QUINTETTE PROJECT

BABCOCK AREA

INTERIM REPORT

21 December, 1971

Updated 8 January, 1972

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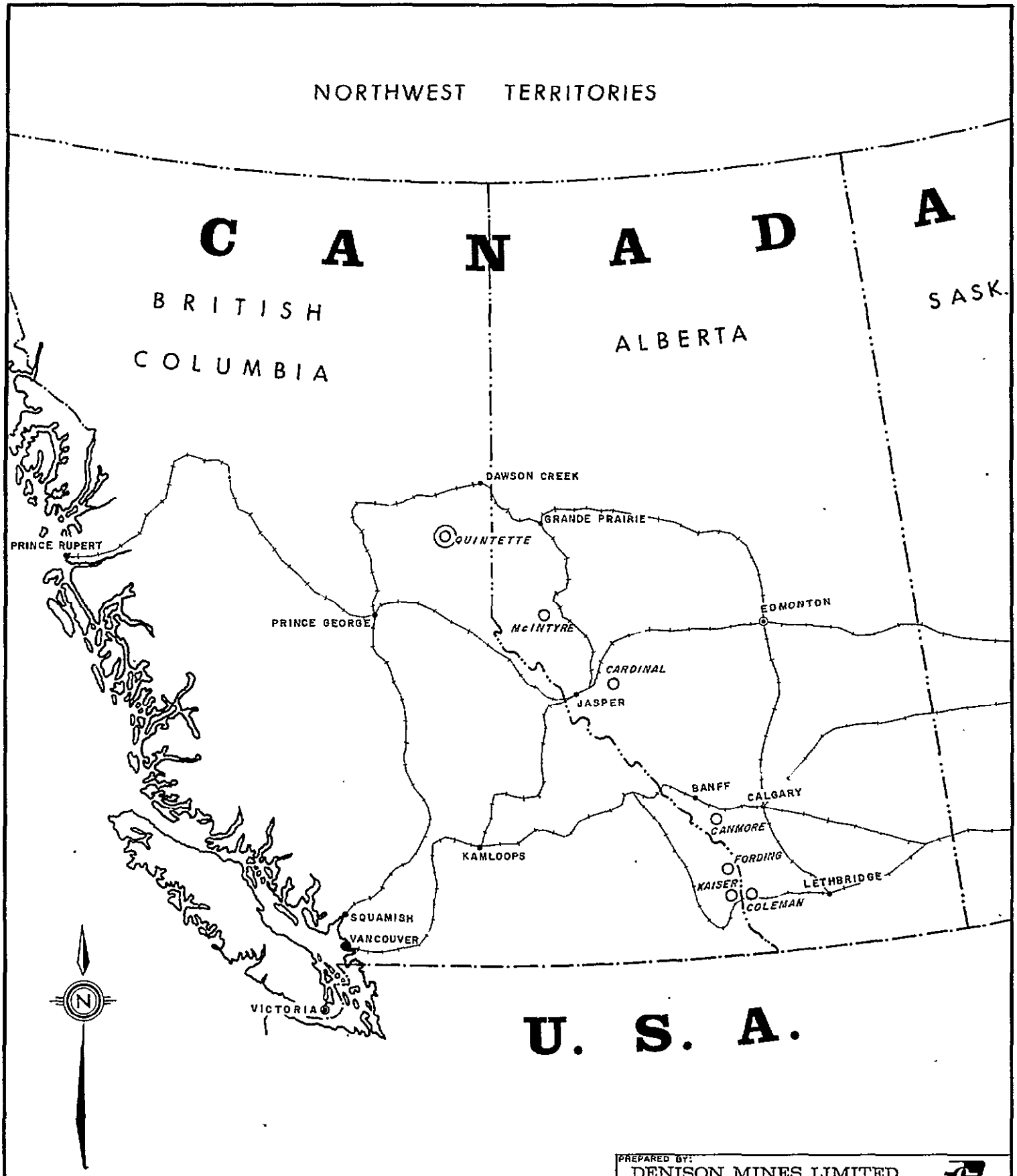


PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

LOCATION MAP

DRAWN BY: E. Toth	DATE: Dec. '71	SCALE: 1" = 130mi±
APPROVED BY:	DRAWING NO: MISC 71 - 0262-R01	

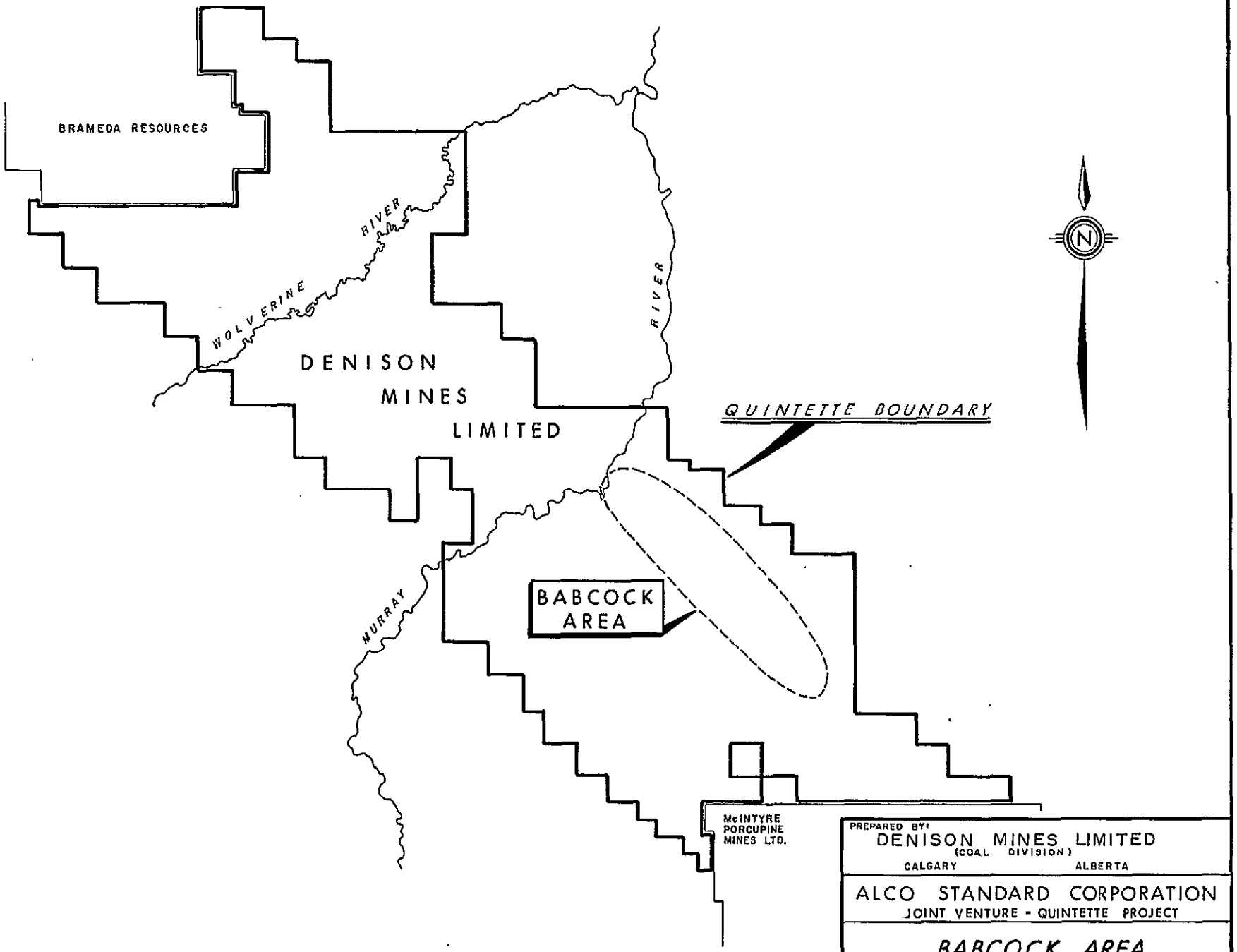
SUMMARY

The Babcock Area of the Quintette project is located just south of the Murray River, 60 miles southwest of the City of Dawson Creek, British Columbia.

This area is the subject of an on-going program of coal exploration and development which is expected to result in the preparation of a feasibility study in mid-1972. This present report has been prepared to provide a broad estimate of the quantity and quality of coal to be expected.

The Babcock area, which represents about one tenth of the Quintette property, has been geologically mapped at a scale of one inch to four hundred feet and ten drill holes (both diamond and rotary) have been completed. The results from two adit washability studies have also been received. This work has outlined a large, gently plunging synclinal structure with dips on the limbs from 0 to 15 degrees. This structure contains a coal reserve of some 250 million tons in place. Of this amount, 60 million tons are foreseen to be recoverable. Additional reserves are expected in areas which have not yet been tested.

Approximately 70% of the analyses of clean product to date have had Free Swelling Indices between 7½ and 9+. This, along with the other analytical data, indicates that a high grade metallurgical coal may be produced with only minor on-site blending. Volatiles are expected to be less than 24% on an "as received" basis assuming 5% moisture and a 7% air-dried ash content.



Scale 1:253433

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JOINT VENTURE - QUINTETTE PROJECT

BABCOCK AREA

Drawn by: E. Toth	Date: OCT. '71	Scale: 1" = 4 mi
App. by:	Drawing No: QNTT 71-0234-R01	

INTRODUCTION

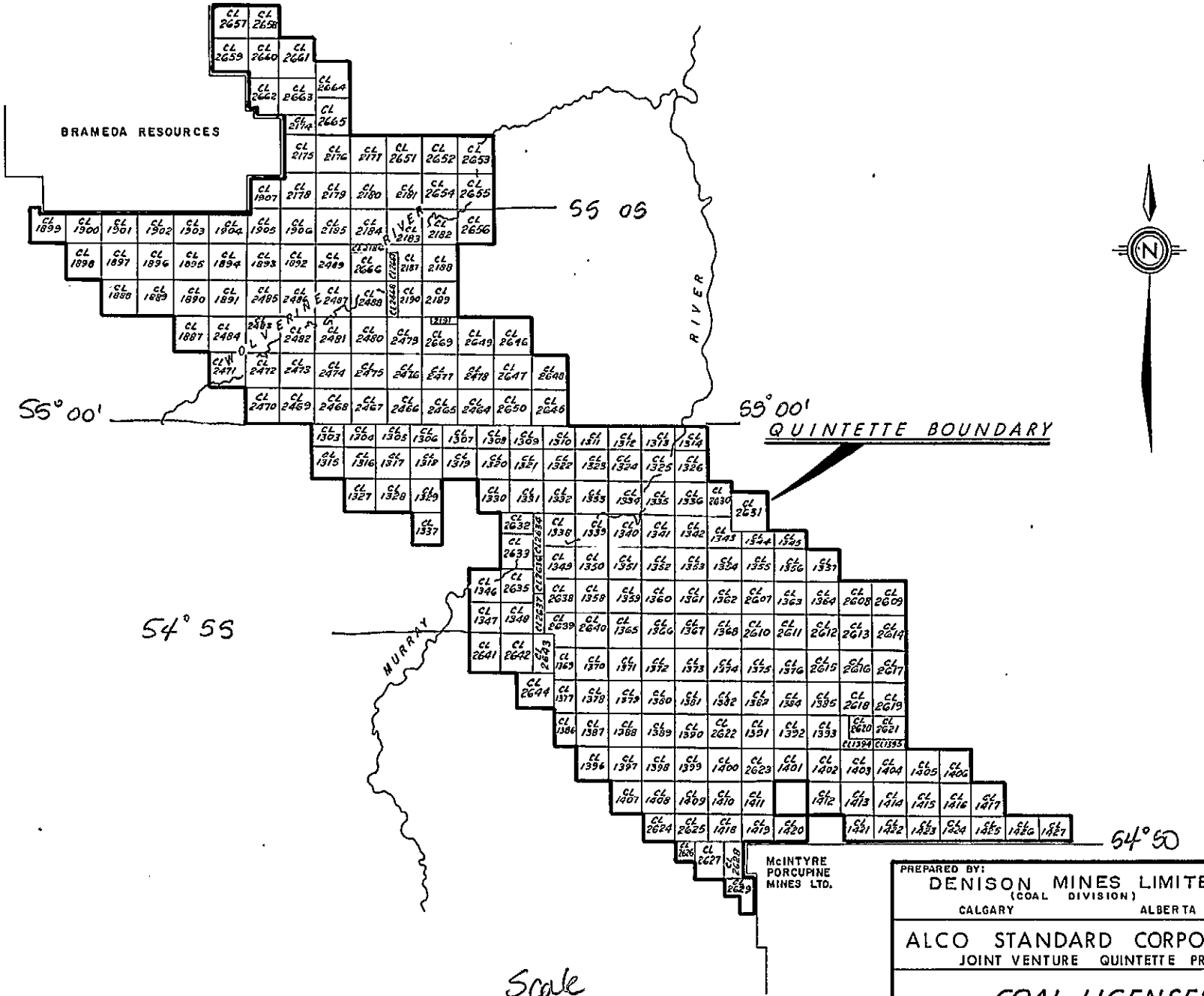
The exploration of the Quintette property was instituted after Denison Mines Limited and Alco Standard Corporation, through its World Resources Division and Barnes & Tucker Coal Co., its coal operating entity, had entered into a joint-venture agreement early in 1971. A program of geological mapping, with ¼ mile detail on a photo-reduced 1:50,000 scale, preceded the drilling, mapping and adit driveage which is dealt with in this report.

Since the work on the Quintette property is continuing at present, readers of this interim progress report should be aware that constant up-dating of the information will continue as the work progresses and additional data is received.

The main purpose of this report is to provide a current statement of progress in the Babcock area. While some changes are expected, there is no reason to believe that any major problems will arise that would materially and detrimentally affect the order of magnitude of the coal deposit or the estimates of quality and quantity of recoverable clean coal.

The investigation of the Babcock area currently involves 10 widely spaced (3000 - 6000 feet apart) diamond and rotary drill holes. Seven adits have been driven and two sets of washability data have been received. (See Appendix A). Two of the adits were placed under a small plateau of coarse sandstone and were abandoned due to oxidation of the coal. (The problem of oxidation here is a local one which does not affect the major synclinal deposit). The seventh adit is underway.

The continuing development on the Babcock area involves a major program of trenching along the northwest face of Babcock Mountain to expose the most important seams throughout their entire cross-sectional length as well as a combined program of diamond and rotary drilling; the driveage of more, larger adits; and exploration of the area to the northeast of the main deposit to determine the possibility of having a combined underground and strip operation. After this work is completed, a feasibility study will be commissioned. The results of the feasibility study should be available by about the middle of 1972.



Scale 1:253433

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JOINT VENTURE QUINTETTE PROJECT

COAL LICENSES

Drawn by : E. TOTH	Date : OCT. '71	Scale : 1"= 4 mi
App. by :	Drawing No: QNTT 71 - 0202 - R02	

PROPERTY, LOCATION AND ACCESS

The Quintette property consists of 253 coal licences comprising 226 square miles staked and registered in the name of Denison Mines Limited under the laws of the Province of British Columbia. (QNTT-71-020-R02).

It is this property which is the subject of a joint-venture agreement between Denison Mines Limited and Alco Standard Corporation. The agreement provides for the eventual formation of a new company, to be jointly owned by these companies, which will operate the mining ventures on the property.

The Babcock area is located in the southern half of the Quintette project, just south of the Murray River on the northeastern side of the property. (See map QNTT-71-0234-R01). The Quintette property, itself, is located in British Columbia within the Rocky Mountain Foothills. It is well located with respect to the Murray river valley which constitutes the main drainage system as well as the most important potential transportation route in the immediate area. The Murray River bisects the property into north and south halves.

One of the main tributaries in the headwaters of the Murray River, begins in the Monkman Pass. The proposed Monkman Pass rail route (80 miles from Babcock to existing rail facilities) would join the Canadian National Railway at Hansard, 46 miles east of Prince George. Another alternative rail route would be to follow the Murray downstream to the northeast from Babcock (66 miles) and join the Pacific Great Eastern Railway at East Pine which is 218 miles N.E. of Prince George. The joint utilization of a proposed rail route from the property

GATES MEMBER - SUMMARY OF UNITS

The first unit of rock containing coal begins at the contact with the overlying Hulcross marine shales, and varies from 90 to 140 feet in thickness. The zone has areas containing up to three coal intervals, seams A, B, and C respectively. The second zone of coal bearing rock is 140 feet $\pm$ 10 feet from the first zone and maintains a relatively constant thickness of 140 feet. This zone commonly contains four seams, D, E, F and G, respectively. Seam G does not, however, remain continuous throughout the Babcock region. The third and last zone is of the order of 120 feet $\pm$ 40 feet from the second and it consists of a total interval of 70 feet containing two, sometimes three, and occasionally four seams, H, I, J and K, respectively The underlying Moosebar shales are approximately 340 feet from the last coal zone. Earlier stratigraphic work, and one drill hole (D-7102) which was drilled through the entire Gates section indicated there were no coal bearing horizons in the bottom 340 feet of the Gates. Thus, in order to cut drilling costs and obtain a maximum amount of geological information, most drill holes were discontinued below the last seam of the last coal zone. This does not preclude possibility of coal intersections occuring below the last coal zone, but the lithologies studied in the last 340 feet indicate it unlikely that laterally significant coal horizons exist.

of Brameda Resources Ltd. (Brameda) is presently under discussion with the developers of the Brameda property which is adjacent to the north west boundary of Quintette.

Once the coal reaches Prince George or Hansard, it can be delivered to any of the existing or proposed major B.C. ports or bulk loading terminals. The distances from present rail to these terminals are as follows:

Prince George to Prince Rupert (CN)	467 miles
Prince George to Squamish (PGE)	426 miles
Hansard to Prince Rupert (CN)	513 miles
Hansard to Squamish (CN, PGE)	472 miles
Hansard to Roberts Bank (CN)	699 miles

Discussions have been held at the highest levels with officials of the Canadian National Railways and the Pacific Great Eastern Railway. Both railways are aware of the developments on the Quintette property and have begun preliminary assessments of various routes. At present no conclusions can be drawn as to which is the most likely route for coal movement from Babcock. Rail haulage in British Columbia is not only very competitive, but each route has its own particular advantages which will be fully evaluated in the near future.

GEOLOGY

GENERAL

The Quintette Project consists of 226 square miles comprising 253 coal licences located over large stretches of coal-bearing cretaceous rocks in the Rocky Mountain Foothills. The regional geology of this area has two favourable units, the Gates Member of the Commotion Formation and the Gething Formation, which are both present in the stratigraphic section. These units contain 2.8 billion tons of potential coal-in-place in structures of varying degrees of complexity, to a depth of 1500 feet. Only a small portion of this potential has been tested by drilling and detailed geological mapping. The results to date have confirmed the original estimates of potential reserve in these areas. Although part of the remaining potential may not be economically viable for some time due to structural and stratigraphic complexities, large areas with immediate potential still remain to be tested.

This report deals with the Babcock area which is the one part of the property on which testing has been sufficient to outline a probable reserve. The main structure is a broad, weakly plunging (5 to 10 degrees) syncline which encompasses at least 5 square miles of coal bearing strata which do not exceed a depth of 1500 feet. The area has been mapped at a scale of 1 inch to 400 feet (1:4800) and the resulting map has been photo-reduced to a scale of 1 inch to 1000 feet (1:2,000). In conjunction with this mapping, ten diamond and rotary holes were placed at widely spaced intervals (3000 feet to 6000

feet apart). This work has confirmed the gross structural interpretation and outlined a probably reserve of some 250 million tons of coal in place. The results of the geological mapping and the longitudinal and cross-sections derived from it are shown on Drawings QNTT-71-0226-R01 and QNTT-71-0259-R01, (in back pocket).

STRUCTURE OF BABCOCK MOUNTAIN

The geological mapping at the 400 foot scale and the drilling have demonstrated that the main structural feature on Babcock Mountain is a broad, asymmetrical syncline which plunges southeast at 4 to 10^{o}. (See maps QNTT-71-0226-R01 and QNTT-71-0259-R01 in back pocket). The change in pitch is gradual and the beds steepen progressively to the southeast. In the cross sections, the consistent westerly pitch is the result of the asymmetry of the syncline and the fact that its axial plane dips about 82^{o} northeast. The area of the syncline, as it is presently defined, encompasses all of the drill holes and, of course, constitutes the host of the major coal reserve. In general, the coal seams follow the same broad structural pattern as the enclosing syncline, although minor irregularities may be found when more detailed data, especially from the northwest face of Babcock Mountain, is available. Present indications are that little or no disturbance affects the coal seams within the syncline.

Northeast of holes D-7104, R-7107 and R-7114, there is a zone of structural complexity which is characterized by tight folds with dips up to 75 and 80 degrees. These folds have short-wave lengths in the order of 1,000 feet. The deformation in this zone appears to be more intense to the northwest and to die out to the southeast where the folds apparently culminate at the surface where the strata are dipping 10 to 15 degrees eastward. Farther to the southeast, in the area of Babcock Creek, and on strike with this zone of deformation, more severe folding is again observed. This suggests the zone is continuous although not uniformly developed throughout its length.

On the southwest side of the main syncline, there is a prominent monocline or anticline which abruptly terminates the reserve area. The axis of this structure is located just southwest of holes D-7101, D-7102, R-7103, R-7105 and R-7106. There is some apparent thickening indicated in the coal intersections in hole R-7103 which suggests the axial plane of the monocline dips to the northeast.

The large scale structural picture has been developed from drill hole data and surface mapping. At this point, no definitive interpretation can be given for such small scale features as warps, minor faults, and boudinage structure which may exist at depth. Although little difficulty is expected in this regard, more definitive statements will be available when the trenching program has been completed.

To the northeast of the main syncline, the structures at depth have been subjectively projected from those to the northwest and southeast, along with data in drill holes D-7104 and R-7114. No natural outcrops exist in this region and further drilling and trenching will be required. The folding in this area offers considerable promise for locating moderate-sized areas with stripping potential and one of the main objectives of the current program is to test this potential.

STRATIGRAPHY

The exploration activity has been concentrated predominately on the Gates member of the Commotion Formation. The Gates member, previously outlined in a Regional Report, is a clastic, possibly near shore, deltaic sequence of river gravels, sands, shales, siltstones, mudstones and coal. In the vicinity of Babcock Mountain the Gates member is approximately 1000 feet thick.

Although the correlation of seams in the Babcock area has been remarkably easy, and the depositional environments appear to have been locally consistant, there are numerous examples of incomplete or interrupted depositional sequences which indicate that regional cyclothems were probably not operative in this area when the seams were formed. This means that regional correlations need not be expected in other areas of the Quintette property, although there is every likelihood that other depositional basins similar in size to the Babcock basin may be expected.

GATES MEMBER

The Gates member of the Commotion Formation can be divided into three major units each of which contains a group of 3 or 4 seams. These units are designated the upper, middle, and lower units in this report.

Drawing numbers QNTT-71-212 to 219 inclusive (back pocket) show the seam variations from hole to hole within individual seams of economic interest.

Drawing QNTT-71-0220 (back pocket) demonstrates the relationship of these seams to each other and the above mentioned upper, middle, and lower units can also be distinguished on this fence diagram as the grouping of seams into three distinct bands is obvious. These fence diagrams (QNTT-71-212 to 220) have been drawn instead of cross sections as the data was not considered to be close enough to draw a large number of sections. In these drawings, the top of each drill hole is located in its proper planimetric position as indicated on the horizontal scale. Each drill hole or seam section has then been rotated ninety degrees into the plane of the drawing to provide a visual presentation of variation within the section and from hole to hole. The vertical scale is exaggerated to allow more detail to be presented. (Note that vertical scale on Seam "J" is smaller than on other seam fence diagrams)

GATES MEMBER - SUMMARY OF UNITS

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Drawing QNTT-71-0220-R02 illustrates the data discussed above. It should be made clear, however, that the seams marked on this diagram are schematic only and they may not always be seams, but rather coal intervals of no economic importance. This is particularly true within the upper coal unit, and seams A, B and C can be considered only coal intervals. No suggestion of quality is implied in this schematic presentation of the facies changes and correlation of seams within the Babcock area.

SEAM DESCRIPTIONS

Reference should be made to the individual fence diagrams while considering the following seam descriptions (QNTT-212-219 inclusive). These descriptions are based on the observation of drill cores and the interpretation of density, neutron, and gamma ray log measurements obtained from rotary drill holes. The fence diagrams exhibit only the detailed density curves as these are a good representation of the ash content in the coal seams. Interpolated ash values are also given as a guide along the side of each hole. These ash values should not be confused with analytical values as they have been calculated by the logging engineer (of BPB Instruments (Canada) Ltd.) over intervals designated by the project geologist. The basis of calculation is a comparison with the electronic responses of the borehole logging device in core holes D-7102 and R-7103 which had been chemically analyzed. Occasionally a cave in the seam will give a response similar to shale on the density log (seam D, hole D-7102, Dwg. QNTT-71-212-R02); and, therefore, interpretation should not be attempted without using all three logs (QNTT-71-0204-R02).

On the fence diagrams, correlation lines have been drawn from seam to seam where obvious partings or bands of coal could be recognized. No suggestion regarding minability is implied.

UPPER UNIT

The upper unit of the Gates member contains several coal intervals tentatively correlated and labelled A, B and C. These "seams" range from 2 to 8 feet in thickness, although they are generally only 2 feet thick. Seam B becomes 8 feet thick in hole R-7105. This seam is also the only interval consistently present. Both seams A and C come and go with no apparent regularity, while seam B varies from one to two bands. All three "seams" are approximately 40 feet apart with intervening cyclic layers of sand, silt, shale and coal. If the full sequence does not develop, shale is usually the unit which does not appear. None of the seams are considered to be of economic importance.

MIDDLE UNIT

The interval to the middle unit is generally represented by a disrupted cyclothemic sequence. Only in the vicinity of R-7106 to R-7105, an isolated area in the west central portions of Babcock, is there a lithologic sequence which is not just a sandstone unit. The main lithology in this area is approximately 50 feet of siltstones and sandstones which grade

laterally, and vertically, into coarse sandstones. In part of the area, seam C rests immediately on top of the sandstone unit. The unit varies in thickness from 100 to 150 feet in thickness and consists of extremely hard, clean indurated siliceous sandstones. Considerable difficulty was encountered in drilling this unit, particularly with the reverse circulation equipment. The neutron log indicates that in the bottom 50 feet of the sandstone, the porosity characteristics are considerably different from the rest of the sandstone unit. At the top of this last sandstone bed, another peculiar characteristic is the occurrence of a 4 - 6 inch, extremely dense, radioactive band. The sandstone ends in a conglomerate, varying from 4 to 12 inches in thickness which commonly lies on top of D seam in the middle coal-bearing unit.

In drill holes D-7102 and R-7105, and also in a trench and in Adit 4 on the northwest spur of Babcock Mountain, a shale band (varying from 2 to 4 feet thick) occurs beneath the conglomerate, before D seam is reached. The shale band is probably a remanent of the primary lithology following deposition of seam D. The conglomerate may have replaced much and, in places, all of the shale above D seam. Thus, localized zones of either shale or coal should occur throughout Babcock at the D seam level. This will tend to increase the D seam thickness, in part, or result in an increased shale thickness for the roof. Because of the variability in the lithology, such changes from conglomerate to shale above the D seam are only conjectural at this point.

SEAM D: (Drawing QNTT-71-212-R02)

Description:

In general seam D is a clean seam which contains large intervals up to 5 feet thick with ash contents from 5 to 10 percent. The thickness varies from 7.0 to 17.6 feet, the latter being an aberrant thickness yet to be explained by more detailed drilling (R-7103). The average thickness of seam D is 10 to 12 feet, increasing from the southeast (R-7114, D-7101) and to the west and north. One dirt band is predominate. This band varies from 0.9 feet (D-7102) to 1.2 feet (R-7114) but averages 0.9+ feet. The band is consistently 1.5 feet from the seam floor, and the coal below it has ash content in excess of 20 per cent. It thickens to the southeast and possibly is related to the complimentary thinning of D seam in this direction (D-7114). Coal above the band, for an interval of approximately 1 foot, again exhibits ash levels in excess of 12 per cent. Roughly one foot from the roof of the seam, there is a coal interval that is quite dirty (20 - 40% ash). This level seems to be correlatable in the northwestern region of Babcock (R-7105, D-7104, D-7102, R-7106) while in other regions, the bands of inferior coal are uncorrelated.

The floor lithology is also variable. The floor is predominately a sandy shale, grading to a siltstone and then to sandstone along a north-east and south-southwest direction (D-7107, - R-7105, - D-7110).

SEAM E: (Drawing QNTT-71-0213-R02)

The roof of Seam E is consistantly a siltstone unit which is 10 to 15 feet thick. To the west (D-7102 - R-7103 - R-7105), the sand component seems to decrease so that the unit becomes a shale. The seam itself varies from 8.8 to 13.0 feet in thickness, although the thickness of the thirteen foot seam is actually due to an additional 4 feet of a coal and a carbonaceous shale interval at the bottom of the seam. The average thickness of the seam is approximately 9.0 feet. Two bands of dirt grading to very poor coal are prevalent in the seam. These bands range from poor coal with 43% ash to dirt or shale with greater than 50 percent ash. Even where they grade to 25 percent ash (as in R-7110), the increase in density and the shape of the density logs are similar. These two dirty intervals average approximately 1 foot, becoming 1.5 feet in places. In turn, the two bands divide seam E into three coal intervals, each approximately 2 feet thick, with ash contents varying from two to 16 percent. The average ash in these intervals is greater than 10 percent. The seam is floored by siltstones which exhibit a similar decrease in sand component, to the west (R-7105, R-7103) where shale predominates.

The interval to the next coal seam is 40 to 60 feet. The lithology from the floor of E seam which is siltstone and shale, changes after approximately 10 feet to a dirty sand unit 10 to 40 feet in thickness. The sand unit becomes thicker in drill holes south of D-7102 and D-7107. Southward the interval to seam F also increases. This is most likely a function of the increasing thickness in the sand unit. The vertical

lithological sequence in the interval, however, remains the same; i.e. siltstone-shale (with a decreasing sand component), sandstone, and then a carbonaceous siltstone - shale unit. The siltstones again are prevalent in the northeast (R-7107) and northwest (D-7102) where they are 6 to 10 feet thick and become shale, increasing southward and eastward to 10 to 14 feet thick, in D-7104 and D-7114, respectively. The unit described above forms the roof for the F seam, and despite being classed predominately as a shale, it has a high silt and sand component which probably gives the unit good roof characteristics.

SEAM F: (Drawing QNTT-71-214-R02)

F seam is consistently 7.9 to 9.9 feet thick. R-7103 had a thickness of 19.2 feet for this seam. This abnormal thickness is believed to be structurally controlled. Otherwise, the seam thins from the northwest to the southeast. Holes R-7105 to R-7107 and D-7102 indicate a seam thickness 2.25 to 2.5 feet greater than the southeastern area; however, this thickening is the result of an additional 0.8 to 1.0 foot shale band which overlies a 1.2 to 1.4 foot coal band in the lower part of the seam. Ash contents are consistantly low, in the order of 2 - 12 percent. They are commonly in the order of 6 percent, indicating a generally clean seam.

The floor of F seam changes to the west and south from siltstones (R-7107) to shale which is carbonaceous in part (R-7110). This interval changes to a shale unit which is approximately 40 to 20 feet thick. The shale in turn grades downward to coal seam G in R-7107 and D-7102 whereas in an easterly direction, it grades to interbanded siltstones, shales and

sandstones and it grades to siltstones and sandstones to the west.

Two coal seams are included in the ensuing interval between the middle unit and the lower unit. These seams G, and H, have been placed in middle unit and lower unit respectively. This again is a subjective interpretation to facilitate description because the two seams are quite local in extent, (Drawing QNTT-71-0220). Seam G appears in D7102 and R7107 and Seam H is present only in R7106.

SEAM G: (Drawing QNTT-71-215 -R02)

Seam G has a thickness varying from 6.9 feet to 9.6 feet (R-7102 - R-7107). The ash contents vary from 60 to 15 percent in the main coal interval which is indicative of intercalated dirt bands. A zone of poor coal with 32% ash occurs in D-7102. It may possibly be lithologically equivalent to a 40% ash level in the seam in R-7107. This is suggested by the density log response. The increased thickness of seam G in R-7107 is due to a 2.3 foot band of dirt topped by a small 1 foot coal interval with 20% ash. Laterally seam G grades into shale which is similar to the roof and floor shale about the seam. The shale floor varies from 10 feet in R-7107 to 4 feet in D-7102.

LOWER UNIT

The interval from the middle unit to the lower unit is in the order of 140 feet. From G seam, or from F seam where pertinent, the lithology passes

from shale to siltstone rhythmically, then into a large sandstone unit (130 feet) in the north (R-7107, D-7102, R-7110), or to a consistant siltstone unit in the south and east (R-7114, D-7104). Approximately half way through the interval, at 60 feet, the H zone appears in the middle of a siltstone unit which grades laterally to sandstone and also down section to a sandstone.

SEAM H: (Drawing QNTT-71-216-R02)

The only place which seam H has been located is in hole R-7106 where it is approximately 9.7 feet thick, one rotary sample has been analysed. It had a raw ash of 27% and recovery (at 7% ash) of 61%. In the north and northwest the sand unit which contains seam H grades down section directly to coal seam J (R-7107 - D-7102). South of this limit, a shale unit is introduced above the J seam. This shale unit is apparently a wedge, maximizing about R-7106 and grading laterally to seam I. Both the shale unit and seam I are probably time equivalent to seam J (in an area between R-7106 to R-7105 and R-7102 to D-7104). The shale unit grades laterally to coal seam I. This is a complimentary change along with the sandstone unit changing to a siltstone unit and it results in I seam having a siltstone roof.

SEAM I: (Drawing QNTT-71-217-R02)

Seam I varies in thickness from 15.3 to 23.4 feet, the latter thickness occurring in hole R-7103; and the former, along strike in hole R-7105. The average thickness is from 16.5 feet to 17 feet, giving ash analyses greater than 10% in part, but improving to approximately 6% southward and westward.

The seam is split into two portions, upper and lower, by a dirt band 1.6 (R-7110) to 4.25 (D-7104) feet in thickness. This band decreases in thickness south westward (R-7103) where it disappears and the upper and lower seams apparently merge.

I seam is floored by a silty shale which is, in part, either a shale or siltstone. The degree of sand is quite variable, but in essence the interval may be considered a siltstone. This interval is only 6 to 10 feet thick before J seam is reached, thickening south and eastward. Seams I and J are so close that in all probability one or the other will not be minable.

SEAM J: (Drawing QNTT-71-218-R02)

Seam J spans an interval up to 40 feet thick in places. Generally it is on the order of 20 feet thick. The largest continuous thicknesses of coal in this seam varies from 12.6 feet to 22.7 feet.

The main coal unit reveals ash contents varying from 3 to 39 percent. The high ash occurs at two levels approximately 2 feet from the top of the main coal unit, and roughly 5 feet from the bottom of the coal unit. These high ash zones are apparent lateral equivalents to shale partings located at similar levels in the coal unit in holes R-7108, R-7107 (42% ash at the lower level), D-7102 and adit J2. These shale-dirt bands average about 1.5 feet thick, and as mentioned previously, grade laterally to coal with high ash contents.

South eastward from R-7105 including D-7104, R-7110, R-7114 and R-7103

a distinct coal interval 2.8 to 5.4 feet exists some 3.5 - 4 feet above the main coal seam. Ash content of this rider seam varies here from 23 to 80 percent improving in quality east and south westward (R-7114 and R-7103 respectively), but thinning in this direction also. To the north and east two similar coal intervals exist below the main coal seam. Each one is approximately 3.5 to 4 feet thick and they are separated from each other and the main coal interval by shale units of the same order of magnitude. Ash contents in the bottom two intervals are highly variable and are unpredictable. They vary from 8 to 49%. The coal intervals like those above the main coal unit also have local shale bands up to 0.6 feet thick.

The floor of seam J is a carbonaceous shale, varying from 4 feet to 10 feet thick (R-7108 and D-7102). The shale grades at depth to a sandstone 40 to 50 feet thick. Westward it rests directly on top of the sandstone unit (R-7106); and to the south and east, a siltstone prevails. The siltstone here persists for a maximum of 10 feet before K seam appears; although in the north and northwest, as mentioned above, there is a 44 to 60 foot interval of shale and sandstone and an additional 10 feet of shale forming the roof of K seam.

SEAM K: (Drawing QNTT-71-219-R02)

Seam K is a highly erratic interval of coal generally in the order of 4.6 feet to 2.5 feet thick. On the average the coal sections are about 2.5 feet thick (D-7104) with ash contents from 15 to 39%. On the western flank of Babcock, seam K apparently consists of 2 units. The thickness of the upper seam varies from 1.9 feet with 8% ash in R-7108 to 2.6

feet with 14% ash in R-7106 and again to 1.6 feet with 3% ash toward R-7110 (note that on the fence diagram R-7105 has been left out because of the complicated nature of the areal picture). The intervening shale unit varies from 2 feet in the northwest, to approximately 4 feet to the south and east. This shale unit separates the lower seam which ranges from 4.2 feet in thickness, with ash values in the 5 - 38% range in hole D-7102 to a 3.1 foot seam with 8% ash in R-7103.

To the east, seam K becomes extremely complicated with many coal intervals occurring. On the fence diagram some of the coal intervals in D-7104 and R-7114 have been tentatively tied to those in drill holes to the west, but here there is too much subjectivity in the correlation with the information gathered thus far, to properly comment. The coal intervals average from 1.2 feet to 2.6 feet thick, ash contents from 11% to 49%. Shale units of equivalent thickness, are interbanded with the coal units.

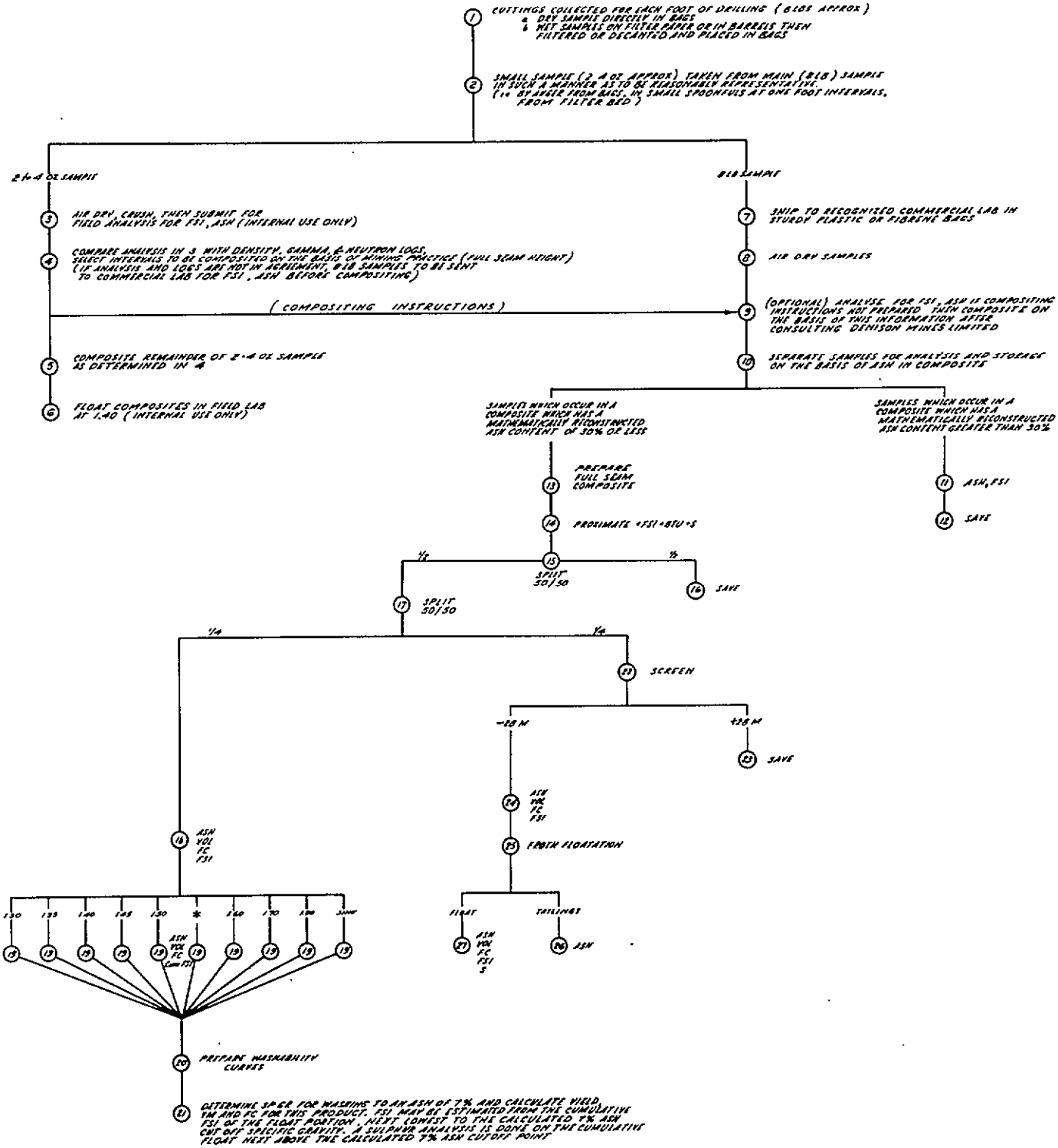
After seam K, there is a sandstone unit (down section) that is 120 feet thick judging from drill hole D-7102, which entered the Moosebar shales to the northwest; but in R-7106, R-7105 and R-7103, K is floored by a 10 foot interval of carbonaceous shales, which in turn changes down section to interbanded sandstone and siltstone and then into a large sandstone unit. This unit was not fully penetrated but it is thought to be equivalent to the large sandstone unit in D-7102.

SAMPLING AND ANALYTICAL METHODS

Reverse circulation rotary drilling and HQ wireline diamond drilling have been the major tools used in exploration of the Babcock area. With soft coals such as are found in the Rocky Mountain Foothills, each of these techniques has its advantages as well as disadvantages. The rotary samples are over-crushed to finer sizes than those occurring in actual mining and washability data result in better yields in the preliminary float-sink analyses. On the other hand, portions of the high quality soft coal within the coal seam may be ground out and lost in diamond drilling, resulting in impoverished analytical results.

The sampling method used for diamond drilling on this project was to first have the core logged, then to chip small samples from along the core and have them field analyzed for ash and F.S.I. The hole was then logged with the standardized radioactive tools; and from all the data on hand, compositing instructions were then prepared. In the early stages of the program the composites were made over 2 to 3 foot increments. This procedure was then improved to provide full "mining height" composites, and a more detailed flow sheet was prepared for the analysis (MISC71-0197-R02)

Sampling of the rotary seams is more difficult than the diamond core. The first and last samples may have some rock contamination, and the petrographic descriptions are more difficult to make. Water in the holes can also create a problem, and a method of using a dewatering screen and rolls of very fine filter paper (cloth) was devised to minimize the problem.



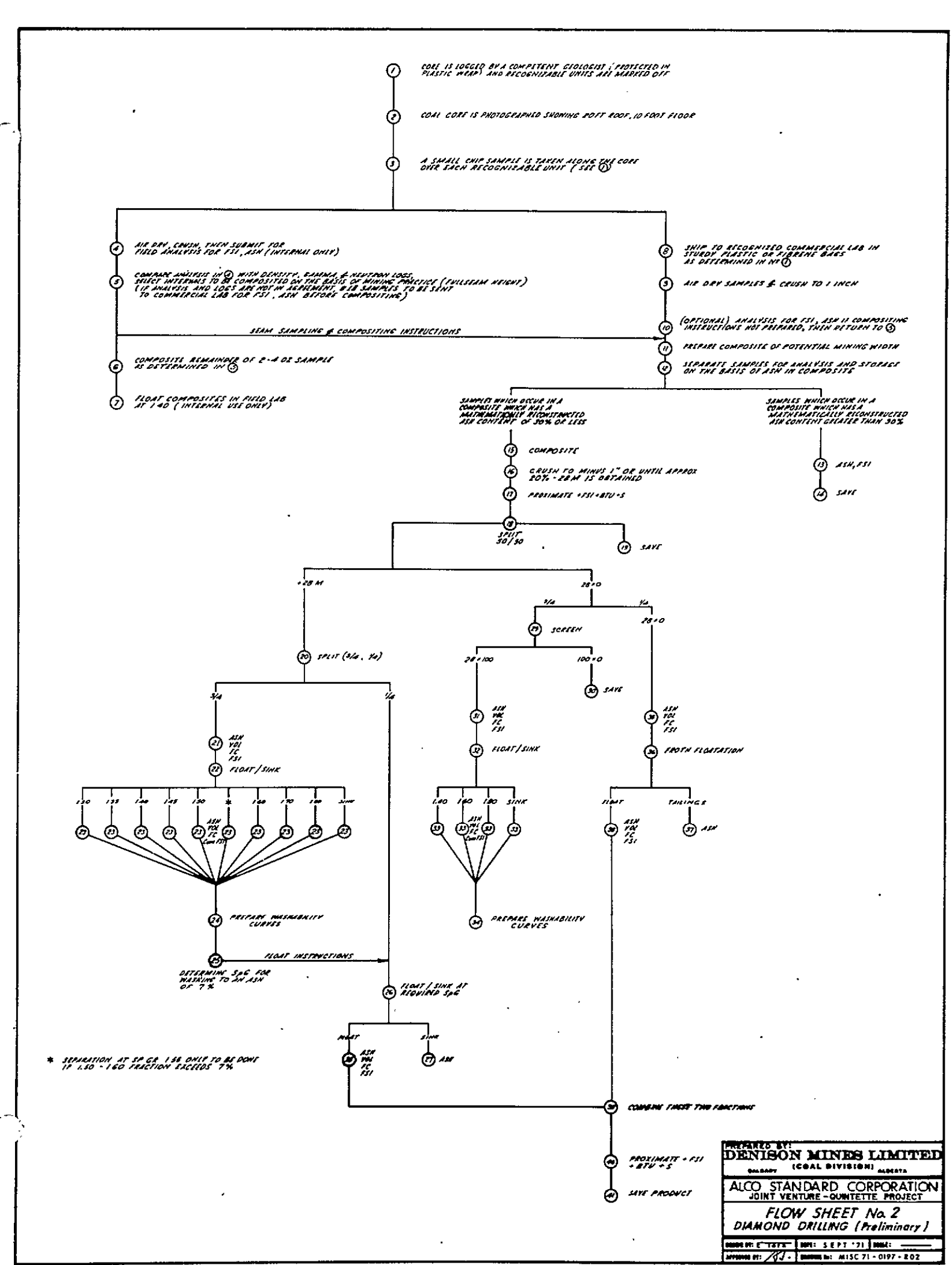
* SEPARATION AT SP GR 1.55 ONLY TO BE DONE IF 1.50 -1.60 FRACTION EXCEEDS 7%

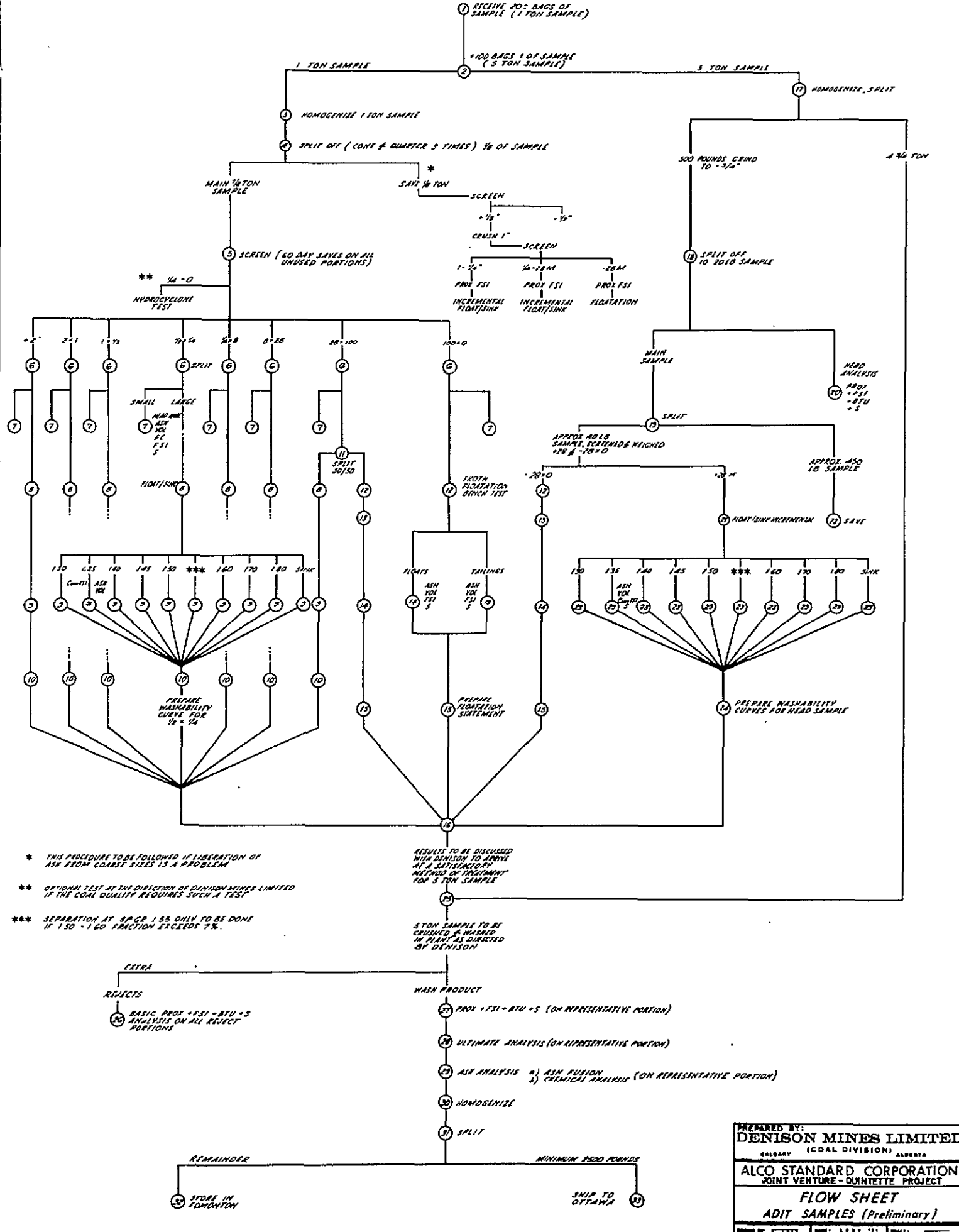
PREPARED BY:
DENISON MINES LIMITED
CALGARY (COAL DIVISION) ALBERTA

ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

FLOW SHEET No. 1
ROTARY DRILLING (Preliminary)

DRAWN BY: E. TATA | DATE: SEPT '71 | SCALE:
APPROVED BY: | DRAWING No: MISC 71-0196-802


1 CORE IS LOGGED BY A COMPETENT GEOLOGIST ; PROTECTED IN PLASTIC WRAP) AND RECOGNISABLE UNITS ARE MARKED OFF
2 COAL CORE IS PHOTOGRAPHED SHOWING ROOF, 10 FOOT FLOOR
3 A SMALL CHIP SAMPLE IS TAKEN ALONG THE CORE OVER EACH RECOGNIZABLE UNIT (SEE 1)
4 AIR DRY, CRUSH, THEN SUBMIT FOR FIELD ANALYSIS FOR FSI, ASH (INTERNAL ONLY)
5 COMPARE ANALYSIS IN 4 WITH DENSITY, GAMMA & NEUTRON LOGS, SELECT INTERVALS TO BE COMPOSITED ON THE BASIS OF MINING PRACTICE (SEAM HEIGHT) (IF ANALYSIS AND LOGS ARE NOT IN AGREEMENT, 8 LB SAMPLES TO BE SENT TO COMMERCIAL LAB FOR FSI, ASH BEFORE COMPOSITING)
6 COMPOSITE REMAINDER OF 2-4 OZ SAMPLE AS DETERMINED IN 5
7 FLOAT COMPOSITES IN FIELD LAB AT 1.40 (INTERNAL USE ONLY)
8 SHIP TO RECOGNISED COMMERCIAL LAB IN STURDY PLASTIC OR FIBREPAK BAGS AS DETERMINED IN NT 1
9 AIR DRY SAMPLES & CRUSH TO 1 INCH
10 (OPTIONAL) ANALYSIS FOR FSI, ASH IF COMPOSITING INSTRUCTIONS NOT PREPARED, THEN RETURN TO 5
SEAM SAMPLING & COMPOSITING INSTRUCTIONS
11 PREPARE COMPOSITE OF POTENTIAL MINING WIDTH
12 SEPARATE SAMPLES FOR ANALYSIS AND STORAGE ON THE BASIS OF ASH IN COMPOSITE
SAMPLES WHICH OCCUR IN A COMPOSITE WHICH HAS A MATHEMATICALLY RECONSTRUCTED ASH CONTENT OF 30% OR LESS
SAMPLES WHICH OCCUR IN A COMPOSITE WHICH HAS A MATHEMATICALLY RECONSTRUCTED ASH CONTENT GREATER THAN 30%
15 COMPOSITE
16 CRUSH TO MINUS 1" OR UNTIL APPROX 80% - 28 M IS OBTAINED
17 PROXIMATE + FSI + BTU + S
18 SPLIT 50/50
19 SAVE
13 ASH, FSI
14 SAVE
+28 M
28 + 0
3/8
1/4
28 + 0
29 SCREEN
20 SPLIT (3/8, 1/4)
28 + 100
100 + 0
30 SAVE
3/8
1/4
21 ASH VOL FC FSI
22 FLOAT / SINK
31 ASH VOL FC FSI
32 FLOAT / SINK
36 ASH VOL FC FSI
36 FROTH FLOTATION
1.30 1.35 1.40 1.45 1.50 * 1.60 1.70 1.80 SINK
ASH VOL FC FSI (and FSI)
1.40 1.60 1.80 SINK
ASH VOL FC FSI (and FSI)
FLOAT TAILINGS
ASH VOL FC FSI
37 ASH
24 PREPARE WASHABILITY CURVES
34 PREPARE WASHABILITY CURVES
25 FLOAT INSTRUCTIONS
DETERMINING SpG FOR WASHING TO AN ASH OF 7%
26 FLOAT / SINK AT REQUIRED SpG
FLOAT
SINK
38 ASH VOL FC FSI
27 ASH
* SEPARATION AT SP GR 1.50 ONLY TO BE DONE IF 1.50 - 1.60 FRACTION EXCEEDS 7%
39 COMBINE THESE TWO FRACTIONS
40 PROXIMATE + FSI + BTU + S
41 SAVE PRODUCT
PREPARED BY: DENISON MINES LIMITED (COAL DIVISION) CALGARY ALBERTA
ALCO STANDARD CORPORATION JOINT VENTURE - QUINTETTE PROJECT
FLOW SHEET No. 2
DIAMOND DRILLING (Preliminary)
DRAWN BY: E. YATES
DATE: SEPT '71
SCALE:
APPROVED BY:
DRAWING No: MISC 71 - 0197 - R02



PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

FLOW SHEET
ADIT SAMPLES (Preliminary)

DRAWN BY: [illegible] DATE: SEPT '71 SCALE: ——
APPROVED BY: [illegible] DENISON No: MISC 71 - 0155 - 002

Some holes at Babcock "made water" at the rate of 40 or 50 gallons per minute. Despite the inherent difficulties in sampling, a comparison of rotary samples with a nearby adit sample indicates that the method is very reliable and that the excess yield is only in the order of 5%. Further experimental work will be done in Phase III exploration to determine more accurately the correlation between rotary washabilities and adit washabilities in both yield and quality. Due to the unnatural size consist of the rotary samples, a slightly modified flow sheet was developed for their analysis (MISC71-0196-R02). Again, logging techniques and field analyses were used as the major tools in deciding the full-seam composite intervals.

Adit sampling was also controlled by the use of the field laboratory. Samples were taken at 10 foot intervals in the adit until a consistent F.S.I. indicated that the zone of oxidation had been fully penetrated. Bulk channel samples were then taken and testing was done according to Flowsheet MISC71-0195-R01.

RESERVES

The reserve nomenclature used in this report follows that of the Engineering Association of Ontario and is fully explained in Appendix B.

The area of influence of each hole has been determined by drawing lines to join adjacent drill holes. The influence of each hole has then been assumed to extend half that distance and a line joining the mid points was drawn to delineate the influence. At the edge of the reserve area, the area of influence was delineated by a line perpendicular to the line joining adjacent holes.

The following assumptions and factors have been used to calculate the gross tons in place and the net tons mined:

1) One cubic foot of coal is equivalent to 83 lbs.
2) The loss of coal in place due to geological problems such as folds, fault, excessive water, gas, etc., is 20% of the original amount.
3) Of the remaining coal, 50% could be expected to be extracted.

Wash plant recoveries have been estimated through a subjective analysis of the washability characteristics of the drill samples, combined with a consideration of the density log response and apparent rock contamination in rotary samples. Generally, the projected yields are 5 to 10 percent below the indicated yields from the washability data.

In calculating the gross reserve, seams I and J have been assumed to occur beneath hole D-7101 which was abandoned before they could be reached. This decision has been made on the basis of very strong stratigraphic evidence that these seams are improving in quality and thickness towards the southwest. As only seam J is expected to be mined, this results in an additional 23 million gross tons or 7 million net clean tons of coal in the reserve.

RESERVE QUANTITY

The coal which has been outlined within the major syncline in the Babcock area has been placed in the probable (indicated) category. The total reserve amounts to 246 million tons of which 68 million tons is classified as recoverable. These figures include seam I which has 9.2 million tons of theoretical product. Since seam I is very close to seam J, most of it will probably be unminable. Therefore, the net recoverable figure should be reduced to about 60 million tons. The following table summarizes the probable reserve in the Babcock area at present. The detailed calculations from which these figures have been derived will be found in Appendix A.

RESERVE CALCULATION

SUMMARY

SEAM	L. TONS IN PLACE x 10^6	NET PRODUCT L. TONS x 10^6
D	41.277	11.537
E	29.352	7.284
F	41.299	12.201
G	5.677	1.249
H	1.438	Nil
I	32.477	9.282
J	90.303	25.813
K	4.557	1.024
	246.380	68.390

= 275.95 short tons = 76.6 sh. tons

2 ton x 1.016047 = 250 metric tonnes. = 69.49 metric tons.

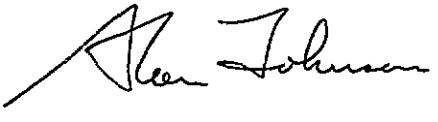
Pages 29-32 of this report contain coal quality data, and remain confidential under the terms of the *Coal Act Regulation*, Section 2(1). They have been removed from the public version.

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_251_2004

CONCLUSIONS

A major deposit of medium volatile metallurgical coal has been outlined in the Babcock area of the Quintette project. Probable reserves outlined to date are 246 million tons of which 60 million tons are recoverable. Additional ground remains to be tested. The Babcock area is well located with respect to the potential transportation routes in the region and the indicated coal product is of a quality which should be quite acceptable in the international market.

Respectfully submitted,



Alan A. Johnson

PERSONNEL

The following persons have been key personnel employed in the various functions indicated with respect to the acquisition and presentation of data for this report.

Mr. D.M. PARKES, P. Eng., Chief Engineer (Coal)

Supervision of adit drivage, selection of seam composites, reserve calculations, design of washability tests and estimation of coal recovery.

Mr. J.A. IRVINE, B.Sc., Project Geologist

Supervision of mapping, drilling, seam compositing, field analysis and sampling.

Mr. R.S. GEE, B.Sc., Geologist

Geological mapping, field supervision, preparation of maps and drawings and general assistance to the project geologist in report preparation.

Alan A. Johnson
Chief Geologist (Coal)

ADDENDUM TO REPORT

Dated 21 December 1971
Updated 8 January 1972

WORK PERFORMED (BABCOCK)

Road Construction	
Main	23 miles
Secondary one	15 miles
Adits	
Sites prepared	12
Adits started	7
Adits complete	4
Adits abandoned	2
Adits incomplete	1
Diamond Drilling	
Holes drilled	3
Footages drilled	2950 feet
Rotary (Reverse Circulation)	
Holes drilled	8
Footages drilled	5920 feet

Topographic Mapping	50 sq. miles
Geological Mapping (Detail)	25 sq. miles
Geological Mapping (Preliminary)	226 sq. miles

WORK PERFORMED (WOLVERINE)

Road Construction	
Main roads (built)	10 miles
Main roads (Maintained)	30 miles
Secondary roads (built)	7 miles
Diamond Drilling	
Holes drilled	5
Footage drilled	4050 feet
Topographic Mapping	50 sq. miles
Geological Mapping (Detail)	20 sq. miles

COAL EXPORT STATISTICS

COMPANY	EXPORT DATE	TONNAGE /YEAR	MM.T. TOTAL	CONTRACT YEARS	VALUE $MM	TRANSPORTATION Route	Miles	Port
Kaiser	1970	5	75.75	15	1300	CPR	700	Roberts Bank
Fording	1972	3	45	15	620	CPR	730	Roberts Bank
Coleman	1967	1.5	18.4	15	300	CPR	750	Port Moody
Canmore	1967	.4	4	10	50	CPR	575	Port Moody
Cardinal	1970	1	15	15	200	CNR	700	Vancouver
McIntyre	1970	2	29.5	15	350	CNR	690	Vancouver

COAL QUALITY ANALYSIS

COMPANY	COAL TYPE	COAL Moist	SPECIFICATIONS Ash	Volatiles	PERCENTAGE S	F.S.I.	MINING METHODS S: Stripping U: Underground
Kaiser	Lvb	6.0	8.7	19/22	.4	6/8	S & U
Fording	Mvb	6.0	8.0	21/24	.5	5/7	S
Coleman	Mvb	5.0	9.5	20/24	.6	6/8	S & U
Canmore	Lvb	6.0	9.0	16/17	.6	6/8	S & U
Cardinal	Lvb	6.0	8.7	24/26	.4	5/8	S
McIntyre	Lvb	6.0	6.3	18/20	.5	7/9	S & U

REFERENCES: L.P. Christmas 1969, Mineral Resources Branch, Dept. of Energy, Mines and Resources. G.Barnes 1971, Coal Op. Assoc. of Canada
Updated: Nov. 1971

RAIL DISTANCES FROM QUINTETTE TO:

PORT	VIA	MILES
PRINCE RUPERT	MONKMAN PASS (CN)	547
	MURRAY RIVER (PGE,CN)	751
SQUAMISH	MONKMAN PASS (CN, PGE)	556
	MURRAY RIVER (PGE)	710
VANCOUVER	MONKMAN PASS (CN)	729
	MONKMAN PASS (CN, PGE)	596
	MURRAY RIVER (PGE)	750
ROBERTS BANK	MONKMAN PASS (CN)	729
	MURRAY RIVER (PGE)	770
	MONKMAN PASS (CN, PGE)	616

NORTHWEST TERRITORES

CANADA

BRITISH COLUMBIA

ALBERTA

SASK.

PACIFIC OCEAN

U. S. A.

Juneau

Hazelton

Prince Rupert

PRINCE RUPERT TO YOKOHAMA 3810 MILES

QUEEN CHARLOTTE ISLANDS

PRINCE RUPERT TO PANAMA 4800 MILES

VANCOUVER ISLAND

VANCOUVER TO YOKOHAMA 4260 MILES

VANCOUVER TO PANAMA 4030 MI. PANAMA TO LE HAVRE 5363 MI.

Prince George

Hansard

Dawson Creek

East Pine

Cherwynd

BRAMEDA

QUINTETTE

MONKMAN PASS

SAXON

CYPRUS

McINTYRE

Beaverlodge

Grande Prairie

Hinton

Edson

Brule

Jasper

Red Pass

CARDINAL

Edmonton

Red Deer

Golden

Revelstoke

Kamloops

Banff

CANMORE

Calgary

EMKAY SCURRY

FORDING

CROWS NEST INDUSTRIES

KAISER

COLEMAN

Fernie

Lethbridge

Fort Macleod

Medicine Hat

Squamish

Vancouver

Roberts Bank

Victoria

PEACE RIVER

ATHABASCA RIVER

LAKE ATHABASCA

FRASER RIVER

JASPER NATIONAL PARK

BANFF NATIONAL PARK

CN

CP

PGE

ANK (CN)

LEGEND

- 24 — RAIL MILEAGE BETWEEN POINTS
- STEAMSHIP ROUTE WITH MILEAGE
- EXISTING RAILROAD
- PROPOSED RAILROAD
- OPERATIONAL MINE
- PROPOSED MINE OR COAL PROSPECT
- INTERNATIONAL BOUNDARY
- PROVINCIAL BOUNDARY

SCALE 1:2,000,000
1 inch equals approx. 32 miles
MILES 20 0 20 40 60 80 100 MILES

Re - Quintette 71(2)C 599

PREPARED BY:
DENISON MINES LIMITED (COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
(JOINT VENTURE - QUINTETTE PROJECT)

TRANSPORTATION DISTANCES

DRAWN BY: E. TOTH	DATE: Nov. '71	SCALE: as shown
APPROVED BY:	DRAWING NO: MISC. 71 - 0225 - R04	

LEGEND

CRETACEOUS

KSh	Shaftesbury Formation
KCm[b]	Commotion Formation (Boulder Creek Member)
KCm[h]	Commotion Formation (Hullcross Member)
KCm[g]	Commotion Formation (Gates Member)
KMb	Moosebar Formation
KGr	Gething Formation

- Contact
- Contact, Inferred
- Anticline (with plunge)
- Syncline (with plunge)
- Thrust Fault
- Slump
- Roads
- Coal Zone
- Adit
- Cross Section Line
- Tree Area
- 4367 Spot Elevation
- Trench
- D-71-01 Drill Site
- 90° Joint
- 75 Joint
- Direction of Movement of Rock
- 30 Strike & Dip
- 80 Cleavage
- 50 Slickenslides
- Horizontal Bed
- 71-203 Photo Point

SCALE

1000 0 1000 2000 3000 4000 FT

CONTOUR INTERVAL 20'

Re- Quintette 71(2)C. 599

PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
(JOINT VENTURE - QUINTETTE PROJECT)

BABCOCK MOUNTAIN GEOLOGY

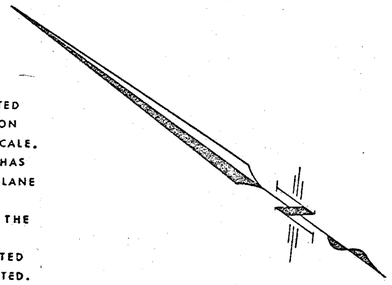
DRAWN BY: E. Toth	DATE: Nov. 1971	SCALE: 1:2,1000'
APPROVED BY:	DRAWING NO: QNTT 71 - 0226 - R05	

Quintette 71(2) B.

Map # 2

EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE. THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.



SCHEMATIC REPRESENTATION ONLY. FOR GEOLOGICAL VARIATION WITHIN THE SEAM INTERVAL SEE DETAIL ON ACCOMPANYING INDIVIDUAL FENCE DIAGRAMS.

LEGEND

A	▬	COAL ZONE "A"
SS		SAND STONE
Sh		SHALE
S		SILTSTONE
CSh		CARBONACEOUS SHALE

800 600 400 200 0

1600 1200 800 400

SCALE IN FEET

RE-QUINTETTE 71(2)C.

PREPARED BY: DENISON MINES LIMITED (COAL DIVISION)

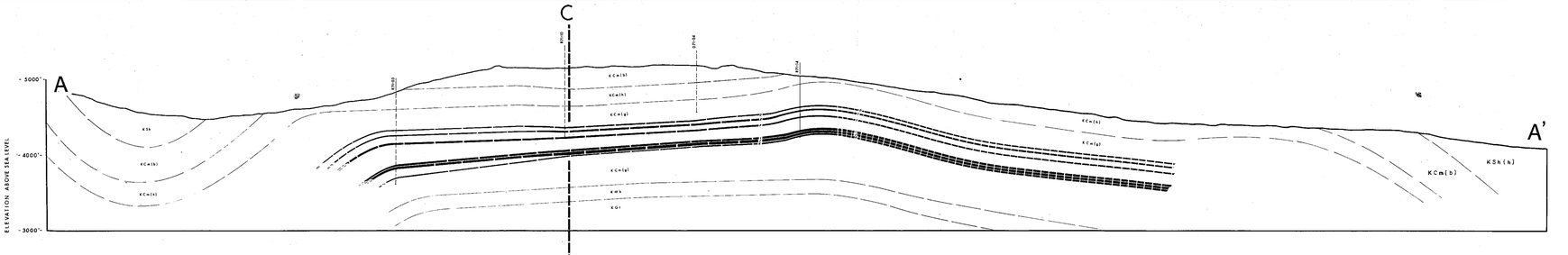
CALGARY ALBERTA

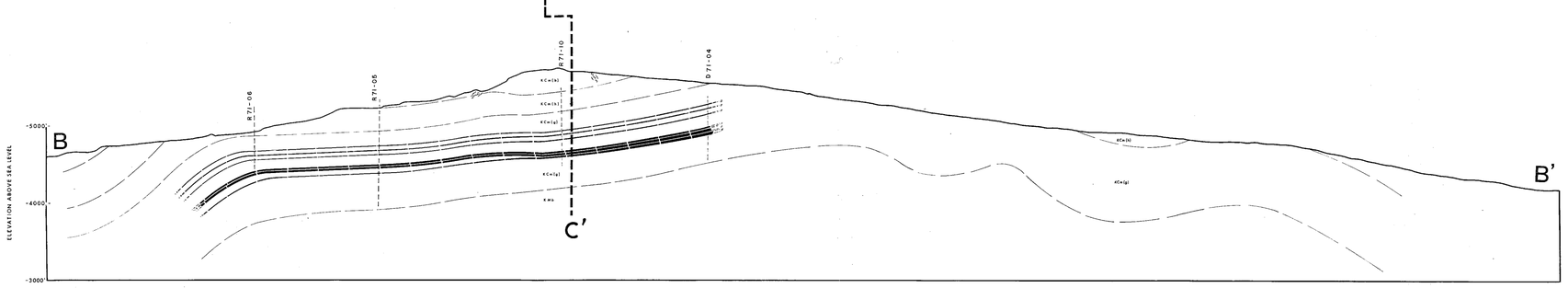
ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

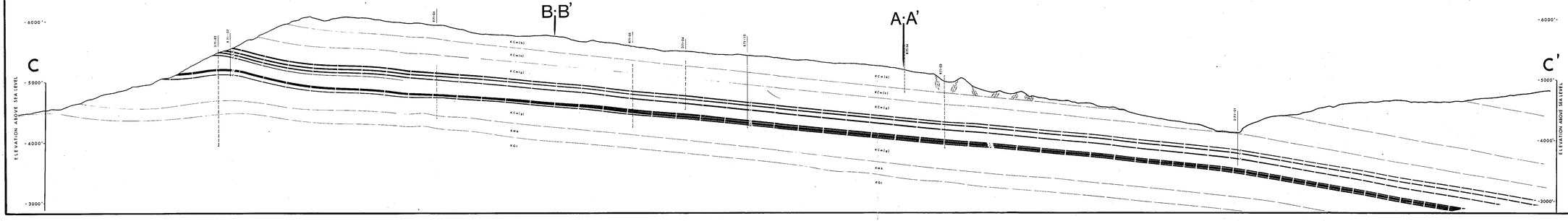
BABCOCK MOUNTAIN
COAL SEAMS & GROSS LITHOLOGY

DRAWN BY: E.T.G.T.H.	DATE: NOV. '71	SCALE: See above
APPROVED BY:	DRAWING No: QNTT 71 - 0220 - R02	

599







NOTE:
COAL SEAMS AND FORMATION CONTACTS AND RELATED STRUCTURES ARE SUBJECTIVE INTERPRETATIONS FROM DRILLHOLE DATA AND STRUCTURES MAPPED ON THE SURFACE.

LEGEND

- PROVEN RESERVE
- PROBABLE RESERVE
- INFERRED RESERVE
- POTENTIAL RESERVE

R71-07 / ROTARY DRILL HOLE.
D71-07 / DIAMOND DRILL HOLE.
R71-07 — DRILL HOLE ON SECTION LINE.
D71-02 — DRILL HOLE + A NORMAL PROJECTION ON TO CROSS-SECTION LINE: NOTE CONTACTS NOT NECESSARILY ON EQUIVALENT LEVELS WITH CROSS-SECTION.

599

Re- Quintette 71(2)C.

PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
(JOINT VENTURE - QUINTETTE PROJECT)

GEOLOGICAL CROSS SECTIONS
BABCOCK

DRAWN BY: E. Lotts	DATE: Dec. '71	SCALE: 1" = 1000'
APPROVED BY:	DRAWING NO: QNTT 71 - 0259 - R03	

R71-10

R71-03

D71-02

R71-06

R71-05

D71-04

R71-14

R71-07

R71-09

R71-08

RADIOACTIVE ZONE

BEACH SAND?

.8825

.5695

- Coal
- Shale
- Silty, Sandy Shale
- Siltstone
- Sandstone

NOTE: TRUE STRATIGRAPHIC POSITIONS ARE NOT REPRESENTED BY RELATIVE LOG POSITIONS.
UNIT THICKNESS ARE NOT CORRECTED FOR ANGLE OF INTERSECTION.

71(a)C

PREPARED BY
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
(JOINT VENTURE - QUINTETTE PROJECT)

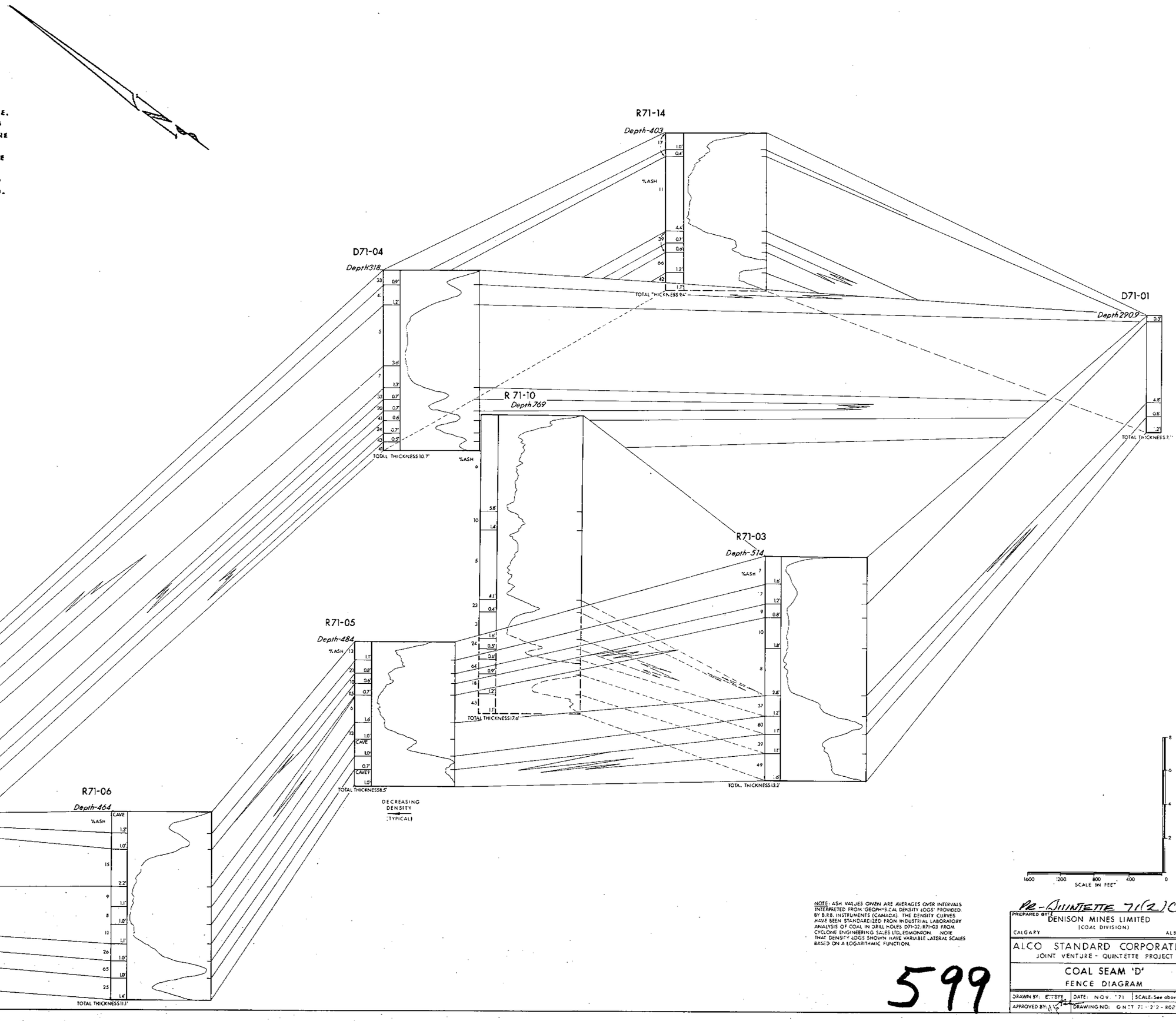
DRILL LOG CORRELATION
COAL SEAMS

DRAWN BY: E.T.S.N. | DATE: Oct '71 | SCALE: 1" = 50'
APPROVED BY: [illegible] | DRAWING No: QNTT 71 - 0204 - R03

599

EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE, THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.



NOTE: ASH VALUES GIVEN ARE AVERAGES OVER INTERVALS INTERPRETED FROM 'GEOPHYSICAL DENSITY LOGS' PROVIDED BY B.P.B. INSTRUMENTS (CANADA). THE DENSITY CURVES HAVE BEEN STANDARDIZED FROM INDUSTRIAL LABORATORY ANALYSIS OF COAL IN DRILL HOLES D71-02, R71-03 FROM CYCLONE ENGINEERING SALES LTD., EDMONTON. NOTE THAT DENSITY LOGS SHOWN HAVE VARIABLE LATERAL SCALES BASED ON A LOGARITHMIC FUNCTION.

599

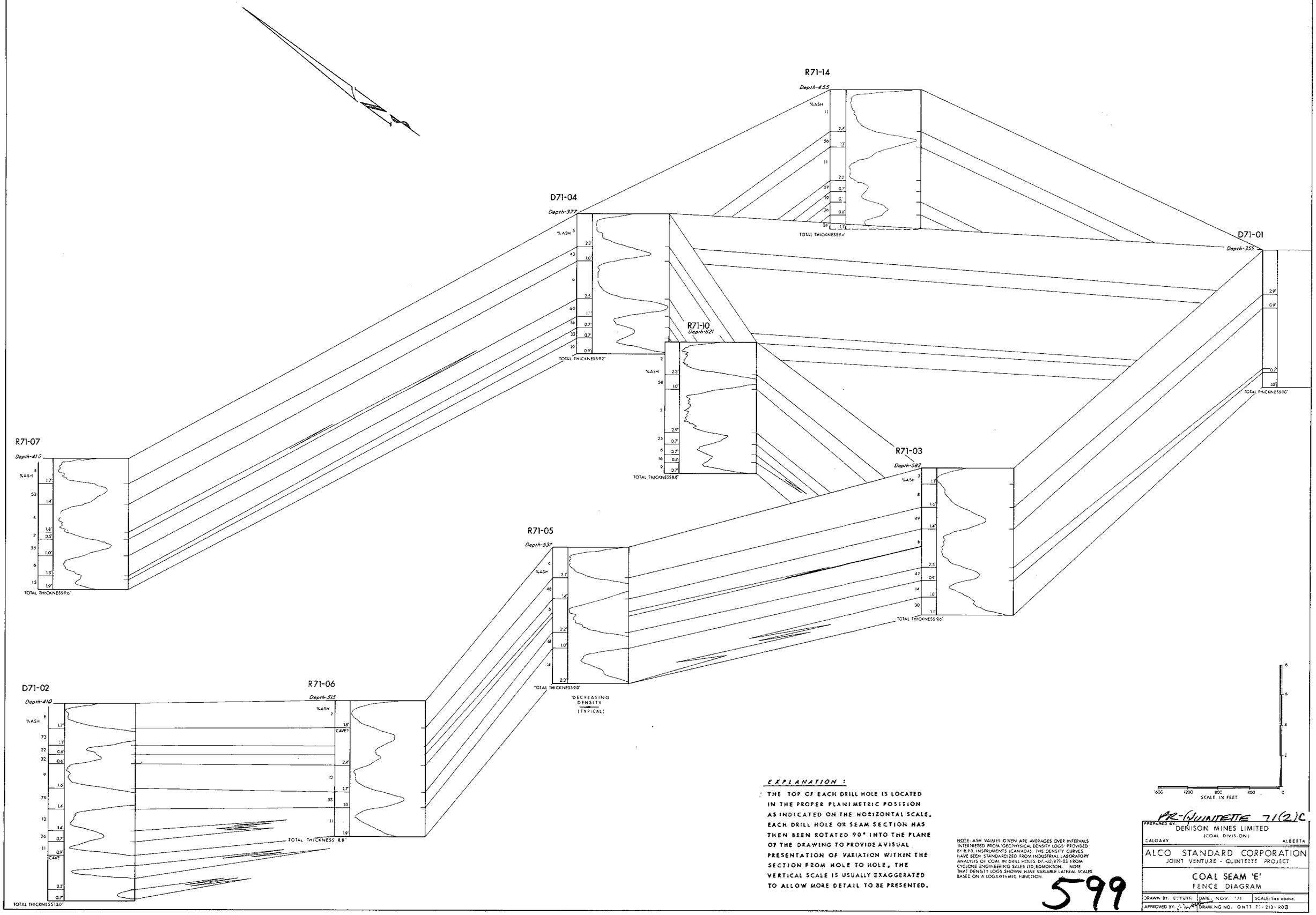
Re-Quintette 71(2)C.

PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

COAL SEAM 'D'
FENCE DIAGRAM

DRAWN BY: E.T.S.T.S. | DATE: NOV. '71 | SCALE: See above.
APPROVED BY: | DRAWING NO: G N T T 71 - 2'2 - 802



EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE, THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.

NOTE: ASH VALUES GIVEN ARE AVERAGES OVER INTERVALS INTERPRETED FROM 'GEOPHYSICAL DENSITY LOGS' PROVIDED BY B.P.B. INSTRUMENTS (CANADA). THE DENSITY CURVES HAVE BEEN STANDARDIZED FROM INDUSTRIAL LABORATORY ANALYSIS OF COAL IN DRILL HOLES D7.-02; 871-03 FROM CYCLONE ENGINEERING SALES LTD, EDMONTON. NOTE THAT DENSITY LOGS SHOWN HAVE VARIABLE LATERAL SCALES BASED ON A LOGARITHMIC FUNCTION.

599

PR-GUINTETTE 71(2)C

PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

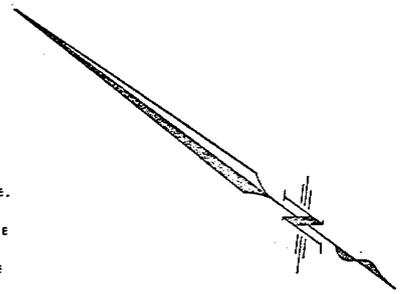
ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

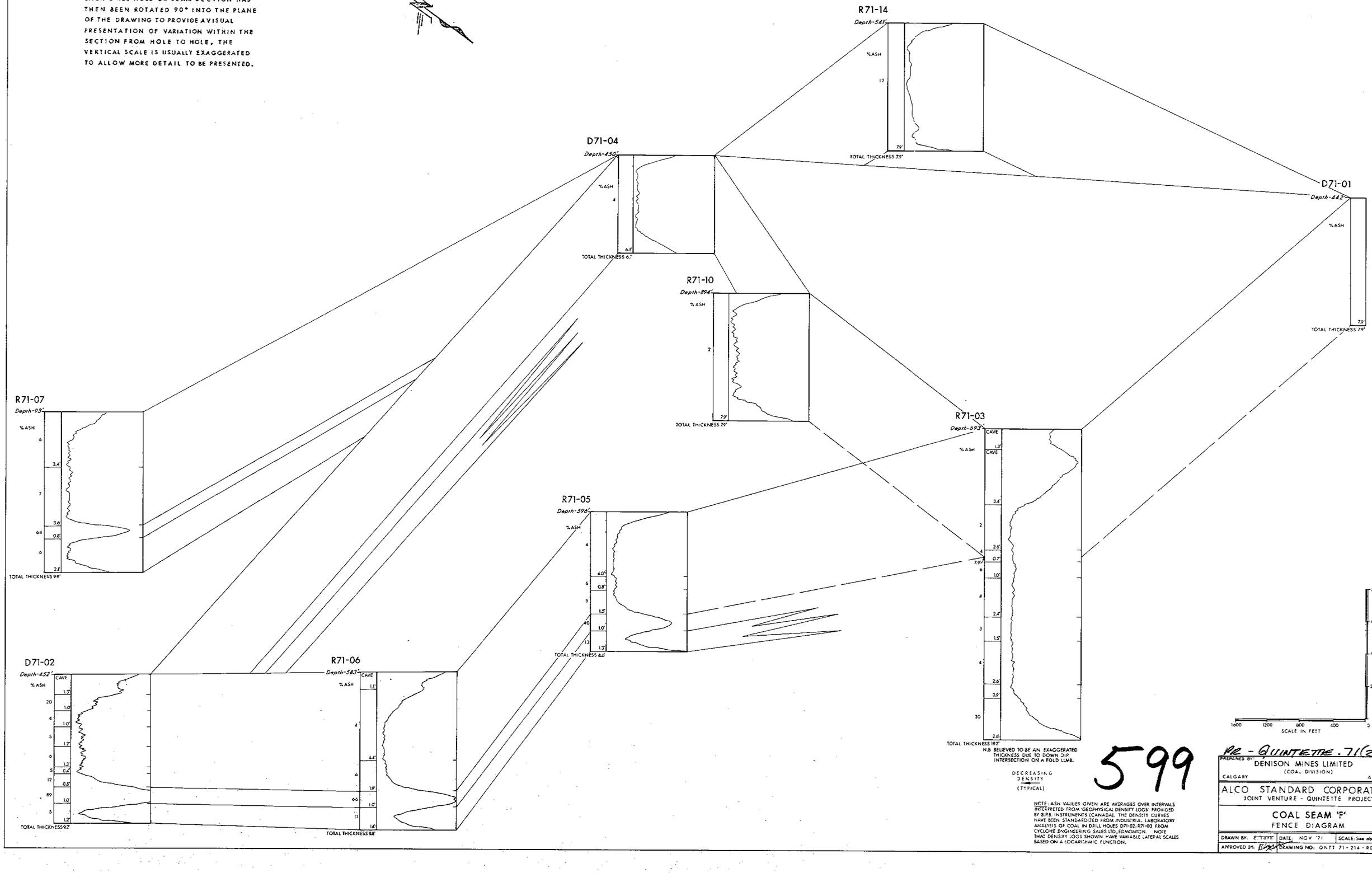
COAL SEAM 'E'
FENCE DIAGRAM

DRAWN BY: E.T.G.H.	DATE: NOV. '71	SCALE: See above.
APPROVED BY:	DRAWING NO: ONTT 71-213-R03	

EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE, THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.





599

NOTE: ASH VALUES GIVEN ARE AVERAGES OVER INTERVALS INTERPRETED FROM GEOPHYSICAL DENSITY LOGS PROVIDED BY B.P.B. INSTRUMENTS (CANADA). THE DENSITY CURVES HAVE BEEN STANDARDIZED FROM INDUSTRIAL LABORATORY ANALYSIS OF COAL IN DRILL HOLES D71-02; R71-03 FROM CYCLONE ENGINEERING SALES LTD., EDMONTON. NOTE THAT DENSITY LOGS SHOWN HAVE VARIABLE LATERAL SCALES BASED ON A LOGARITHMIC FUNCTION.

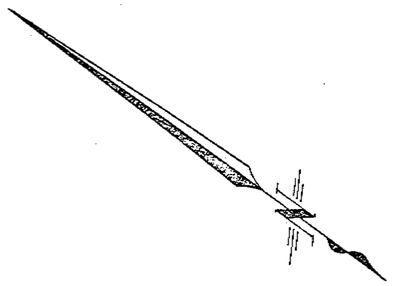
RE - QUINTETTE . 71(2)C

PREPARED BY: DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

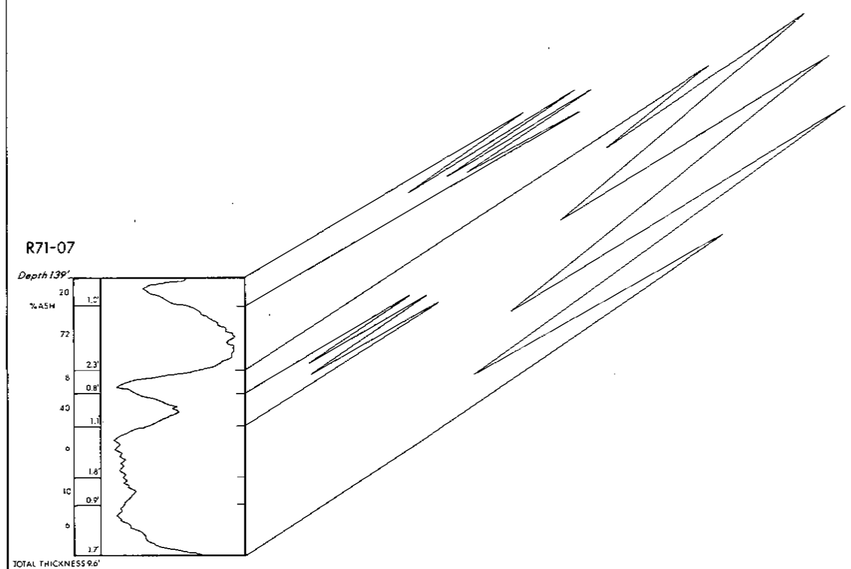
ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

COAL SEAM 'F'
FENCE DIAGRAM

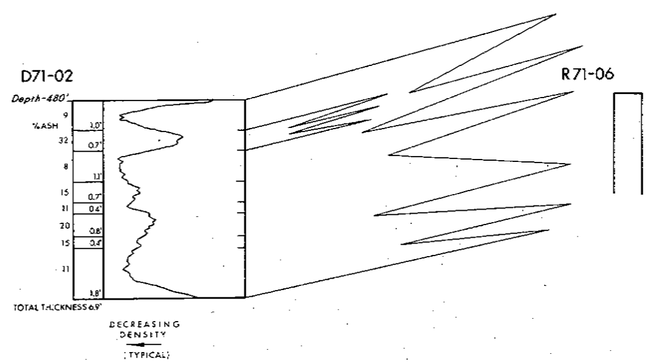
DRAWN BY: E.T.O.Y.K.	DATE: NOV '71	SCALE: See above.
APPROVED BY:	DRAWING NO: QNTT 71 - 214 - RG2	



D71-04



R71-05



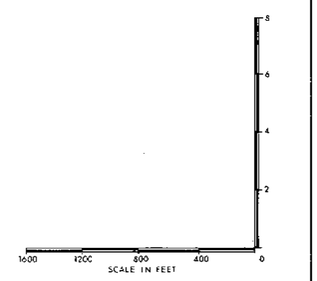
R71-06

EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE, THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.

NOTE. ASH VALUES GIVEN ARE AVERAGES OVER INTERVALS INTERPRETED FROM 'GEOPHYSICAL DENSITY LOGS' PROVIDED BY B.P.B. INSTRUMENTS (CANADA). THE DENSITY CURVES HAVE BEEN STANDARDIZED FROM INDUSTRIAL LABORATORY ANALYSIS OF COAL IN DRILL HOLES D71-02, R71-03 FROM CYCLONE ENGINEERING SALES LTD., EDMONTON. NOTE THAT DENSITY LOGS SHOWN HAVE VARIABLE LATERAL SCALES BASED ON A LOGARITHMIC FUNCTION.

599



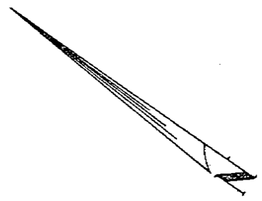
RR - QUINTETTE 71(21C

PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

COAL SEAM 'G'
FENCE DIAGRAM

DRAWN BY: E.T.S.T.R. | DATE: NOV. '7[illegible] | SCALE: See above
APPROVED BY: P.S. Lund | DRAWING NO: ONTT 71 - 215 - R02



EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE, THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.

D71-04

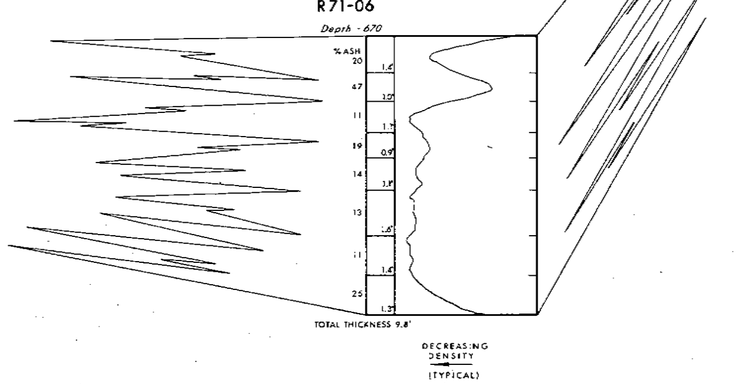
R71-07

R71-05

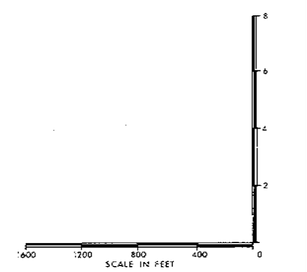
D71-02

R71-06

Depth - 670



DECREASING DENSITY →
(TYPICAL)



NOTE: ASH VALUES GIVEN ARE AVERAGES OVER INTERVALS INTERPRETED FROM GEOPHYSICAL DENSITY LOGS PROVIDED BY B.P.B. INSTRUMENTS (CANADA). THE DENSITY CURVES HAVE BEEN STANDARDIZED FROM INDUSTRIAL LABORATORY ANALYSIS OF COAL IN DRILL HOLES D71-02, R71-03 FROM CYCLONE ENGINEERING SALES LTD., EDMONTON. NOTE THAT DENSITY LOGS SHOWN HAVE VARIABLE LATERAL SCALES BASED ON A LOGARITHMIC FUNCTION.

599

PR - QUINTETTE 71(2)C

PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

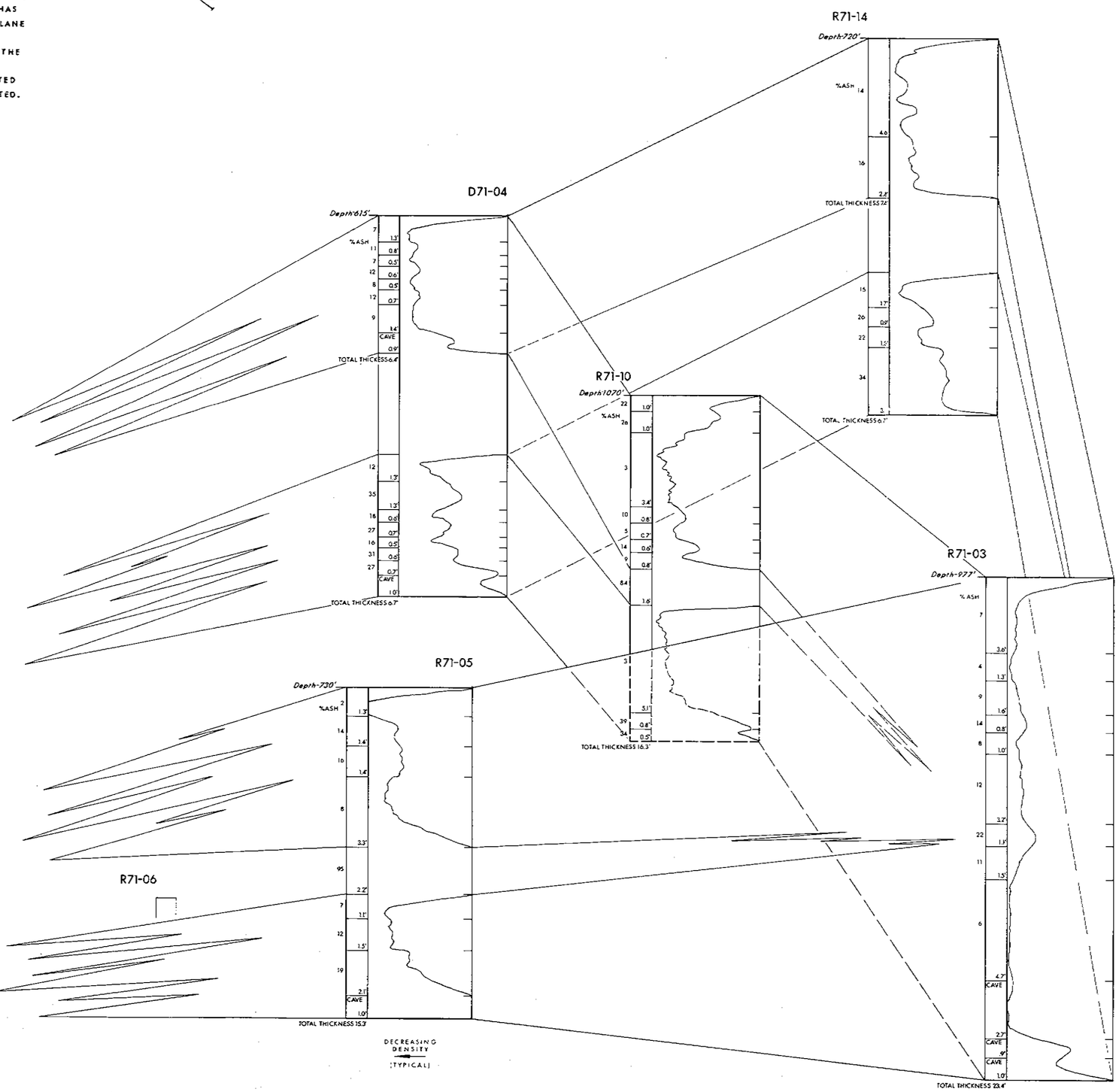
ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

COAL SEAM 'H'
FENCE DIAGRAM

DRAWN BY: E.T.S.T.K.	DATE: NOV. '71	SCALE: See above
APPROVED BY:	DRAWING No.: QNTT 71 - 216 - R02	

EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE, THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.



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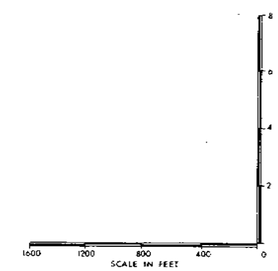


VR - QUINTETTE 71(2)C

PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
JOINT VENTURE ~ QUINTETTE PROJECT

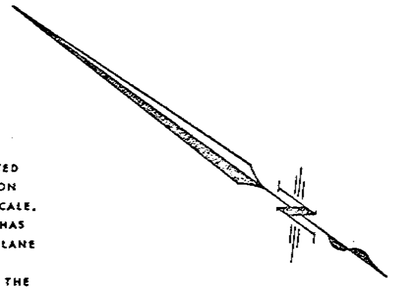
COAL SEAM 'I'
FENCE DIAGRAM

DRAWN BY: [illegible]	DATE: NOV. '71	SCALE: See above.
APPROVED BY: [illegible]	DRAWING NO: QNTT 71 - 217 - R02	

599

EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE. THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.



R71-14
Depth-745
TOTAL THICKNESS 2.8'
TOTAL THICKNESS 19.9'

D71-04
Depth-640
TOTAL THICKNESS 4.0'
TOTAL THICKNESS 15.9'

R71-10
Depth-1093
TOTAL THICKNESS 3.4'
TOTAL THICKNESS 3.5'

R71-03
Depth-1004
TOTAL THICKNESS 3.9'
TOTAL THICKNESS 19.8'

R71-05
Depth-753
TOTAL THICKNESS 5.4'
TOTAL THICKNESS 22.2'
TOTAL THICKNESS 3.0'
TOTAL THICKNESS 17.6'

R71-07
Depth-345
TOTAL THICKNESS 19.5'

R71-06
Depth-757
TOTAL THICKNESS 22.7'

D71-02
Depth-694
TOTAL THICKNESS 10.4'
TOTAL THICKNESS 15.4'

R71-08
Depth-124
TOTAL THICKNESS 19.2'

DECREASING DENSITY
(TYP CAL)

16 12 8 4
1600 1200 800 400 0
SCALE IN FEET

NOTE: ASH VALUES GIVEN ARE AVERAGES OVER INTERVALS INTERPRETED FROM 'GEOPHYSICAL DENSITY LOGS' PROVIDED BY B.P.B. INSTRUMENTS (CANADA). THE DENSITY CURVES HAVE BEEN STANDARDIZED FROM INDUSTRIAL LABORATORY ANALYSIS OF COAL IN DRILL NO.ES D71-07, R71-03 FROM CYCLONE ENGINEERING SALES LTD. EDMONTON. NOTE THAT DENSITY LOGS SHOWN HAVE VARIABLE LATERAL SCALES BASED ON A LOGARITHMIC FUNCTION.

AR - QUINTETTE 71(2)C

PREPARED BY:
DENISON MINES LIMITED
(COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

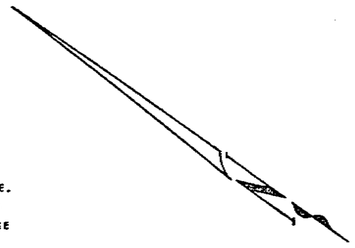
COAL SEAM 'J'
FENCE DIAGRAM

DRAWN BY: [illegible]	DATE: NOV. '71	SCALE: See above
APPROVED BY: [illegible]	DRAWING NO: QNTT 71 - 218 - R02	

599

EXPLANATION :

THE TOP OF EACH DRILL HOLE IS LOCATED IN THE PROPER PLANIMETRIC POSITION AS INDICATED ON THE HORIZONTAL SCALE. EACH DRILL HOLE OR SEAM SECTION HAS THEN BEEN ROTATED 90° INTO THE PLANE OF THE DRAWING TO PROVIDE A VISUAL PRESENTATION OF VARIATION WITHIN THE SECTION FROM HOLE TO HOLE, THE VERTICAL SCALE IS USUALLY EXAGGERATED TO ALLOW MORE DETAIL TO BE PRESENTED.



599

NOTE. ASH VALUES GIVEN ARE AVERAGES OVER INTERVALS INTERPRETED FROM 'GEOPHYSICAL DENSITY LOGS' PROVIDED BY G.P.R. INSTRUMENTS (CANADA). THE DENSITY CURVES HAVE BEEN STANDARDIZED FROM INDUSTRIAL LABORATORY ANALYSIS OF COAL IN DRILL HOLES D71-02, 871-03 FROM CYCLONE ENGINEERING SALES LTD., EDMONTON. NOTE THAT DENSITY LOGS SHOWN HAVE VARIABLE LATERAL SCALES BASED ON A LOGARITHMIC FUNCTION.

RE - QUINTETTE 71(2)C.

PREPARED BY: DENISON MINES LIMITED (COAL DIVISION)
CALGARY ALBERTA

ALCO STANDARD CORPORATION
JOINT VENTURE - QUINTETTE PROJECT

COAL SEAM 'K'
FENCE DIAGRAM

DRAWN BY: ETTEN | DATE: NOV. '71 | SCALE: See above.
APPROVED BY: | DRAWING NO. QNTT 71 - 219 - RQ2

QUINTETTE PROJECT

BABCOCK AREA

ADDENDUM TO APPENDIX A

CONFIDENTIAL

4 MARCH 1972

PR - QUINTETTE 71(4) C

599

CONFIDENTIAL

7 1/4

DENISON MINES LIMITED
(COAL DIVISION)

EXECUTIVE OFFICE:
4 KING STREET WEST
TORONTO 1, ONTARIO
TEL. 416-363-4991
TELEX 02-2205

From: DIVISION OFFICE:
1660 AQUITAINE TOWER
540 FIFTH AVENUE S.W.
CALGARY 1, ALBERTA
TEL. 403-269-4327
T2P 0M2

File: 0907-TNRE

GEOLOGICAL BRANCH
ASSESSMENT REPORT

April 21, 1972

The Chief Gold Commissioner
The Government of the Province of B. C.
Department of Mines & Petroleum Resources
Parliament Buildings
Victoria, B. C.

00 599

Dear Sir:

We have now received the complete analysis for our 1971 work in the Babcock area of our Quintette property. An Addendum to the Appendix of the Babcock Interim Report submitted to you on January 28, 1972 is therefore enclosed.

ASGT

Yours very truly,

DENISON MINES LIMITED

A. A. Johnson
Chief Geologist (Coal)

For: QUINTETTE COAL LIMITED

AAJ/dj
encls. Copy our letter, Jan. 28/72
Addendum to Appendix A, 29 Mar./72
(#49)

APR 24 '72 AM

DEPT. OF MINES
AND PETROLEUM RESOURCES

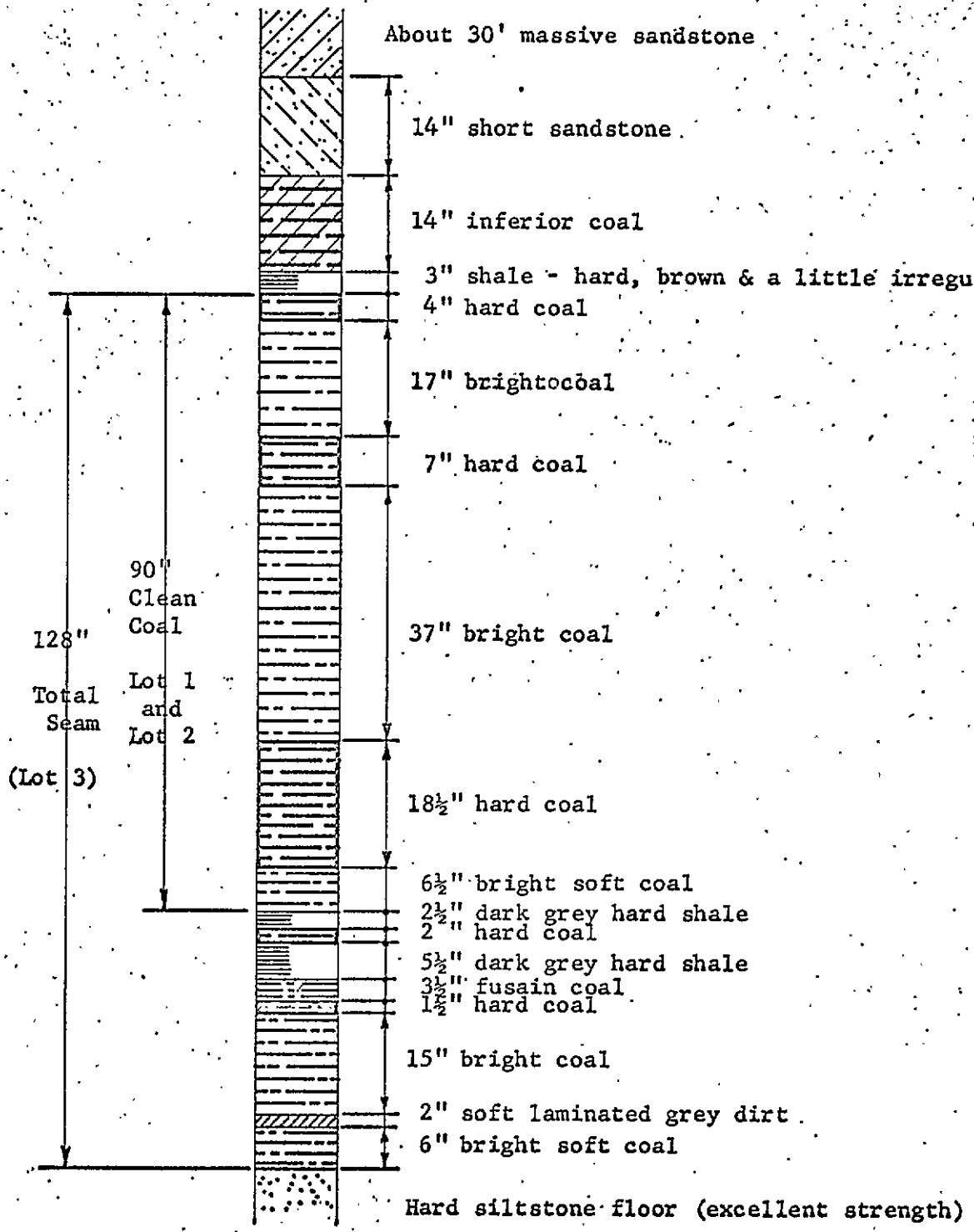
D.M.	
C.G.C.	25/4
C.C.	
D.C.G.C.	
D.C.C.	
ACCTS.	
C.M.B.	
C.I.	
C.A.	
R. T.	
C.P.E.	
A.R.C.	25/4
MR JAMES	

The 297 pages of this report following this page contain coal quality data, and remain confidential under the terms of the *Coal Act Regulation*, Section 2(1). They have been removed from the public version.

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_251_2004

DENISON MINES LTD.

QUINTETTE ADIT D4



Scale 1/2" = 1'0"

The 400 pages of this report following this page contain coal quality data, and remain confidential under the terms of the *Coal Act Regulation*, Section 2(1). They have been removed from the public version.

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_251_2004

APPENDIX B

Definition of Reserves

APPENDIX B

DEFINITION OF RESERVES

The following definitions, approved by the Association of Professional Engineers of the Province of Ontario have been used in this report.

"Proven Ore" or "Measured Ore" is that material for which tonnage is computed from dimensions revealed in outcrops or trenches or underground workings and/or drill holes and for which the grade is computed from the results of adequate sampling. The sites for inspection, sampling, and measurement are so spaced and the geological character so well defined that the size, shape, and mineral content are established. The computed tonnage and grade are judged to be accurate within limits which must be stated. It must be stated whether the tonnage and grade of "proven" or "measured" ore is in situ or extractable, with dilution factors shown, and reasons for the use of these dilution factors clearly explained.

"Probable Ore" or "Indicated Ore" is that material for which tonnage and grade are computed partly from specific measurements, samples or production data, and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately

spaced to outline the material completely or to establish its grade throughout.

"Possible Ore" or "Inferred Ore" is that material for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition for which there are reasonable geological indications; these indications may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific evidence of their presence.

Estimates of "possible" or "inferred" ore should include a statement of conditions within which the "inferred" material occurs.

The arithmetical average of any amount of sampling is not necessarily representative, unless the distribution of values and number of samples are properly taken into account. A statement of how samples were taken should be given, and where mineralization is erratic, the method of treating erratic values should be given in the narrative of the report.