BRITISH GEOLOGICAL SURVEY

TECHNICAL REPORT WA/89/21

Onshore Geology Series

TECHNICAL REPORT WA/89/21

SP28NE

Fillongley

Part of 1:63:360 Sheets 169 (Coventry)

J G Rees

Geographical index
UK, C England, Warwickshire,

Subject index
Geology, Quaternary,
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CONTENTS

SUMMARY

The geology of Sheet SP28NE (Fillongley) is described with reference to information from rocks at outcrop and significant boreholes and shafts.

Cambrian rocks and the overlying coal bearing part of the Carboniferous sequence are known from several boreholes. Much of the dominantly red- bed Carboniferous sequence overlying these is known also from outcrop.

Glacial deposits cover much of the area, and details are given of their lithology and distribution. Diagrams show the elevation of the sub- drift (bedrock) topography and drift thickness.

Currently, coal mining is the only form of mineral extraction in the area.

A schedule of boreholes is appended.

INTRODUCTION

The following report describes the geology of 1:10,000 sheet SP28NE (Fillongley) (Figure 1) and is designed to be used in conjunction with the 1:10 000 Geological sheet. Uncoloured dyeline copies of this map may be obtained from the British Geological Survey, Keyworth, Nottingham NG12 5GG.

Similar reports covering adjoining areas are:

SP28SE (Allesley)	(Rees 1989)
SP28NW (Maxstoke)	(Old 1989)
SP38NW (Bedworth West)	(Bridge 1989)

The map forms part of 1:50 000 Geological Sheet 169 (Coventry) for which a memoir was published (Eastwood and others 1923). The area was surveyed at 1:10 560 by C.H.Cunnington and T.Eastwood in 1912-1914. The whole of SP28NE was surveyed at the 1:10,000 scale by J.G.Rees in 1988 under the direction of Dr.A.J.Wadge as Regional Geologist. The survey and production of the map and this report were part- funded by the Department of the Environment. Palaeontological contributions were by Dr.A.W.A.Rushton, Dr.S.G.Molyneux and Dr.N.J.Riley.

TOPOGRAPHY AND LAND-USE

The area occurs north- east of Coventry on Upper Palaeozoic rocks of the "Barren" Coal Measures that form higher ground than the Mesozoic rocks east and west of the coalfield. The sandstones of these measures form dip slopes which are in places overlain by drift sequences, composed mostly of tills, that form clay plateaux. The area is largely given over to agriculture. The poorly drained soils on glacial clays and Upper Palaeozoic mudstones have given rise to dairying. The better- drained soils on Upper Palaeozoic sandstones, glacial sands and gravels and alluvium are largely used for sheep rearing. The ground is dissected by the River Bourne and its tributaries.

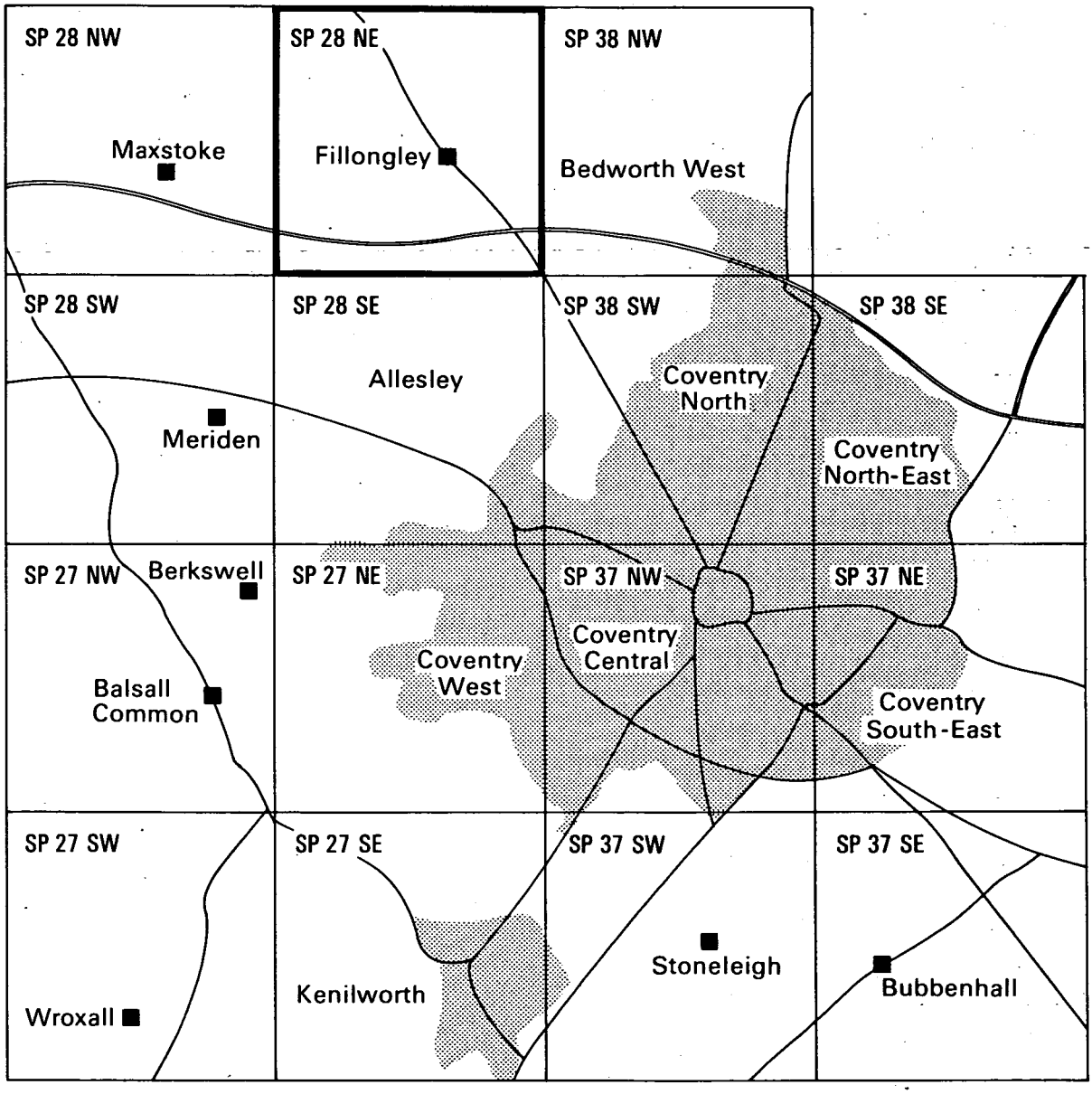

Figure 1. Area of this report relative to area of whole contract is shown with bold outline

GEOLOGICAL SEQUENCE

The solid formations and Quaternary deposits on sheet SP28NE are listed below; the relative and absolute thicknesses of the former are shown on the map.

Quaternary and Recent

Head
Alluvium
Till
Fluvio- glacial sand and gravel
Glacio- lacustrine laminated clay and silt

Unconformity

Permo- Carboniferous

Westphalian D- Stephanian	Coventry Sandstone Formation
	Keele Formation
	Halesowen Formation
Westphalian C	Etruria Marl Formation *
Westphalian A-C	Productive Coal Measures *

Unconformity

Cambrian
(including Tremadoc)

Tremadoc Series	Merevale Shales*
Merioneth Series	Monks Park Shales*

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* present at depth

Cambrian

Wherever proved, the pre- Carboniferous rocks are of Cambrian age (here taken to include the Tremadoc Series).

Monks Park Shales

The upper part of this formation has been proved at the base of the Fillongley, Solomons's Temple, Dale Wood, and Moor Farm boreholes (Figure 2). It consists of black- pale grey, slightly calcareous mudstones with a sparse brachiopod and trilobite fauna that includes *Broggeria salteri, Leptoplastus crassicornis, Parabolina spinulosa, Sphaerophthalmus sp.* and *Orusia lenticularis.*

Merevale Shales Formation
The lower part of the formation which generally lacks distinctive biostratigraphically useful fossils has been proved at the base of the Blabers Hall borehole. It is distinguished by burrowed and bioturbated mudstones which contain thin sandstones and siltstones. These contain *Lingulella sp.* and an acritarch flora including *Acanthodiacrodium achrasi, A.angustum, Cymatiogalea bellicosa, C.cristata, C.cuvillieri, C.cf. multarea, Dasydiacrodium cf. caudatum, Stelliferidium cortinulum* and *Timofeevia? sp.*

Upper Carboniferous (Westphalian- Stephanian)

Upper Carboniferous (Westphalian- Stephanian) rocks overlie the Cambrian rocks unconformably. The succession comprises mudstones, siltstones, sandstones and seatearths, and is coal bearing in its lower part. The lithostratigraphy of the group is summarised in Table 1. The upwards passage from predominantly grey rocks of deltaic and alluvial facies, to red measures, suggests a progressive change to more arid conditions in late Westphalian and Stephanian times. The paucity of marine and non- marine fauna, particulaly in the upper part of the Westphalian and in the Stephanian, makes a precise chronostratigraphic subdivision of the sequence impractical, and the ages of the younger formations can only be estimated.

Productive Coal Measures (Westphalian A,B and C) (Figure 2)

The Productive Coal Measures include all of the Westphalian strata up to the base of the Etruria Marl. The Westphalian A/B boundary is taken at the Vanderbeckei (Seven Feet) Marine Band, or in its absence, immediately above the Seven Feet Coal. The Westphalian B/C boundary is placed at the base of the Aegiranum (Nuneaton) Marine Band.

Measures below the Thick Coal

These have been proved in a programme of drilling carried out by British Coal. The succession which consists of mudstone, siltstone and seatearth with subordinate thin sandstones is estimated to be between 70 and 135m thick and thins south westwards. Ironstone in the form of thin bands is common. Coals occur at several levels but none has been worked. The principal named seams, in ascending order, are the **Bench, Seven Feet,** and **Smithy.** Of these, only the **Bench** is widely developed and of workable thickness.

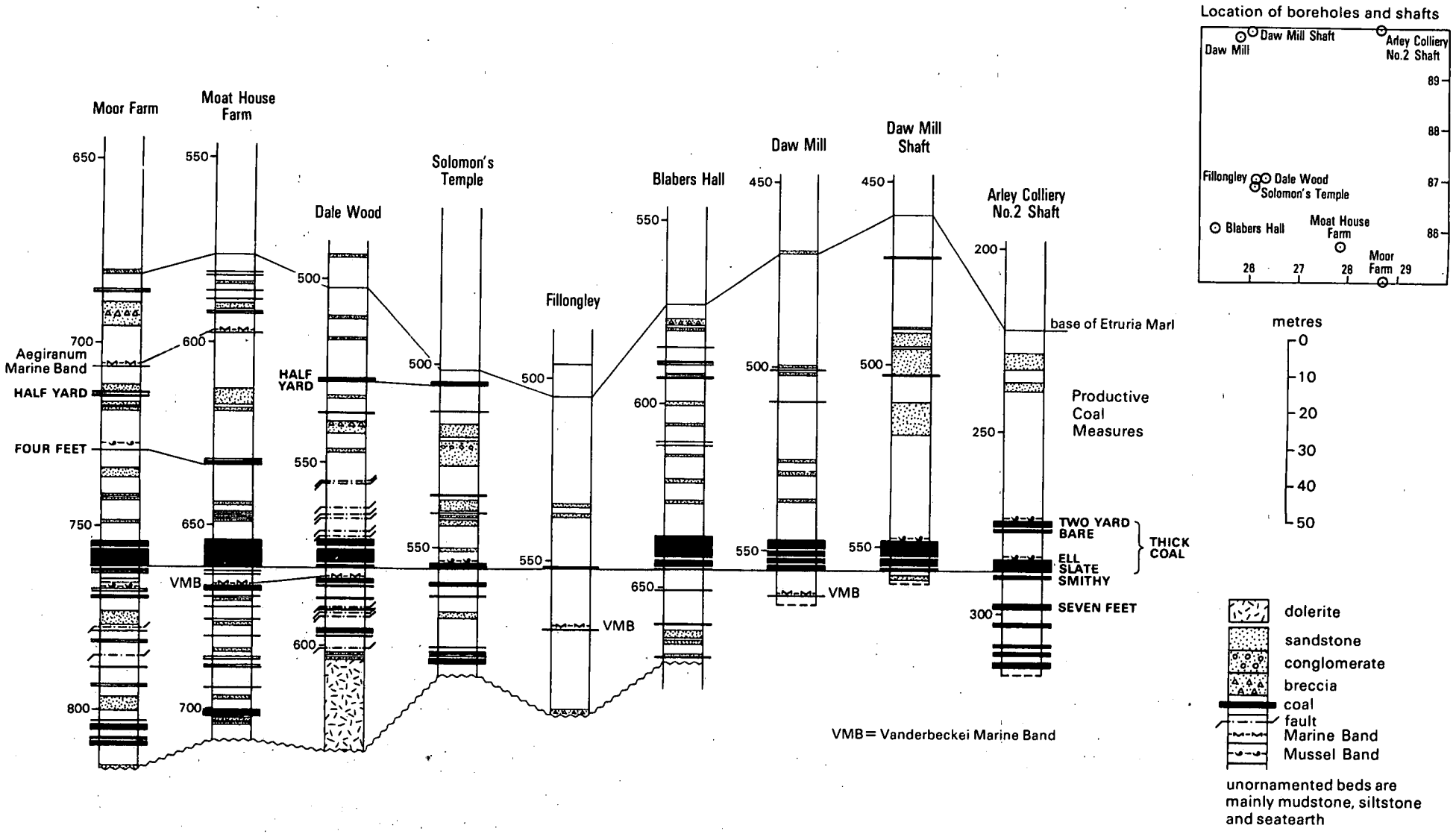


Figure 2. Comparative sections of the productive coal measures

	LITHOLOGY	FACIES
Coventry Sandstone Formation	Red sandstones and conglomerates with subordinate mudstones	Red- bed
Keele Formation	Red mudstones with subordinate sandstones and thin limestones	Red- bed
Halesowen Formation	Grey sandstones and mudstones with thin coals and limestones	Delta top
Etruria Marl Formation	Variegated mudstones seatearths and sandstones	Alluvial
Productive Coal Measures	Grey mudstones, seatearths and sandstones with coals of workable thickness	Coal swamp

Table 1. Summary of Westphalian- Stephanian Lithostratigraphy

The **Bench**, which usually is split, is cumulatively over 1.6m thick in the Arley Colliery no.3 underground downbore [2976 8296] but thins towards the west. It is of good quality but tends to become inferior towards the roof and floor. The seam is overlain by c.15-30m of planty mudstones and seatearths. These contain coals, which over most of the area are very thin, though near Arley, several are over 0.5m thick. Cross and parallel laminated sandstones in the middle part of this interval occur throughout the area, though are best developed to the south. A dolerite sill occurs in this interval in the Dale Wood borehole. This is described under Post Cambrian igneous rocks (see below).

The **Seven Feet** varies considerably in compostion and thickness over the area but is generally represented as a single seam, which in the Arley Colliery no.2 shaft is over 1.3m thick.

The Vanderbeckei Marine Band is generally represented by an impoverished Lingula fauna dominated by *L.mytilloides* lying close to, or in contact with the Seven Feet. It was not detected in the Arley Colliery shafts (Figure 2), though it was recorded in

several underground boreholes in the north eastern part of the area. The 5-8m interval between it and the **Thick Coal** is dominated by seatearths though also contains some thin, laterally impersistent seams, one of which, the **Smithy**, was considered to be part of the **Thick Coal** by Cope and Jones (1970).

The Thick Coal

The **Thick Coal** is a combination of several seams that include, in ascending order, the **High Main, Nine Feet, Ell, Ryder, Bare,** and **Two Yard** coals (Fulton and Williams 1988, p.204). Over most of the area these seams are not split, though in the Arley area over 7.5m of mudstone occurs between the **Ell** and **Bare** seams. The Thick Coal generally varies between 5 and 7.8m in thickness. It is apparently much reduced in thickness in the Solomon's Temple and Fillongley boreholes, though this is probably due to faulting (shown on Figure 2) and poor borehole recovery respectively. A flora collected from the Ryder Coal at Arley Colliery is described by Vernon (1912).

Measures between the Thick Coal and the Etruria Marl

The thickness of this interval varies considerably from about 35 to 90m. Over much of the area, at the base of this interval, the mudstones immediately overlying the **Thick Coal** contain an impoverished fauna of bivalves. *Carbonicola spp.* is the most common element of the fauna, and *C.aqualina* was recorded by Vernon (1912) with *Naiadites carinata* at Arley Colliery. Above this is a 15-20m thick sandstone rich interval that is overlain by the **Four Feet** coal; a laterally impersistent seam, best developed in the south eastern part of the area, which is less than 0.5m thick. This in turn is overlain in parts by a shelly band containing ostracods and fish debris which is separated from the **Half Yard** seam by c.15-25m of mudstone and seatearth and sporadic sandstones. The **Half Yard** which is commonly split and less than 0.2m thick is laterally impersistent over the area.

The Aegiranum (Nuneaton) Marine Band, is separated from the Half Yard by c.10-15m of mudstone and sandstones. It is persistent only in the south eastern part of the area where it contains a brachiopod fauna dominated by *Lingula,* particularly *L.mytilloides*. In the western part of the area the Aegiranum Marine Band probably occurs, though has not been recorded, within the Etruria Marl Formation (see the Solomons Temple, Fillongley and Blabers Hall boreholes in Figure 2). Fulton and Williams (1988) show 4 facies in the Aegiranum Marine Band in the area from a palaeosol (terrestrial) facies in the west to a productoid, fully marine facies in the east.

The sequence between the Aegiranum Marine Band and the base of the Etruria Marl ranges in thickness between 0 and c15m and is litholgically very variable, consisting dominantly of mudstones seatearths, sandstones and coal seams.

Etruria Marl Formation (Westphalian C)

A sequence of pebbly mudstones, sandstones, and breccio-conglomerates, mainly grey in colour but also variegated red brown and yellow, occurs between the Productive Coal Measures and the Halesowen Formation. The boundaries of the formation are rather indefinite but the base is taken at the bottom of the red bed sequence or the lowest occurrence of breccio- conglomerates of "espley" facies. The top of the formation is placed at the incoming of grey sandstones of the Halesowen Formation. As thus defined, the thickness of the formation varies between 27-100m and shows a general eastwards thinning. Parts of the formation were cored in several boreholes (Figure 2) and sections occur in the shafts at Arley and Daw Mill collieries.

Halesowen Formation Westphalian D

The Halesowen Formation is dominated by grey sandstones, greenish grey mudstones and seatearths with subsidiary rare coals and limestones. The thickness of the formation recorded in boreholes ranges between 57 and 100m. In the absence of better evidence, the base of Westphalian D is arbitrarily taken at the base of the formation. The formation was cored in the Fillongey and Daw Mill boreholes, and the section exposed in the shaft setions of Arley and Daw Mill Collieries. Flaggy sandstones predominate in the lower part of the formation, where they are associated with impersistent coals, including the **Milton** which is widely developed in the area to the south. The sandstones exposed in Bourne Brook near Arley [2784 8974, 2786 8966] are poorly sorted grey and micaceous. The **Index Limestone** (Eastwood and others 1923) forms a useful marker horizon at about 30m below the top of the formation. At Arley, just north of the area, it is c.0.3m thick. The beds above the **Index Limestone** are dominantly mudstones which are mostly grey but locally are chocolate- brown, yellow or red. The top of the formation is defined by the base of the Keele Formation which is taken at the change to predominantly red- bed facies.

Keele Formation (Westphalian D- Stephanian?)

The Halesowen Formation is overlain by a red- bed sequence consisting mainly of mudstone, but including subordinate sandstones and rare thin beds of porcellaneous limestone. The junction with the underlying Halesowen Formation is transitional but is taken at the change to a predominantly red- bed facies. Cored boreholes in the Coventry area show that this occurs c.15m above a distinctive gamma peak in the Halesowen Formation. This gamma peak has been used to approximately define the base of the formation in uncored boreholes. The Keele Formation is estimated to be between 175 to 303m thick. In the absence of reliable palaeontological data the formation is tentatively ascribed a Westphalian D to Stephanian age (Besly 1988).

The mudstone dominated parts of the sequence contain resistant siltstones. These form consipicuous features, often indistinguishable from those formed by sandstones, that are particularly common in the Keele Formation south of the River Bourne.

The mudstones and sandstones towards the base of the formation, which occur in the fault bounded block along Station Road, Arley [275 895] and near The Woodlands, Spring Hill [2825 8950], are uncharacteristic of those in the rest of the Keele Formation. The mudstones contain numerous calcrete nodules, and are in places very silty and clearly laminated. They occur in shades of red, white, yellow and brown. The sandstones are sometimes difficult to distinguish from those in the Halesowen Formation as they are occasionally grey or yellow in colour. Grey sandstones may in part be due to post- depostional reduction, such as those observed in sandstones in the Arley Industrial Estate section [2880 8981].

	m
Mudstone, red with green reduction spots towards the base.	>0.90
Sandstone, red,fine grained, massive, with large reduction areas.	0.35
Siltstone, red, sandy.	0.15
Sandstone, red, fine grained, with reduction spots.	0.15
Mudstone, red, laminated, with reduction spots.	0.25
Sandstone, red, medium grained, trough cross- stratified.	>1.90

Sandstones predominate over mudstones in the middle part of the formation where they form the dip slopes between the Arley Fault and the River Bourne. Considerable lateral variation in thickness of sandstones is evident in the section exposed south- east of Daw Mill Colliery [261 899]:

	m
Sandstone, red, medium grained, pebbly.	
Siltstone.	0.03
Sandstone, red, medium grained, massive.	0.10
Siltstone, red, sandy, laminated, with lenticular beds (<4cm thick) of fine to medium grained sandstone.	0.71
Sandstone, red medium to coarse grained, cross stratified towards the base, though massive towards the top.	0.90
Siltstone, red, sandy, laminated, with lenticular beds (<3cm thick) of fine to medium grained sandstone.	0.60
Sandstone, red, medium to coarse grained, parallel laminated with erosional base.	0.83
Siltstone, red, sandy, laminated.	1.15
Sandstone, red, medium to coarse grained, cross- stratified.	>1.50

The sandstone dominated part of the Keele Formation also contains several breccias which vary considerably in composition. Most consist of a variety of greywacke, vein quartz, chert and quartzite pebbles. Some contain a variety of pebbles of limestones. Those recorded by C.H.Cunnington at Hill Cottage [2763 8835] include oolites, fine calcarenites and crinoidal

limestones. The lithology, and contained fossils of these, including *Lithostrotian irregulare*, suggest that these are of Dinantian age. Others breccias consist primarily of clasts of mudstones and porcellaneous limestones. The best exposure of these occurs near the cliffs on Tipper's Hill [281 889] where granule to pebble grade imbricated breccias are interbedded over c.5.5m with coarse brownish red cross stratified, and massive sandstones. Compared with most breccio- conglomerates, the proportion of clasts derived the Keele Formation in these is large.

The best known breccio- conglomerate in the sandstone dominated part of the Keele Formation is the "Arley Conglomerate" which was recorded in the Arley station section [273 890] by C.H.Cunnington in 1916. He noted that the 2.43m thick coarse conglomerate at the bridge passes laterally into a massive, 1.5m thick sandstone to the east and splits into c.10cm thick beds within c.2.4m of whitish-brown sandstone to the west. As other conglomerates at a similar horizon are also laterally impersistant, use of the Arley Conglomerate as a formally defined stratigraphical unit is discontinued.

Porcellaneous limestone fragments found in the soil at two localities in the Bourne Valley [2601 8933, 2630 8950] probably represent two separate thin beds.

The Keele Formation was deposited in a dominantly fluvial environment. The mudstones being formed by overbank, or lacustrine muds, and the sandstones formed by channellised and overbank sands. The overbank deposits periodically dried out giving rise to desiccation cracks (e.g. in the sandstones at Mawdykes Farm [2609 8883]), and calcretes which are common towards the base of the formtion. The porcellaneous limestones probably represent a lacustrine environment (or possibly marine incursions). Further information on the environment of depostion of the formation is given by Besly (1987, 1988).

Enville Group

Coventry Sandstone Formation (Westphalian D- Stephanian)

The Coventry Sandstone Formation consists of an alternating red-bed sequence of sandstones, mudstones, thin conglomerates and thin porcellaneous limestones. The predominance of sandstones serves to distinguish it from the underlying Keele Formation, though mudstones are predominant between about 50m above the base of the formation and the base of the Corley Member. The base of the formation is defined by a thick sandstone, forming a conspicuous scarp which is most clearly seen near Colliers Oak Farm [255 879], which overlies the mudstone dominated Keele Formation.

Most sandstones are moderately to well sorted, fine to coarse grained, and often fine upwards from a pebbly lag base. Several fine sandstones and mudstones in the sequence are parallel laminated or contain green- blue reduced areas or discrete spots.

Many sandstones and mudstones are laterally very impersistent. Locally developed breccio- conglomerates (below the Corley Member) were recorded in one of the M6 motorway cuttings [259 856] and at Chapel Green [2583 8538]. Greenish grey, sandy, dolomitic porcellaneous limestone fragments were recorded at three localities north of the M6 motorway [2618 8653, 2573 8567, 2829 8598]. It is possible that the latter two of these may represent the same stratigraphic horizon.

Most coarser sandstones, particularly those with pebbly bases are interpreted as channel sandstones, whilst the matrix supported breccio- conglomerates are interpeted as debris flows. Many mudstones and fine grained sandstones were probably overbank deposits, whilst other mudstones, and the porcellaneous limestones were probably lacustrine deposits. Further information on the environment of depostion of the formation is given by Besly (1987, 1988).

From the interpretation of geophysical logs of un- cored boreholes the Coventry Sandstone Formation is c.300m thick. The formation was tentatively placed by Besly (1988) in the Stephanian though definitive biostratigraphical evidence is lacking.

The Corley Member

The Corley Member encompasses a sequence of pebbly sandstones and conglomerates in the middle part of the Coventry Sandstone Formation. The lowest 17m of the member crop out at Corley although conglomerates and pebbly sandstones are only well developed immediately west of the School [2950 8501]. The regional pattern of clast types is described in detail by Shotton (1927). As pebbly sandstones and conglomerates occur in the Coventry Sandstone Formation below the Corley Member (see above) the base of the member, which is diachronous, is rather indefinite.

POST- CAMBRIAN IGNEOUS ROCKS

A 25.6m thick dolerite sill is intruded between the Monks Park Shales and Productive Coal Measures in the Dale Wood borehole. The dolerite is mostly dark grey and fine to medium grained, though pegmatitic intervals and mudstone xenoliths occur within it. The rock has a poikilophytic texture of hornblende plates enclosing plagioclase laths and olivine pseudomorphs. Areas of intergranular texture, consisting of anhedral augite, plagioclase and Ti- magnetite also occur. Accessory minerals include apatite, late alkali amphibole, and biotite.

Secondary zeolite facies alteration of the dolerite is pervasive: plagioclase is altered to albite; ferromagnesian minerals are replaced by chlorite or chlorite-saponite, magnetite is altered to leucoxene and zeolites are replaced by clay minerals and carbonates. Veins of chlorite, pyrite and carbonate are common.

The Westphalian mudstones above the sill are hornfelsed, proving a Westphalian A or younger age. This age is supported by the

composition of the sill which is unlike that of the lamprophyre suite intruding the Cambrian near Nuneaton (Taylor and Rushton 1971). By comparison with other Coal Measures intrusions in the Midlands (Kirton 1984) it is probable that the sill is no younger than Permian in age.

STRUCTURE

Pre- Carboniferous structures

Viewed in their regional setting (Old and others 1987, fig.2) the Cambrian rocks lie on the NW limb of a broad, presumably Caledonian, NE-SW trending syncline, which has been identified by plotting the faunal zones proved in boreholes. The varied dips proved in the boreholes listed in the appendix are not necessarily in accord with this structure and the folding of these beds is evidently more complicated in detail.

Intra Carboniferous movements

From borehole evidence it is evident that there are large lateral thickness variations of the Carboniferous formations in the area. These may, in part, be attributed to different sedimentation patterns on either side of syn- sedimentary faults. It is evident that the Arley Fault north west of Nuneaton area was active during depostion of the Keele Formation as the underlying Carboniferous formations are preserved only on one side of the fault. Unconformities exist at the base of the Halesowen Formation (Mitchell 1942, Old and others 1987) and possibly also beneath the Enville Group (Besly 1987). Non- sequences at these levels are not easily demonstrated in the present area, though some structural differences between the surface and the Two Yard horizon may be due in part to a non-sequence or unconformity at the base of the Halesowen Formation. These include differences in the sense of throws of faults near Fillongley, and differences in the postion of the hinge point on the main scissors fault (see below), between the Tamworth Road [2743 8878] at the surface, and near Solomon's Temple Farm [263 868] at the Two Yard horizon.

Post- Carboniferous structures

Following the deposition of the Enville Group the Carboniferous rocks were folded during the Hercynian earth movements. The area occurs towards the centre of an open, southerly plunging syncline that contains several smaller southerly plunging folds and, shallow folds which mostly trend NE-SW.

The major NE-SW trending fold is the Fillongley Anticline, a broad fold, with limbs dipping at less than 5 degrees. Its south easterly limb has been cut out by the Arley Fault. The axial trace of the anticline can easily be mapped between the River Bourne near Slowley Hall [2680 8885] and near Wood Corner Farm [256 868], and the form of the fold can be clearly seen looking south- westwards from the Tamworth road [270 895]. An anticline of similar trend occurs north of the Arley Fault, with rocks of

the Halesowen Formation outcropping in its core. The steep SE limb of this anticline is evident from plans of old coal workings, whilst the Arley Fault prevents detailed assesment of the NW limb. Other folds of a similar trend, and shallow limbs, are a NNE-SSW trending syncline near Aston Farm [2625 8890] which terminates against the NW-SE fault in the Bourne Valley, and an anticline near Wood End Lane [2895 8680].

The other principal fold trend in the area is NW-SE. A major syncline with this trend occurs along the Bourne Valley between Mill Farm [274 886] and the northern margin of the map to the west of Daw Mill Colliery. It has limbs which dip at 3-4 degrees and a faulted axis. A south- easterly plunging anticline of this trend, which occurs near Stone House Cottage [280 894], may be related to the fault which trends along the brook north of Tipper's Hill.

Although there is considerable variation in fault trend in the area, most faults broadly parallel the major fold trends, NE-SW and NW-SE, and have throws of less than 10m.

The most important fault in the area is the Arley Fault, a scissors fault which trends between NE-SW and NNE-SSW, crosses the western and northern margins of the map at [2500 8555] and [2769 9000] respectively, and hinges at the Tamworth Road. To the southwest of the hinge, the fault downthrows to the SE whilst to the northeast of the hinge it downthrows towards the SE. Although a single fault occurs at the surface, information at depth proves two parallel faults of this trend which throw in opposite senses, forming a graben.

The downthrow to the SE of the north western fault of this pair increases westwards from the Tamworth Road. The structure at the base of the **Two Yard** seam shows that at Solomon's Temple Farm [261 869] the throw is c.10m, near Green End [258 863] it is c.45m and just west of the map area, on a pair of faults, it is cumulatively c.65m. Several associated faults with parallel or anticlockwise trend occur to the northwest of the fault.

The south eastern fault of the pair which downthrows to the NE can be traced at the **Two Yard** horizon from north of the Tamworth Road southwards to Green End. At the surface the same fault can be mapped as far as Kinwalsey [256 856]. The throw of this fault at the **Two Yard** horizon decreases to the south from c.50m at the Tamworth Road, to c.10m. at Solomon's Temple Farm.

The graben between these faults occurs at the surface between Fillongley Hall [268 877] and Kinwalsey. It has several structures associated with it including NE-SW, NNE-SSW, N-S and NW-SE trending faults and a minor N-S syncline at its northern end. Whilst several features of the fault system as a whole have characteristics of strike- slip faulting, such as irregular fault plane trace, the lack of major displacement across the system, and small throws relative to the length of the faults, the fault patterns are not typical of a strike slip system with uniform lateral displacement.

Associated with the above system are a set of faults which broadly trend E-W. The sense of throw on these is variable though the amount of throw is mostly less than 10m.

QUATERNARY

Glacial deposits, consisting mainly of till, but also including waterlain sands, silts and clays cover much of the area. Conventionally, these deposits have been attributed to the Wolstonian Glaciation (Shotton and West 1969), but the stratigraphic basis of this glaciation is now considered questionable, and the deposits are regarded by many workers as Anglain in age (Sumbler 1983; Bowen and others 1986).

The glacial drift was deposited on a surface with considerable topographical variation (Figure 3). As boreholes have rarely penetrated the base of the drift, true drift thickness may be considerably greater than are shown (Figure 4).

Although a formal nomenclature has been applied to the stratified glacial deposits to the south east of the area (Shotton 1953), the classification is more difficult to apply in the present area, and a more generalised terminology has been adopted.

Till (Undivided)

The till sheet usually directly overlies the solid formations though near Manor House Farm it is underlain by fluvioglacial sand and gravel. It consists of a stiff, brown or reddish brown, sandy clay with a variety of exotic and locally derived erratics. Pebbles of "Bunter" quartzite and Keele and Coventry Sandstone Formation lithologies (sandstones and siltstones) are ubiquitous. In most areas the till contains a high proportion of brown-weathering quartzite blocks of the Cambrian Hartshill Quartzite. Other common clasts include shales, probably from the Cambrian north of the coalfield, and skerry sandstone and siltstone fragments from the Mercia Mudstone Group around the coalfield. Fluvio- glacial sand and gravel sheets occur within the till, for instance in the Coventry Road area south of Fillongley [284 863- 293 872], and in the Gun Hill and New Arley areas [286 895- 296 899]. Several other stringers of sand and gravel and laminated clay and silt were not separately mappable, and have been included within the till.

The till sheet can be tentatively divided in the Fillongley area. The lower tills, such as those in the immediate vicinity of Fillongley tend to be clay-rich and dark brown. They are overlain by much more sandy and stony tills in which sand and gravel sheets are common. Parts of the upper tills are extremely sandy and pebbly and cannot easily be distinguished from sand and gravel. Good examples of the latter occur at the top of the till sheet, on the plateau near New Arley [293 892]. Ditch sections through the tills in this area show vertical zones which have abundant stones with vertically oriented long axes, possibly caused by cryoturbation.

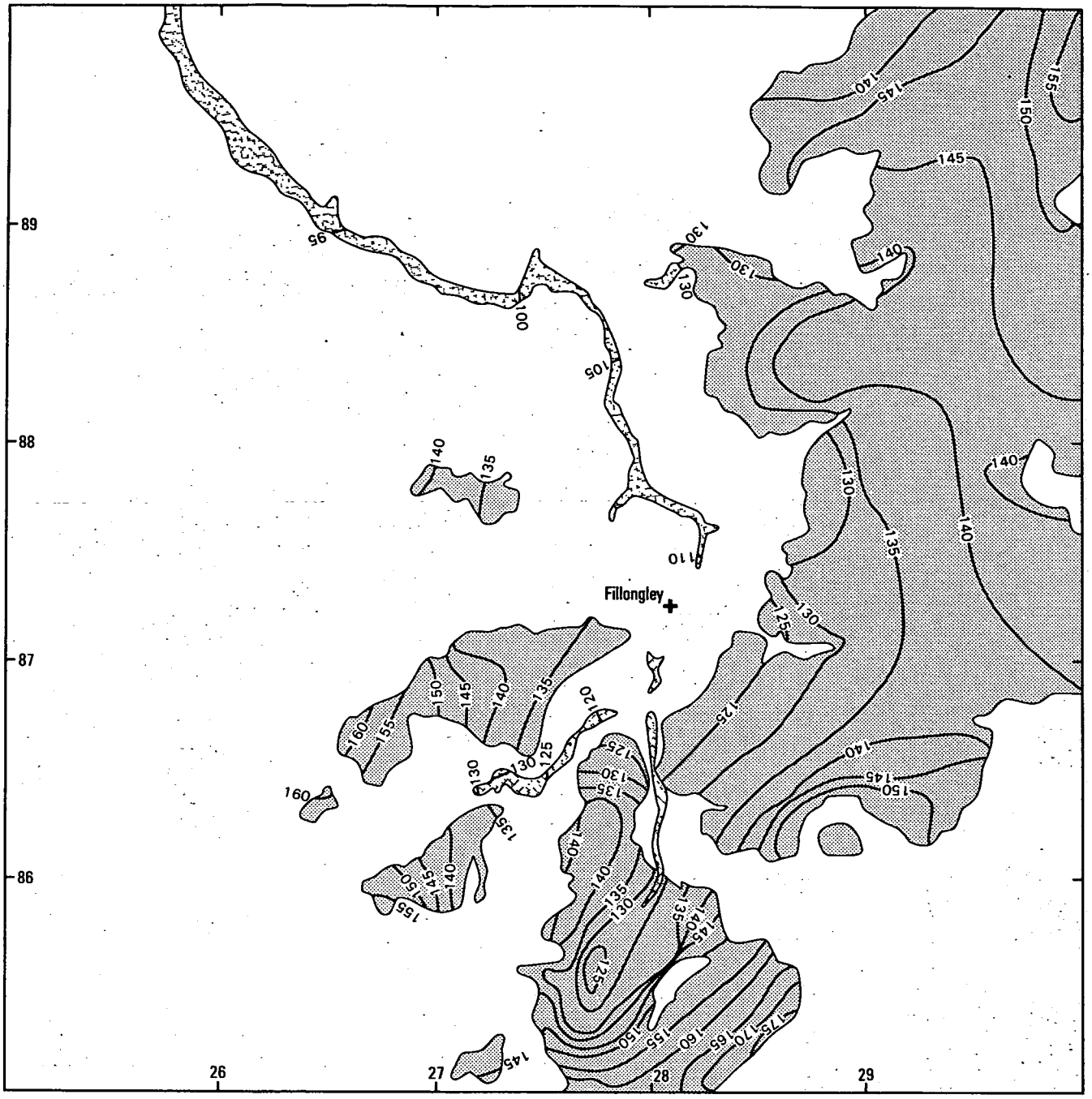
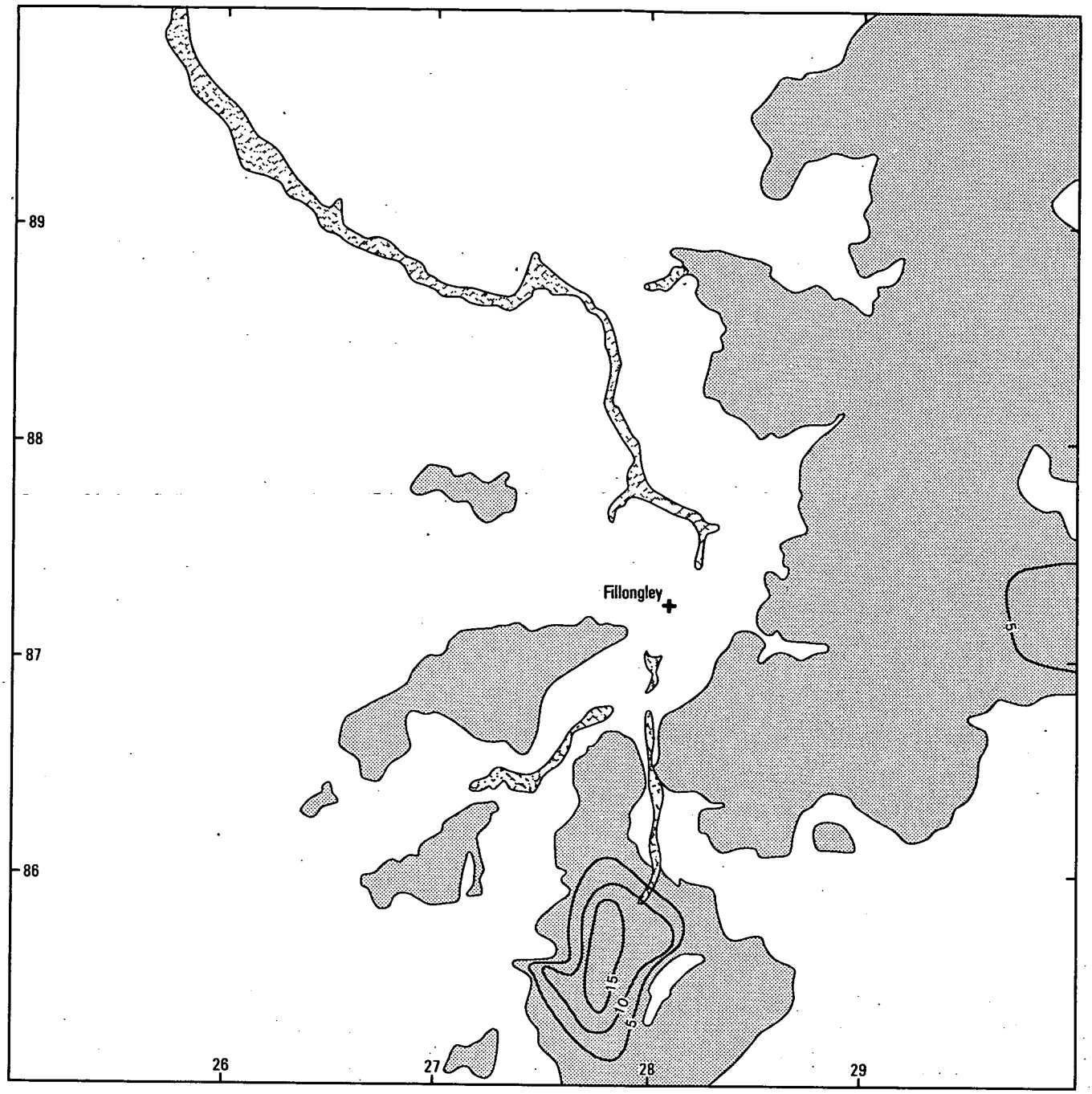


Figure 3. Sub-drift rockhead elevation



Outcrop of post-glacial drift

Outcrop of glacial drift

—10— Drift thickness contour in metres

0 1 2
kilometres

Figure 4. Thickness of drift

Glacio- lacustrine silts and clays

Silts and clays mostly occur at the top of the main till sheet and underlie fluvoglacial sand and gravel deposits. They are dominated by generally stoneless, sandy, laminated, silts and clays which range in colour between whitish- yellow and dark choclate brown. The clays tend to be finely laminated, whilst the silts tend to be more massive, and slightly more red- brown in colour. Several laminated clay and silt beds occur within the main till sheet but have not been mapped.
The silt and clay deposits were probably laid down in glacial lakes formed near the ice- margin. Their association with sand and gravel beds (e.g. Figure 5) suggest that the lakes may have been assoicated with fluvial systems.

Fluvioglacial sand and gravel

Sands and gravels in the area are commonest at the top of the till sheet, where they often overlie any glacio- lacustrine silts and clays, though also occur within, and at the base of the till. They are mostly composed of poorly to well sorted, pale yellow, or yellow- orange sands, such as occur near the Grange [295 870]. However variations in colour are common; for instance dark brown sands often occur towards the top of the drift sequence near High House Farm [299 874]. Colour changes, where observed, were mostly transitional. The sands and gravels usually contain a large proportion of well rounded to angular pebbles and cobbles. These are compositionally similar to the erratics in the till sheets (see above). Several of the sand and gravel beds within the till sheets are associated with non- pebbly silts and clays (e.g. Figure 5) suggesting that the sand and gravel beds were not created by removal of clay and silt fines from the tills.

Alluvium

Thin spreads of alluvium occur along the River Bourne and its tributaries. The deposits, which are rarely more than 2m thick, consist principally of sandy, silty, pale reddish- brown loam, above a basal gravel. Where the alluvium overlies sandstones of the Keele and Coventry Sandstone Formations it usually contains a high proportion of red- brown sand.

Head

The head deposits which occur towards the bottom of valleys or in gullies are usually a mixture of till and clays from the Keele Formation. The clays and silt within the head often have a vague lamination, possibly caused by shearing during down-hill creep.

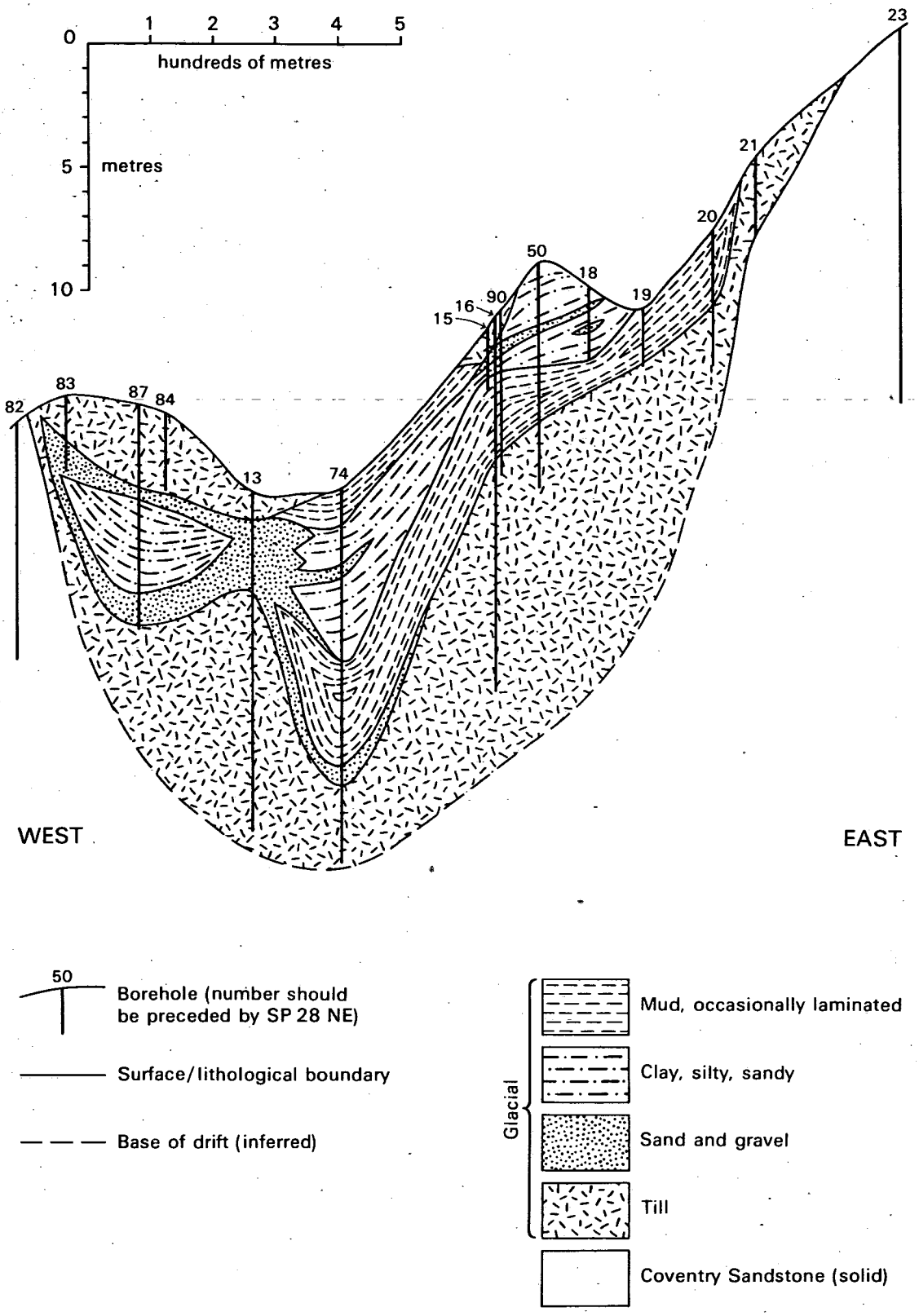


Figure 5. Section across pre-glacial valley north of Corley based on M6 motorway boreholes

Made Ground

There are several sites of made ground, most of which were created to level the ground surface, either by infilling of existing depressions, or building a ramp on a slope. The four main sites of made ground are:

Daw Mill Colliery [260 899], where the made ground consists mostly of debris from the Keele Formation and Productive Coal Measures;

The site of Arley Colliery [287 899], where the made ground consists mostly of colliery waste;

Little London playing fields, Fillongley [284 873] where the ground has been levelled using mudstones and till;

and Meriden Road [272 860] where a depression on the route of the old Meriden Road has been infilled.

ECONOMIC GEOLOGY

Coal

The **Thick Coal** is currently being worked in the area by British Coal from Daw Mill Colliery and was also formerly worked from Arley and Coventry collieries. Several other seams, including the **Bench** and **Seven Feet** were also worked from Arley Colliery.

Sand and gravel

Although there are large outcrops of fluvio- glacial sands and gravels, most production of sand and gravel in the past was very localised, and was derived from the de- cemented regolith of the Coventry Sandstone.

Brick clay

Brick clay used to be worked in the Corley area. Old brick pits and works occur on Old House Lane [295 856].

Stone

There are no good building stones in the area, and no quarrying of stone is currently being undertaken. In the past however, sandstones from the Keele and Coventry Sandstone Formations been used locally.

Water supply

Several water wells have been drilled in the area (Butler 1946), though none are presently productive.

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APPENDIX BOREHOLE SCHEDULE FOR SP28NE

BOREHOLE REG.NO.	BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)■	DATE
1	FILLONGLEY BORING	2614	8700	624.84	1940
2	ARLEY NO.3 ARLEY	2682	8890	535.08	1909
3	SLOWLEY BH NO.2 ARLEY	2720	8868	389.43	1906
4	ARLEY COLLIERY NO.2 SHAFT ARLEY	2863	8989	314.93	----
5	DAW MILL BH ARLEY	2578	8982	565.25	1949
6	ARLEY COLLIERY NO.1 SHAFT ARLEY	2865	8986	291.69	----
7	COVENTRY COLLIERY NO.1 UBH FILLONGLEY	29421	87115	51.51	1964
8	ARLEY COLLIERY NO.3 UBH ASTLEY	29760	89260	53.64	1963
9	ARLEY COLLIERY NO.4 UBH FILLONGLEY	28888	88344	43.59	1963
10	DAW MILL SHAFT ARLEY	26038	89951	558.70	1959
11	DAW MILL UG-BH NO.30 ARLEY	26710	88676	5.36	1975
12	DAW MILL UG-BH NO.31 ARLEY	26608	88882	5.08	1975
13	MIDLAND M/WAY LINK BH1076 CORLEY	2769	8560	13.72	1966
14	MIDLAND M/WAY LINK BH1077 CORLEY	2782	8560	15.24	1966
15	MIDLAND M/WAY LINK BHH1078 CORLEY	2807	8564	3.05	1966
16	MIDLAND M/WAY LINK BHH1079 CORLEY	2808	8566	15.24	1966
17	MIDLAND M/WAY LINK BHH1080 CORLEY	2809	8563	15.24	1966
18	MIDLAND M/WAY LINK BHH1081B CORLEY	2823	8566	3.05	1966
19	MIDLAND M/WAY LINK BHH1082 CORLEY	2830	8565	12.19	1966
20	MIDLAND M/WAY LINK BHH1082B CORLEY	2842	8569	3.05	1966
21	MIDLAND M/WAY LINK BH1083 CORLEY	2850	8569	12.27	1965
22	MIDLAND M/WAY LINK BH1084 CORLEY	2870	8574	15.24	1965
23	MIDLAND M/WAY LINK BH1085 CORLEY	2873	8571	15.24	1965
24	MIDLAND M/WAY LINK BH1086 CORLEY	2882	8572	9.14	1965
25	MIDLAND M/WAY LINK BH1087 CORLEY	2891	8577	10.67	1965
26	MIDLAND M/WAY LINK BH1088 CORLEY	2899	8575	9.14	1965
27	MIDLAND M/WAY LINK BH1089 CORLEY	2910	8579	9.14	1965
28	MIDLAND M/WAY LINK BH1048 CORLEY	2503	8571	12.19	1966
29	MIDLAND M/WAY LINK BH1049 CORLEY	2506	8567	12.19	1966
30	MIDLAND M/WAY LINK BH1051 CORLEY	2513	8567	12.19	1965
31	MIDLAND M/WAY LINK BH1052 CORLEY	2528	8566	6.10	1965
32	MIDLAND M/WAY LINK BH1054 CORLEY	2559	8562	15.24	1965
33	MIDLAND M/WAY LINK BH1055 CORLEY	2572	8561	15.24	1965
34	MIDLAND M/WAY LINK BH1056 CORLEY	2581	8565	13.26	1965
35	MIDLAND M/WAY LINK BH1057 CORLEY	2581	8558	15.24	1965
36	MIDLAND M/WAY LINK BH1058 CORLEY	2589	8558	12.19	1965
37	MIDLAND M/WAY LINK BH1059 CORLEY	2598	8559	9.14	1965
38	MIDLAND M/WAY LINK BH1090 CORLEY	2925	8583	4.42	1966
39	MIDLAND M/WAY LINK BH1091 CORLEY	2936	8586	6.10	1966
40	MIDLAND M/WAY LINK BH1092 CORLEY	2943	8585	12.95	1966
41	MIDLAND M/WAY LINK BH1093 CORLEY	2944	8589	12.19	1966
42	MIDLAND M/WAY LINK BH1094 CORLEY	2955	8590	12.19	1966
43	MIDLAND M/WAY LINK BH1095 CORLEY	2968	8593	6.10	1966
44	MIDLAND M/WAY LINK BH1096 CORLEY	2981	8598	7.01	1966
45	MIDLAND M/WAY LINK BH1097 CORLEY	2989	8593	11.58	1966

BOREHOLE REG.NO.		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
46		MIDLAND M/WAY LINK BH1098 CORLEY	2991	8601	10.82	1966
47		MIDLAND M/WAY LINK BH1099 CORLEY	2998	8598	11.28	1966
48		MIDLAND M/WAY LINK BH1050 CORLEY	2511	8570	9.75	1966
49		MIDLAND M/WAY LINK BH1053 CORLEY	2544	8563	3.05	1965
50		MIDLAND M/WAY LINK BH1081 CORLEY	2814	8564	9.14	1965
51		NEW HOUSE NEAR CHESHIRE FARM CORLEY	2897	8523	10.53	1918
52		NEAR HILL COTTAGE CORLEY	2878	8504	12.88	1919
53		COTTAGE NEXT TO IVY COTTAGE CORLEY MOOR	2847	8519	5.64	1919
54		NEAR HILL TOP CORLEY	2971	8507	16.38	1919
55		COOPERS COTTAGE CORLEY ASH	2968	8606	12.19	1919
56		PRIMROSE COTTAGE FILLONGLEY	2712	8815	46.63	1948
57		BROAD LANE FILLONGLEY	2624	8781	60.96	1965
58		STONE HOUSE FARM FILLONGLEY	2609	8774	36.58	----
59		PACKSADDLE HALL FILLONGLEY	2586	8779	36.58	1965
60		SHAWBURY SCHOOL SHUSTOKE WARKS	2561	8913	76.20	1938
61		WOOD CORNER FARM FILLONGLEY	2557	8675	93.27	----
62		DAWMILL COLLIERY WARWICKS	2615	8902	150.00	1976
63	C	SOLOMONS TEMPLE	2610	8689	655.53	1980
64		CATTHORPE-CASTLE BROMWICH SPECIAL RD1402	2566	8563	12.34	1967
65		CATTHORPE-CASTLE BROMWICH SPECIAL RD1403	2584	8564	15.24	1967
66		CATTHORPE-CASTLE BROMWICH SPECIAL RD1404	2500	8566	9.30	1967
67		DAW MILL SHAFT	2605	8988	----	----
68	C	MOAT HOUSE FARM	2776	8567	715.17	----
69		MIDLAND MOTORWAY LINK 1060	2608	8559	12.19	1965
70		MIDLAND MOTORWAY LINK 1061	2609	8556	15.24	1965
71		MIDLAND MOTORWAY LINK H1062	2615	8557	3.18	1965
72		MIDLAND MOTORWAY LINK H1063	2641	8557	3.05	1965
73		MIDLAND MOTORWAY LINK 1064	2652	8556	15.24	1965
74		MIDLAND MOTORWAY LINK 1065	2658	8556	9.14	1965
75		MIDLAND MOTORWAY LINK H1066	2665	8555	3.05	1965
76		MIDLAND MOTORWAY LINK 1067	2687	8556	10.82	1965
77		MIDLAND MOTORWAY LINK 1068	2695	8556	12.19	1965
78		MIDLAND MOTORWAY LINK 1069	2708	8555	9.14	1965
79		MIDLAND MOTORWAY LINK 1070	2708	8559	9.14	1965
80		MIDLAND MOTORWAY LINK 1071	2715	8557	12.19	1965
81		MIDLAND MOTORWAY LINK 1072	2724	8558	11.13	1966
82		MIDLAND MOTORWAY LINK 1073	2731	8557	9.14	1965
83		MIDLAND MOTORWAY LINK H1074	2739	8558	3.05	1965
84		MIDLAND MOTORWAY LINK H1075	2755	8558	3.05	1965
85		GREEN END	2600	8558	9.14	1967
86		MIDLAND MOTORWAY CONNECTION 160	2685	8556	9.14	1960
87		MIDLAND MOTORWAY CONNECTION 162	2751	8557	9.14	1960
88		MIDLAND MOTORWAY CONNECTION 156	2513	8568	9.14	1960
89		MIDLAND MOTORWAY CONNECTION 157	2581	8560	15.24	1960
90		MIDLAND MOTORWAY CONNECTION 164	2808	8564	9.45	1960
91		MIDLAND MOTORWAY CONNECTION 166	2940	8587	9.14	1960
92		MIDLAND MOTORWAY CONNECTION 168	2950	8589	9.14	1960
93		ARLEY TRADING ESTATE BH1	2872	8973	9.80	1979
94		ARLEY TRADING ESTATE BH2	2863	8973	8.50	1979
95		ARLEY TRADING ESTATE BH3	2854	8977	8.95	1979
96		DAW MILL BH D	2589	8999	5.95	1976

BOREHOLE REG.NO.		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
97		DAW MILL BH E	2573	8994	11.00	1976
98		DAW MILL BH G	2583	8986	11.30	1976
99		DAW MILL BH R	2586	8994	2.65	1976
100		DAW MILL BH S	2589	8987	4.50	1976
101		DAW MILL BH T	2594	8989	3.00	1976
102		DAW MILL BH U	2598	8990	6.35	1976
103		DAW MILL CONVEYOR SYSTEM 19	2598	8998	8.00	1986
104		DAW MILL LANDSALE STOCKPILE AREA 20	2598	8998	5.50	1986
105		DAW MILL LANDSALE STOCKPILE AREA 21	2585	8997	6.50	1986
106		DAW MILL LANDSALE STOCKPILE AREA 22	2585	8998	6.50	1986
107		DAW MILL LANDSALE STOCKPILE AREA 23	2586	8998	6.50	1986
108		DAW MILL LANDSALE STOCKPILE AREA 24	2585	9000	6.50	1986
109		DAW MILL PIT TOP STOCKYARD 27	2612	8989	5.50	1986
110		DAW MILL PIT TOP STOCKYARD 28	2607	8984	3.00	1986
111		DAW MILL PIT TOP STOCKYARD 29	2606	8982	3.00	1986
112		DAW MILL PIT TOP STOCKYARD 30	2603	8981	2.00	1986
113		DAW MILL PIT TOP STOCKYARD 31	2604	8979	2.00	1986
114		DAW MILL 600 TON BUNKER 1	2597	8993	6.80	1979
115		DAW MILL SINGLES BUNKER 4	2593	8993	3.70	1979
116		DAW MILL CHAIN GRATE SMALLS BUNKER 5	120	8994	5.80	1979
117		DAW MILL TRANSFER TOWER 6	2582	8988	7.60	1979
118		DAW MILL RAW COAL SCREEN HOUSE 8	2593	8989	4.40	1979
119		DAW MILL DENSE MEDIUM PLANT 9	2591	8988	5.30	1979
120		DAW MILL DENSE MEDIUM PLANT 10	2586	8987	6.50	1979
121		DAW MILL 600 TON BUNKER 11	2598	8993	16.50	1979
122	c	BLABERS HALL	2533	8607	687.50	1988
123	c	MOOR FARM	2872	8500	832.00	1988
124	c	DALE WOOD	2632	8701	699.70	1987

Detailed logs of non-confidential boreholes may be examined at the BGS National Geosciences Data Centre, Keyworth, by prior appointment and payment of the current fees.

c. Denotes confidential records, details of which may only be released to a third party by permission of the original client.

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