angular flint; orange brown	3.1	5.3
Boulder Clay (Lowestoft Till)	Clay, medium dark grey; abundant rounded chalk and angular flint pebbles	7.5	12.8
Glacial Sand and Gravel	**c** Pebbly sand Gravel: mainly fine; angular flint with some vein quartz, quartzite, rounded chalk and well rounded flint Sand: mainly medium; subangular quartz and subangular flint; greyish yellow	8.4	21.2
Glacial Silt	Silt, part sandy, greenish grey	1.8	23.0
Glacial Sand and Gravel	**d** Pebbly sand Gravel: mainly fine; angular flint with rounded vein quartz; some rounded flint, quartzite and limestone Sand: medium, with fine and some coarse; subangular and rounded quartz	2.0+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	18	52	30	0.5-1.9	18	19	28	5	14	16	0
b	11	55	34	2.2-3.2	19	9	25	8	16	23	0
				3.2-4.2	8	9	43	12	12	16	0
				4.2-5.3	8	5	38	14	19	16	0
				Mean	**11**	**8**	**36**	**11**	**16**	**18**	**0**
c	5	74	21	12.8-13.8	8	16	42	6	16	12	0
				13.8-14.8	9	18	55	7	10	1	0
				14.8-16.8	2	20	40	12	11	15	0
				16.8-19.0	2	4	43	14	26	11	0
				19.0-21.2	7	18	72	2	1	0	0
				Mean	**5**	**14**	**51**	**9**	**13**	**8**	**0**
d	7	74	19	23.0-25.0	7	26	34	14	13	6	0
a-d	**8**	**68**	**24**	**Mean**	**8**	**15**	**43**	**10**	**13**	**11**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	0.5-1.9	70	6	11	12	0	0	0	1
b	2.2-3.2	80	5	12	3	0	0	0	0
	3.2-4.2	75	8	5	12	0	0	0	0
	4.2-5.3	76	2	10	8	0	0	0	4
	Mean	**77**	**4**	**10**	**7**	**0**	**0**	**0**	**2**
c	12.8-13.8	57	2	13	13	9	0	1	5
	13.8-14.8	70	0	3	11	8	0	1	7
	14.8-16.8	46	10	17	12	11	0	0	4
	16.8-19.0	59	14	14	9	trace	0	1	3*
	Mean	**57**	**9**	**13**	**11**	**5**	**0**	**1**	**4**
d	23.0-25.0	50	11	22	11	0	3	0	3

* including silicified limestone

TM 28 SE 39 **2826 8431** **The Common, Homersfield** **Block H**

Surface level +10.6 m
Water struck at +8.7 m
Shell and auger
October 1982

Overburden	0.7 m
Mineral	10.7 m
Waste	1.3 m
Mineral	1.6 m
Waste	0.1 m
Mineral	1.9 m
Bedrock	3.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, moderate brown	0.1	0.1
Alluvium	Clay, sandy, mottled orange and brown; some shells	0.6	0.7
River Terrace Deposits	**a** Sand: medium with fine; subrounded quartz; scattered fine subangular flint pebbles	1.2	1.9
Channel Fill Deposits	**b** Sandy gravel Gravel: fine and coarse; angular flint with some rounded flint, vein quartz, quartzite, chalk limestone and shell Sand: mainly medium; subangular quartz and flint; some chalk becoming more abundant with depth; light brown	9.5	11.4
	Clay, silty, firm, bluish grey; scattered pebbles of flint, chalk and black (Jurassic) mudstone	0.6	12.0
	c 'Clayey' gravel Gravel: coarse, with some fine; angular flint with rounded flint and brown quartzite; some chalk, vein quartz and limestone Sand: angular quartz, chalk and flint; olive grey	0.6	12.6
	Clay, silty, olive grey, with chalk and flint pebbles	0.1	12.7

	d Gravel Gravel: fine and coarse with some cobbles; subangular flint with rounded flint, vein quartz and quartzite; some chalk, igneous rock and shell Sand: medium and coarse; subangular quartz with some flint and shell	1.6	14.3
	Clay, silty and sandy, brownish grey	0.1	14.4
	e Pebbly sand Gravel: fine and coarse; subangular flint with well rounded flint, quartzite and vein quartz; some chalk and limestone Sand: medium and fine; subrounded quartz and angular shell; greyish green	1.9	16.3
Crag	**f** Pebbly sand, greenish grey; shells and ironpan	3.7+	20.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	8	88	4	0.7-1.9	8	34	53	1	2	2	0
b	1	58	41	1.9-2.9	0	1	41	11	31	16	0
				2.9-3.9	2	12	45	7	17	17	0
				3.9-4.9	1	17	53	8	11	10	0
				4.9-6.0	2	10	50	9	12	17	0
				6.0-7.0	0	12	41	7	23	17	0
				7.0-8.0	0	4	29	11	26	28	2
				8.0-9.0	3	2	39	13	32	11	0
				9.0-10.0	1	2	28	12	33	24	0
				10.0-11.4	2	5	27	16	27	23	0
				Mean	**1**	**7**	**40**	**11**	**23**	**18**	**trace**
c	11	28	61	12.0-12.6	11	8	14	6	26	35	0
d	1	39	60	12.7-13.7	1	4	18	16	31	27	3
				13.7-14.3	1	3	26	14	30	26	0
				Mean	**1**	**3**	**21**	**15**	**31**	**27**	**2**
e	3	87	10	14.4-15.3	2	20	56	4	11	7	0
				15.3-16.3	3	56	35	3	2	1	0
				Mean	**3**	**39**	**45**	**3**	**6**	**4**	**0**
f	4	80	16	16.3-17.3	2	13	74	5	2	4	0
				17.3-18.3	3	17	42	7	15	16	0
				18.3-19.3	5	27	52	5	6	5	0
				19.3-20.0	7	27	46	5	7	8	0
				Mean	**4**	**20**	**54**	**6**	**8**	**8**	**0**
a-e	2	**62**	**36**	**Mean**	**2**	**13**	**40**	**9**	**20**	**16**	**trace**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	1.9-2.9	71	6	7	13	0	0	0	3
	2.9-3.9	75	7	2	14	0	1	0	1
	3.9-4.9	67	3	6	7	13	3	0	1*
	4.9-6.0	68	8	4	11	8	0	0	1*
	6.0-7.0	49	22	8	9	8**	1	1	2*
	7.0-8.0	58	15	9	12	2	2	0	2*
	8.0-9.0	60	14	11	8	1	0	0	6
	9.0-10.0	62	15	7	12	1	0	0	3
	10.0-11.4	41	7	14	10	14	2	2	10**
	Mean	**61**	**11**	**8**	**11**	**4**	**1**	**trace**	**4**
c	12.0-12.6	41	18	9	17	8	3	1	3*
d	12.7-13.7	38	19	17	18	1	1	1	5*
	13.7-14.3	38	20	14	17	1	0	1	9
e	14.4-16.3	40	17	12	15	3	5	0	8
f	16.3-17.3	0	0	0	0	0	0	0	100***

* including shell ** including red chalk *** shell and iron pan

TM 28 SE 40 **2857 8391** **South of Downs Farm, Homersfield** **Block I**

Surface level +29.7 m
Water struck at c.+10.7 m
Shell and auger
September 1982

Overburden 0.6 m
Mineral 25.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, moderate brown; scattered flint pebbles	0.6	0.6
Beccles Beds ('Glacial' on Pebbly Series)	Sand and pebbly sand with bands of gravel; thin silt bands and scattered charcoal fragments to 14.6 m Gravel: fine with coarse; angular flint with rounded flint, quartz and quartzite; some chalk in upper part Sand: medium and fine; well rounded to subangular quartz with some chalk and flint; pale brown to orange	25.7+	26.3

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
6	81	13	0.6-2.3	5	17	48	7	12	11	0
			2.3-3.3	10	34	45	3	5	3	0
			3.3-4.3	9	37	52	1	1	0	0
			4.3-5.3	8	27	51	6	8	2	0
			5.3-6.3	6	14	52	12	12	4	0
			6.3-7.3	5	13	51	13	13	5	0
			7.3-8.5	4	17	66	5	5	3	0
			8.5-10.5	3	29	66	1	1	0	0
			10.5-12.5	4	44	50	1	1	0	0
			12.5-14.6	7	25	64	1	2	1	0
			14.6-15.7	10	7	24	14	32	13	0
			15.7-16.7	10	66	15	3	5	1	0
			16.7-17.7	4	24	39	6	15	12	0
			17.7-19.0	5	6	16	23	37	13	0
			19.0-20.0	9	53	11	10	13	4	0
			20.0-21.0	14	40	23	5	12	6	0
			21.0-22.0	3	10	33	22	24	8	0
			22.0-23.0	5	58	25	5	4	3	0
			23.0-24.0	4	31	52	8	5	0	0
			24.0-25.0	2	33	51	4	6	4	0
			25.0-26.3	8	71	18	2	1	0	0
			Mean	**6**	**31**	**43**	**7**	**9**	**4**	**0**

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
0.6-2.3	62	4	9	18	1	0	1*	5
2.3-5.3	55	13	11	8	7	0	0	6
5.3-6.3	49	20	11	17	1	0	0	2
6.3-7.3	46	33	7	12	trace	0	1*	2
7.3-8.5	55	10	11	15	5	0	0	4
Mean	**54**	**16**	**9**	**14**	**2**	**0**	1	**4**
14.6-15.7	56	10	17	10	1	0	1	5**
15.7-16.7	68	13	3	8	0	0	0	8
16.7-17.7	49	12	14	25	0	0	0	0
17.7-19.0	42	16	18	21	0	0	1	2
19.0-20.0	40	16	12	32	0	0	0	0
20.0-21.0	62	16	14	5	0	1	0	2
21.0-22.0	49	14	20	12	0	trace	0	5
22.2-25.0	49	23	11	17	0	0	0	0
Mean	**50**	**14**	**16**	**17**	**trace**	**trace**	**trace**	**3**

* porphyry

** including shell

TM 28 SE 41 **2838 8287** **Oakhill Farm, Mendham** **Block I**

Surface level +36.5 m (120 ft)
Groundwater conditions not recorded
Shell and auger
October 1982

Overburden 9.9 m
Mineral 14.5 m
Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and clayey, dark brown	0.1	0.1
Boulder Clay (Lowestoft Till)	Clay, silty, mottled orange, brown and grey near top, light grey to dark grey below, ironstained at the base; scattered subangular flint and chalk pebbles	9.8	9.9
Beccles Beds ('Glacial')	**a** Pebbly sand Gravel: mainly fine; angular flint with rounded flint, quartzite and vein quartz; some limestone and shell; a trace of chalk Sand: mainly medium; subangular and subrounded quartz with some chalk; yellowish orange	11.1	21.0
(Kesgrave Sands and Gravels)	**b** Sandy gravel Gravel: coarse and fine; subangular flint with rounded flint, quartzite and vein quartz Sand: mainly medium; subrounded quartz; yellowish brown	1.0	22.0
(Westleton Beds)	**c** Gravel Gravel: fine and coarse; well rounded black flint with subangular black flint; some vein quartz, quartzite and igneous rock Sand: mainly medium; subrounded quartz; light brown	2.4	24.4
Crag	**d** Silt and sand, dark greyish green	1.6+	26.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
a	3	91	6	9.9-10.9	8	32	57	1	2	0	0
				10.9-11.9	7	18	70	1	4	0	0
				11.9-12.9	1	16	63	4	12	4	0
				12.9-13.9	4	13	72	2	4	5	0
				13.9-15.9	2	11	78	3	5	1	0
				15.9-17.9	3	41	44	3	5	4	0
				17.9-18.9	2	11	71	4	6	6	0
				18.9-21.0	3	34	61	1	1	0	0
				Mean	**3**	**24**	**65**	**2**	**4**	**2**	**0**
b	2	62	36	21.0-22.0	2	21	37	4	17	19	0
c	1	33	66	22.0-23.0	0	3	23	12	35	27	0
				23.0-24.4	1	3	17	9	35	35	0
				Mean	**1**	**3**	**20**	**10**	**35**	**31**	**0**
d	44	56	0	24.4-26.0	44	54	2	0	0	0	0
a+b+c	**3**	**79**	**18**	**9.9-24.4**	**3**	**20**	**55**	**4**	**10**	**8**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
a	10.9-12.9	51	19	6	14	trace	5	0	5*
	12.9-15.9	69	6	2	21	0	0	0	2
	15.9-17.9	55	12	11	12	1	0	0	9**
	Mean	**59**	**13**	**6**	**15**	**trace**	**2**	**0**	**5**
b	22.0-23.0	38	26	14	18	0	0	0	4
c	23.0-24.0	29	50	10	8	0	0	2	1

* including jasper ** including shell

TM 28 SE 42 2864 8163 Kett's Farm, Mendham Block I

Surface level +46.5 m
Groundwater conditions not recorded
Shell and auger
November 1982

Overburden	17.0 m
Mineral	1.5 m
Waste	0.2 m
Mineral	7.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey and sandy	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, stiff, dark grey, moderate brown to 1.8 m; abundant rounded chalk and angular flint pebbles and some angular black (Jurassic) mudstone pebbles	16.5	16.7
Glacial Silt	Silt, clayey and sandy, laminated, micaceous, moderate brown	0.3	17.0
Beccles Beds	a 'Clayey' sand: medium and fine; subrounded quartz, with subangular flint; moderate yellowish brown; scattered well well rounded quartzite and vein quartz pebbles	1.5	18.5
(? Starston Till)	Clay, slightly sandy, dark yellowish brown; sparse pebbles of rounded quartz and quartzite; some coarse-sand grade chalk	0.2	18.7
(Pebbly Series)	b 'Clayey' pebbly sand Gravel: mainly fine; subangular grey and black flint with rounded flint and some vein quartz and quartzite; some chalk at the top Sand: medium, with some fine; rounded quartz with some subangular flint; yellowish brown to yellowish grey	7.3+	26.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	12	85	3	17.0-18.5	12	41	43	1	2	1	0
b	15	71	14	18.7-19.4	11	11	58	7	9	4	0
				19.4-20.3	8	7	55	13	11	6	0
				20.3-21.4	20	13	55	4	5	3	0
				21.4-22.4	8	8	49	7	25	3	0
				22.4-23.4	6	14	57	8	11	4	0
				23.4-24.8	10	9	42	17	13	9	0
				24.8-26.0	40	55	4	1	0	0	0
				Mean	**15**	**17**	**46**	**8**	**10**	**4**	**0**
a+b	**15**	**72**	**13**	**Mean**	**15**	**21**	**44**	**7**	**9**	**4**	**0**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	18.7-19.4	59	22	13	2	2	0	0	2
	19.4-20.3	50	32	12	3	0	0	0	3
	21.4-22.4	52	28	6	10	0	0	0	4
	Mean	**54**	**28**	**8**	**7**	**trace**	**0**	**0**	**3**

TM 28 SE 43 **2843 8081** **Church Farm, Mendham** **Block I**

Surface level +24.8 m
Water struck at +19.9 m
Shell and auger
November 1982

Overburden 0.4 m
Mineral 19.4 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.4	0.4
Head	**a** 'Very clayey' pebbly sand Gravel: fine and coarse; angular grey flint Sand: mainly medium; subrounded quartz with subangular flint; moderate brown	1.8	2.2
Glacial Sand and Gravel	**b** Sandy gravel Gravel: fine and coarse, with some cobbles in upper part; subangular and rounded flint; some quartzite and vein quartz Sand: mainly medium; subrounded quartz with some subangular flint; moderate yellowish brown	4.3	6.5
Beccles Beds (Westleton Beds)	**c** Sandy gravel Gravel: fine with coarse; well rounded black flint and subangular grey flint; some vein quartz and quartzite Sand: fine and medium; rounded quartz with a trace of subangular flint	1.3	7.8
Crag	**d** Sand: mainly fine, rounded quartz, with some mica below 15.8 m; moderate to dark yellowish brown; partings of olive grey silty clay below	12.0	19.8
	e Sand; fine, glauconitic, greenish olive grey	2.0+	21.8

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	28	65	7	0.4-2.2	28	2	59	4	4	3	0
b	4	60	36	2.2-3.0	5	7	19	9	27	30	3
				3.0-4.8	2	16	36	6	13	17	10
				4.8-5.5	5	13	54	10	17	1	0
				5.5-6.5	4	15	53	8	16	4	0
				Mean	**4**	**13**	**39**	**8**	**17**	**14**	**5**
c	2	52	46	6.5-7.8	2	26	21	5	29	17	0
d	8	92	0	7.8-8.8	6	85	8	0	1	0	0
				8.8-9.8	8	65	27	0	0	0	0
				9.8-10.8	5	73	22	0	0	0	0
				10.8-11.8	5	79	16	0	0	0	0
				11.8-13.8	10	80	10	0	0	0	0
				13.8-15.8	10	82	8	0	0	0	0
				15.8-17.8	10	78	12	0	0	0	0
				17.8-19.8	9	71	20	0	0	0	0
				Mean	**8**	**78**	**14**	**0**	**0**	**0**	**0**
e	8	92	0	19.8-21.8	8	64	28	0	0	0	0
a+b+c	**9**	**60**	**31**	**0.4-7.8**	**9**	**13**	**41**	**6**	**16**	**12**	**3**
a-d	9	**79**	**12**	**0.4-19.8**	**9**	**52**	**25**	**2**	**6**	**5**	**1**

COMPOSITION

	Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
		Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
b	2.2-3.0	65	20	4	7	0	0	0	4
	3.0-4.8	69	12	5	4	0	0	4	6
	4.8-5.5	70	20	2	3	0	0	1	4
	5.5-6.5	62	35	0	1	0	0	0	2
	Mean	**67**	**27**	**1**	**2**	**0**	**0**	**trace**	**3**
c	6.5-7.8	47	47	2	2	0	0	0	2

TM 28 SE 44 **2884 8017** **South of Oakhill, Metfield** **Block I**

Surface level +47.7 m
Water not struck
Shell and auger
December 1982

Overburden	17.4 m
Mineral	2.6 m
Waste	1.3 m
Mineral	5.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey and sandy	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, silty to 1.1 m, firm below, moderate brown to olive grey; subangular to angular flint and rounded vein quartz and chalk pebbles; bed of clayey sand at 1.1 m	8.8	9.0
Beccles Beds (Starston Till)	Clay, stiff, becoming sandy with depth, dark yellowish brown and bright orange; rounded and angular flint and rounded vein quartz pebbles; scattered coarse-sand grade chalk in top 3 m	8.4	17.4
(Pebbly Series)	a 'Very clayey' pebbly sand Gravel: fine and coarse; rounded flint with subangular flint Sand: mainly medium; subangular flint and subrounded quartz; strong yellowish brown	2.6	20.0
(Palaeosol)	Clay, silty and sandy, mottled bright orange and light olive grey; scattered rounded pebbles of flint, vein quartz and quartzite	1.3	21.3
(Kesgrave Sands and Gravels)	b Pebbly sand Gravel: coarse and fine; subangular flint with rounded flint, vein quartz and quartzite Sand: mainly medium; subrounded quartz with some subangular flint; pale orange to moderate yellowish brown	5.7+	27.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	21	71	8	17.4-18.8	24	15	50	4	3	4	0
				18.8-19.4	14	22	42	4	11	7	0
				19.4-20.0	22	24	50	2	0	2	0
				Mean	**21**	**19**	**49**	**3**	**4**	**4**	**0**
b	6	72	22	21.3-23.3	6	12	52	10	7	13	0
				23.3-23.9	6	11	39	14	13	17	0
				23.9-25.0	6	6	43	12	16	17	0
				25.0-27.0	7	22	54	3	8	6	0
				Mean	**6**	**14**	**50**	**8**	**10**	**12**	**0**
a+b	**11**	**71**	**18**	**Mean**	**11**	**16**	**48**	**7**	**8**	**10**	**0**

TM 28 SE 45 **2975 8370** **Spring's Farm, St. Cross, South Elmham** **Block I**

Surface level +28.5 m
Water struck at +25.5 m
Shell and auger
November 1982

Waste	21.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy below 3.4 m, moderate brown to top, mainly olive grey and dark grey below; abundant chalk and flint pebbles; some red chalk near top	20.8+	21.0

TM 28 SE 46 **2961 8231** **East of Moat Farm, Mendham** **Block I**

Surface level +38.5 m
Groundwater conditions not recorded
Shell and auger
November 1982

Overburden	10.4 m
Mineral	3.7 m
Waste	1.7 m
Mineral	9.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, sandy near top and base, moderate yellowish brown near top, dark olive grey below, mainly scattered chalk and flint pebbles	10.1	10.4
Beccles Beds (Pebbly Series)	a 'Clayey' pebbly sand Gravel: mainly fine; rounded flint with rounded vein quartz and quartzite; a trace of chalk Sand: mainly medium; subrounded quartz and subangular flint; moderate yellowish brown	3.7	14.1
(Starston Till)	Clay, firm, dark brownish grey; scattered rounded black flint pebbles	1.7	15.8
(Kesgrave Sands and Gravels)	b Pebbly sand Gravel: mainly fine; rounded flint and angular flint with some vein quartz and quartzite Sand: fine and medium; subrounded quartz with subangular flint; yellowish grey	9.2+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	11	81	8	10.4-12.4	13	44	40	2	1	0	0
				12.4-14.1	8	21	51	5	9	6	0
				Mean	**11**	**33**	**44**	**4**	**5**	**3**	**0**
b	5	81	14	15.8-16.6	5	15	36	10	18	16	0
				16.6-17.6	9	66	12	1	7	5	0
				17.6-19.0	8	67	21	0	2	2	0
				19.0-20.0	5	27	51	3	12	2	0
				20.0-20.8	6	26	47	3	13	5	0
				20.8-21.8	4	37	43	5	11	0	0
				21.8-22.8	2	23	37	7	24	7	0
				22.8-25.0	4	45	42	4	5	0	0
				Mean	**5**	**41**	**36**	**4**	**10**	**4**	**0**
a+b	**7**	**82**	**11**	**Mean**	**7**	**39**	**39**	**4**	**8**	**3**	**0**

TM 28 SE 47 **2815 8368** **West of Middleton Hall, Mendham** **Block I**

Surface level +13.2 m
Water struck at +11.4 m
Shell and auger
February 1983

Overburden 1.2 m
Mineral 12.3 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty; moderate brown	0.5	0.5
Alluvium	Silt, clayey, firm, mottled dark yellowish brown and light grey	0.7	1.2
Channel Fill Deposits	a Pebbly sand Gravel: mainly fine; angular flint with some rounded brown quartzite, vein quartz and rounded flint Sand: medium with fine; well rounded quartz with some angular white flint; pale to dark yellowish brown	12.3	13.5
Crag	b Pebbly sand, glauconitic, olive grey; shells and some flint, quartz and quartzite pebbles	2.0+	15.5

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	3	87	10	1.2-1.8	16	33	43	3	5	0	0
				1.8-3.0	4	23	58	2	5	8	0
				3.0-4.5	1	29	60	1	3	6	0
				4.5-6.0	3	31	44	6	10	6	0
				6.0-8.0	2	58	33	6	1	0	0
				8.0-10.0	1	65	32	1	1	0	0
				10.0-11.0	3	28	56	4	4	5	0
				11.0-12.0	2	12	43	13	18	12	0
				12.0-13.5	2	9	65	10	9	5	0
				Mean	**3**	**35**	**47**	**5**	**6**	**4**	**0**
b	2	82	16	13.5-14.0	2	11	68	10	7	2	0
				14.0-15.0	3	7	51	12	18	9	0
				15.0-15.5	2	9	83	5	1	0	0
				Mean	**2**	**9**	**63**	**10**	**11**	**5**	**0**

TM 28 SE 48 **2632 8468** **Church Road, Redenhall with Harleston** **Block G**

Surface level +15.1 m
Water struck at +12.3 m
Shell and auger
February 1983

Overburden	2.8 m
Mineral	9.8 m
Bedrock	3.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, humic, black	0.3	0.3
Alluvium	Clay, sandy, soft, moderate brown; sparse pebbles of chalk and flint	0.6	0.9
Peat	Peat, fibrous, black, becoming dusky red below 2.2 m	1.9	2.8
Channel Fill Deposits	**a** Sandy gravel Gravel: fine with coarse and some cobbles; angular flint with some rounded flint, brown quartzite, chalk and vein quartz Sand: mainly medium; angular flint and subangular quartz with some chalk; greyish brown	9.8	12.6
Crag	Clay, silty, firm, laminated; abundant shell fragments	1.8	14.4
	b 'Clayey' sand, greenish grey, with some glauconite, shell fragments and quartz pebbles	1.6+	16.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	3	72	25	2.8-3.8	2	21	54	2	5	16	0
				3.8-4.8	3	8	42	9	25	13	0
				4.8-5.8	1	9	54	5	15	13	3
				5.8-6.8	1	21	75	1	2	0	0
				6.8-7.8	1	12	56	9	14	8	0
				7.8-8.8	1	2	21	13	32	28	3
				8.8-9.8	0	5	33	2	36	22	2
				9.8-10.8	2	16	67	8	7	0	0
				10.8-11.8	10	25	61	2	1	1	0
				11.8-12.6	5	13	59	18	5	0	0
				Mean	**3**	**13**	**52**	**7**	**14**	**10**	**1**
b	13	86	1	14.4-16.0	13	28	55	3	1	0	0

TM 28 SE 49 **2925 8486** **East of Holehouse Farm, Homersfield** **Block I**

Surface level +33.8 m
Water struck at +21.8 m and +10.8 m
Shell and auger
February 1983

Overburden 16.4 m
Mineral 8.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey	0.4	0.4
Boulder Clay (Lowestoft Till)	Clay, sandy, firm, moderate brown near top, olive grey below; scattered angular flint and rounded quartz pebbles to 5.0 m; abundant pebbles of rounded chalk and angular flint below	16.0	16.4
Beccles Beds (Pebbly Series)	'Clayey' pebbly sand Gravel: mainly fine; subangular flint with some rounded quartzite, vein quartz and a trace of chalk Sand: mainly medium; subangular flint and subrounded quartz; a trace of chalk; moderate brown	8.6+	25.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$ mm
15	77	8	16.4-18.4	19	23	44	5	9	0	0
			18.4-20.1	37	20	31	3	5	4	0
			20.1-22.1	5	42	47	2	3	1	0
			22.1-24.1	4	12	71	4	7	2	0
			24.1-25.0	16	26	36	9	7	6	0
			Mean	**15**	**24**	**49**	**4**	**6**	**2**	**0**

TM 28 SE 50 **2647 8379** **South-west of Low Farm, Wortwell** **Block G**

Surface level +38.6 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 9.4 m
Mineral 8.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey and pebbly	0.3	0.3
Boulder Clay (Lowestoft Till)	Clay, slightly silty, olive grey, becoming darker with depth; bluish grey from 6.0 m to 7.0 m; abundant subangular chalk pebbles	9.1	9.4
Beccles Beds	Sand with occasional pebbles and thin partings of pebbly clay below 10.5 m Gravel: coarse and fine; angular and subangular flint, with some fine rounded chalk from 10.5 m to 13.0 m Sand: medium and fine; subangular and subrounded quartz with some subangular chalk and flint; brownish orange	3.6	13.0
	Sand: fine, well rounded quartz with some mica; pale yellowish orange	4.8+	17.8

TM 28 SE 51 **2528 8302** **East of White House, Redenhall with Harleston** **Block G**

Surface level +39.4 m
Water struck at +31.2 m
B 30 Power Auger 115 mm diameter
July 1982

Overburden 6.3 m
Mineral 7.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.2	0.2
Cover Sand	Sandy silt and silty sand, moderate brown and light olive grey, with occasional fine angular flint pebbles	1.3	1.5
Boulder Clay (Lowestoft Till)	Clay, stiff, waxy, mottled greyish olive and moderate olive brown, with scattered small angular chalk pebbles	2.3	3.8
	Silt, sandy, soft, light olive brown	0.8	4.6
	Clay, silty brown to greyish olive to 5.0 m, olive grey below; abundant subangular chalk and sparse patinated flint pebbles	1.7	6.3
Glacial Sand and Gravel	'Clayey' sand, very silty, olive grey to 9.1 m, with a thin bed of pebbles at 8.2 m; very clayey and orange brown from 9.1 m to 12.2 m, and olive grey with boulder clay partings below	7.4+	14.7

TM 28 SE 52 **2562 8060** **Laurel Farm, Weybread** **Block J**

Surface level +42.8 m
Water struck at +31.9 m
B 30 Power Auger 115 mm diameter
July 1982

Overburden 13.7 m
Mineral 4.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Cover Sand	Sand, silty, brownish orange	1.0	1.0
Boulder Clay (Lowestoft Till)	Clay, waxy, olive grey to olive black, with chalk and black (Jurassic) mudstone pebbles	9.9	10.9
	Clay, slightly silty, olive grey, with chalk pebbles throughout and a thin bed of gravel near the base (poor sample recovery below the water table)	2.8	13.7
? Glacial Sand and Gravel	Sand, very silty, olive grey (poor sample recovery below the water table)	4.3+	18.0

TM 28 SE 53 **2741 8047** **North of Thorpe Hall, Mendham** **Block I**

Surface level +43.6 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 11.7 m
Mineral 4.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Silty sand	1.0	1.0
Boulder Clay (Lowestoft Till)	Clay, waxy, light olive grey mottled with light olive grey to 2.0 m; moderate olive brown and with flint and angular chalk pebbles to 3.1 m; olive grey to 7.0 m, with a bed of chalky gravel at c5.0 m	6.0	7.0
Beccles Beds (? Starston Till)	Clay, silty and sandy, greyish brown, with angular pebbles of flint and coarse-sand grade chalk	1.0	8.0
(? Starston Till)	Silt, clayey and sandy, brownish grey, with sparse small chalk pebbles; brown to orange-brown with occasional angular brown flint pebbles at the base	3.7	11.7
(? Kesgrave Sands and Gravels)	'Clayey' sandy gravel Gravel: coarse and fine; angular and well rounded flint, rounded vein quartz and quartzite Sand: coarse, medium and fine; subrounded and well rounded quartz; dark yellowish brown to 13.8 m, dark orange below	3.3	16.0
Crag	Sand: fine, well rounded quartz with some mica; pale yellow	1.3+	17.3

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
11.7-16.0	46	31	5	16	0	0	0	2

TM 28 SE 54 **2791 8210** **North of Park Farm, Mendham** **Block I**

Surface level +42.0 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 14.9 m
Mineral 4.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil; sandy clay, moderate brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, waxy, moderate olive brown to olive black, with rounded and subangular chalk pebbles (abundant to 1.2 m) and flint pebbles	2.9	3.1
Glacial Silt	Silt, olive grey, micaceous	3.5	6.6
Boulder Clay (Lowestoft Till)	Clay, silty, olive grey, becoming brown near the base; chalk and flint pebbles throughout	8.3	14.9
Beccles Beds	Pebbly sand; two beds of yellowish brown sandy silty clay, containing sparse rounded chalk pebbles, near the base Gravel: well rounded flint and vein quartz, with some angular flint Sand: medium and fine; subangular quartz with some angular flint; moderate brown	4.8+	19.7

TM 28 SE 55 **2874 8220** **Moat Farm, Needham** **Block I**

Surface level +42.8 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 14.0 m
Mineral 4.7 m
Waste 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil: sandy clay, moderate yellowish brown	0.6	0.6
Boulder Clay (Lowestoft Till)	Clay, moderate olive brown mottled with light grey; subangular chalk and occasional patinated flint pebbles	c.1.6	c.2.2
	Clay, waxy, olive grey, with chalk and flint pebbles	11.8	14.0
Glacial Sand and Gravel	Pebbly sand Gravel: well rounded flint with some angular flint, rounded vein quartz and chalk Sand: flint and quartz; light olive grey becoming light olive brown towards the base	4.7	18.7
Boulder Clay (Lowestoft Till)	Clay, olive grey, with chalk pebbles	0.1+	18.8

TM 28 SE 56 **2957 8466** **School Farm, St. Cross, South Elmham** **Block I**

Surface level +35.0 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden	11.9 m
Mineral	3.3 m
Waste	0.1 m
Mineral	0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Boulder Clay (Lowestoft Till)	Clay, silty and light olive grey with abundant fine chalk to 1.8 m becoming waxy and dark olive grey below; chalk and flint pebbles below 3.0 m	10.0	10.0
	Clay, silty, brownish olive grey, with sparse chalk and well rounded flint pebbles	0.7	10.7
Glacial Sand and Gravel	Sand, dark orange, with sparse fine rounded chalk pebbles	0.5	11.2
Boulder Clay (Lowestoft Till)	Clay, stiff, very silty, medium dark grey to brownish grey, with scattered angular chalk and flint pebbles	0.7	11.9
Beccles Beds	Pebbly sand; greyish orange to 12.2 m, pale yellowish brown below Gravel: angular flint with some rounded chalk and vein quartz to 12.2 m; well rounded brown and grey flint with some rounded vein quartz and quartzite below Sand: coarse, medium and fine angular flint and quartz with some chalk to 12.2 m; medium, rounded quartz and flint below	3.3	15.2
(? Starston Till)	Clay, silty and sandy, stiff, brownish grey, with sparse angular chalk and rounded flint pebbles	0.1	15.3
	Sand: medium with fine, quartz with chalk in parts; pale yellowish brown	0.9+	16.2

TM 28 SE 57 **2942 8268** **Weston House, Mendham** **Block I**

Surface level +38.9 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden	10.6 m
Mineral	8.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, moderate brown	0.2	0.2
Boulder Clay (Lowestoft Till)	Clay, mottled light olive brown and light olive grey, with fine subangular chalk and scattered flint pebbles	2.8	3.0
	Clay, olive grey, with abundant fine subangular chalk pebbles to about 0.9 m; dark brown with chalk and angular flint pebbles below	c.7.6	c.10.6
Beccles Beds	Sand: fine, well rounded and subrounded quartz with some mica; strong yellowish orange	5.4	16.0
	Pebbly sand Gravel: subrounded and subangular flint with some rounded brown quartzite Sand: medium and fine rounded quartz; strong yellowish orange	1.5	17.5
Crag	Sand: fine, well rounded quartz; yellowish orange	2.0+	19.5

TM 28 SE 58 **2947 8107** **Rookery Farm, Metfield** **Block I**

Surface level +47.0 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 16.8 m
Mineral 2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy and silty, moderate brown	0.1	0.1
Boulder Clay (Lowestoft Till)	Clay, stiff, slightly silty, mottled olive brown and light olive grey, with abundant subrounded chalk and angular flint pebbles	1.4	1.5
	Clay, stiff, waxy, olive grey, with subrounded and angular chalk pebbles; scattered angular flint pebbles and chalk cobbles at the base	8.1	9.6
	Clay, stiff, waxy, olive grey, with horizontal beds of rounded chalk pebbles at the base	4.6	14.2
Beccles Beds (Starston Till)	Clay, sandy and silty, brownish grey and greyish brown, with scattered well rounded and angular flint pebbles and occasional coarse-sand grade chalk; thin beds of gravel towards the base	2.6	16.8
(undivided)	'Very clayey' sand, pebbly to 17.7 m Gravel: coarse and fine, angular flint with well rounded flint, vein quartz and some subangular chalk Sand: fine with medium; angular flint, quartz and chalk; greyish brown	2.8+	19.6

TM 28 SE 59 **2887 8039** **Oakhill, Metfield** **Block I**

Surface level +44.3 m
Water not struck
B 30 Power Auger 115 mm diameter
July 1982

Overburden 14.2 m
Mineral 5.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		1.0	1.0
Boulder Clay (Lowestoft Till)	Clay, olive grey, with subangular chalk and flint pebbles	c.12.0	c.13.0
	Clay, sandy, grey to brownish grey, with fine angular chalk pebbles	0.5	13.5
Beccles Beds (Starston Till)	Clay, silty and sandy, dusky yellowish brown, with sparse angular flint pebbles; thin beds of gravel at the base	0.7	14.2
(Westleton Beds)	Sandy gravel with thin beds of laminated silt Gravel: coarse and fine; well rounded and subangular flint with sparse vein quartz and quartzite Sand: medium and fine, with some coarse below 15.0 m; subangular quartz and a trace of flint to 15.0 m; well rounded quartz with some mica below; dark orange to 15.0 m, pale yellow below	5.4+	19.6

COMPOSITION

Depth below surface (m)	Percentages by weight in +8-16 mm fraction							
	Angular flint	Rounded flint	Vein Quartz	Quartzite	Chalk	Limestone	Igneous and Metamorphic	Others
14.2-15.0	41	54	1	4	0	0	0	0
17.0-18.0	42	56	1	1	0	0	0	0
Mean	**41**	**55**	**1**	**3**	**0**	**0**	**0**	**0**

TM 28 SE 60 **2735 8177** **Chestnut Lodge Farm, Mendham** **Block I**

Surface level +43.1 m
Water struck at +31.2 m
Shell and auger
September 1983

Overburden	11.9 m
Mineral	8.5 m
Waste	0.3 m
Mineral	1.7 m
Waste	0.9 m
Mineral	1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy, dark yellowish brown	0.3	0.3
Cover Sand	Sand, silty, moderate brown; sparse ironstone pebbles	0.2	0.5
Boulder Clay (Lowestoft Till)	Clay, silty; sandy at the top, waxy below 1.6 m; mottled light olive brown and light olive grey near top, mainly olive grey below; abundant rounded chalk pebbles and scattered angular flint and black (Jurassic) mudstone pebbles	11.4	11.9
Beccles Beds ('Glacial')	**a** Pebbly sand, with charcoal fragments near the base Gravel: mainly fine; rounded chalk and angular flint, with some rounded brown quartzite and vein quartz Sand: mainly medium; subrounded quartz with some angular flint and calcite; a trace of chalk below 18.0 m; pale yellowish brown	8.5	20.4
	Silt, clayey, brown, with sparse well rounded flint and quartzite pebbles at the top	0.3	20.7
	b 'Very clayey' pebbly sand Gravel: mainly fine; flint, vein quartz and quartzite Sand: mainly fine; well rounded quartz with some mica; dark yellowish orange	1.7	22.4
	Silt, sandy, stiff, laminated, dusky yellow green and brownish grey	0.9	23.3
(Pebbly Series)	**c** Gravel Gravel: mainly fine; well rounded black and grey flint with some angular flint, vein quartz and quartzite Sand: mainly medium; with coarse; rounded quartz and angular flint; pale yellowish brown	1.7+	25.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
a	9	81	10	11.9-14.0	14	23	54	4	4	1	0
				14.0-16.0	10	28	52	2	6	2	0
				16.0-18.0	5	14	47	7	14	13	0
				18.0-20.4	6	30	58	3	3	0	0
				Mean	**9**	**24**	**53**	**4**	**6**	**4**	**0**
b	24	67	9	20.7-22.4	24	48	16	3	8	1	0
c	5	44	51	23.3-25.0	5	6	22	16	32	19	0
a+b+c	**10**	**75**	**15**	**Mean**	**10**	**25**	**45**	**5**	**10**	**5**	**0**

Shallow resistivity survey: method and results

During the course of the sand and gravel survey, 49 resistivity depth soundings were carried out to provide information about the lateral variation of overburden and the underlying mineral resources. The resistivity data were collected by the Offset-Wenner technique, using the multicore cable described by Barker (1981) and an ABEM SAS 300 digital Terrameter. The field data were processed on a Research Machines 380Z microcomputer using the interactive interpretation procedure developed by BGS during work in the Redditch-Solihull area (Clarke and others, 1982) and more fully described by Clarke and Finch (*in press*). The geological and lithological interpretations are presented together with the computer-generated geo-electric model in the resistivity sounding logs appended below.

A number of general conclusions can be drawn from the results of the survey. Within this field area, the principal overburden comprises boulder clay with interpreted resistivity values ranging from about 12 to 25 ohm m. However, at some sites, for example TM 28 NE R1, an upper weathered part of the boulder clay can be recognised in the geo-electric model, with interpreted resistivity values of about 20–25 ohm m. Glacial silts are commonly found within the glacial sequence, and in this area are interpreted as being present where values of about 50–75 ohm m are recorded (as in the sounding at site TM 28 SW RES 5). Thick and extensive sandy deposits forming part of the Beccles Beds, known from the detailed field mapping of the area, can also be recognised in the resistivity logs, where values of about 150 ohm m are typical. At many sites the interface between the boulder clay and the underlying sandy strata is marked by a zone, about 4 m thick, with high interpreted resistivity (about 400 ohm m). This may in places represent the quartz-rich Kesgrave Sands and Gravels or flint-rich glacial sand and gravel. Finally, the extensive river terrace deposits at Homersfield and Flixton show abnormally high interpreted resistivity values (at sites TM 38 NW R2a, b and c) ranging from 1209 to 1819 ohm m. These high values may have been caused by the low water-table conditions existent at Flixton Park due, in part, to the time of survey (June) but also to the de-watering of nearby pits.

Explanation of the records

The numbered paragraphs below correspond to the annotations on the first record.

1. The resistivity site is registered in a similar manner to the assessment boreholes. The site number has the form 'Rn'; where more than one sounding has been made at a site, the registration number is suffixed by the letters a, b, c etc.
2. The position of the site is generally referred to the nearest named locality on the 1:25 000 map. The grid reference, accurate to 10 m, is also given.
3. Surface levels have been estimated in relation to spot heights or contours on the appropriate six-inch or 1:10 000 map.
4. The date of the sounding is given.
5. The general resource evaluation is presented in a similar manner to that for assessment boreholes; generally, no thickness is given for the lowest layer because the junction with the underlying deposit is undefined.
6. The resistivity log is derived from the computer-generated model which best fits the field data. The lithological interpretation and geological classification are based upon knowledge of local geology and correlation with nearby boreholes.
7. The results plotted are those used in the computer modelling. The field data, generally gathered at electrode spacings of 0.5, 1, 2, 4, 8, 16, 32 and 64 m, and intermediate values obtained by computer processing of this data are shown. The curve represents the computer-generated model.

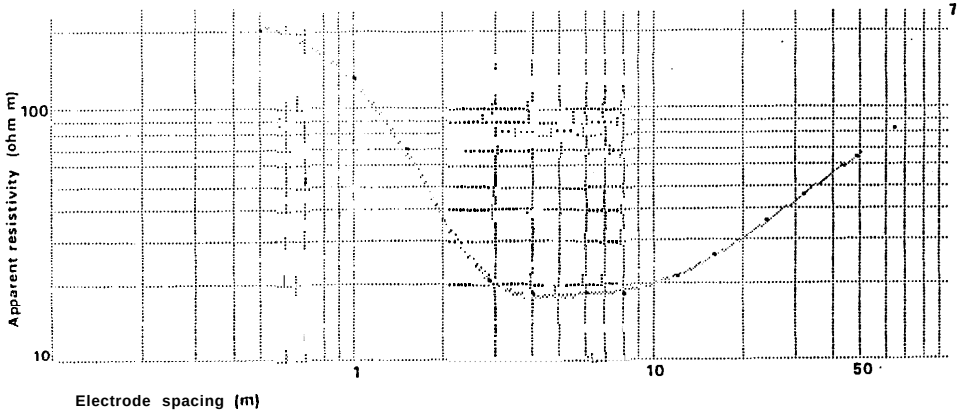
TM 27 NW R1[1] 2258 7830 near **Evans Barn, Hoxne**[2] Block K

Surface level: c. +46 m[3]
August 1982[4]

Overburden 15.7 m[5]
Mineral -

Interpretation[7]

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, pebbly	236	0.8	0.8
Boulder Clay	Clay, silty	17	14.9	15.7
Glacial Sand and Gravel	Sandy gravel	395	-	-



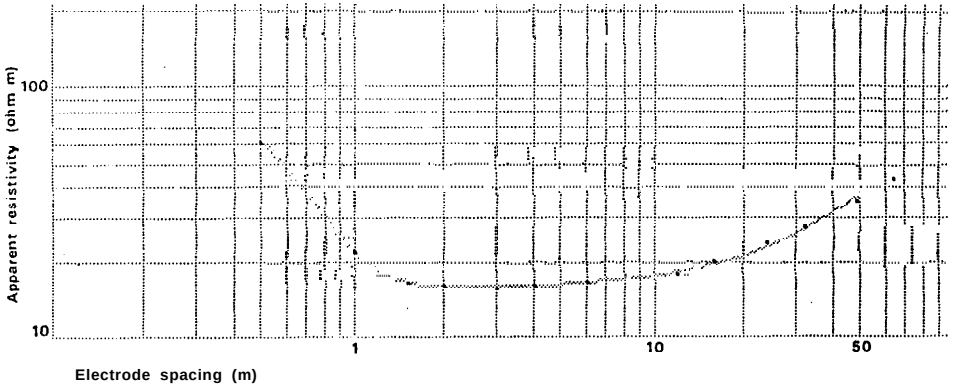
TM 27 NW R2 2202 7709 **The Green, Wingfield** Block K

Surface level: c. +48 m
August 1982

Waste 26.5 m

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty, sandy	126	0.3	0.3
Boulder Clay	Clay, silty, firm	15	3.7	4.0
	Clay, silty	18	22.5	26.5
?Beccles Beds	Sand	146		



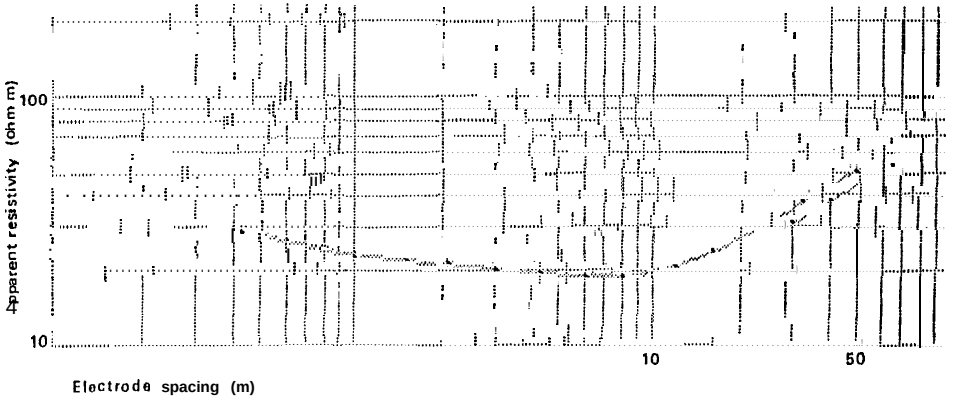
TM 27 NW R3 2188 7578 **near Chickering Farm, Wingfield** **Block K**

Surface level: c. +49 m
August 1982

Overburden 18.4 m
Mineral 4.9 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	42	0.2	0.2
Boulder Clay	Clay, silty (weathered)	22	1.6	1.8
	Clay, silty	18	16.6	18.4
?Glacial Sand and Gravel	Sandy gravel	395	4.9	23.3
? Beccles Reds	Sand	142		



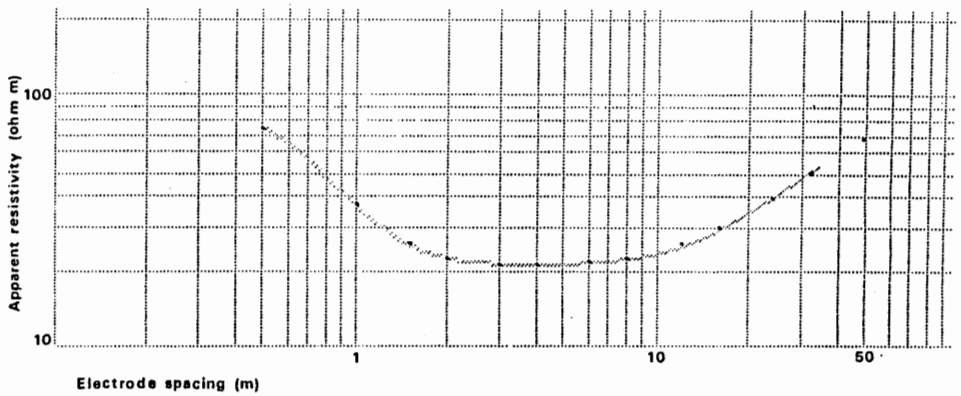
TM 27 NW R4 **2358 7773** **near Bleach Green, Wingfield** **Block K**

Surface level: c. +51 m
August 1982

Overburden 16.9 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy	104	0.4	0.4
Boulder Clay	Clay, silty	21	16.5	16.9
Glacial Sand and Gravel	Sandy gravel	399	-	-



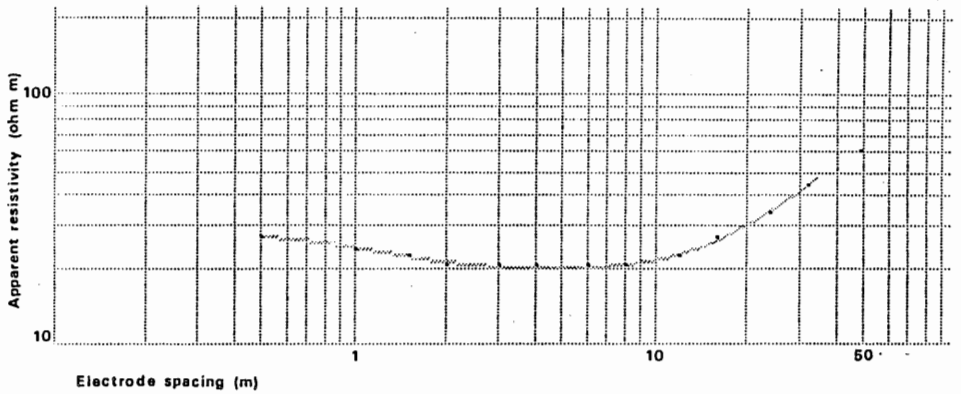
TM 27 NW R5 **2447 7934** **Church Farm, Fressingfield** **Block J**

Surface level: c. +40 m
August 1982

Overburden 18.3 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	28	0.7	0.7
Boulder Clay	Clay, silty	19	17.6	18.3
Beccles Beds	Sandy gravel	398	-	-



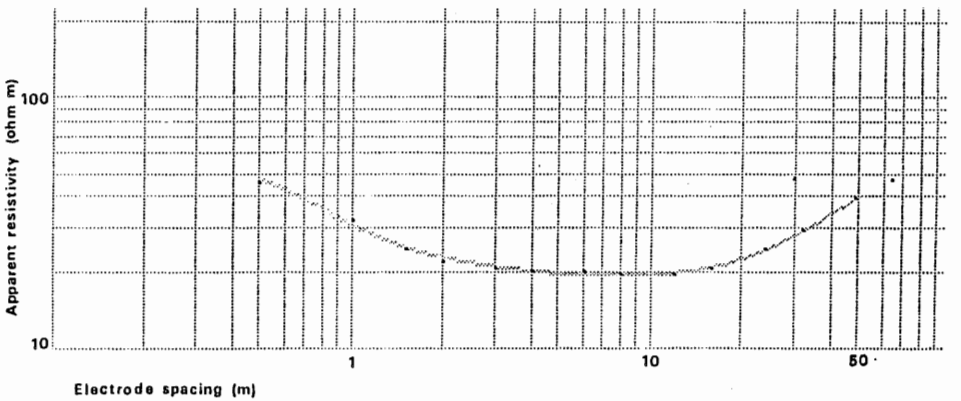
TM 27 NW R6 **2423 7545** **Pixey Green, Fressingfield**

Surface level: c. +52 m
August 1982

Waste 25.8 m

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	60	0.4	0.4
Boulder Clay	Clay, silty (weathered)	22	1.5	1.9
	Clay, silty	18	23.9	25.8
?Beccles Beds	Sand	150	-	-



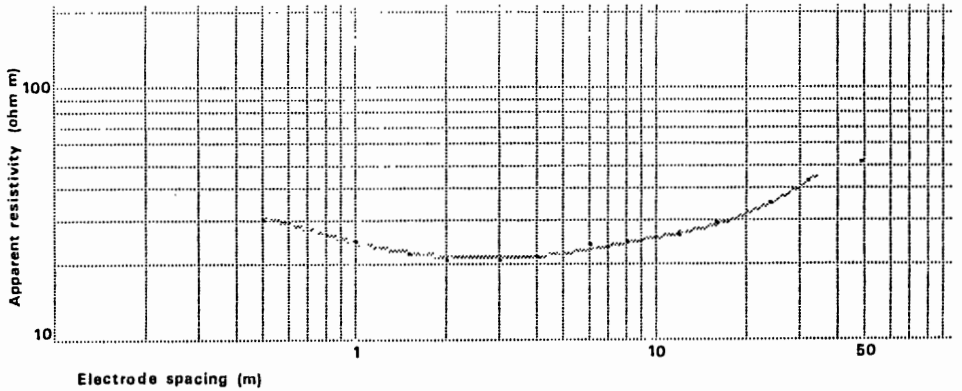
TM 27 NW R7 **2164 7781** **Great Greens, Syleham** **Block K**

Surface level: c. +50 m
May 1983

Overburden 16.9 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	36	0.4	0.4
Boulder Clay	Clay, silty (weathered)	20	6.2	6.6
Glacial Sand and Gravel	Gravel, clayey	91	1.7	8.3
Boulder Clay	Clay, silty, firm	13	8.6	16.9
Beccles Beds	Sandy gravel	400	-	-



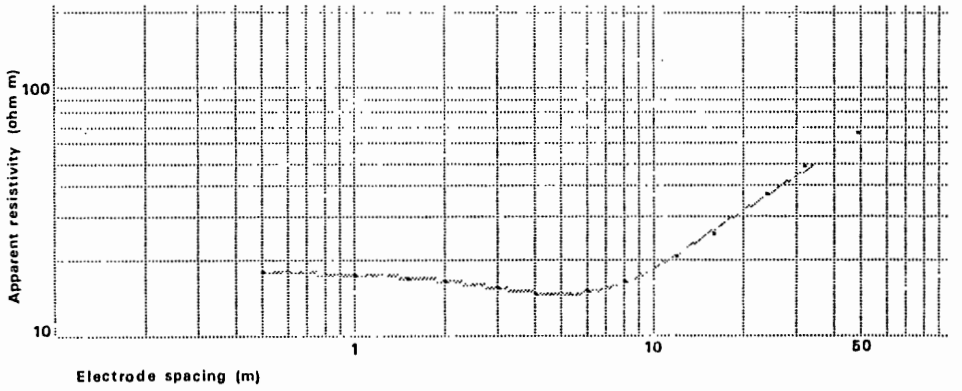
TM 27 NW R8a **2140 7602** **Stud Farm, Hoxne** **Block K**

Surface level: c. +49 m
May 1983

Overburden 9.3 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	18	0.4	0.4
Boulder Clay	Clay, silty	17	1.6	2.0
	Clay, silty, firm	12	7.3	9.3
?Beccles Beds	Sand	161	-	-



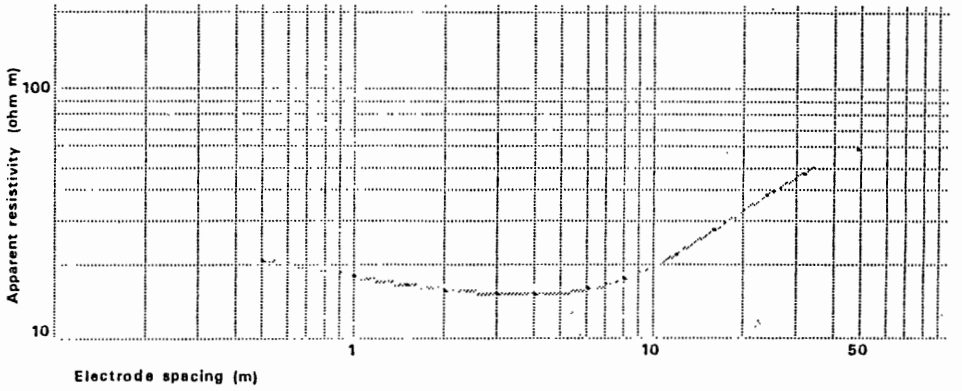
TM 27 NW R8b **2134 7602** **Stud Farm, Hoxne** **Block K**

Surface level: c. +49 m
May 1983

Overburden 10.2 m
Mineral 4.0 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	23	0.4	0.4
Boulder Clay	Clay, silty	16	1.4	1.8
	Clay, silty, firm	13	8.4	10.2
?Glacial Sand and Gravel	Sandy gravel	401	4.0	14.2
?Beccles Beds	Sand	135	-	-



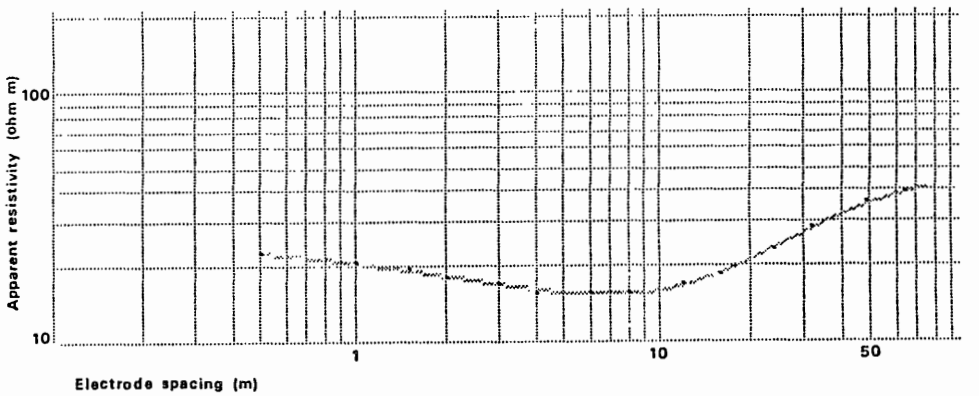
TM 27 NW R9a **2295 7504** **near Hill Farm, Stradbroke**

Surface level: c. +43 m
May 1983

Overburden 16.8 m
Mineral 4.0 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty	24	0.5	0.5
Boulder Clay	Clay, silty	18	1.5	2.0
	Clay, silty, firm	14	14.8	16.8
Beccles Beds	Sandy gravel	251	4.0	20.8
?Crag	Sand, silty	50	-	-



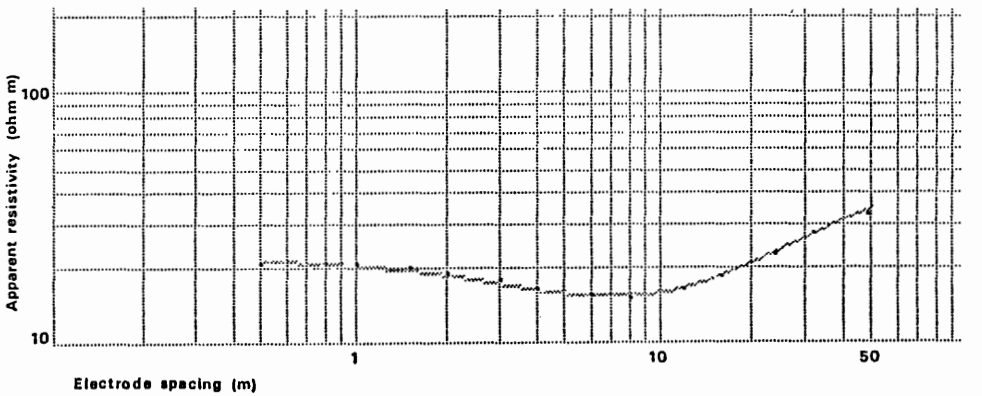
TM 27 NW 9b **2298 7507** **near Hill Farm Stradbroke**

Surface level: c. +43 m
May 1983

Overburden 17.3 m
Mineral 4.0 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	23	0.3	0.3
Boulder Clay	Clay, silty (weathered)	20	1.5	1.8
	Clay, silty, firm	14	15.5	17.3
Beccles Beds	Sandy gravel	249	4.0	21.3
?Crag	Sand, silty	50	-	-



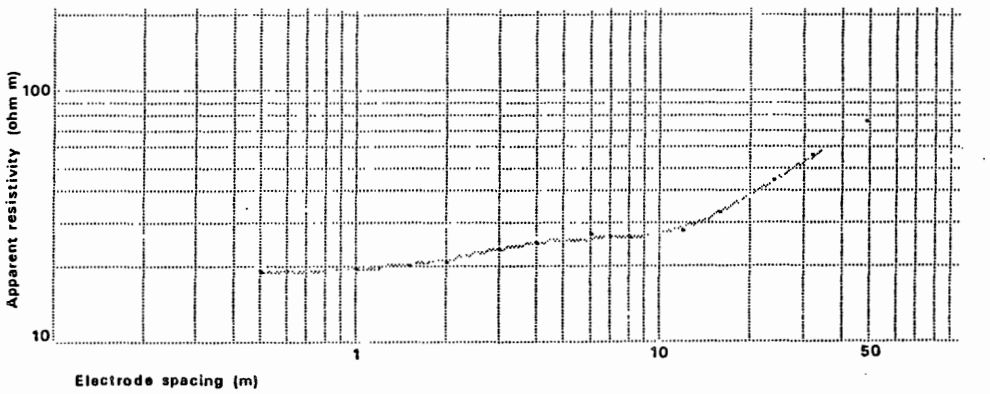
TM 27 NW R10 **2473 7990** **Potters Farm, Weybread** **Block J**

Surface level: c. +48 m
May 1983

Overburden 13.1 m
Mineral 4.3 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	19	1.9	1.9
Boulder Clay	Clay, silty (weathered)	36	2.3	4.2
	Clay, silty	18	8.9	13.1
Beccles Beds	Sandy gravel	448	4.3	17.4
	Sand	170	-	-



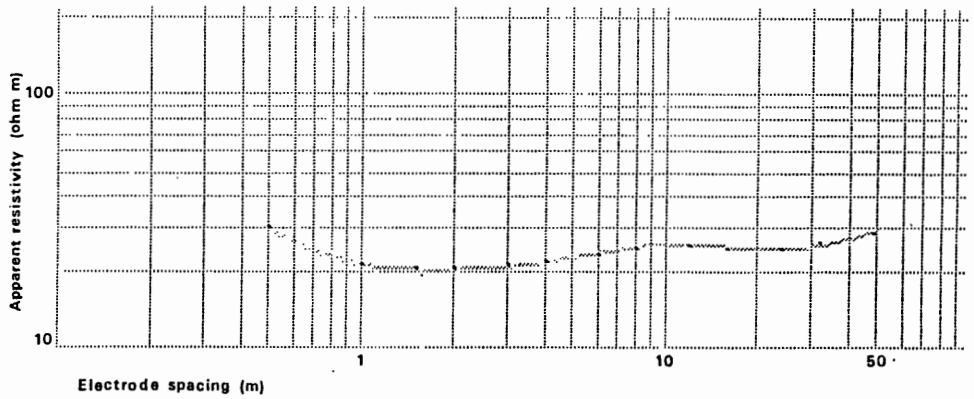
TM 27 NE R1 **2882 7607** **Willow Farm, Stradbroke**

Surface level: c. +55 m
August 1982

Waste 22.4 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	56	0.2	0.2
Boulder Clay	Clay, silty	20	3.6	3.8
	Silt, clayey	33	7.9	11.7
	Clay, silty, firm	13	10.7	22.4
	Silt	47	-	-



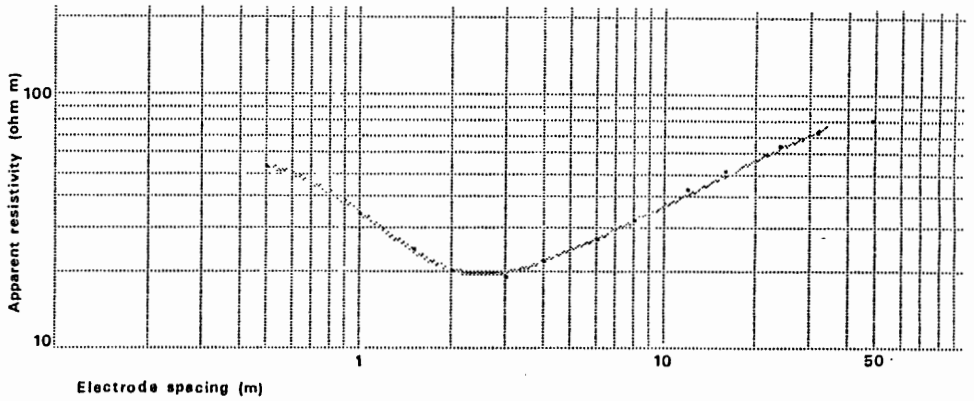
TM 28 SW R1 **2038 8266** **near Leist's Farm, Dickleburgh**

Surface level: c. +43 m
August 1982

Overburden 10.7 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	60	0.6	0.6
Boulder Clay	Clay, silty	15	2.6	3.2
Glacial Silt	Silt	44	7.5	10.7
Glacial Sand and Gravel	Sand	136	-	-



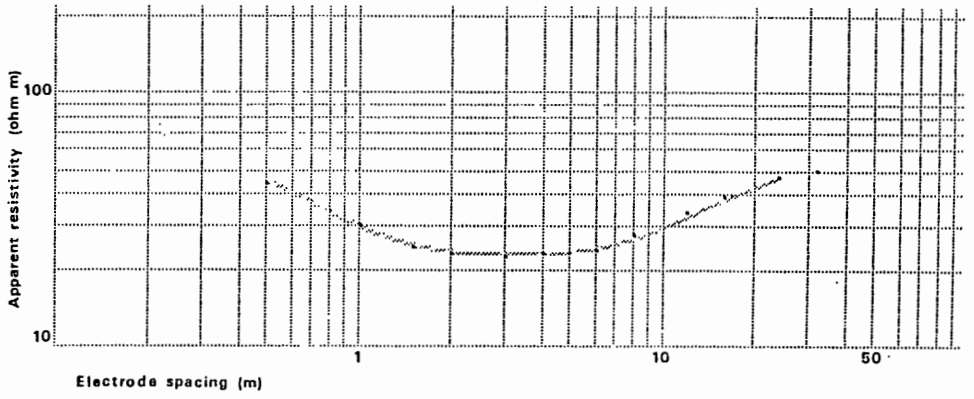
TM 28 SW R2 **2172 8377** **Garlic Street, Pulham St. Mary**

Surface level: c. +40 m
August 1982

Overburden 10.0 m
Mineral 5.9 m
Waste -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	57	0.4	0.4
Boulder Clay	Clay, silty	22	9.6	10.0
Glacial Sand and Gravel	Sandy gravel, silty	251	5.9	15.9
?Glacial Silt	Silt	33	-	-



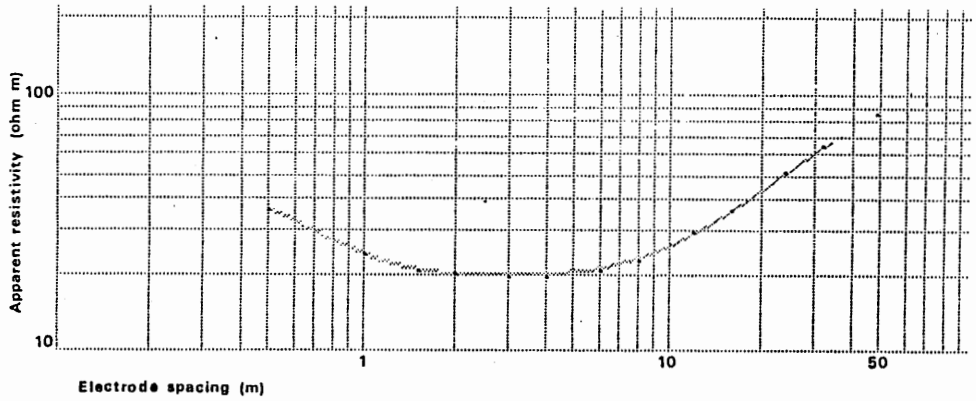
TM 28 SW R3 **2124 8208** **near Doles Farm, Needham**

Surface level: c. +46 m
August 1982

Overburden 11.2 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, silty, sandy	50	0.4	0.4
Boulder Clay	Clay, silty	19	10.8	11.2
Glacial Sand and Gravel	Sandy gravel	284	-	-



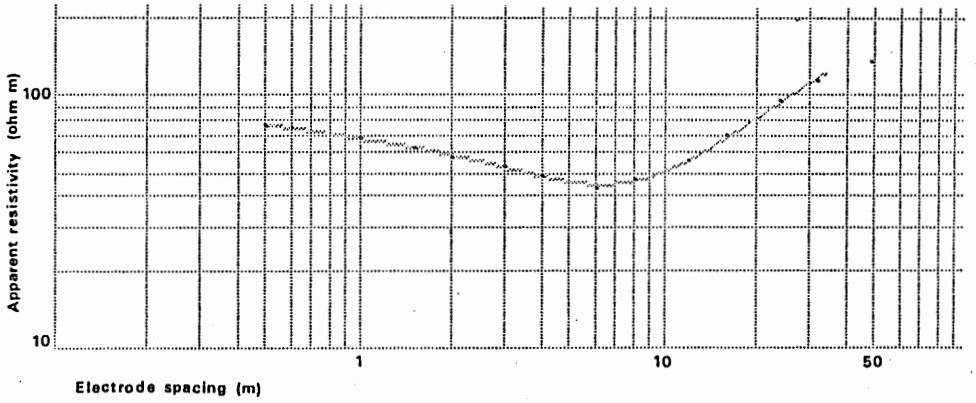
TM 28 SW R4 **2278 8319** **near Rose Cottage, Starston**

Surface level: c. +43 m
August 1982

Overburden 11.0 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	83	0.4	0.4
Boulder Clay	Clay, silty, sandy (weathered)	61	1.8	2.2
Glacial Silt	Silt	34	8.8	11.0
Glacial Sand and Gravel	Sandy gravel	403	-	-



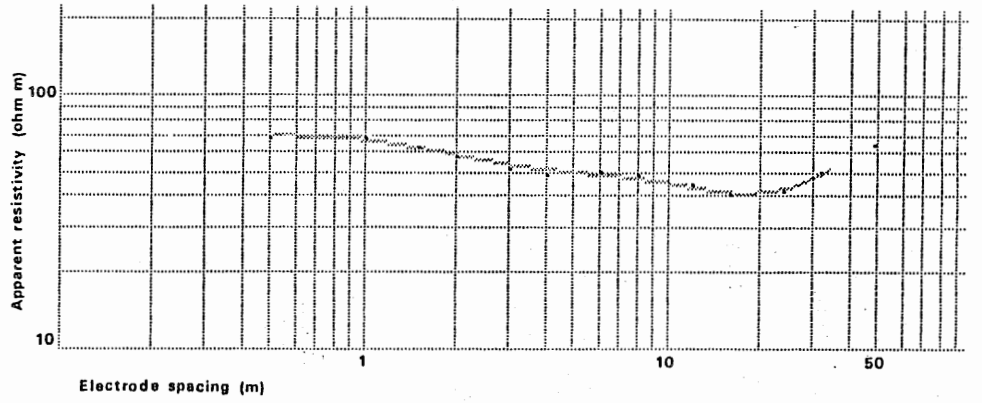
TM 28 SW R5 **2426 8017** **near Holiday House, Weybread**

Surface level: c. +46 m
August 1982

Waste 21.7 m

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	68	0.3	0.3
Boulder Clay	Clay, silty, sandy	72	0.8	1.1
Glacial Silt	Silt	48	10.4	11.5
Boulder Clay	Clay, silty	18	10.2	21.7
Beccles Beds	Sandy gravel	235	-	-



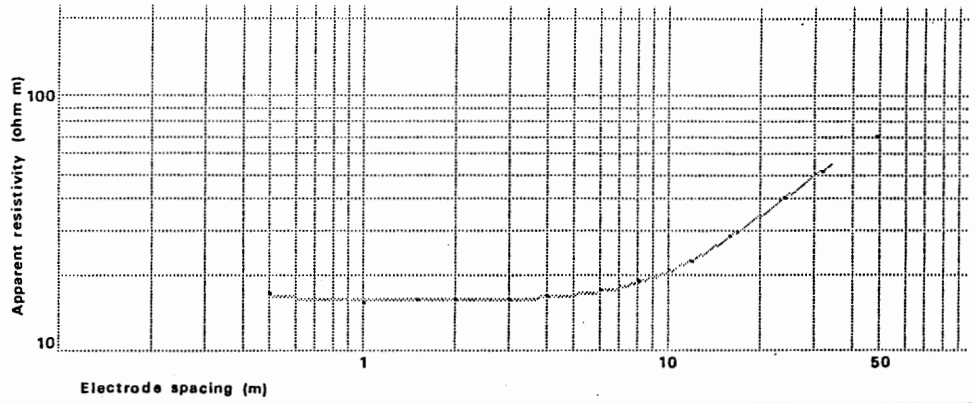
TM 28 SW R6 **2083 8144** **near Furze Covert, Dickleburgh**

Surface level: c. +46 m
August 1982

Overburden 12.2 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	27	0.1	0.1
Boulder Clay	Clay, silty	14	0.2	0.3
	Clay, silty	16	11.9	12.2
Glacial Sand and Gravel	Sandy gravel	395	-	-



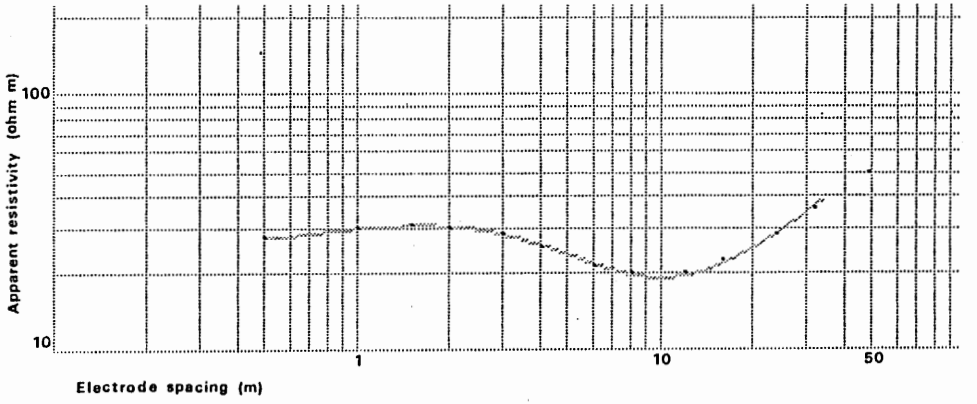
TM 28 SW R7a **2040 8190** **Dodds Wood, Dicklelburgh**

Surface level: c. +47 m
May 1983

Overburden 18.5 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	26	0.4	0.4
Boulder Clay	Clay, silty (weathered)	34	2.4	2.8
	Clay, silty, firm	15	15.7	18.5
Glacial Sand and Gravel	Sandy gravel	376	-	-



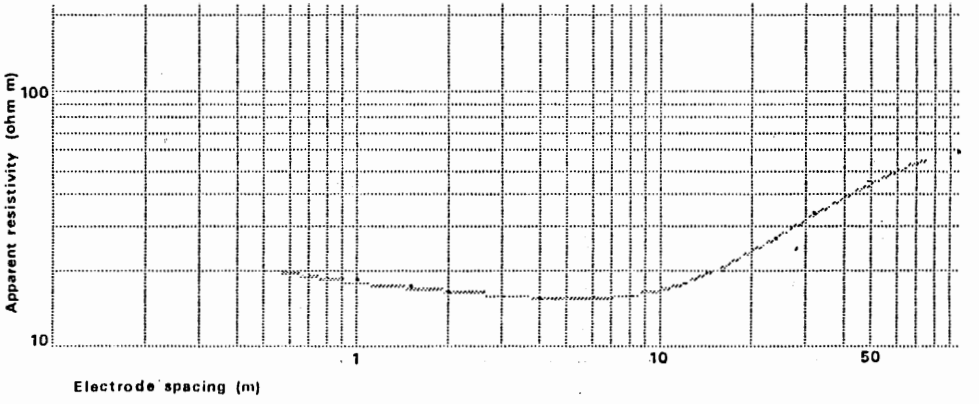
TM 28 SW R7b **2028 8185** **Dodds Wood, Dickleburgh**

Surface level: c. +47 m
May 1983

Overburden 15.9 m
Mineral 3.9 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	23	0.3	0.3
Boulder Clay	Clay, silty	17	1.5	1.8
	Clay, silty	15	14.1	15.9
Glacial Sand and Gravel	Sandy gravel	475	3.9	19.8
?Crag	Sand, silty	82	-	-



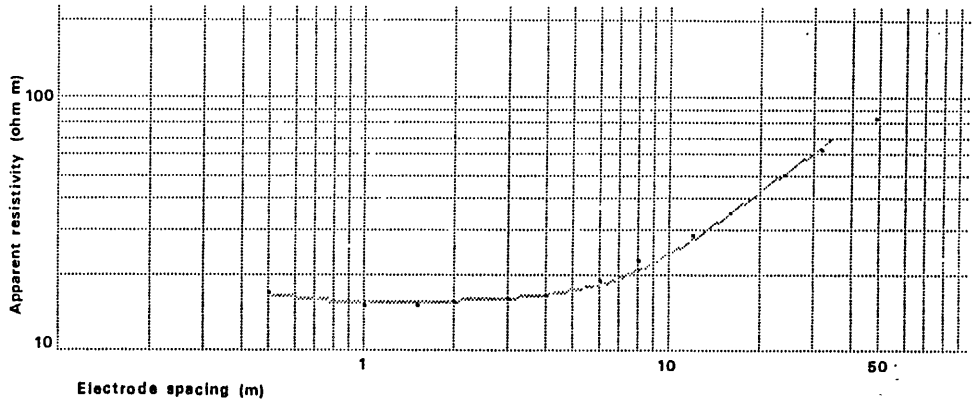
TM 28 SE R1 **2642 8379** **Cook's Lane, Wortwell**

Surface level: c. +37 m
August 1982

Overburden 9.5 m
Mineral -

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil; silty clay	21	0.2	0.2
Boulder Clay	Clay, silty, firm	14	0.4	0.6
	Clay, silty	16	8.9	9.5
Beccles Beds	Sandy gravel	395	-	-



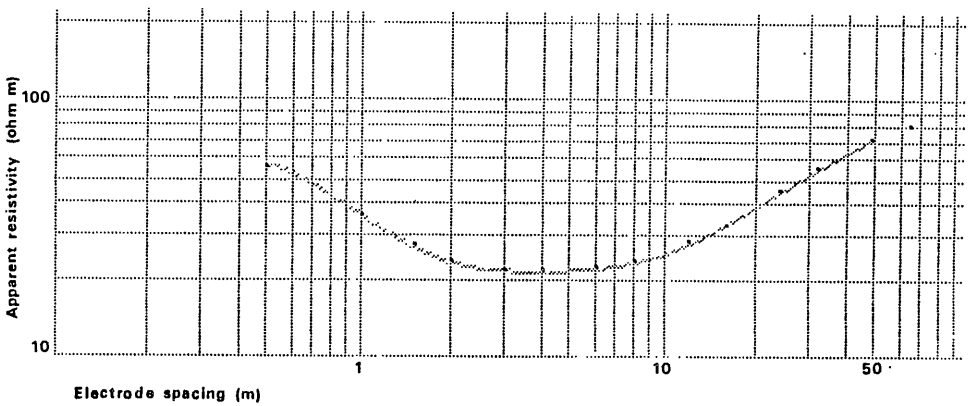
TM 28 SE R2 **2869 8224** **near Moat Farm, Mendham**

Surface level: c. +43 m
August 1982

Overburden 13.1 m
Mineral 3.9 m+

Interpretation

Geological classification	Lithology	Resistivity (ohm m)	Thickness (m)	Depth (m)
	Soil, sandy, silty	68	0.5	0.5
Boulder Clay	Clay, silty	20	12.6	13.1
Glacial Sand and Gravel	Sandy gravel	392	3.9	17.0
?Beccles Beds	Sand	143	-	-



145 (SHEET 1)

BRITISH GEOLOGICAL SURVEY

THE SAND AND GRAVEL RESOURCES OF THE COUNTRY AROUND HARLESTON AND BUNGAY

Scale 1:25 000 or about 2½ Inches to 1 Mile

ORDNANCE SURVEY
PARTS OF SHEETS TM 28, 38 & 39
PROVISIONAL EDITION

Generalized contours in metres on the surface of the Crag relative to Ordnance Datum. A deep glacial channel (trending SW-NE) and tributary channels (trending NW-SE) have been excavated into the surface of the Crag. The areas of potentially workable Crag occur principally on the flanks of the channels.

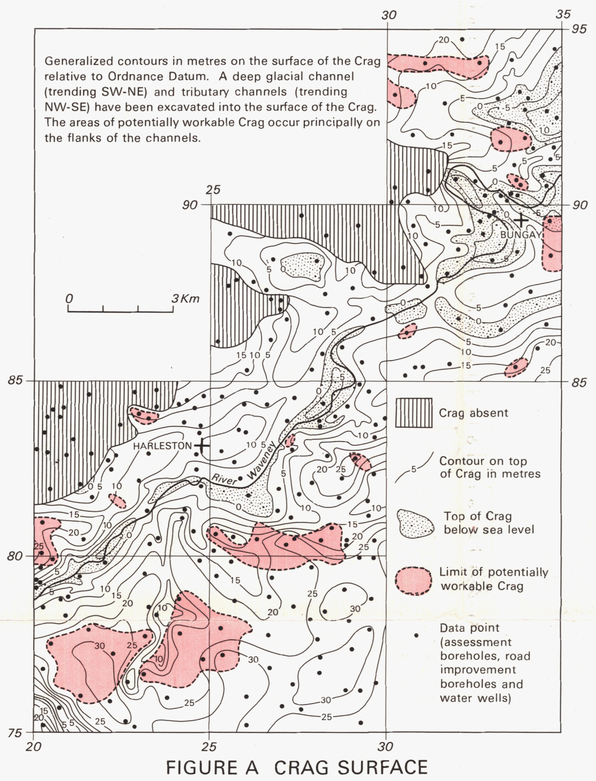
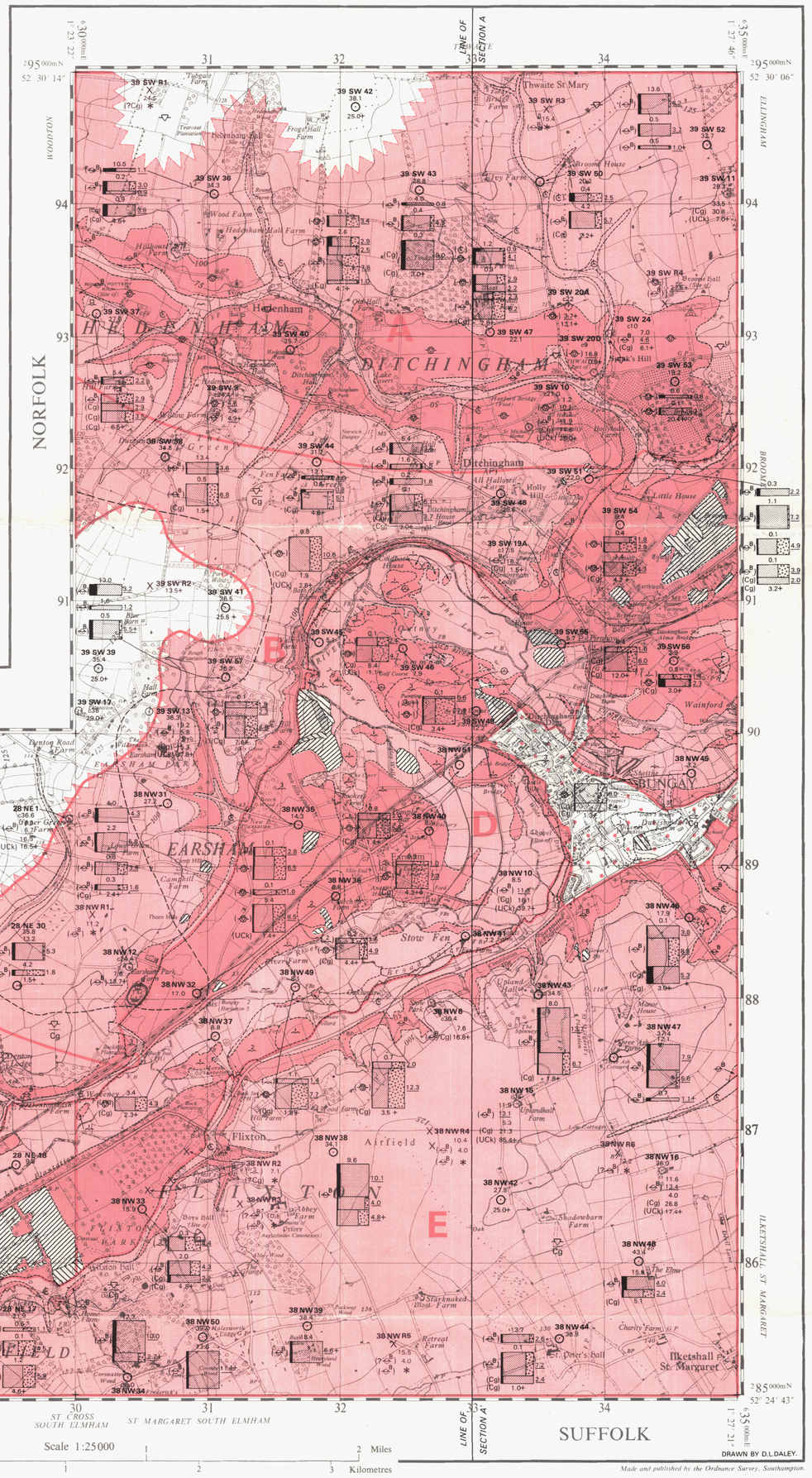


FIGURE A CRAG SURFACE



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

Made and published by the Ordnance Survey, Southampton.

Geological lines from a survey at the scale of six inches to one mile by C.J.Wilcox and A.Horton in 1980.
Conjectural limit of Crag by C.A.Auton in 1984.

Sand and Gravel survey by C.A.Auton and M.R.Clarke in 1983 -84.

1 : 25 000 Sand and Gravel Resources Sheet published in 1985.
W.A.Read, Manager Programme B5.
G.M.Brown, D.Sc., F.R.S., *Director British Geological Survey.*

PRINTED BY COOK HAMMOND & KELL LTD. MITCHAM & WESTMINSTER

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

Contour values are in feet
1 square inch on this map represents 99·639 acres on the ground.

Data quoted for an individual borehole refer strictly to that site; reliable conclusions cannot be drawn about the thickness and grading elsewhere in the deposit, particularly in material as variable as sand and gravel. However, estimates of the volume and mean grading of the mineral as a whole in each Resource Block are given in the Report.

Compiled from 6" sheets last fully revised 1903-26
Other systematic revision 1946-53 has been incorporated
Major roads revised 1977

This map and accompanying report were commissioned and financed by the Department of the Environment.

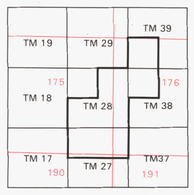


Diagram showing the relationship of sheets 1 and 2 to the National Grid 1:25 000 sheets and the New Series One-Inch Geological Sheets 175, 176, 190 and 191.

THE SAND AND GRAVEL RESOURCES OF THE COUNTRY AROUND HARLESTON AND BUNGAY - SHEET 1

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

EXPLANATION OF SYMBOLS AND ABBREVIATIONS (FOR SHEETS 1 AND 2)

DRIFT

- **Blown Sand** - fine and medium sand — BS-15
- **Peat** - dark brown organic matter — P-11
- **Alluvium** - soft silts and clays with occasional shells — A-70
- **River Terrace Deposits** - sand and angular flint gravels — RT-38
- **Head** - sandy silty clay or very clayey pebbly sand, derived by solifluxion — H-59
- **Head Gravel** - sandy gravel with angular cobbles of flint — H-60
- **Boulder Clay (Lowestoft Till)** - dark olive grey clay with scattered pebbles of chalk and flint — BC-51
- **Glacial Drift, Undifferentiated** - channel-fill deposits comprising glacial sand and gravel, silt and boulder clay — GD-5
- **Glacial Laminated Deposits** - grey silt, often laminated — GLD-1
- **Glacial Sand and Gravel** - poorly sorted sand and gravel with pebbles of flint, quartzite, vein quartz, chalk and limestone — GS-94
- **Beccles Beds** - a diverse suite of sands and gravels, mainly flint but rich in quartz and quartzite pebbles — BB-2
- **Starston Till** - yellowish brown sandy clay with scattered flint pebbles — STT-1

RECENT AND PLEISTOCENE

SOLID

- Cg — **Crag** - micaceous quartz sand, in part dark green (glauconitic) and occasionally silty; some rounded flint and vein quartz pebbles — CG-3 (IF IT OCCURS AT ALL IN THE RESOURCE AREAS)
- UCK — **Upper Chalk** - soft white limestone

CRETACEOUS

- **Made Ground** — MG-2
- **Area worked for sand and gravel** — WO-20

BOUNDARY LINES

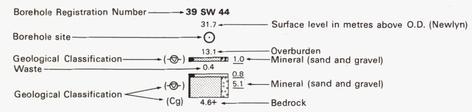
- Geological boundary, Drift
- Geological boundary, Solid
- Inferred boundary between recognised categories of deposits
- Resource block boundary

Broken lines denote uncertainty.

BOREHOLE DATA
SITE LOCATIONS

- Assessment boreholes
- Other boreholes

ASSESSMENT BOREHOLES

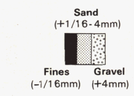


Grading Diagram
Thicknesses in metres

Note:
(i) Figures underlined denote thicknesses used in the assessment of resources
(ii) The + sign indicates that the base of the deposit was not reached
(iii) The Geological Classification is given only for mineral and bedrock

Borehole Registration Number
Each assessment borehole is identified by a Registration Number eg. **39 SW 44**. The first number and letters refer to the quarter sheet and the second number to the B.G.S. serial number for that quarter. The unique designation for borehole **39 SW 44** is **TM 39 SW 44**.

Grading Diagrams
Each grading diagram shows the mean particle size distribution of a distinct deposit of mineral.



The height of the diagram is proportional to the mineral thickness. The widths of the divisions show the proportions of **Fines, Sand** and **Gravel**, but small amounts of gravel may be omitted or exaggerated.

OTHER BOREHOLES
The layout of information is the same as for assessment boreholes although data available may not be as comprehensive. They are registered in the same series.

GEOPHYSICAL DATA

RESISTIVITY DEPTH SOUNDINGS

Note:
(1) The Depth Sounding Indentification Number comprises the alphanumeric code for the quarter sheet eg. **38 NW** followed by the letter '**R**' and the site number eg. **38 NW R3**
(2) The figures represent the mean thickness of each deposit, derived from the interpretation of resistivity soundings clustered at each site.
(3) Other conventions are the same as for assessment boreholes.

CATEGORIES OF DEPOSITS

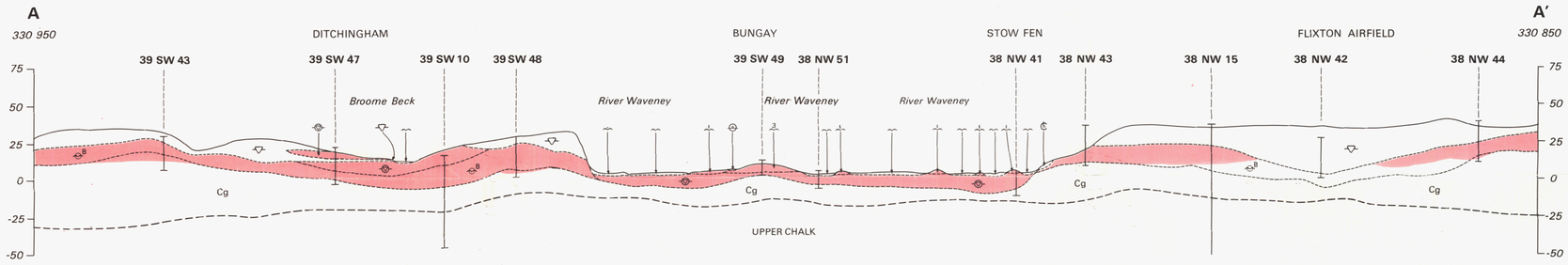
- Exposed mineral. — CAT-E6
- Continuous or almost continuous spreads of mineral beneath overburden. — CAT-C1
- Sand and gravel either not potentiallly workable (see Report) or absent. — CAT-A2
- Sand and gravel not assessed. — CAT-N1

RESOURCE BLOCKS
For the purpose of assessment, the map is divided into Resource blocks. Each block is designated by a letter.

Detailed records may be consulted on application to the Manager, Programme B5, British Geological Survey, Nicker Hill, Keyworth, Nottingham, NG12 5GG.

GENERALIZED HORIZONTAL SECTION SHOWING RELATIONSHIPS OF DRIFT DEPOSITS

HORIZONTAL SCALE 1 : 25 000 VERTICAL EXAGGERATION 10 x



Key to Sections

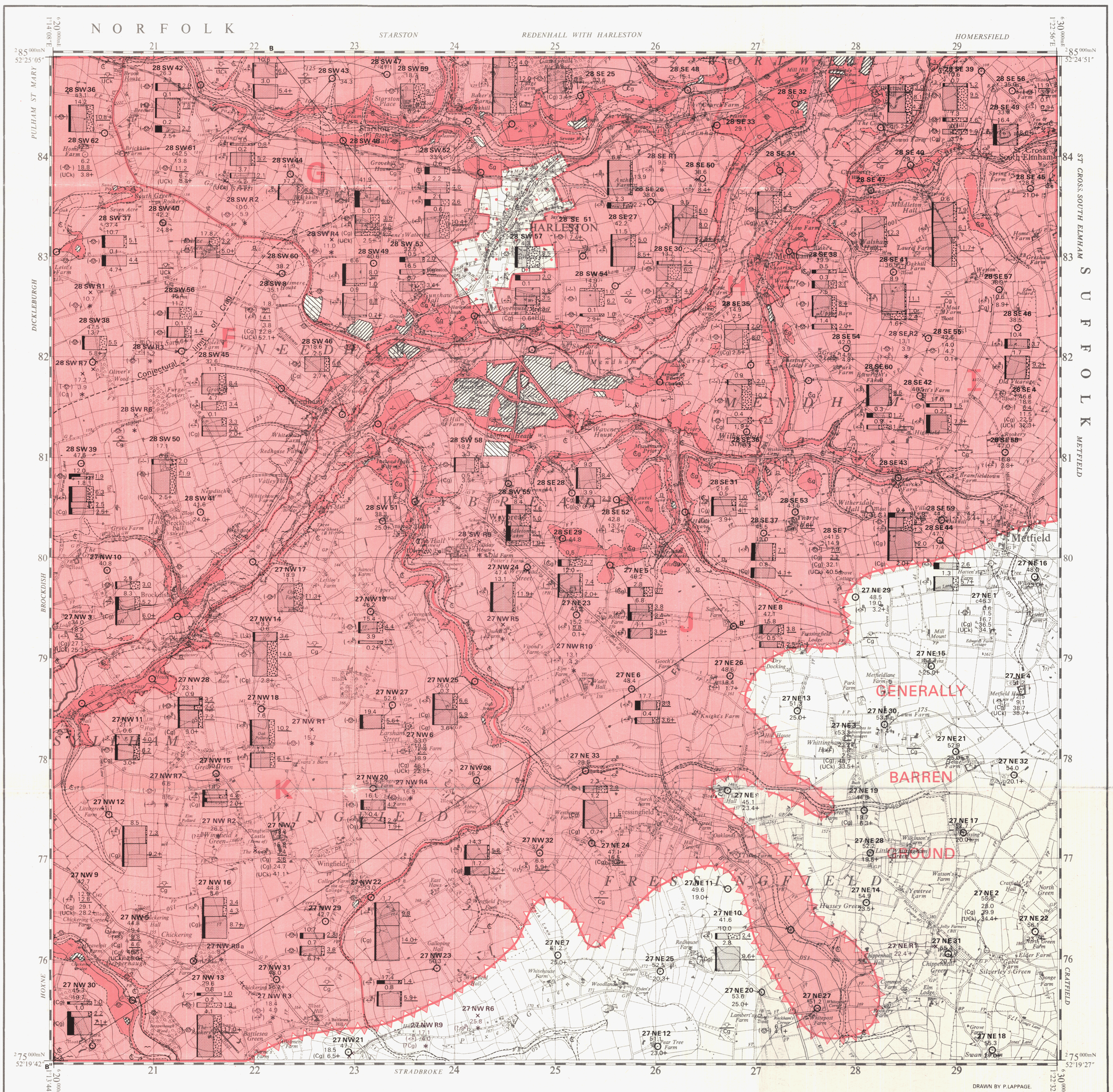
- Mineral

BRITISH GEOLOGICAL SURVEY

THE SAND AND GRAVEL RESOURCES OF THE COUNTRY AROUND HARLESTON AND BUNGAY

Scale 1:25 000 or about 2½ Inches to 1 Mile

ORDNANCE SURVEY
PARTS OF SHEETS TM 27 & TM 28
PROVISIONAL EDITION



Yards 1000 0 1 2 Miles
Metres 1000 0 1 2 3 Kilometres
Scale 1:25000

DRAWN BY P.LAPPAGE.

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Made and published by the Ordnance Survey, Southampton.

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Compiled from 6" sheets last fully revised 1903-26.
Other partial systematic revision 1946-53 has been incorporated.
This map and the accompanying Report were commissioned and financed by the Department of the Enviroment.

EXPLANATION OF SYMBOLS AND ABBREVIATIONS
(see SHEET 1)

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

THE SAND AND GRAVEL RESOURCES OF THE COUNTRY AROUND HARLESTON AND BUNGAY-SHEET 2

145 (SHEET 2)

GENERALISED HORIZONTAL SECTIONS SHOWING RELATIONSHIPS OF DRIFT DEPOSITS.

SEE SHEET 1 FOR KEY

HORIZONTAL SCALE 1:25 000 VERTICAL EXAGGERATION 10x