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# COAL OCCURRENCES AND RELATED GEOLOGY, FOX CREEK AREA, ALBERTA

by

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## ERRATA

Page 21, Figure 8:

Under "Research Council Coal Testholes" read:
LSD.13 - SEC.17 - TP.62 - R.20 - W5 for
left-hand log;
LSD.14 - SEC.8 - TP.64 - R.18 - W5 for
right-hand log.

Under "Oil and Gas Wells" read:
LSD.11 - SEC.16 - TP.63 - R.24 - W5 for
left-hand log;
LSD.12 - SEC.22 - TP.61 - R.19 - W5 for
right-hand log.

## CONTENTS



## ILLUSTRATIONS

## TABLES

# COAL OCCURRENCES AND RELATED GEOLOGY, FOX CREEK AREA, ALBERTA


## Abstract

The Fox Creek area, Alberta, which lies between longitudes 116° 0′ and 118° 0′ west and latitudes 54° 15′ and 55° 15′ north, is underlain entirely by nonmarine, coal-bearing bedrock strata of the Wapiti Formation. Within the area, the Wapiti appears to consist of three stratigraphic divisions which correlate roughly with the Belly River Group, the Edmonton Formation and the Paskapoo Formation of the central Alberta Plains; the Kneehills Member, Edmonton Formation, is traceable with certainty westward as far as the Simonette River. Five more or less distinct horizons of coaly strata are recognizable, one in Belly River-equivalent strata, three in Edmonton-equivalent strata and one in Paskapoo-equivalent strata. Only one of the five coaly horizons, the uppermost in Edmonton-equivalent strata, contains coal in economically significant quantities, but this, a stratigraphic correlative of the Ardley coal zone of the central Alberta Plains, contains immense reserves. Its chief region of outcrop, between Iosegun and Meekwap Lakes, is believed to contain approximately 340 million tons of subbituminous coal mostly under less than 100 feet of overburden. High effective ash contents, glacial deformation of bedrock strata and extensive postglacial slumping will make exploration and exploitation comparatively difficult.


## INTRODUCTION

In the middle 1960's, a number of wells drilled for gas in the Kaybob South Field near Smoke Lake in Tp. 62, R. 20[1] encountered thick bodies of coal and coaly sediments at depths of 700 to 900 feet. The Research Council of Alberta became aware of these deposits in late 1967, and, in consequence, centered its coal survey activities during the ensuing field seasons of 1968 and 1969 on the region of Smoke Lake and the adjacent village of Fox Creek. Within the surrounding area, designated the Fox Creek area (Fig. 1, Fig. 5), survey activities were aimed at tracing the zone of the Smoke Lake coal deposit up-dip to its outcrop, and exploring for any strippable coal bodies that might occur.

Essentially the same methods were used in the Fox Creek area as in the previously studied areas in the Plains of Alberta (Campbell and Almadi, 1964; Pearson, 1959); coal testholes, drilled about 150 feet deep and 1-2 miles apart with conventional mud-rotary shothole drilling rigs, were described lithologically from

[1] All locations given in this report are west of the 5th Meridian.

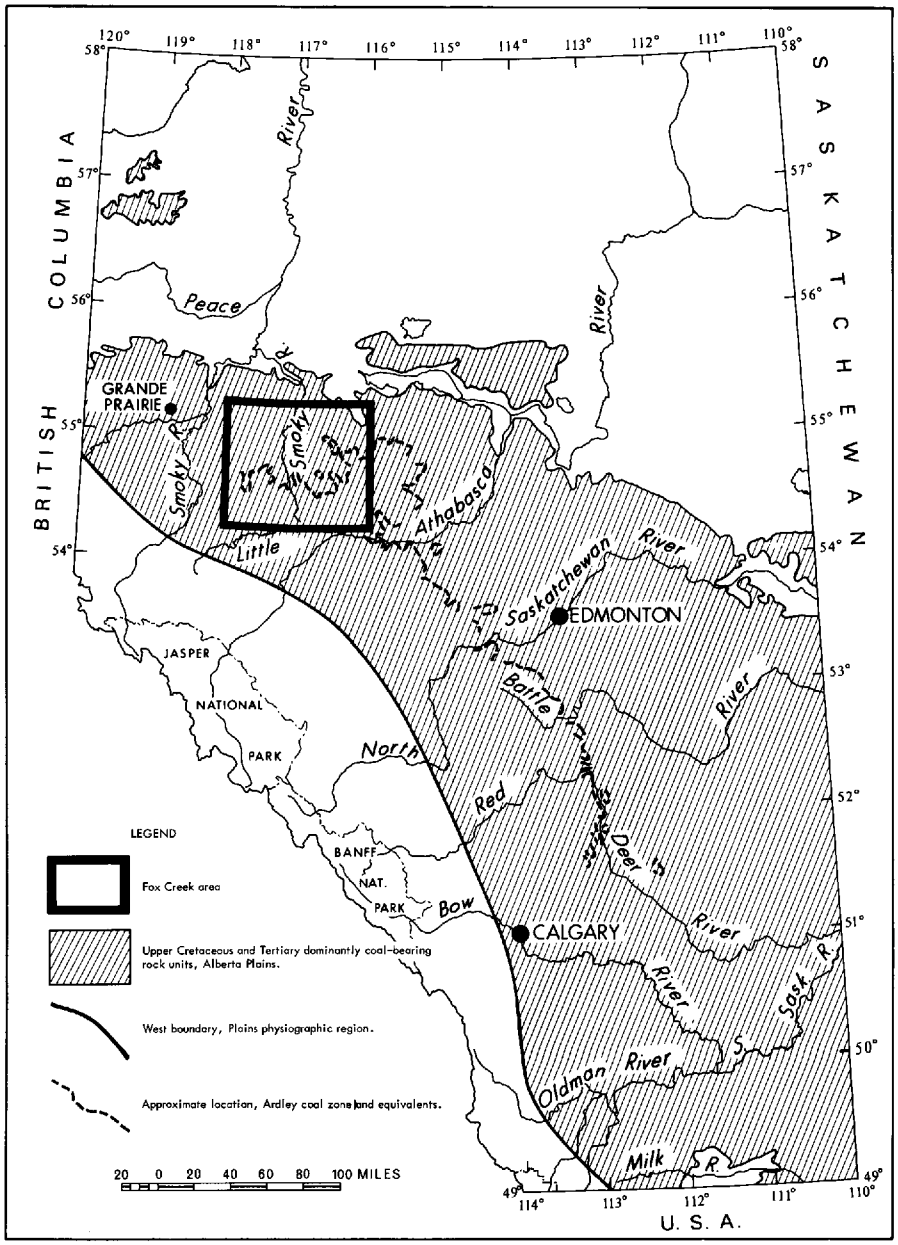


*FIGURE 1. Ardley-equivalent coal zone in Alberta*

mud-stream cuttings dipped at 5-foot depth intervals, and electrologged for spontaneous potential and resistivity using a single-point portable miniaturized instrument; air-drilling is not favored since considerable reliance is placed on electrolog interpretation. A study of bedrock outcrop, of landforms and of other surface indications complimented the borehole program.

However, the nature of the Fox Creek area – a land of brush, forest and muskeg – necessitated considerable alteration in the *modus operandi*. In the first place, the continuous mantle of bog and brushy vegetation as well as the extensive slumps and massive glacial deformation, all of which obscure outcrops and landforms, serve to reduce the value of surface studies; and the almost complete absence of past mining activity excludes a source of preliminary information only partly replaced by seismic shothole records. The best comprehensive reconnaissance of the area, in fact, was gained by an overflight in a light aircraft.

In the second place, because of access difficulties, coal testholes had to be spotted somewhat irregularly wherever available roads and seismic cut lines permitted, rather than in a regular checkerboard pattern as on the prairies. The drill units themselves had to be mounted much of the time on slow tracked vehicles to negotiate the trails and cut lines, and trailer camps had to be set up. With the facilities available, it was found inadvisable to operate more than five miles from the nearest truck road; east of Meekwap Lake, where a camp was carried into the bush, this limit was indeed exceeded, but potentially coal-bearing areas north of the Goose River and in the lower Simonette River drainage had to be passed up because of their isolation. To a very large extent the pattern of borehole distribution (Fig. 5) was governed by logistics.

In the two field seasons, a total of 295 shallow holes and 2 deep holes (each about 750 feet deep), totalling 49 655 feet, were drilled in the Fox Creek area. The locations of all of these testholes are shown in figure 5 while logs of each, "corrected" by collating lithologs with electrologs, are presented in appendix A.

Appendix B consists of the "corrected" log of a "pilot" hole, a conventional mud-rotary testhole, drilled by Canadian Utilities Limited and electrologged by Research Council of Alberta in November, 1970, preliminary to a small coal-coring program south of Meekwap Lake; the location of this hole is shown in figure 5.

**Acknowledgments**

Coal survey activities of the Research Council of Alberta were begun by the Coal Division in 1958 in an effort to reassess the resources of cheaply strippable thermal coal in the Plains region of Alberta.[2] Surveying activities in the Fox Creek

2 Objectives and organization of Research Council of Alberta coal survey activities are more fully explained in previous reports (Campbell and Almadi, 1964; Pearson, 1959).

area were supported by the Northern Alberta Development Council, Canadian Utilities Limited and Calgary Power Limited, members at that time of the *ad hoc* steering committee; without their encouragement and financial help this project would not have been possible. Canadian Utilities Limited also kindly made available to Council the logs and cores from several coreholes drilled south of Meekwap Lake in the fall of 1970.

Thanks are also due to the Sturgeon Lake Indian Band of Calais, Alberta and to their Chief at that time, Mr. Dave Capot, for permission to drill several testholes on Band lands. Mr. Lorris Mjolsness of L M Water Wells, Edmonton, supplied much subsurface information that proved invaluable to the survey. Chevron Standard Ltd. gave permission to gather and analyze coal cutting samples during drilling of a well near Smoke Lake (Table 3). Chevron Standard Ltd., Hudson's Bay Oil and Gas Co. Ltd., and Mr. Steve Mostowich, lumberman of Fox Creek, all very kindly allowed use of their private roads for access to the area of study. Finally, numerous residents tendered information that substantially aided the project. To all these most sincere thanks are extended.

## The Fox Creek Area

In this report, the area bounded by longitudes 116° 0′ and 118° 0′ west and latitudes 54° 15′ and 55° 15′ north is designated the Fox Creek area (Fig. 5); it covers over 152 townships, about 5 500 square miles.

The central part of the area is occupied by a broad undulating basin below the 3 000 foot contour, draining northward by way of the Simonette and Little Smoky Rivers (Fig. 4). This "Little Smoky Basin," as it is designated in this report, is bounded on the east by the Swan Hills upland and on the southwest by outliers of the Rocky Mountain Foothills; on the north it is partially enclosed by a discontinuous chain of prominent hills including Blue Mountain (Tp. 69, R. 17), Snipe Lake Hill (Tp. 70, R. 19) and Puskwaskau Hill (Tp. 72, R. 23), while on the south a low divide about township 61 separates it from the valley of the Athabasca River which, in ranges 14 to 17, lies just south of the area boundary.

The central part of the Little Smoky Basin, from Iosegun Lake to Valleyview, is a flat or gently rolling plain, generally about 2 200 to 2 400 feet in elevation, underlain by shaly or silty bedrock with thin till cover, or by extensive postglacial lake deposits. Elsewhere topography is marked by distinct subparallel sandstone ridges, relatively subdued within the basin but increasingly prominent at higher elevations. The most prominent of these ridges, the highest point in the Fox Creek area, is in the southwest quarter of Sec. 34, Tp. 66, R. 14, near the eastern boundary of the area, where Goose Fire Tower stands on the westernmost spur of the Swan Hills, 4 510 feet above sea level.

The lowest points in the area lie in the sharply incised inner valleys of the two main rivers, in the Little Smoky River valley in Sec. 21, Tp. 72, R. 20 with an elevation of 1 875 feet and in the Simonette River valley in Sec. 35, Tp. 70, R. 27 with an elevation of 1 748 feet. Throughout the gently rolling central part of the basin the rivers, especially the Little Smoky and its eastern tributary, the Goose, lie in sharp but relatively shallow trenches 50 to 120 feet deep, and it is in the deeper parts of these trenches that almost all of the few bedrock outcrops of the area are to be found. While most of the outcrops are badly distorted by glacial deformation and recent slumping, usually to the point where section measurement is impossible, a certain amount of information can be gained by simply noting the distribution of float coal in the bars of the rivers and streams.

About 22 townships in the northeastern part of the Fox Creek area, mostly occupied by rough terrain and difficult of access, are drained by tributaries of the East and West Prairie Rivers.

The climate and natural biota of the Fox Creek area are those typical of the mixedwood boreal forest zone (Halliday, 1937; Rowe, 1959). Precipitation is very low, but evapotranspiration also is relatively low so that moisture-surplus conditions prevail much of the time. The resulting vegetation cover in areas of adequate drainage is almost entirely arborescent, modified only by the frequent fires that have ravaged the area. On the drier sites such as sand dunes and sandstone ridges, a subclimax develops, dominated by jack pine (here probably a hybrid between *Pinus contorta*, the western jack pine or lodgepole pine, and *Pinus banksiana*, the eastern jack pine); on the mesic sites, the subclimax vegetation consists of willow brush and aspen poplar. Climax, which is seldom reached, is dominated by white spruce (*Picea glauca*). Extensive areas of interrupted drainage are covered with muskeg, that is, moss or sedge bog, either open or invaded by stunted forest of black spruce (*Picea mariana*) and tamarack (*Larix laricina*).

The oldest settlement in the Fox Creek area is the native community now organized as the Sturgeon Lake Indian Reserve on the south shore of Sturgeon Lake at Calais. Intensive settlement began around Valleyview about the time of the First World War, but the main access route, Highway 43, was not completed until 1956, and the only railway in the area was built in 1968.

Agriculture is the economic mainstay of most of the permanent residents, but agricultural settlement is still restricted to narrow corridors along the Little Smoky River valley north of Little Smoky settlement, about Tp. 66, R. 21, and east and west of Valleyview from Snipe Lake to Sturgeon Heights. In the last decade there has been a notable movement of homesteading pioneer families into the peripheral portions of this settlement, especially in the Sweathouse Creek and Little Smoky regions.

A considerable amount of sawtimber is produced each year within the area by a number of mills, mostly situated relatively close to Highway 43, although the

largest of these is at Meekwap Lake. Forest production is expected to increase dramatically within the next few years since much of the timber here is allotted to major woodpulp operations with mills either in operation or projected.

Of greater financial importance at the present time are a number of oil and gas fields in the area. Snipe Lake, Sturgeon Lake, Goose River, Ante Creek, Simonette and the lower pool of Kaybob are primarily oil fields, while the upper pool of Kaybob field, and Bigstone and Kaybob South fields, produce natural gas; Kaybob South, presently under development in Tps. 61-62, Rs. 17-21, is one of the biggest gas fields in Canada.

The main access route, running diagonally across the Fox Creek area, is Highway 43, the Whitecourt-Valleyview cutoff; this, and Highway 34 in the northwestern part of the area, are first class paved roads, serving as part of the Alaska Highway system. A sparse network of good gravel roads serves oil and gas fields in the southern two thirds of the area, but between them, large tracts of unoccupied bush are inaccessible except by means of rough trails and seismic cut lines passable only by tracked vehicles or on foot. Regions of agricultural settlement in the northern one third of the area, on the other hand, are reasonably well served with a network of country roads. The only railway is the CNR spur line extending northwest from Whitecourt with two branches to gas and sulphur plants at Bigstone (Tp. 61, R. 22) and Smoke Lake (Tp. 62, R. 20).

There are only two towns within the area. Whitecourt, the larger, serves the agricultural settlements and the stabilized petroleum industry of the north, while Fox Creek is economically dependent on the still expanding oil and gas fields of the south.

## GEOLOGIC SETTING

### Bedrock Geology

The greater part of the Fox Creek area is underlain by continental clastic bedrock strata of the Wapiti Formation (Dawson, 1881). Only a small region about Tps. 71-72, Rs. 14-15 on the floor of the East Prairie River valley is said to be underlain by marine shales of the Smoky River Group (Jones, 1966); the coal survey added no information here since it was possible to drill only 2 boreholes in the vicinity, and these yielded ambiguous results.

The Wapiti Formation is a thick sequence of irregularly bedded nonmarine sandstones, siltstones, shales, bentonite beds and coaly sediments believed to be uppermost Cretaceous and lower Paleocene in age, the northern correlative of the thick continental sequence in central and southern Alberta that includes the Belly River Group (Foremost and Oldman Formations) and the Edmonton and Paskapoo Formations (Allan and Carr, 1946; Dawson, 1881; Gleddie, 1954; and Jones, 1966).

Regional structure appears as a simple monocline within the Fox Creek area, apparently dipping quite uniformly about 25 feet a mile south-southwestward or southward (Fig. 5; Jones, 1966, Figs. 10 and 14). The lower limit of the Wapiti Formation, marked by the top of the shaly, marine Smoky River Group, is possibly slightly diachronous, lying stratigraphically lower in the southern part of the area, while the top of the formation is the present erosional surface which slopes generally downward towards the north. Thus, within the Fox Creek area, the Wapiti Formation varies tremendously in thickness from about 400 feet at Little Smoky Mines (Tp. 72, R. 20) to more than 4 300 feet in Tp. 61, R. 21 (e.g., Pan Am 6-1 Kaybob S 4-27-61-21 well).

Lithology of the Wapiti Formation is very variable, with much interlensing of sandstone with softer sediments; the few outcrops are usually disturbed. However, the shallow drilling program shows that in a general way topography is an indicator of Wapiti lithology; almost invariably ridges and uplands are underlain by relatively resistant sandstone, valley and lowlands by shales and other argillaceous sediments and by coaly zones. Bedrock at surface in the rougher peripheral regions of the Fox Creek area is dominantly sandstone, while coal-bearing sediments are more likely to be found in the flatter central and northern parts of the Little Smoky Basin.

Allan and Carr (1946) distinguished five members containing a number of coal seams in the Wapiti Formation south of Grande Prairie where it was originally described. However, in the Fox Creek area, shallow drilling results seem to indicate that the Wapiti consists of just three divisions, and these are tentatively correlated with the Belly River Group, the Edmonton Formation and the Paskapoo Formation of the central Alberta Plains (Fig. 2; Fig. 3; Fig. 5, section A-A'). Definitive geological studies will doubtless accurately extend the boundaries of the central Alberta rock units across the area, and the Wapiti may then be more properly designated a group. However, in this report, the term "Wapiti Formation" is retained and its three divisions are informally referred to as "Belly River-equivalent strata," "Edmonton-equivalent strata" and "Paskapoo-equivalent strata" respectively.

"Belly River-equivalent strata," constituting the lowest of the three divisions, are light to dark grey sediments, mostly shales and argillaceous siltstones with numerous thin layers of indurated siltstone and ironstone and, north of Sunset House about Tps. 71-72, Rs. 19-20, several thick (20 to 40 feet) light grey, buff-weathering, uniform, massive, scarcely consolidated sandstone beds. A horizon of very sporadic thin coaly strata lies below the sandstone zone about the middle of this division (Fig. 2). Belly River-equivalent strata at surface in the Fox Creek area are believed to be more than 800 feet thick.

"Edmonton-equivalent strata" make up the middle division of the Wapiti Formation. Their lower limit is arbitrarily set at the base of a thick zone of argillaceous, probably lensy salt-and-pepper sandstone beds whose surface

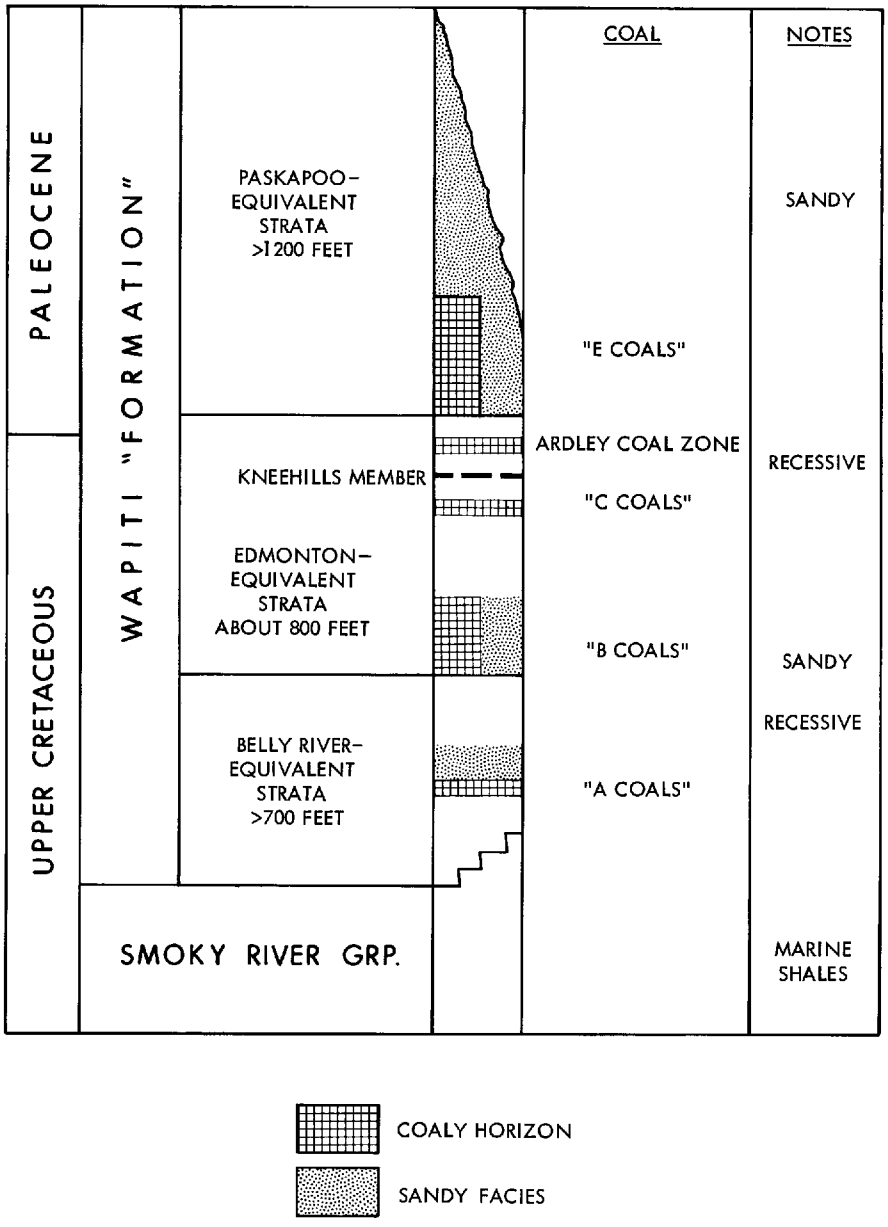


*FIGURE 2. Stratigraphic column, Fox Creek area*

expression is believed to be the range of hills enclosing the central Little Smoky Basin on its north side, for example, Blue Mountain (Tp. 69, R. 17), Snipe Lake Hill (Tp. 70, R. 19) and Puskwaskau Hill (Tp. 72, R. 23). In places, especially in the lower Little Smoky River valley between Valleyview and Little Smoky settlement, these relatively resistant sandstones change laterally into rather more argillaceous, somewhat less sandy and distinctly less resistant facies. Above the sandstone zone, Edmonton-equivalent strata, as seen in cutting samples, are mostly medium grey bentonitic shales and very light grey to medium grey, soft, very argillaceous siltstones, with almost no indurated layers.

Besides typical grey argillaceous strata, the upper one third of the division contains, between two coaly horizons (see below), an extremely persistent stratigraphic unit, 30-60 feet thick, consisting chiefly of a uniform, black, noncarbonaceous, highly bentonitic shale bed, giving a characteristic low resistivity pattern in electric logs; this unit clearly represents a northwestern extension of the Kneehills Member, Edmonton Formation, of the Plains region of central Alberta.[3] The Kneehills Member, with its correlatives, is a remarkably widespread unit, probably volcanic in origin, recognizable in outcrop and in subsurface from the Cypress Hills of southwestern Saskatchewan to the Simonette River; it is the only reliable marker horizon above the Colorado Group and equivalents in the Plains region of Alberta, and because of its volcanic nature (it usually contains one or more tuff beds near its top), it is believed to be essentially isochronous. Two outcrops on the north bank of the Goose River, one in Lsd. 5, Sec. 19, Tp. 66, R. 16 and the other in Lsd. 3, Sec. 20, Tp. 66, R. 16, in the foot of old slump blocks, appear to expose the Kneehills Member; and an enormous, relatively recent slump extending northwest from Secs. 18-19, Tp. 66, R. 15 to the Goose River about Sec. 26, Tp. 66, R. 16 is believed to have glided on underlying highly bentonitic Kneehills strata. Portions of the member, profoundly ice deformed, are exposed in a small road cut in Lsd. 12, Sec. 25, Tp. 66, R. 23.

Edmonton-equivalent strata within the Fox Creek area include three distinct horizons of coaly strata of which the lowest and most diffuse lies within the basal argillaceous sandstone zone and its more shaly equivalents, while the other two lie adjacent to the Kneehills Member. One of the upper coaly horizons, lying below the Kneehills, is also quite diffuse, but the other, lying 80 to 300 feet above the member, constitutes a true coal zone, well marked and thick, which is quite persistent under more than 60 townships in the southeast portion of the Fox Creek area. This coal zone occupies the same stratigraphic position relative to the Kneehills Member as the Ardley coal zone of central Alberta (Campbell, 1967;

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[3] For description and discussion of the Kneehills Member see Allan and Sanderson (1945), Campbell (1962, 1967), Irish (1967), Irish and Havard (1968), Ower (1960), Ritchie (1957) and Sanderson (1931). Irish (1970) has proposed raising the Kneehills to formational status (with a concomitant name change) and, in consequence, drastically revising the Edmonton Formation nomenclature. His proposals are not followed in this report since, for the present, it is more expedient to make use of topographically expressed lithologic variations.

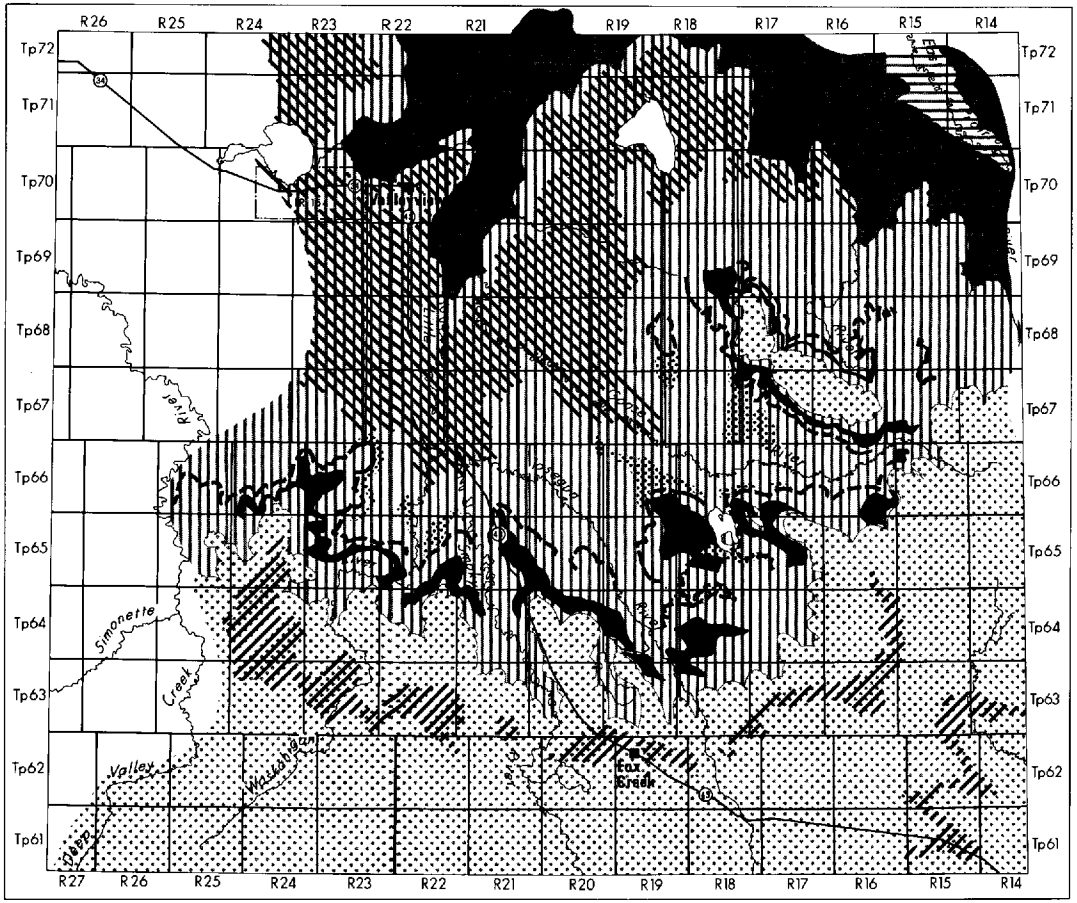



*FIGURE 3. Generalized bedrock geology, Fox Creek area*

Fig. I; Fig. 2) and for that reason is referred to in this report as the Ardley-equivalent coal zone. The only coal deposits of truly commercial importance in the Fox Creek area are contained within this zone.

Edmonton-equivalent strata are relatively uniform in thickness, expanding moderately southwestward; assuming that their upper limits are about 100 feet above the Ardley coal zone (Fig. 5, section A-A'), they are believed to be about 1 200 feet thick in South Brush Mountain (about Tp. 68, R. 17), and about 1 800 feet thick in Pan Am Kaybob South 4-27-61-21 well.

"Paskapoo-equivalent strata," which form the upper division of the Wapiti Formation in the Fox Creek area, are characterized throughout by numerous grey, buff-weathering, medium-grained, quite permeable salt-and-pepper sandstone lenses. These sandstones are expressed topographically in the many prominent ridges of the uplands surrounding the Little Smoky Basin and their permeability causes considerable difficulty to exploration testhole programs in the form of lost circulation. Interbedded with these sandstones are beds of siltstone and shale which are distinctly less bentonitic than similar sediments in the other divisions of the Wapiti Formation; in the lower 300 feet of the division, there is a noticeable coaly horizon of impersistent carbonaceous stringers. Within the Fox Creek area, Paskapoo-equivalent strata are everywhere limited at the top by the present erosional surface (disregarding a thin till mantle); in Tp. 61, R. 21 (e.g., Pan Am 6-1 Kaybob South 4-27-61-21 well) they exceed 1 200 feet in thickness.

## Quaternary Geology

Surficial deposits of the northwest part of the Fox Creek area were described by Henderson (1960) and those of the southeastern part by St. Onge (1967). In general, uplands expose a frequently discontinuous mantle of till, while the central part of the Little Smoky Basin is floored by an extensive but relatively thin deposit of postglacial lake sediment.

In exploring for coal or exploiting it within the Fox Creek area, the two features of Quaternary geology that will always have to be taken into consideration are (1) glacial ice disturbance of bedrock, and (2) recent extensive slumping, since both features are much more severe here than in coal-bearing areas of central Alberta.

Glacial disturbance has probably affected all near-surface bedrock within this area to some extent.[4] However, regions believed to have suffered most severely, shown in figure 4, lie mostly within the Little Smoky Basin where the bedrock consists in large part of soft argillaceous sediments of Edmonton-equivalent strata. Disturbance is particularly severe in regions where the highly bentonitic Kneehills Member lies close to the surface and also wherever ice moved against the base of a

[4] Although ice-disturbed bedrock falls within many if not most definitions of till, it is included as bedrock proper for convenience in this report. Most coal strip mines in the Alberta Plains win at least some of their production from glacially disturbed seams.

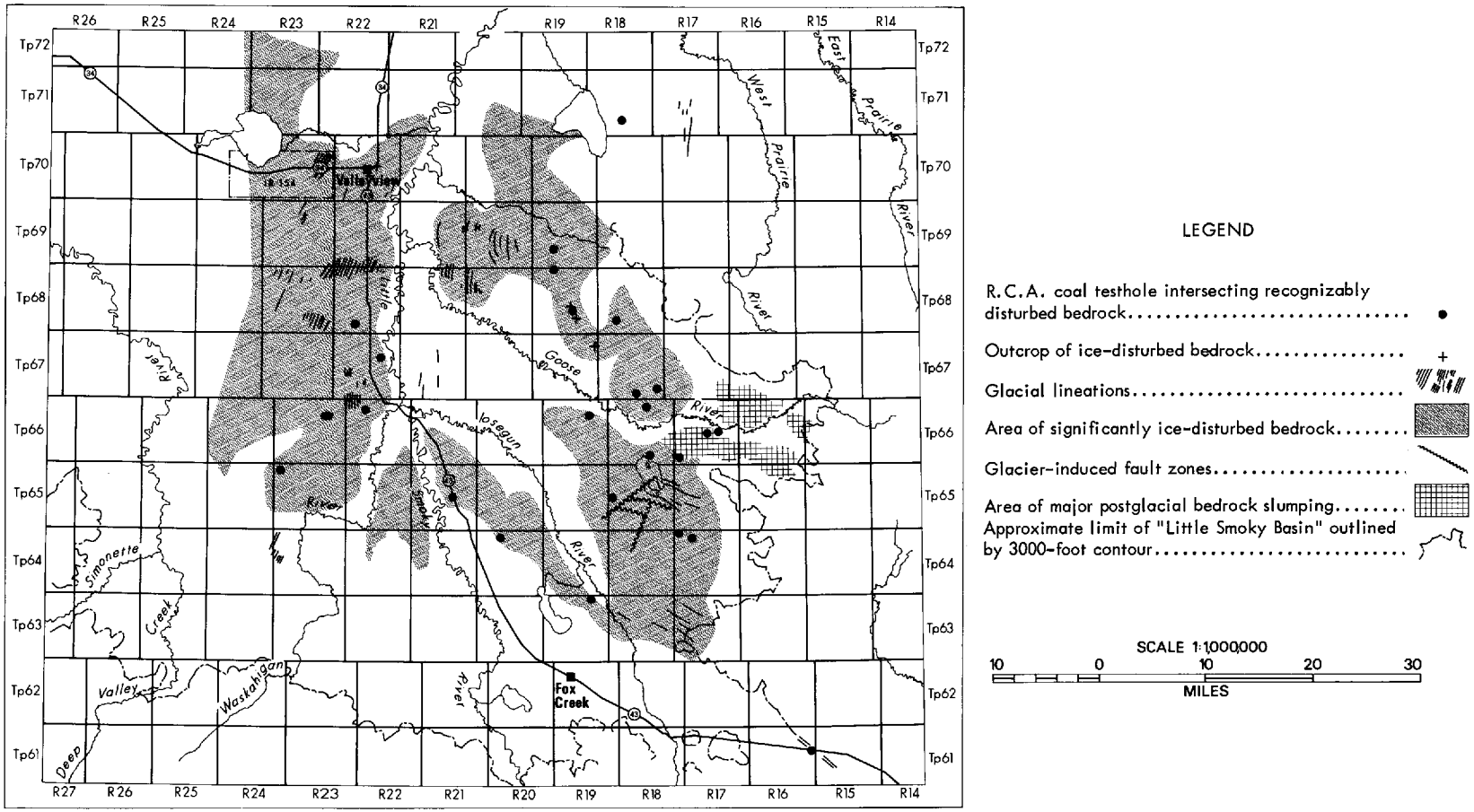



*FIGURE 4. Glacial disturbance and slumping of bedrock, Fox Creek area*

hill made of relatively soft sediments. On the other hand, hills made of arenaceous Paskapoo-equivalent strata appear to have suffered minimal disturbance.

Glacial lineations (Fig. 4) indicate that ice moved from the north-northeast in the northern part of the Little Smoky Basin, but swung southeastward in the lee of the relatively resistant Blue Mountain-Brush Mountain ridge. Consequently, while on Snuff Mountain (Tp. 66, Rs. 23-24) major bedrock distortion is found on the north-facing hillside, it occurs on the northwest-facing slopes in the valleys of the Goose and Iosegun Rivers (Tps. 63-67, Rs. 16-20).

Glacial disturbance often gives rise to structures reminiscent of those induced by regional tectonism, including open or tight folds, and a wide variety of faults. Exact structure is usually impossible to determine in soft sediments obscured by drift and vegetation cover; the following three examples are probably typical.

(1) In Lsd. 1, Sec. 36, Tp. 67, R. 19, in a road ditch outcrop more than 300 feet long, a 2.5-3 foot thick coal seam exhibits near-vertical dips.

(2) At the northeast corner of Lsd. 14, Sec. 23, Tp. 67, R. 22, four boreholes were drilled within a radius of 600 feet, of which one passed through 30 feet of coal, one encountered 12 feet of coal, one found only 2 feet, and one had no coal; fault duplication and a vertical seam are suspected.

(3) Southwest of Meekwap Lake in Tps. 64-65, R. 18, a structure disclosed by a number of boreholes drilled to study the Ardley coal cannot be plotted in detail, but, as an oversimplification, is interpreted as four major faults, one of which is a normal fault at least 5 miles long with a throw of more than 100 feet (Fig. 4; Fig. 5, section A-A').

Slumping of outcrops, the other Quaternary feature that interferes with coal exploration in the Fox Creek area, is, like glacial bedrock disturbance, most frequent and most intense within the Little Smoky Basin in bedrock consisting of soft argillaceous strata. The Kneehills Member in particular, being very bentonitic, causes slumping wherever it occurs near the surface as exemplified by the unusually large, relatively recent slump-landslide, mentioned above, which extends west from the crest of a hill in Secs. 18-19, Tp. 66, R. 15 for a distance of 2 1/2 miles to the Goose River in NE 1/4 Sec. 26, Tp. 66, R. 16. Slumps, even very old ones (e.g., bordering Outlet Creek, Tp. 64, R. 19), are relatively easily detected by air photo study.

## COAL RESOURCES

### Mines

No coal mines have been registered within the Fox Creek area itself, but, less than 1 mile north of its northern boundary in the valley of the Little Smoky River (Fig. 5), there were two mines both exploiting the same coal seam which outcrops in the river cutbanks. Table 1 presents particulars of these mines (Campbell, 1964).

Table 1. Coal mines, Fox Creek area

| Location | | | | Mine No. | Type | Life Span | Seam (ft) | Cover (ft) |
|---|---|---|---|---|---|---|---|---|
| Lsd. | Sec. | Tp. | R. | | | | | |
| 5 | 27 | 72 | 20 | 1615 | underground | 1943-45 | 2.9 | 30+ |
| 1, 2, 7, 8 | 28 | 72 | 20 | 1567 | strip | 1939-46 | 3.8 | 17 |

## Coal Distribution

Coaly deposits of the Wapiti Formation, which underlies practically all of the Fox Creek area, appear to be most prevalent within five more or less broad zones or coaly horizons, three of which lie within the middle division of the formation and one each within Belly River equivalent strata and Paskapoo equivalent strata. These five coaly horizons are designated in ascending order in this report "A coals," "B coals," "C coals," "D coals," or Ardley-equivalent coal zone, and "E coals" (Fig. 2, Fig. 3).

Four of the five coaly horizons are diffuse, probably consisting only of a scattering of impersistent carbonaceous stringers which occasionally include recognizable coal seams; consequently they are difficult to distinguish in subsurface records of oil and gas wells. On the other hand the remaining coaly horizon, the "D coals" or Ardley-equivalent coal zone, is well marked and extremely persistent; it has been traced in subsurface records southward from its outcrop to the limits of the Fox Creek area (Fig. 5).

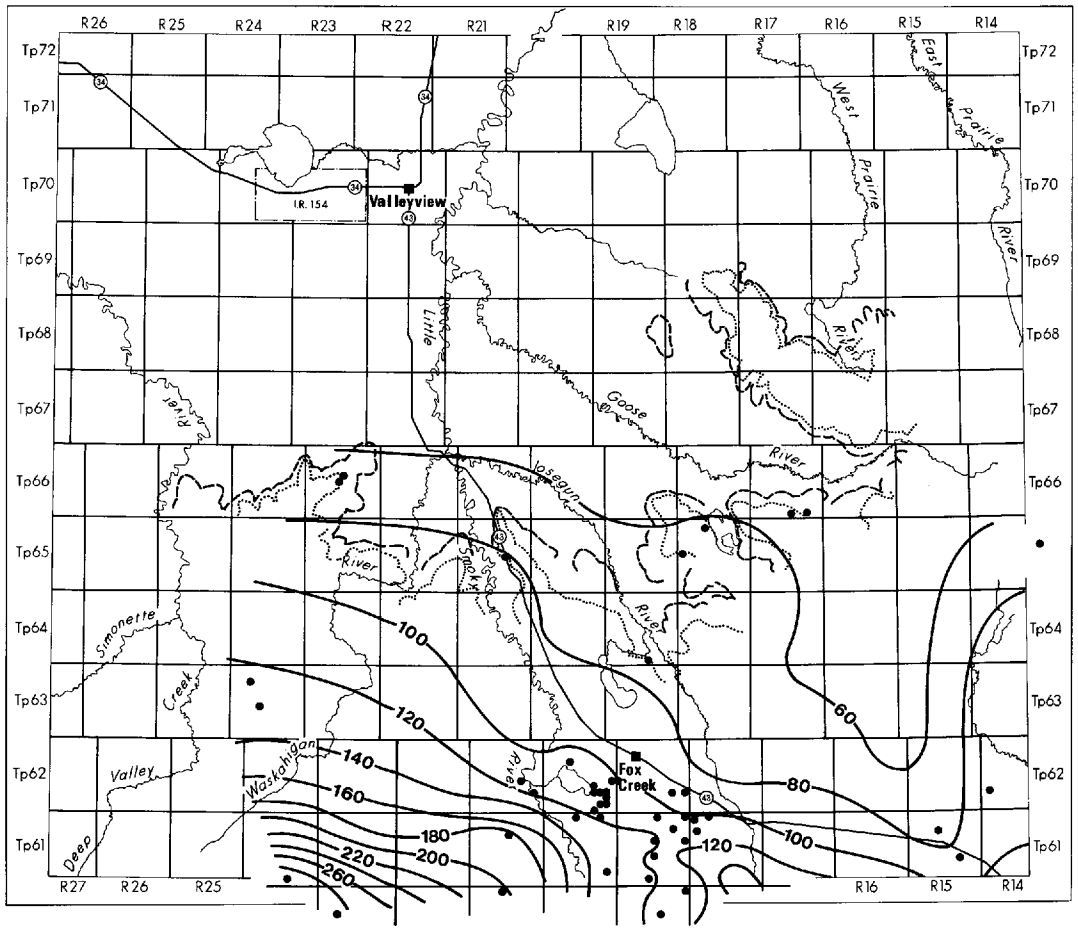
"A coals," the lowest in the Wapiti Formation (Fig. 2), appear in the valley of the Little Smoky River about Secs. 27-28, Tp. 72, R. 20 (actually about 1/2 mile north of the north boundary of the Fox Creek area) as two or more carbonaceous shale stringers or thin coal seams outcropping below the zone of grey, scarcely consolidated sandstone beds in Belly River-equivalent strata. On the west bank of the river at this locality, one coal seam thickens to 3 or 3.5 feet and was exploited by the two small mines operating briefly here during the 1940's. "A coals" are not known to outcrop elsewhere in or near the Fox Creek area, but a number of scattered and probably impersistent coal seams intersected at depth in oil and gas wells in the central part of Belly River-equivalent strata (e.g., in Pan Am Sun A1 – McGowan 12-17-67-16 well, at 1 870 feet and at 2 012 feet depths) and are arbitrarily included here. It is believed that the possibility of finding economically recoverable coal deposits amongst the "A coals" is extremely small.

"B coals" include a number of coaly stringers and thin coal seams lying within the zone of argillaceous salt-and-pepper sandstone beds and its shaly lateral equivalent which constitutes the lowermost Edmonton-equivalent strata;

near-surface indications of this coaly horizon all appear in or near the lowlands of the northern half of the Fox Creek area (Fig. 2, Fig. 3). Except for a thin coaly shale band in three relatively undisturbed outcrops in the narrow inner valley of the Goose River (Lsd. 9, Sec. 7, Tp. 68, R. 20; Lsd. 4, Sec. 14 and Lsd. 2, Sec. 15, Tp. 68, R. 21; see Fig. 5), "B coals" were only observed in subsurface intersections. Seams of this horizon, 1-4 feet thick, were encountered in 16 Research Council coal testholes in the northern part of the Little Smoky Basin and around Snipe Lake Hill and Puskwaskau Hill (Tp. 67, R. 22 and Tps. 69-72, Rs. 18-23) and also in a water well at Calais in Sec. 14, Tp. 70, R. 24; a number of seismic shotholes in the same general region also reported finding coaly sediments (Fig. 5). Two coal zones found in the wildcat oilwell, Shell Amerada Simon 6-34-64-25, at 1 763 feet and 1 900 feet respectively are also referred to the "B coals"; the fact that both zones appear to contain two seams 4-6 feet thick, suggests that the horizon may be distinctly more coaly westward from the Little Smoky River valley. During the depression years, local settlers are believed to have exploited "B coals" on the north slope of Blue Mountain (about Sec. 13, Tp. 70, R. 17), along Coalmine Lick Creek (about the northeast corner of Tp. 71, R. 18) and around the south shore of Snipe Lake. However, neither the exploited seams nor those encountered in shallow testholes exceed 4 feet in thickness and none has any lateral continuity; consequently it seems unlikely that any deposits of economic significance will be found in the "B coals" horizon in the Fox Creek area.

"C coals" comprise a group of usually isolated, occasionally clustered, coal lenses, none of which is known to exceed 4 feet in thickness, scattered randomly through the 200 feet of argillaceous sediments below the Kneehills Member in Edmonton-equivalent strata. In places the lenses are sufficiently numerous that the horizon appears to be distinctly more coaly than either "A coals" or "B coals," but none is thick enough or persistent enough to be of economic interest. "C coals" were encountered chiefly while exploring for the overlying Ardley-equivalent coal zone on the south wall of the Goose River valley (Tp. 66, Rs. 16-19) and on the north and east slopes of Snuff Mountain (Tps. 65-66, Rs. 23-25), usually in strongly ice-distorted strata (Fig. 5). Numerous coal occurrences in rounded hills north of Goose River (Tp. 67, Rs. 17-18), all exceedingly ice distorted, are tentatively referred to as the "C coals." The horizon has been recognized in subsurface in several oil and gas wells, for example, Calstan BA Fox Creek N 10-21-62-18 well, where a 25-foot coaly zone with numerous partings lies 915 feet below the surface, about 120 feet below the Kneehills Member. Two badly slumped coal outcrops in Secs. 19-20, Tp. 66, R. 16 along the upper Goose River, may represent this zone or may derive from the overlying "D coals."

"D coals" lie 80 to 300 feet above the Kneehills Member in Edmonton-equivalent strata (Fig. 6) and constitute the Ardley-equivalent coal zone discussed at length below. All potentially commercial coal deposits within the Fox Creek area are contained within this zone.




LEGEND

Ardley-equivalent coal zone; assumed line of outcrop and subcrop.....

Kneehills Member; assumed line of outcrop and subcrop...

Isopach of interval between top of Kneehills Member and base of Ardley-equivalent coal zone, subsurface and projected (interval 20 feet)..... 60

Datum point.....

SCALE 1:1,000,000

10 0 10 20 30

MILES

*FIGURE 6. Thickness of Kneehills to Ardley-equivalent interval, Fox Creek area*

"E coals" comprise a coaly horizon of sparse discontinuous carbonaceous stringers and thin coal seams lying within the lower 300 feet of Paskapoo equivalent strata. Most of the Research Council coal testholes along Highway 43 in township 61, where it crosses the Athabasca-Iosegun divide, as well as the four testholes in Tp. 62, Rs. 14-15, appear to penetrate only the barren upper part of the division; but one testhole close to the Athabasca River in Tp. 61, R. 15, one in Tp. 61, R. 18 in the deep Iosegun River valley, two near Fox Creek in Tp. 62, R. 20, and two at the summit of Snuff Mountain on the north boundary of Tp. 65, R. 24, were drilled at suitable elevations to encounter "E coals." The deep testhole in Sec. 17, Tp. 62, R. 20, cut eight coaly bands in lower Paskapoo-equivalent strata, but only one of these (at about 508 feet) contained a true coal seam. "E coals" do not include any mineable coal deposits within the Fox Creek area; however, the thick coal zones outcropping along the Smoky, Cutbank and Kakwa Rivers, 10 to 40 miles west of the area, are believed to be stratigraphic equivalents of this coaly horizon.

### Ardley-Equivalent Coal Zone

The thick bodies of coal discovered while drilling for gas in the Kaybob South Field are the "D coals" or the "Ardley-equivalent coal zone," the only deposits that include appreciable resources of mineable coal within the Fox Creek area (see above); the chief aim of the Research Council coal survey activity was to trace, if possible, the near-surface occurrences of these deposits.

Outcrops are rare because of massive slumping and the heavy drift mantle; the zone was observed with certainty only in a road cut at the crossing of Outlet Creek in Sec. 3, Tp. 64, R. 19, and in another road cut on the northeast shoulder of Snuff Mountain in Lsd. 1, Sec. 21, Tp. 66, R. 23. The two badly slumped outcrops along the upper Goose River in Secs. 19-20, Tp. 66, R. 16 may, as mentioned above, represent the Ardley-equivalent coal zone or the stratigraphically lower "C coals." Float coal occurs plentifully in the Goose River, especially in Tp. 66, R. 18, and in the Little Smoky and Waskahigan Rivers at the crossings of Highway 43. The Goose River float was observed to originate in the region of the outcrops in Tp. 66, R. 16 and upstream, possibly largely from occurrences obscured by slumping; doubtless much of the float in the other rivers also derives from Ardley-equivalent coal zone outcrops which, from extrapolation (Fig. 5), are believed to occur 10 to 15 miles upstream, but these could not be visited. Extensive coal outcrops have been reported (RCA Ann. Rept. 1969, p. 28; Kramers and Mellon, in press and pers. comm.) on the Little Smoky River, and also from Tp. 64, R. 25, in the valleys of Simonette River and Deep Valley Creek near their confluence; the Simonette exposures are believed to represent a westward extension of an upper section of the Ardley-equivalent coal zone (see below) but they could not be examined during the allotted field season.

By far the best information on the Ardley-equivalent coal zone was obtained from borehole intersections; from these it was possible to determine the

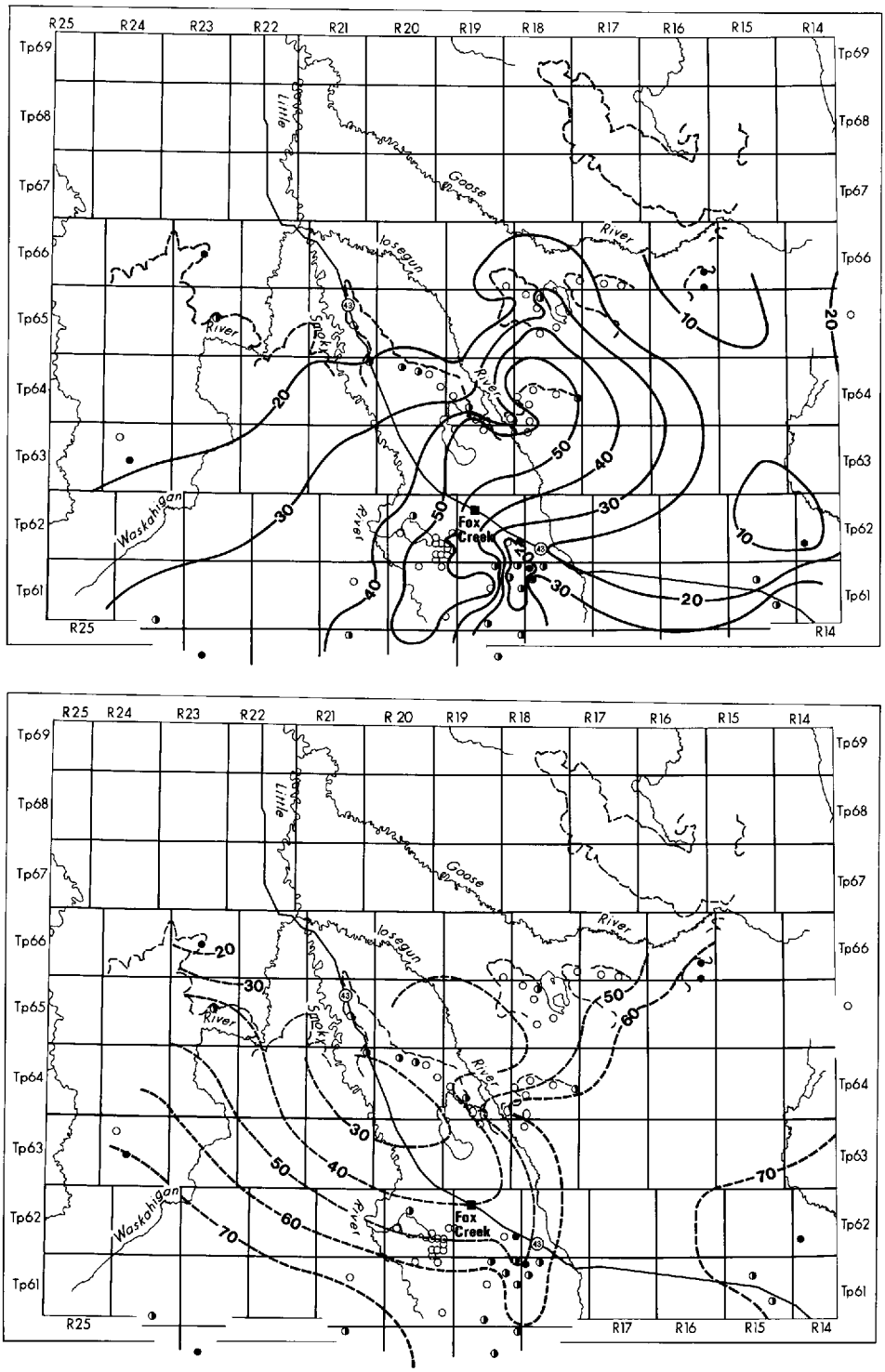



*FIGURE 7. Thickness and "coaliness" of Ardley-equivalent coal zone, Fox Creek area*

approximate location of the line of subcrop under the drift (Fig. 5), and to construct several isopleth maps (Figs. 5, 6, 7).

Subsurface information used in tracing the zone included records from 49 deep wells drilled for oil and gas, from 59 shallow Research Council coal testholes near the line of subcrop, and from two deep (700-800 feet) Research Council coal testholes near Smoke Lake in Tp. 62, R. 20 (Fig. 5). The Smoke Lake holes were drilled near existing oil and gas wells to compare two different types of electric log records and to procure coal samples from deep deposits for analysis. Figure 8 shows four sections through the zone, two from deep wells, and two from Research Council coal testholes, each from a different region.

Regional structure is a comparatively simple monocline dipping south-southwestward and southward at a moderately uniform slope, about 25 feet a mile (Fig. 5); the consistent relationship of the coal zone to the Kneehills Member (Fig. 6) strongly indicates that the zone is indeed a northwestern equivalent of the Ardley coal zone of central Alberta.

---

LEGEND

Ardley-equivalent coal zone; assumed line of outcrop and subcrop.....

Isopach of basal coaly portion; assumed, subsurface and projected (interval 10 feet)..... 40

Isopleth of "coaliness"* of basal coaly portion; assumed, subsurface and projected (interval 10 per cent)..... 60

Datum point, separate upper coaly portion not observed.....

Datum point, upper portion thinner than basal.....

Datum point, upper portion thicker than basal.....

*"coaliness" is percentage of total zone thickness that consists of coal in seams > 2 feet thick.

SCALE 1:1000000

10 0 10 20 30

MILES

Even in detail, at least in the region of Smoke Lake where there is good control, local structure appears to be relatively simple at depths great enough to escape surface disturbance. However, near the line of subcrop glacial distortion is always present, often on a scale too small for plotting on the maps used (1:250 000) and always in confusing detail; only in Tps. 64-65, R. 18 was there sufficient information available to attempt a structural interpretation and here, the four faults shown doubtless represent a gross oversimplification.

A number of anomalies of coal distribution observed in testhole coal intercepts along the south bank of the Goose River, such as the 100-foot northward drop in apparent coal elevation in Tp. 60, R. 16 between the testhole in Lsd. 2, Sec. 2, and the testhole in Lsd. 10, Sec. 11, are believed to indicate extensive slump displacement of the coal zone.

Within the Ardley-equivalent coal zone, in the Fox Creek area, individual coal seams are erratic and commonly discontinuous, never more than 10 feet thick and separated by shaly or silty strata and bentonite beds 1-3 feet thick (which are especially numerous and prominent around Snuff Mountain in Tps. 65-66, Rs. 23-24). Well and testhole records indicate that the transition from the strictly noncarbonaceous shaly sediments of the Kneehills-Ardley interval to the distinctly coaly basal portion of the Ardley-equivalent coal zone is sharp and probably does not vary more than 20 feet in stratigraphic position; in fact, the base is the only feature of the zone that appears reliable enough to use in plotting structure contours (Fig. 5). Total thickness and "coaliness" (defined below) of the zone vary greatly, but much of the variability occurs in the middle and upper portions, the basal portion always being distinctly coaly. Around Smoke Lake in Tp. 62, R. 20 (e.g., H.B. Union 12-11-62-20 well) and northeastward to the line of subcrop in Tp. 64, Rs. 18-19 (e.g., Research Council coal testhole in Lsd. 7, Sec. 4, Tp. 64, R. 19), the coaly basal portion is thick, constituting the whole of the Ardley-equivalent coal zone. In other regions it thins markedly, especially eastward and northeastward (e.g., Atlantic *et al.* Virginia Hills 10-24-65-14 well) and northwestward at Snuff Mountain in Tp. 66, R. 23 (e.g., Research Council coal testhole in Lsd. 1, Sec. 21, Tp. 66, R. 23). Isopleths of "coal thickness" plotted in figure 7a represent the thickness of the basal coaly portion of the zone alone.

The upper portion of the zone is more erratic than the lower, and in many places (indicated by symbols in figure 7) separated from the basal portion by a prominent sequence of noncoaly strata (e.g., H.B. Union Fox Creek W. 10-4-61-19 and Fina *et al.* Sakwatamau 10-7-62-14 wells in the southern and southeastern parts of the area, and in Pan Am Waskahigan 11-16-63-24 well in the west). The separation may be sufficiently pronounced, and the two coaly portions sufficiently thick (e.g., near the Simonette River in the Pan Am Waskahigan well, where the noncoaly mid-portion is about 55 feet thick and the two coaly portions each about 25 feet thick) to warrant speaking of Upper and Lower Ardley-equivalent coal zones; the prominent outcrops of coal reported from the Simonette River forks (see

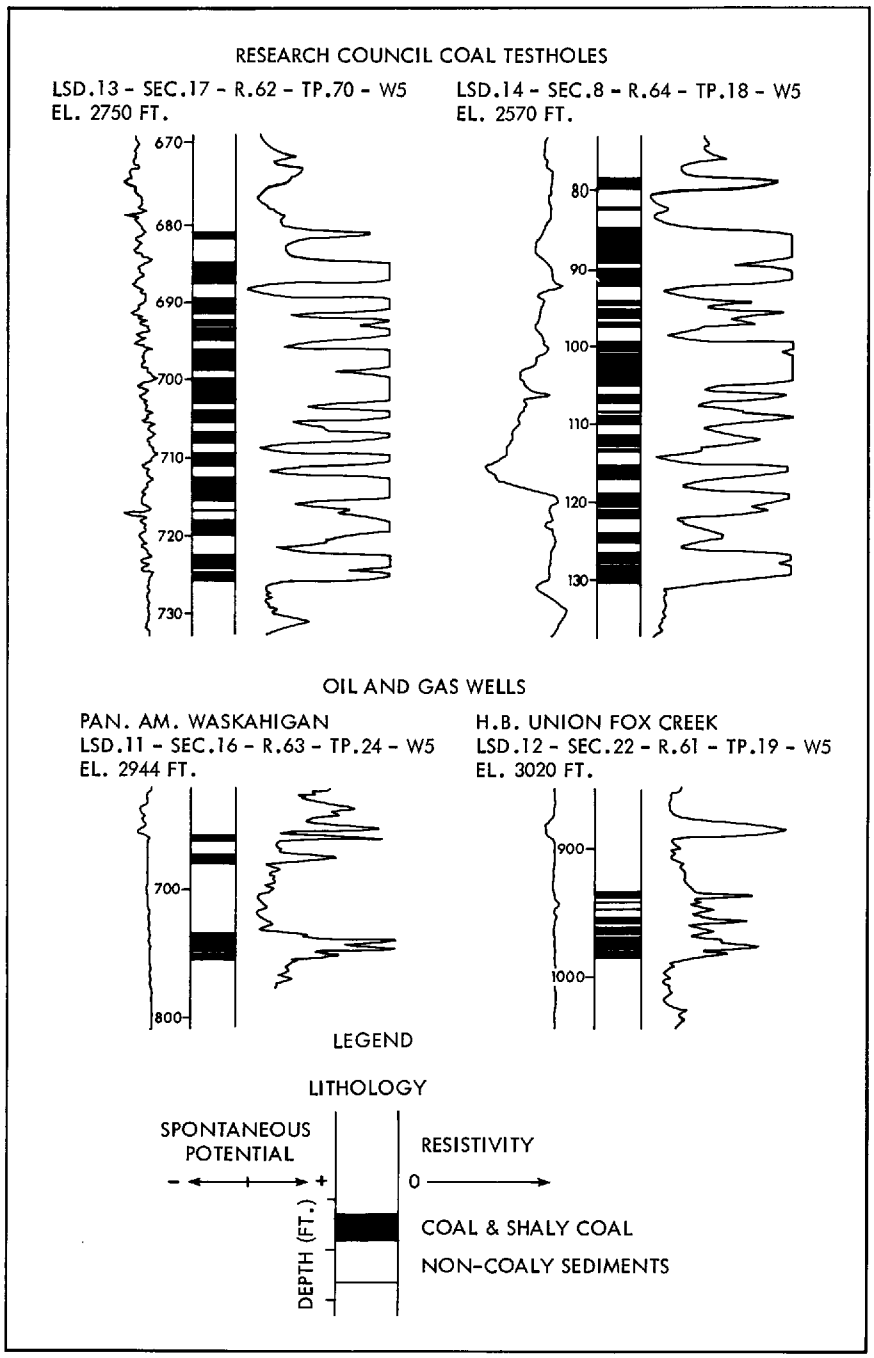



*FIGURE 8. Representative seam-logs, Ardley-equivalent coal zone, Fox Creek area*

above) appear, by extrapolation, to be exposures of the upper zone, probably relatively undisturbed under deep cover.

"Coaliness" is here defined as the percentage of total coal zone thickness which actually consists of coal in seams more than 2 feet thick; isopleths of "coaliness" plotted in figure 7b characterize the basal coaly portion of the zone irrespective of its thickness.

Structure trends indicate that the Ardley-equivalent coal zone ought to be present (barring unexpectedly great glacial disturbances) between the Waskahigan and Little Smoky Rivers in Tp. 65, Rs. 21-22, and also north of the Goose River in South Bush Mountain as far as Tp. 68, R. 17 (Fig. 5). However, trends in thickness and "coaliness" appear to indicate that the zone in these two regions may be relatively thin and noncoaly (Fig. 7) so that exploration there, in the face of considerable access difficulties, may not be warranted under the present circumstances.

In contrast, the Ardley-equivalent coal zone is comparatively thick and "coaly" along its line of subcrop around Meekwap Lake, Atikkamek Creek and the adjacent part of the Iosegun River about Tps. 63-66, Rs. 17-20 inclusive (Fig. 5). In this region, the near-surface coal is broken by glacier-induced faulting (see above) and by stream-valley erosion, into a number of partially isolated bodies underlying the topographic highs; the portions of these bodies with less than 100 feet of cover, designated "fields" and numbered I-VII, are delineated in figure 5 and catalogued in table 3.

Generally, glacial deformation of the Ardley-equivalent coal zone appears to be distinctly more severe in Fields IV-VII, north of Atikkamek Creek, than in the southern fields. Especially in Field IV, the coal, while probably present in considerable tonnages, is believed to be complexly disturbed and faulted.

On the other hand, in Fields I and II which occupy the west bank of the Iosegun River valley and the ridge along the highway in Tp. 65, R. 21, the coal zone seems to be relatively undisturbed, but it thins northwestward and, because of the rising ground to the southwest, is deeply covered by overburden except in a very narrow band along the line of subcrop.

In Field III, which lies between the Iosegun River and Atikkamek Creek in Tp. 64, R. 18, the Ardley coal zone is somewhat thicker and "coalier" than in the other fields, and has suffered rather less glacial distortion than elsewhere. Strata in the northwestern angle of the field, about Sec. 18, Tp. 64, R. 18, lie about 50 feet above their expected position and dip southeastward instead of south-southwestward; however, within the field there are no known breaks in the coal zone. The log of Research Council coal testhole in Lsd. 14, Sec. 8, Tp. 64, R. 18, shown in figure 8, probably exhibits a typical cross section of the coal zone in Field III, which appears to be the most favorable location in the Fox Creek area for recovering coal by stripmining methods.

## Coal Quality

Proximate analyses of twelve samples of coal collected in the Fox Creek area and processed in the Research Council Coal Division analytical laboratory are shown in table 2; all are from drilled wells or testholes, and all but one (Sample A) from the Ardley-equivalent coal zone. Five of the samples were cores and consequently yielded reliable determinations of all parameters including ash. The other seven were drill cuttings extracted from the drilling-mud stream that had suffered unknown additions of mineral material from the mud itself, and possible modifications by the winnowing action of the stream; ash determinations derived from these seven are of no value, and other determinations are recognized to have a slightly wider margin of error than is commonly tolerated in coal testing. Nevertheless, the results of all these analyses, when presented on an "Ash-Free" basis (as well as on a "Capacity Moisture" basis, the best for comparing low-rank coals), are sufficiently precise to outline the general features of the true coaly materials of the Ardley-equivalent coal zone in the Fox Creek area and to confirm that they all lie within the ASTM classifications "Subbituminous C," "Subbituminous B" or "Subbituminous A" coals. Such coals, as well as being suitable for thermal power production, are particularly well adapted to large-scale manufacture of "substitute pipeline gas."

Ash content requires separate consideration. The Ardley-equivalent coal zone, like the Ardley coal zone in central Alberta, consists of a concentration of seams and coaly lenses separated by irregular shale and clay partings (Fig. 8). Individual seams may have relatively low ash content (e.g., the reliable ash determination in the core samples F, G, H, J, K, Table 2) but in many cases they are thin and would have to be mined in groups together with mineral partings, so that the average ash would be significantly increased. In fact, ash content is largely dependent upon mining practice.

## Tonnages

The seven coal "fields" shown in figure 5 are regions close to the line of subcrop where the Ardley-equivalent coal zone mostly lies under less than about 100 feet of cover, and consequently might be economically recovered by stripmining. Table 3 lists these "fields" and gives estimates of recoverable *high-ash* coal tonnages in each. Assuming (1) coal specific gravity about 1.5 (i.e., mined at about 35% average ash), (2) about 90 per cent recovery and (3) a 50 per cent reduction factor to allow for imperfect information on details of coal structure, details of coal benches and partings and their lateral persistence, drift thickness, and details of glacial deformation, then tonnage estimates are arrived at using the formula: field area (sq mi) x average mineable coal thickness (ft) x factor 580 000.

The Ardley-equivalent coal zone within the Fox Creek area is only marginally attractive under the present economic conditions, but it does constitute an enormous reservoir of energy. It seems reasonable to estimate that approximately

Table 2. Proximate analyses, coals of Fox Creek area

| Sample | Location Lsd. | Sec. | Tp. | R. | Depth (ft) | AFCM[1] Basis $H_2O$[1] | VM[1] | FC[1] | G.BTU[1] | CM[1] Basis S[1] | A[1] | ASTM Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A[2] | - | 14 | 70 | 24 | 40 | 27.4 | 30.7 | 41.9 | 8970 | 0.5 | - | Subbituminous "C" |
| B[3] | 11 | 36 | 64 | 21 | 30-40 | 24.0 | 30.8 | 45.2 | 9480 | 0.4 | - | Subbituminous "C" |
| C[4] | 12 | 17 | 62 | 20 | 685-700 | 18.8 | 31.0 | 50.2 | 10560 | 0.4 | - | Subbituminous "A" |
| D[4] | 12 | 17 | 62 | 20 | 700-720 | 18.2 | 31.3 | 50.5 | 10690 | 0.4 | - | Subbituminous "A" |
| E[4] | 12 | 17 | 62 | 20 | 720-725 | 16.8 | 32.6 | 50.6 | 10860 | 0.4 | - | Subbituminous "A" |
| F[5] | 10 | 18 | 64 | 18 | 159 | 20.0 | 31.7 | 48.3 | 10310 | 0.5 | 11.5 | Subbituminous "B" |
| G[5] | 10 | 18 | 64 | 18 | 171 | 20.6 | 30.4 | 49.0 | 10180 | 0.4 | 13.2 | Subbituminous "B" |
| H[5] | 10 | 18 | 64 | 18 | 193 | 21.5 | 31.7 | 46.8 | 9940 | 0.4 | 14.2 | Subbituminous "B" |
| J[5] | 10 | 18 | 64 | 18 | 196 | 26.3 | 34.5 | 39.2 | 8610 | 0.2 | 46.1 | High-ash interferes with analysis |
| K[5] | 10 | 18 | 64 | 18 | 203 | 20.0 | 32.8 | 47.2 | 10420 | 0.3 | 8.5 | Subbituminous "B" |
| L[6] | 12 | 18 | 62 | 19 | 770-800 | 17.9 | 30.7 | 51.4 | 10740 | 0.9 | - | Subbituminous "A" |
| M[6] | 12 | 18 | 62 | 19 | 800-830 | 17.1 | 31.6 | 51.3 | 11010 | 0.3 | - | Subbituminous "A" |

[1] Abbreviations: AFCM - ash-free capacity moisture basis; CM - capacity moisture only basis; $H_2O$ - capacity moisture percentage; VM - volatile matter percentage; FC - fixed carbon percentage; G.BTU - gross calorific value in BTU/lb; S - elemental sulphur percentage; A - ash percentage.

[2] Water well, Calais, Alberta, drilled by L.M. Water Wells, Edmonton, "B coals" horizon

[3] Research Council, coal test hole, June 18, 1968, chip samples screened from mudstream

[4] Research Council, "deep" testhole "Smoke Lake No. 2", October, 1969, chip samples screened from mudstream, concentrated by Zn Br flotation

[5] Canadian Utilities Ltd. corehole No. 3, November 10, 1970

[6] Oilwell Chevron Gulf Kaybob S. 12-18-62-19, February, 1970, chip samples collected by "Sample Boy" sample catcher, concentrated by Zn Br flotation

Table 3. Coal tonnages, Fox Creek area

| Field[1] | Thickness: Zone Range (ft) | Thickness: Approx. Mineable (ft) | Area (sq mi) | Mineable High-Ash Coal (tons x $10^6$) |
|---|---|---|---|---|
| I | 20–29 | 6 | 22 | 80 |
| II | 30–47 | 14 | 3 | 20 |
| III | 27–53 | 12 | 12[2] | 90 |
| IV | 30–50 | 12 | 3 | 10 |
| V | 25–35 | 9 | 16[3] | 90 |
| VI | 20–25 | 8 | 9 | 40 |
| VII | 14 | 6 | 3 | 10 |
| | | | | 340 |

[1] See figure 5

[2] Includes about 3 sq mi with cover 100–150 ft

[3] Includes about 3 sq mi with cover 100–120 ft

340 million tons of *high-ash*, glacially disturbed coal lies, recoverable by stripmining methods, in this zone in the valleys of the Iosegun River, Atikkamek Creek and Goose River; and of this total, about one quarter, or about 90 million tons, lies within Field III in Tp. 64, R. 18.

However, the richest known portion of the Ardley-equivalent coal zone within the area lies buried 700-1 000 feet deep just south of Smoke Lake. Throughout a 26-square mile area centered on the north half of Tp. 61, R. 20, the basal portion of the zone, with a maximum cover of 1 000 feet, is believed to exceed 50 feet in thickness (maximum about 63 feet) and 50 per cent "coaliness" (maximum about 70 per cent), and to contain over 300 million tons of coal recoverable by underground mining methods. Because of its depth of burial, and its partial involvement with producing gas and oil fields, this deposit is not now exploitable, but, with ever-increasing demands for energy, it will become economic within a very few years. In fact, it may prove to be as attractive as the near-surface fields because of its slightly higher calorific value (Table 2), its lack of glacial deformation, and the possibility of mining it at a markedly lower ash content.

## REFERENCES CITED

Allan, J. A. and J. L. Carr (1946): Geology and coal occurrences of Wapiti-Cutbank area, Alberta; Res. Coun. Alberta Rept. 48, 43 pages.

Allan, J. A. and J. O. G. Sanderson (1945): Geology of Red Deer and Rosebud sheets; Res. Coun. Alberta Rept. 13, 109 pages.

Campbell, J. D. (1962): Boundaries of the Edmonton Formation in the central Alberta Plains; Jour. Alberta Soc. Petroleum Geol., Vol. 10, p. 308-319.

---------- (1967): Ardley coal zone in the Alberta Plains: central Red Deer River area; Res. Coun. Alberta Rept. 67-1, 28 pages.

Campbell, J. D. and Almadi, I. S. (1964): Coal occurrences of the Vulcan-Gleichen area, Alberta; Res. Coun. Alberta Prelim. Rept. 64-2, 58 pages.

Dawson, G. M. (1881): Report on an exploration from Port Simpson on the Pacific Coast to Edmonton on the Saskatchewan River, embracing a portion of the northern part of British Columbia and the Peace River country; Geol. Surv. Can., Rept. of Progr., 1879-80, Pt. B, p. 1-177.

Gleddie, J. (1949): Upper Cretaceous in western Peace River plains, Alberta; Bull. Am. Assoc. Petroleum Geol., Vol. 33, p. 486-509.

Halliday, W. E. D. (1937): A forest classification for Canada; Canada Dept. Mines and Resources, Forest Serv. Bull. 89, 50 pages.

Henderson, E. P. (1960): Surficial geology of Sturgeon Lake map-area, Alberta; Geol. Surv. Can., Mem. 303, 108 pages.

Irish, E. J. W. (1967): Drumheller; Geol. Surv. Can., Prelim. Map 5-1967.

---------- (1970): The Edmonton Group of south-central Alberta; Bull. Can. Petroleum Geol., Vol. 18, p. 125-155.

Irish, E. J. W. and Havard, C. J. (1968): The Whitemud and Battle Formations ("Kneehills Tuff Zone") – a stratigraphic marker; Geol. Surv. Can., Paper 67-63, 51 pages.

Jones, J. F. (1966): Geology and groundwater resources of the Peace River district, northwestern Alberta; Res. Coun. Alberta Bull. 16, 143 pages.

Ower, J. R. (1960): The Edmonton Formation; Jour. Alberta Soc. Petroleum Geol., Vol. 8, p. 309-23.

Pearson, G. R. (1959): Coal reserves for strip-mining, Wabamun Lake district, Alberta; Res. Coun. Alberta Prelim. Rept. 59-1, 47 pages.

Research Council of Alberta: Ann. Rept. for 1969.

Ritchie, W. D. (1957): The Kneehills Tuff; unpublished M.Sc. thesis, Dept. of Geol., Univ. of Alberta, 66 pages.

Rowe, J. S. (1959): Forest regions of Canada; Canada Dept. N. Affairs and Nat. Resources, Forestry Branch Bull. 123, 71 pages.

St. Onge, D. A. (1967): Iosegun Lake (east half); Geol. Surv. Can., Prelim. Map 15-1966.

Sanderson, J. O. G. (1931): Upper Cretaceous volcanic ash beds in Alberta; Trans. Roy. Soc. Can., Ser. 3, Vol. 25, p. 61-70.

# APPENDIX A

## LOGS, RCA COAL TESTHOLES, FOX CREEK AREA, ALBERTA

Appendix A: Research Council of Alberta Coal Test Holes;
Fox Creek Area, Alberta

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 8-7-61-14<br>2680; June 4/68 |
| 0-30 | Brown grey & grey clay; few boulders & pebbles; few coal fragments |
| 30-45 | Grey siltstone; traces of brown carbonaceous shale (el. bedrock 2650) |
| 45-55 | Greenish grey silty shale |
| 55-70 | Grey siltstone; some grey shale; few stringers of brown to dark brown carbonaceous shale |
| 70-80 | Grey siltstone; some fine grey ss |
| 80-85 | Grey to light grey shale; some brown & black carbonaceous shale; some creamy white very bentonitic shale |
| 85-105 | Grey & brownish grey slightly carbonaceous shale |
| 105-115 | Grey shale; some brown carbonaceous shale; traces of coal |
| 115-120 | Blue grey silty shale with hard ledge |
| 120-145 | No samples; lost circulation |
| 145-150 | Hard drilling; no samples |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 5-13-61-15<br>2655; June 7/68 |
| 0-36 | Brown clay; some blue grey clay; few pebbles |
| 36-45 | Grey coarse siltstone; very small coal trace (el. bedrock 2619) |
| 45-60 | Greenish brown weathered siltstone |
| 60-70 | Uniform grey siltstone to fine ss |
| 70-85 | Grey siltstone; some grey & greenish grey shale |
| 85-90 | Grey siltstone; grey shale; some brown & brown grey carbonaceous shale; very thin coal stringer |
| 90-110 | Grey shale & grey siltstone |
| 110-115 | Brown carbonaceous shale; brown grey shale; some creamy white very bentonitic shale |
| 115-130 | Grey shale & siltstone |
| 130-135 | Grey shale |
| 135-150 | Grey shale; some grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 12-20-61-15<br>2910; June 7/68 |
| 0-5 | Light brown clay |
| 5-15 | Buff weathered & dark grey shale (el. bedrock 2905) |
| 15-50 | Light grey to grey siltstone |
| 50-55 | Fairly hard grey shale |
| 55-65 | Dark grey siltstone |
| 65-75 | Green grey silty shale |
| 75-80 | Brown carbonaceous shale |
| 80-90 | Grey to light grey bentonitic shale |
| 90-115 | Grey silty shale; some grey siltstone |
| 115-120 | Grey coarse siltstone |
| 120-130 | Green grey silty shale |
| 130-140 | Grey siltstone |
| 140-150 | Dark grey shale |
| | Lsd. 2-22-61-15<br>2740; June 7/68 |
| 0-15 | Brown & grey clay; few pebbles |
| 15-30 | Brown grey weathered shale (el. bedrock 2725) |
| 30-50 | Grey shale & grey coarse soft siltstone |
| 50-80 | Very soft grey ss |
| 80-85 | Dark grey & brown grey carbonaceous shale; coal traces |
| 85-105 | Grey silty shale |
| 105-110 | Grey to dark grey shale with few white flecks |
| 110-125 | Greenish grey shale |
| 125-135 | Coarse grey siltstone |
| 135-150 | Grey siltstone; some fine grey ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 24-61-16<br>2995; June 8/68 |
| 0-2 | Soil |
| 2-20 | Light brown weathered shale (el. bedrock 2993) |
| 20-30 | Bright blue & brown grey shale |
| 30-40 | Very dark brown carbonaceous shale & fine siltstone |
| 40-55 | Creamy grey & light brown grey shale |
| 55-75 | Dark grey & brown grey siltstone |
| 75-85 | Grey & brown grey siltstone |
| 85-150 | Grey soft siltstone; some brown to very light brown silty shale |
| | Lsd. 6-27-61-16<br>2752; June 8/68 |
| 0-5 | Very sandy brown clay |
| 5-10 | Very sandy brown clay; stringer of fine gravel |
| 10-25 | Grey well-sorted clay |
| 25-40 | Blue grey shale & siltstone (el. bedrock 2727) |
| 40-45 | Grey medium-grained to fine ss |
| 45-50 | Grey & dark grey silty shale |
| 50-65 | Grey shale & siltstone |
| 65-70 | Brown grey fine ss; lost circulation; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 5-29-61-16<br>2880; June 8/68 |
| 0-15 | Dark brown clay; few pebbles |
| 15-23 | Sandy brown clay; few pebbles |
| 23-30 | Brown weathered siltstone (el. bedrock 2857) |
| 30-35 | Light grey very bentonitic shale |
| 35-40 | Grey with some dark brown carbonaceous shale |
| 40-75 | Grey, light grey & blue grey shale & siltstone |
| 75-80 | Grey siltstone |
| 80-100 | Grey ss |
| 100-105 | Grey ss & fine siltstone |
| 105-125 | Grey siltstone & silty shale |
| 125-130 | Grey siltstone & fine ss |
| 130-150 | Grey silty shale; some grey siltstone |
| | Lsd. 12-25-61-17<br>3020; June 10/68 |
| 0-5 | Brown clay |
| 5-15 | Brown unconsolidated sand |
| 15-30 | Grey sandy clay |
| 30-45 | Soft weathered brown grey siltstone (el. bedrock 2990) |
| 45-50 | Grey & dark grey fine siltstone |
| 50-65 | Blue grey silty shale |
| 65-70 | Grey silty shale with very hard ledge of ss |
| 70-75 | Grey siltstone |
| 75-95 | Grey & dark grey siltstone; some creamy white bentonite |
| 95-110 | Grey siltstone with fine ss ledges |
| 110-115 | Fine grey ss |
| 115-120 | Grey siltstone |
| 120-135 | Uniform grey ss |
| 135-140 | Grey & dark grey carbonaceous shale; trace of coal |
| 140-150 | Grey silty shale |
| | NE cor. 28-61-17<br>3010; June 10/68 |
| 0-5 | Brown clay |
| 5-15 | Brown grey clay; few pebbles; few boulders |
| 15-110 | Grey well-sorted clay; few pebbles & boulders; thin gravel stringer @ 55 feet |
| 110 | Large quartzite boulder; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 2-32-61-17<br>2985; June 10/68 |
| 0-10 | Brown clay |
| 10-90 | Grey clay; few pebbles |
| 90-95 | Grey clay with sand & fine gravel stringer |
| 95-105 | Grey clay; few pebbles |
| 105-115 | Disturbed bedrock; blue grey silty shale; few coal fragments |
| 115-120 | Fine gravel & sandy grey clay; some bedrock fragments |
| 120-125 | Grey silty shale; some brown & brown grey weathered silty shale (el. bedrock 2865) |
| 125-130 | Grey siltstone; hard ledge of calcareous grey ss @ 126-127 feet |
| 130-140 | Fine grey ss; lost circulation |
| 140-150 | Blue grey silty shale |
| | NE cor. 26-61-18<br>2700; June 11/68 |
| 0-5 | Brown sand with some clay |
| 5-20 | Brown grey sand |
| 20-25 | Sand; some fragments of brown weathered bedrock |
| 25-90 | Brown & brown grey weathered ss; lost circulation @ 45 feet (el. bedrock 2675) |
| 90-100 | Fine blue grey ss |
| 100-105 | No sample; lost circulation |
| 105-110 | Grey shale |
| 110-125 | Grey siltstone; some grey silty shale |
| 125-140 | Grey & dark grey carbonaceous shale |
| 140-150 | Bluish grey silty shale |
| 150-155 | Grey, dark grey & some brown grey carbonaceous shale; trace of coal |
| 155-160 | Grey siltstone |
| 160-180 | Grey silty shale |
| | Lsd. 5-31-62-14<br>2855; Sept. 12/69 |
| 0-29 | Very soft brown & grey clay |
| 29-35 | Gravel |
| 35-40 | No sample; poor circulation |
| 40-50 | Brown weathered siltstone (el. bedrock 2815) |
| 50-55 | Grey siltstone |
| 55-90 | Blue grey ss with hard ledges; lost circulation |
| 90-110 | Grey silty shale |
| 110-125 | Grey siltstone |
| 125-150 | Grey siltstone with some grey & light grey ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-31-62-14 2796; Sept. 13/69 |
| 0-10 | Brown weathered fine ss (el. bedrock 2796) |
| 10-30 | Blue grey ss |
| 30-45 | No samples; lost circulation |
| 45-60 | No samples |
| 60-70 | Fine grey ss |
| 70-100 | Very poor samples; siltstone & ss |
| 100-110 | Grey & some dark grey shale |
| 110-115 | Thin coal seam in dark grey carbonaceous shale |
| 115-125 | Grey shale; traces of dark grey & brownish grey shale |
| 125-140 | Grey shale; some green grey shale |
| 140-150 | Grey & green very bentonitic shale |
| | Lsd. 14-25-62-15 2960; Sept. 12/69 |
| 0-15 | Brown & brown grey clay; few pebbles |
| 15-40 | Grey silty shale with hard ledges (el. bedrock 2945) |
| 40-45 | Dark grey silty shale |
| 45-80 | Grey siltstone |
| 80-90 | Fine grey ss; some grey siltstone; lost circulation |
| 90-105 | Grey silty shale |
| 105-110 | Grey silty shale; trace of dark brown carbonaceous shale |
| 110-120 | Grey & some green silty shale |
| 120-125 | Grey siltstone; some grey silty shale |
| 125-135 | Grey to dark grey shale |
| 135-150 | Grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-26-62-15 3050; Sept. 12/69 |
| 0-10 | Brown clay; few small pebbles |
| 10-42 | Grey clay; few small pebbles |
| 42-55 | Grey very silty shale to siltstone (el. bedrock 3008) |
| 55-60 | Grey shale |
| 60-80 | Grey coarse siltstone |
| 80-150 | Grey uniform silty shale |
| | Lsd. 3-3-62-18 2850; June 11/68 |
| 0-10 | Brown silty clay; few pebbles |
| 10-75 | Grey silty clay; few pebbles |
| 75-80 | Grey ss; lost circulation (el. bedrock 2775) |
| 80-81 | Hard thin ledge of light grey ss |
| 81-105 | Lost circulation; poor samples; grey to light grey ss; abandoned |
| | Lsd. 14-4-62-18 2950; June 11/68 |
| 0-60 | Brown & grey silty clay; few pebbles |
| 60-80 | Very sandy clay; few thin gravel stringers |
| 80-85 | Soft weathered brown grey shale (el. bedrock 2870) |
| 85-105 | Grey silty shale |
| 105-110 | Light grey silty shale |
| 110-120 | Blue grey siltstone; lost circulation; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 13-7-62-18<br>2895; June 11/68 |
| 0-25 | Light brown & brown grey silty clay; few small pebbles |
| 25-85 | Grey clay; few sand & gravel stringers |
| 85-90 | Soft grey shale (el. bedrock 2810) |
| 90-95 | Hard dark grey siltstone |
| 95-105 | Light grey very bentonitic shale |
| 105-110 | Dark grey shale |
| 110-120 | Grey siltstone; lost circulation |
| | Lsd. 12-13-62-19<br>2960; June 15/68 |
| 0-10 | Brown clay; many small pebbles |
| 10-65 | Grey silty clay; many pebbles |
| 65-75 | Grey shale & light grey siltstone (el. bedrock 2895) |
| 75-80 | No sample; lost circulation |
| 80-85 | Hard grey siltstone |
| 85-90 | Grey siltstone |
| 90-100 | Grey shale & siltstone |
| 100-105 | Lost circulation; abandoned |
| | Lsd. 14-22-62-19<br>2810; June 15/68 |
| 0-15 | Brown weathered clay |
| 15-30 | Brown soft weathered ss (el. bedrock 2795) |
| 30-40 | Weathered hard, brown & light grey ss |
| 40-60 | Brown grey ss |
| 60-75 | Blue grey ss |
| 75-95 | Blue grey siltstone |
| 95-115 | Blue grey silty shale |
| 115-125 | Grey shale with hard ledge |
| 125-130 | Grey siltstone |
| 130-150 | Brown grey fine ss with few ledges |
| | Lsd. 5-31-62-19<br>2725; June 15/68 |
| 0-82 | Brown & grey clay; few small pebbles |
| 82-95 | Few thin coal seams in weathered grey shale (el. bedrock 2643) |
| 95-105 | Grey, dark brown & some brown carbonaceous shale |
| 105-125 | Grey very bentonitic shale |
| 125-130 | Grey shale |
| 130-135 | Light grey shale, slightly bentonitic |
| 135-180 | Grey siltstone with few hard ledges |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 12-2-62-20 2783; Aug. 16/68 |
| 0-5 | Wellsite fill |
| 5-80 | Grey clay; few pebbles |
| 80-145 | Light grey to light bluish grey shale (el. bedrock 2703) |
| 145-165 | Grey siltstone; traces of grey ss |
| 165-195 | Grey ss; some grey siltstone |
| 195-220 | Shattered grey & some brown grey ss; lost circulation |
| 220-225 | Light blue grey coarse ss |
| 225-230 | Light blue grey coarse ss; some grey siltstone |
| 230-245 | Grey shale; traces of brown shale |
| 245-260 | Fine grey ss |
| 260-275 | Grey silty shale & some grey siltstone |
| 275-312 | Grey shale with hard ledge |
| 312-350 | Grey ss with few hard ledges |
| 350-455 | Grey shale |
| 455-465 | Light grey shale |
| 465-480 | Hard grey siltstone |
| 480-485 | Soft blue shale |
| 485-510 | Light grey medium-grained to coarse ss |
| 510-540 | Poor samples; grey siltstone |
| 540-545 | Grey soft ss |
| 545-565 | Grey silty shale; some grey siltstone |
| 565-570 | Some coal in grey shale |
| 570-575 | Grey shale; some grey ss |
| 575-615 | Grey very soft ss |
| 615-630 | Poor samples (lost circulation); light grey ss; some greenish grey siltstone; some grey very bentonitic shale; few small coal fragments |
| 630-670 | Hard ledge; poor samples; same as 615-630 |
| 670-683 | Grey ss; traces of coal |
| 683-696.5 | Four thin coal seams with shale & ss partings (el. top coal 2100) |
| 696.5-699 | Coal seam |
| 699-699.5 | Parting |
| 699.5-703 | Coal seam with two thin partings |
| 703-704 | Parting |
| 704-710 | Coal seam with 0.5-foot parting |
| 710-719 | Three thin coal seams with partings |
| 719-721.5 | Coal seam |
| 721.5-723.5 | Parting |
| 723.5-726.5 | Coal seam |
| 726.5-750 | Shale & ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 12-17-62-20<br>2750; Oct. 2/69 |
| 0-8 | Brown silty clay |
| 8-25 | Grey silty clay |
| 25-40 | Grey silty clay; sandy stringers; bedrock & coal fragments; few small pebbles |
| 40-93 | Grey clay; bedrock fragments |
| 93-135 | Blue grey clay with few boulders |
| 135-160 | Grey silty clay; few boulders & very small pebbles; large boulder @ 160 feet |
| 160-170 | Grey silty clay; few boulders |
| 170-235 | Brown grey very silty clay; few boulders |
| 235-236 | Seam of quartzite gravel |
| 236-260 | Brown grey & grey clay; few boulders; some pebbles & coal fragments |
| 260-264 | Grey silty clay; pebbles & boulders; some coal fragments |
| 264-315 | Brown & light grey silty shale (el. bedrock 2486) |
| 315-320 | Grey shale; hard siltstone |
| 320-325 | Brown grey carbonaceous shale with trace of coal |
| 325-330 | Grey fine ss with trace of coal |
| 330-345 | Light grey silty shale |
| 345-360 | Grey silty shale; few fine ss ledges |
| 360-370 | Grey shale; few coal fragments |
| 370-380 | Brown & dark grey carbonaceous shale; coal fragments; some grey very bentonitic shale; some creamy white bentonite |
| 380-391 | Light grey shale with hard ledge |
| 391-400 | Light greenish grey shale; some green siltstone |
| 400-405 | Grey, dark grey & brown carbonaceous shale; some coal |
| 405-420 | Light grey & green grey shale |
| 420-430 | Light grey silty shale |
| 430-440 | Fine ss |
| 440-450 | Poor samples |
| 450-455 | Light grey siltstone |
| 455-460 | Grey shale; coal fragments |
| 460-470 | Grey shale; few coal fragments |
| 470-480 | Grey & brown grey ss |
| 480-485 | Grey shale |
| 485-495 | Chocolate brown carbonaceous shale; some very bentonitic grey shale; some black shale; coal fragments |
| 495-500 | Grey ss & some grey siltstone |
| 500-508.5 | Light grey silty shale |
| 508.5-510.5 | Coal seam |
| 510.5-515 | Light brown & very dark brown carbonaceous shale |
| 515-520 | Some coal in brown carbonaceous shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| 520-525 | Brown carbonaceous shale; some coaly material |
| 525-545 | Grey silty shale |
| 545-555 | Brown carbonaceous shale |
| 555-560 | No sample; lost circulation |
| 560-580 | Poor samples; bluish grey ss |
| 580-582 | Lost circulation |
| 582-600 | No samples |
| 600-615 | Grey & dark grey shale; some dark brown carbonaceous shale |
| 615-620 | Grey siltstone |
| 620-642 | Grey siltstone; some fine ss with two hard ledges |
| 642-655 | Hard fine light grey ss |
| 655-665 | Light grey very bentonitic ss with hard ledges |
| 665-679 | Hard green grey siltstone |
| 679-680 | Grey silty shale |
| 680-681.5 | Thin coal seam (el. top coal 2070) |
| 681.5-684 | Brown & black carbonaceous shale |
| 684-687 | Coal seam |
| 687-689 | Shale |
| 689-691 | Coal seam |
| 691-692 | Shale |
| 692-694.5 | Coal seam with thin parting |
| 694.5-695.5 | Shale |
| 695.5-705 | Coal seam with two thin partings |
| 705-712 | Two thin coal seams in carbonaceous shale |
| 712-715 | Coal seam |
| 715-716 | Shale |
| 716-720.5 | Coal seam, slightly dirty |
| 720.5-721.5 | Shale |
| 721.5-725.5 | Coal seam with thin parting |
| 725.5-740 | Grey bentonitic shale |
| 740-752 | Light grey fairly hard siltstone |
| 752-780 | Light grey siltstone |
| | NE cor. 18-63-18 |
| | 2540; June 16/69 |
| 0-15 | Brown soft clay |
| 15-55 | Grey clay; disturbed bedrock; ss, shale, coal fragments & pebbles |
| 55-60 | Light grey soft shale (el. bedrock 2485) |
| 60-165 | Grey to light grey ss; many hard ledges; lost circulation |
| | Lsd. 5-32-63-18 |
| | 2460; June 15/69 |
| 0-10 | Brown clay; few pebbles |
| 10-65 | Grey clay; few sandy stringers; thin gravel stringer @ 60-65 feet |
| 65-79 | Very soft grey shale (el. bedrock 2395) |
| 79-85 | Coal with 1.5-foot parting (el. top coal 2381) |
| 85-93 | Thin coal seams; dark grey & black shale |
| 93-99 | Coal with 1-foot parting |
| 99-105 | Dark grey & black shale |
| 105-113 | Grey silty shale |
| 113-128 | Thin coal seams in black & chocolate brown shale; some creamy white bentonite |
| 128-131.5 | Coal with 1-foot parting |
| 131.5-150 | Grey uniform silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 8-33-63-18 2600; June 15/69 |
| 0-10 | Brown silty clay; few pebbles |
| 10-50 | Grey very plastic clay |
| 50-75 | Grey sandy to silty clay; some boulders & pebbles |
| 75-115 | Soft grey shale (el. bedrock 2525) |
| 115-125 | Hard fine grey ss |
| 125-165 | Grey ss with few hard ledges |
| | NE cor. 24-63-19 2512; June 16/69 |
| 0-45 | Brown & brown grey silty clay; pebbles |
| 45-110 | Grey clay; some pebbles |
| 110-148 | Grey fine ss with few hard ledges (el. bedrock 2405) |
| 148-150 | Coal seam (el. top coal 2367) |
| 150-152 | Shale |
| 152-153.5 | Coal seam |
| 153.5-165 | Chocolate brown & black shale |
| | Lsd. 14-25-63-19 2530; June 9/69 |
| 0-35 | Brown & grey clay; few pebbles |
| 35-55 | Grey fine to medium-grained ss (el. bedrock 2495) |
| 55-90 | Bluish grey s & p ss; few ledges |
| 90-105 | Soft grey ss |
| 105-125 | Very coarse s & p ss; lost circulation |
| 125-130 | Grey ss |
| 130-140 | Grey silty shale; some dark chocolate brown & black shale |
| 140-150 | Grey shale |
| 150-165 | Light brown & grey bentonitic shale; some black shale |
| | Lsd. 6-26-63-19 2580; June 16/69 |
| 0-20 | Brown silty clay |
| 20-30 | Grey silty clay; few pebbles |
| 30-40 | Brown grey weathered siltstone (el. bedrock 2550) |
| 40-60 | Very fine grey ss |
| 60-80 | Medium-grained to coarse grey ss |
| 80-100 | Coarse s & p ss; some hard ledges |
| 100-120 | Soft grey ss |
| 120-150 | Medium-grained to coarse s & p ss; lost cirulation |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 12-27-63-19 2610; June 4/69 |
| 0-15 | Brown clay; many small pebbles |
| 15-25 | Grey clay; some disturbed bedrock |
| 25-45 | Light grey & some dark brown carbonaceous shale (el. bedrock 2585) |
| 45-90 | Grey & light grey shale |
| 90-105 | Light grey fine to medium-grained ss |
| 105-115 | Light grey fine to medium-grained ss with some shale |
| 115-125 | Medium-grained to coarse grey ss |
| 125-158 | Grey ss with two hard ledges |
| 158-165 | Grey ss; lost circulation |
| | Lsd. 12-34-63-19 2550; June 4/69 |
| 0-15 | Brown soft clay |
| 15-25 | Brown grey & dark brown grey weathered shale (el. bedrock 2535) |
| 25-50 | Medium-grained to coarse grey ss |
| 50-110 | Light grey & grey shale |
| 110-115 | Dark grey & brown grey carbonaceous shale with coal trace |
| 115-120 | Grey shale |
| 120-133.5 | Coaly material in brown & dark grey carbonaceous shale |
| 133.5-135.5 | Coal seam (el. top coal 2416.5) |
| 135.5-141.5 | Thin coal seam in brown & dark grey carbonaceous shale |
| 141.5-145.5 | Coal seam |
| 145.5-165 | Few thin coal seams in soft brown & dark grey carbonaceous shale |
| | Lsd. 11-35-63-19 2500; June 9/69 |
| 0-25 | Brown & grey clay with pebbles |
| 25-45 | Brown grey weathered siltstone |
| 45-65 | Grey ss with hard ledges; lost circulation |
| 65-115 | Coarse soft blue grey ss |
| 115-155 | Reworked shale & siltstone |
| 155-160 | Black & chocolate brown shale; some small pebbles; entire hole disturbed; lost circulation |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 7-1-63-20 2660; June 15/68 |
| 0-5 | Coarse gravel |
| 5-25 | Brown & grey clay with some disturbed bedrock fragments |
| 25-27 | Grey clay |
| 27-80 | Grey ss, harder with depth (el. bedrock 2633) |
| 80-90 | Grey siltstone; some grey shale |
| 90-100 | Brown & dark grey carbonaceous shale; coal traces; some bentonitic shale |
| 100-105 | Light grey soft shale |
| 105-115 | Grey, dark grey & some brown carbonaceous shale; trace of coal |
| 115-130 | Soft light grey shale |
| 130-150 | Grey to light grey siltstone |
| 150-180 | Uniform coarse grey siltstone |
| | NE cor. 10-63-20 2695; June 16/68 |
| 0-15 | Light brown & brown grey clay; few pebbles |
| 15-20 | Brown grey clay with some ss fragments |
| 20-25 | Grey clay |
| 25-75 | Brown to light brown weathered ss with many ledges (el. bedrock 2670) |
| 75-80 | Light grey ss |
| 80-85 | Grey siltstone |
| 85-90 | Grey ss |
| 90-125 | Grey siltstone with hard ledges |
| 125-135 | Dark grey carbonaceous shale |
| 135-145 | Greenish grey siltstone |
| 145-150 | Dark grey to grey shale |
| 150-155 | Greenish blue shale |
| 155-160 | Grey fine ss with hard ledge |
| 160-165 | Grey fine siltstone |
| | Lsd. 5-22-63-20 2555; June 16/68 |
| 0-10 | Yellow brown dune sand |
| 10-20 | Brown grey clay |
| 20-60 | Grey clay; few pebbles |
| 60-75 | Soft grey silty shale (el. bedrock 2495) |
| 75-80 | Soft grey silty shale, grading into ss; lost circulation; abandoned |
| | NE cor. 29-63-20 2600; June 16/68 |
| 0-5 | Brown dune sand |
| 5-15 | Brown silty clay; few small pebbles |
| 15-50 | Grey clay; few small pebbles |
| 50-55 | Grey siltstone (el. bedrock 2550) |
| 55-65 | Light grey shale |
| 65-67 | Very hard ledge; lost circulation |
| 67-95 | No samples |
| 95-103 | Light grey fine ss & grey siltstone |
| 103-120 | No samples; lost circulation; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 15-31-64-17<br>2680; June 30/69 |
| 0-20 | Light brown & grey clay |
| 20-55 | Disturbed grey shale & siltstone |
| 55-125 | Grey very plastic clay; some bedrock & coal fragments; many pebbles & boulders |
| 125-150 | Fine grey unconsolidated sand |
| | Lsd. 8-32-64-17<br>2705; July 1/69 |
| 0-20 | Light brown silty clay |
| 20-60 | Dark grey silty clay & pebbles |
| 60-155 | Very soft disturbed bedrock; some grey clay with sandy lenses; few coal fragments; many small pebbles |
| | Lsd. 6-1-64-18<br>2640; June 14/69 |
| 0-10 | Brown clay |
| 10-25 | Grey clay; some grey sand; boulders & pebbles |
| 25-40 | Grey siltstone (el. bedrock 2615) |
| 40-50 | Bluish green shale |
| 50-65 | Grey shale |
| 65-95 | Uniform grey siltstone |
| 95-110 | Greenish grey silty shale |
| 110-115 | Dark grey silty shale |
| 115-120 | Grey silty shale |
| 120-150 | Grey clayey ss, harder with depth; lost circulation @ 145 feet |
| | Lsd. 14-3-64-18<br>2655; June 14/69 |
| 0-15 | Brown silty clay; many pebbles |
| 15-60 | Grey silty clay; many pebbles & sandy stringers |
| 60-75 | Grey silty shale (el. bedrock 2595) |
| 75-95 | Grey ss & grey siltstone; lost circulation |
| 95-105 | Grey coarse siltstone |
| 105-140 | Blue grey s & p ss |
| 140-150 | Grey coarse fairly hard ss; lost circulation |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 6-5-64-18 2540; June 10/69 |
| 0-10 | Brown silty clay |
| 10-24 | Grey silty clay; few pebbles |
| 24-55 | Weathered brown & grey soft ss (el. bedrock 2516) |
| 55-90 | Grey silty shale to siltstone |
| 90-95 | Grey to dark grey shale |
| 95-105 | Dark grey & some brown carbonaceous shale |
| 105-110 | Grey shale |
| 110-116 | Coal seam with 1-foot parting (el. top coal 2430) |
| 116-123 | Few thin coal seams in chocolate brown & black shale |
| 123-129 | Coal seam with 1-foot parting |
| 129-147 | Many thin coal seams in brown shale with few hard ss ledges |
| 147-165 | Black shale & some brown bentonitic shale |
| | Lsd. 14-8-64-18 2570; June 10/69 |
| 0-10 | Brown grey clay |
| 10-70 | Grey clay; few pebbles |
| 70-85 | Black coaly shale; thin coal seam (el. bedrock 2500) |
| 85-92 | Coal seam with 1.7-foot parting (el. top coal 2485) |
| 92-99.5 | Black shale; coaly material; few thin coal seams |
| 99.5-119 | Many thin coal seams in black shale |
| 119-122 | Dirty coal seam |
| 122-126.5 | Coaly shale in black & brown bentonitic shale |
| 126.5-130.5 | Coal seam with thin parting |
| 130.5-140 | Hard brown shale |
| 140-165 | Grey coarse to medium-grained siltstone |
| | Lsd. 15-9-64-18 2605; June 15/69 |
| 0-10 | Brown grey clay |
| 10-30 | Grey clay; very few pebbles |
| 30-53 | Grey soft disturbed shale |
| 53-58 | As above with disturbed coal seam |
| 58-79 | Soft grey clay; sand stringers; boulders & pebbles |
| 79-115 | Grey silty shale (el. bedrock 2526) |
| 115-121 | Thin coal seam in dark brown & black shale |
| 121-127.5 | Coal seam with thin parting (el. top coal 2484) |
| 127.5-134 | Coaly material; some coal in dark brown & black shale |
| 134-139.5 | Coal seam with 1-foot parting |
| 139.5-144.5 | Two coal seams in dark brown & black shale; some bentonite |
| 144.5-157 | Coaly material; thin coal seams; dark brown & black shale |
| 157-160 | Grey siltstone |
| 160-165 | Dark grey & brown carbonaceous shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 15-11-64-18 2702; June 14/69 |
| 0-15 | Brown & grey clay; few pebbles |
| 15-30 | Grey silty shale (el. bedrock 2687) |
| 30-40 | Green grey shale |
| 40-55 | Grey siltstone |
| 55-65 | Grey & dark grey shale |
| 65-90 | Grey shale; some grey siltstone |
| 90-150 | Medium-grained to coarse grey ss with hard ledges; lost circulation |
| | Lsd. 10-13-64-18 2670; June 13/69 |
| 0-15 | Very coarse dark brown sand |
| 15-40 | Bluish grey siltstone with some ironstone (el. bedrock 2655) |
| 40-45 | Bluish grey ss |
| 45-80 | Brown grey ss |
| 80-100 | Blue grey ss |
| 100-127 | Blue grey s & p coarse ss |
| 127-150 | Brown & black carbonaceous shale with coal seams (el. top coal 2543) |
| 150-155 | Light brown to creamy white bentonite |
| 155-160 | Hard grey siltstone ledge; lost circulation |
| 160-165 | No sample |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 15-64-18 2600; June 13/69 |
| 0-15 | Light brown clay |
| 15-25 | Brown grey clay; few pebbles |
| 25-38 | Brown very sandy clay |
| 38-58 | Grey fine ss; some soft grey ss (el. bedrock 2562) |
| 58-74 | Grey very bentonitic shale |
| 74-80.5 | Coal seam (el. top coal 2526) |
| 80.5-87.5 | Thin coal seams in dark brown & black shale |
| 87.5-93.5 | Coal seam with 1-foot parting |
| 93.5-98.5 | Two thin coal seams in dark brown & black shale |
| 98.5-131 | Thin coal seams; coaly material in brown & black shale |
| 131-150 | Greenish grey siltstone with one hard ledge |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 12-18-64-18 2560; June 10/69 |
| 0-22 | Brown & grey clay; some large pebbles |
| 22-31 | Grey soft silty shale (el. bedrock 2538) |
| 31-35 | Black & brown shale; some coal |
| 35-40 | Coal seam (el. top coal 2525) |
| 40-62 | Grey siltstone; black & chocolate brown shale; few coal seams |
| 62-67.5 | Coal seam with thin parting |
| 67.5-81 | Grey very bentonitic shale; brown & black shale; five thin coal seams |
| 81-84.5 | Coal seam with very thin parting |
| 84.5-97 | Grey silty shale |
| 97-102 | Grey siltstone with hard ledge |
| 102-110 | Coarse s & p ss |
| 110-150 | Uniform grey siltstone |
| | Lsd. 2-19-64-18 2595; June 11/69 |
| 0-30 | Brown very plastic clay |
| 30-35 | Grey very plastic clay; many pebbles |
| 35-55 | Grey brown unconsolidated very coarse sand |
| 55-70 | Grey silty shale (el. bedrock 2540) |
| 70-100 | Grey silty shale; some coarse siltstone |
| 100-105 | Coal seam in grey shale |
| 105-120 | Light grey medium-grained to coarse ss |
| 120-135 | Light grey siltstone; lost circulation |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 7-20-64-18 2585; June 11/69 |
| 0-15 | Brown clay; few pebbles |
| 15-19 | Unconsolidated blue coarse sand |
| 19-38 | Light grey ss (el. bedrock 2566) |
| 38-40 | Grey silty shale |
| 40-45 | Grey silty shale with hard ledges |
| 45-87 | Fairly uniform grey silty shale |
| 87-90.5 | Black & brown shale; some coal |
| 90.5-95 | Coal seam (el. top coal 2494.5) |
| 95-96.5 | Shale |
| 96.5-99 | Coal seam |
| 99-105.5 | Some coal in black & brown shale |
| 105.5-111.5 | Coal seam with 1-foot parting |
| 111.5-135.5 | Five thin coal seams with many brown & black shale partings |
| 135.5-138 | Coal seam |
| 138-145 | Thin coaly seam in brown & black shale |
| 145-165 | Grey silty shale |
| | Lsd. 6-26-64-18 2560; June 12/69 |
| 0-45 | Brown & grey clay |
| 45-60 | Light grey ss (el. bedrock 2515); lost circulation |
| 60-95 | Grey silty shale |
| 95-135 | Grey to light grey ss with some very hard ledges |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 2-28-64-18 2510; June 12/69 |
| 0-35 | Muskeg |
| 35-135 | Very poor circulation due to muskeg, sand & disturbed bedrock; some coal fragments |
| | Lsd. 3-30-64-18 2545; June 11/69 |
| 0-18 | Brown grey clay; few pebbles |
| 18-25 | Grey & dark grey shale; coal trace (el. bedrock 2527) |
| 25-45 | Grey silty shale |
| 45-60 | Grey siltstone with ledges |
| 60-71 | Grey silty shale |
| 71-95 | Dark grey silty shale (el. top Kneehills 2474) |
| 95-115 | Very dark grey uniform shale |
| 115-120 | Creamy white & very light grey bentonitic shale |
| 120-130 | Very light grey, slightly shaly bentonite |
| 130-135 | Very light grey bentonite; some black shale |
| 135-140 | Grey shale |
| 140-155 | Light grey fine to medium-grained ss |
| 155-165 | Light grey, coarse & hard ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 35-64-18 2555; July 1/69 |
| 0-20 | Brown clay with many pebbles |
| 20-25 | Grey clay |
| 25-40 | Grey siltstone (el. bedrock 2530) |
| 40-60 | Grey siltstone with grey ss ledges |
| 60-70 | Grey ss; some grey siltstone |
| 70-135 | Brown & brown grey uniform shale with some very bentonitic shale |
| 135-145 | Light grey ss |
| 145-160 | Grey silty shale |
| 160-165 | Grey & brown grey carbonaceous shale |
| | Lsd. 10-1-64-19 2515; June 9/69 |
| 0-15 | Brown clay |
| 15-44 | Grey clay; few pebbles |
| 44-60 | Grey silty shale & grey siltstone (el. bedrock 2471) |
| 60-80 | Soft grey ss |
| 80-110 | Grey ss with few hard ledges |
| 110-125 | Grey silty shale |
| 125-129 | Coal seam (el. top coal 2390) |
| 129-131 | Brown & black shale |
| 131-133 | Coal seam |
| 133-140 | Coaly material; some coal; brown & black shale |
| 140-146 | Coal seam with 1.5-foot parting |
| 146-165 | Many thin coal seams with brown & black shale partings |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 7-3-64-19 2480; Sept. 30/68 |
| 0-11 | Brown silty clay |
| 11-25 | Gravel with some clay & bedrock fragments |
| 25-39 | Grey clay |
| 39-53.5 | Soft bluish grey silty shale (el. bedrock 2441) |
| 53.5-56 | Coal seam (el. top coal 2426.5) |
| 56-58.5 | Brown shale |
| 58.5-62 | Shaly coal seam |
| 62-63 | Shale |
| 63-68.5 | Coal seam |
| 68.5-72.5 | Shale with thin coal seam |
| 72.5-76 | Coal seam |
| 76-83.5 | Two thin coal seams in brown & chocolate brown shale |
| 83.5-86.5 | Coal seam |
| 86.5-88.5 | Shale |
| 88.5-93.5 | Coal seam with very thin parting |
| 93.5-100 | Brown grey & grey silty shale |
| 100-130 | Grey siltstone with few ledges |
| 130-145 | Grey silty shale & siltstone |
| 145-170 | Grey siltstone with some grey ss |
| 170-180 | Grey, dark grey & traces of brown grey carbonaceous shale |
| 180-195 | Dark grey shale |
| 195-200 | Grey to light grey very bentonitic shale; some light grey bentonite |
| 200-210 | Grey & dark grey silty shale |
| 210-225 | Grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 7-4-64-19 2480; June 5/69 |
| 0-4 | Road fill & muskeg |
| 4-24 | Dark grey clay |
| 24-35 | Grey shale (el. bedrock 2456) |
| 35-44 | Grey & chocolate brown carbonaceous shale with two thin coal seams (el. top coal 2445) |
| 44-47 | Coal seam |
| 47-64 | Fine grey ss & siltstone; some brown grey siltstone |
| 64-67 | Coal seam with thin parting |
| 67-73 | Thin coal seam in brown & dark grey silty shale |
| 73-79 | Coal seam with 1-foot parting |
| 79-100 | Many thin coal & coaly seams in dark grey & brown shale; some light brown bentonite |
| 100-104.5 | Coal seam |
| 104.5-125 | Very fine to medium-grained grey ss |
| 125-135 | Brown grey siltstone with few hard ledges |
| 135-145 | Grey coarse siltstone |
| 145-165 | Grey fine very dry ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 7-5-64-19 2510; June 5/69 |
| 0-65 | Brown & grey clay with many large pebbles |
| 65-75 | Dark grey silty shale (el. bedrock 2445) |
| 75-80 | Grey siltstone |
| 80-85 | Coal trace in dark grey shale |
| 85-115 | Grey very silty shale |
| 115-135 | Light grey fine siltstone; lost circulation |
| | Lsd. 12-9-64-19 2541; Sept. 29/68 |
| 0-40 | Brown grey & grey clay; few pebbles |
| 40-45 | Grey shale (el. bedrock 2501) |
| 45-50 | Grey shale; some dark grey & brown grey shale |
| 50-53.5 | Coal seam (el. top coal 2491) |
| 53.5-60 | Thin coal seam in brown & grey shale |
| 60-65 | Hard grey & dark grey silty shale |
| 65-75 | Grey shale; some brown & brown grey carbonaceous shale |
| 75-98.5 | Grey slightly bentonitic shale & siltstone |
| 98.5-101.5 | Coal seam |
| 101.5-107.5 | Brown & chocolate brown shale |
| 107.5-112.5 | Coal seam |
| 112.5-117 | Thin coal seams in brown & chocolate brown shale |
| 117-119.5 | Coal seam |
| 119.5-132 | Many thin coal seams in brown & chocolate brown shale |
| 132-136.5 | Coal seam with thin parting |
| 136.5-160 | Grey silty shale; some dark grey shale |
| 160-164 | Very hard ledge of grey siltstone |
| 164-180 | Grey shale |
| | Lsd. 10-18-64-19 2565; June 5/69 |
| 0-45 | Brown & grey clay; few sandy stringers; few pebbles |
| 45-90 | Brown grey weathered ss & grey coarse ss (el. bedrock 2520) |
| 90-114 | Uniform grey siltstone |
| 114-118 | Coal seam (el. top coal 2451) |
| 118-137 | Coal & coaly seams in brown & black carbonaceous shale |
| 137-141 | Coal seam with 1-foot parting |
| 141-165 | Dark grey silty shale |

| Depth (feet | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 5-27-64-19 2441 ; Sept. 29/68 |
| 0-3 | Wellsite fill |
| 3-12 | Muskeg |
| 12-30 | Unconsolidated fine blue grey sand |
| 30-75 | Well-sorted lake clay |
| 75-115 | Silty wot sandy grey clay; very few small pebbles |
| 115-135 | Very soft clay with some shale & fine ss |
| 135-155 | Light brown to yellow brown fine ss (el. bedrock 2306) |
| 155-180 | Soft grey shale; some grey ss |
| | Lsd. 3-29-64-19 2503; Sept. 30/68 |
| 0-30 | Brown & grey silty clay |
| 30-35 | Thin coal seam in bluish grey shale (el. bedrock 2473) |
| 35-40 | Blue grey shale |
| 40-65 | Grey, some green grey & dark grey siltstone |
| 65-75 | Coarse blue grey siltstone |
| 75-85 | Coarse blue grey ss |
| 85-100 | Grey medium-grained to coarse siltstone |
| 100-110 | Grey & some dark grey shale |
| 110-130 | Soft grey shale; some brownish grey shale |
| 130-140 | Grey & dark grey shale; some brown & chocolate brown carbonaceous shale |
| 140-150 | Greenish grey & grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 11-5-64-20 2615; June 17/68 |
| 0-10 | Brown clay; few pebbles; few large boulders |
| 10-150 | Grey silty clay; some pebbles; few boulders |
| | Lsd. 7-18-64-20 2610; June 17/68 |
| 0-85 | Brown grey & grey clay; boulders |
| 85-100 | Uniform grey shale (el. bedrock 2525) |
| 100-105 | Green grey shale |
| 105-110 | Dark grey & some brown carbonaceous shale |
| 110-120 | Green grey shale |
| 120-140 | Grey siltstone |
| 140-148 | Fine to medium-grained blue grey ss |
| 148-150 | Lost circulation; no samples; abandoned |
| | Lsd. 11-22-64-20 2645; June 7/69 |
| 0-15 | Brown grey silty clay |
| 15-30 | Light bluish grey fine ss; lost circulation (el. bedrock 2630) |
| 30-45 | Light grey siltstone |
| 45-65 | Very light grey silty shale |
| 65-90 | Light grey siltstone; lost circulation; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-24-64-20 2600; June 6/69 |
| 0-42 | Brown & grey clay; many pebbles |
| 42-70 | Brown weathered fine ss (el. bedrock 2558) |
| 70-97 | Grey fine to coarse ss |
| 97-121 | Coal & coaly seams in black & dark brown shale (el. top coal 2503) |
| 121-124 | Coal seam with thin parting |
| 124-150 | Dark grey siltstone |
| 150-155 | Dark grey shale |
| 155-165 | Dark grey very silty shale |
| | Lsd. 10-26-64-20 2600; June 6/69 |
| 0-10 | Brown clay |
| 10-30 | Poor samples; lost circulation; appears to be ss (el. bedrock 2590) |
| 30-85 | Brown & bluish grey ss |
| 85-95 | No circulation |
| 95-105 | Large coal seam; poor circulation (el. top coal 2505) |
| 105-120 | Chocolate brown & black carbonaceous shale with some coal seams |
| 120-135 | Light grey ss; poor samples |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 15-27-64-20 2565; June 8/69 |
| 0-12 | Light brown clay; few pebbles |
| 12-25 | Light grey soft siltstone (el. bedrock 2553) |
| 25-30 | Light grey soft siltstone with thin coal seam |
| 30-38 | Grey silty shale |
| 38-42 | Grey silty shale with thin coal seam |
| 42-70 | Uniform grey shale |
| 70-75 | Thin coal seam in dark grey & chocolate brown carbonaceous shale (el. top coal 2495) |
| 75-77 | Coal seam |
| 77-81.5 | One thin coal seam in dark grey & chocolate brown carbonaceous shale |
| 81.5-83.5 | Coal seam |
| 83.5-96.5 | Thin coal & coaly seams; light brown & creamy white bentonite |
| 96.5-99.5 | Coal seam with 1-foot parting |
| 99.5-110 | Brown & dark grey shale; thin shaly coal seam |
| 110-116 | Grey silty shale |
| 116-118 | Hard ledge of grey siltstone |
| 118-150 | Grey & green grey shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 5-33-64-20 2603; June 8/69 |
| 0-33 | Brown & grey clay; some pebbles |
| 33-55 | Soft grey silty shale (el. bedrock 2570) |
| 55-74 | Thin coal seams in brown & dark grey carbonaceous shale |
| 74-77 | Coal seam |
| 77-79 | Brown & dark grey carbonaceous shale |
| 79-84 | Coal seam |
| 84-102 | Fine grey ss |
| 102-110 | Grey bentonitic shale |
| 110-135 | Dry grey siltstone with hard ledge |
| 135-145 | Grey, some dark brown & some black shale |
| 145-155.5 | Many thin coal seams with shale partings (el. top coal 2548) |
| 155.5-165 | Chocolate brown bentonitic shale; some grey shale; few thin coal seams |
| | Lsd. 6-13-64-21 2565; June 18/68 |
| 0-10 | Light grey silty clay & pebbles |
| 10-95 | Grey silty clay; some pebbles |
| 95-150 | Grey clay; some coal fragments throughout |
| | NE cor. 24-64-21 2605; June 17/68 |
| 0-15 | Brown silty clay; many boulders |
| 15-45 | Grey silty clay; many large pebbles |
| 45-75 | Grey to light grey ss with hard ledges (el. bedrock 2560); poor samples; lost circulation; abandoned |
| | Lsd. 15-25-64-21 2612; June 18/68 |
| 0-28 | Brown & grey clay; boulders & pebbles |
| 28-55 | Grey siltstone (el. bedrock 2584) |
| 55-113 | Light grey fine to medium-grained ss; some brown carbonaceous shale |
| 113-117 | Coal seam (el. top coal 2499) |
| 117-130 | Grey fine ss |
| 130-135 | Grey siltstone |
| 135-138 | Coal seam |
| 138-145 | Brown shale; some light brown bentonite |
| 145-175 | Grey silty shale |
| 175-195 | Grey siltstone with hard ledge |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 11-36-64-21 2553; June 18/68 |
| 0-14 | Brown silty clay; few pebbles |
| 14-30 | Brown grey soft, weathered shale (el. bedrock 2539) |
| 30-36.5 | Coal seam with 1.3-foot parting (el. top coal 2523) |
| 36.5-65 | Grey shale & siltstone |
| 65-80 | Light grey ss |
| 80-86 | Grey, dark grey & brown grey carbonaceous shale |
| 86-101.5 | Three thin coal seams in coaly dark brown & dark grey carbonaceous shale |
| 101.5-106 | Coal seam with thin parting |
| 106-170 | Grey siltstone & shale; some grey ss |
| 170-175 | Grey shale; few traces of brown carbonaceous shale & light brown bentonite |
| 175-195 | Grey fine ss; few shaly ledges |
| | NE cor. 30-64-23 2755; Aug. 15/69 |
| 0-30 | Brown & grey clay; few small pebbles |
| 30-55 | Light grey silty shale with hard ledges (el. bedrock 2725) |
| 55-75 | Grey medium-grained to coarse siltstone; lost circulation |
| 75-90 | Fine to medium-grained brown grey ss |
| 90-110 | Grey ss; lost circulation |
| 110-130 | No samples; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 31-64-24 2950; June 23/68 |
| 0-15 | Light brown & brown grey clay |
| 15-31 | Grey clay; few pebbles |
| 31-45 | Light brown to yellow weathered siltstone; some ironstone (el. bedrock 2919) |
| 45-50 | Grey shale |
| 50-85 | Grey coarse siltstone |
| 85-95 | Grey & dark grey silty shale |
| 95-120 | Grey silty shale with some grey siltstone |
| 120-130 | Light grey shale |
| 130-140 | Fine grey siltstone |
| 140-150 | Grey silty shale |
| | NE cor. 10-65-17 2805; July 17/69 |
| 0-5 | Muskeg |
| 5-10 | Brown weathered shale (el. bedrock 2800) |
| 10-25 | Soft grey shale |
| 25-45 | Medium-grained to very coarse grey siltstone |
| 45-75 | Grey, fine to medium-grained ss with ledges |
| 75-95 | Coarse fairly hard bluish grey ss |
| 95-105 | Some coal in dark brown, dark grey & black carbonaceous shale |
| 105-115 | Light grey bentonitic shale; some dark grey & chocolate brown shale |
| 115-135 | Light grey fairly hard ss; lost circulation |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 14-65-17 2840; July 17/69 |
| 0-5 | Brown clay; few pebbles |
| 5-20 | Brown & grey silty shale (el. bedrock 2835) |
| 20-30 | Coarse to medium-grained grey siltstone |
| 30-40 | Soft grey shale |
| 40-60 | Coarse grey siltstone |
| 60-80 | Grey fine ss |
| 80-100 | Fine to medium-grained grey ss |
| 100-105 | Coal seam; lost circulation |
| 105-115 | Chocolate brown & dark grey carbonaceous shale; some whitish bentonite |
| 115-130 | Soft grey shale |
| 130-140 | Grey coarse siltstone |
| 140-150 | Grey verybentonitic shale |
| | NE cor. 17-65-17 2650; July 18/69 |
| 0-20 | Brown & grey clay |
| 20-30 | Grey siltstone (el. bedrock 2630) |
| 30-35 | Grey fine ss |
| 35-65 | Grey silty shale |
| 65-100 | Greenish grey soft shale |
| 100-120 | Fine grey ss |
| 120-125 | Grey siltstone |
| 125-145 | Grey silty shale |
| 145-165 | Grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 14-22-65-17 2800; July 18/69 |
| 0-5 | Brown grey clay |
| 5-33 | Grey clay; many small pebbles |
| 33-65 | Soft grey shale (el. bedrock 2767) |
| 65-90 | Slightly darker grey shale |
| 90-110 | Grey silty shale |
| 110-118 | Grey siltstone |
| 118-124.5 | Coal seam with thin parting (el. top coal 2682) |
| 124.5-132 | Thin coal seam; coaly material & some dark grey, brown & black carbonaceous shale |
| 132-136.5 | Coal seam with 1.5-foot parting |
| 136.5-147 | Dark grey, brown & black carbonaceous shale |
| 147-165 | Grey very silty shale |
| | Lsd. 12-26-65-17 3055; July 17/69 |
| 0-11 | Brown clay & boulders; very sandy @ 5-10 feet |
| 11-20 | Brown weathered shale (el. bedrock 3044) |
| 20-30 | Brown weathered shale with ironstone |
| 30-60 | Brown weathered fine soft ss |
| 60-95 | Bluish grey silty shale |
| 95-110 | Coarse to medium-grained grey siltstone |
| 110-165 | Uniform fine grey ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 9-29-65-17 2820; July 18/69 |
| 0-5 | Brown clay |
| 5-15 | Brown weathered shale; some ironstone (el. bedrock 2815) |
| 15-25 | Grey silty shale |
| 25-45 | Grey siltstone |
| 45-75 | Grey, fine to medium-grained ss with several hard ledges |
| 75-103.5 | Grey siltstone; some grey ss |
| 103.5-108.5 | Coal seam (el. top coal 2716.5) |
| 108.5-116.5 | Thin coal seam in brown & dark grey shale |
| 116.5-120.5 | Coal seam with 1-foot parting |
| 120.5-125 | Thin coal seams in brown & dark grey shale; some light brown very bentonitic shale |
| 125-150 | Very coarse to medium-grained grey siltstone |
| 150-165 | Dark grey, grey & some brown grey silty carbonaceous shale |
| | Lsd. 14-32-65-17 2855; July 12/69 |
| 0-15 | Brown silty clay |
| 15-30 | Grey & dark grey silty shale (el. bedrock 2840) |
| 30-40 | Light bluish grey shale |
| 40-85 | Grey shale & siltstone |
| 85-130 | Coarse to very fine grey ss |
| 130-150 | Some coal in dark grey & chocolate brown carbonaceous shale |
| 150-165 | Grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 33-65-17 2905; July 11/69 |
| 0-5 | Brown clay; few pebbles |
| 5-30 | Light blue grey silty shale & siltstone (el. bedrock 2900) |
| 30-45 | Grey siltstone |
| 45-55 | Dark grey, brown to dark brown carbonaceous shale |
| 55-80 | Grey silty shale |
| 80-90 | Greenish grey shale |
| 90-105 | Grey siltstone |
| 105-150 | Grey ss with few hard ledges; lost circulation @ 148 feet; abandoned |
| | NE cor. 1-65-18 2630; June 30/69 |
| 0-10 | Soft light brown clay |
| 10-15 | Brown grey weathered shale (el. bedrock 2620) |
| 15-25 | Grey siltstone |
| 25-30 | Thin coal seam in grey shale |
| 30-115 | Soft grey shale |
| 115-135 | Dark grey & blue grey shale |
| 135-150 | Grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 14-4-65-18 2540; June 17/69 |
| 0-10 | Light brown clay; few pebbles |
| 10-45 | Grey silty clay; many pebbles; some coal fragments |
| 45-65 | Very sandy grey clay; some pebbles |
| 65-75 | Brownish grey weathered shale (el. bedrock 2475) |
| 75-80 | Thin coal seam in dark brown carbonaceous shale |
| 80-115 | Grey silty shale; very little grey siltstone |
| 115-120 | Thin coal seam in dark grey shale |
| 120-125 | Grey silty shale |
| 125-135 | Grey coarse siltstone |
| 135-143.5 | Grey silty shale; some white bony flecks |
| 143.5-145.5 | Coal seam (el. top coal 2396.5) |
| 145.5-152 | Thin coal seams with many partings |
| 152-165 | Grey shale |
| | Lsd. 5-5-65-18 2540; June 17/69 |
| 0-20 | Brown & grey silty clay; many pebbles |
| 20-35 | Grey silty shale (el. bedrock 2520) |
| 35-45 | Dark grey & brown grey shale |
| 45-55 | Grey shale |
| 55-60 | Grey shale; coal trace |
| 60-75 | Grey siltstone; fine grey ss |
| 75-85 | Dark grey shale |
| 85-114 | Grey, coarse to medium-grained ss; some grey siltstone with hard ledge @ 103 feet |
| 114-119 | Grey siltstone |
| 119-123 | Coal seam with thin parting (el. top coal 2421) |
| 123-126 | Some coal in brown grey & chocolate brown shale |
| 126-129 | Coal seam |
| 129-137 | Brown grey & chocolate brown shale |
| 137-140 | Grey silty shale |
| 140-145 | Grey ss |
| 145-160 | Grey silty shale with coal traces |
| 160-165 | Grey siltstone |
| | Lsd. 10-8-65-18 2650; June 17/69 |
| 0-15 | Brown clay |
| 15-50 | Weathered brown & grey silty shale (el. bedrock 2635) |
| 50-85 | Dark brown grey shale |
| 85-99 | Light grey to greenish white very bentonitic shale |
| 99-101 | Coal seam (el. top coal 2551) |
| 101-105 | Chocolate brown shale |
| 105-120 | Soft fine grey ss |
| 120-135 | Fine grey ss |
| 135-145 | Grey siltstone |
| 145-151 | Fine grey ss |
| 151-155 | Chocolate brown carbonaceous shale |
| 155-165 | Grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 9-10-65-18 2675; June 19/69 |
| 0-10 | Brown clay & pebbles |
| 10-95 | Grey clay; many small pebbles; some sandy stringers |
| 95-100 | Grey shale with some white bony flecks (el. bedrock 2580) |
| 100-105 | Black & very dark grey shale |
| 105-110 | Two thin coal seams in dark brown & dark grey shale |
| 110-125 | Grey siltstone |
| 125-165 | Grey silty shale, very uniform |
| | Lsd. 11-12-65-18 2615; July 2/69 |
| 0-10 | Brown clay; few pebbles |
| 10-65 | Grey clay; few pebbles |
| 65-150 | Grey to dark grey clay; many pebbles; few large boulders; many thin sandy stringers |
| | Lsd. 10-14-65-18 2690; June 19/69 |
| 0-15 | Brown & grey clay |
| 15-25 | Light grey ss (el. bedrock 2675) |
| 25-40 | Grey silty shale |
| 40-55 | Coal trace in dark grey & chocolate brown carbonaceous shale |
| 55-115 | Uniform grey silty shale |
| 115-135 | Grey shale; some dark grey shale |
| 135-145 | Grey silty shale |
| 145-150 | Light grey bentonitic siltstone |
| 150-155 | Very dry green grey silty shale |
| 155-165 | Very small coal trace in grey & dark grey bentonitic shale |
| | Lsd. 15-15-65-18 2770; July 2/69 |
| 0-28 | Brown & grey clay; many pebbles |
| 28-53 | Fairly hard light grey & grey ss; lost circulation (el. bedrock 2742) |
| 53-55.5 | Coal seam (el. top coal 2717) |
| 55.5-71.5 | Coal & coaly seams in brown & black carbonaceous shale |
| 71.5-77 | Coal seam with 1-foot parting |
| 77-82 | Thin coal seam in brown & black carbonaceous shale |
| 82-90 | Grey silty shale |
| 90-99 | Grey fine ss with hard ledge |
| 99-116 | Black & dark grey carbonaceous shale; few thin coal seams |
| 116-120 | Light brown very bentonitic shale |
| 120-150 | Greenish grey silty shale; few hard ledges |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 3-16-65-18 2720; June 18/69 |
| 0-25 | Brown & grey clay; many pebbles |
| 25-45 | Weathered reddish brown & grey ss (el. bedrock 2695) |
| 45-60 | Grey ss with hard ledges |
| 60-66 | Coal seam with very thin parting (el. top coal 2660) |
| 66-102 | Coal & coaly seams in brown, dark grey & black shale; some creamy white bentonite |
| 102-105 | Dark grey shale |
| 105-120 | Grey siltstone; lost circulation |
| 120-125 | Greenish grey silty shale |
| 125-145 | Fine grey siltstone |
| 145-165 | Hard grey silty shale |
| | NE cor. 16-65-18 2775; July 8/69 |
| 0-5 | Light brown silty clay |
| 5-15 | Brown grey silty clay; few pebbles |
| 15-25 | Grey silty clay; some blue grey shale fragments |
| 25-85 | Grey silty clay; many pebbles & small boulders; some very small coal fragments |
| 85-98 | Three thin coal seams in black & brown carbonaceous shale (el. bedrock 2690) |
| 98-105 | Brown & black carbonaceous shale |
| 105-110 | Grey shale with hard ledge of light grey ss; lost circulation |
| 110-115 | Brown grey shale |
| 115-140 | Greenish grey siltstone |
| 140-165 | Brownish grey silty shale with thin hard ledge |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 2-19-65-18 2690; Sept. 28/68 |
| 0-5 | Brown clay; small pebbles |
| 5-33 | Blue grey clay; small pebbles |
| 33-40 | Blue grey clay; some coal fragments |
| 40-45 | Shale with two very thin coal seams (el. bedrock 2650) |
| 45-120 | Light grey to grey siltstone with few ledges |
| 120-145 | Very bentonitic slightly silty mauve shale |
| 145-150 | White bentonitic ss |
| 150-175 | Light grey very bentonitic siltstone |
| 175-180 | Shale with two very thin coal seams |
| 180-225 | Light grey siltstone |
| | Lsd. 6-21-65-18 2735; June 18/69 |
| 0-5 | Brown clay |
| 5-10 | Brown clay with coal fragments |
| 10-70 | Grey clay with many boulders & pebbles |
| 70-75 | Light grey very bentonitic shale (el. bedrock 2665) |
| 75-80 | Grey silty shale |
| 80-90 | Fine to medium-grained grey ss |
| 90-100 | Grey siltstone |
| 100-105 | Grey, coarse to medium-grained ss |
| 105-120 | Brownish grey silty shale |
| 120-130 | Soft grey shale |
| 130-150 | Brown grey silty shale |
| 150-165 | Light green grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 11-24-65-18<br>2695; July 2/69 |
| 0-5 | Light brown well-sorted clay |
| 5-10 | Black & dark brown weathered shale (el. bedrock 2690) |
| 10-45 | Weathered brown grey & grey silty shale |
| 45-60 | Greenish grey silty shale |
| 60-95 | Brown grey fairly uniform shale |
| 95-105 | Light grey to creamy white very bentonitic shale |
| 105-110 | Chocolate brown, brown & black carbonaceous shale |
| 110-115 | Grey silty shale |
| 115-134 | Grey to light grey fine ss |
| 134-165 | Slightly harder grey ss |
| | Lsd. 8-29-65-18<br>2750; Sept. 28/68 |
| 0-15 | Brown clay with some disturbed bedrock |
| 15-50 | Blue grey clay; few very small pebbles & coal fragments |
| 50-75 | Grey, green grey & light grey fine to medium-grained ss (el. bedrock 2700) |
| 75-88 | Light grey ss; coal trace |
| 88-93.5 | Rusty grey siltstone |
| 93.5-97.5 | Coal seam (el. top coal 2656.5) |
| 97.5-101.5 | Shale with thin coal seam |
| 101.5-103.5 | Coal seam |
| 103.5-108 | Shale with thin coal seam |
| 108-115.5 | Grey & dark grey bentonite |
| 115.5-118 | Coal seam with 0.5-foot parting |
| 118-127 | Grey fine ss |
| 127-130 | Clayey siltstone |
| 130-134 | Hard fine ss ledge |
| 134-145 | Bentonitic dark grey shale |
| 145-150 | Light grey, very fine slightly bentonitic siltstone |
| | Lsd. 7-30-65-18<br>2750; July 8/69 |
| 0-10 | Brown clay |
| 10-15 | Grey clay; few large pebbles |
| 15-35 | Almost all coal; some dark brown bentonitic shale (el. bedrock & top coal 2735) |
| 35-55 | Grey uniform shale; lost circulation |
| 55-65 | Coal & brown shale; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 9-31-65-18<br>2820; Sept. 27/68 |
| 0-10 | Brown clay; few pebbles |
| 10-15 | Grey soft clay |
| 15-30 | Grey silty shale<br>(el. bedrock 2805) |
| 30-40 | Light blue grey siltstone |
| 40-95 | Grey & brown grey ss<br>with few hard ledges |
| 95-111 | Grey fine ss |
| 111-116.5 | Brown shale with two<br>thin coal seams<br>(el. top coal 2709) |
| 116.5-119 | Coal seam |
| 119-130 | Brown shale with<br>thin coal seam |
| 130-133 | Coal seam with very<br>thin parting |
| 133-145 | Grey silty shale |
| 145-155 | Grey siltstone with<br>hard ledge |
| 155-160 | Green grey siltstone |
| 160-180 | Grey siltstone; some<br>grey ss |
| | Lsd 5-33-65-18<br>2755; July 8/69 |
| 0-4.5 | Light brown clay; few<br>pebbles |
| 4.5-6.5 | Weathered coal seam<br>(el. bedrock & top coal<br>2750.5) |
| 6.5-39 | Grey silty shale;<br>some brown shale |
| 39-46 | Thin coal seam in grey,<br>brown & black shale |
| 46-50 | Coal seam |
| 50-54 | Shale with thin coal seam |
| 54-56 | Coal seam |
| 56-71 | Few thin coal seams<br>in brown & black<br>carbonaceous shale |
| 71-75 | Brown & dark grey shale |
| 75-130 | Grey siltstone & grey<br>ss with hard ledge |
| 130-140 | Grey silty shale |
| 140-145 | Dark grey & grey<br>silty shale |
| 145-165 | Grey silty bentonitic<br>shale |
| | Lsd. 4-11-65-19<br>2592; Sept. 29/68 |
| 0-28 | Brown & grey clay;<br>few pebbles |
| 28-50 | Dark grey fairly hard<br>shale; some light grey<br>bentonitic shale; some<br>very bentonitic grey<br>& mauve shale<br>(el. bedrock 2564) |
| 50-70 | Grey to very light<br>grey very bentonitic<br>shale |
| 70-75 | Dark grey slightly<br>carbonaceous shale |
| 75-85 | Light green grey<br>slightly bentonitic shale |
| 85-95 | Grey slightly bentonitic<br>siltstone |
| 95-110 | Dark grey silty shale |
| 110-125 | Dark grey silty shale<br>with very few fragments<br>of black & dark brown<br>carbonaceous shale |
| 125-140 | Grey to dark grey shale |
| 140-150 | Grey slightly<br>bentonitic shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 1-14-65-19 2695; Sept. 28/68 |
| 0-15 | Brown & light grey clay; small pebbles |
| 15-85 | Blue grey clay; pebbles; some coal fragments @ 67 feet |
| 85-120 | Grey unconsolidated sand |
| 120-140 | Dark grey to rusty grey slightly bentonitic shale (el. bedrock 2575) |
| 140-144 | Light grey bentonitic shale |
| 144-148 | Dark grey shale; some bentonitic siltstone |
| 148-165 | Very bentonitic light grey green, fine to medium-grained ss, fairly hard |
| | Lsd. 9-2-65-20 2455; June 7/69 |
| 0-15 | Brown silty clay; many pebbles |
| 15-30 | Blue clay; many pebbles; many coal fragments |
| 30-45 | Grey shale with harder ledges (el. bedrock 2425) |
| 45-60 | Grey shale (el. top Kneehills 2410) |
| 60-75 | Dark grey & brown grey carbonaceous shale; some light brown bentonite |
| 75-85 | Green shale; some greenish grey shale |
| 85-95 | Grey shale with some creamy white bentonite |
| 95-105 | Grey silty shale |
| 105-120 | Grey ss |
| 120-140 | Grey silty shale |
| 140-145 | Very light grey very bentonitic shale |
| 145-165 | Fine grey ss |
| | NE cor. 2-65-21 2520; June 19/68 |
| 0-15 | Brown clay; pebbles & few boulders |
| 15-60 | Grey clay; few pebbles |
| 60-65 | Brown weathered silty shale (el. bedrock 2460) |
| 65-90 | Grey silty shale |
| 90-105 | Grey siltstone |
| 105-110 | Grey fine & some brown fine ss |
| 110-120 | Grey to light grey ss |
| 120-145 | Grey silty shale; some grey ss |
| 145-150 | Grey & dark grey slightly carbonaceous shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 15-65-21 2595; June 19/68 |
| 0-15 | Brown & grey clay; pebbles |
| 15-20 | Grey clay with disturbed thin coal seam |
| 20-34 | Grey clay & pebbles; large boulder |
| 34-36 | Brown carbonaceous shale (el. bedrock 2561) |
| 36-46 | Several thin coal seams in brown carbonaceous shale (el. top coal 2559) |
| 46-51 | Coal seam with 0.5-foot parting |
| 51-55 | Light brown bentonite; some brown shale |
| 55-80 | Green grey, dark grey & grey shale |
| 80-90 | Grey siltstone |
| 90-135 | Grey silty shale; small coal traces |
| 135-160 | Dark grey & grey silty shale |
| 160-195 | Green shale; grey silty shale |
| | Lsd. 3-34-65-21 2605; June 19/68 |
| 0-10 | Brown clay; few pebbles |
| 10-29 | Grey clay; few pebbles & boulders |
| 29-45 | Brown grey & dark grey weathered shale (el. bedrock 2576) |
| 45-65 | Grey to light grey shale |
| 65-75 | S & p ss with hard ledges |
| 75-80 | Grey shale |
| 80-85 | Coal trace; some brown & dark grey bentonitic carbonaceous shale |
| 85-90 | Grey shale |
| 90-110 | Light grey silty shale with hard ledges |
| 110-120 | Grey silty shale |
| 120-125 | Dark grey shale |
| 125-130 | Light grey very bentonitic shale |
| 130-140 | Grey silty shale |
| 140-150 | Grey siltstone |
| | Lsd. 14-5-65-23 2595; Aug. 15/69 |
| 0-10 | Weathered brown grey silty shale; some ironstone (el. bedrock 2595) |
| 10-25 | Bluish grey shale; lost circulation |
| 25-35 | Few thin coal seams in dark brown & dark grey carbonaceous shale |
| 35-65 | Grey uniform shale |
| 65-75 | Grey coarse siltstone |
| 75-80 | Thin coal seam in grey shale |
| 80-100 | Grey silty shale |
| 100-115 | Grey fine siltstone |
| 115-125 | Grey shale |
| 125-145 | Coal seams in dark grey & chocolate brown carbonaceous shale (el. top coal 2470) |
| 145-150 | Grey siltstone; lost circulation; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 8-15-65-23 2605; Aug. 14/69 |
| 0-10 | Brown clay & many boulders |
| 10-115 | Grey clay; many boulders |
| 115-135 | Grey clay; few boulders |
| | Lsd. 5-16-65-23 2610; Aug. 13/69 |
| 0-2 | Soil |
| 2-15 | Brown weathered silty shale (el. bedrock 2608) |
| 15-30 | Brown grey silty shale |
| 30-45 | Grey fine to medium-grained ss with few hard ledges |
| 45-50 | Grey soft shale |
| 50-55 | Dark grey & chocolate brown carbonaceous shale; very small coal trace |
| 55-60 | Grey shale with very hard ledge |
| 60-70 | Grey silty shale |
| 70-90 | Grey siltstone with few hard ledges |
| 90-100 | Fine grey ss with hard ledges |
| 100-105 | Grey siltstone |
| 105-120 | Thin coal seams in dark grey & black shale |
| 120-137 | Grey siltstone with hard ledges; lost circulation |
| 137-155 | Very poor samples; drills like shattered ss |
| 155-160 | No circulation; no samples |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 3-21-65-23 2410; Aug. 13/69 |
| 0-10 | Brown very soft clay |
| 10-60 | Grey clay |
| 60-90 | Grey clay; many thin gravel seams |
| 90-100 | Fine gravel & sand; very little clay |
| 100-110 | Grey silty clay |
| 110-130 | Grey silty shale (el. bedrock 2300); poor samples due to gravel; abandoned |
| | Lsd. 8-22-65-23 2475; Aug. 14/69 |
| 0-10.5 | Brown clay |
| 10.5-12.5 | Soft weathered coal seam (el. bedrock & top coal 2464.5) |
| 12.5-35 | Grey silty shale |
| 35-40 | Dark grey & brown grey carbonaceous shale |
| 40-55 | Few thin coal seams in grey & chocolate brown shale; some creamy white bentonitic partings |
| 55-80 | Grey shale |
| 80-85 | Grey ss |
| 85-105 | Brown clayey coarse ss |
| 105-120 | Grey clayey ss |
| 120-150 | Very dry light grey fine ss |
| 150-165 | Grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 7-31-65-23 2730; Aug. 3/69 |
| 0-35 | Brown grey & grey clay; few pebbles |
| 35-75 | Soft grey disturbed shale |
| 75-105 | Brown, black & dark grey carbonaceous shale; some coal, all mixed & badly disturbed |
| 105-135 | Disturbed shales & ss |
| 135-150 | Lost circulation; no samples; abandoned |
| | Lsd. 9-32-65-23 2520; Aug. 4/69 |
| 0-5 | Brown weathered shale with some ironstone (el. bedrock 2520) |
| 5-10 | Black shale & some soft weathered coal |
| 10-30 | Grey soft siltstone |
| 30-60 | Grey soft ss |
| 60-65 | Grey siltstone; lost circulation |
| 65-110 | Grey shale; very little grey siltstone |
| 110-130 | Grey brown shale; some light brown & creamy white very bentonitic shale |
| 130-155 | Light grey very bentonitic silty shale |
| 155-165 | Grey silty shale |
| | NE cor. 1-65-24 2820; Aug. 14/69 |
| 0-2 | Soil |
| 2-25 | Brown & light brown weathered silty shale (el. bedrock 2818) |
| 25-40 | Yellow brown silty shale |
| 40-50 | Blue grey silty shale |
| 50-55 | Trace of coal in dark grey carbonaceous shale |
| 55-95 | Lost circulation; no samples; abandoned |
| | Lsd. 14-2-65-24 2700; Aug. 15/69 |
| 0-5 | Light brown clay |
| 5-15 | Brown grey clay; few pebbles |
| 15-125 | Grey silty clay; few pebbles; few sandy stringers |
| 125-143 | Lost circulation; no samples; abandoned |
| | NE cor. 5-65-24 2950; June 23/68 |
| 0-50 | Brown & grey clay; few very small pebbles |
| 50-55 | Light brown weathered siltstone (el. bedrock 2900) |
| 55-60 | Grey ss |
| 60-65 | Grey silty shale |
| 65-75 | Coarse grey siltstone |
| 75-80 | Dark grey silty shale |
| 80-90 | Fine grey ss |
| 90-95 | Grey shale |
| 95-105 | No samples; lost circulation; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 9-65-24 2880; June 23/68 |
| 0-15 | Brown grey clay; few pebbles |
| 15-32 | Grey clay; few pebbles |
| 32-37 | Gravel & black sand |
| 37-50 | Grey clay |
| 50-75 | Uniform grey siltstone (el. bedrock 2830) |
| 75-78 | Light grey siltstone |
| 78-90 | Grey siltstone with hard ledge |
| 90-105 | Greenish grey silty shale |
| 105-130 | Grey siltstone |
| 130-135 | Grey siltstone; few fragments of dark brown carbonaceous siltstone |
| 135-150 | Grey siltstone; some grey silty shale |
| | Lsd. 7-24-65-24 2700; Aug. 13/69 |
| 0-15 | Brown clay; few pebbles |
| 15-70 | Grey clay; few pebbles |
| 70-120 | Bluish grey clay; sandy lenses & narrow gravel seams |
| | Lsd. 8-27-65-24 2950; June 23/68 |
| 0-10 | Brown very silty clay; some pebbles |
| 10-60 | Grey very plastic clay; many pebbles |
| 60-68 | Coarse to fine gravel |
| 68-105 | Light grey to blue grey silty shale (el. bedrock 2882) |
| 105-115 | Grey & dark grey slightly carbonaceous shale |
| 115-120 | Grey siltstone |
| | NE cor. 33-65-24 2910; Aug. 7/69 |
| 0-42 | Brown & dark grey clay; pebbles |
| 42-75 | Grey & light grey shale (el. bedrock 2868) |
| 75-85 | Greenish grey silty shale |
| 85-105 | Grey shale |
| 105-110 | Dark grey & dark brown carbonaceous shale |
| 110-115 | Thin coal seam in dark grey & dark brown carbonaceous shale |
| 115-120 | Grey silty shale |
| 120-150 | Grey siltstone |
| 150-165 | Dark grey slightly carbonaceous shale |
| | Lsd. 10-35-65-24 2850; Aug. 3/69 |
| 0-5 | Brown clay & pebbles |
| 5-90 | Grey clay; sandy stringer; many pebbles & boulders |
| 90-105 | Sand & gravel stringers; some clay; lost circulation; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 2-2-66-16 2945; July 16/69 |
| 0-5 | Light brown clay |
| 5-15 | Grey clay; few pebbles |
| 15-28.5 | Dark grey, black & brown carbonaceous shale (el. bedrock 2930) |
| 28.5-37 | Coal seam with 2-foot parting (el. top coal 2916.5) |
| 37-42 | Thin coal & coaly seams in dark grey, black & brown carbonaceous shale |
| 42-60 | Black & dark grey silty shale |
| 60-65 | Coal trace in black & dark grey shale |
| 65-95 | Grey siltstone; some grey shale |
| 95-105 | Few thin coal seams in dark grey & chocolate brown shale |
| 105-125 | Greenish grey shale |
| 125-150 | Grey silty shale |
| | Lsd. 2-4-66-16 2900; July 16/69 |
| 0-10 | Brown clay |
| 10-40 | Brown unconsolidated sand; very little clay |
| 40-45 | Very hard brown ss (el. bedrock 2860) |
| 45-75 | Brown ss with hard ledges; some very soft to unconsolidated ss |
| 75-110 | Grey very soft ss |
| 110-135 | Poor samples due to sand |
| | NE cor. 4-66-16 2955; July 14/69 |
| 0-35 | Light brown & grey silty shale (el. bedrock 2955) |
| 35-40 | Very small coal trace in dark grey & black shale |
| 40-70 | Grey silty shale; sand & grey siltstone |
| 70-75 | Dark grey shale |
| 75-90 | Grey siltstone |
| 90-100 | Harder grey siltstone |
| 100-165 | Grey ss with hard ledge @ 140 feet; lost circulation |
| | Lsd. 12-6-66-16 2840; July 14/69 |
| 0-5 | Brown clay |
| 5-30 | Grey siltstone with some ironstone (el. bedrock 2835) |
| 30-65 | Grey ss, hard to very hard |
| 65-105 | No samples; lost circulation |
| 105-165 | Brown to yellow brown ss, hard to very hard |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 2-8-66-16 2805; July 15/69 |
| 0-5 | Brown clay |
| 5-50 | Weathered brown & bluish grey ss (el. bedrock 2800) |
| 50-65 | Some coal in dark grey & brown shale |
| 65-95 | Grey, medium-grained to very coarse siltstone |
| 95-105 | Blue grey silty shale |
| 105-130 | Grey to dark grey shale |
| 130-140 | Light grey to grey slightly bentonitic shale |
| 140-150 | Light grey fine ss |
| | Lsd. 10-11-66-16 2875; July 15/69 |
| 0-4 | Brown clay |
| 4-10 | Brown silty shale (el. bedrock 2871) |
| 10-30 | Soft grey shale |
| 30-45 | Grey shale |
| 45-53 | Grey, dark grey & brown carbonaceous shale |
| 53-59 | Shaly coal seam (el. top coal 2822) |
| 59-65 | Thin shaly coal seams in grey, dark grey & brown carbonaceous shale |
| 65-75 | Grey to light grey silty shale |
| 75-100 | Grey bentonitic shale |
| 100-125 | Light grey very bentonitic shale |
| 125-135 | Brown & dark grey carbonaceous shale; some light grey shale |
| 135-150 | Grey very silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 3-15-66-16 2825; July 16/69 |
| 0-22 | Brown & grey clay; many small pebbles |
| 22-50 | Grey & dark grey shale (el. bedrock 2803) |
| 50-60 | Grey slightly bentonitic shale |
| 60-75 | Light grey very bentonitic shale |
| 75-85 | Grey fine ss |
| 85-95 | Grey siltstone; some grey silty shale |
| 95-115 | Grey ss with few hard ledges |
| 115-120 | Brownish grey carbonaceous shale |
| 120-135 | Grey siltstone |
| 135-165 | Grey, medium-grained to very coarse ss |
| | Lsd. 8-2-66-17 2805; July 14/69 |
| 0-15 | Brown & grey clay; few pebbles |
| 15-50 | Bluish grey silty shale (el. bedrock 2790) |
| 50-55 | Bluish grey silty shale; coal trace |
| 55-70 | Grey silty shale |
| 70-95 | Dark grey & chocolate brown carbonaceous shale |
| 95-110 | Light grey very bentonitic shale |
| 110-115 | Some coal in brown & grey bentonitic shale |
| 115-120 | Grey shale |
| 120-135 | Brown grey carbonaceous shale |
| 135-155 | Fine grey ss |
| 155-165 | Hard & coarse grey ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 6-3-66-17 2935; July 14/69 |
| 0-5 | Muskeg |
| 5-15 | Yellow weathered shale (el. bedrock 2930) |
| 15-25 | Blue grey siltstone |
| 25-40 | Dark grey shale |
| 40-60 | Grey siltstone |
| 60-80 | Grey silty shale |
| 80-95 | Coarse grey siltstone |
| 95-115 | Grey ss |
| 115-128 | Light grey ss with few hard ledges |
| 128-131.5 | Coal seam with thin parting (el. top coal 2807) |
| 131.5-140 | Thin coal seams in dark grey & brown carbonaceous shale |
| 140-143 | Coal seam |
| 143-165 | Grey, dark grey & some green grey silty shale; some white bentonitic flecks |
| | Lsd. 9-5-66-17 2835; July 10/69 |
| 0-26 | Light brown & grey clay; pebbles |
| 26-29 | Gravel seam |
| 29-66 | Blue grey ss (el. bedrock 2806) |
| 66-75.5 | Thin coal seams in dark grey & chocolate brown shale (el. top coal 2769) |
| 75.5-79 | Coal seam |
| 79-85 | Some coal in dark grey & chocolate brown shale |
| 85-100 | Grey silty shale |
| 100-115 | Black, dark grey & chocolate brown shale |
| 115-120 | Green grey siltstone |
| 120-165 | Grey to dark grey silty shale; some coarse siltstone; all bedrock appears to be disturbed |
| | Lsd. 15-6-66-17 2920; July 10/69 |
| 0-25 | Brown coarse sand |
| 25-65 | Very soft brown weathered ss |
| 65-80 | Yellow brown weathered shale, very soft |
| 80-165 | Shales & siltstones of all colours; reworked bedrock |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-9-66-17 2730; July 11/69 |
| 0-5 | Muskeg & grey clay |
| 5-15 | Grey clay; few small pebbles |
| 15-20 | Light grey ss (el. bedrock 2715) |
| 20-25 | Thin coal seam in dark grey shale |
| 25-35 | Grey silty shale |
| 35-40 | Dark grey & some dark brown carbonaceous shale |
| 40-45 | Grey silty shale |
| 45-50 | Dark grey carbonaceous shale |
| 50-85 | Light grey very bentonitic shale |
| 85-100 | Grey silty shale |
| 100-105 | Black & dark grey shale; some chocolate brown shale |
| 105-120 | Grey shale |
| 120-130 | Thin hard ledge of brown grey siltstone in grey siltstone |
| 130-138 | Grey silty shale |
| 138-140 | Few hard ledges of brown siltstone |
| 140-155 | Grey very silty shale |
| 155-165 | Light grey ss |
| | Lsd. 6-11-66-17 2750; July 19/69 |
| 0-30 | Muskeg |
| 30-65 | No samples; appears to be sandy clay |
| 65-125 | Fairly hard ss; very poor samples (el. bedrock 2685) |
| 125-135 | No samples; lost circulation due to muskeg; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 5-13-66-17 2755; July 19/69 |
| 0-10 | Light brown clay |
| 10-45 | Grey clay & many small pebbles |
| 45-50 | Light grey silty shale (el. bedrock 2710) |
| 50-100 | Dark brown grey shale |
| 100-120 | Grey shale to fine siltstone |
| 120-140 | Light grey bentonitic shale |
| 140-150 | Grey to slightly dark grey silty shale |
| 150-165 | Light grey very bentonitic shale |
| | NE cor. 15-66-17 2655; July 19/69 |
| 0-2 | Soil |
| 2-10 | Rusty brown weathered shale |
| 10-25 | Brownish grey weathered shale |
| 25-30 | Very light grey shale |
| 30-50 | Green grey silty shale |
| 50-75 | Grey silty shale |
| 75-95 | Fine sand; bedrock fragments; coal fragments; sandy clay & small pebbles |
| 95-160 | Soft grey silty shale; siltstone & ss mixed; entire hole is disturbed |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 16-66-17 2645; July 20/69 |
| 0-45 | Disturbed bedrock & pebbles |
| 45-50 | Disturbed bedrock & pebbles with narrow gravel seam |
| 50-75 | Grey clay, shale & siltstone; boulders & thin gravel seams |
| 75-100 | Gravel seam in sandy clay; abandoned |
| | Lsd. 8-18-66-17 2650; July 20/69 |
| 0-5 | Brown grey clay |
| 5-35 | Grey clay; few pebbles; few boulders |
| 35-60 | Well-sorted lake clay |
| 60-100 | Sandy to silty clay; many pebbles & thin gravel seams |
| 100-108 | Gravel |
| 108-130 | Very poor samples due to gravel; abandoned |
| | Lsd. 7-20-66-17 2605; July 20/69 |
| 0-15 | Light brown clay; few pebbles & coal fragments |
| 15-25 | Grey clay; few pebbles |
| 25-35 | Grey ss (el. bedrock 2580) |
| 35-65 | Grey silty shale |
| 65-75 | Grey ss with few hard ledges |
| 75-90 | Grey silty shale to coarse siltstone |
| 90-105 | Grey fine ss; lost circulation |
| 105-110 | Grey siltstone |
| 110-115 | Grey fine ss |
| 115-130 | Bluish grey silty shale |
| 130-140 | Coarse to medium-grained grey siltstone |
| 140-145 | Blue grey silty shale |
| 145-150 | Grey ss |
| 150-165 | Grey siltstone |
| | NE cor. 1-66-18 2860; July 10/69 |
| 0-20 | Dark brown clay; many pebbles |
| 20-50 | Brown clay & disturbed bedrock |
| 50-55 | Two gravel seams |
| 55-70 | Very sandy clay & pebbles |
| 70-124 | Medium-grained to fine fairly hard grey ss (el. bedrock 2790) |
| 124-146 | Two thin coal seams in brown & grey shale (el. top coal 2736) |
| 146-149 | Coal seam with thin parting |
| 149-165 | Grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 2-66-18 2765; July 10/69 |
| 0-10 | Light brown clay |
| 10-30 | Grey clay & pebbles |
| 30-40 | Brown grey silty shale (el. bedrock 2735) |
| 40-45 | Coal seam (el. top coal 2725); lost circulation |
| 45-65 | Light grey & white bentonite; some coal & brown shale |
| 65-70 | Bright green shale |
| 70-85 | Grey silty shale |
| 85-100 | Greenish grey silty shale |
| 100-110 | Grey shale |
| 110-120 | Grey & some brown grey slightly carbonaceous shale; lost circulation |
| 120-140 | Poor samples |
| 140-150 | Grey silty shale |
| | NE cor. 3-66-18 2725; July 9/69 |
| 0-1 | Soil |
| 1-40 | Light brown weathered silty shale; some ironstone |
| 40-50 | Light brown weathered fine to medium-grained ss; lost circulation |
| 50-65 | Light brown weathered silty shale |
| 65-95 | Poor samples; no circulation |
| 95-115 | Disturbed bedrock; ss & shale; grey clay & small pebbles |
| 115-150 | Grey clay; pebbles |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 6-10-66-18 2605; July 9/69 |
| 0-10 | Brown sand |
| 10-20 | Brown clay |
| 20-70 | Plastic grey clay |
| 70-120 | Very poor samples; soft clay |
| | NE cor. 10-66-18 2655; July 9/69 |
| 0-34 | Brown & grey clay; many pebbles |
| 34-50 | Grey siltstone; few hard ledges (el. bedrock 2621) |
| 50-68 | Grey shale |
| 68-71.5 | Grey shale; some brown shale & coaly shale |
| 71.5-73.5 | Coal seam (el. top coal 2583.5) |
| 73.5-85 | Grey shale |
| 85-95 | Grey fine ss |
| 95-102 | Grey ss |
| 102-106 | Shale with two thin coal seams |
| 106-110 | Brown & dark grey carbonaceous shale |
| 110-130 | Grey shale |
| 130-135 | Green grey shale |
| 135-150 | Fine soft grey ss |
| 150-160 | Grey silty shale |
| 160-165 | Grey fine ss; hard ledge |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 11-12-66-18 2705; July 21/69 |
| 0-15 | Dark brown clay; pebbles |
| 15-25 | Grey clay; pebbles |
| 25-55 | Grey, coarse to medium-grained siltstone (el. bedrock 2680) |
| 55-74 | Grey siltstone |
| 74-77 | Coal seam with thin parting (el. top coal 2631) |
| 77-80 | Grey silty shale |
| 80-115 | Grey shale |
| 115-130 | Grey siltstone |
| 130-140 | Grey fine ss |
| 140-155 | S & p ss |
| 155-165 | Dark grey & brown carbonaceous shale with coal trace |
| | Lsd. 5-17-66-18 2655; Sept. 22/68 |
| 0-10 | Brown grey clay |
| 10-50 | Grey clay; few pebbles |
| 50-54 | Very coarse gravel |
| 54-63 | Fine to very fine gravel & sand; abandoned |
| | Lsd. 2-24-66-18 2615; July 20/69 |
| 0-15 | Brown grey sand; very little grey clay |
| 15-105 | Grey clay; sandy grey clay; bedrock particles; many coal fragments |
| 105-110 | Grey silty clay |
| 110-120 | Bluish grey silty shale |
| 120-165 | Disturbed bedrock; some clay & pebbles |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 32-66-18 2650; Aug. 3/68 |
| 0-25 | Brown & brown grey silty clay; many boulders |
| 25-75 | Grey silty clay; many boulders |
| 75-90 | Weathered brown siltstone & fine ss (el. bedrock 2575) |
| 90-135 | Ss, siltstone & shale, all very soft |
| 135-150 | Blue grey slightly harder siltstone |
| | Lsd. 7-34-66-18 2705; Sept. 24/68 |
| 0-15 | Brown grey clay; few small pebbles |
| 15-25 | Grey clay; much bedrock incorporated |
| 25-30 | Coal seam in disturbed bedrock & clay |
| 30-68 | Grey clay; bedrock fragments; some small pebbles & large boulders |
| 68-93 | Unconsolidated grey coarse sand; some clay |
| 93-130 | Grey clay; disturbed bedrock; many small pebbles |
| 130-165 | Very sandy clay; sand lenses |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 5-1-66-19 2820; Sept. 26/68 |
| 0-5 | Brown sand & gravel |
| 5-23 | Grey clay; few pebbles |
| 23-30 | Bluish grey silty shale (el. bedrock 2797) |
| 30-35 | Coal trace in grey shale |
| 35-56 | Grey shale & siltstone |
| 56-67 | Coal seam with three thin shale partings (el. top coal 2764) |
| 67-74 | Thin coal seam in grey & brown shale; some bentonite |
| 74-85 | Coal seam with two thin partings |
| 85-88 | Grey & brown shale; some bentonite |
| 88-125 | Grey to light grey ss |
| 125-150 | Grey silty shale with some grey siltstone |
| | Lsd. 2-15-66-19 2675; Sept. 26/68 |
| 0-15 | Brown clay; few pebbles |
| 15-20 | Dark brown weathered shale (el. bedrock 2660) |
| 20-35 | Grey shale & green grey siltstone |
| 35-37 | Coal seam (el. top coal 2640) |
| 37-45 | Grey shale; some brown & chocolate brown carbonaceous shale |
| 45-50 | Two thin coal seams in grey bentonitic shale |
| 50-60 | Grey bentonitic shale |
| 60-70 | Grey shale |
| 70-75 | Light grey ss |
| 75-100 | Grey siltstone |
| 100-126.5 | Grey silty shale |
| 126.5-131.5 | Thin coal seam in grey shale |
| 131.5-133.5 | Coal seam |
| 133.5-150 | Grey shale |
| | Lsd. 6-24-66-19 2696; Sept. 10/68 |
| 0-10 | Brown clay; few pebbles |
| 10-90 | Grey silty clay; pebbles |
| 90-100 | Grey sandy clay; many pebbles |
| 100-105 | Fine gravel |
| 105-110 | Grey sandy clay; abandoned |
| | NE cor. 25-66-19 2450; Aug. 4/68 |
| 0-5 | Very coarse sand |
| 5-10 | Fine gravel, shield rock |
| 10-15 | Sandy grey clay |
| 15-20 | Sand & fine gravel |
| 20-45 | Grey silty clay |
| 45-85 | Gravel & grey sand |
| 85-150 | Clay; few boulders; gravel & sand stringers |
| | Lsd. 10-26-66-19 2590; Sept. 10/68 |
| 0-40 | Brown & grey clay; few small pebbles; some fine gravel @ 30-35 feet |
| 40-85 | Disturbed bedrock; shale, siltstone & ss |
| 85-100 | Grey sandy clay |
| 100-107 | Gravel seam |
| 107-114 | Poor sample; sandy clay |
| 114-119 | Gravel; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 8-34-66-19 2570; Sept. 10/68 |
| 0-15 | Brown clay; many pebbles |
| 15-105 | Grey silty clay; few sand & fine gravel stringers |
| 105-120 | Light brown grey weathered siltstone (el. bedrock 2465) |
| 120-125 | Fine brown weathered ss |
| 125-150 | Brown grey weathered silty shale |
| | Lsd. 15-2-66-21 2450; June 20/68 |
| 0-20 | Brown grey silty clay; boulders & pebbles |
| 20-87 | Grey silty clay; boulders & pebbles |
| 87 | Very hard boulder; abandoned |
| | Lsd. 15-4-66-21 2510; June 19/68 |
| 0-15 | Brown clay; few boulders & pebbles |
| 15-125 | Grey silty clay; some small pebbles |
| 125-150 | Grey silty shale; some grey siltstone (el. bedrock 2385) |
| | Lsd. 15-17-66-21 2290; June 20/68 |
| 0-10 | Brown grey clay |
| 10-46 | Grey clay & boulders |
| 46-55 | Brown weathered fine ss (el. bedrock 2244) |
| 55-70 | Grey to light grey ss |
| 70-90 | Bluish grey siltstone |
| 90-120 | Brown ss |
| 120-150 | Grey to light grey siltstone |
| | Lsd. 12-20-66-21 2220; June 21/68 |
| 0-15 | Brown grey well - sorted lake clay |
| 15-150 | Grey clay; few sandy lenses; few small pebbles |
| | Lsd. 3-30-66-21 2175; June 20/68 |
| 0-10 | Fine gravel; lost circulation |
| 10-45 | Soft clay; unable to keep circulation; abandoned |
| | NE cor. 29-66-22 2445; June 21/68 |
| 0-25 | Brown grey clay; few pebbles |
| 25-90 | Disturbed very soft siltstone & ss |
| 90-150 | Grey silty clay; many pebbles; few coal fragments |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-34-66-22 2285; June 20/68 |
| 0-30 | Brown clay |
| 30-45 | Grey clay & pebbles |
| 45-50 | Light grey soft ss (el. bedrock 2240) |
| 50-60 | Light grey very bentonitic shale with white bentonite parting |
| 60-90 | Grey to dark grey siltstone; some fine ss |
| 90-100 | Grey siltstone |
| 100-110 | Grey silty shale |
| 110-120 | Grey siltstone |
| 120-150 | Grey ss; coal trace |
| | Lsd. 12-9-66-23 2535; Aug. 4/69 |
| 0-30 | Brown & grey clay; few coal fragments |
| 30-45 | Dark grey & grey shale (el. bedrock 2505) |
| 45-50 | Fine grey siltstone |
| 50-65 | Fine to medium-grained grey ss |
| 65-70 | Thin coal seam in brown & dark grey carbonaceous shale |
| 70-75 | Grey & dark grey carbonaceous shale |
| 75-80 | Thin coal seam in brown bentonitic shale |
| 80-95 | Grey shale |
| 95-110 | Light grey silty shale with hard ledge |
| 110-120 | Fine light grey ss |
| 120-130 | Grey silty shale |
| 130-135 | Thin coal seam in grey shale; trace of dark brown carbonaceous shale |
| 135-140 | Grey shale |
| 140-165 | Grey, medium-grained to coarse siltstone with few hard ledges |
| | Lsd. 9-10-66-23 2560; Aug. 5/69 |
| 0-10 | Brown to light brown clay |
| 10-35 | Weathered light brown & grey shale (el. bedrock 2550) |
| 35-80 | Dark brown grey shale |
| 80-85 | Light grey bentonitic shale |
| 85-90 | Light grey coarse siltstone |
| 90-100 | Light grey silty shale |
| 100-105 | Dark brown grey shale |
| 105-115 | Light grey bentonitic shale |
| 115-125 | Grey shale |
| 125-130 | Two thin coal seams in dark brown carbonaceous shale |
| 130-150 | Grey silty shale |
| 150-155 | Grey, dark grey & some brown grey carbonaceous shale; trace of coal |
| 155-165 | Grey & some green grey shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 16-66-23 2790; June 22/68 |
| 0-2 | Soil |
| 2-18 | Very soft weathered ss (el. bedrock 2788) |
| 18-20.5 | Brown grey weathered silty shale |
| 20.5-24 | Coal seam (el. top coal 2769.5) |
| 24-35 | Few thin coal seams in brown & chocolate brown shale; bentonite trace |
| 35-52 | Grey & dark grey silty shale |
| 52-60 | Light grey coarse siltstone |
| 60-74 | Grey coarse siltstone |
| 74-80.5 | Grey ss |
| 80.5-84 | Thin coal seam in brown carbonaceous shale |
| 84-86.5 | Coal seam |
| 86.5-90 | Brown carbonaceous shale; some light brown bentonite |
| 90-100 | Grey shale with very little coal |
| 100-110 | Grey shale |
| 110-120 | Grey very bentonitic shale; some brown grey bentonite |
| 120-145 | Grey shale |
| 145-150 | Grey siltstone |
| 150-165 | Grey ss |
| | Lsd. 12-17-66-23 2870; June 22/68 |
| 0-19 | Light brown grey weathered silty shale (el. bedrock 2790) |
| 19-20.5 | Thin coal seam (el. top coal 2771) |
| 20.5-23 | Coal seam |
| 23-25 | Thin coal seam in brown carbonaceous shale |
| 25-40 | Light grey shale |
| 40-62 | Light grey siltstone |
| 62-70 | Thin coal seam in brown shale |
| 70-75 | Grey silty shale |
| 75-90 | Lost circulation; no samples |
| 90-117 | Soft ss |
| 117-140 | Grey siltstone; ledges of fine ss |
| 140-149 | Four thin coal seams in grey & brown shale |
| 149-165 | Grey siltstone |
| 165-180 | Grey silty shale |
| | Lsd. 5-22-66-23 2690; Aug. 6/69 |
| 0-38 | Brown & grey soft clay; many pebbles; few boulders |
| 38-55 | Grey silty shale (el. bedrock 2652) |
| 55-60 | Dark grey silty shale; coal trace |
| 60-90 | Dark brown grey slightly bentonitic shale |
| 90-100 | Grey silty shale |
| 100-105 | Grey coarse siltstone |
| 105-110 | Light grey to creamy white very bentonitic shale |
| 110-120 | Grey shale |
| 120-130 | Dark grey shale |
| 130-150 | Silty shale; some medium-grained to coarse grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 12-25-66-23 2600; July 16/69 |
| 0-21 | Brown, dark brown & brown grey clay; many pebbles & boulders |
| 21-60 | Light grey fine to medium-grained ss (el. bedrock 2579) |
| 60-75 | Grey silty shale |
| 75-80 | Dark grey & some dark brown shale |
| 80-85 | Light green grey shale |
| 85-90 | Light grey silty shale |
| 90-105 | Light grey fine ss |
| 105-120 | Grey silty shale |
| 120-130 | Chocolate brown & dark grey carbonaceous shale; trace of coal |
| 130-150 | Grey very silty shale |
| | NE cor. 25-66-23 2505; June 21/68 |
| 0-10 | Brown grey clay; pebbles |
| 10-90 | Grey clay; many pebbles; few large boulders; few large bedrock fragments |
| 90-150 | Grey clay; many small pebbles; sandy lenses |
| | Lsd. 7-26-66-23 2725; Aug. 5/69 |
| 0-15 | Weathered brown grey & grey shale |
| 15-25 | Black shale; some coal |
| 25-45 | Grey siltstone |
| 45-60 | No samples; lost circulation |
| 60-65 | Grey shale |
| 65-75 | Very little coal in mixed shale & ss, disturbed |
| 75-80 | Grey silty shale |
| 80-165 | Disturbed very soft ss, siltstone & shale |
| | Lsd. 2-3-66-24 3055; June 22/68 |
| 0-5 | Brown weathered silty shale (el. bedrock 3055) |
| 5-10 | Brown weathered carbonaceous shale; thin weathered coal seam |
| 10-25 | Light brown & brown grey silty shale |
| 25-30 | Dark grey & some brown shale; coal trace |
| 30-60 | Grey siltstone |
| 60-65 | Fine grey ss |
| 65-70 | Green grey silty shale |
| 70-75 | Grey siltstone; lost circulation; abandoned |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 3-5-66-24 2800; Aug. 7/69 |
| 0-5 | Brown grey weathered shale (el. bedrock 2800) |
| 5-10 | Brown grey weathered fine ss |
| 10-25 | Brown grey weathered silty shale; lost circulation |
| 25-35 | Very light grey & light brown bentonitic shale |
| 35-50 | Coal seams in black & dark grey carbonaceous shale (el. top coal 2765) |
| 50-65 | Light grey siltstone with hard ledges |
| 65-75 | Light grey fine ss |
| 75-85 | Hard to very hard grey ss |
| 85-95 | Thin coal seam in brown, dark brown & dark grey carbonaceous shale |
| 95-110 | Grey fine siltstone with hard ledge |
| 110-115 | Grey silty shale; few siltstone ledges |
| 115-120 | Thin coal seam; dark grey & brown grey carbonaceous shale |
| 120-125 | Grey shale |
| 125-150 | Grey coarse siltstone with few ledges |
| 150-165 | Grey silty shale |
| | NE cor. 12-66-24 2855; June 22/68 |
| 0-35 | Brown grey, green grey & grey siltstone (el. bedrock 2855) |
| 35-45 | Grey very bentonitic shale |
| 45-50 | Grey siltstone |
| 50-55 | Dark grey & grey silty shale |
| 55-60 | Dark grey shale; coal trace |
| 60-65 | Grey siltstone |
| 65-70 | Grey shale |
| 70-95 | Grey siltstone |
| 95-100 | Grey ss |
| 100-105 | Thin coal seam in dark grey & brown shale |
| 105-110 | Grey to dark grey shale |
| 110-115 | Grey to dark grey shale; coal trace |
| 115-125 | Light grey bentonitic shale |
| 125-150 | Grey silty shale |
| | NE cor. 1-66-25 2565; Aug. 7/69 |
| 0-15 | Brown clay; few pebbles |
| 15-66 | Grey well-sorted lake clay |
| 66-85 | Grey silty shale (el. bedrock 2499) |
| 85-110 | Grey, fine to medium-grained siltstone |
| 110-140 | Yellow brown fine ss with some very hard ledges |
| 140-145 | Coarse pebble conglomerate in ss |
| 145-165 | Grey silty shale; some grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 12-2-66-25 2600; Aug. 9/69 |
| 0-5 | Brown weathered coarse siltstone (el. bedrock 2600) |
| 5-10 | Brown grey weathered siltstone; some ironstone |
| 10-15 | Grey soft shale |
| 15-20 | Black, dark brown & dark grey carbonaceous shale |
| 20-25 | Grey shale |
| 25-30 | Grey fine ss |
| 30-50 | Grey silty shale |
| 50-60 | Grey coarse siltstone to grey ss |
| 60-70 | Grey shale |
| 70-85 | Grey siltstone |
| 85-130 | Grey shale & grey siltstone |
| 130-135 | Light grey fine ss |
| 135-145 | Dark brown grey & trace of brown carbonaceous shale |
| 145-150 | Grey silty shale |
| 150-165 | Grey siltstone |
| | Lsd. 10-9-66-25 2605; Aug. 8/69 |
| 0-10 | Dark brown clay |
| 10-65 | Dark grey well-sorted lake clay |
| 65-125 | Soft grey shale (el. bedrock 2540) |
| 125-130 | Grey siltstone |
| 130-140 | Grey siltstone with some shell fragments |
| 140-150 | Grey silty shale; very little dark grey shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 15-13-66-25 2480; Aug. 9/69 |
| 0-10 | Brown clay & pebbles |
| 10-15 | Brown clay; many coal fragments |
| 15-40 | Grey clay; few pebbles |
| 40-70 | Fine pea gravel & coarse sand; some clay |
| 70-85 | Grey clay; few pebbles & coal fragments |
| 85-90 | Light grey shale; coal trace (el. bedrock 2395) |
| 90-100 | Grey siltstone |
| 100-150 | Dark grey siltstone; coal traces |
| | Lsd. 2-14-66-25 2545; Aug. 8/69 |
| 0-20 | Brown grey & grey clay; very few small pebbles |
| 20-30 | Grey shale (el. bedrock 2525) |
| 30-40 | Grey siltstone |
| 40-70 | Brownish grey fine to medium-grained ss |
| 70-100 | Grey silty shale |
| 100-115 | Grey siltstone; some grey ss |
| 115-150 | Grey fine to medium-grained ss |
| 150-165 | Grey siltstone; very little grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 3-21-66-25 2565; Aug. 8/69 |
| 0-15 | Brown weathered silty shale (el. bedrock 2565) |
| 15-25 | Brown grey weathered siltstone |
| 25-35 | Brown grey fine ss |
| 35-40 | Brown grey silty shale |
| 40-75 | Grey, fine to medium-grained ss |
| 75-85 | Grey siltstone |
| 85-90 | Dark grey silty shale |
| 90-120 | Grey fine to coarse siltstone |
| 120-130 | Grey silty shale |
| 130-135 | Grey s & p ss |
| 135-145 | Grey ss; some very hard ledges |
| 145-150 | Grey fine ss; some black carbonaceous shale |
| 150-165 | Fairly hard grey silty shale |
| | Lsd. 9-22-66-25 2455; Aug. 8/69 |
| 0-15 | Brown weathered silty shale (el. bedrock 2455) |
| 15-30 | Brown weathered siltstone |
| 30-40 | Dark grey shale; some chocolate brown carbonaceous shale |
| 40-70 | Grey siltstone |
| 70-85 | Light brown ss; lost circulation |
| 85-100 | Grey, medium-grained to coarse siltstone |
| 100-105 | Dark grey & chocolate brown carbonaceous shale |
| 105-135 | Grey siltstone |
| 135-165 | Grey silty shale |
| | Lsd. 14-18-67-17 2765; Sept. 25/68 |
| 0-10 | Brown grey clay; few pebbles |
| 10-15 | Grey clay |
| 15-25 | Sandy clay; some bedrock fragments |
| 25-31 | Grey clay; pebbles; few coal fragments |
| 31-40 | Some coal in green grey & brown shale (el. bedrock 2734) |
| 40-45 | Grey coarse ss |
| 45-50 | Grey siltstone |
| 50-55 | Thin coal seam in grey siltstone |
| 55-70 | Light grey bentonite; some green grey shale |
| 70-95 | Grey siltstone & fine ss |
| 95-97 | Grey shale |
| 97-102 | Coal seam with parting (el. top coal 2668) |
| 102-105 | Grey shale |
| 105-130 | Fine grey ss & grey siltstone; hard ledge |
| 130-135 | Grey siltstone; thin hard ledge |
| 135-150 | Grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 1-67-18 2800; Sept. 25/68 |
| 0-20 | Brown grey & brown clay; few small pebbles |
| 20-55 | Grey clay; few pebbles & few boulders |
| 55-60 | Some coal in grey clay |
| 60-70 | Grey clay; few boulders |
| 70-80 | Grey shale (el. bedrock 2730) |
| 80-100 | Grey to light grey soft ss |
| 100-103 | Grey soft shale with some grey ss |
| 103-109 | Few thin coal seams with grey shale partings (el. top coal 2697) |
| 109-112 | Coal seam with 1-foot parting |
| 112-115 | Thin coal seam in grey shale |
| 115-117 | Coal seam |
| 117-135 | Grey silty shale |
| 135-140 | Light grey siltstone; hard ledge |
| 140-145 | Light grey fine ss |
| 145-150 | Grey ss |
| | Lsd. 10-3-67-18 2700; Aug. 4/68 |
| 0-10 | Grey silty shale |
| 10-15 | Coal seam in grey shale, disturbed |
| 15-20 | Grey shale, disturbed |
| 20-25 | Very light blue grey silty shale, disturbed |
| 25-130 | Grey clay; some bedrock; many small pebbles; few large boulders; many coal fragments |
| 130-140 | Grey brown siltstone (el. bedrock 2570) |
| 140-145 | Light brown ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-7-67-18 2496; Aug. 9/68 |
| 0-2 | Road fill |
| 2-5 | Muskeg |
| 5-15 | Grey silty clay; few small pebbles |
| 15-75 | Grey silty to sandy clay; few small pebbles; few coal fragments |
| 75-85 | Sandy grey clay |
| 85-90 | Soft sand with some clay |
| 90-150 | Grey silty clay; sandy lenses; some boulders between 120-150 feet |
| | Lsd. 2-16-67-18 2595; Aug. 3/68 |
| 0-20 | Brown & grey silty clay; pebbles; few sand lenses |
| 20-50 | Grey clay; few pebbles |
| 50-70 | Grey siltstone (el. bedrock 2545) |
| 70-80 | Grey silty shale |
| 80-90 | Grey siltstone with ledges of light grey fairly hard ss |
| 90-95 | Grey siltstone |
| 95-100 | Ledge of very hard ss in grey siltstone |
| 100-105 | Blue grey siltstone |
| 105-115 | Grey siltstone |
| 115-125 | Blue grey siltstone |
| 125-135 | Blue grey & grey siltstone |
| 135-140 | Grey very dry siltstone; few hard ledges |
| 140-150 | Grey uniform fine ss; lost circulation |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 7-19-67-18 2485; Aug. 3/68 |
| 0-10 | Brown silty clay |
| 10-75 | Grey silty clay; many small pebbles |
| 75-85 | Grey silty clay; few fine gravel seams in very sandy clay |
| 85-125 | Grey silty clay; few pebbles |
| 125-150 | Very soft grey clay; few pebbles |
| | Lsd. 10-21-67-18 2546; Aug. 4/68 |
| 0-3 | Wellsite fill |
| 3-9 | Muskeg |
| 9-15 | Very fine grey siltstone |
| 15-60 | Grey silty clay & pebbles |
| 60-65 | Dark grey silty shale (el. bedrock 2486) |
| 65-80 | Light & dark grey shale & siltstone |
| 80-85 | Some friable coal in grey shale |
| 85-130 | Soft grey siltstone & grey shale |
| 130-145 | Grey shale with some very light grey to almost white bentonite |
| 145-155 | Grey siltstone & some fine ss |
| 155-160 | Grey silty shale |
| 160-165.5 | Grey silty shale; two very thin coal seams |
| 165.5-170 | Dark grey silty shale |
| 170-195 | Light grey shale & siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-23-67-18 2755; Aug. 4/68 |
| 0-15 | Brown weathered siltstone (el. bedrock 2755) |
| 15-25 | Grey silty shale |
| 25-30 | Grey coarse siltstone |
| 30-35 | Grey, dark grey & some black carbonaceous shale |
| 35-85 | Light grey & grey ss; few harder ledges |
| 85-95 | Greenish grey shale |
| 95-100 | Greenish grey siltstone |
| 100-115 | Grey siltstone; some harder ledges of grey ss |
| 115-150 | Grey siltstone; some fine grey ss |
| | Lsd. 3-32-67-18 2600; Sept. 7/68 |
| 0-20 | Brown & grey clay |
| 20-40 | Grey clay; sandy stringers; many pebbles & coal fragments |
| 40-55 | Grey clay; pebbles & coal fragments |
| 55-65 | Very sandy clay; pebbles &coal fragments |
| 65-120 | Grey clay; few pebbles |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 11-33-67-18 2552; Sept. 6/68 |
| 0-5 | Brown soil & brown weathered shale (el. bedrock 2550) |
| 5-35 | Light brown & brown weathered shale |
| 35-65 | Grey shale; grey siltstone with ledge of hard ss |
| 65-70 | Grey ss |
| 70-80 | Grey siltstone |
| 80-88 | Grey ss |
| 88-95 | Grey siltstone |
| 95-100 | Thin coal seam in grey ss |
| 100-120 | Grey silty shale |
| 120-125 | Grey, brown & black shale; coal traces |
| 125-130 | Coal trace in grey shale |
| 130-140 | Grey shale |
| 140-150 | Grey shale; some chocolate brown shale; trace of creamy white bentonite |
| 150-160 | Grey, medium-grained to coarse ss |
| 160-165 | Grey siltstone |
| 165-175 | Grey fine ss |
| | NE cor. 3-67-19 2415; Sept. 9/68 |
| 0-10 | Soft red brown sandy clay |
| 10-15 | Fine gravel & sand |
| 15-25 | Grey silty clay |
| 25-30 | Grey silty clay; many coal fragments |
| 30-40 | Grey sandy clay; fine gravel traces |
| 40-85 | Grey silty clay; few pebbles |
| 85-130 | Sandy grey clay; many egg-sized white quartzite boulders |
| 130-150 | Grey clay & boulders |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 11-14-67-19 2470; Sept. 9/68 |
| 0-5 | Muskeg |
| 5-30 | Well-sorted soft lake clay |
| 30-55 | Grey clay; few pebbles |
| 55-60 | Some fine gravel in grey clay |
| 60-90 | Grey clay; few pebbles |
| 90-105 | Grey clay; many pebbles & coal fragments |
| 105-120 | Grey sandy clay; many fine to medium-sized gravel lenses |
| 120-150 | Many thin gravel seams in grey very sandy clay |
| | Lsd. 3-22-67-19 2520; Sept. 9/68 |
| 0-20 | Brown clay; few pebbles |
| 20-25 | Brown grey weathered shale, disturbed |
| 25-105 | Grey silty clay; many small pebbles; few boulders |
| 105-125 | Very sandy grey clay; bedrock traces |
| 125-140 | Sand; very little clay |
| 140-150 | Clay; sand; traces of dark grey shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 28-67-19 2590; Aug. 13/68 |
| 0-5 | Brown clay |
| 5-25 | Brown grey clay; pebbles & boulders |
| 25-35 | Some fine gravel in sandy clay |
| 35-100 | Grey clay; sandy lenses |
| 100-120 | Grey clay; gravel stringers |
| 120-150 | Grey silty to sandy clay |
| | Lsd. 12-36-67-19 2690; Aug. 3/68 |
| 0-5 | Fine gravel; some grey clay |
| 5-15 | Grey clay; many coal fragments |
| 15-20 | Grey clay |
| 20-25 | Thin gravel seam in grey clay |
| 25-75 | Grey silty clay; few boulders; 55-75 feet quite sandy |
| 75-80 | Gravel in grey clay |
| 80-85 | Grey silty clay |
| 85-90 | Grey silty shale (el. bedrock 2605) |
| 90-100 | Blue grey silty shale |
| 100-115 | Grey shale |
| 115-120 | Grey silty shale; some grey ss |
| 120-150 | Grey silty shale; some grey siltstone |
| | Lsd. 6-2-67-22 2315; June 20/68 |
| 0-22 | Brown grey clay; few pebbles |
| 22-40 | Brown weathered fine ss (el. bedrock 2293) |
| 40-60 | Grey siltstone; some grey ss |
| 60-110 | Blue grey & grey shale; some siltstone |
| 110-120 | Grey fine ss; hard grey ss ledge |
| 120-125 | Brown ss |
| 125-135 | Grey siltstone & grey ss |
| 135-140 | Grey & dark grey shale; coal trace |
| 140-155 | Grey silty shale |
| 155-160 | Grey, brown grey & brown carbonaceous shale |
| 160-168.5 | Blue grey silty shale |
| 168.5-171.5 | Coal seam (el. top coal 2146.5) |
| 171.5-175 | Dark grey shale |
| 175-195 | Grey ss |
| 195-210 | Light grey ss |
| | Lsd. 6-15-67-22 2352; June 24/68 |
| 0-10 | Brown clay; few pebbles |
| 10-135 | Grey clay; some bedrock fragments |
| 135-150 | Grey sandy clay; sandy stringers & thin gravel stringers |
| | Lsd. 8-20-67-22 2280; June 24/68 |
| 0-10 | Brown grey clay; few pebbles |
| 10-150 | Shale & siltstone - reworked bedrock |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 14-23-67-22 2155; June 24/68 Test hole 51 |
| 0-30 | Brown grey clay & disturbed bedrock |
| 30-55 | Grey clay & some disturbed bedrock |
| 55-90 | Soft grey silty shale & siltstone |
| 90-120 | Disturbed coal seam; coal very friable (el. top coal 2065); some chocolate brown carbonaceous shale; some creamy white bentonite |
| | Lsd. 14-23-67-22 2165; June 26/68 Test hole 51A (340 feet west of test hole 51) |
| 0-25 | Brown silty clay; many pebbles |
| 25-40 | Disturbed grey bedrock |
| 40-67 | Disturbed grey siltstone |
| 67-76 | Three thin coal seams; brown shale; some creamy white bentonite |
| 76-90 | Creamy white bentonite; some silty shale |
| 90-100 | Very bentonitic light grey shale |
| 100-120 | Shattered grey siltstone |
| 120-155 | Disturbed fine ss; some siltstone & shale |
| 155-180 | Very soft disturbed bedrock; sandy lenses |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 14-23-67-22 2165; July 2/68 Test hole 51B (25 feet west of test hole 51A) |
| 0-5 | Plastic well-sorted clay |
| 5-15 | Brown grey clay |
| 15-25 | Disturbed brown to brown grey weathered siltstone; some ironstone |
| 25-35 | Disturbed grey siltstone; some brown siltstone |
| 35-50 | Grey clay; many boulders |
| 50-55 | Coal trace in black shale |
| 55-65 | Grey & light grey coarse siltstone |
| 65-75 | Grey silty shale & grey siltstone |
| 75-80 | Some coal in grey & dark grey shale |
| 80-85 | Soft grey silty shale |
| 85-91 | Some coal in brown grey & chocolate brown carbonaceous shale |
| 91-93 | Coal seam (el. top coal 2074) |
| 93-95 | Black & brown shale |
| 95-105 | Some coal; grey silty shale; some light grey bentonite |
| 105-120 | Grey slightly bentonitic shale |
| 120-130 | Grey to dark grey shale |
| 130-150 | Grey siltstone — disturbed bedrock |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 14-23-67-22<br>2165; July 2/68<br>Test hole 51 C (300 feet west of test hole 51B) |
| 0-10 | Brown grey clay & pebbles |
| 10-75 | Grey clay & pebbles; few boulders; some bedrock fragments |
| 75-150 | Very soft disturbed bedrock; few sandy ledges; hard granite boulder @ 96 feet |
| | NE cor. 28-67-22<br>2260; June 24/68 |
| 0-25 | Brown silty clay; many pebbles |
| 25-75 | Grey silty clay; many pebbles |
| 75-80 | Coarse blue grey sand |
| 80-155 | Grey sandy clay; many pebbles; bedrock fragments & many coal fragments; sandy stringers |
| 155-180 | Sandy stringers in grey clay |
| | NE cor. 20-67-23<br>2496; July 7/68 |
| 0-5 | Brown clay |
| 5-23 | Grey silty clay; few pebbles |
| 23-40 | Grey siltstone (el. bedrock 2473) |
| 40-65 | Grey silty shale |
| 65-80 | Grey fine ss; some grey siltstone |
| 80-120 | Fairly uniform grey silty shale |
| 120-130 | Grey siltstone; few ss ledges |
| 130-145 | Grey silty shale |
| 145-150 | Grey siltstone |
| | NE cor. 22-67-23<br>2390; July 7/68 |
| 0-5 | Brown grey clay |
| 5-150 | Grey silty to sandy clay; some pebbles; few boulders throughout |
| | NE cor. 30-67-23<br>2520; July 7/68 |
| 0-10 | Brown clay |
| 10-100 | Grey clay; few pebbles; some gravel @ 90-95 feet |
| 100-110 | Brown grey weathered silty shale (el. bedrock 2420) |
| 110-120 | Grey silty shale with thin harder ledge |
| 120-125 | Greenish grey shale |
| 125-135 | Green grey siltstone |
| 135-136 | Very hard ledge of light brown siltstone |
| 136-150 | Fine grey ss |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 5-68-18 2750; Sept. 6/68 |
| 0-20 | Brown & grey clay; few pebbles; some fine gravel |
| 20-40 | Grey clay; some pebbles; some sand |
| 40-45 | Grey clay; many pebbles & coal fragments |
| 45-75 | Grey silty clay; few pebbles & boulders |
| 75-165 | Disturbed bedrock in till |
| 165-180 | Clay; bedrock & many gravel seams |
| 180-185 | Fine gravel; some clay |
| 185-210 | Grey clay & pebbles |
| | NE cor. 1-68-19 2820; Sept. 5/68 |
| 0-20 | Brown & grey clay; few pebbles & boulders |
| 20-25 | Coarse grey sand; some clay |
| 25-60 | Grey clay; few pebbles & boulders; much bedrock incorporated |
| 60-65 | Grey ss with hard ledge (el. bedrock 2760) |
| 65-70 | Grey soft shale |
| 70-80 | Light grey & brown grey ss |
| 80-85 | Brown grey & grey ss; coal trace |
| 85-95 | Grey fine ss & grey siltstone; coal trace |
| 95-100 | Light grey & some black shale; some creamy white bentonite; few thin coal seams |
| 100-105 | Medium-grained to very coarse grey siltstone |
| 105-110 | Thin coal seam in grey siltstone |
| 110-130 | Light grey, grey & green grey shale |
| 130-135 | Bright green siltstone |
| 135-140 | Light grey soft ss |
| 140-165 | Grey & green grey siltstone |
| | NE cor. 10-68-19 2775; Aug. 1/68 |
| 0-95 | Shale; siltstone & ss; coal trace; all disturbed bedrock |
| 95-120 | Grey clay; small pebbles & boulders |
| | Lsd. 6-24-68-19 2915; Aug. 9/68 |
| 0-15 | Brown & grey silty clay; pebbles |
| 15-20 | Grey silty shale; coal trace (el. bedrock 2900) |
| 20-30 | Grey silty shale |
| 30-35 | Grey silty shale; some light grey bentonitic shale |
| 35-40 | Coal trace in grey shale |
| 40-75 | Grey siltstone; some grey shale |
| 75-90 | Grey ss |
| 90-95 | Grey ss & grey siltstone; coal trace |
| 95-115 | Grey siltstone |
| 115-120 | Grey ss |
| 120-125 | Grey ss; hard ledge of brown grey ironstone |
| 125-130 | Grey siltstone; some grey ss |
| 130-150 | Blue grey shale; some grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 9-28-68-19<br>2670; Aug. 1/68 |
| 0-15 | Brown clay; small pebbles; many boulders |
| 15-65 | Brown clay; few pebbles |
| 65-150 | Grey silty clay; sandy lenses; many pebbles & boulders |
| | NE cor. 32-68-19<br>2555; Aug. 1/68 |
| 0-45 | Brown & grey silty clay; many pebbles |
| 45-50 | Grey clay; many pebbles & coal fragments |
| 50-85 | Disturbed shale & some coal |
| 85-90 | Gravel (shield rock) |
| 90-110 | Grey clay & some disturbed bedrock |
| 110-125 | Grey silty shale (el. bedrock 2445) |
| 125-130 | Grey & dark grey shale; very little coal; some black shale |
| 130-145 | Grey siltstone |
| 145-150 | Very light grey ss |
| | NE cor. 32-68-21<br>2152; July 3/68 |
| 0-25 | Brown grey clay; some disturbed weathered brown grey siltstone |
| 25-130 | Well-sorted plastic lake clay |
| 130-150 | Soft grey clay; pebbles; sandy stringers |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 5-68-22<br>2252; July 6/68 |
| 0-20 | Brown silty clay |
| 20-25 | Some coal, bentonite & brown shale; some grey clay & small pebbles |
| 25-120 | Soft grey shale & clay; many small pebbles; some large boulders; badly disturbed |
| 120-130 | Grey silty shale (el. bedrock 2132) |
| 130-150 | Grey shale & siltstone |
| | Lsd. 6-15-68-22<br>2180; June 27/68 |
| 0-25 | Brown grey silty clay; pebbles |
| 25-75 | Grey silty to sandy clay; many pebbles |
| 75-85 | Grey silty clay; some brown disturbed ss |
| 85-150 | Grey clay; few sandy lenses; many small pebbles; few boulders; many bedrock fragments; some coal fragments |
| | NE cor. 18-68-22<br>2253; July 6/68 |
| 0-25 | Brown silty clay; few pebbles |
| 25-104 | Grey silty clay; some pebbles; few coal fragments |
| 104-120 | Very soft grey silty shale (el. bedrock 2149) |
| 120-130 | Grey soft siltstone & light brown ss |
| 130-150 | Fine grey ss ; some grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 21-68-22 2215; June 27/68 |
| 0-30 | Brown grey silty clay & pebbles |
| 30-150 | Grey silty clay & pebbles; few boulders; some bedrock fragments |
| | Lsd. 6-24-68-22 2125; July 8/68 |
| 0-5 | Light brown silty clay |
| 5-10 | Very coarse unconsolidated sand |
| 10-15 | Very sandy clay |
| 15-30 | Grey silty clay |
| 30-140 | Very soft plastic well-sorted lake clay |
| 140-165 | Grey silty clay; pebbles; some boulders |
| 165-180 | Fine gravel in sandy clay |
| 180-225 | Grey silty clay & pebbles |
| | NE cor. 30-68-22 2315; July 6/68 |
| 0-20 | Brown grey clay; pebbles & boulders; few coal fragments |
| 20-105 | Grey silty clay; few pebbles; many boulders |
| 105-125 | Soft grey siltstone (el. bedrock 2210) |
| 125-135 | Grey ss & grey siltstone |
| 135-150 | Brown & brown grey ss; some siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 34-68-22 2180; June 27/68 |
| 0-25 | Brown & brown grey silty clay; few pebbles |
| 25-90 | Grey silty to sandy clay; some bedrock fragments throughout |
| 90-100 | Grey silty shale (el. bedrock 2090) |
| 100-105 | Light grey siltstone |
| 105-125 | Grey siltstone; some silty shale |
| 125-130 | Grey ss |
| 130-145 | Grey, dark grey & traces of brown grey carbonaceous shale |
| 145-150 | Grey to light grey bentonitic shale |
| | NE cor. 36-68-22 2100; July 3/68 |
| 0-10 | Dark brown clay |
| 10-20 | Very sandy grey clay |
| 20-30 | Grey clay |
| 30-100 | Well-sorted plastic lake clay |
| 100-150 | Grey clay; pebbles & few boulders |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 1-68-23 2340; July 7/68 |
| 0-50 | Brown & grey silty clay; many small pebbles |
| 50-60 | Grey sandy clay; some fine gravel |
| 60-90 | Grey silty clay; some small pebbles |
| 90-110 | Brown grey weathered very bentonitic shale (el. bedrock 2250) |
| 110-125 | Brown grey weathered siltstone |
| 125-145 | Brown grey weathered siltstone; some brown grey weathered ss |
| 145-165 | Brown grey silty shale |
| | NE cor. 3-68-23 2397; July 7/68 |
| 0-10 | Brown clay; many small pebbles |
| 10-95 | Grey silty clay; many small pebbles; many boulders |
| 95-95.5 | Very hard boulder |
| 95.5-105 | Grey silty clay; pebbles; many boulders |
| 105-150 | Grey silty clay; few sandy stringers; coal fragments; two gravel stringers |
| | NE cor. 8-69-19 2455; Aug. 1/68 |
| 0-5 | Grey well-sorted clay |
| 5-15 | Grey clay; some ironstone |
| 15-35 | Grey silty clay; few small pebbles; few coal fragments |
| 35-40 | Grey very silty soft shale |
| 40-45 | Grey siltstone; some rusty brown ss; some ironstone |
| 45-50 | Grey, dark grey & brown grey silty shale |
| 50-55 | Light brown fine ss; some siltstone |
| 55-65 | Soft brown grey to light brown fine siltstone & fine ss; some small particles of white grey calcite |
| 65-80 | Grey fine ss to siltstone |
| 80-85 | Dark grey & brown grey shale |
| 85-120 | Grey siltstone |
| 120-125 | Pebble conglomerate |
| 125-135 | Grey & green grey shale |
| 135-155 | Clay; shale & pebbles |
| 155-165 | Clay & pebbles; entire hole badly disturbed |
| | NE cor. 20-69-19 2410; July 21/68 |
| 0-15 | Brown grey clay; few small pebbles |
| 15-70 | Grey clay; few small pebbles |
| 70-75 | Light brown weathered shale (el. bedrock 2340) |
| 75-95 | Grey silty shale |
| 95-100 | Dark grey & brown grey carbonaceous shale |
| 100-105 | Grey shale |
| 105-110 | Light grey shale; coal trace |
| 110-115 | Grey silty shale |
| 115-120 | Green grey silty shale |
| 120-130 | Very coarse grey siltstone; fine ss |
| 130-150 | Grey silty shale |
| 150-155 | Coal trace in grey shale |
| 155-170 | Grey silty shale |
| 170-180 | Coarse grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 31-69-19 2357; July 21/68 |
| 0-25 | Brown clay; many small pebbles |
| 25-95 | Grey clay; some coal fragments; small pebbles; few boulders; some disturbed bedrock |
| 95-115 | Sand & fine gravel; some clay |
| 115-140 | Silty grey shale (el. bedrock 2242) |
| 140-150 | Very silty grey shale |
| | NE cor. 8-69-21 2100; July 8/68 |
| 0-15 | Chocolate brown clay |
| 15-35 | Grey silty clay; many pebbles; few boulders |
| 35-105 | Grey well-sorted lake clay |
| 105-150 | Grey silty to sandy clay; pebbles & few boulders |
| | NE cor. 10-69-21 2205; July 8/68 |
| 0-10 | Brown clay; pebbles |
| 10-55 | Grey clay; pebbles & boulders |
| 55-120 | Grey very plastic clay; many boulders |
| | NE cor. 12-69-21 2302; July 8/68 |
| 0-15 | Brown clay; few pebbles |
| 15-150 | Grey uniform clay; many boulders throughout |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 23-69-21 2292; July 9/68 |
| 0-25 | Brown grey silty clay |
| 25-45 | Light brown, grey & light grey shale (el. bedrock 2267) |
| 45-50 | Dark grey shale; some creamy white bentonite |
| 50-75 | Grey siltstone |
| 75-80 | Dark grey & black carbonaceous shale |
| 80-100 | Grey siltstone |
| 100-105 | Black & dark grey carbonaceous shale; trace of white bentonite |
| 105-110 | Grey to dark grey shale |
| 110-115 | Greenish grey silty shale |
| 115-130 | Grey silty shale |
| 130-140 | Grey siltstone |
| 140-150 | Grey s & p ss; some grey siltstone |
| | NE cor. 31-69-21 2110; July 9/68 |
| 0-5 | Light brown clay |
| 5-25 | Coarse s & p sand |
| 25-105 | Well-sorted plastic soft lake clay |
| | NE cor. 9-69-22 2203; June 27/68 |
| 0-20 | Brown silty well-sorted lake clay |
| 20-45 | Grey silty well-sorted lake clay |
| 45-150 | Grey silty to sandy clay; many small pebbles; few bedrock fragments |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 11-69-22 2110; June 27/68 |
| 0-20 | Brown & grey clay |
| 20-90 | Well-sorted plastic lake clay |
| 90-120 | Grey clay with sandy lenses, bedrock & coal fragments |
| 120-145 | Grey shale; coal trace; some grey siltstone (el. bedrock 1990) |
| 145-150 | Brown carbonaceous shale |
| 150-160 | Thin coal seam in grey & brown shale |
| 160-180 | Grey shale; some fine grey ss |
| | NE cor. 19-69-22 2395; July 6/68 |
| 0-10 | Brown grey silty clay |
| 10-100 | Grey clay; very few pebbles; some disturbed bedrock |
| 100-130 | Uniform soft grey shale (el. bedrock 2295) |
| 130-135 | Dark grey, some black & some chocolate brown carbonaceous soft shale |
| 135-150 | Grey very silty soft shale |
| | NE cor. 21-69-22 2260; July 3/68 |
| 0-15 | Brown silty clay; few pebbles |
| 15-75 | Grey silty clay; few pebbles; much disturbed bedrock |
| 75-80 | Grey shale (el. bedrock 2185) |
| 80-90 | Grey siltstone |
| 90-95 | Grey silty shale |
| 95-105 | Grey siltstone |
| 105-110 | Grey shale |
| 110-130 | Grey shale & siltstone |
| 130-140 | Grey silty shale |
| 140-145 | Brown grey slightly carbonaceous shale |
| 145-160 | Grey silty shale |
| | NE cor. 24-69-22 2110; July 9/68 |
| 0-5 | Light brown clay |
| 5-10 | Grey, coarse to medium-grained sand; some grey clay |
| 10-150 | Well-sorted plastic soft lake clay |
| | NE cor. 31-69-22 2420; July 4/68 |
| 0-5 | Light brown clay |
| 5-15 | Brown grey ss (el. bedrock 2415) |
| 15-35 | Fine to coarse grey ss |
| 35-65 | Grey shale & siltstone |
| 65-100 | Fine to coarse grey ss |
| 100-105 | Brown grey ss; hard ledge |
| 105-135 | Grey siltstone & grey shale |
| 135-150 | Grey shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 33-69-22 2362; July 4/68 |
| 0-45 | Brown & grey clay; pebbles; few coal fragments |
| 45-50 | Grey clay; lens of grey disturbed ss |
| 50-70 | Grey shale (el. bedrock 2312) |
| 70-90 | Grey siltstone; some grey shale |
| 90-95 | Grey to dark grey shale |
| 95-110 | Grey shale & siltstone |
| 110-125 | Green grey & grey shale |
| 125-135 | Grey siltstone; some light grey ss |
| 135-140 | Grey siltstone |
| 140-145 | Grey s & p ss |
| 145-160 | Grey & dark grey slightly carbonaceous shale |
| 160-165 | Brown & chocolate brown carbonaceous shale; very little coaly material |
| 165-190 | Brown grey, green grey & grey shale |
| 190-195 | Creamy white bentonite |
| 195-210 | Grey shale; some green shale |
| 210-220 | Grey & some brown grey shale |
| 220-225 | Grey & brown grey carbonaceous shale; coal trace |
| | NE cor. 35-69-22 2115; July 4/68 |
| 0-10 | Brown silty clay; few pebbles |
| 10-150 | Grey silty clay; few pebbles; some disturbed bedrock; very few coal fragments |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 9-69-23 2480; July 5/68 |
| 0-20 | Brown & brown grey clay; some pebbles |
| 20-60 | Grey clay; few pebbles |
| 60-85 | Very soft silty shale (el. bedrock 2420) |
| 85-90 | Grey siltstone |
| 90-115 | Light brown & some brown grey ss & coarse siltstone |
| 115-120 | Grey silty shale |
| 120-125 | Grey, dark grey & black carbonaceous shale; coal trace |
| 125-130 | Grey shale |
| 130-150 | Grey very silty shale |
| | NE cor. 20-69-23 2375; July 5/68 |
| 0-30 | Brown silty clay; few pebbles |
| 30-105 | Grey silty clay; few pebbles; some disturbed bedrock |
| 105-120 | Very soft grey silty shale (el. bedrock 2270) |
| 120-125 | Soft, grey & dark grey silty shale |
| 125-130 | Soft greenish grey siltstone |
| 130-150 | Soft grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 22-69-23 2430; July 5/68 |
| 0-25 | Brown silty clay |
| 25-70 | Grey silty clay |
| 70-95 | Grey shale; some grey siltstone (el. bedrock 2360) |
| 95-100 | Grey siltstone |
| 100-105 | Grey s & p ss |
| 105-115 | Grey ss & siltstone |
| 115-120 | Grey shale & siltstone |
| 120-145 | Grey ss & siltstone |
| 145-150 | Grey silty shale |
| | NE cor. 31-69-23 2301; July 5/68 |
| 0-20 | Light brown well-sorted lake clay |
| 20-90 | Grey well-sorted lake clay |
| 90-150 | Sandy to silty grey clay; few boulders; few sand & fine gravel stringers |
| | NE cor. 33-69-23 2366; July 5/68 |
| 0-20 | Brown very silty clay |
| 20-105 | Grey silty clay; few pebbles; some disturbed bedrock |
| 105-110 | Greenish grey shale (el. bedrock 2261) |
| 110-125 | Soft grey silty shale |
| 125-150 | Grey siltstone; some grey shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 35-69-23 2370; July 4/68 |
| 0-10 | Brown clay & pebbles |
| 10-90 | Grey clay; many boulders |
| 90-110 | Silty grey shale (el. bedrock 2280) |
| 110-120 | Grey siltstone |
| 120-135 | Grey silty shale |
| 135-137 | Coal seam (el. top coal 2235) |
| 137-140 | Grey, dark grey & some brown shale |
| 140-180 | Grey shale & some grey siltstone |
| | Lsd. 10-1-70-18 2900; Aug. 11/68 |
| 0-5 | Brown clay |
| 5-15 | Brown grey weathered shale (el. bedrock 2895) |
| 15-30 | Brown grey weathered shale; some ironstone |
| 30-110 | Brown silty weathered shale; fine brown ss ledges |
| 110-125 | Blue siltstone |
| 125-135 | Blue grey fine ss; lost circulation |
| | Lsd. 12-13-70-18 2653; Aug. 11/68 |
| 0-10 | Light brown clay |
| 10-92 | Grey clay; many gravel seams |
| 92-110 | Grey shale (el. bedrock 2561) |
| 110-115 | Dark grey soft silty shale |
| 115-150 | Grey soft silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 18-70-18 2615; Aug. 11/68 |
| 0-10 | Brown silty clay; many boulders |
| 10-15 | Brown grey weathered shale (el. bedrock 2605) |
| 15-30 | Grey silty shale |
| 30-35 | Grey ss; some grey shale |
| 35-40 | Green grey shale |
| 40-45 | Brown grey shale; lost circulation |
| 45-130 | Grey silty shale |
| 130-140 | Green grey coarse siltstone |
| 140-150 | Grey silty shale |
| | Lsd. 10-22-70-18 2640; Aug. 11/68 |
| 0-10 | Brown clay; many pebbles & boulders |
| 10-85 | Grey clay; many pebbles & boulders |
| 85-95 | Gravel; abandoned |
| | Lsd. 2-32-70-18 2480; Aug. 11/68 |
| 0-45 | Brown & grey clay; few pebbles |
| 45-70 | Grey shale (el. bedrock 2435) |
| 70-80 | Grey siltstone |
| 80-85 | Dark grey & brown carbonaceous shale; very thin coal seam |
| 85-95 | Green grey siltstone |
| 95-120 | Grey silty shale |
| 120-130 | Soft grey shale; some brown carbonaceous shale |
| 130-135 | Grey silty shale |
| 135-150 | Coarse grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 6-13-70-19 2525; Aug. 11/68 |
| 0-15 | Brown soft clay |
| 15-20 | Weathered brown grey & grey silty shale (el. bedrock 2510) |
| 20-25 | Grey fine ss & siltstone |
| 25-55 | Grey silty shale; some grey siltstone |
| 55-60 | Dark grey & brown shale; coal trace |
| 60-110 | Grey siltstone & shale |
| 110-115 | Slightly darker grey shale |
| 115-120 | Dark brown & dark grey shale; some creamy white bentonite |
| 120-145 | Grey silty shale & siltstone |
| 145-150 | Greenish grey bentonitic shale |
| | NE cor. 19-70-19 2557; July 12/68 |
| 0-10 | Brown clay |
| 10-45 | Grey clay; few pebbles |
| 45-70 | Grey silty shale (el. bedrock 2512) |
| 70-90 | Grey fine to medium-grained ss |
| 90-147 | Grey shale & siltstone |
| 147-148.5 | Coal seam |
| 148.5-155 | Grey shale |
| 155-180 | Grey silty shale, very dry |
| 180-190 | Grey siltstone |
| 190-210 | Grey shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 22-70-19 2570; Aug. 13/68 |
| 0-25 | Brown clay; few pebbles |
| 25-30 | Coarse gravel; abandoned |
| | NE cor. 32-70-19 2452; Aug. 9/68 |
| 0-5 | Brown silty clay |
| 5-15 | Brown grey silty clay |
| 15-55 | Grey silty to sandy clay; many small pebbles |
| 55-73 | Gravel; some sand & grey clay |
| 73-76 | Soft grey silty clay |
| 76-85 | Light grey ss (el. bedrock 2376) |
| 85-90 | Grey siltstone |
| 90-100 | Grey siltstone & some ss |
| 100-150 | No samples; hole condition poor due to gravel |
| | NE cor. 34-70-19 2442; Aug. 10/68 |
| 0-20 | Brown & grey silty clay |
| 20-60 | Grey & some green grey siltstone (el. bedrock 2422) |
| 60-70 | Grey ss; some grey siltstone |
| 70-75 | Grey ss with hard ledge; grey shale; coal trace |
| 75-95 | Green grey silty shale |
| 95-110 | Grey shale & some dark grey & chocolate brown carbonaceous shale |
| 110-125 | Grey silty shale; some creamy white bentonite |
| 125-135 | Grey siltstone & soft ss |
| 135-150 | Grey siltstone & shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 12-70-20 2302; July 21/68 |
| 0-10 | Brown silty clay; few pebbles |
| 10-125 | Grey silty clay; many pebbles; few boulders; few sandy lenses |
| 125-160 | Grey silty soft shale (el. bedrock 2177) |
| 160-165 | Grey & some brown grey silty shale |
| 165-170 | Green grey fine siltstone |
| 170-180 | Grey fine siltstone |
| | NE cor. 19-70-20 2198; July 12/68 |
| 0-10 | Brown grey silty clay |
| 10-75 | Well-sorted lake clay; very few small pebbles |
| 75-150 | Silty to sandy grey clay; some pebbles; few boulders |
| | NE cor. 21-70-20 2250; July 13/68 |
| 0-5 | Very dark brown clay |
| 5-25 | Brown silty clay; pebbles |
| 25-35 | Brown grey silty clay; many pebbles |
| 35-150 | Grey silty clay; few sandy lenses; many pebbles & boulders |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 23-70-20 2280; July 12/68 |
| 0-10 | Brown grey silty clay; few pebbles |
| 10-140 | Grey silty to sandy clay; pebbles; some boulders |
| 140-155 | Grey silty to sandy clay; some disturbed bedrock |
| 155-180 | Very sandy clay; sand lenses; many small pebbles; coal fragments |
| | NE cor. 34-70-20 2332; July 13/68 |
| 0-5 | Brown silty clay |
| 5-15 | Brown grey silty clay |
| 15-105 | Grey silty clay; few pebbles |
| 105-150 | Very soft disturbed bedrock; some soft grey clay; many small pebbles; sandy lenses |
| | NE cor. 36-70-20 2360; July 12/68 |
| 0-25 | Brown & brown grey clay; few pebbles |
| 25-65 | Grey silty clay; pebbles; few boulders |
| 65-70 | Light grey bentonitic shale (el. bedrock 2295) |
| 70-90 | Grey siltstone & ss |
| 90-95 | Greenish grey shale |
| 95-110 | Grey silty shale |
| 110-125 | Greenish grey silty shale |
| 125-145 | Grey silty shale |
| 145-155 | Green grey shale |
| 155-180 | Grey silty shale; some grey siltstone |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 19-70-21 2200; July 10/68 |
| 0-60 | Brown silty clay; many small pebbles |
| 60-75 | Grey silty clay; many small pebbles |
| 75-95 | Grey fairly well-sorted lake clay |
| 95-150 | Grey silty to sandy clay; many boulders |
| | NE cor. 21-70-21 2080; July 10/68 |
| 0-20 | Soft brown clay |
| 20-125 | Grey silty clay; few sandy stringers; small pebbles & few boulders |
| 125-150 | Very fine gravel; some coarse sand |
| 150-195 | Very soft coarse grey sand |
| 195-200 | Coarse gravel; abandoned |
| | NE cor. 23-70-21 2155; July 11/68 |
| 0-40 | Brown silty clay; some small pebbles |
| 40-150 | Grey silty clay; some small pebbles; few boulders; few sandy lenses |
| | NE cor. 36-70-21 2198; July 11/68 |
| 0-25 | Brown clay; few pebbles |
| 25-65 | Well-sorted silty lake clay |
| 65-150 | Grey clay; some pebbles |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 10-70-22 2400; July 9/68 |
| 0-20 | Brown to light brown clay |
| 20-45 | Yellow brown silty weathered shale; lost circulation (el. bedrock 2380) |
| 45-60 | Greenish grey shale |
| 60-75 | Grey siltstone |
| 75-105 | Very soft s & p ss; lost circulation |
| 105-120 | Very light grey silty shale |
| 120-140 | Grey to light grey siltstone |
| 140-150 | No samples, lost circulation |
| | NE cor. 21-70-22 2243; July 10/68 |
| 0-10 | Brown grey silty clay |
| 10-20 | Brown grey weathered shale (el. bedrock 2233) |
| 20-25 | Very little weathered coal in brown & chocolate brown very bentonitic shale |
| 25-35 | Brown silty weathered shale |
| 35-40 | Grey s & p ss |
| 40-55 | Grey siltstone |
| 55-60 | Dark grey & brown grey shale |
| 60-80 | Grey silty shale |
| 80-90 | Grey siltstone |
| 90-145 | Grey fine ss; hard ledges |
| 145-150 | Grey silty shale |
| | NE cor. 23-70-22 2280; July 11/68 |
| 0-15 | Brown clay; few pebbles |
| 15-20 | Brown silty weathered shale (el. bedrock 2265) |
| 20-25 | Brown silty weathered shale; thin weathered coal seam |
| 25-30 | Brown silty weathered shale; some soft weathered black shale |
| 30-40 | Brown weathered siltstone & some brown weathered ss |
| 40-50 | Grey siltstone |
| 50-55 | Grey siltstone; some white bentonite |
| 55-60 | Dark grey & brown grey silty shale |
| 60-70 | Grey siltstone |
| 70-75 | Grey s & p ss |
| 75-100 | Grey silty shale |
| 100-120 | Fine grey ss; some grey siltstone |
| 120-150 | Grey silty shale; some grey siltstone |
| | NE cor. 36-70-22 2150; July 10/68 |
| 0-30 | Light brown silty weathered shale (el. bedrock 2150) |
| 30-40 | Brown grey weathered ss |
| 40-45 | Grey ss |
| 45-50 | Grey silty shale |
| 50-60 | Grey siltstone |
| 60-75 | Grey shale |
| 75-90 | Grey fine ss; some grey siltstone |
| 90-115 | Grey ss; hard ledges |
| 115-120 | Grey ss; ledge of harder brown ss |
| 120-130 | Grey silty shale |
| 130-150 | Bluish grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-19-70-23 2252; Aug. 15/68 |
| 0-70 | Brown, brown grey & grey silty clay; very few small pebbles |
| 70-95 | Grey silty shale; some grey siltstone (el. bedrock 2182) |
| 95-105 | Grey fine ss |
| 105-120 | Grey siltstone |
| 120-125 | Grey shale; hard ledge |
| 125-130 | Grey shale |
| 130-140 | Grey siltstone |
| 140-150 | Grey ss |
| | NE cor. 32-70-23 2230; Aug. 14/68 |
| 0-15 | Well-sorted brown lake clay |
| 15-30 | Well-sorted grey lake clay |
| 30-85 | Grey silty clay; few pebbles |
| 85-150 | Sandy soft grey clay |
| | NE cor. 14-70-24 2252; Aug. 15/68 |
| 0-5 | Very sandy brown clay |
| 5-70 | Silty grey clay; few pebbles & boulders |
| 70-80 | Grey shale (el. bedrock 2182) |
| 80-85 | Grey & some brown shale; very thin coal seam |
| 85-95 | Grey shale |
| 95-100 | Dark grey shale; very thin coal seam |
| 100-115 | Grey silty shale |
| 115-125 | Coarse to medium-grained grey ss |
| 125-130 | Soft green grey shale |
| 130-135 | Coal trace in grey shale |
| 135-145 | Very soft grey silty shale |
| 145-165 | Grey siltstone & fine grey ss |
| | Lsd. 14-24-71-17 2247; Sept. 27/69 |
| 0-15 | Brown silty clay |
| 15-20 | Brown weathered siltstone (el. bedrock 2232) |
| 20-25 | Brown weathered fine ss; some ironstone |
| 25-45 | Brown weathered fine ss; some brown weathered silty shale |
| 45-75 | Weathered brown grey & grey soft ss |
| 75-80 | Light grey to creamy white hard ss |
| 80-100 | Brownish grey fine ss |
| 100-115 | Grey siltstone |
| 115-125 | Grey silty shale |
| 125-135 | Grey coarse siltstone |
| 135-145 | Grey fine ss |
| 145-150 | Grey siltstone |
| | Lsd. 12-2-71-18 2610; Aug. 12/68 |
| 0-15 | Brown silty clay |
| 15-60 | Grey silty clay; few pebbles & boulders |
| 60-140 | Grey silty to sandy clay; many gravel & sandy stringers; many boulders |
| 140-150 | Soft grey silty shale (el. bedrock 2470) |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 12-10-71-18 2565; Aug. 12/68 |
| 0-15 | Brown silty clay; few pebbles |
| 15-75 | Grey silty clay; some boulders |
| 75-115 | Disturbed grey shale |
| 115-125 | Disturbed grey shale; coal trace |
| 125-150 | Grey silty to sandy clay; many small pebbles; many coal fragments |
| | Lsd. 2-17-71-18 2475; Aug. 12/68 |
| 0-20 | Brown grey silty clay; few small pebbles |
| 20-105 | Grey silty clay; few small pebbles |
| 105-135 | Pea gravel & sand; abandoned |
| | NE cor. 19-71-18 2453; Aug. 12/68 |
| 0-10 | Brown clay; few small pebbles |
| 10-120 | Grey clay; few sandy lenses; few pebbles & boulders |
| 120-150 | Silty to sandy grey clay |
| | Lsd. 10-31-71-18 2480; Aug. 12/68 |
| 0-15 | Brown clay; few small pebbles |
| 15-150 | Grey clay; few pebbles; few sandy lenses |
| | NE cor. 19-71-19 2416; July 17/68 |
| 0-10 | Brown clay; few pebbles |
| 10-130 | Grey clay; few pebbles & boulders; sandy lense @ 60 feet |
| 130-150 | Grey soft shale (el. bedrock 2286) |
| | NE cor. 32-71-19 2393; July 17/68 |
| 0-15 | Brown silty clay; few pebbles |
| 15-85 | Grey silty clay; few pebbles & sandy lenses |
| 85-110 | Grey, slightly weathered silty soft shale (el. bedrock 2308) |
| 110-120 | Grey siltstone; trace of brown grey fine ss |
| 120-130 | Grey silty shale |
| 130-135 | Grey silty shale; trace of dark grey & dark brown shale |
| 135-150 | Soft grey silty shale |
| | NE cor. 8-71-20 2285; July 13/68 |
| 0-15 | Brown clay; small pebbles |
| 15-105 | Grey silty clay; many small pebbles; large boulder @ 65 feet |
| 105-150 | Soft sandy clay; many small pebbles |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 10-71-20 2470; July 13/68 |
| 0-45 | Brown & grey clay |
| 45-70 | Grey siltstone; some grey shale (el. bedrock 2425) |
| 70-75 | Very light grey ss |
| 75-80 | Dark grey silty shale |
| 80-120 | Fairly uniform grey siltstone |
| 120-125 | Green grey silty shale |
| 125-130 | Grey silty shale |
| 130-140 | Grey siltstone |
| 140-150 | Grey silty shale |
| | NE cor. 12-71-20 2430; July 13/68 |
| 0-10 | Brown clay |
| 10-30 | Grey silty clay; few pebbles |
| 30-35 | Fine grey ss; some siltstone (el. bedrock 2400) |
| 35-60 | Very coarse to medium-grained grey siltstone |
| 60-65 | Grey silty shale |
| 65-70 | Dark brown & dark grey shale; coal trace |
| 70-80 | Dark grey silty shale |
| 80-85 | Grey silty shale |
| 85-90 | Fine grey ss |
| 90-105 | Grey siltstone; some grey ss |
| 105-120 | Grey shale |
| 120-150 | Grey siltstone; few ledges of fine grey ss |
| | NE cor. 19-71-20 2165; July 15/68 |
| 0-45 | Brown grey clay; many pebbles & boulders |
| 45-100 | Grey clay; many boulders; many coal fragments |
| 100-150 | Grey sandy clay; sandy lenses; many boulders |
| | NE cor. 21-71-20 2280; July 13/68 |
| 0-5 | Brown grey clay |
| 5-30 | Brown weathered siltstone (el. bedrock 2275) |
| 30-45 | Grey silty shale |
| 45-55 | Grey ss |
| 55-75 | Grey shale |
| 75-120 | Fairly uniform grey siltstone |
| 120-125 | Grey fine ss |
| 125-140 | Grey silty shale |
| 140-145 | Dark grey shale |
| 145-150 | Grey silty shale |
| 150-165 | Grey siltstone; very little grey ss |
| | NE cor. 23-71-20 2315; July 15/68 |
| 0-30 | Brown & grey clay |
| 30-45 | Grey silty clay |
| 45-60 | Grey very silty shale (el. bedrock 2270) |
| 60-70 | Grey siltstone |
| 70-80 | Grey fine ss; some coarse siltstone |
| 80-85 | Grey siltstone |
| 85-145 | Grey silty shale; some grey siltstone |
| 145-155 | Grey siltstone; some grey fine ss |
| 155-180 | Greenish grey silty shale |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 32-71-20 2125; July 15/68 |
| 0-15 | Brown grey silty clay; many boulders |
| 15-30 | Many boulders in brown clay |
| 30-45 | Silty grey shale (el. bedrock 2095) |
| 45-60 | Fine uniform grey ss |
| 60-70 | Grey siltstone |
| 70-90 | Grey soft ss; lost circulation; abandoned |
| | NE cor. 34-71-20 2231; July 20/68 |
| 0-20 | Brown & grey clay; few pebbles |
| 20-30 | Grey silty shale (el. bedrock 2211) |
| 30-40 | Grey ss & siltstone |
| 40-55 | Very soft grey ss |
| 55-80 | Grey shale |
| 80-105 | Fine to coarse s & p ss |
| 105-115 | Grey silty shale |
| 115-120 | Grey coarse siltstone |
| 120-150 | Grey shale & siltstone |
| | NE cor. 36-71-20 2275; July 18/68 |
| 0-10 | Brown silty clay; small pebbles |
| 10-60 | Grey silty clay; small pebbles & few boulders |
| 60-65 | Some coal; grey shale; soft sandy clay & pebbles |
| 65-150 | Very soft grey shale; some grey clay; boulders & pebbles; many coal fragments |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 11-16-71-23 2400; Aug. 14/68 |
| 0-15 | Brown silty clay; few pebbles |
| 15-50 | Grey silty clay; few pebbles |
| 50-132 | Some clay & reworked bedrock; small pebbles & some coal fragments |
| 132-165 | Brown grey soft ss |
| 165-180 | Brown grey soft ss & some grey siltstone |
| | Lsd. 5-28-71-23 2530; Aug. 14/68 |
| 0-10 | Brown clay; few pebbles |
| 10-20 | Brown grey clay; few pebbles |
| 20-115 | Grey clay; few boulders |
| 115-125 | Sandy grey clay; few gravel lenses |
| 125-150 | Sandy grey clay |
| | Lsd. 9-6-72-16 2150; Sept. 27/69 |
| 0-5 | Brown weathered well-sorted lake clay |
| 5-15 | Grey well-sorted lake clay |
| 15-40 | Very dark grey well-sorted lake clay |
| 40-60 | Grey well-sorted clay |
| 60-135 | Grey silty clay; few sandy stringers; few small pebbles |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | NE cor. 7-72-19 2265; July 17/68 |
| 0-10 | Brown clay; few pebbles |
| 10-20 | Brown grey clay; few pebbles |
| 20-75 | Grey clay; many pebbles |
| 75-85 | Sandy grey clay; thin gravel stringers |
| 85-120 | Silty to sandy grey clay |
| | Lsd. 8-20-72-19 2210; July 17/68 |
| 0-20 | Brown clay; many boulders |
| 20-105 | Grey clay; many boulders |
| 105-150 | Very sandy soft clay; many grey sand lenses; small pebbles |
| | NE cor. 2-72-20 2162; July 18/68 |
| 0-10 | Brown clay; many pebbles; few boulders |
| 10-75 | Grey clay; pebbles & few boulders |
| 75-150 | Grey silty to sandy clay; gravel stringers; many boulders; some disturbed bedrock |
| | NE cor. 9-72-20 2112; July 20/68 |
| 0-20 | Brown clay; few pebbles & boulders |
| 20-25 | Brown grey weathered silty shale (el. bedrock 2092) |
| 25-55 | Grey shale & siltstone |
| 55-65 | Blue grey shale |
| 65-75 | Grey siltstone; hard ledge @ 85 feet |
| 75-85 | Grey shale |
| 85-90 | Grey siltstone |
| 90-100 | Grey silty shale |
| 100-110 | Grey siltstone, very dry |
| 110-130 | Silty grey shale |
| 130-150 | Grey siltstone |
| | NE cor. 22-72-20 2080; July 20/68 |
| 0-20 | Brown & brown grey clay; pebbles |
| 20-70 | Grey clay; pebbles; few boulders |
| 70-80 | Very sandy clay; very fine gravel seam |
| 80-105 | Very sandy clay; sand lenses |
| 105-135 | Soft grey silty shale; some grey siltstone (el. bedrock 2025) |
| 135-150 | Blue grey fine ss; coarse blue grey siltstone |
| 150-170 | Fine blue grey ss; some brown grey shale & siltstone |
| 170-190 | Grey silty shale |
| 190-195 | Fine grey ss; lost circulation |

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 9-5-72-23 2805; Aug. 14/68 |
| 0-5 | Brown clay |
| 5-10 | Soft brown weathered ss (el. bedrock 2800) |
| 10-30 | Brown weathered shale |
| 30-35 | Brown weathered ss |
| 35-40 | Brown weathered siltstone & ironstone |
| 40-70 | Grey silty shale |
| 70-75 | Light blue grey shale; lost circulation |
| 75-115 | Grey siltstone, fairly uniform |
| 115-120 | Dark grey silty shale |
| 120-150 | Grey shale; some grey siltstone |
| | Lsd. 12-13-72-23 2540; Aug. 15/68 |
| 0-8 | Dark brown clay; few boulders |
| 8-20 | Dark brown, dark grey & grey shale (el. bedrock 2532); lost circulation |
| 20-25 | Grey to dark grey shale; coal trace |
| 25-30 | Greenish grey silty shale |
| 30-35 | Grey shale; some white grey bentonite |
| 35-90 | Grey silty shale; some grey siltstone |
| 90-95 | Grey shale; some fine grey ss |
| 95-100 | Grey silty shale |
| 100-105 | Grey ss |
| 105-110 | Dark brown shale; coal trace; some white grey bentonite |
| 110-120 | Grey ss; some silty grey shale |
| 120-130 | Very bentonitic shale; some grey ss |
| 130-150 | Green grey silty shale |

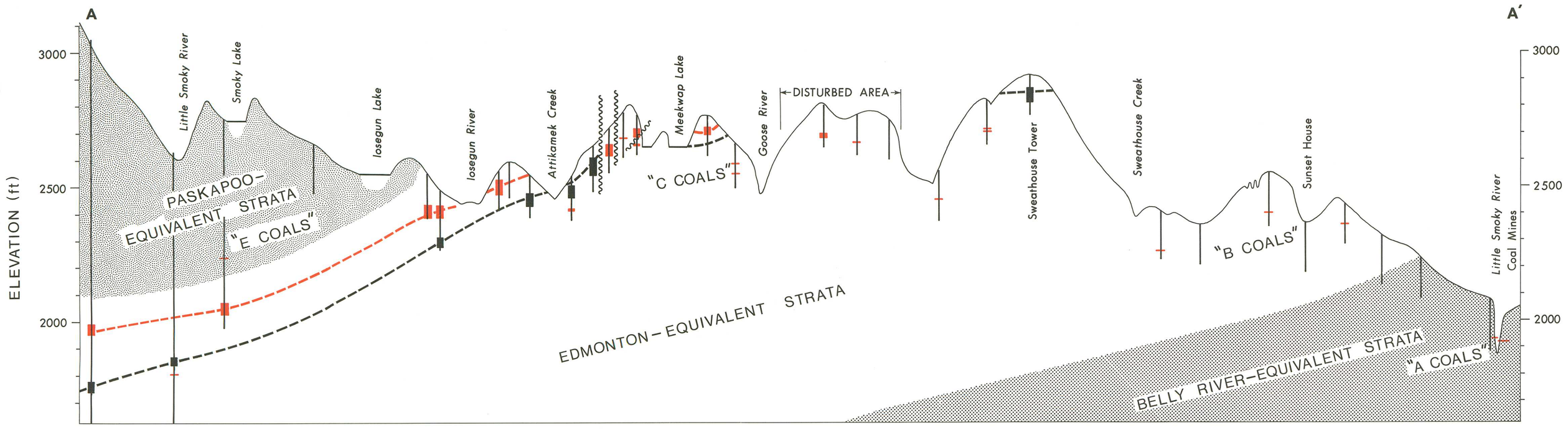
| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 2-16-72-23 2800; Aug. 14/68 |
| 0-5 | Brown clay |
| 5-15 | Rusty brown weathered shale; some ironstone (el. bedrock 2795) |
| 15-20 | Light brown weathered shale |
| 20-35 | Blue shale |
| 35-55 | Grey silty shale |
| 55-60 | Brown carbonaceous shale |
| 60-70 | Grey siltstone; some fine grey ss |
| 70-90 | Grey shale |
| 90-95 | Thin coal seam in grey shale |
| 95-117.5 | Grey shale; traces of brown grey carbonaceous shale |
| 117.5-119.5 | Coal seam (el. top coal 2682.5) |
| 119.5-125 | Blue grey siltstone |
| 125-165 | Grey siltstone |
| | Lsd. 7-18-72-23 2700; Aug. 15/68 |
| 0-15 | Brown & grey clay; few boulders & pebbles |
| 15-30 | Grey silty shale (el. bedrock 2685) |
| 30-55 | Grey siltstone |
| 55-60 | Thin coaly seam in grey shale |
| 60-70 | Grey silty shale |
| 70-95 | Light grey very bentonitic shale |
| 95-105 | Grey shale |
| 105-115 | Grey, dark grey & brown grey shale; thin coal seam |
| 115-150 | Grey shale |

# APPENDIX B

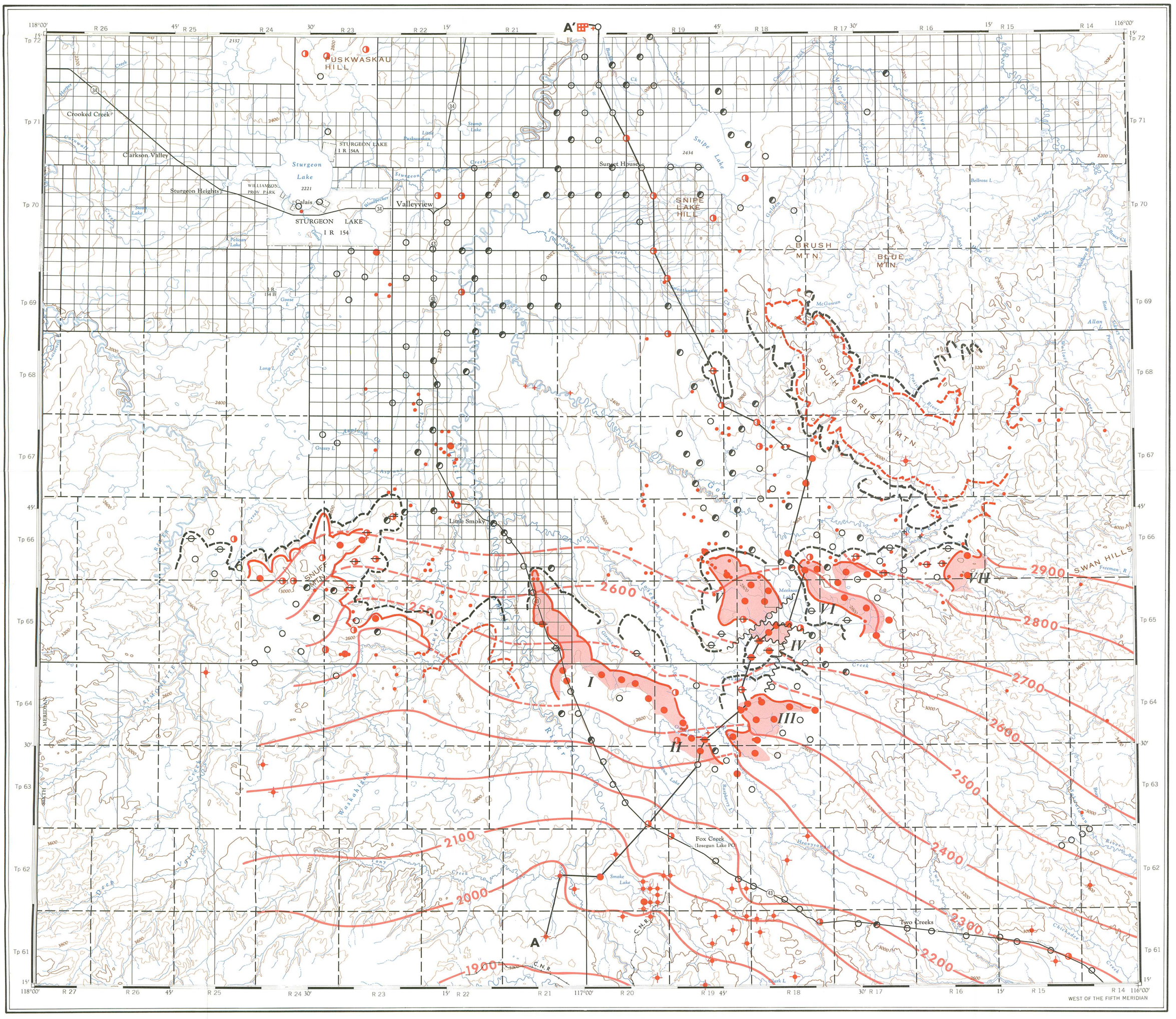
# LOG, CANADIAN UTILITIES LIMITED PILOT HOLE, FOX CREEK, ALBERTA

Appendix B: Canadian Utilities Limited Coal Pilot Hole, Fox Creek Area, Alberta

| Depth (feet) | Location W 5th Mer. Top elevation (feet); Date |
|---|---|
| | Lsd. 10-18-64-18 2605; Nov. 3/70 |
| 0-10 | Brown grey weathered silty clay; few pebbles & small boulders |
| 10-50 | Grey silty clay |
| 50-64 | Grey sandy clay; many pebbles & boulders |
| 64-67 | Grey soft ss (el. bedrock 2541) |
| 67-70 | Light grey s & p ss |
| 70-73 | Brownish grey shale |
| 73-81 | Grey slightly silty shale |
| 81-83 | Dark brown & little black carbonaceous shale; trace of coal |
| 83-85 | Light grey, grey & brown grey shale; some creamy white bentonite |
| 85-86 | Hard ledge of grey to dark grey siltstone |
| 86-90 | Grey coarse siltstone |
| 90-101 | Grey silty shale |
| 101-114 | Grey very silty shale with few brown flecks |
| 114-117 | Brown very bentonitic & carbonaceous shale |
| 117-121 | Coal seam (el. top coal 2488) |
| 121-124 | Grey shale parting |
| 124-126 | Coal seam |
| 126-133 | Brown shale with two thin coal seams |
| 133-138.5 | Coal seam |
| 138.5-153 | Four thin coal seams with brown & black shale partings |
| 153-156 | Coal seam with thin shale partings |
| 156-161 | Black & brown carbonaceous shale with some dirty coal |
| 161-164 | Coal seam with thin shale parting |
| 164-170 | Brown bentonitic shale with some dirty coal |
| 170-171 | Grey shale |
| 171-181 | Light grey shale |
| 181-185 | Grey to dark grey shale; very small trace of coal |




Section A-A': Smoke Lake to Little Smoky Mines




SCALE 1:250,000
1 Inch to 4 Miles Approximately

Miles 5 0 5 10 15 20

Kilometres 5 0 5 10 15 20 25 30

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Coal Geology by J.D. Campbell 1968 - 69

# FIGURE 5
# COAL RESOURCES
# FOX CREEK AREA
# ALBERTA

LEGEND

- R.C.A. coal testhole intersecting coal > 2 feet thick
- R.C.A. coal testhole intersecting coal trace
- R.C.A. coal testhole penetrating bedrock, no coal
- R.C.A. coal testhole intersecting Kneehills Member
- R.C.A. coal testhole intersecting drift only
- Other shallow boreholes reporting coal (water well, Alberta Power Ltd. testhole, seismic shothole)
- Oil or gas well intersecting coal
- Land parcel licensed for coal mining
- Outcrop, coal
- Outcrop, Kneehills Member
- Borehole coal intersection (in section)
- Borehole Kneehills Member intersection (in section)
- Line of Ardley-equivalent coal zone outcrop, subcrop, elevation; approximate, assumed
- Structure contour on base of Ardley-equivalent coal zone; subsurface, projected (interval 100 feet)
- Coal "field"; overburden on Ardley-equivalent coal zone <100 feet; numbered I - VII
- Line of Kneehills Member outcrop, subcrop, elevation; approximate, assumed
- Glacier - induced fault
- Line of section
- Topographic contour (interval 200 feet)