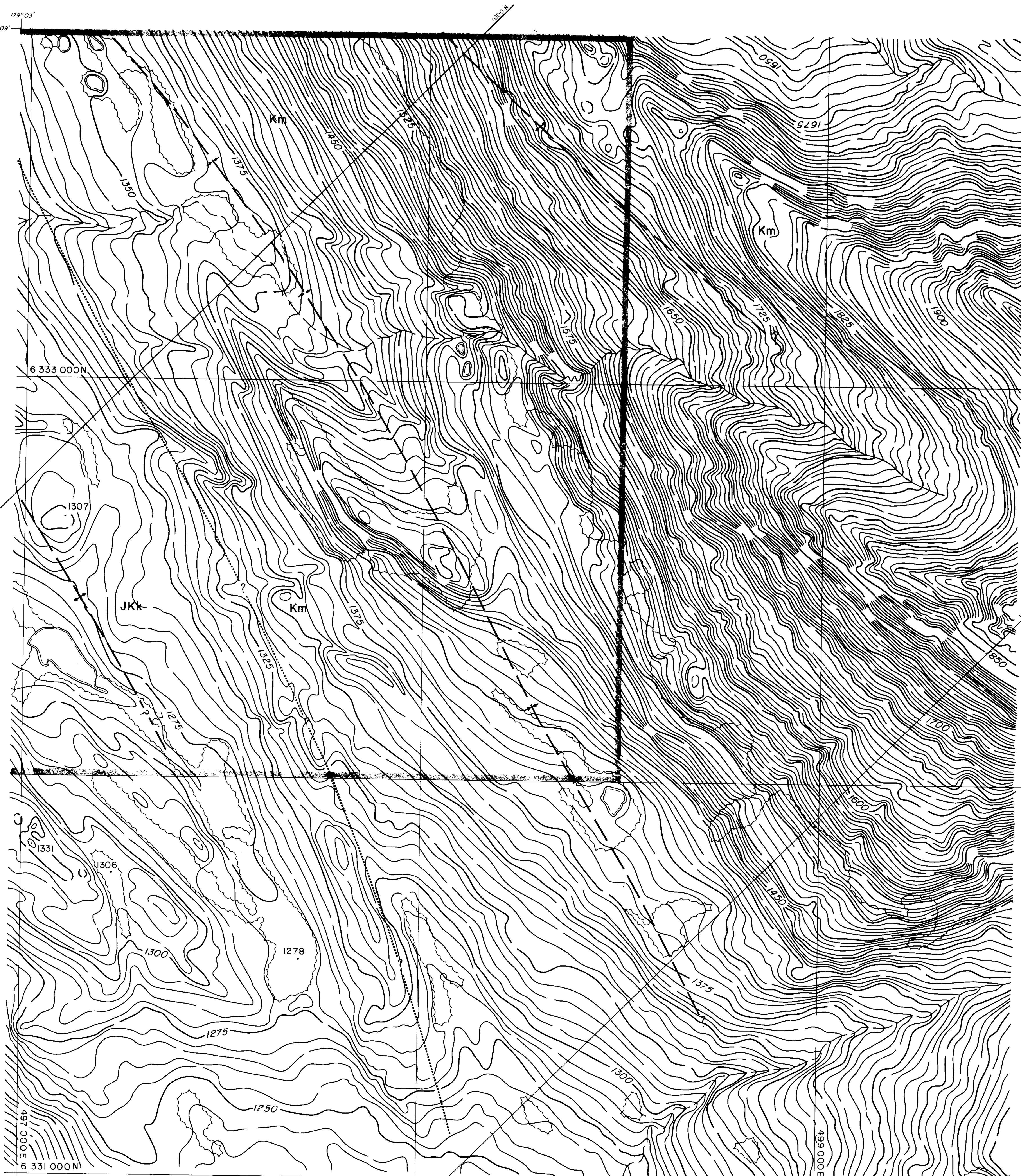
00722

APPENDIX II



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

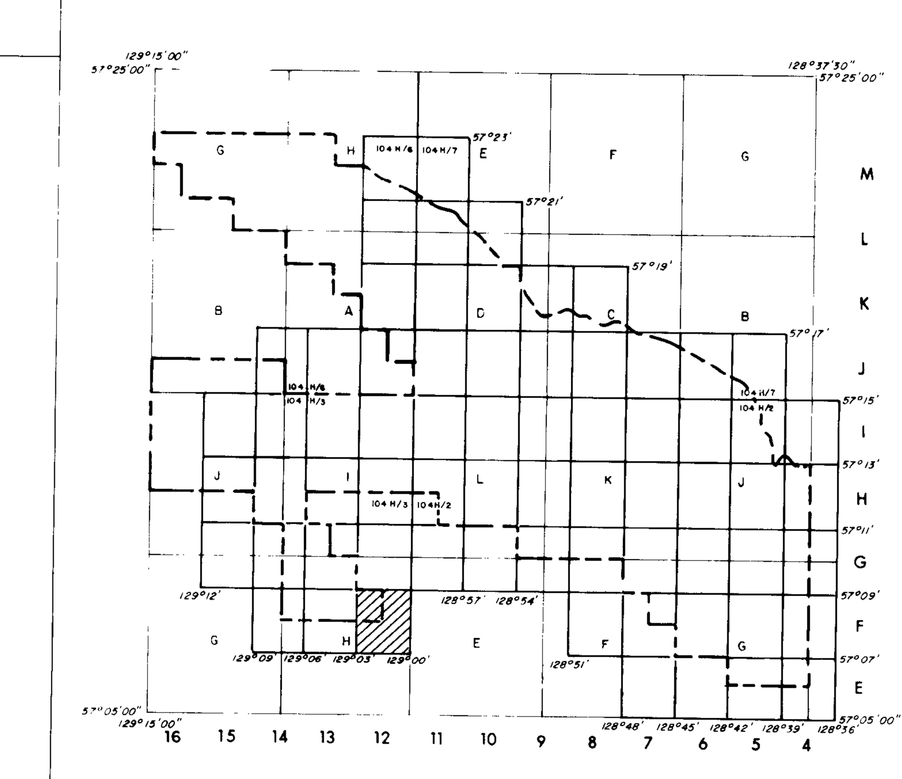
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1 60 000 (APPROXIMATE)

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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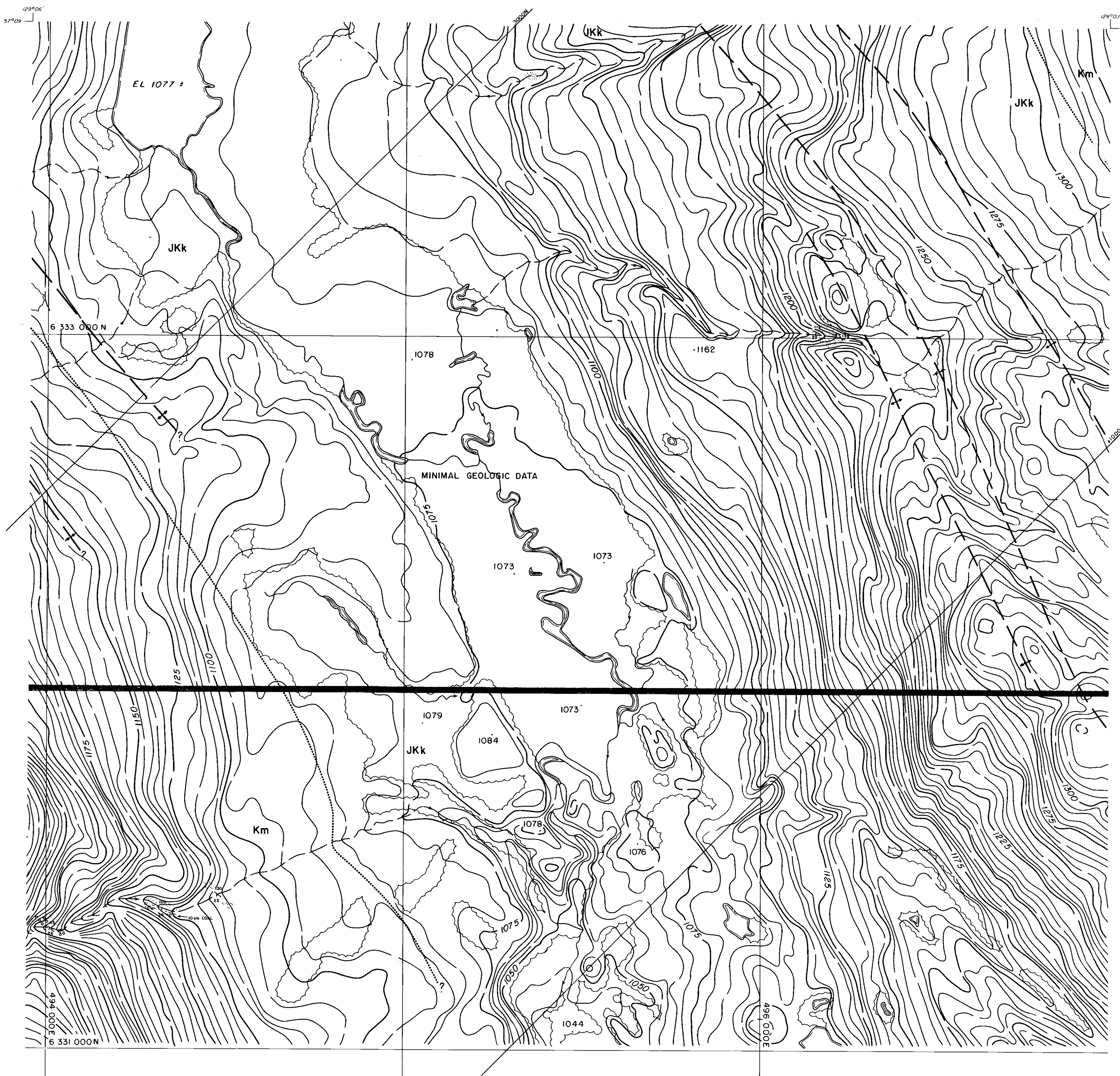
LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 — SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP F-12	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR.1987	DRAWING No. KPN86NA-01



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

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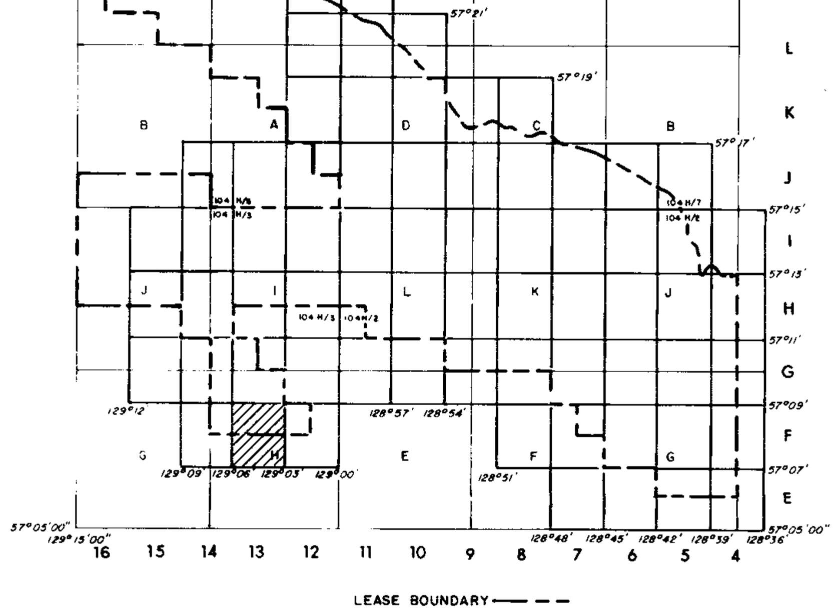
SCALE 1:5000

0.25 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



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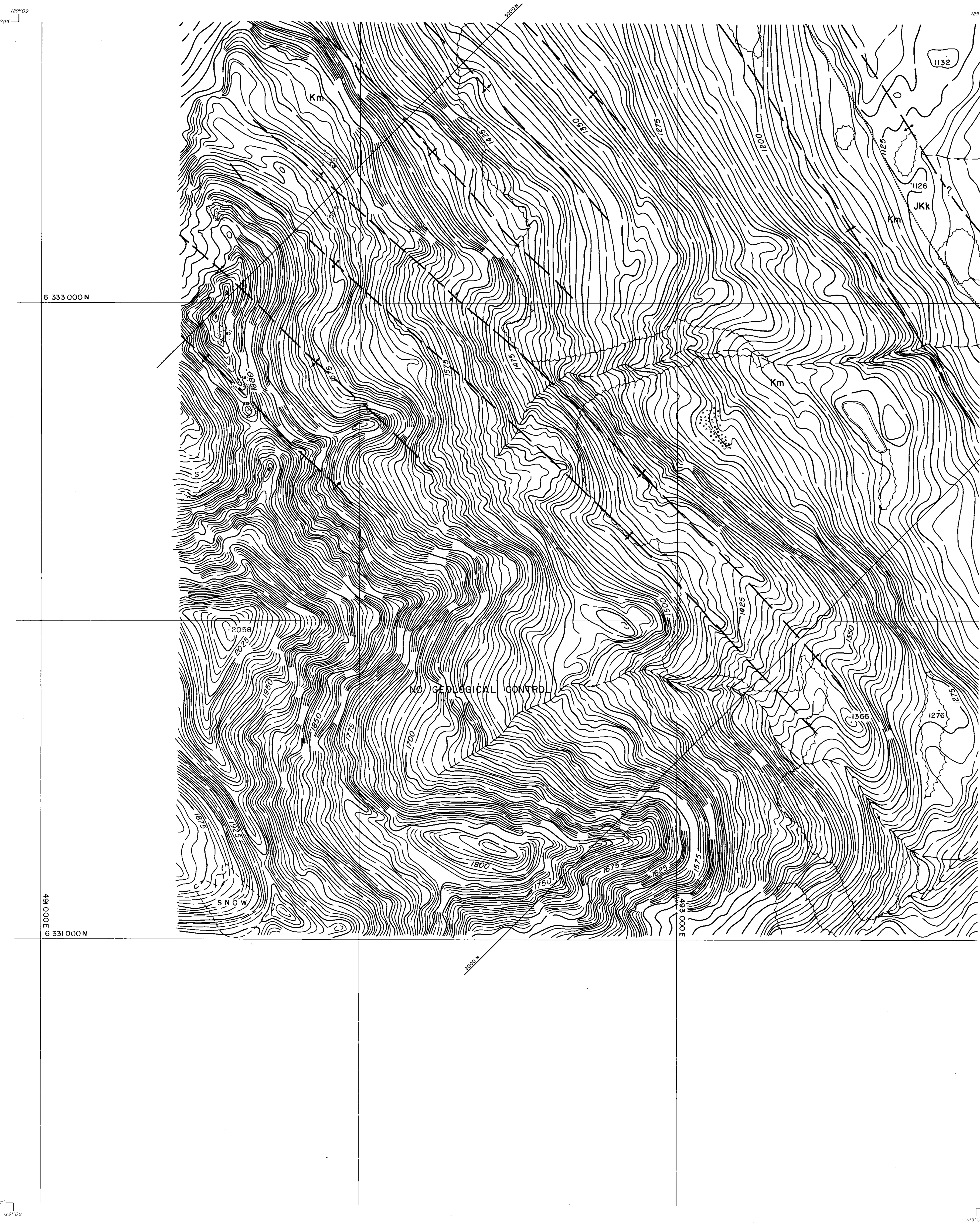
LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP F-13	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-02



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
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TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

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COMPILED BY
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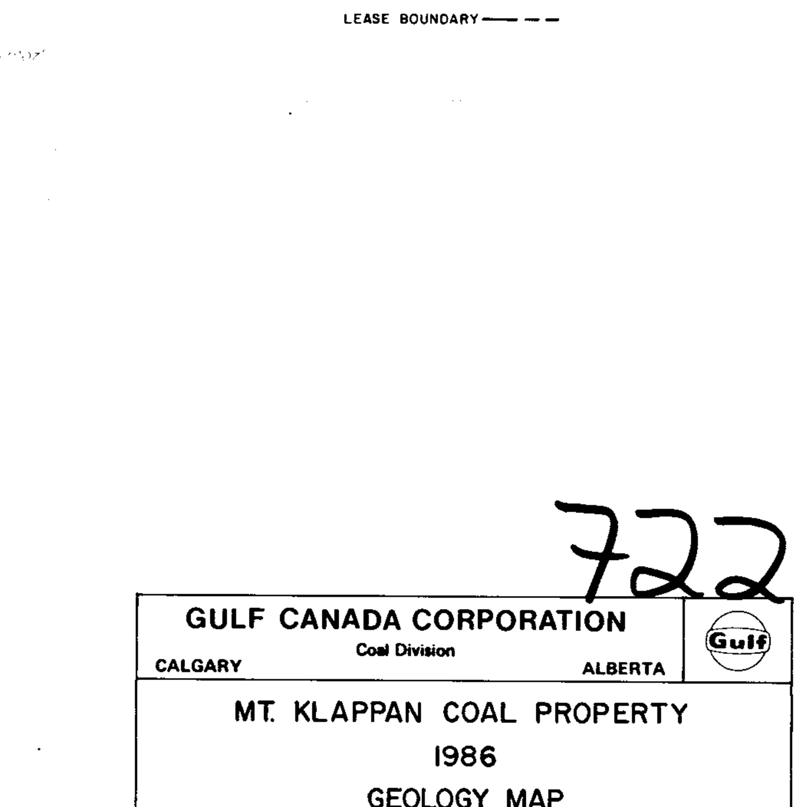
SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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LEGEND

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COAL SEAM (DEFINED, INFERRED)
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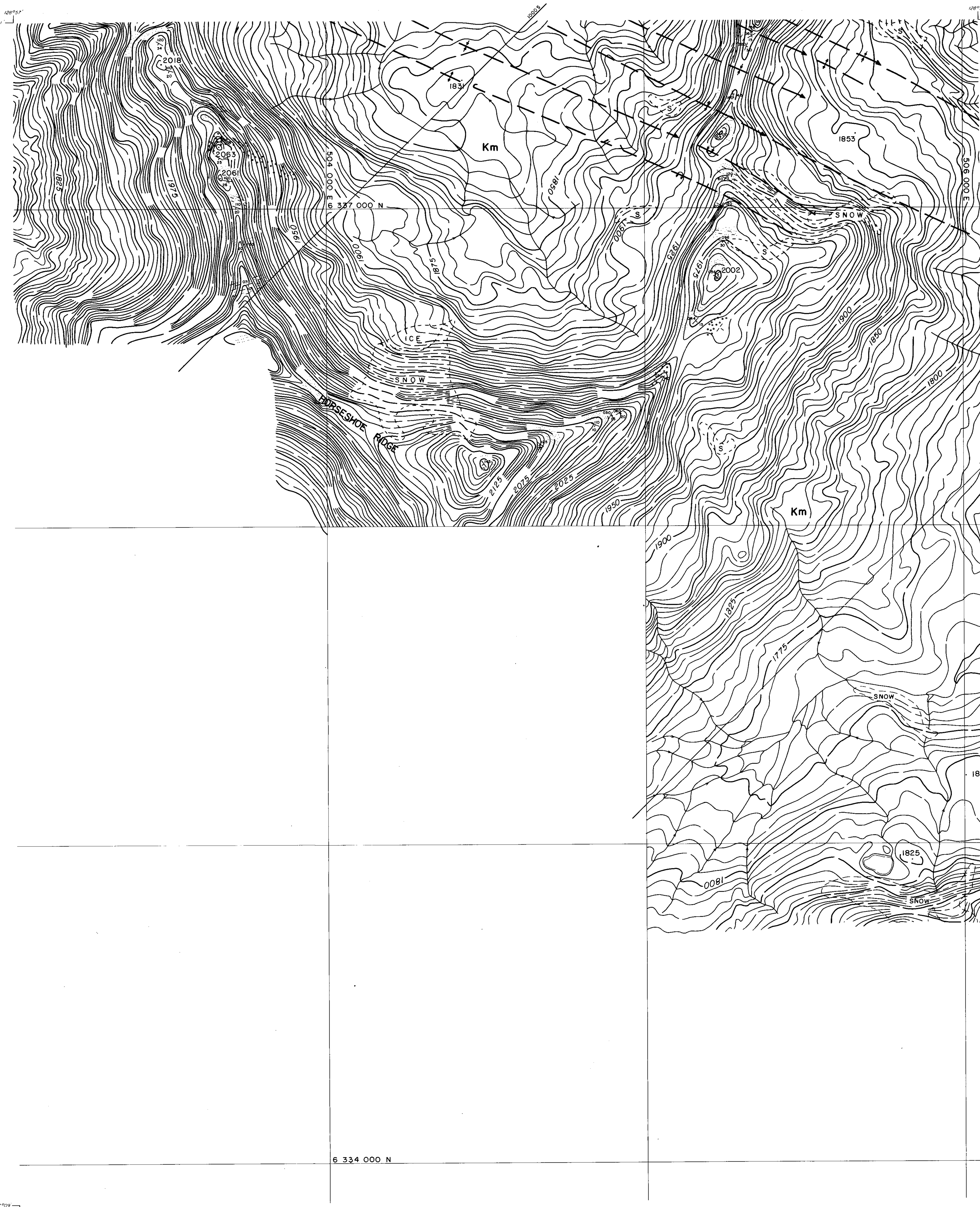
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP F-14	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-03



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
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TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
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APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
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FIELD CONTROL POINT — CP 121
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NOTES

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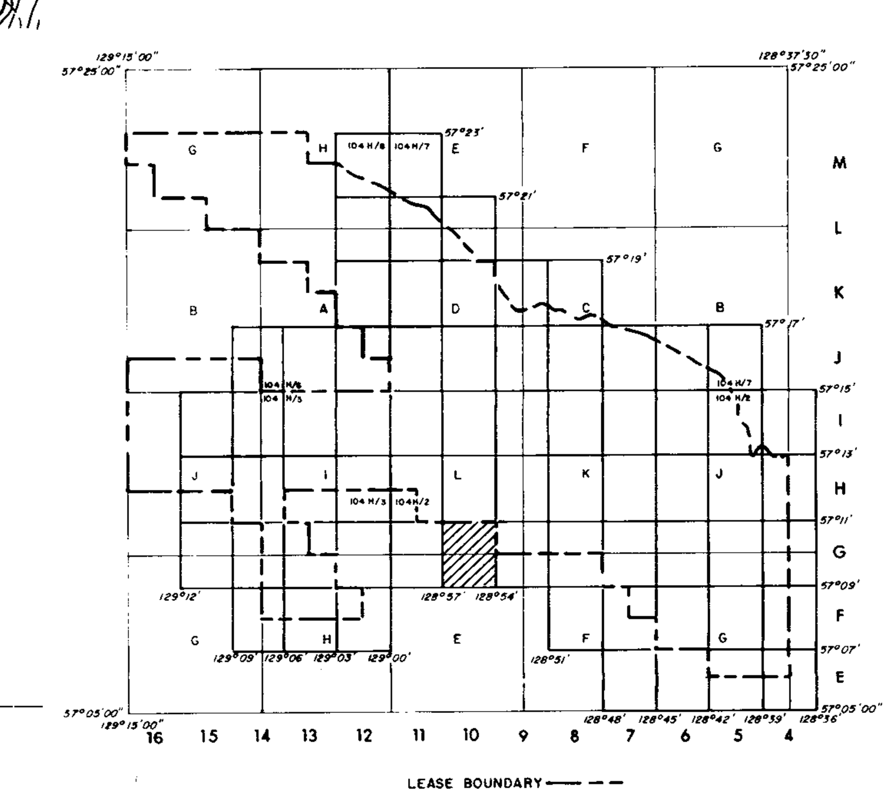
SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



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LEGEND

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JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
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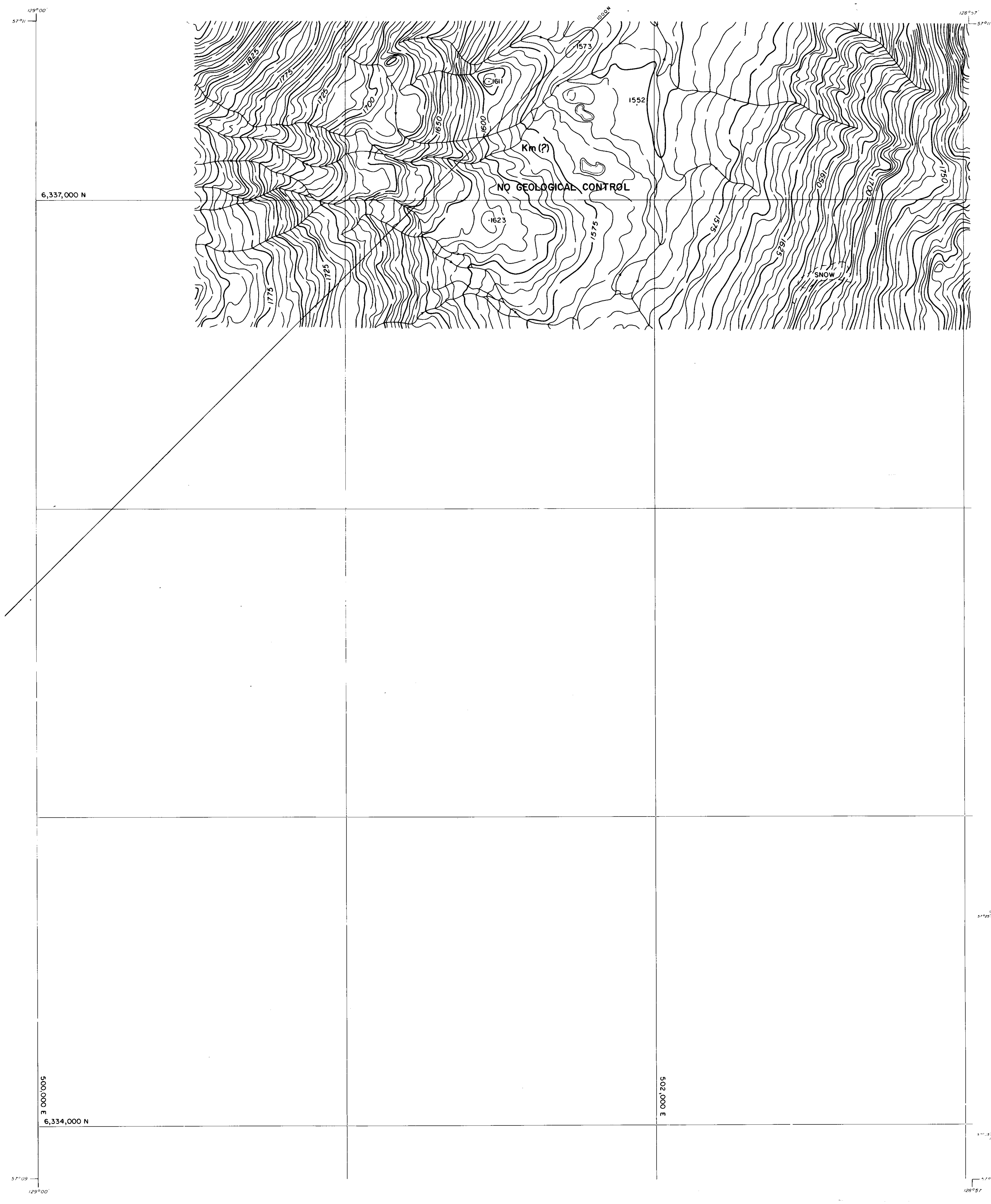
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 — SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA		Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP G-10		
PREPARED BY: S.M./L.S.		SCALE 1:5000
APPROVED BY: E.S.	DATE: MAR. 1987	DRAWING No. KPN86NA-04



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
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N

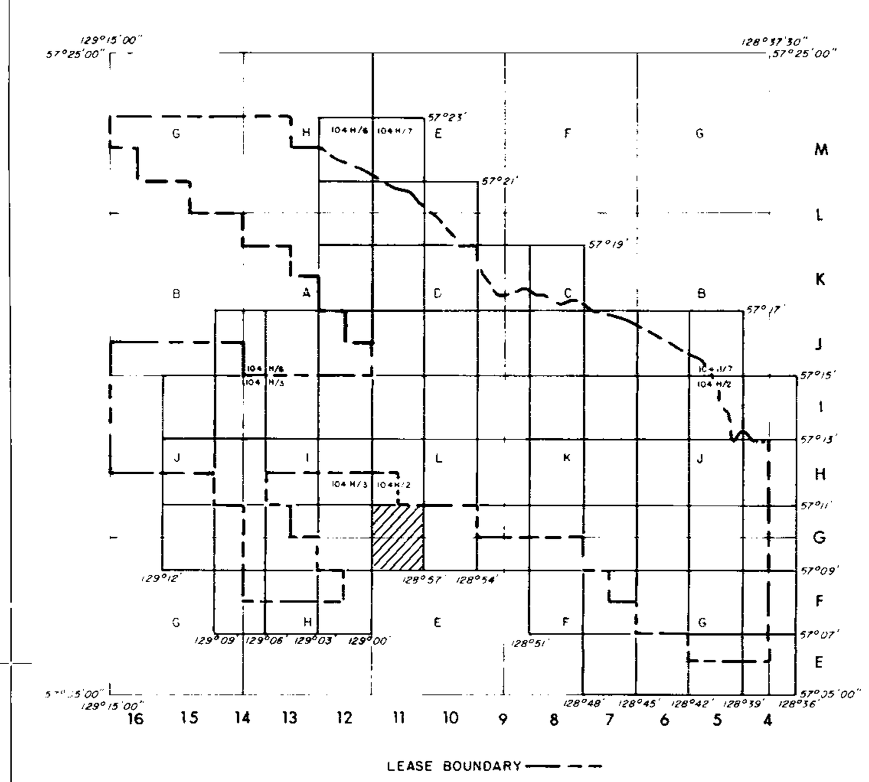
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY — — —

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TRC84001 — ADIT TRENCH COAL SPOIL
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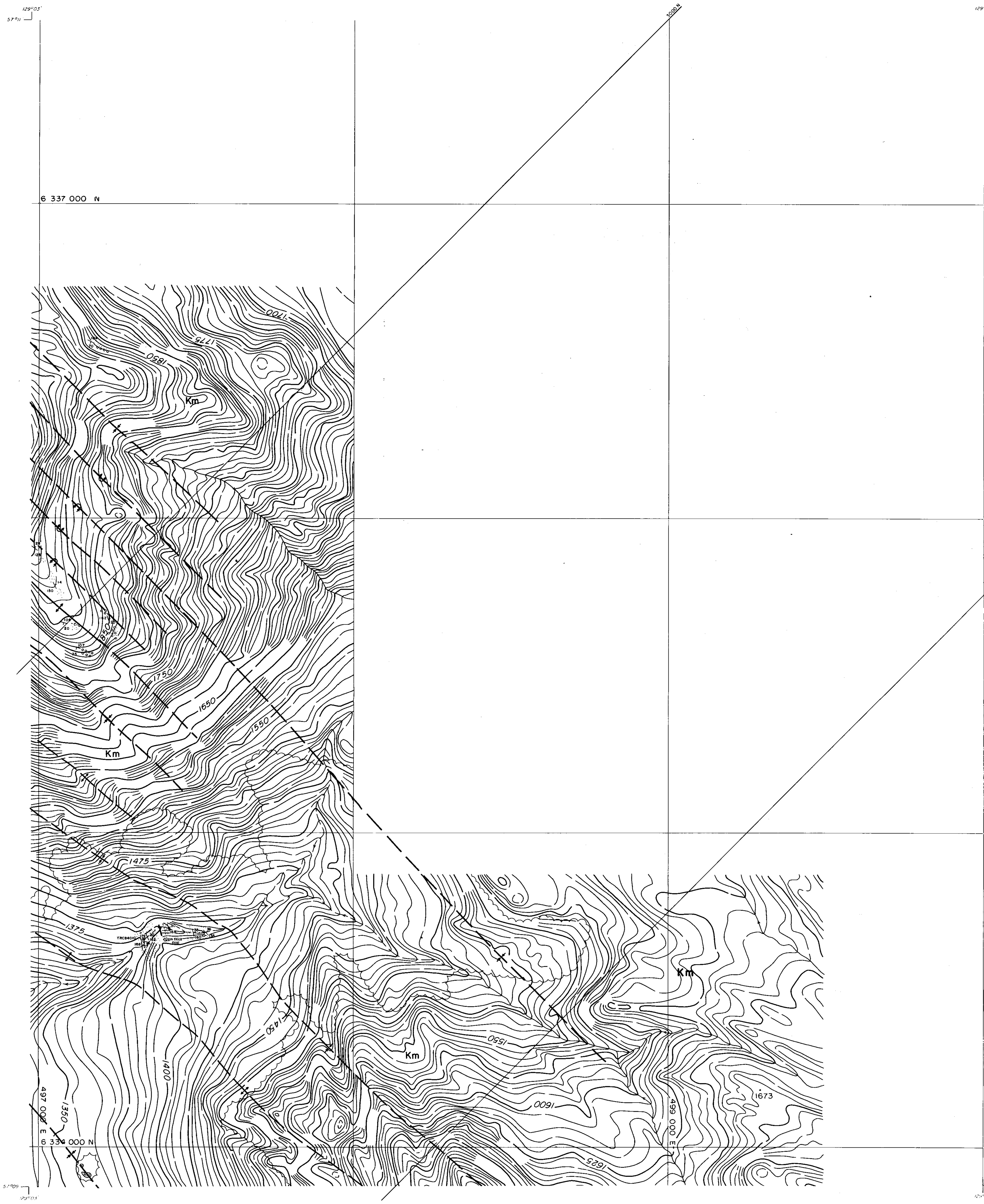
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION	
Coal Division	
CALGARY	ALBERTA
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP G-11	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-05



LEGEND

BUILDING
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LOOSE SURFACE
CART TRACK
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WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — 7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

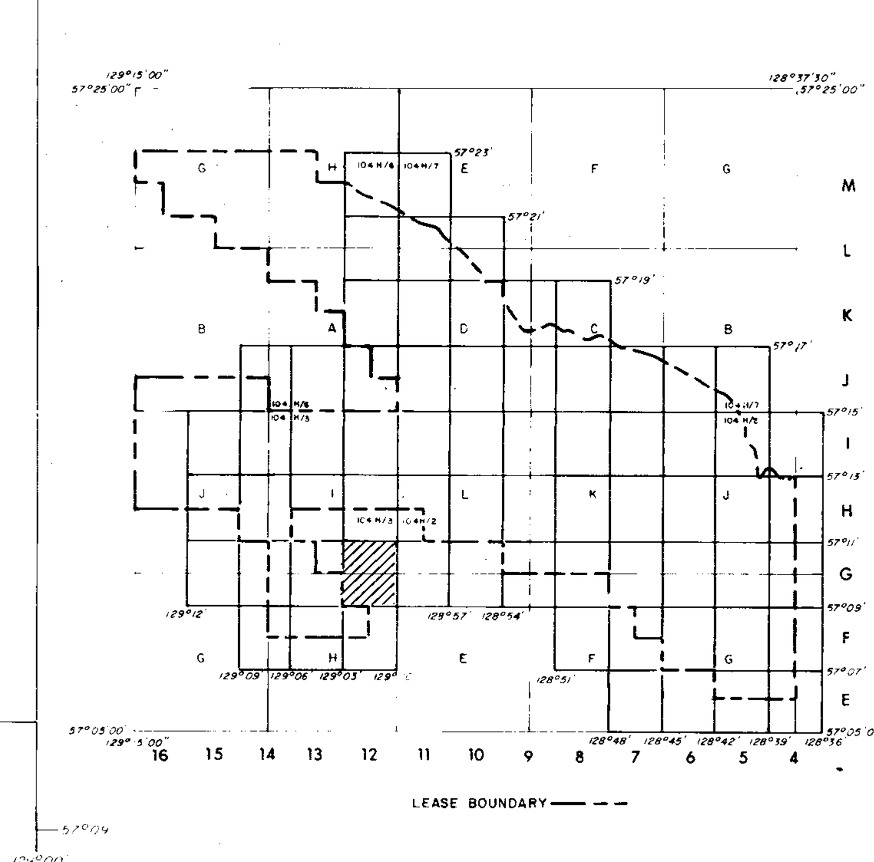
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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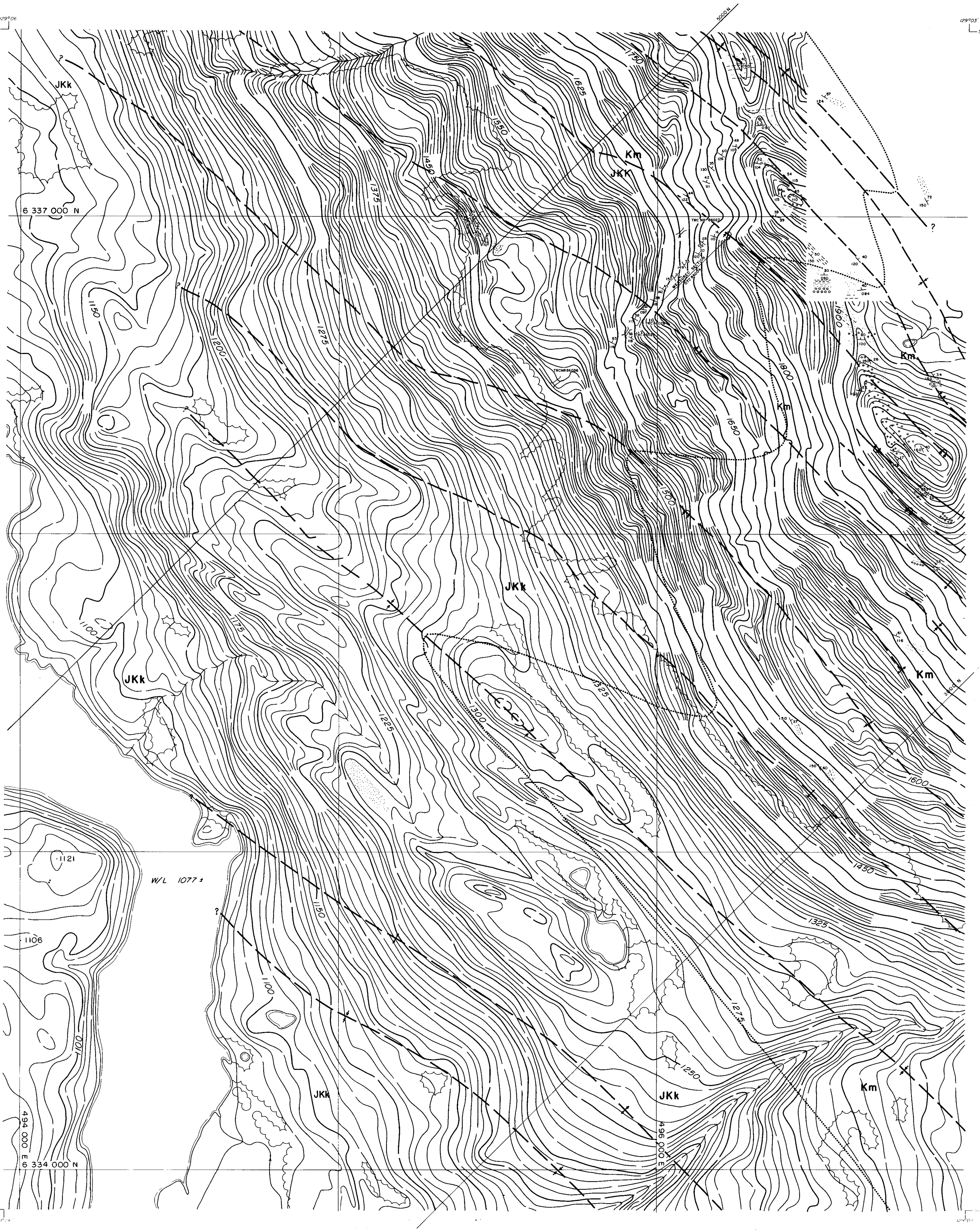
LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 — SP — ADIT TRENCH COAL SPOIL
DDH RDH WKO — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP G-12	
PREPARED BY: S.M. / L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-06



LEGEND

- BUILDING
- ROAD, HARD SURFACE
  - LOOSE SURFACE
  - CART TRACK
  - TRAIL
- RAILROAD BED
- RIVER
- STREAM, DEFINITE
  - APPROXIMATE
  - SPLIT
- LAKE
- WATER LEVEL — EL 505±
- SWAMP
- BEAVER DAM — B.D. B.D.
- TREE LINE
- CUT LINE
- CONTOURS, INDEX — 1750
  - INTERMEDIATE
  - DEPRESSION
  - APPROXIMATE
- SPOT ELEVATION — ·7654
- FORM LINES
- CUT/FILL
- FIELD CONTROL POINT — CP 121
- COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

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RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
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N

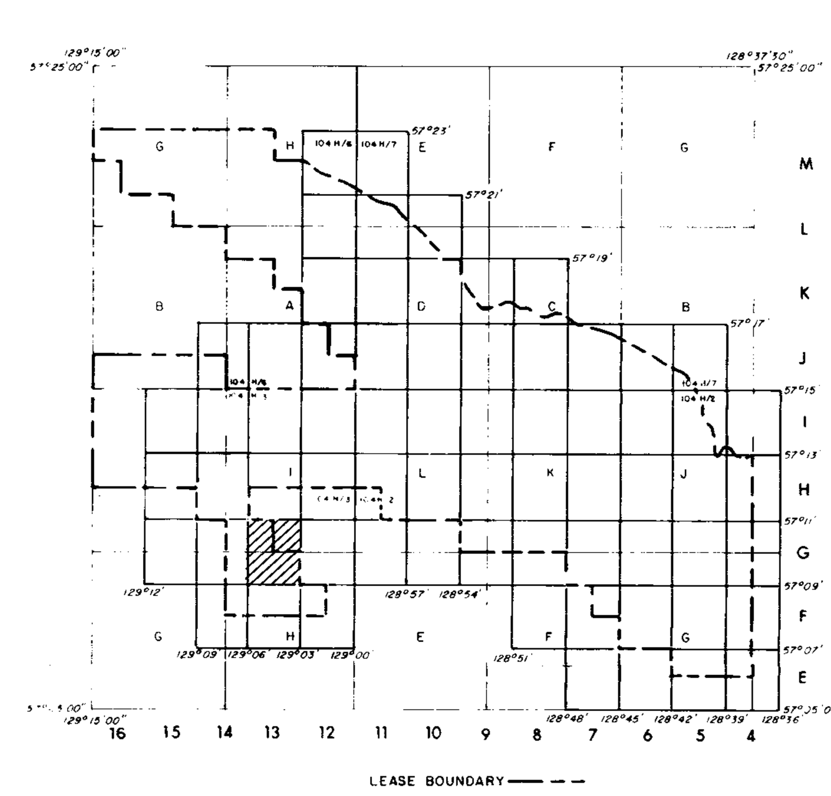
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY — — —

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

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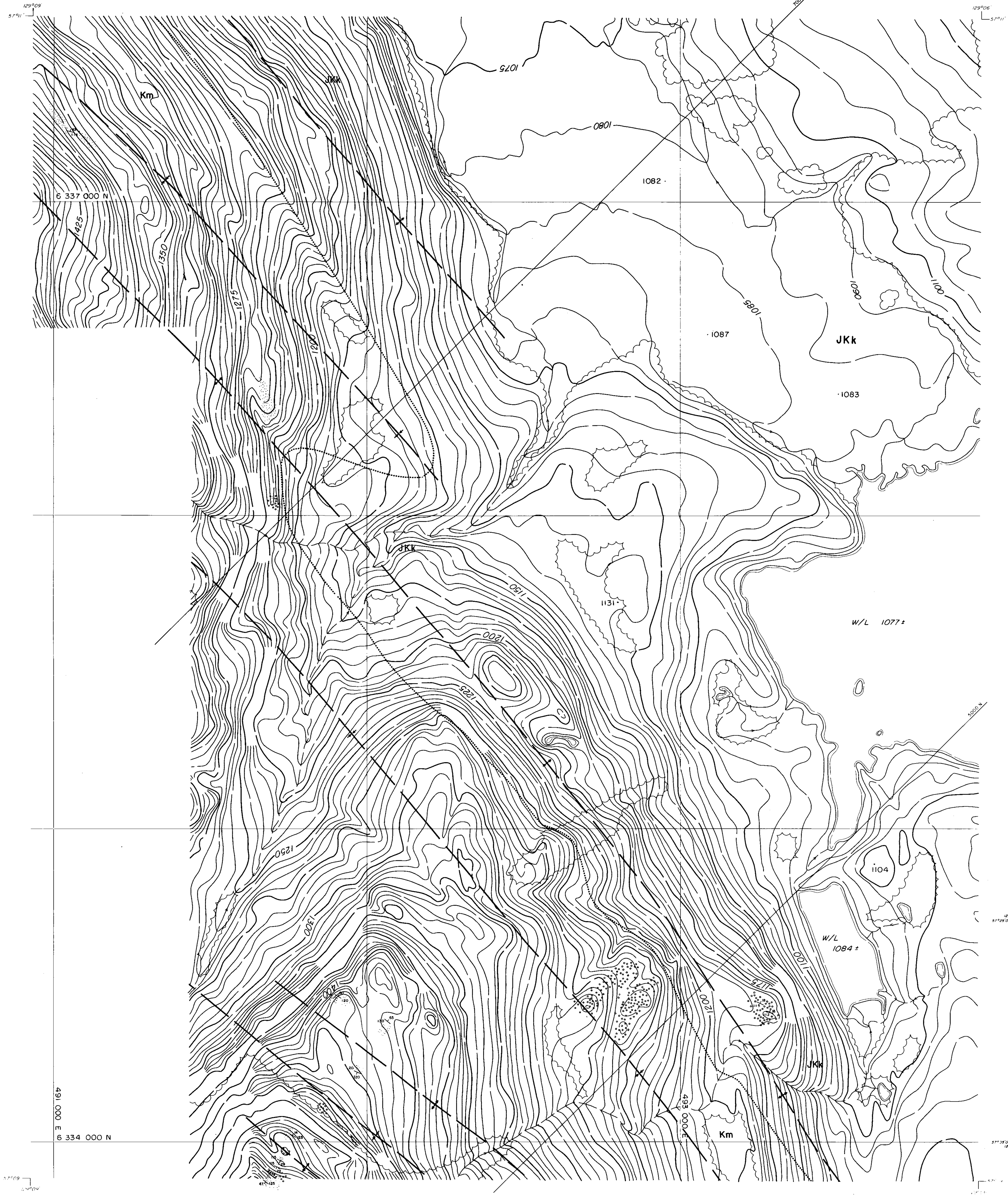
LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- TRC84001, SP — ADIT TRENCH COAL SPOIL
- DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- OTC 84001 — MEASURED SECTION
- SC-17 — SURVEY CAIRN
- 3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP G-13	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-07



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D. BD
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

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RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
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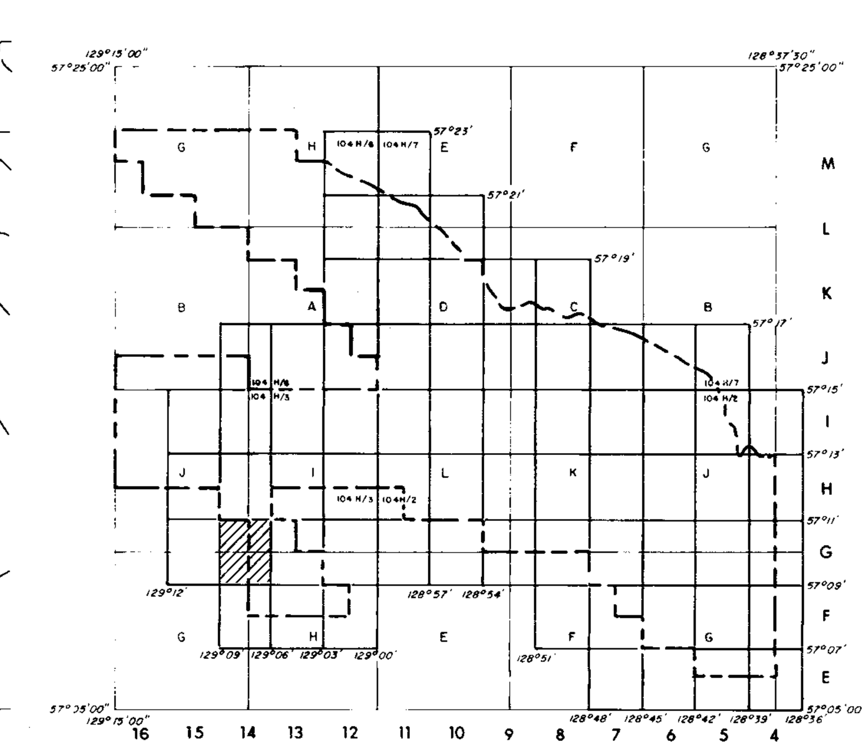
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
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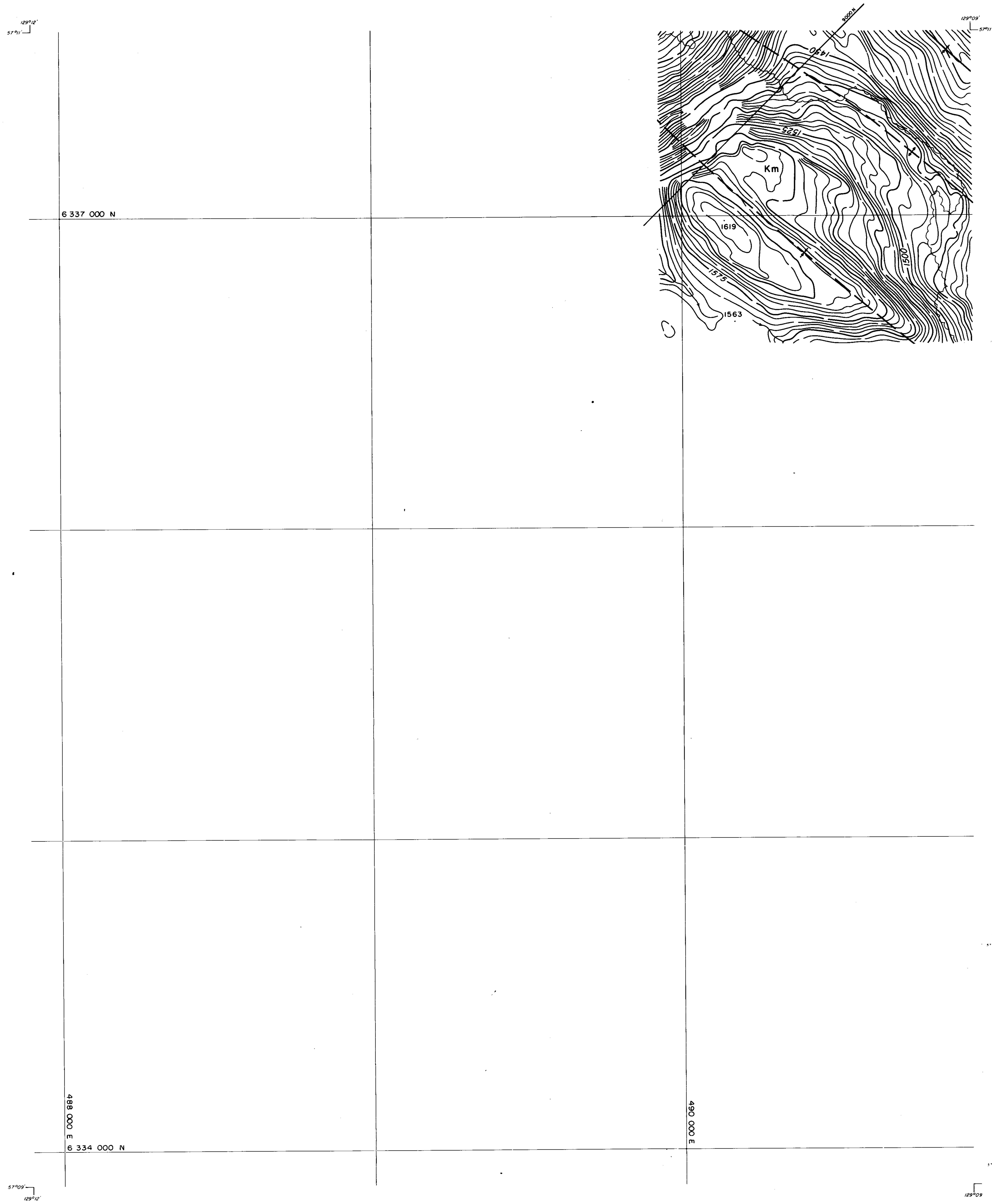
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE — U D
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL — TRC84001 — SP
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION) — DDH RDH WKD
MEASURED SECTION — OTC 84001
SURVEY CAIRN — SC-17
CROSS SECTION LINE — 3000 N

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP G-14	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-08



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D. B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

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RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

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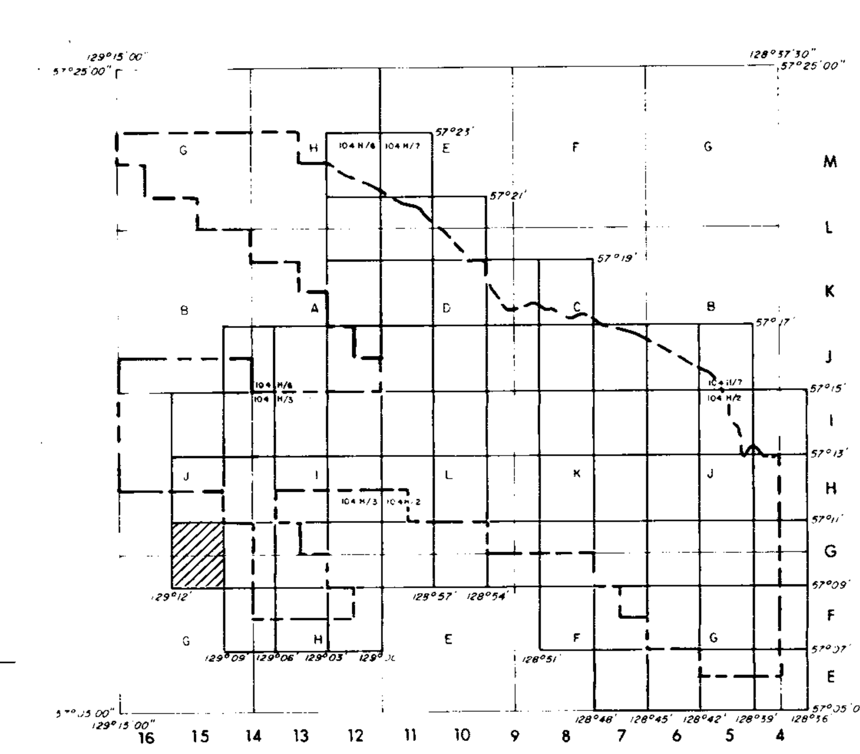
SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
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OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
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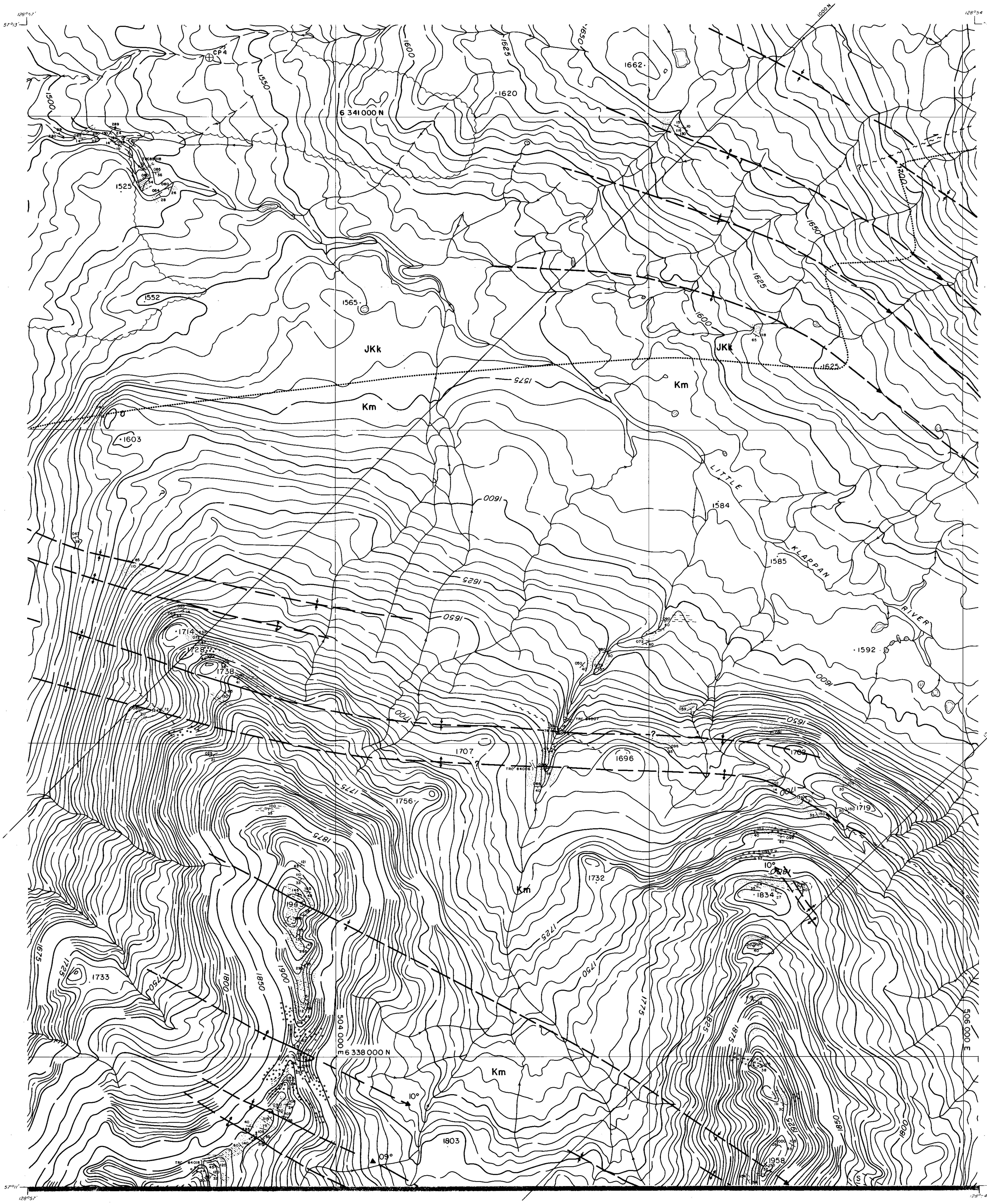
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP G-15	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-09



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
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NOTES

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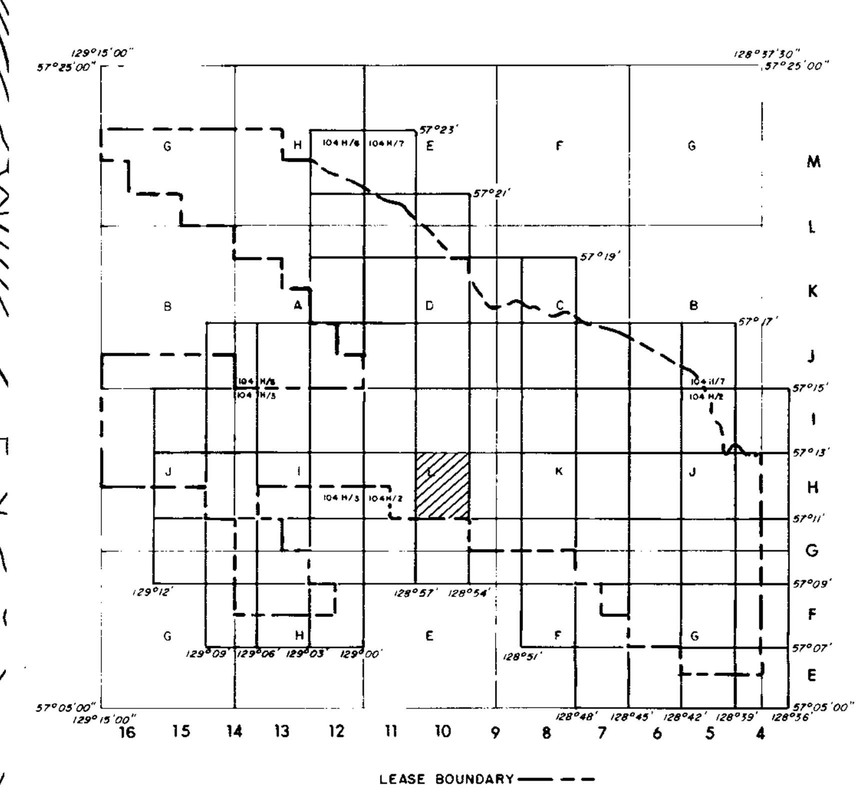
SCALE 1:5000

MILES
METERS

MT. KLAPPAN AREA

INDEX MAP



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LEGEND

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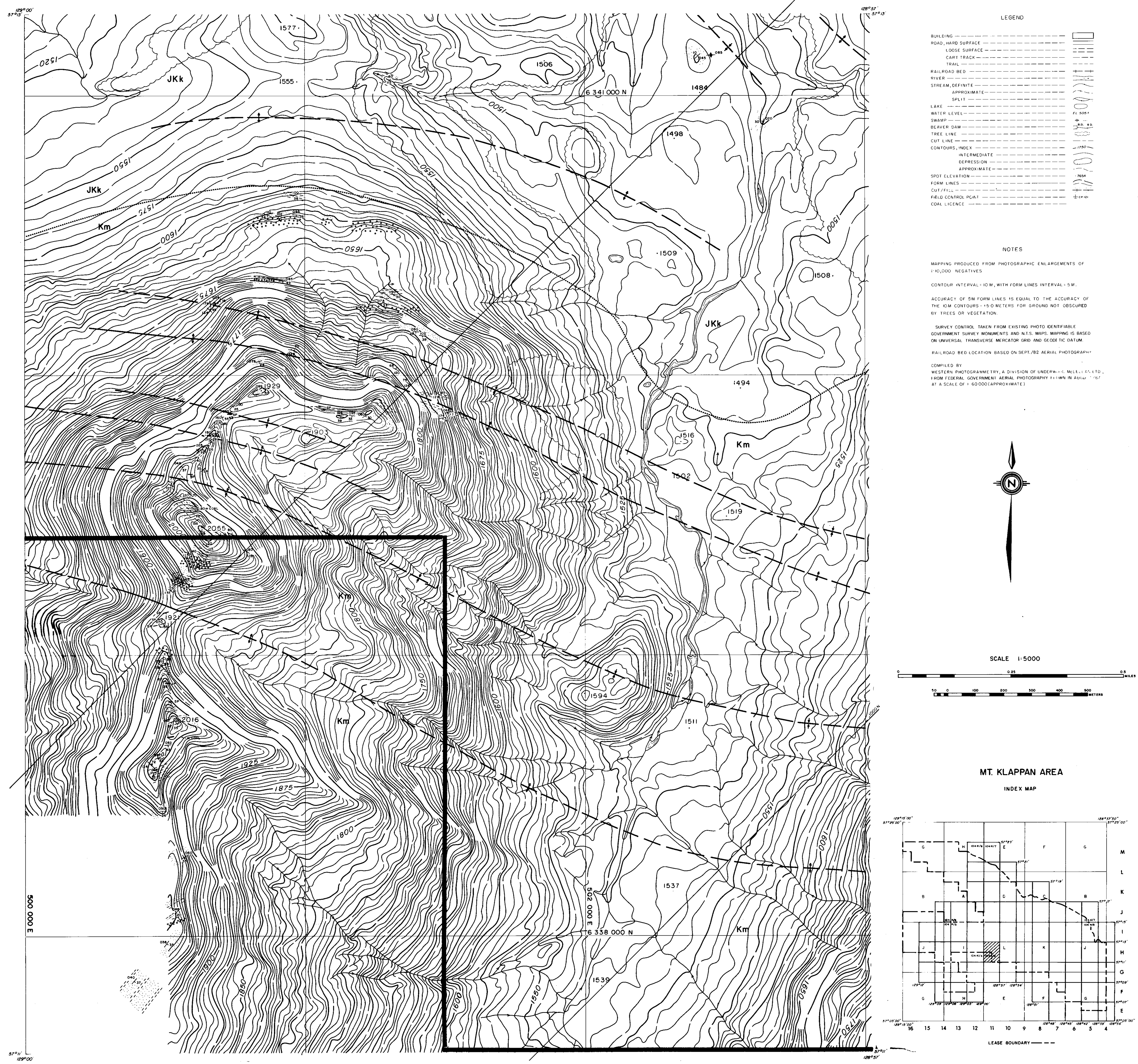
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 — SP ADIT TRENCH COAL SPOIL
DDH RDH WKD DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 MEASURED SECTION
SC-17 SURVEY CAIRN
3000 N CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP H-10	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-10



LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
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- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT TRENCH COAL SPOIL
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- MEASURED SECTION
- SURVEY CAIRN
- CROSS SECTION LINE

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

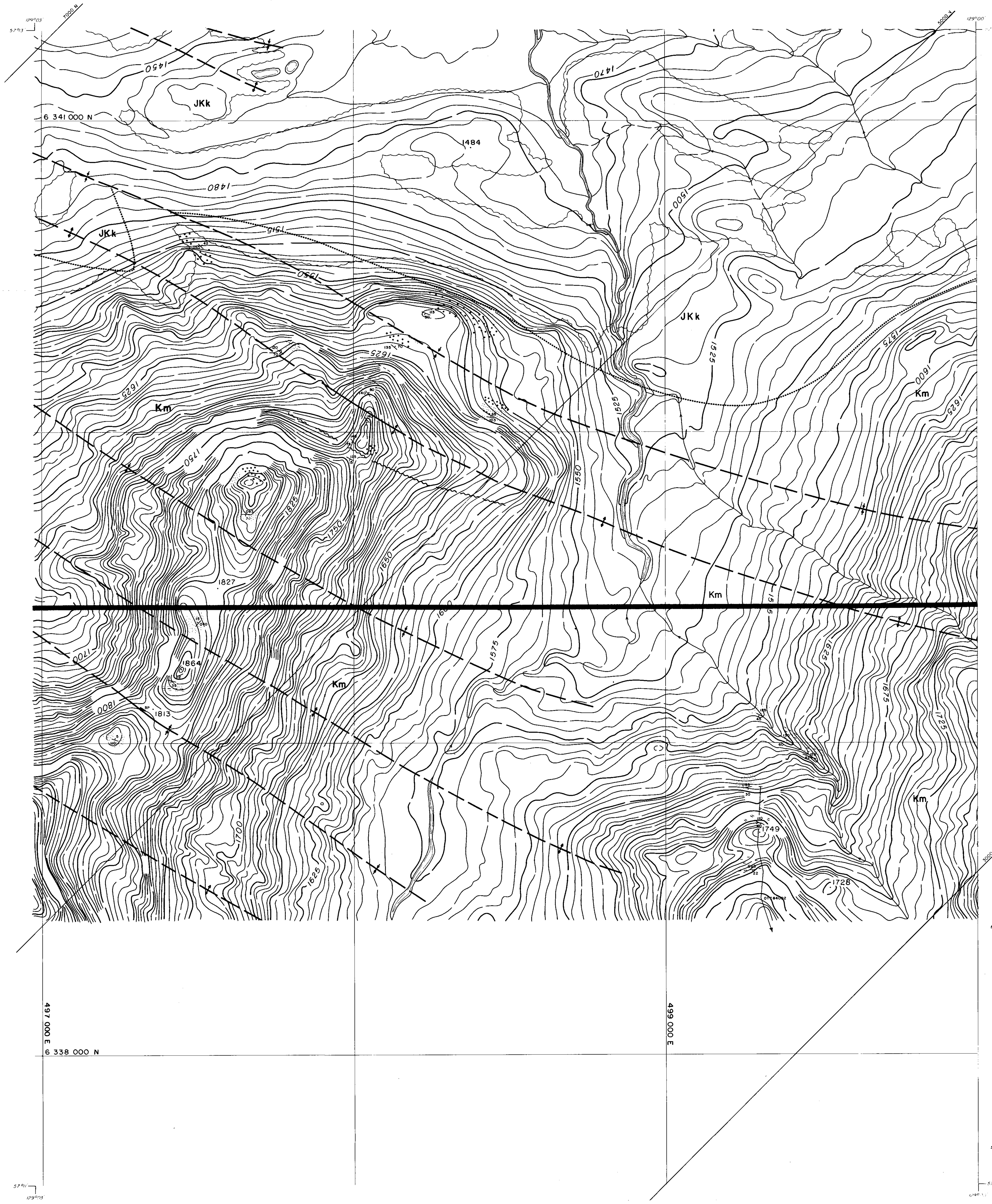
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
NASS AREA
MAP H-11

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-11



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 5051
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — 7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

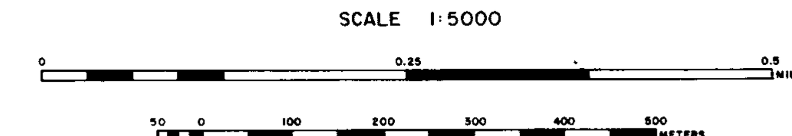
ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

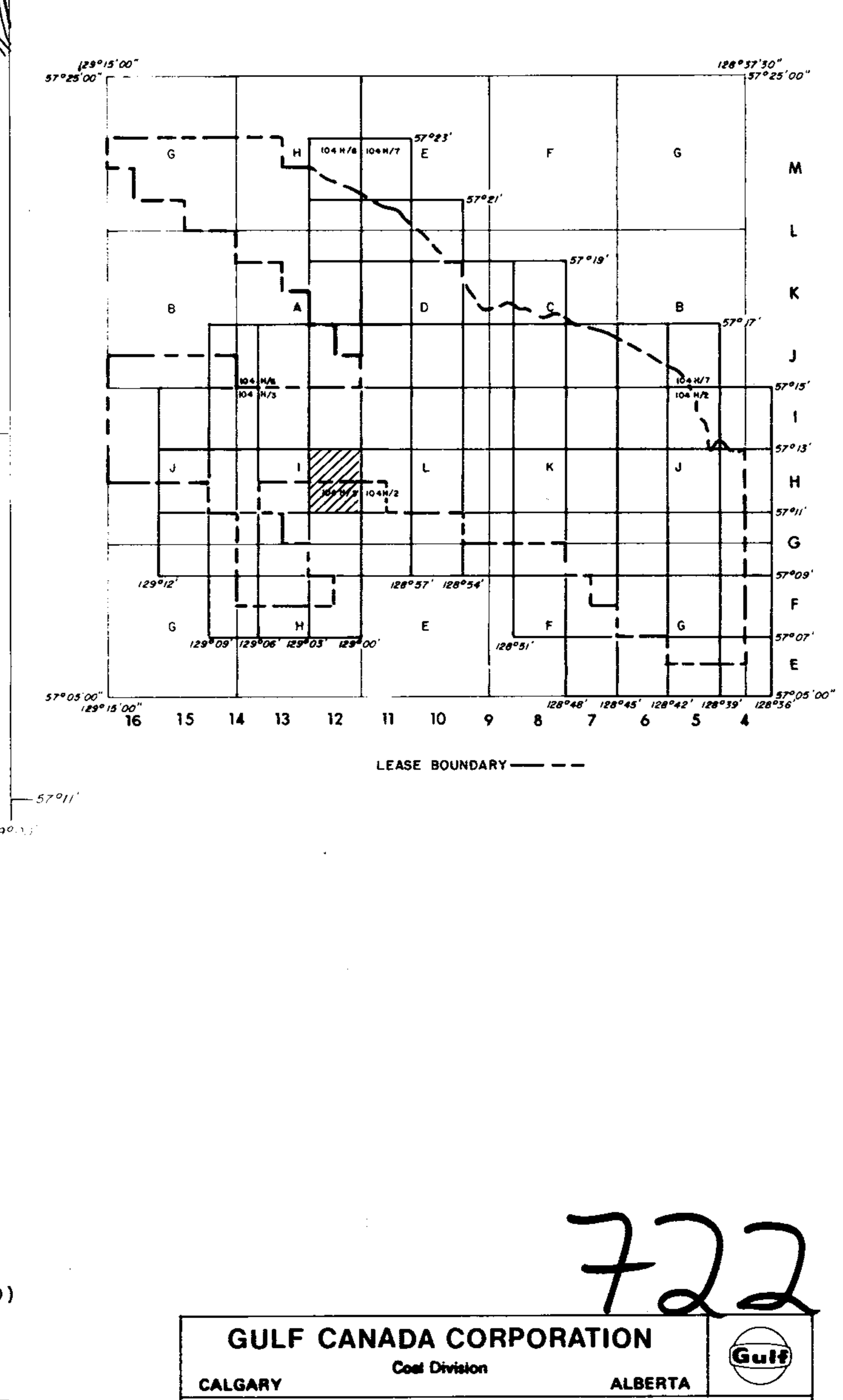
COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

SCALE 1:5000



MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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KLAPPAN SEQUENCE (main coal-bearing unit)

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SPATSIZI SEQUENCE

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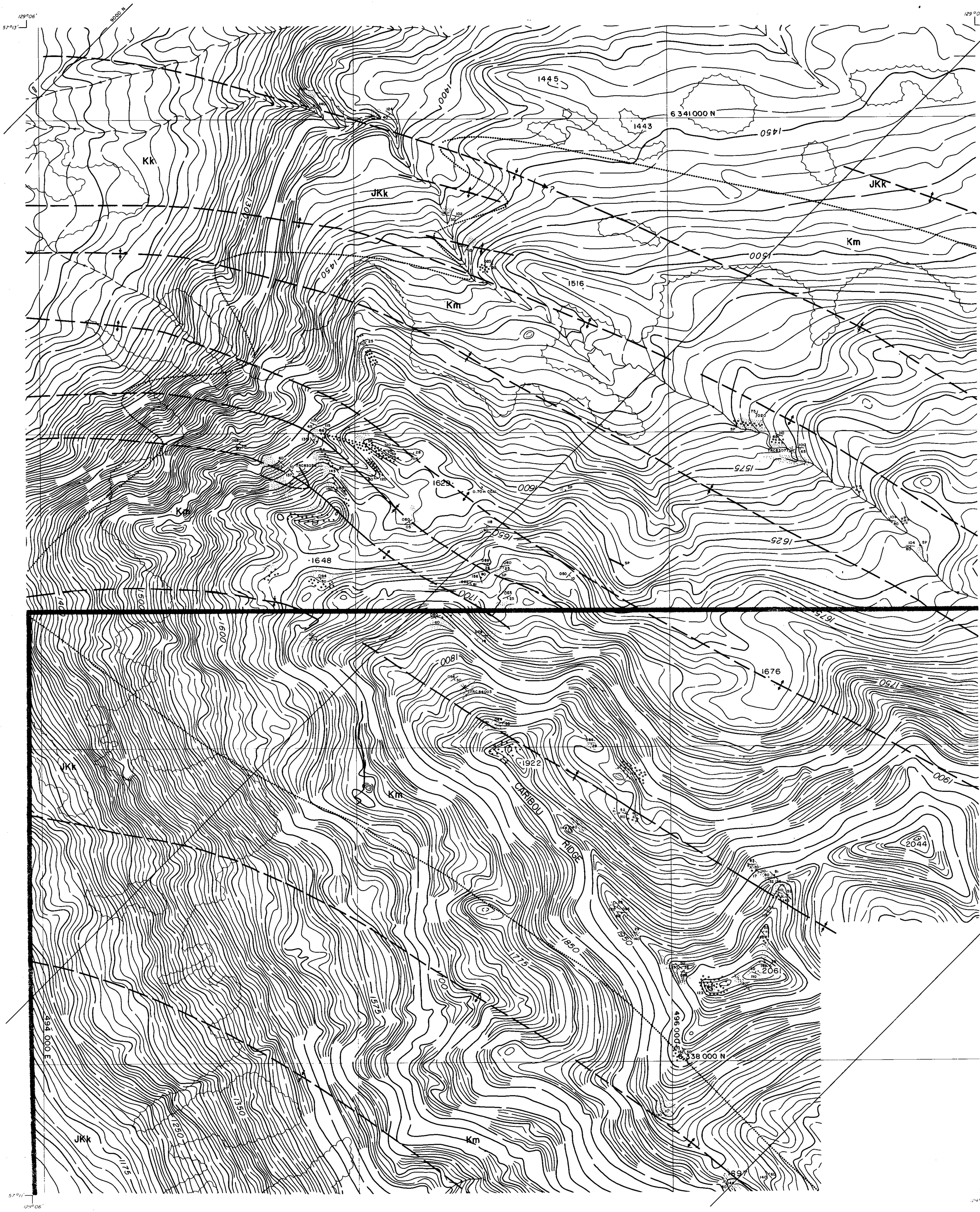
LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION — OTC 84001
SURVEY CAIRN
CROSS SECTION LINE — 5000 N

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP H-12	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-12



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES.

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1 60 000 (APPROXIMATE).

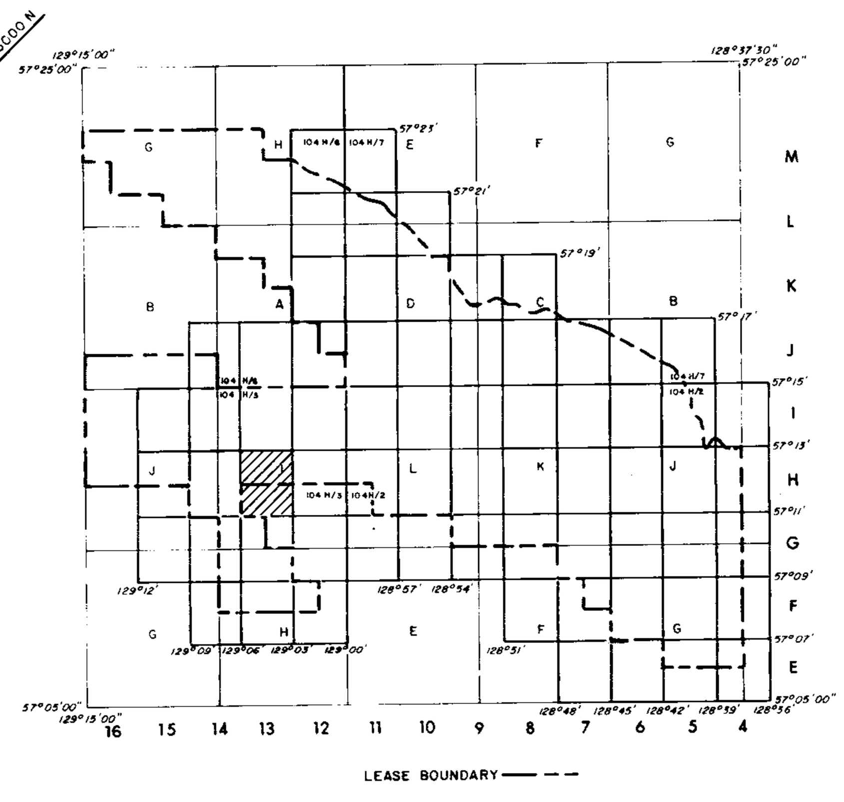
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

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KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

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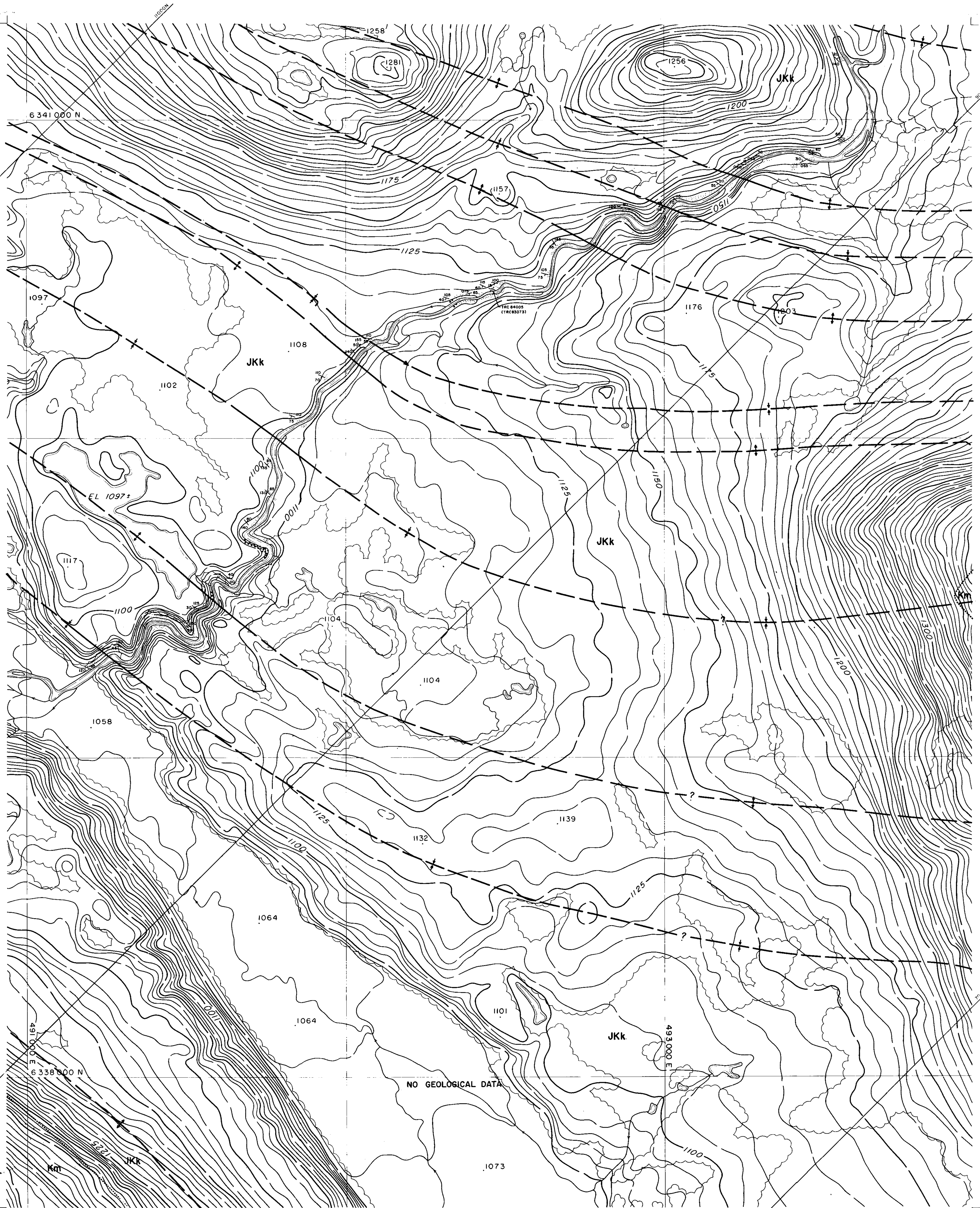
LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP H-13	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-13



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT / FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

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RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

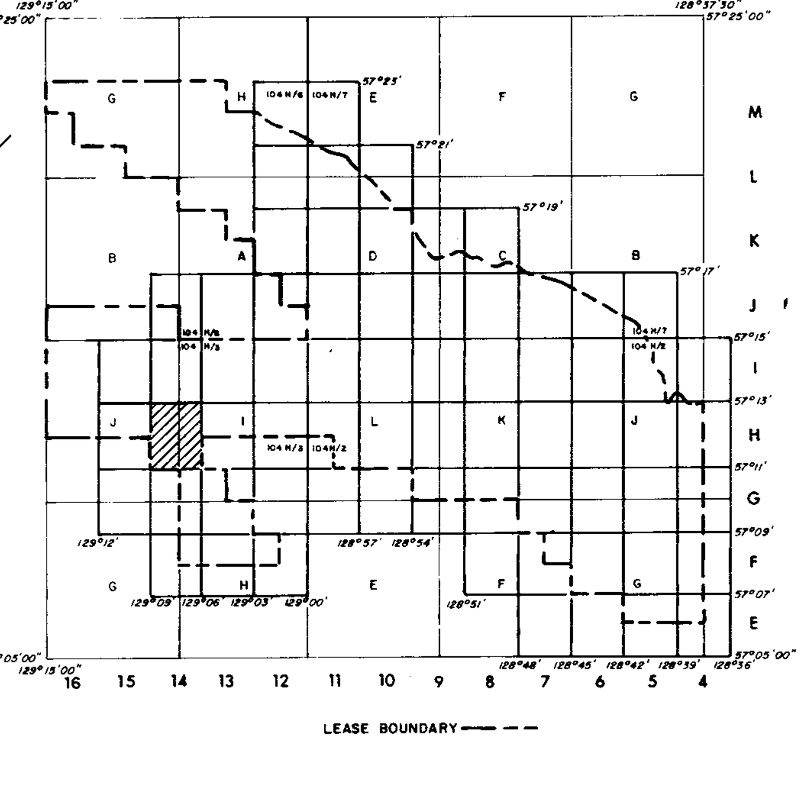
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

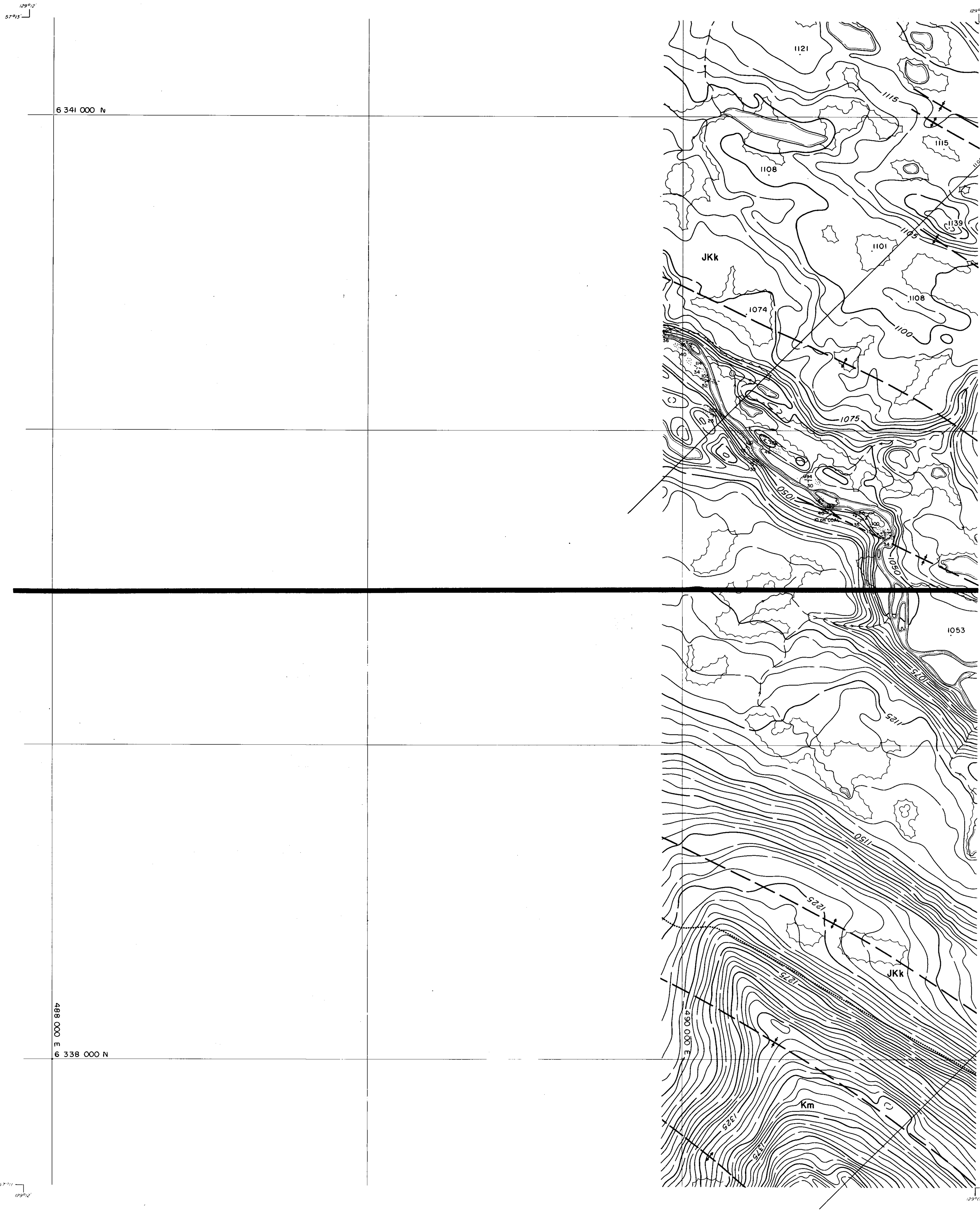
LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
NASS AREA
MAP H-14

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-14



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

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RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
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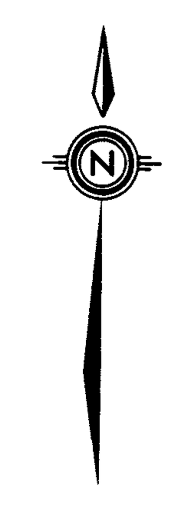
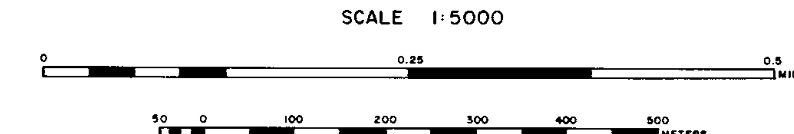
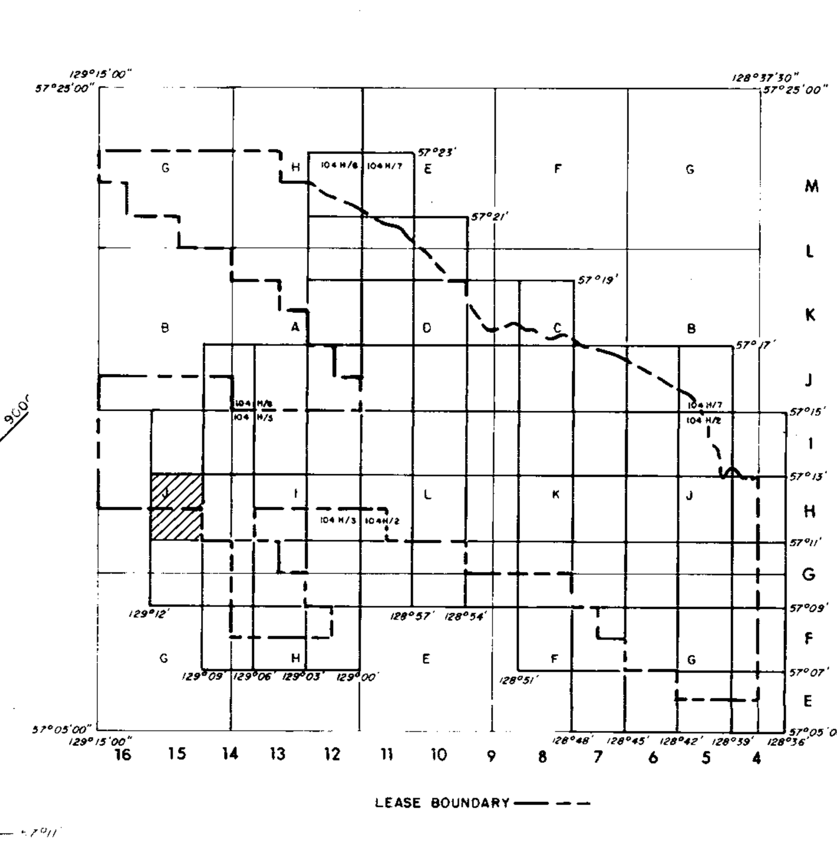


SCALE 1:5000



MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY — — —

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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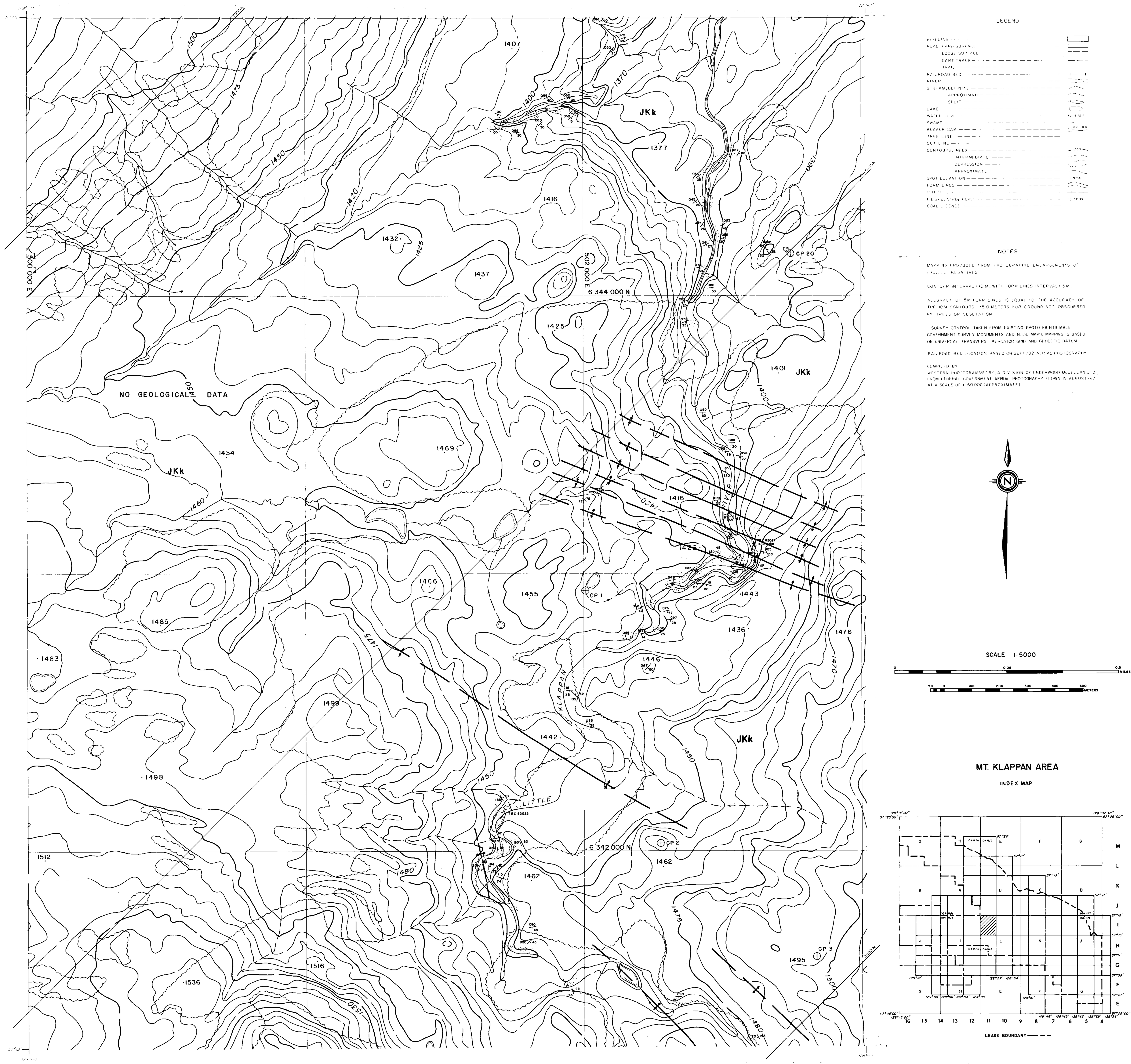
LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP ADIT TRENCH COAL SPOIL
DDH RDH WKD DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 MEASURED SECTION
SC-17 SURVEY CAIRN
3000 N CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP H-15	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-15



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LEGEND

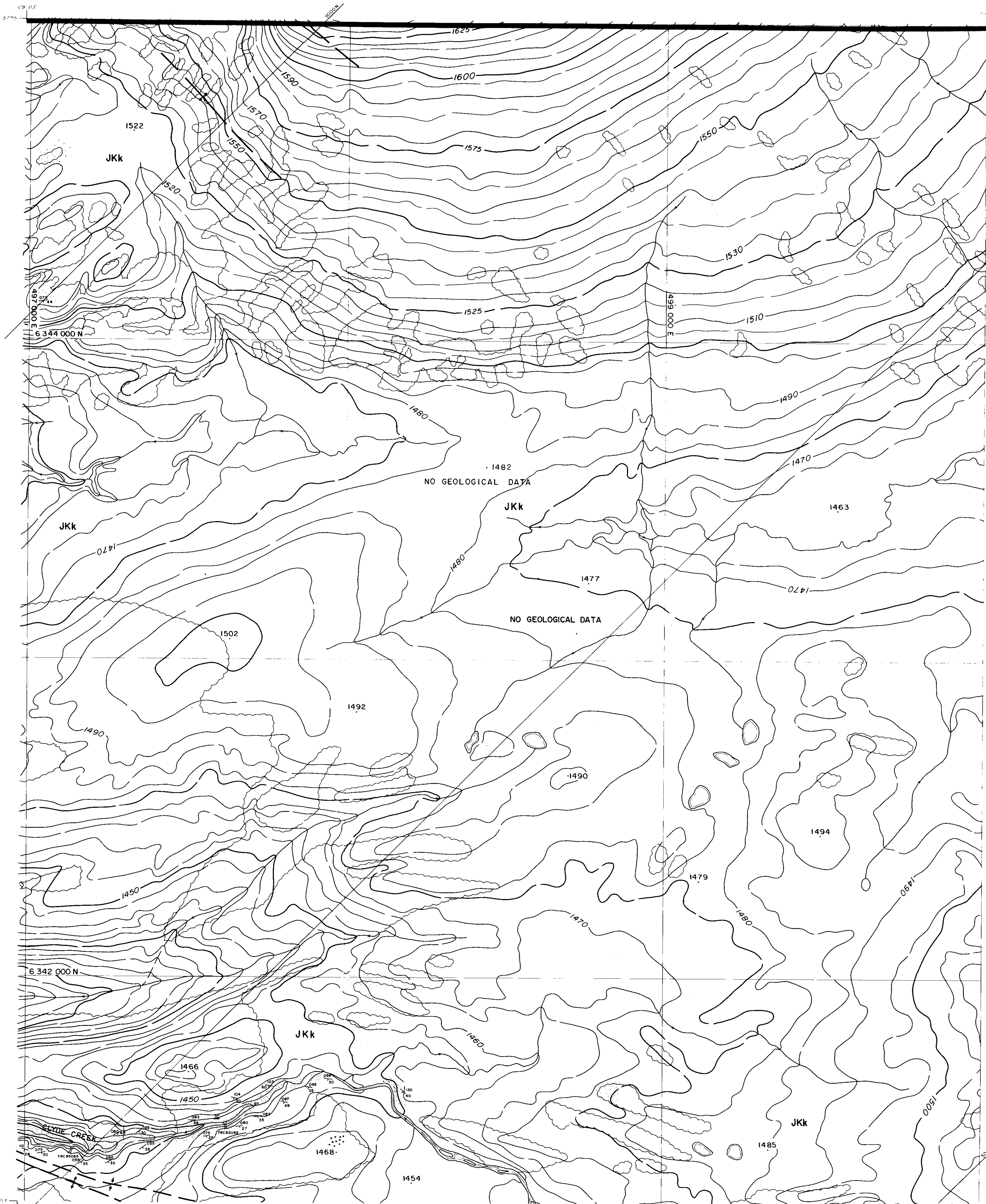
- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT TRENCH COAL SPOIL
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- MEASURED SECTION
- SURVEY CAIRN
- CROSS SECTION LINE

722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
NASS AREA
MAP I-11

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR 1987	DRAWING No. KPN86NA-16



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 60,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS ± 5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

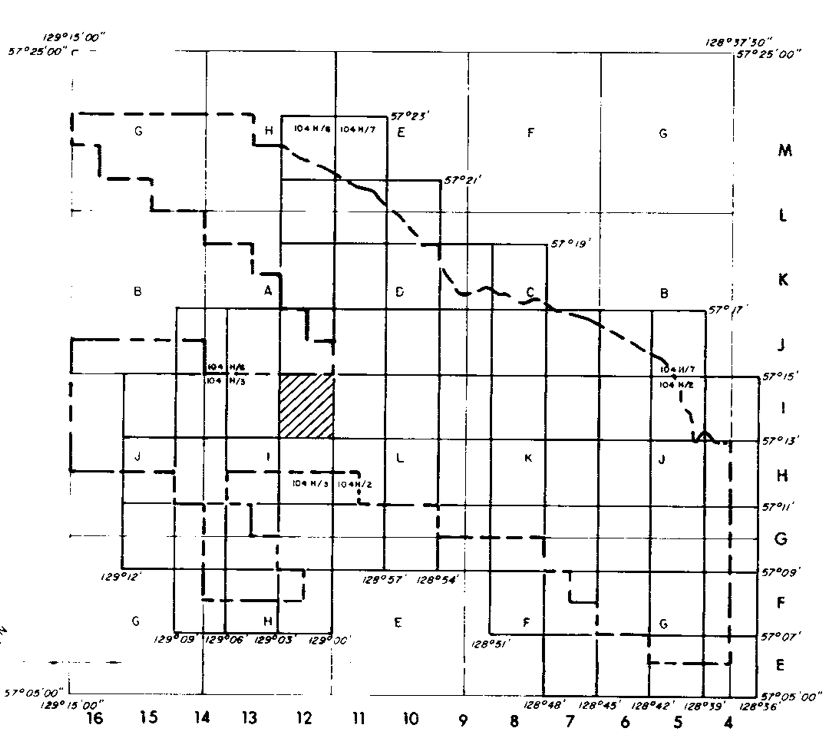
RAILROAD BED LOCATION BASED ON SEPT/82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP ADIT TRENCH COAL SPOIL
DDH RDH WKD DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 MEASURED SECTION
SC-17 SURVEY CAIRN
3000 N CROSS SECTION LINE

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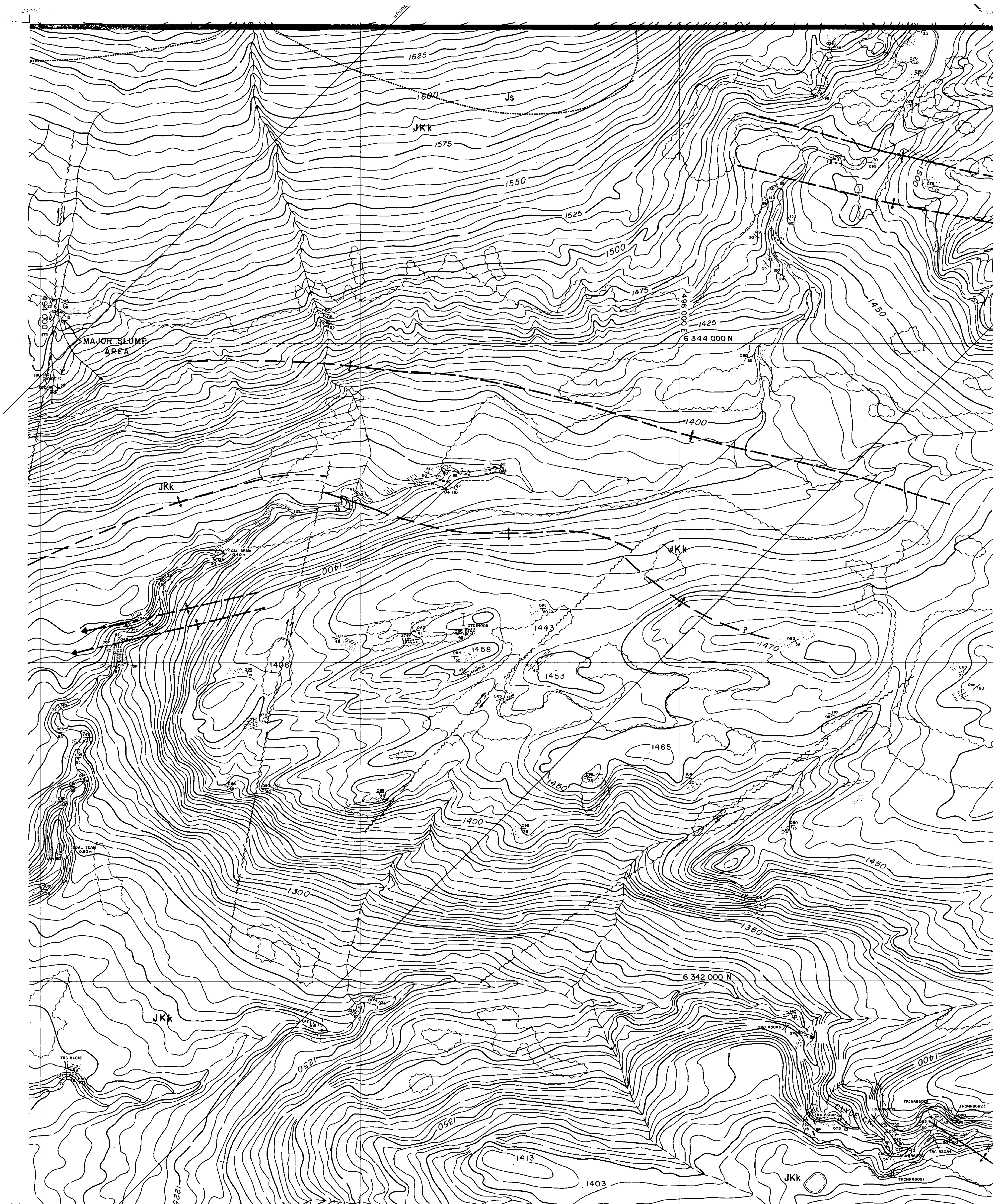
GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
NASS AREA
MAP I-12

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-17



LEGEND

- BUILDING
- ROAD, HARD SURFACE
  - LOOSE SURFACE
  - CART TRACK
  - TRAIL
- RAILROAD BED
- RIVER
- STREAM, DEFINITE
  - APPROXIMATE
  - SPLIT
- LAKE
- WATER LEVEL — EL 505±
- SWAMP
- BEAVER DAM — B.D. B.D.
- TREE LINE
- CUT LINE
- CONTOURS, INDEX — 1750
  - INTERMEDIATE
  - DEPRESSION
  - APPROXIMATE
- SPOT ELEVATION — ·7654
- FORM LINES
- CUT/FILL
- FIELD CONTROL POINT — CP 121
- COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

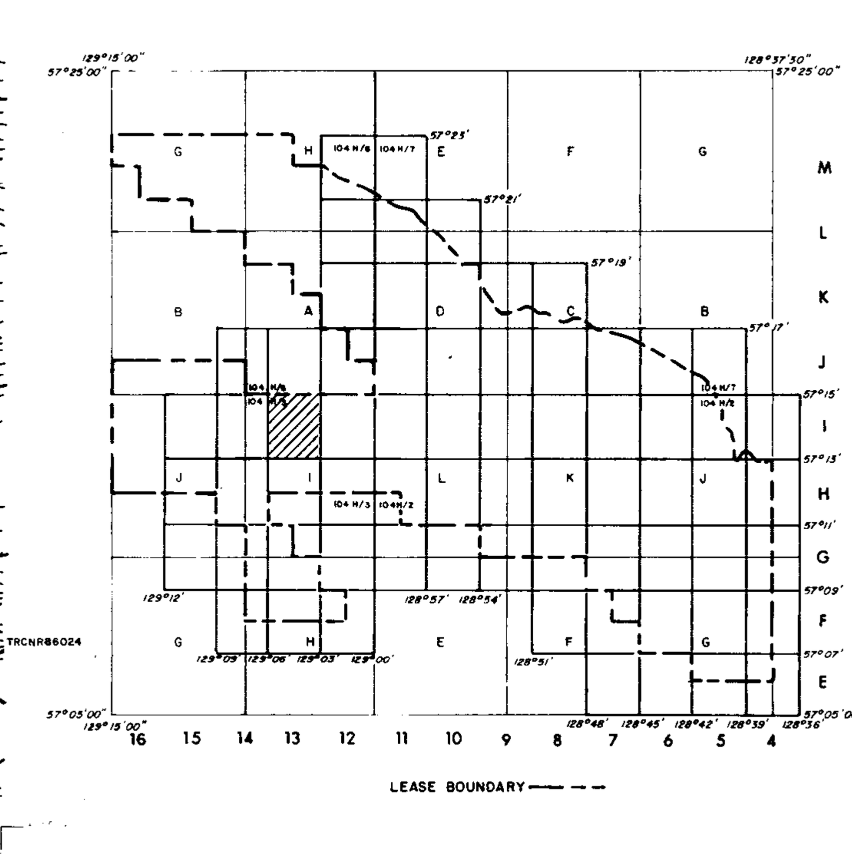
SCALE 1:5000

0 0.25 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

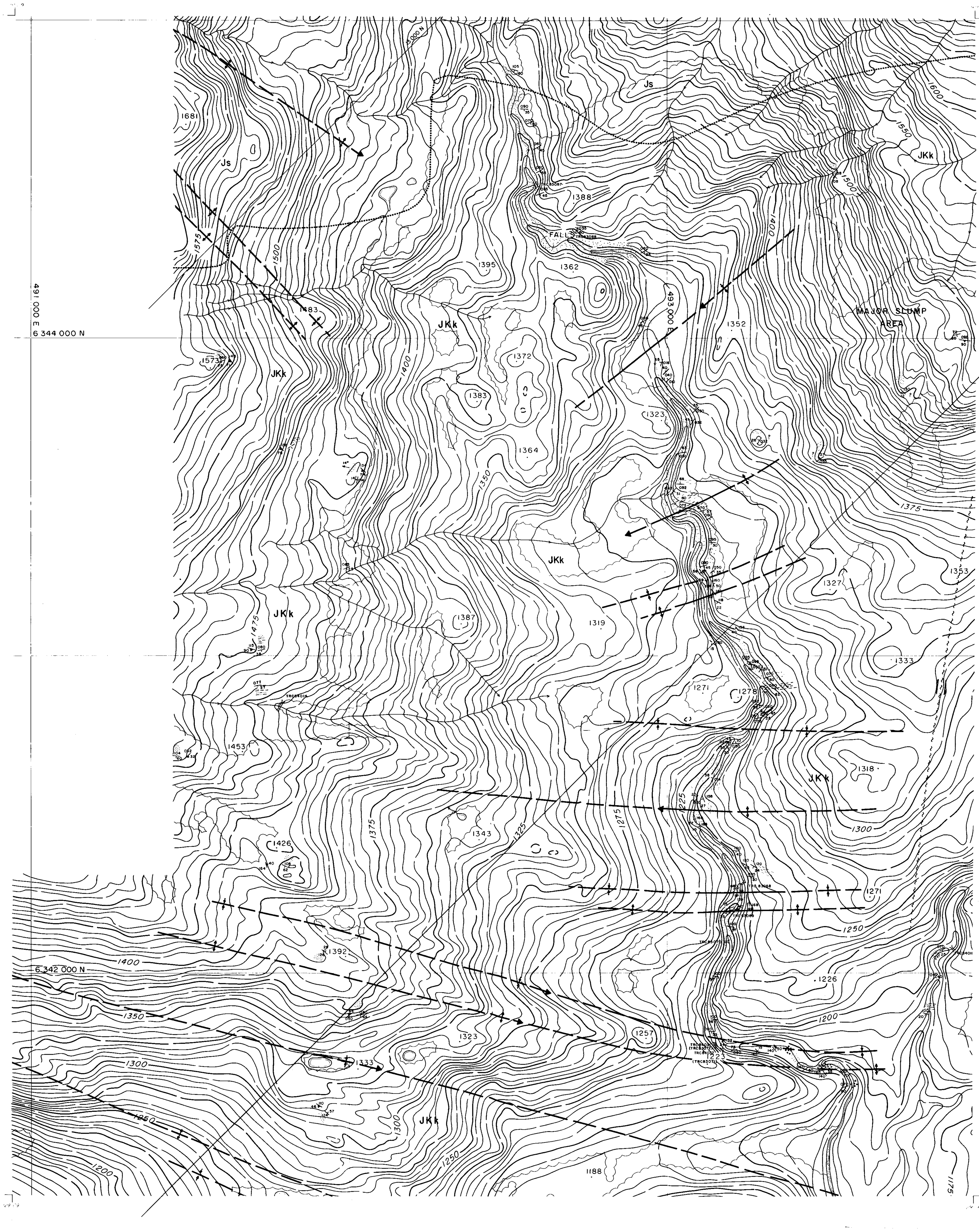
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT TRENCH COAL SPOIL
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- MEASURED SECTION
- SURVEY CAIRN
- CROSS SECTION LINE

722

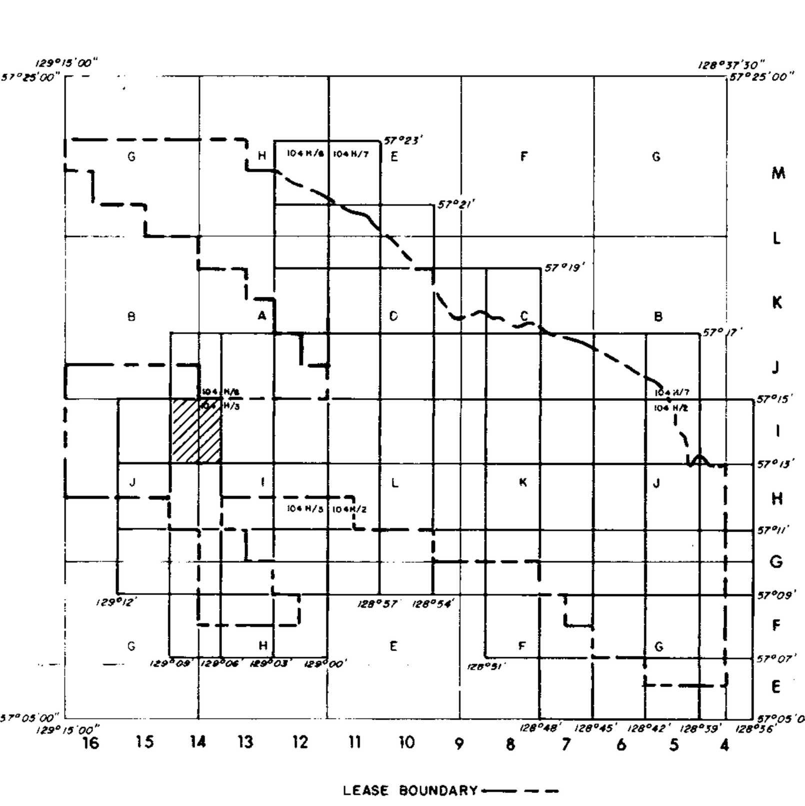
GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP I-13	
PREPARED BY: S.M. / L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-18



SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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LEGEND

LICENCE BOUNDARY

GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)

COAL SEAM (DEFINED, INFERRED)

ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION

SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION

OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)

OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)

MONOCLINE (DEFINED, APPROXIMATE)

BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)

FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)

JOINTS (INCLINED, VERTICAL, HORIZONTAL)

THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE

U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE

FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT

TRC84001 SP — ADIT TRENCH COAL SPOIL

DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)

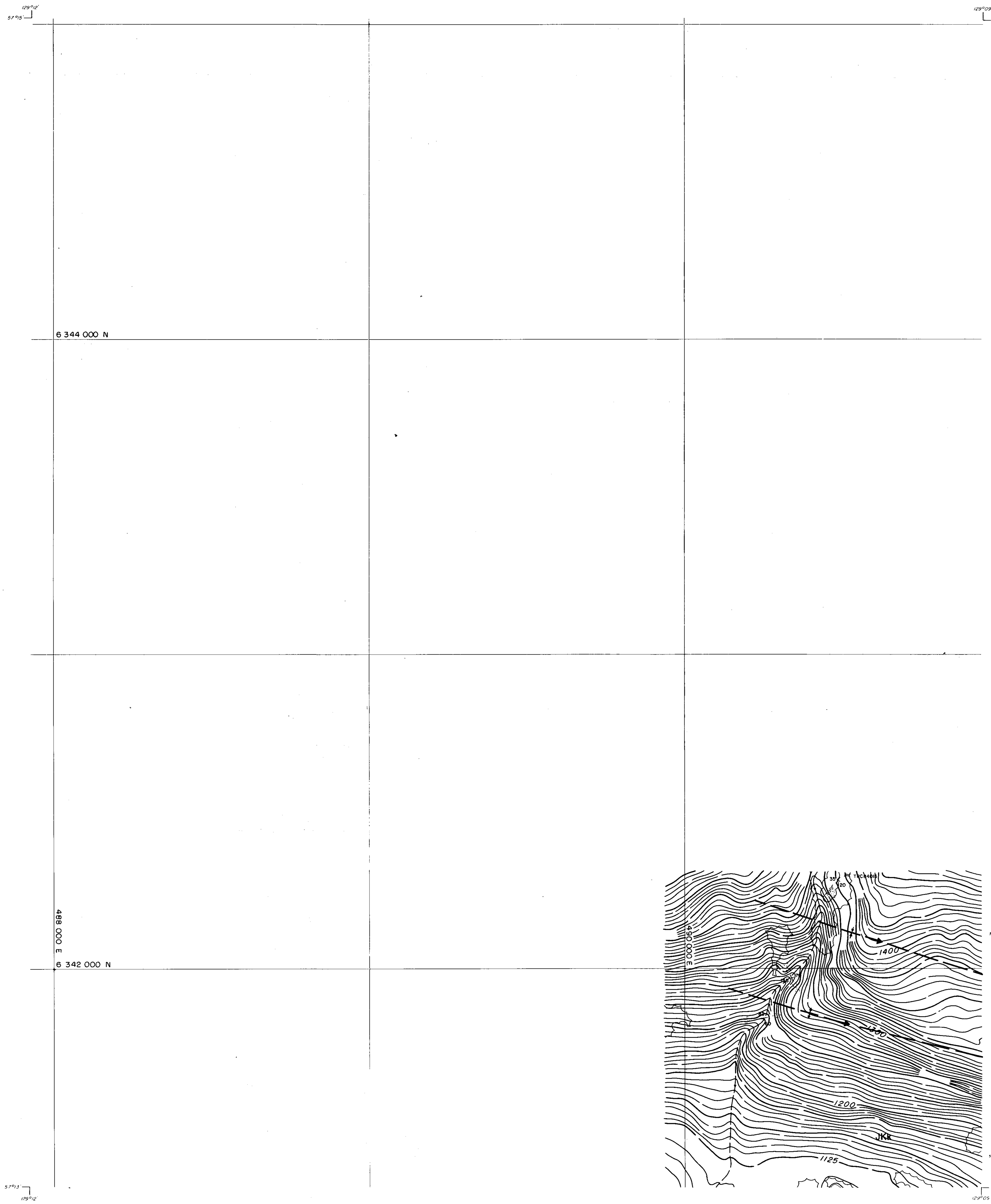
OTC 84001 — MEASURED SECTION

SC-17 — SURVEY CAIRN

3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP I-14	
PREPARED BY: S.M. / L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-19



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES.

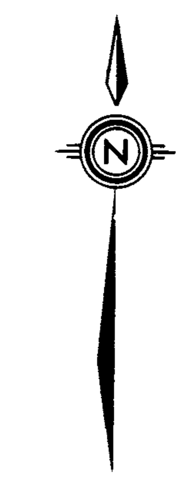
CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

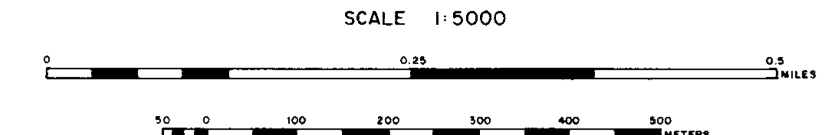
SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1 60 000 (APPROXIMATE)

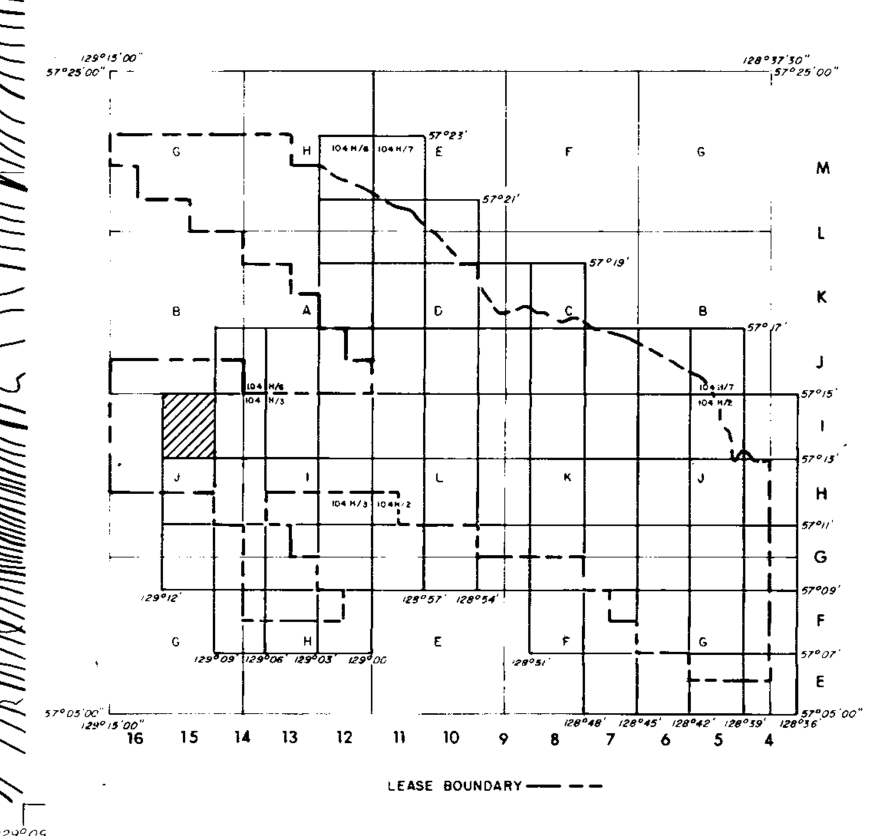


SCALE 1:5000



MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

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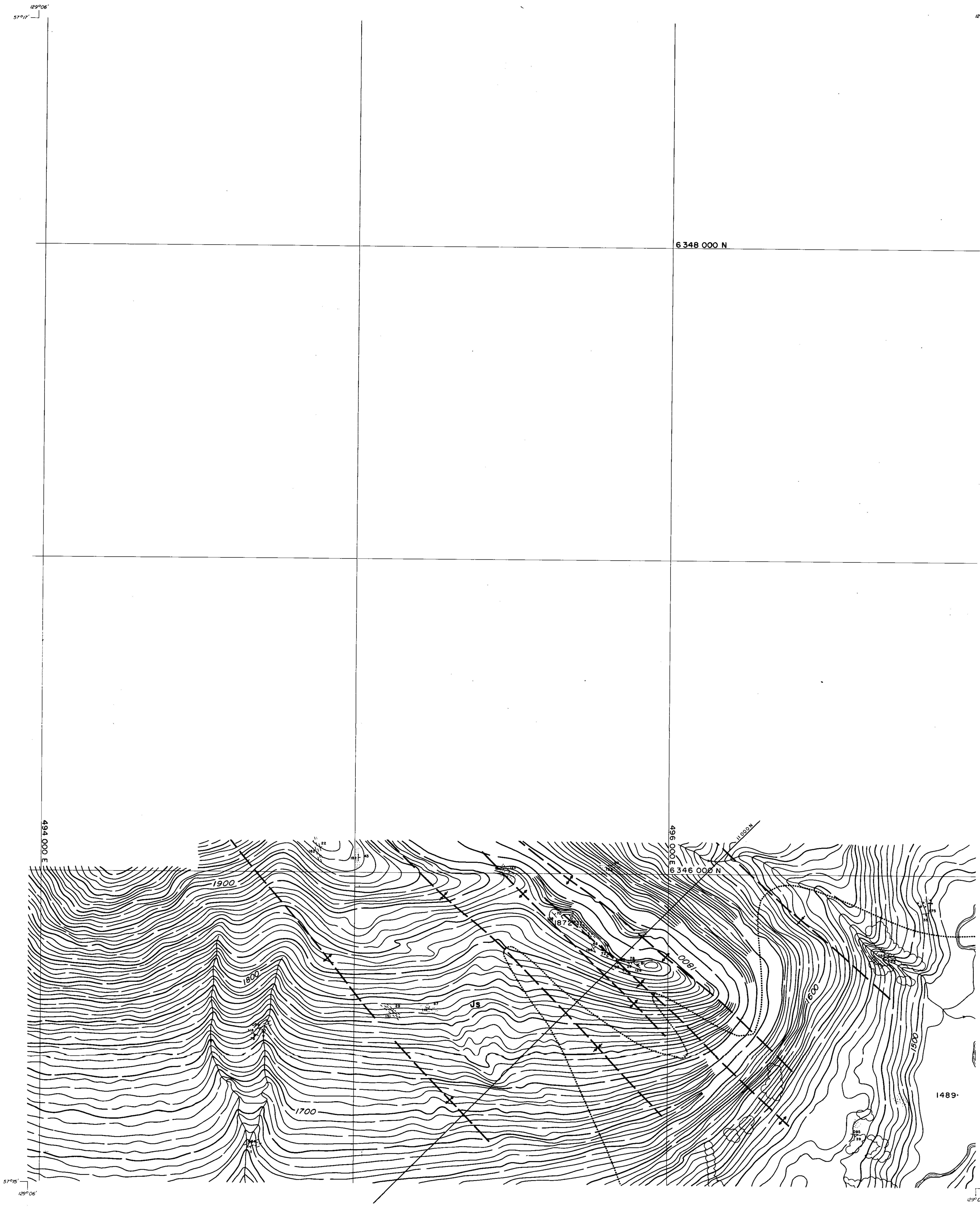
GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
NASS AREA
MAP I-15

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-20



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES.

CONTOUR INTERVAL = 10 M; WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5·0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

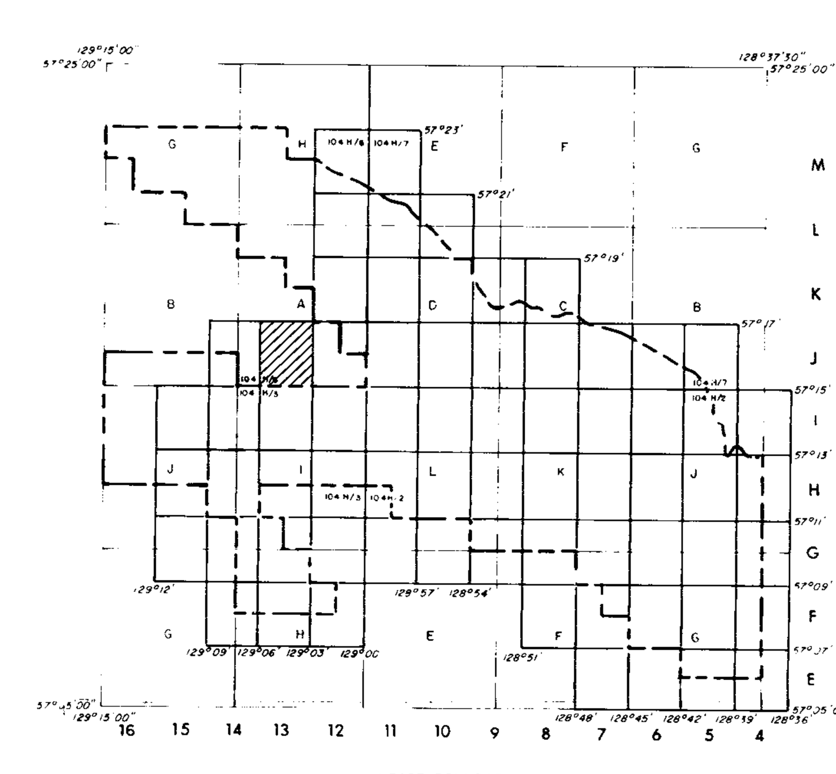
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY:
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD, FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1 60 000 (APPROXIMATE).

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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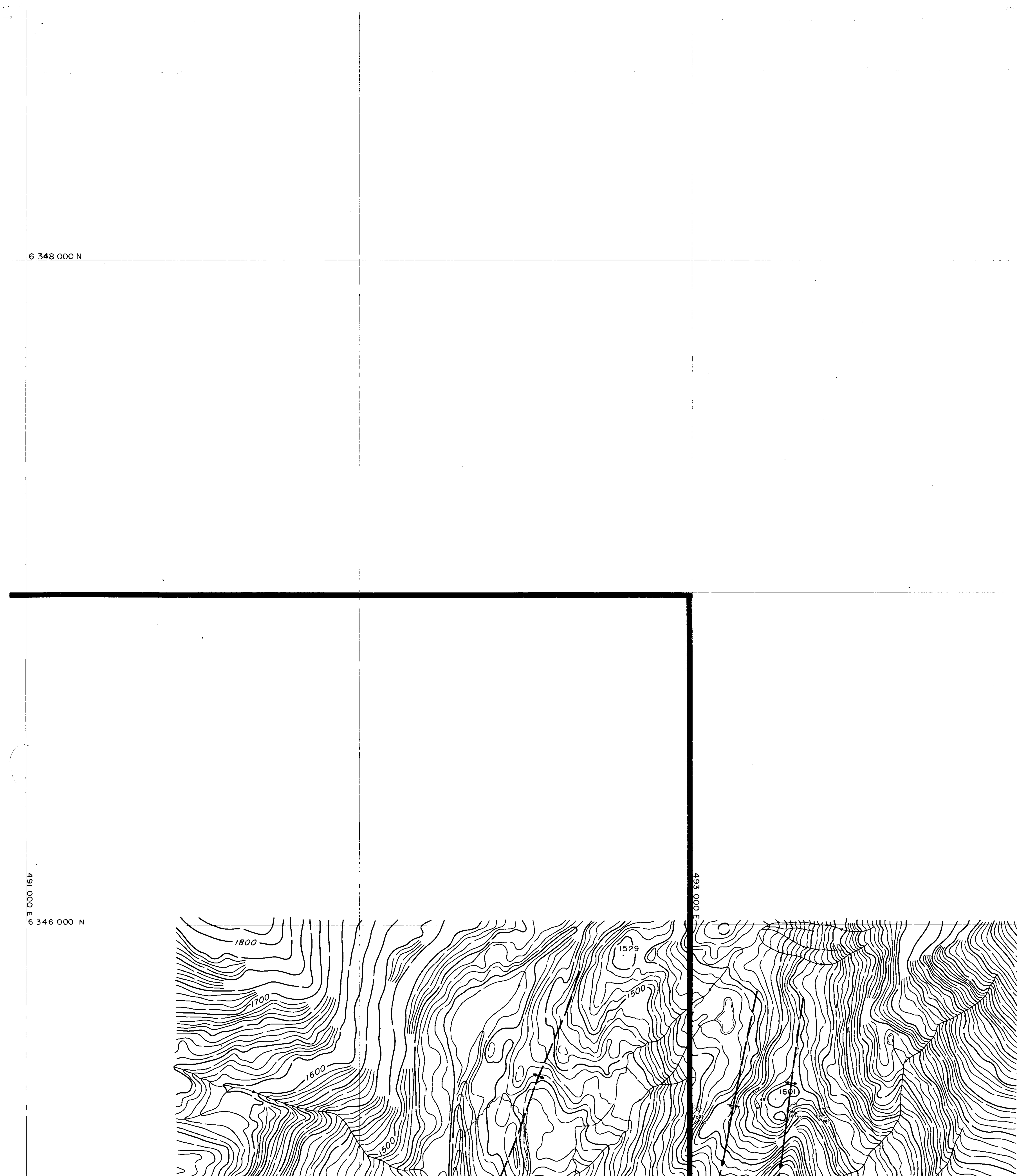
GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
NASS AREA
MAP J-13

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-21



LEGEND

- BUILDING
- ROAD, HARD SURFACE
  - LOOSE SURFACE
  - CART TRACK
  - TRAIL
- RAILROAD BED
- RIVER
- STREAM, DEFINITE
  - APPROXIMATE
  - SPLIT
- LAKE
- WATER LEVEL — EL 505±
- SWAMP
- BEAVER DAM — B.D.
- TREE LINE
- CUT LINE
- CONTOURS, INDEX — 1750
  - INTERMEDIATE
  - DEPRESSION
  - APPROXIMATE
- SPOT ELEVATION — 7654
- FORM LINES
- CUT/FILL
- FIELD CONTROL POINT — CP 121
- COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

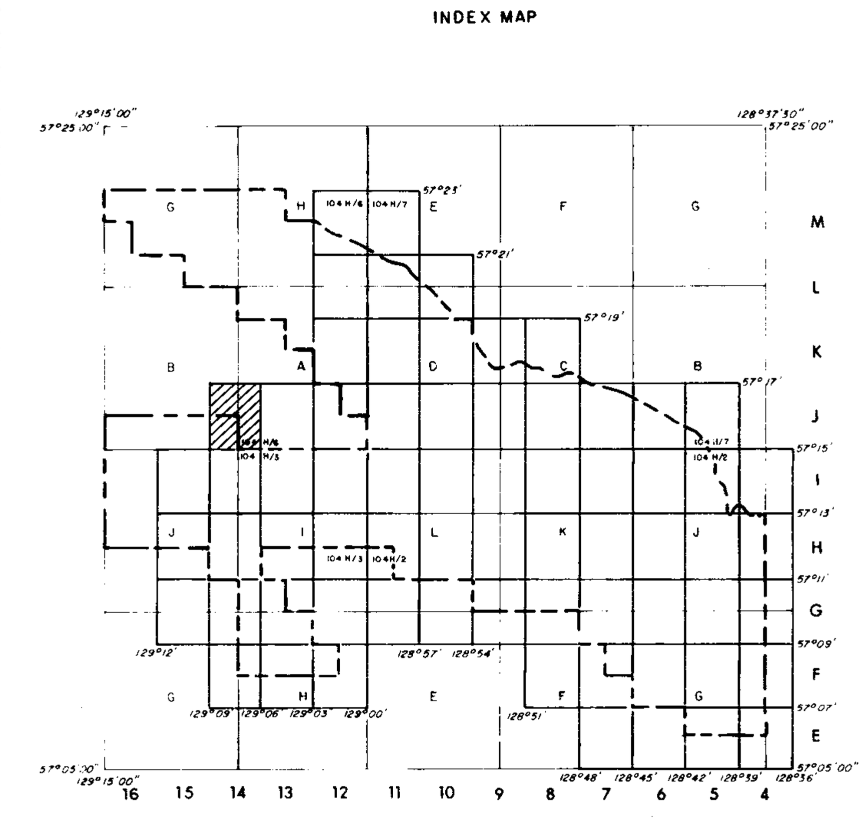
RAILROAD BED LOCATION BASED ON SEPT/82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60,000 (APPROXIMATE)

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

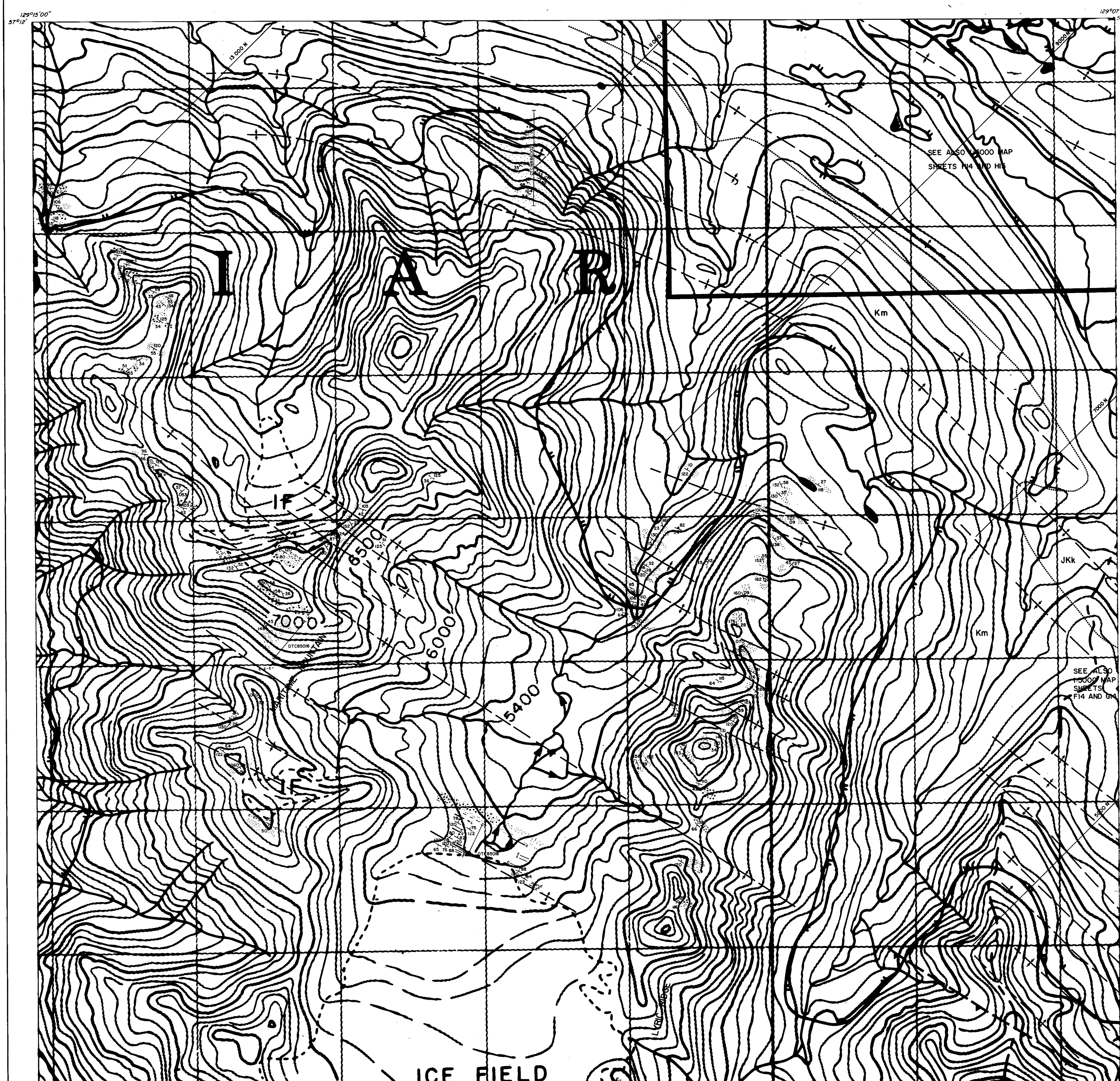
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

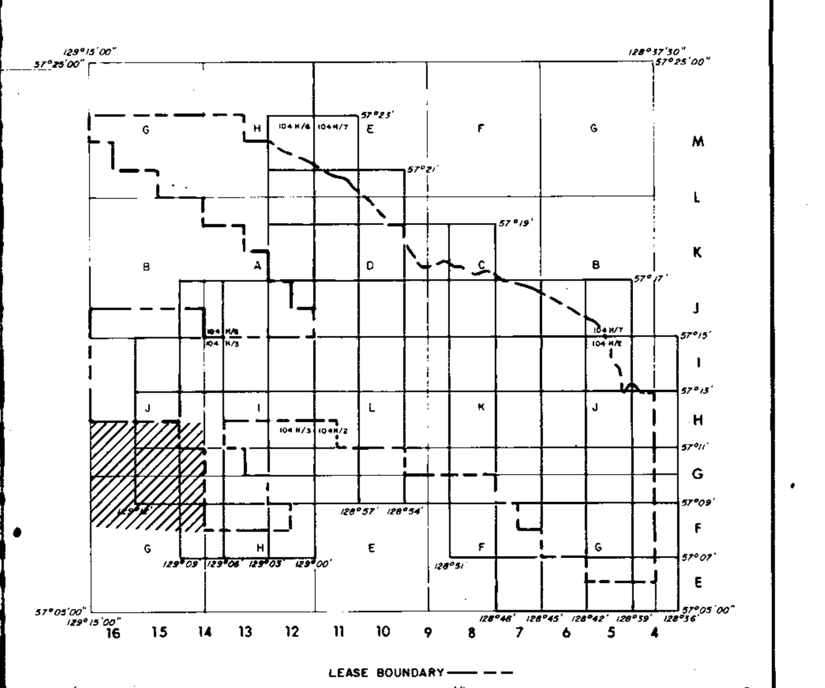
LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- U / D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- TRC84001 — SP — ADIT TRENCH COAL SPOIL
- DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- OTC 84001 — MEASURED SECTION
- SC-17 — SURVEY CAIRN
- 3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY **1986** **GEOLOGY MAP** **NASS AREA** **MAP J-14**	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-22





722

RHONDDA SEQUENCE

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LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
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- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
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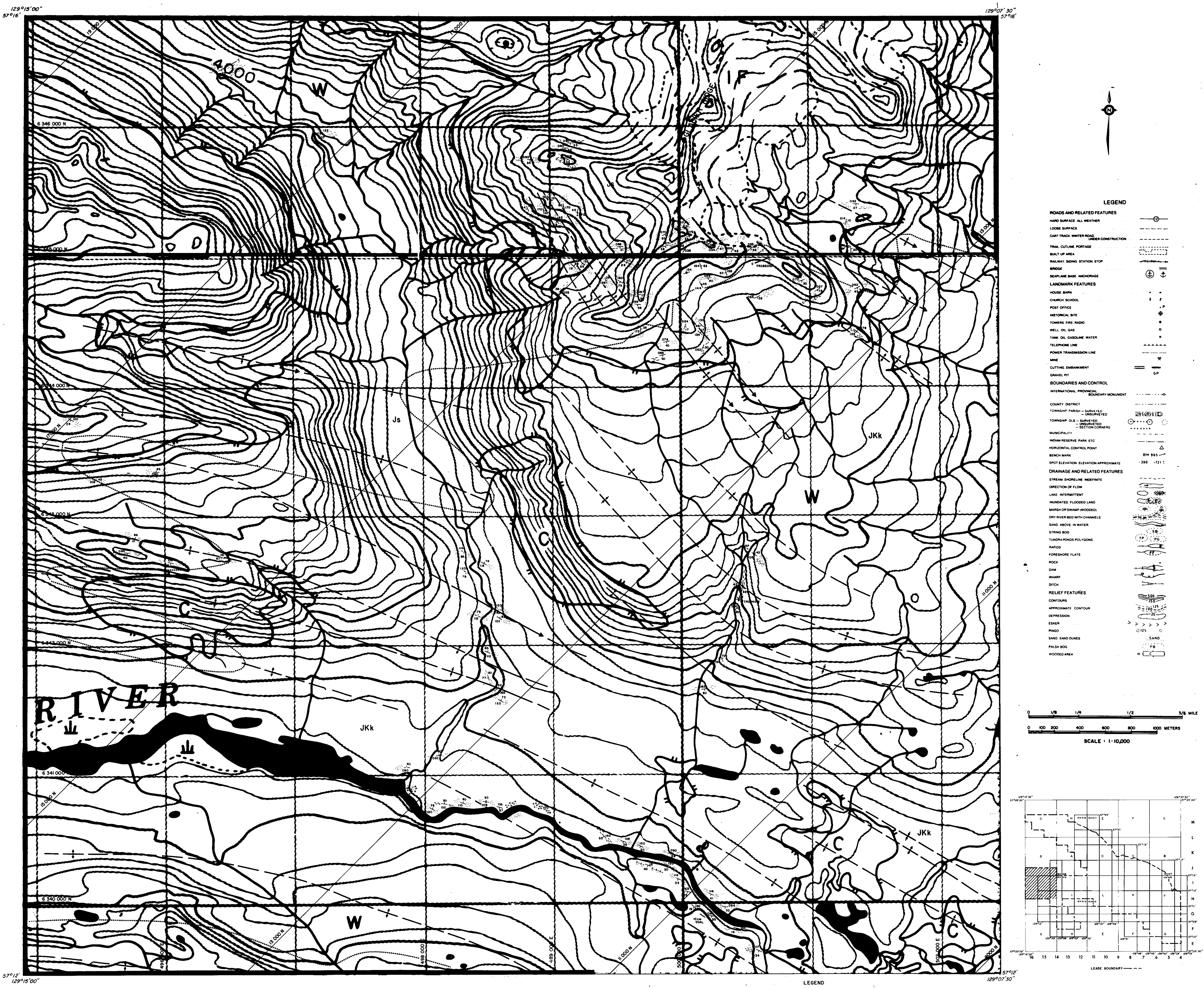
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT TRENCH COAL SPOIL
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- MEASURED SECTION
- SURVEY CAIRN
- CROSS SECTION LINE

GULF CANADA RESOURCES INC. Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP NASS AREA MAP 104 H/3 G	
PREPARED BY: S.M./L.S.	SCALE 1:10,000
APPROVED BY: E.S. DATE: MAR. 1987	DWG. No. KPN86NA-23



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
NASS AREA
MAP 104 H/3 J

PREPARED BY: S.M./L.S.	SCALE 1:10,000
APPROVED BY: E.S. DATE: MAR. 1987	DWG. No. KPN86NA-24

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
NASS AREA
11000 N (WEST)

PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-25

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES 0 50 100 150 200 250

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA
Gulf

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
NASS AREA
9000N (WEST)

PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-26

METRES ABOVE SEA LEVEL

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

NASS AREA

7000 N (WEST)

PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-27

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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COAL SEAM TRACE (DEFINED, INFERRED)
GEOLOGICAL CONTACT (APPROX, INFERRED)
FAULT TRACE (DEFINED, APPROX.)
BEDFORM
BEDDING ATTITUDE
DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES
0 50 100 150 200 250

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
NASS AREA
5000 N (WEST)

PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE MAR. 1987	DRAWING No. KPN86NA-28

722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
NASS AREA
3000 N (WEST)

PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-29

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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COAL SEAM TRACE (DEFINED, INFERRED)
GEOLOGICAL CONTACT (APPROX, INFERRED)
FAULT TRACE (DEFINED, APPROX.)
BEDFORM
BEDDING ATTITUDE
DDH 85001 DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES
0 50 100 150 200 250

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
NASS AREA
5000 N (WEST)

PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE MAR. 1987	DRAWING No. KPN86NA-28


AREA OF NO MAP COVERAGE
NO GEOLOGICAL CONTROL
NO GEOLOGICAL DATA
722
GULF CANADA CORPORATION
Coal Division
CALGARY
ALBERTA
Gulf
MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
NASS AREA
1000 N (WEST)
PREPARED BY: L.S. / S.M.
SCALE 1:5000
APPROVED BY: E.S.
DATE: MAR. 1987
DRAWING No. KPN86NA-30

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

NASS AREA

1000 S (WEST)

PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-31

RHONDDA SEQUENCE

Kr	Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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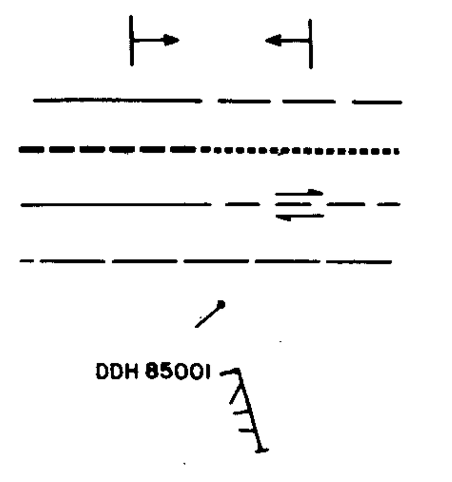

722

METRES
0 100 200 300 400 500

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MOUNT KLAPPAN COAL PROPERTY 1986 GEOLOGICAL CROSS SECTION NASS AREA 17000 N (WEST)	
PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-32

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams Conglomerate beds grade laterally into sandstone Sandstones often display tabular or trough cross bedding Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout Petrified wood and rare coquina may be present towards the upper contact

SPATSIZI SEQUENCE

Js — Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present Belemnites are rare Plant debris may occur near the upper gradational contact

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 100 200 300 400 500

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

NASS AREA

15000N (WEST)

PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-33

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

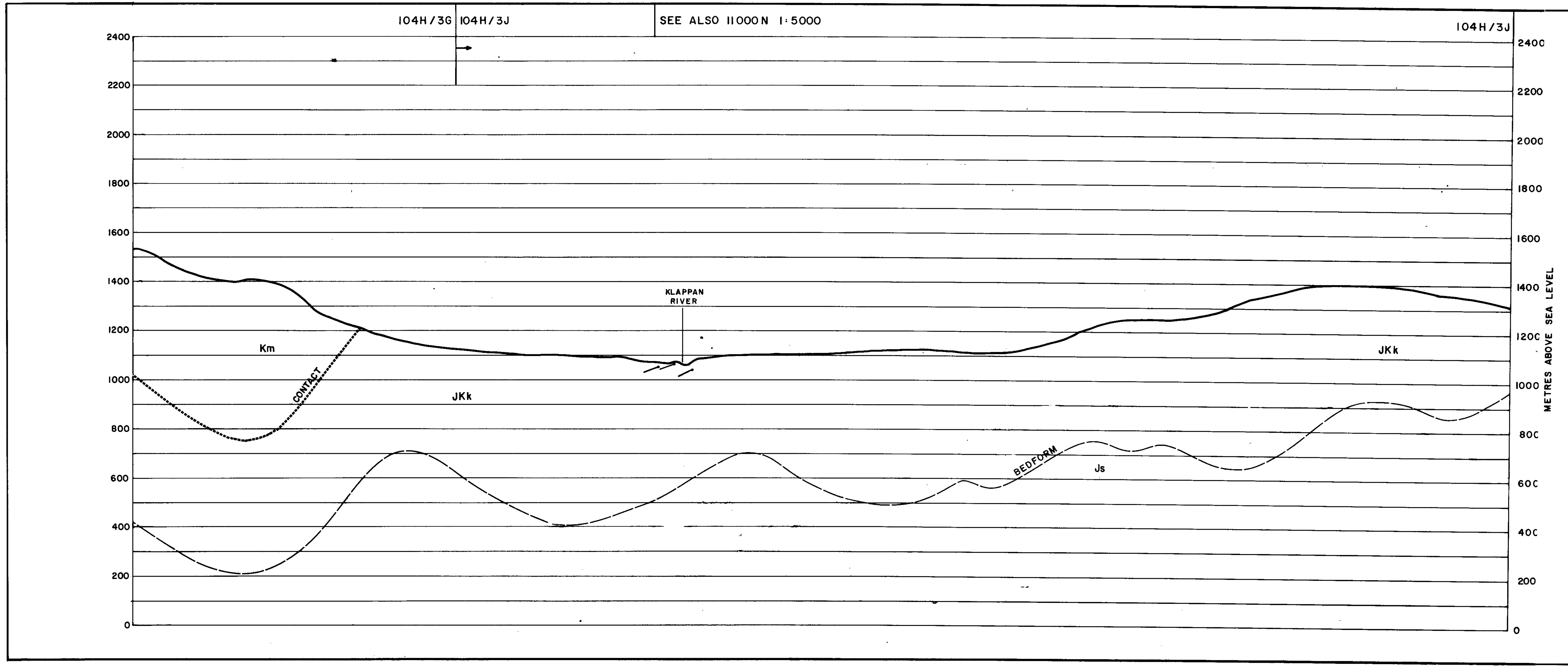
0 100 200 300 400 500

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
NASS AREA
13000N (WEST)

PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-34



RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

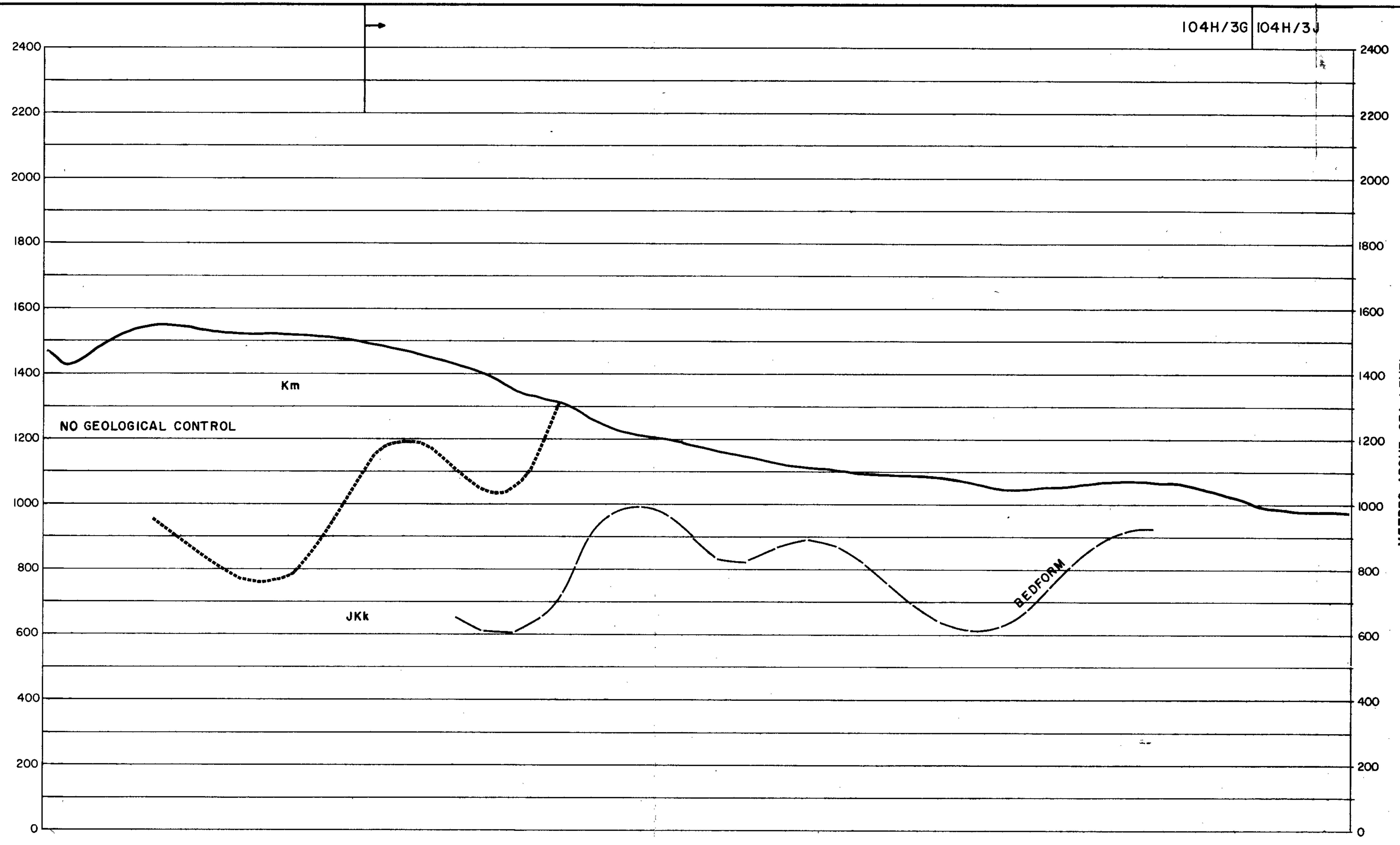
722

METRES
0 100 200 300 400 500

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
NASS AREA
11000N (WEST)

PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR.1987	DRAWING No. KPN86NA-35



RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact

SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 100 200 300 400 500

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

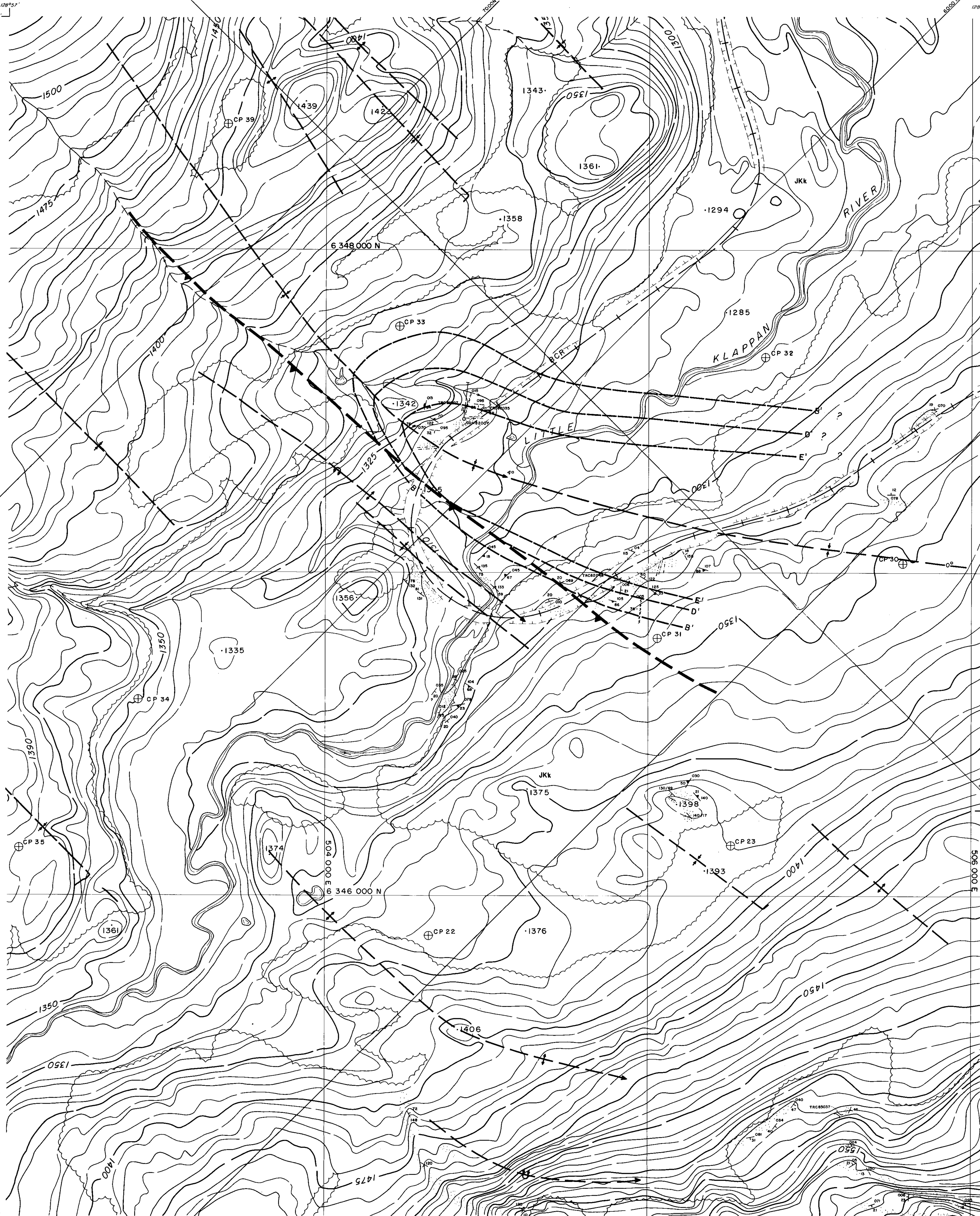
1986

GEOLOGICAL CROSS SECTION

NASS AREA

9000N (WEST)

PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86NA-36



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505'
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

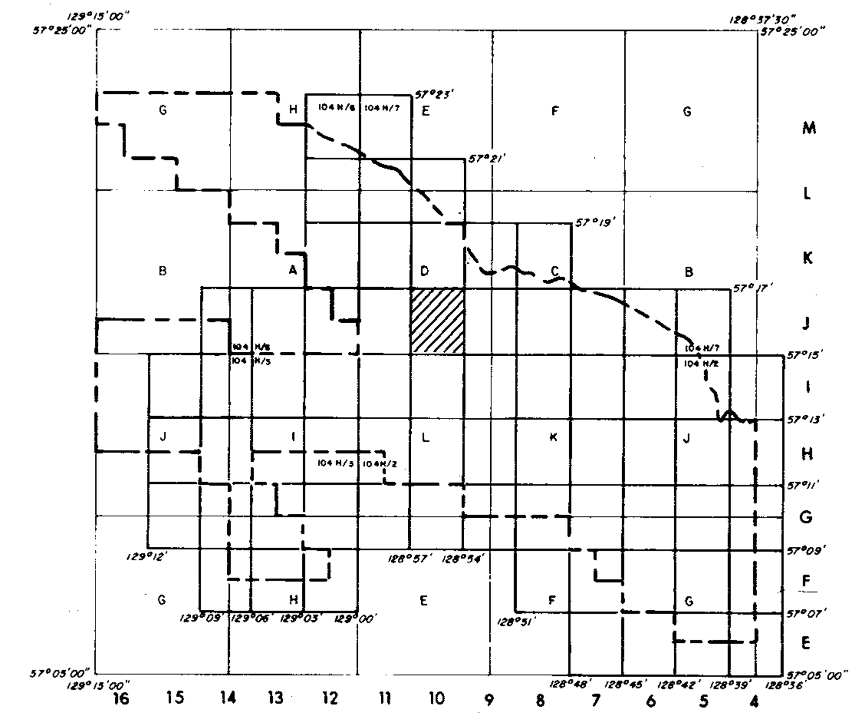
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

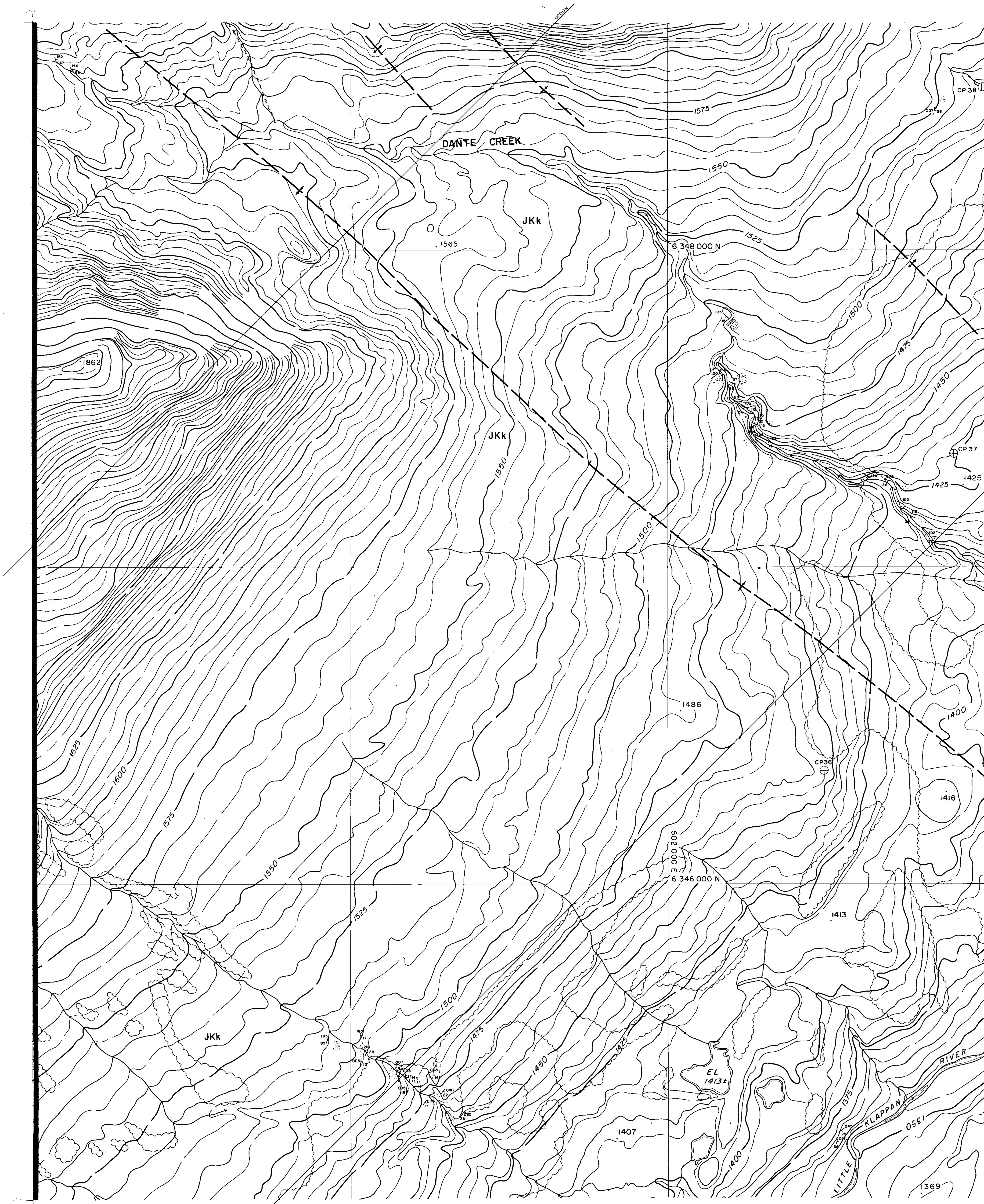
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP J-10	
PREPARED BY: E.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA+01



LEGEND

BUILDING	
ROAD, HARD SURFACE	
LOOSE SURFACE	
CART TRACK	
TRAIL	
RAILROAD BED	
RIVER	
STREAM, DEFINITE	
APPROXIMATE	
SPLIT	
LAKE	
WATER LEVEL	EL 505±
SWAMP	
BEAVER DAM	B.D. B.D.
TREE LINE	
CUT LINE	
CONTOURS, INDEX	1750
INTERMEDIATE	
DEPRESSION	
APPROXIMATE	
SPOT ELEVATION	1654
FORM LINES	
CUT/FILL	
FIELD CONTROL POINT	CP-21
COAL LICENCE	

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL - 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

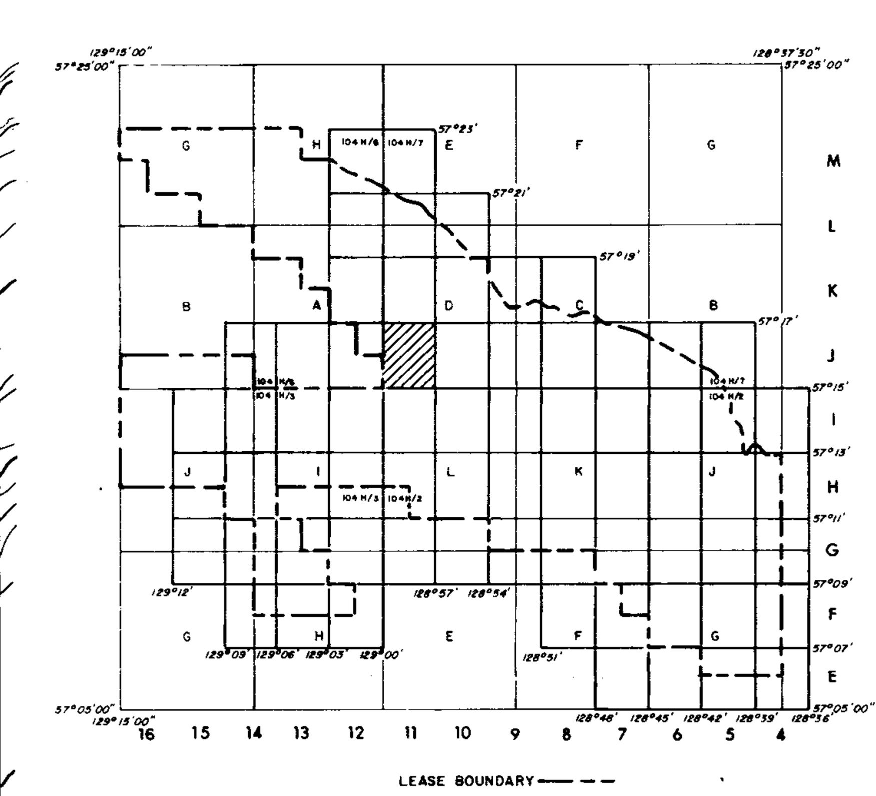
RAILROAD BED LOCATION BASED ON SEPT/82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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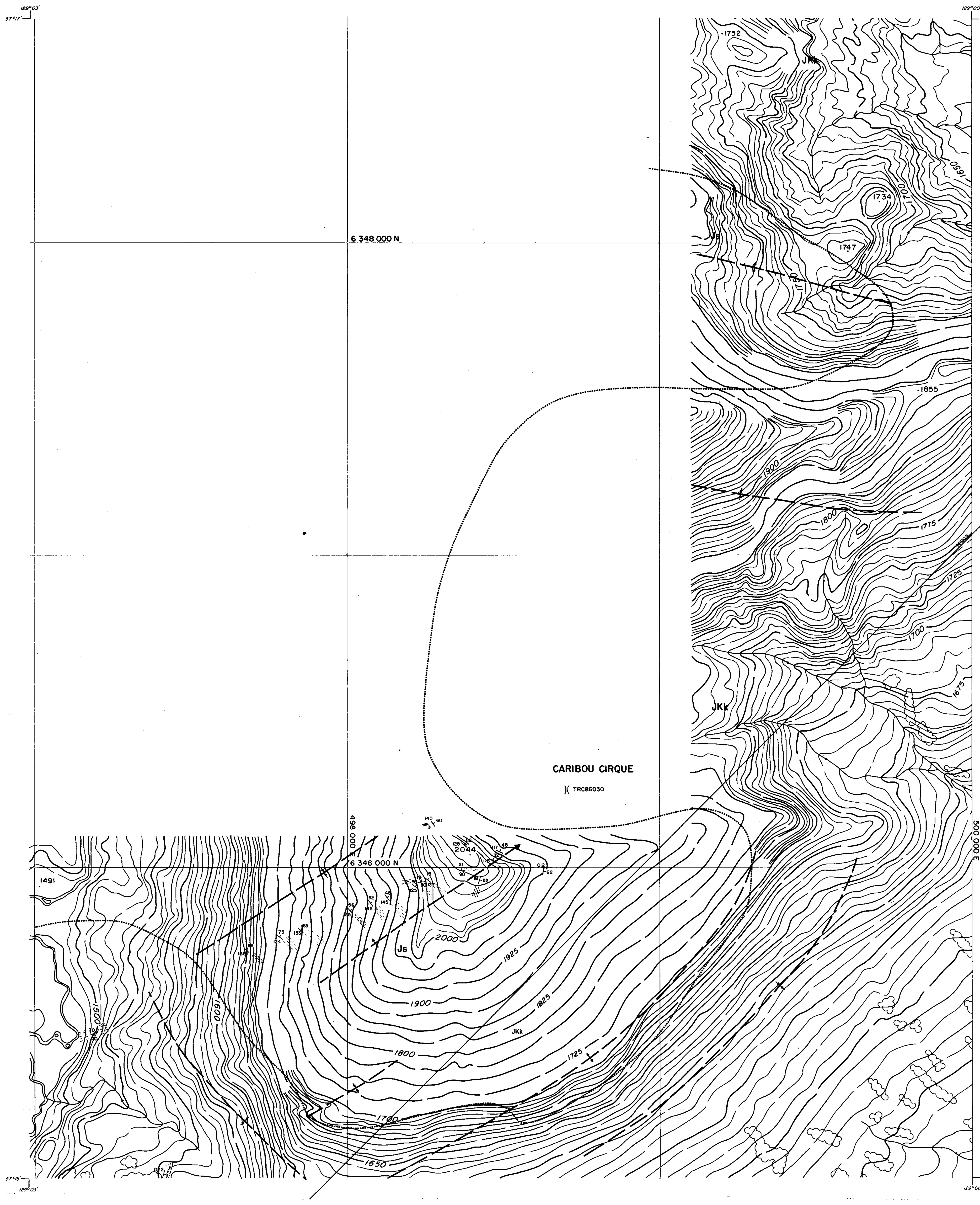
LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE (U, D)
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT — TRENCH (TRC84001) — COAL SPOIL (SP)
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION) (DDH, RDH, WKD)
- MEASURED SECTION (OTC 84001)
- SURVEY CAIRN (SC-17)
- CROSS SECTION LINE (3000 N)

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP J-11	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR.1987	DRAWING No. KPN86SA-02



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES.

CONTOUR INTERVAL = 10 M; WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE).

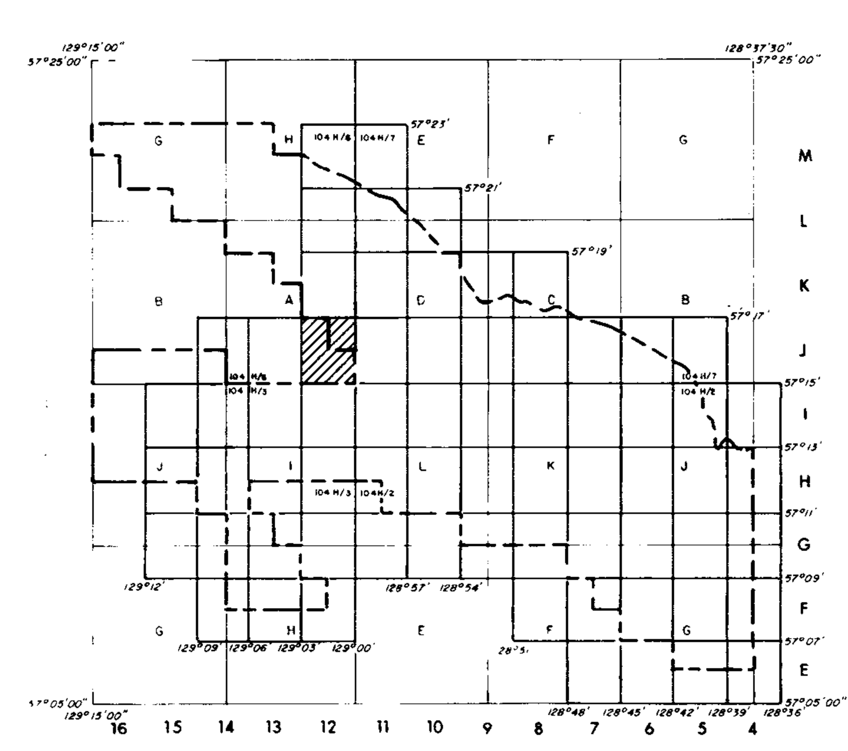
SCALE 1:5000

MILES 0 0.25 0.5

METERS 50 0 100 200 300 400 500

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

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LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
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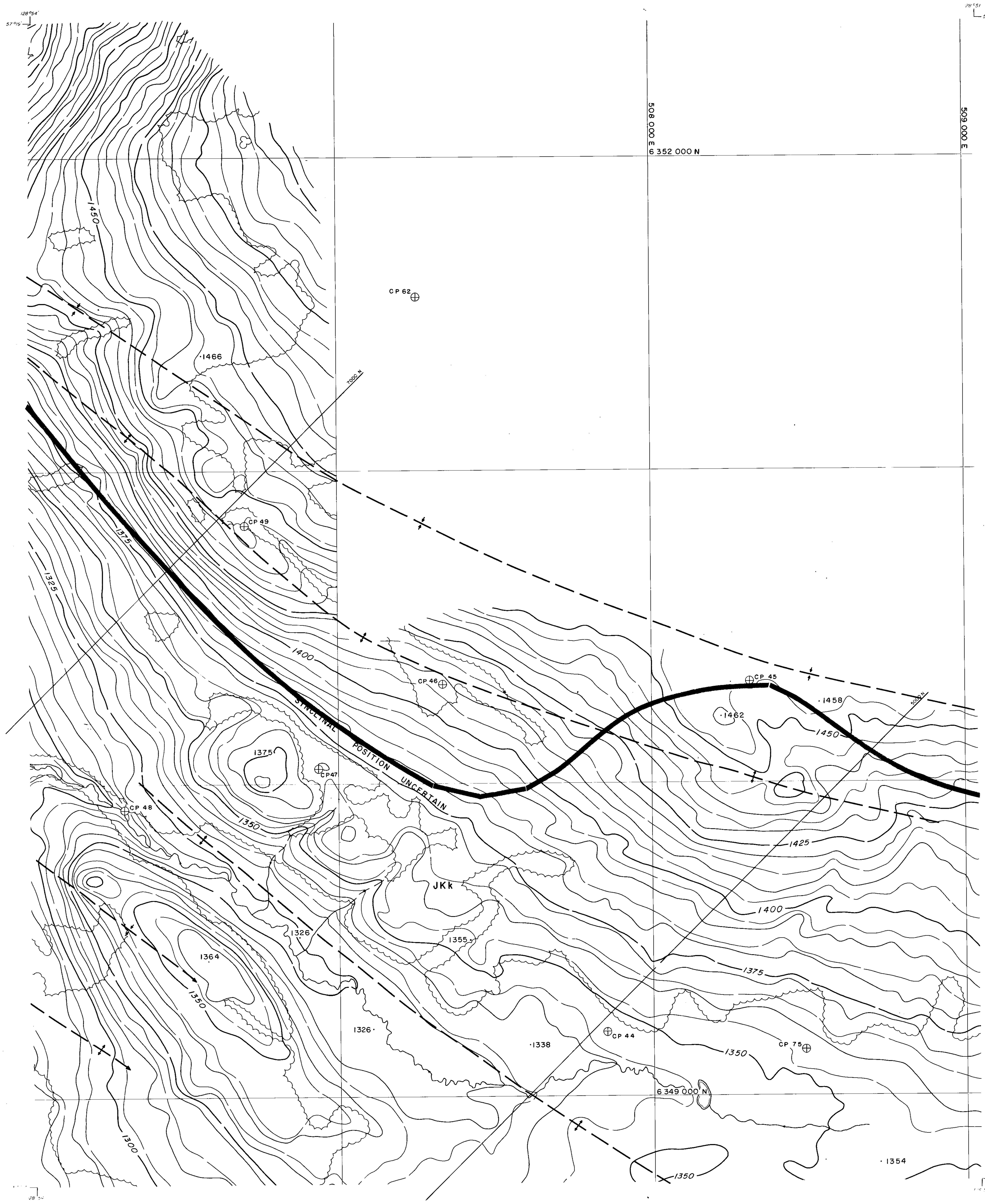
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001, SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP J-12	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-03



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

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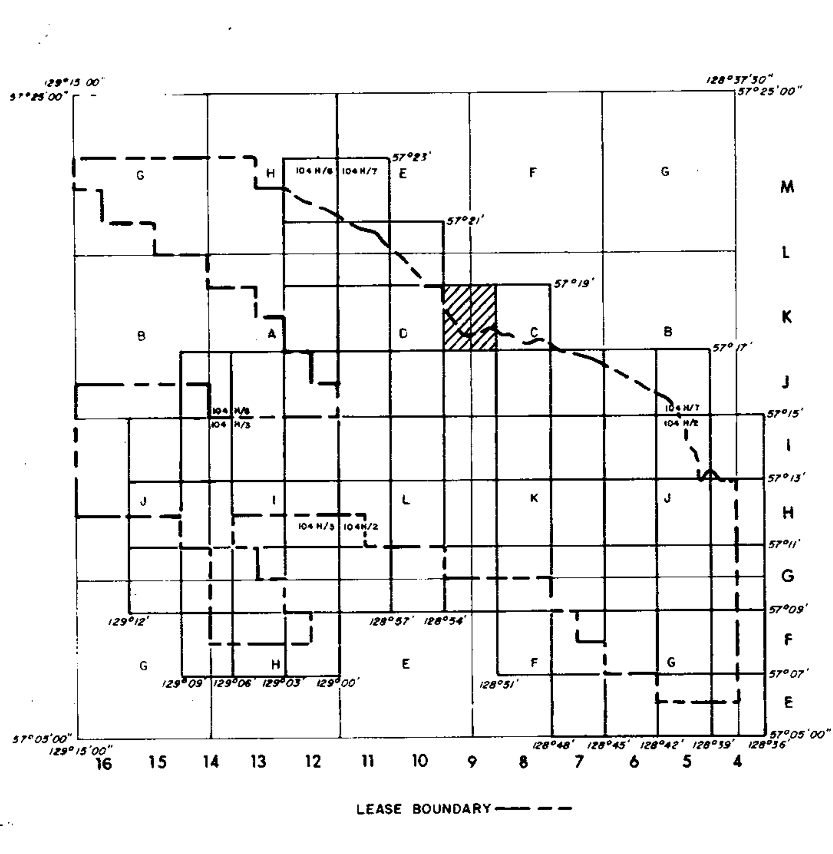
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

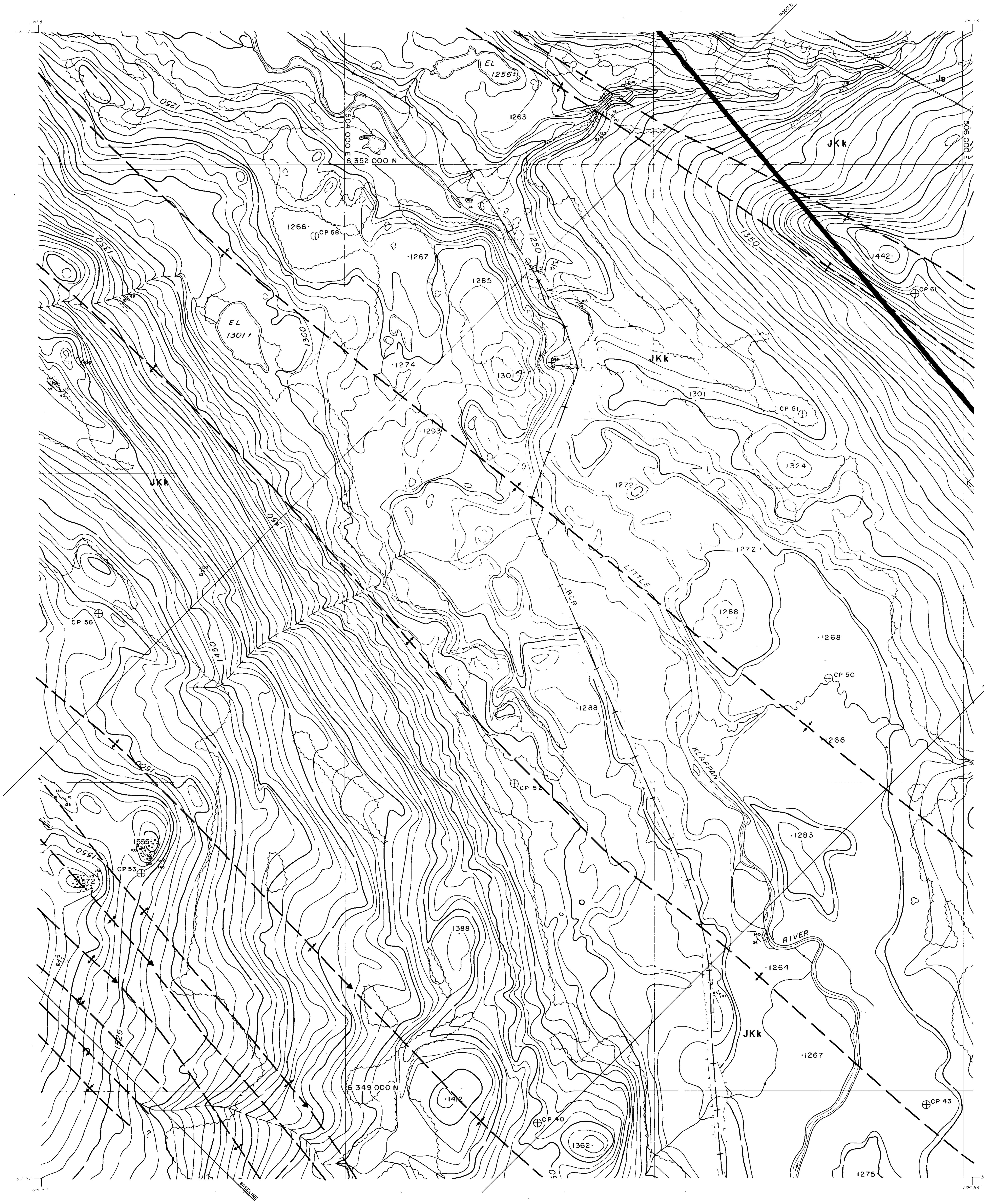
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP K-9	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-04



NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL [illegible] M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE [illegible] M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

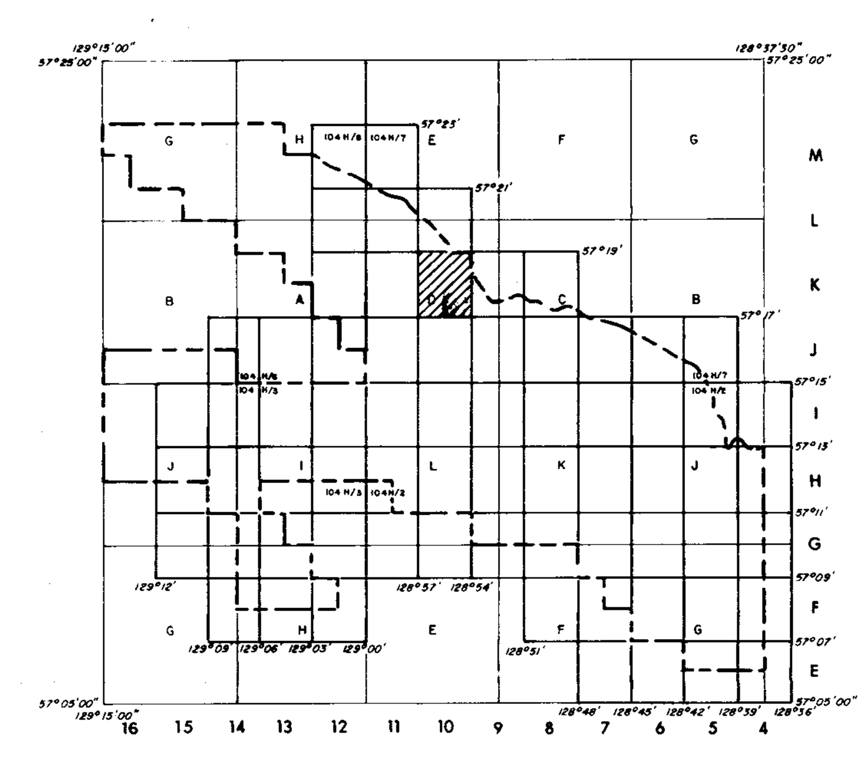
RAILROAD [illegible] ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY [illegible] DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF [illegible] (APPROXIMATE)

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



RHONDDA SEQUENCE

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KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

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LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
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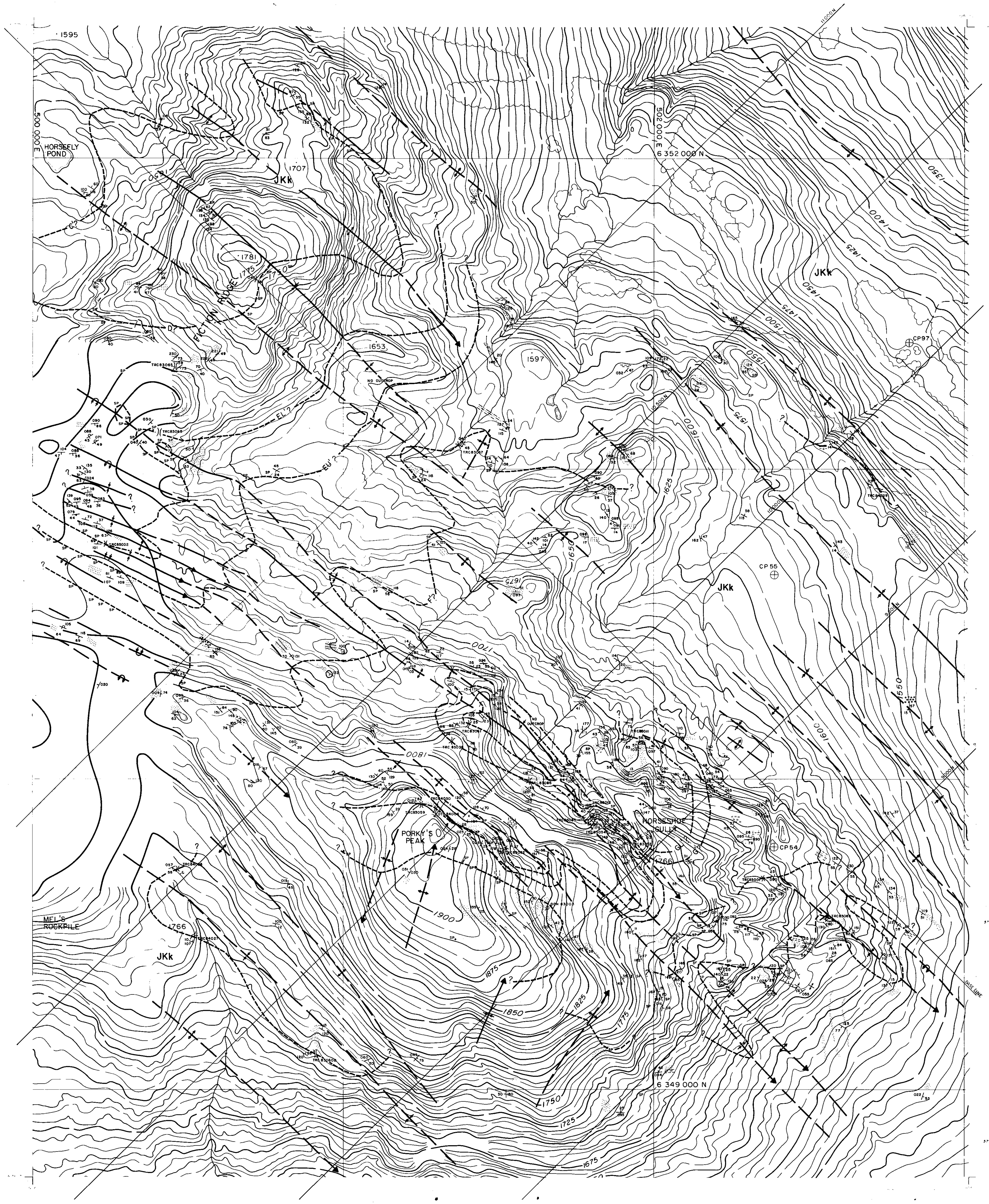
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 — SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP K-10	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-05



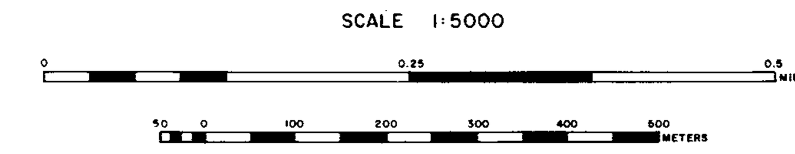
NOTES

CONTOUR INTERVAL 10 M, WITH FORM LINES INTERVAL 5 M

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

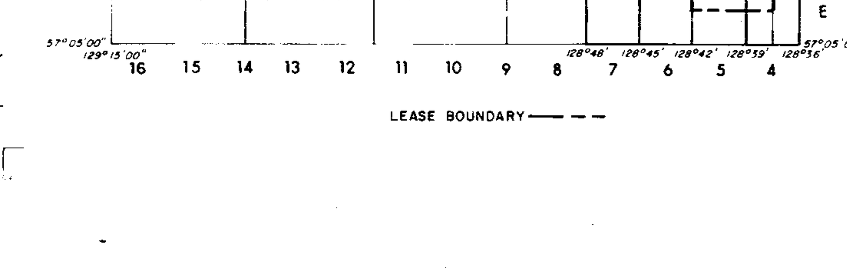
COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/6

SCALE 1:5000



MT. KLAPPAN AREA

INDEX MAP



RHONDDA SEQUENCE

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LEGEND

LICENCE BOUNDARY

GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)

COAL SEAM (DEFINED, INFERRED)

ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION

SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION

OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)

OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)

MONOCLINE (DEFINED, APPROXIMATE)

BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)

FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)

JOINTS (INCLINED, VERTICAL, HORIZONTAL)

THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE

U D FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE

FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT

TRC84001 SP ADIT TRENCH COAL SPOIL

DDH RDH WKD DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)

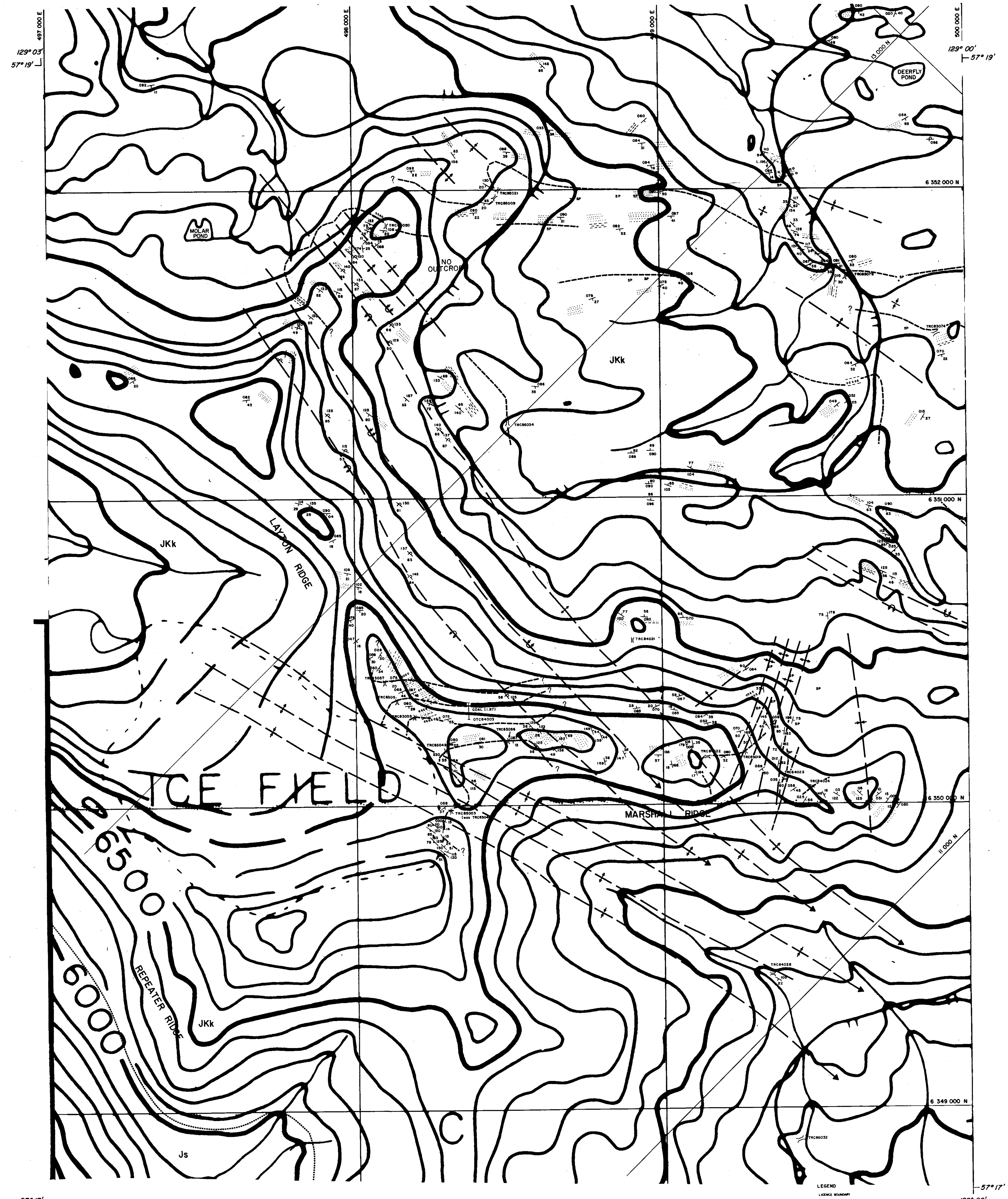
OTC 84001 MEASURED SECTION

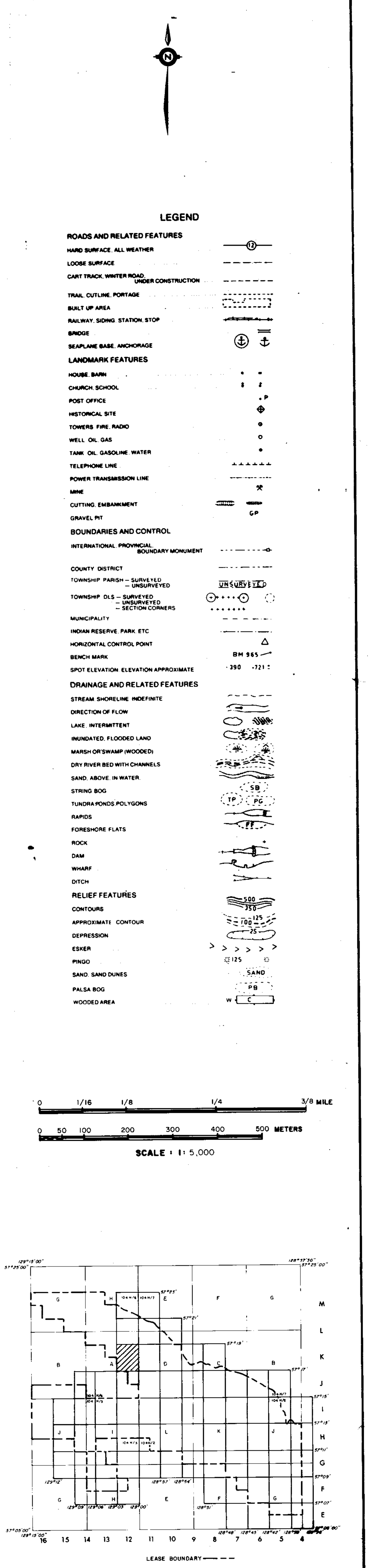
SC-17 SURVEY CAIRN

3000 N CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP K-11	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-06





RHONDDA SEQUENCE

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LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
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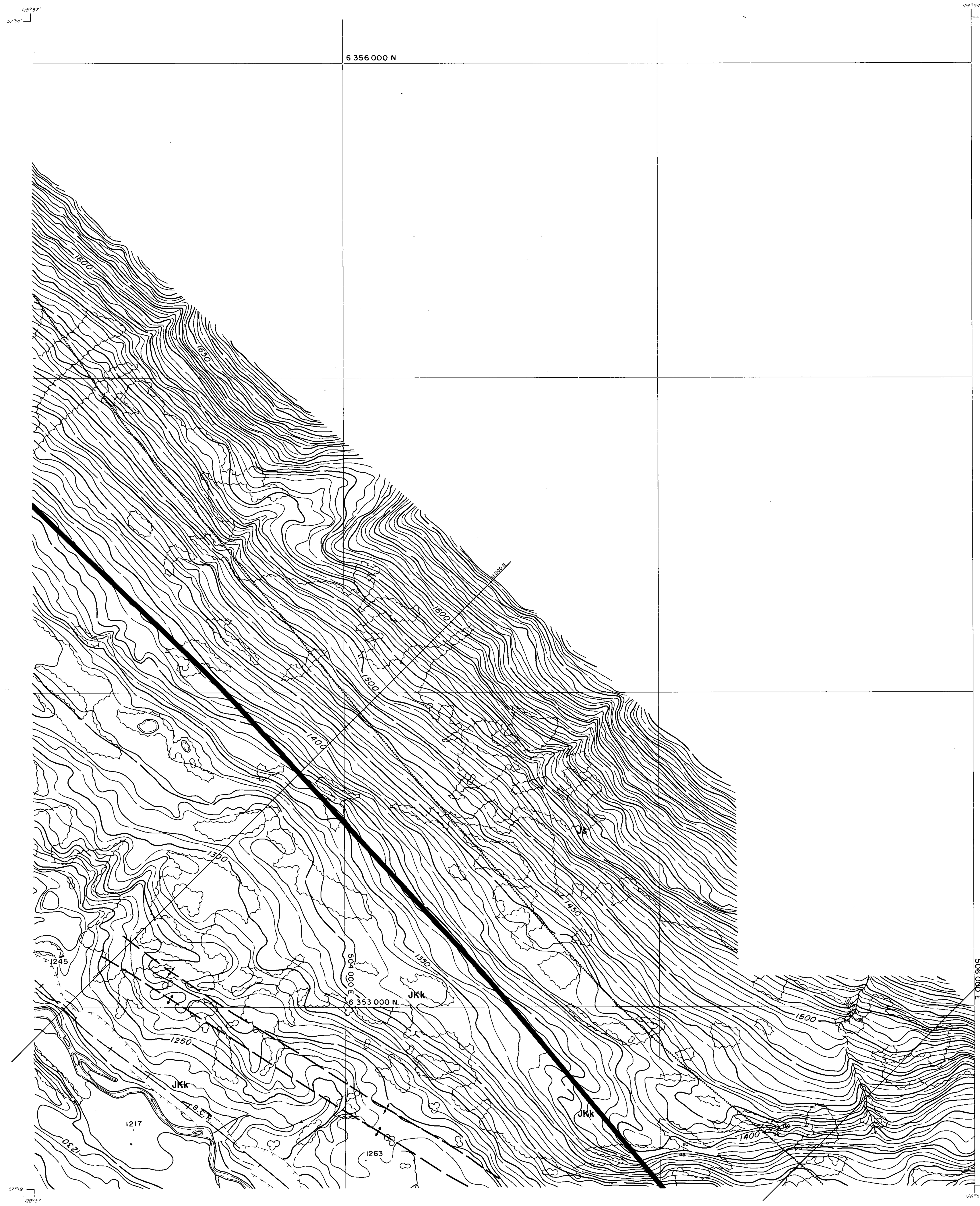
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SUMMIT AREA
MAP K-12

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DWG. No. KPN86SA-07



LEGEND

BUILDING	
ROAD, HARD SURFACE	
LOOSE SURFACE	
CART TRACK	
TRAIL	
RAILROAD BED	
RIVER	
STREAM, DEFINITE	
APPROXIMATE	
SPLIT	
LAKE	
WATER LEVEL	EL 505'
SWAMP	
BEAVER DAM	B.D. B.D.
TREE LINE	
CUT LINE	
CONTOURS, INDEX	1750
INTERMEDIATE	
DEPRESSION	
APPROXIMATE	
SPOT ELEVATION	·7654
FORM LINES	
CUT/FILL	
FIELD CONTROL POINT	CP (2)
COAL LICENCE	

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

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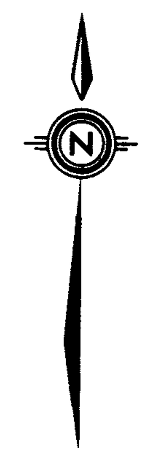
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

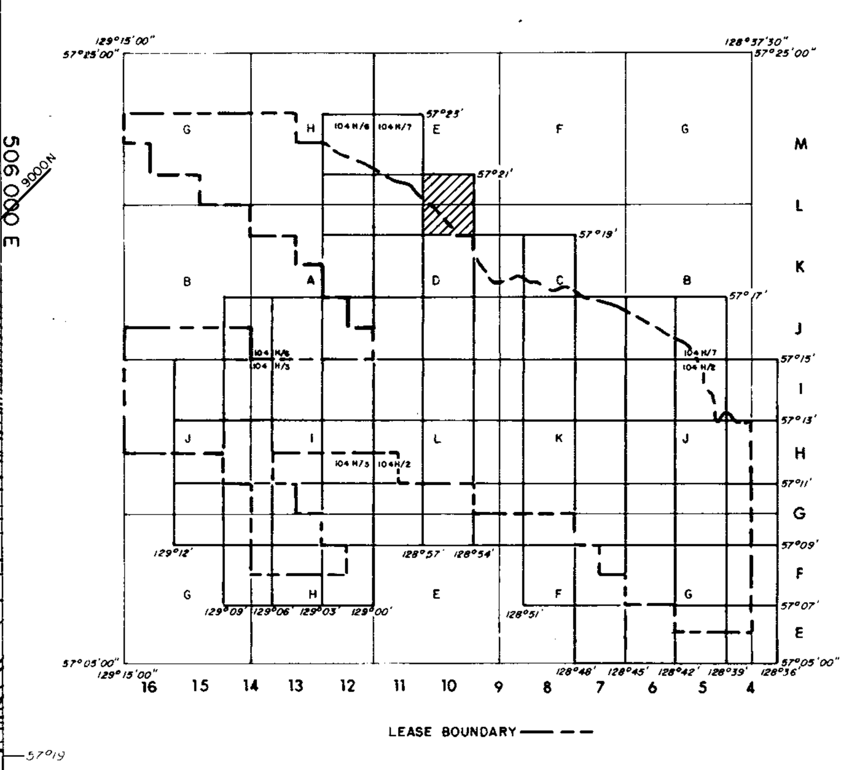
COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)



SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



RHONDDA SEQUENCE

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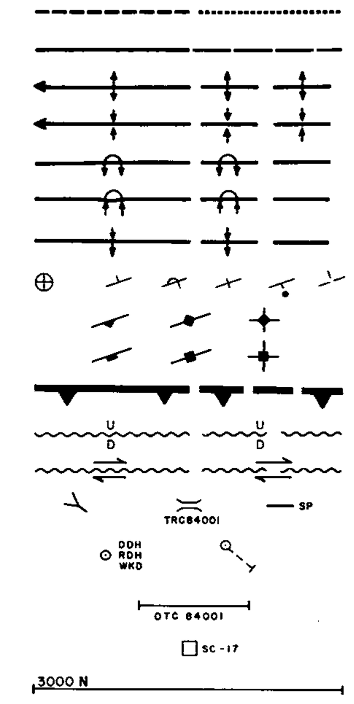
LEGEND



LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
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BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
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JOINTS (INCLINED, VERTICAL, HORIZONTAL)
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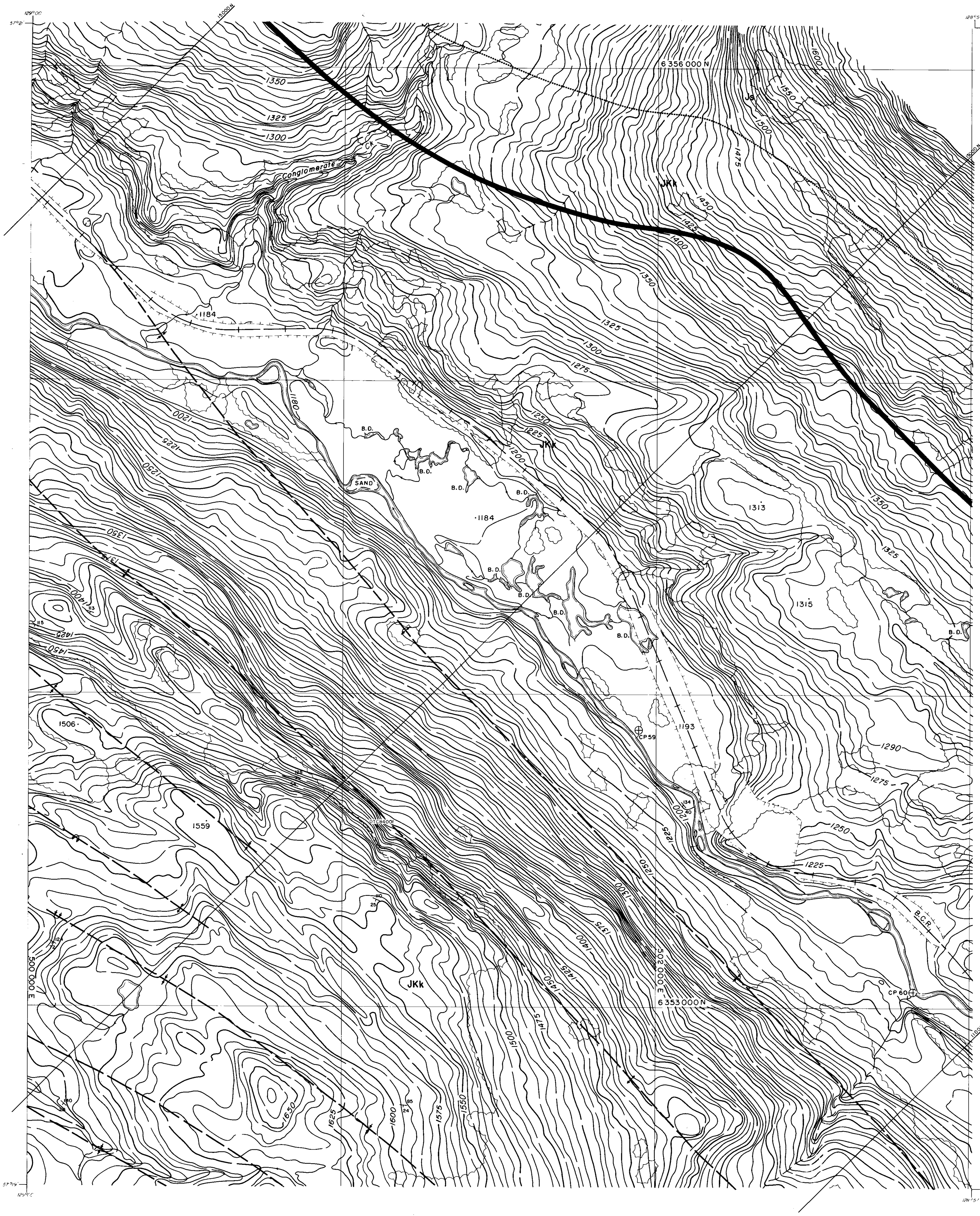
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA CORPORATION	
Coal Division	
CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP L-10	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-08



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

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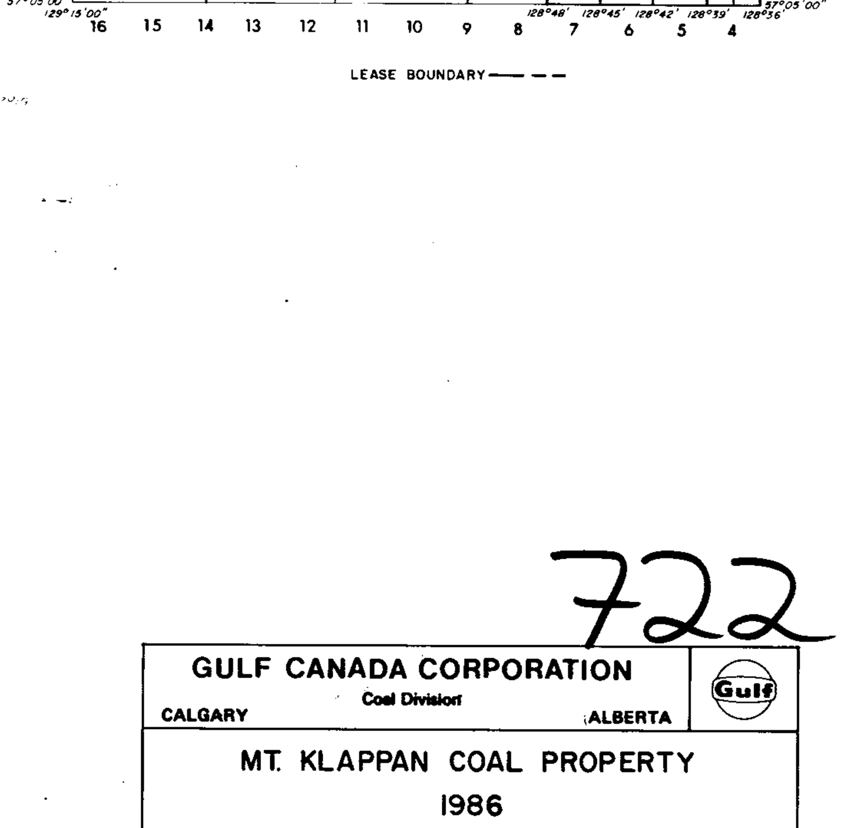
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD, FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE).

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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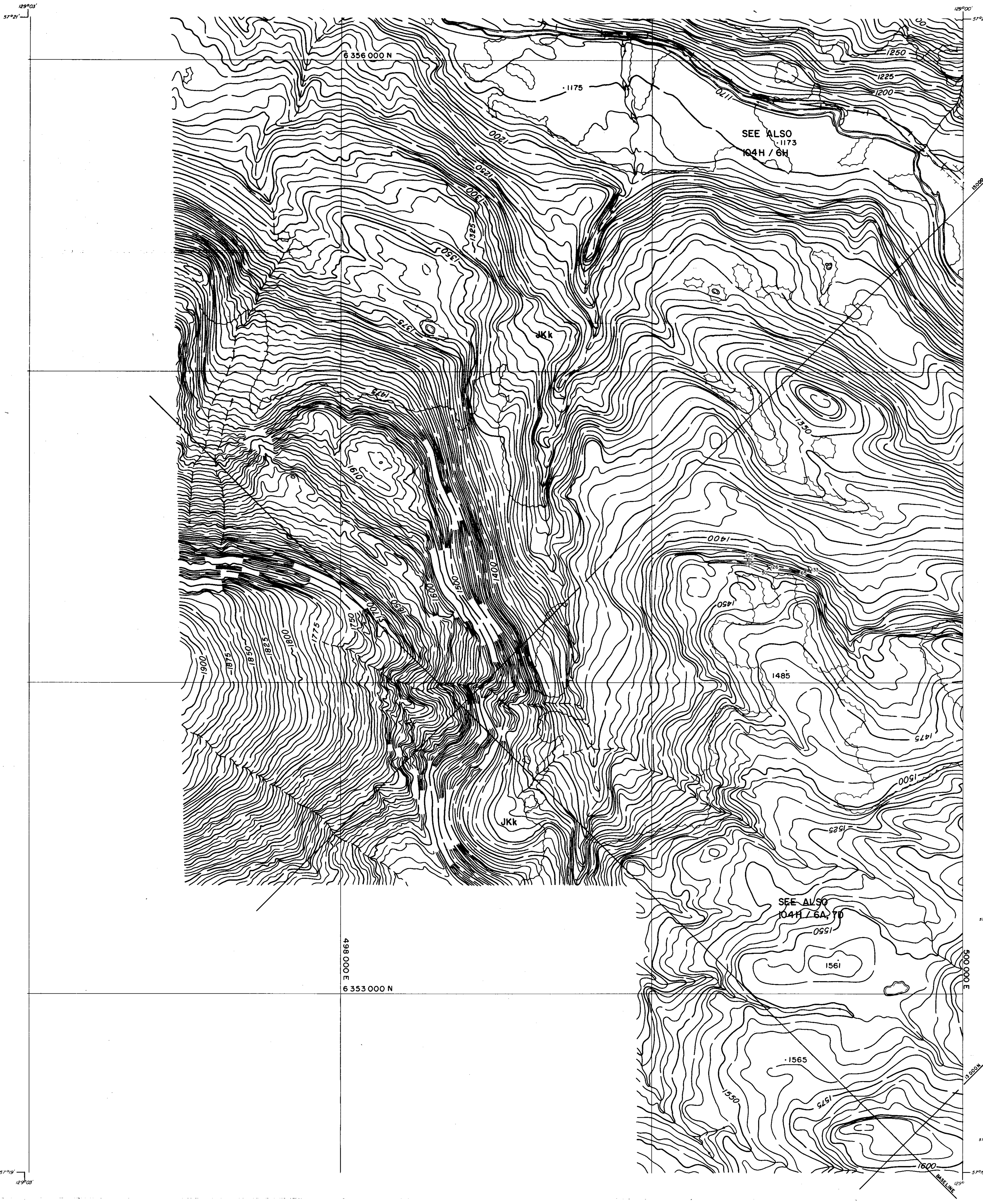
LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT TRENCH COAL SPOIL
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- MEASURED SECTION
- SURVEY CAIRN
- CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP L-11	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-09



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES.

CONTOUR INTERVAL = 10 M; WITH FORM LINES INTERVAL = 5 M.

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RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY:
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE).

N

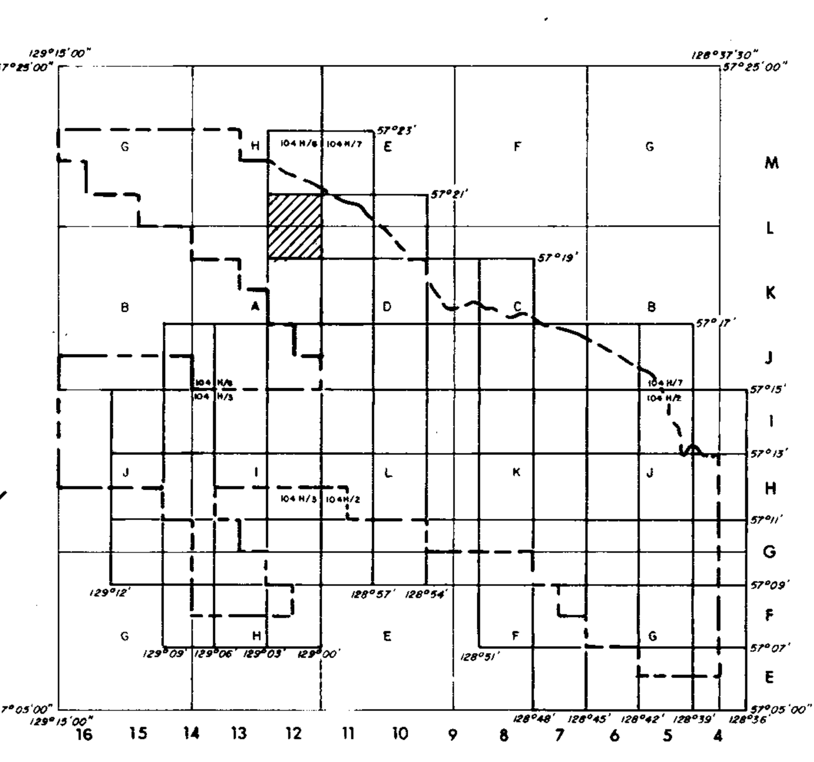
SCALE 1:5000

0 0.25 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

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LEGEND

LICENCE BOUNDARY
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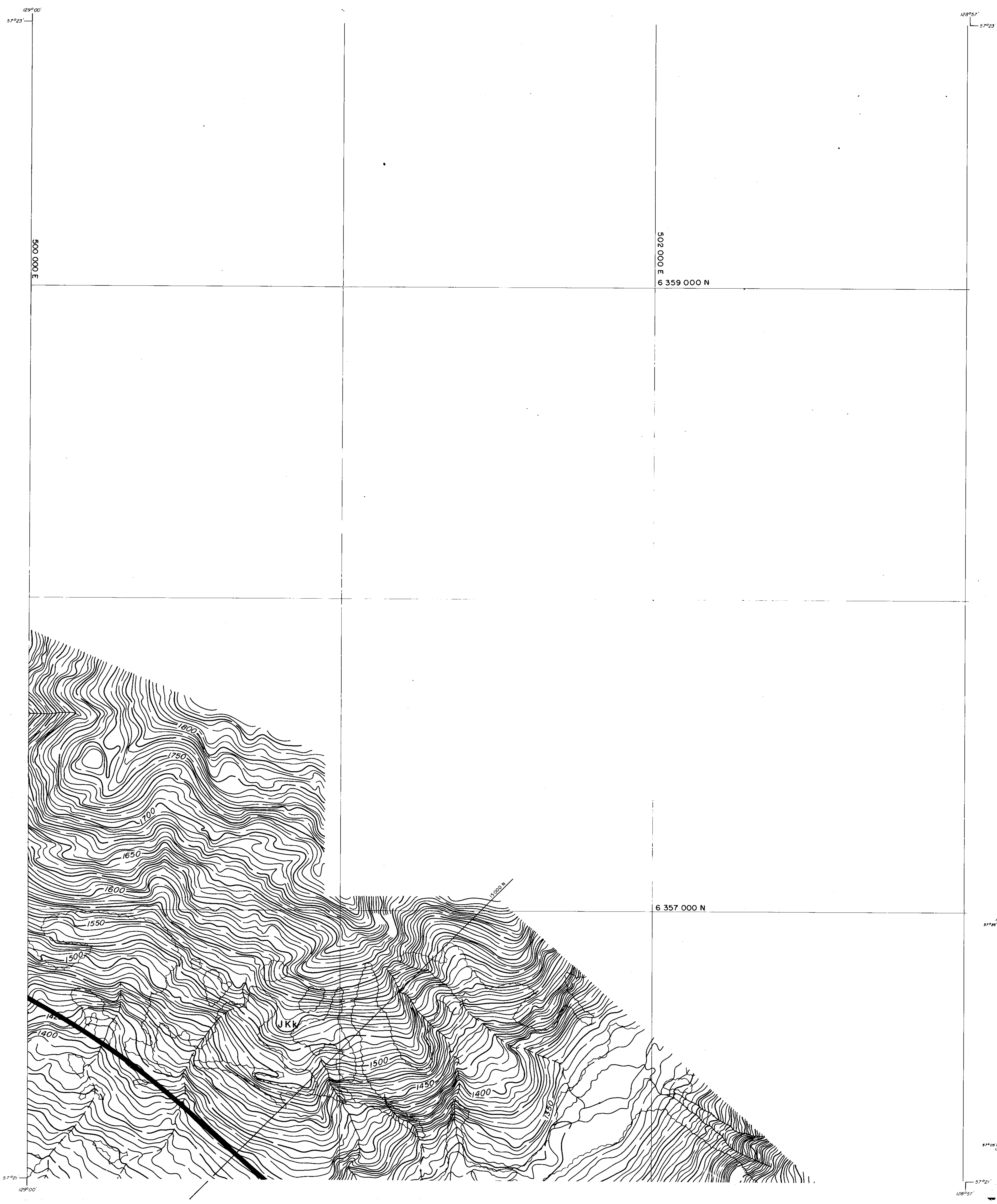
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP ADIT TRENCH COAL SPOIL
DDH RDH WKD DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 MEASURED SECTION
SC-17 SURVEY CAIRN
3000 N CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP L-12	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-10



LEGEND

- BUILDING
- ROAD, HARD SURFACE
  - LOOSE SURFACE
  - CART TRACK
  - TRAIL
- RAILROAD BED
- RIVER
- STREAM, DEFINITE
  - APPROXIMATE
  - SPLIT
- LAKE
- WATER LEVEL — EL 505.1
- SWAMP
- BEAVER DAM
- TREE LINE
- CUT LINE
- CONTOURS, INDEX — 1750
  - INTERMEDIATE
  - DEPRESSION
  - APPROXIMATE
- SPOT ELEVATION — ·7654
- FORM LINES
- CUT/FILL
- FIELD CONTROL POINT — CP 121
- COAL LICENCE

NOTES

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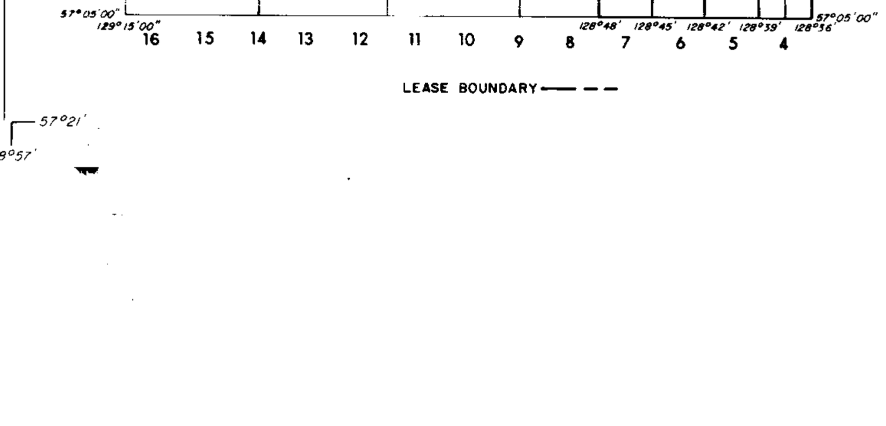
SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



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LEGEND

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- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
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- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
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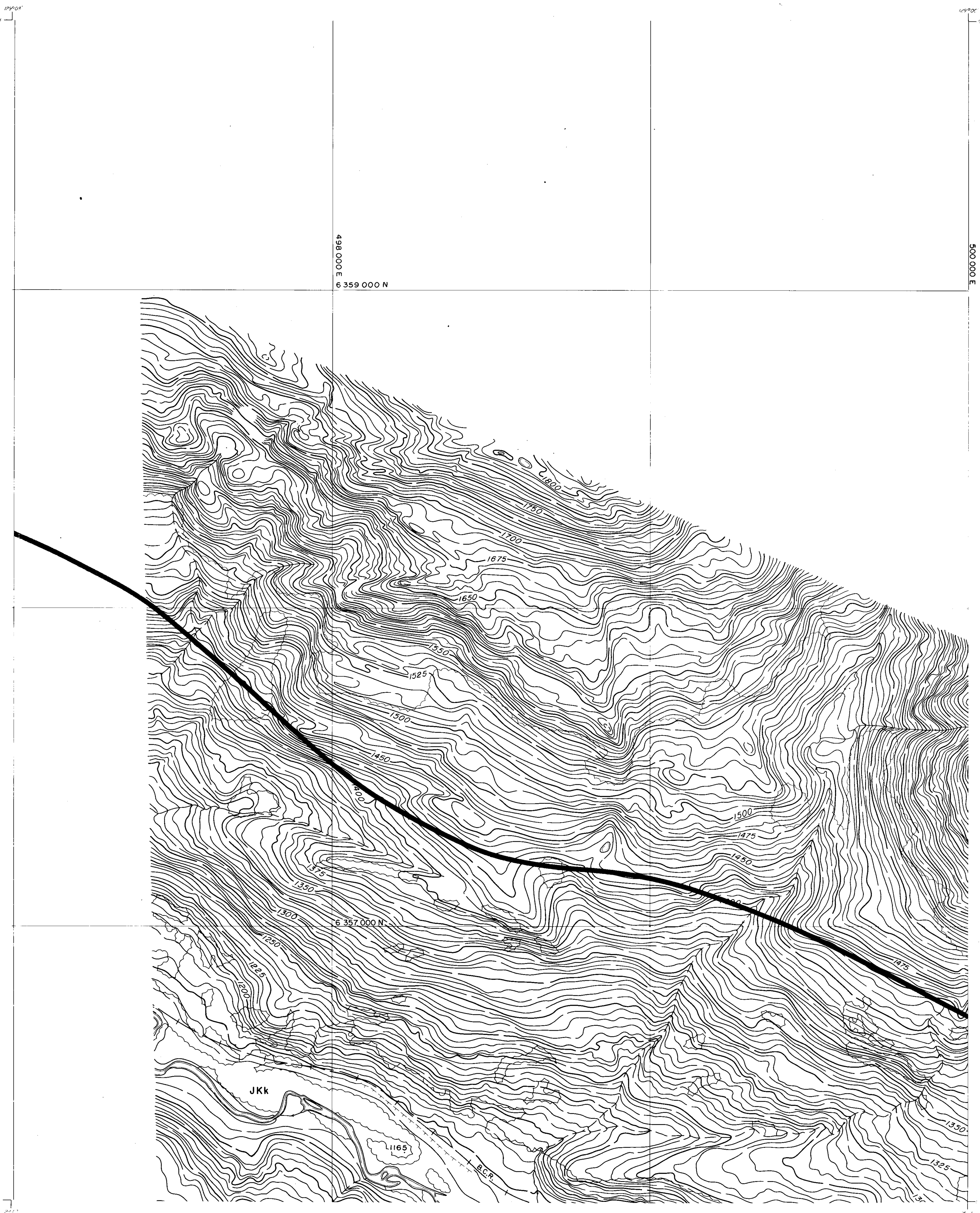
- DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- DTC 84001 — MEASURED SECTION
- SC-17 — SURVEY CAIRN
- 3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SUMMIT AREA MAP M-11	
PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR.1987	DRAWING No. KPN86SA-11



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
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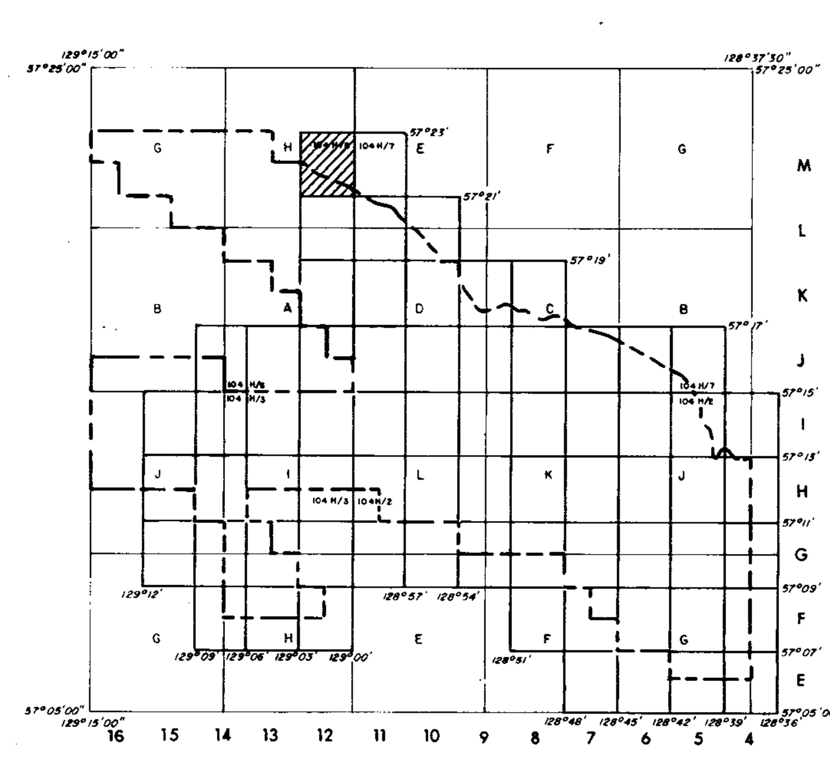
SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



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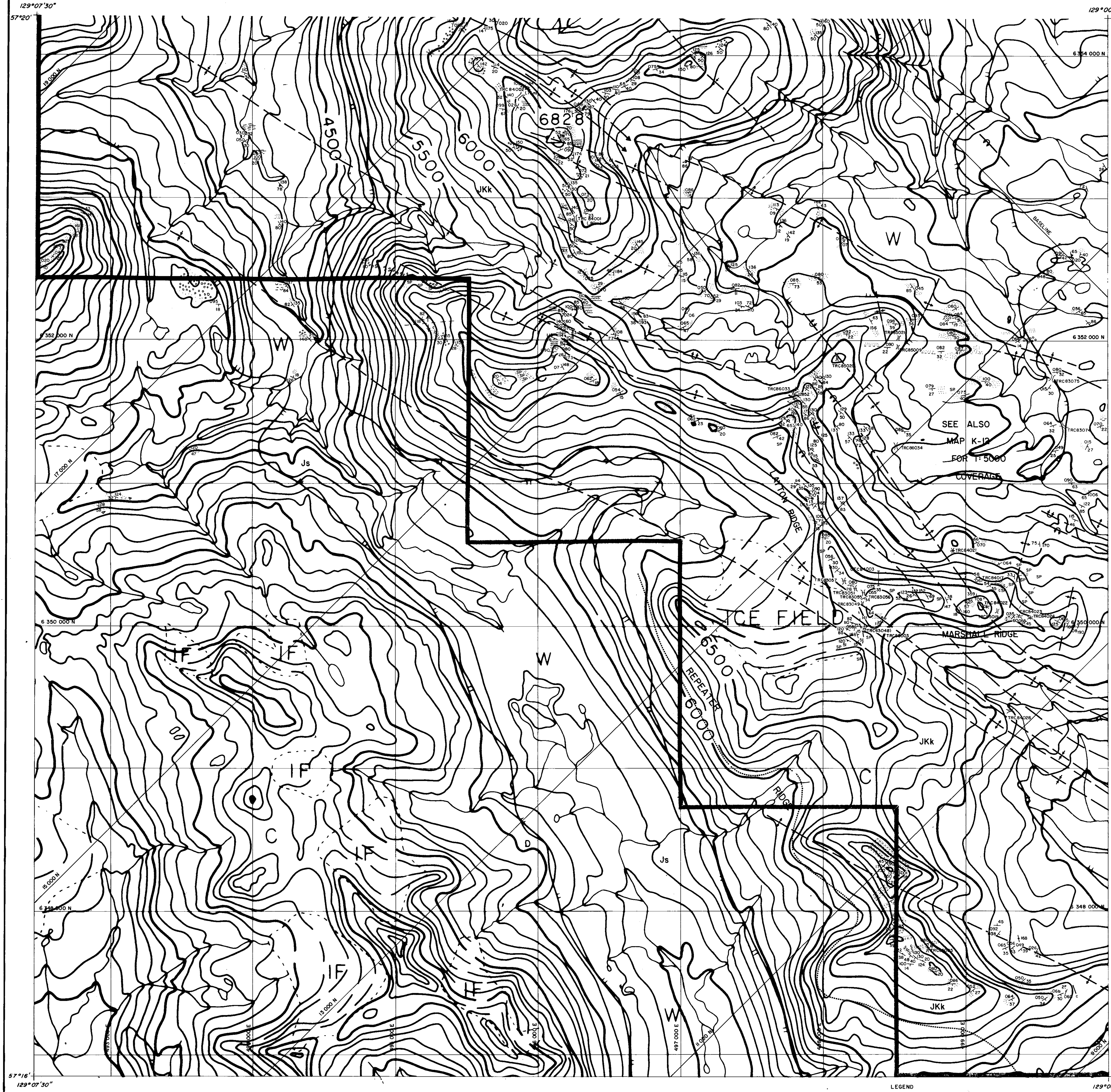
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

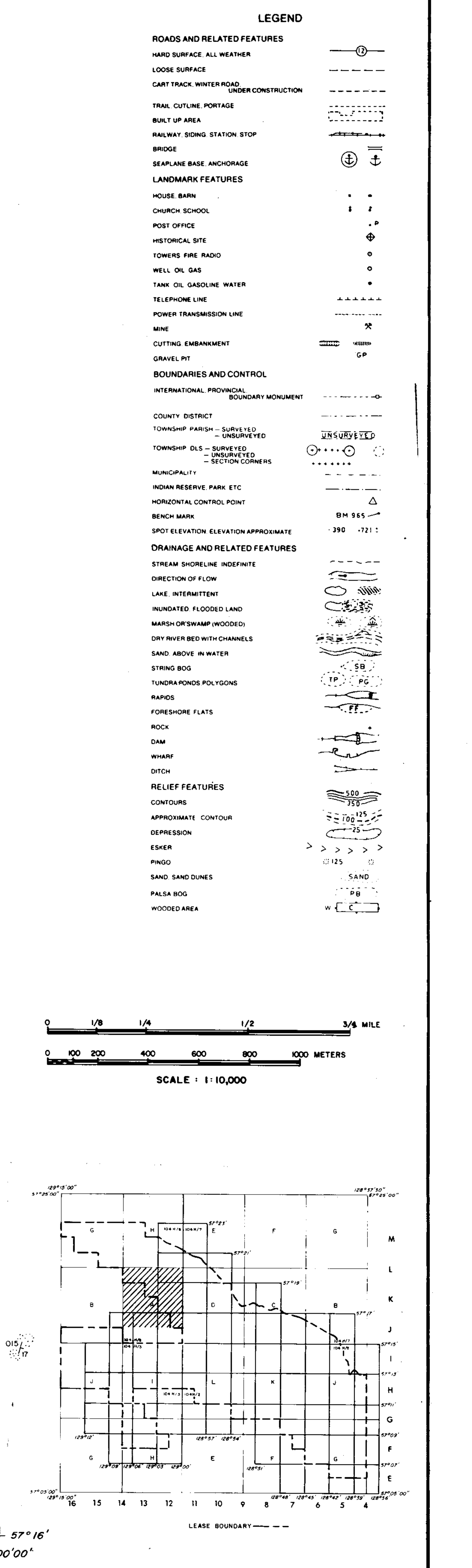
722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SUMMIT AREA
MAP M-12

PREPARED BY: L.S./S.M.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-12





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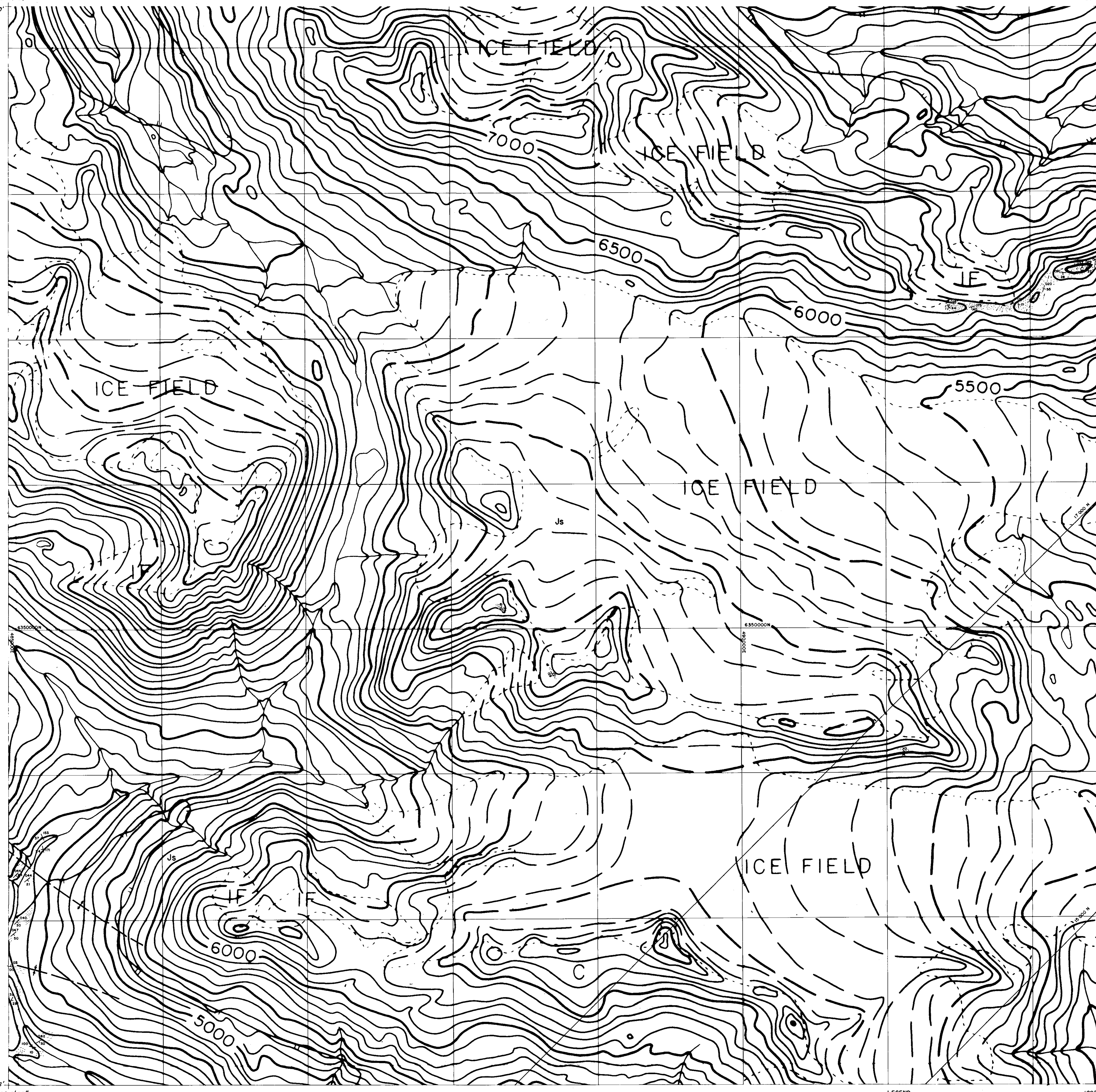
- MEASURED SECTION
- SURVEY CAIRN
- CROSS SECTION LINE

722

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SUMMIT AREA
MAP 104 H/6 A 104 H/7 D

PREPARED BY: S.M./L.S.	SCALE 1:10,000
APPROVED BY: E.S. DATE: MAR. 1987	DWG. No. KPN86SA-13



LEGEND

ROADS AND RELATED FEATURES

HARD SURFACE ALL WEATHER
LOOSE SURFACE
CART TRACK WINTER ROAD UNDER CONSTRUCTION
TRAIL CUTLINE PORTAGE
BUILT UP AREA
RAILWAY SIDING STATION STOP
BRIDGE
SEAPLANE BASE ANCHORAGE

LANDMARK FEATURES

HOUSE BARN
CHURCH SCHOOL
POST OFFICE
HISTORICAL SITE
TOWERS FIRE RADIO
WELL OIL GAS
TANK OIL GASOLINE WATER
TELEPHONE LINE
POWER TRANSMISSION LINE
MINE
CUTTING EMBANKMENT
GRAVEL PIT — GP

BOUNDARIES AND CONTROL

INTERNATIONAL PROVINCIAL BOUNDARY MONUMENT
COUNTY DISTRICT
TOWNSHIP PARISH – SURVEYED – UNSURVEYED — UNSURVEYED
TOWNSHIP DLS – SURVEYED – UNSURVEYED – SECTION CORNERS
MUNICIPALITY
INDIAN RESERVE PARK ETC
HORIZONTAL CONTROL POINT
BENCH MARK — BM 965
SPOT ELEVATION ELEVATION APPROXIMATE — ·390 ·721

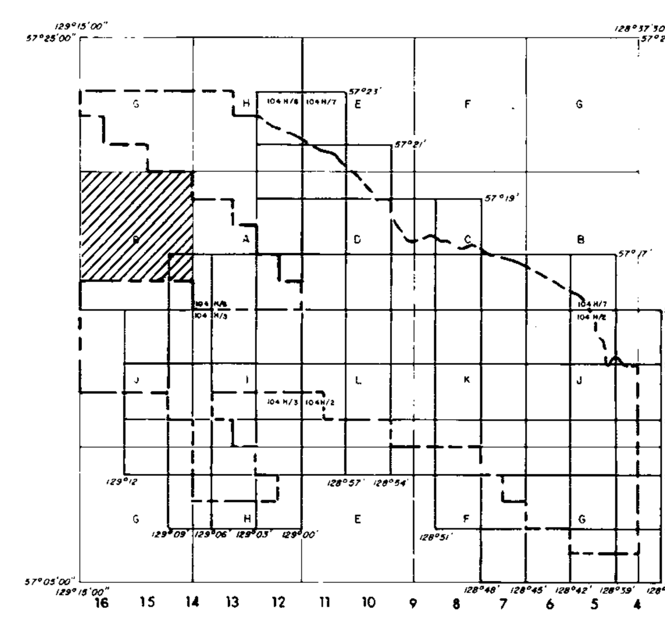
DRAINAGE AND RELATED FEATURES

STREAM SHORELINE INDEFINITE
DIRECTION OF FLOW
LAKE INTERMITTENT
INUNDATED FLOODED LAND
MARSH OR SWAMP (WOODED)
DRY RIVER BED WITH CHANNELS
SAND ABOVE IN WATER
STRING BOG — SB
TUNDRA PONDS POLYGONS — TP PG
RAPIDS
FORESHORE FLATS — FF
ROCK
DAM
WHARF
DITCH

RELIEF FEATURES

CONTOURS — 500 350
APPROXIMATE CONTOUR — 125 100
DEPRESSION — 25
ESKER
PINGO — 125
SAND SAND DUNES — SAND
PALSA BOG — PB
WOODED AREA — W C

0 1/8 1/4 1/2 3/4 MILE
0 100 200 400 600 800 1000 METERS
SCALE 1:10,000



LEASE BOUNDARY — — —

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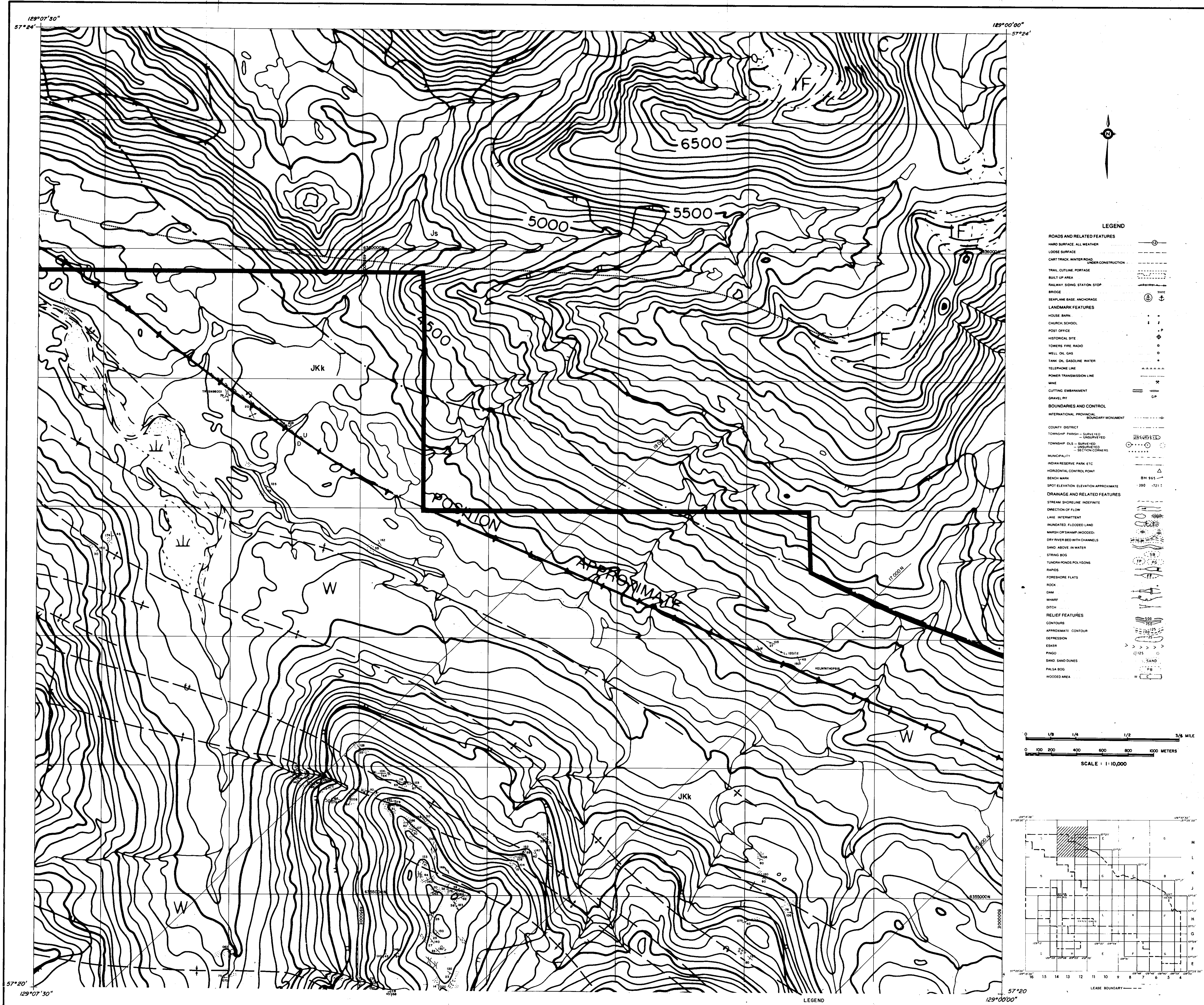
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE — 3000 N

722

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SUMMIT NORTH
SHEET 104H/6B

PREPARED BY: S.M./L.S.	SCALE 1:10,000
APPROVED BY: E.S. DATE: MAR., 1987	DWG. No. KPN86SA-14



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KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SUMMIT AREA
MAP 104 H/6 H

PREPARED BY: S.M./L.S.		SCALE 1:10,000
APPROVED BY: E.S.	DATE: MAR. 1987	DWG. No. KPN86SA-15

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js — Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

SUMMIT AREA

13000N (EAST & WEST)

PREPARED BY: L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-16

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

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SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

SUMMIT AREA

11000N (EAST & WEST)

PREPARED BY: L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-17

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence

KLAPPAN SEQUENCE (main coal-bearing unit)

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SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MOUNT KLAPPAN COAL PROPERTY 1986 GEOLOGICAL CROSS SECTION SUMMIT AREA 10 500 N (EAST & WEST)	
PREPARED BY: L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-18

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

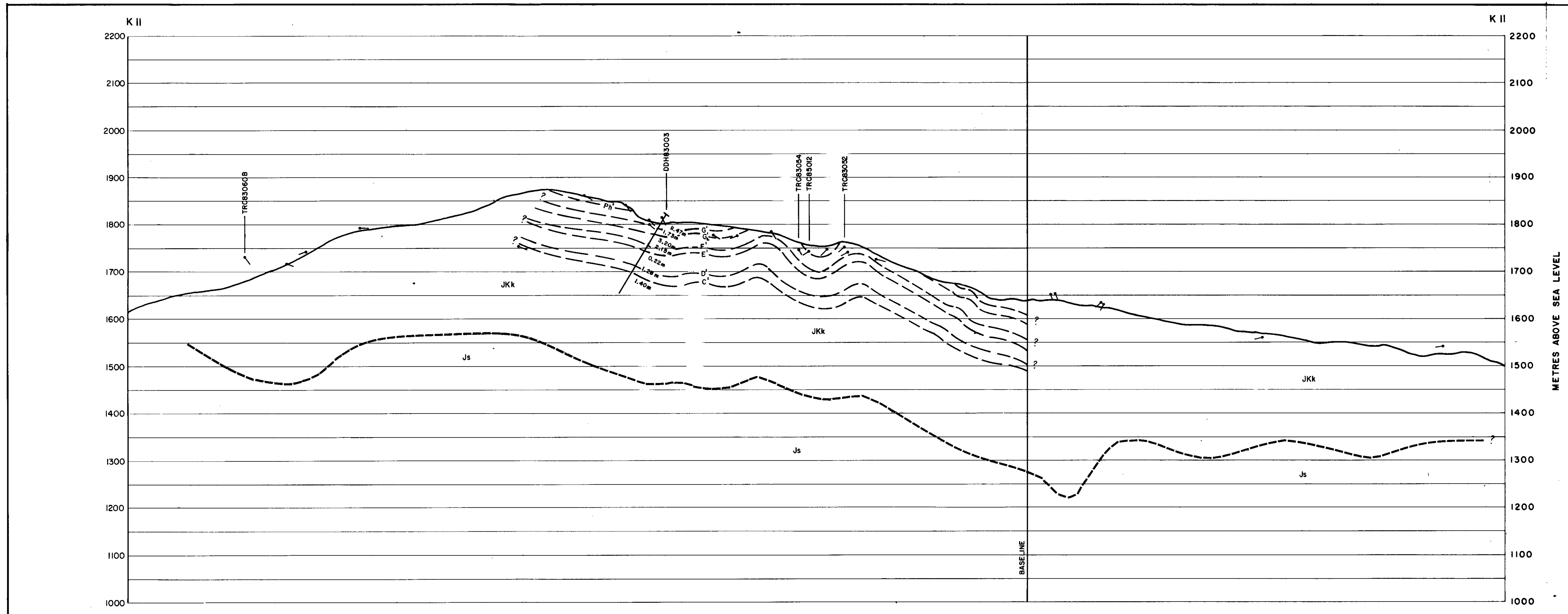
1986

GEOLOGICAL CROSS SECTION

SUMMIT AREA

10 000 N (EAST & WEST)

PREPARED BY: L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-19



RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

SUMMIT AREA

9500N (EAST & WEST)

PREPARED BY: L.S.		SCALE 1:5000
APPROVED BY: E.S.	DATE: MAR.1987	DRAWING No. KPN86SA-20

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js — Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LICENCE BOUNDARY
COAL SEAM TRACE (DEFINED, INFERRED)
GEOLOGICAL CONTACT (APPROX, INFERRED)
FAULT TRACE (DEFINED, APPROX.)
BEDFORM
BEDDING ATTITUDE
DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES
0 50 100 150 200 250

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA
Gulf

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SUMMIT AREA
9000N (EAST & WEST)

PREPARED BY: L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE MAR. 1987	DRAWING No. KPN86SA - 21

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

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JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js — Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LICENCE BOUNDARY
COAL SEAM TRACE (DEFINED, INFERRED)
GEOLOGICAL CONTACT (APPROX, INFERRED)
FAULT TRACE (DEFINED, APPROX.)
BEDFORM
BEDDING ATTITUDE
DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES
0 50 100 150 200 250

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SUMMIT AREA
7000N (EAST & WEST)

PREPARED BY: L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-22

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js — Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

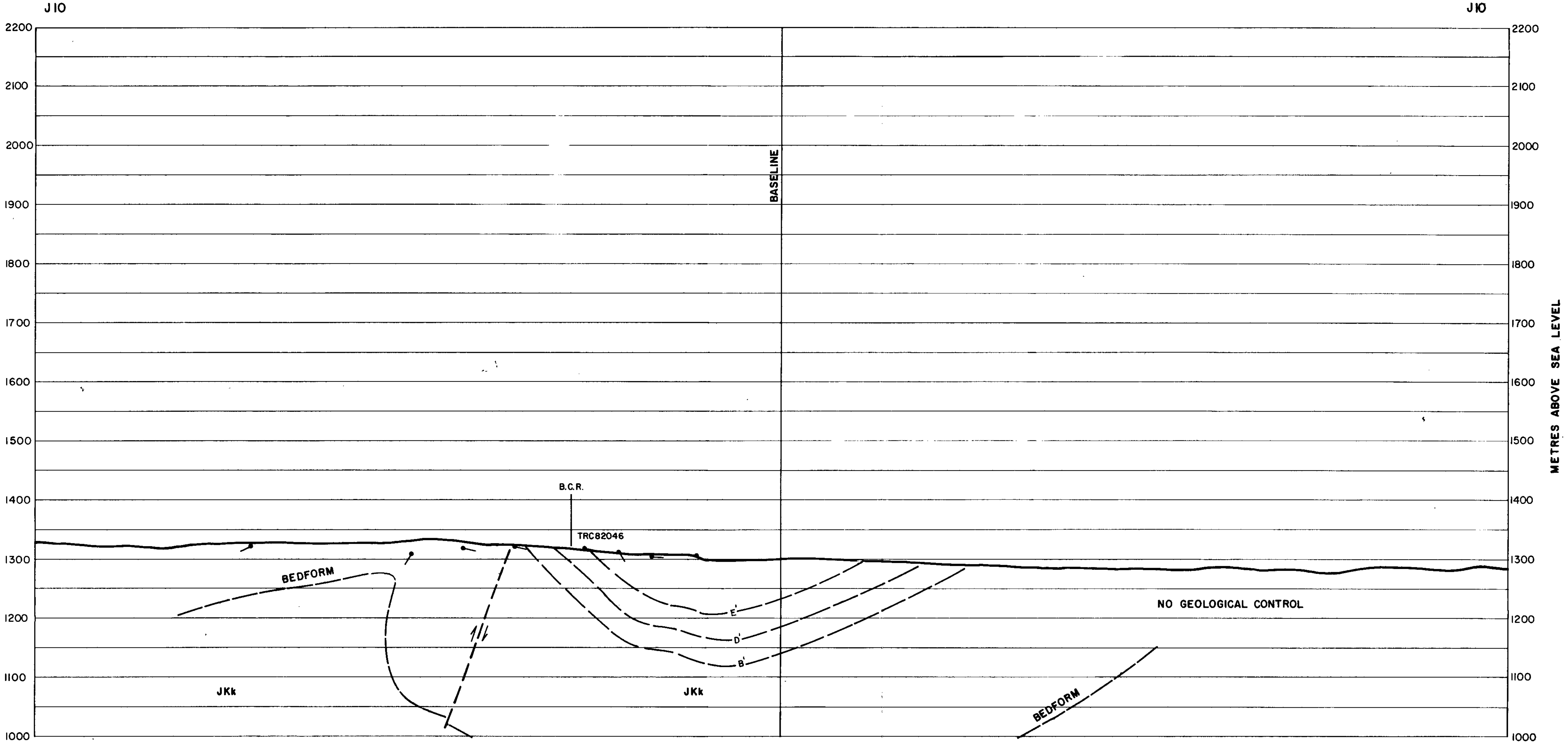
GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SUMMIT AREA
6000N (EAST & WEST)

PREPARED BY: L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-23



RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

SUMMIT AREA

5500 N (EAST & WEST)

PREPARED BY: L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-24

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact Twenty-three species of plant fossils occur within the sequence

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout Petrified wood and rare coquina may be present towards the upper contact

SPATSIZI SEQUENCE

Js — Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present Belemnites are rare Plant debris may occur near the upper gradational contact

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 100 200 300 400 500

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

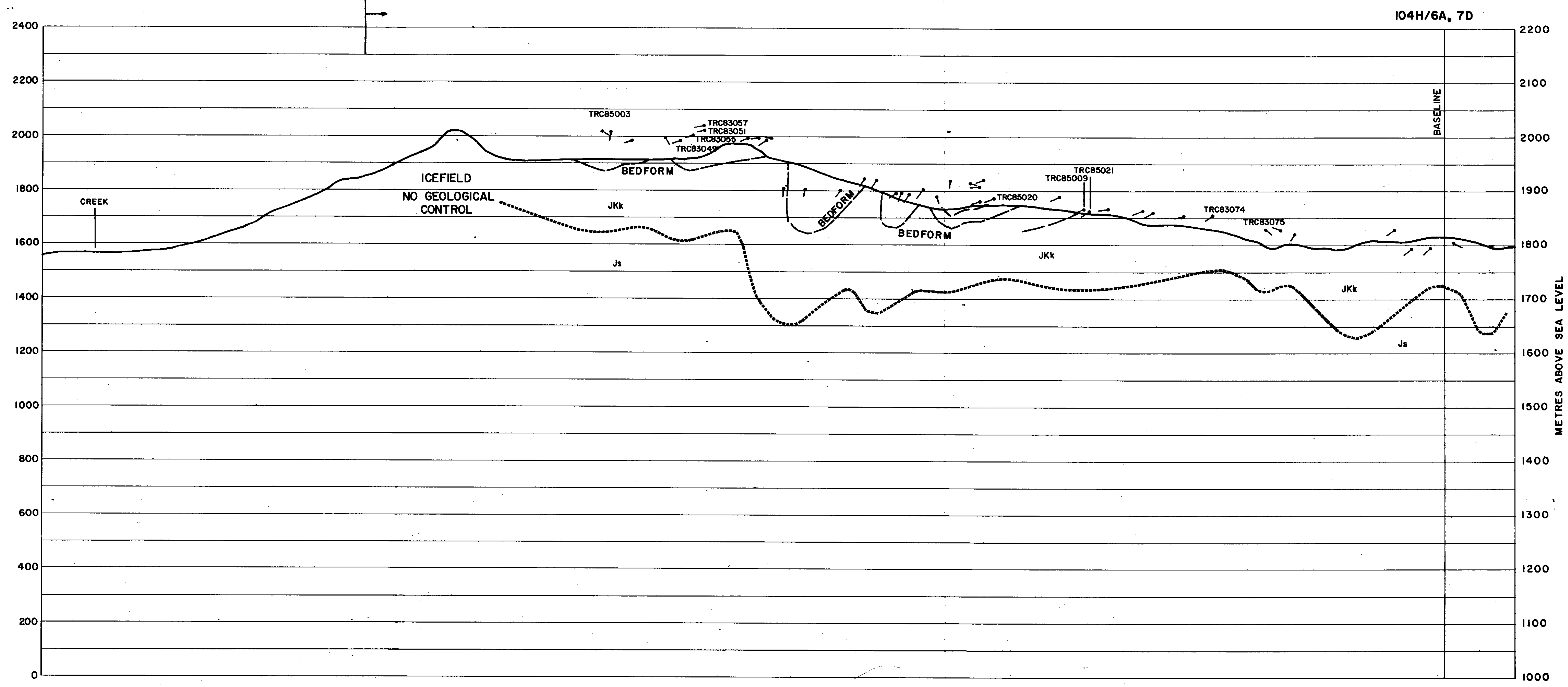
1986

GEOLOGICAL CROSS SECTION

SUMMIT AREA

15 000N (EAST & WEST)

PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-26



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

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SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 100 200 300 400 500

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

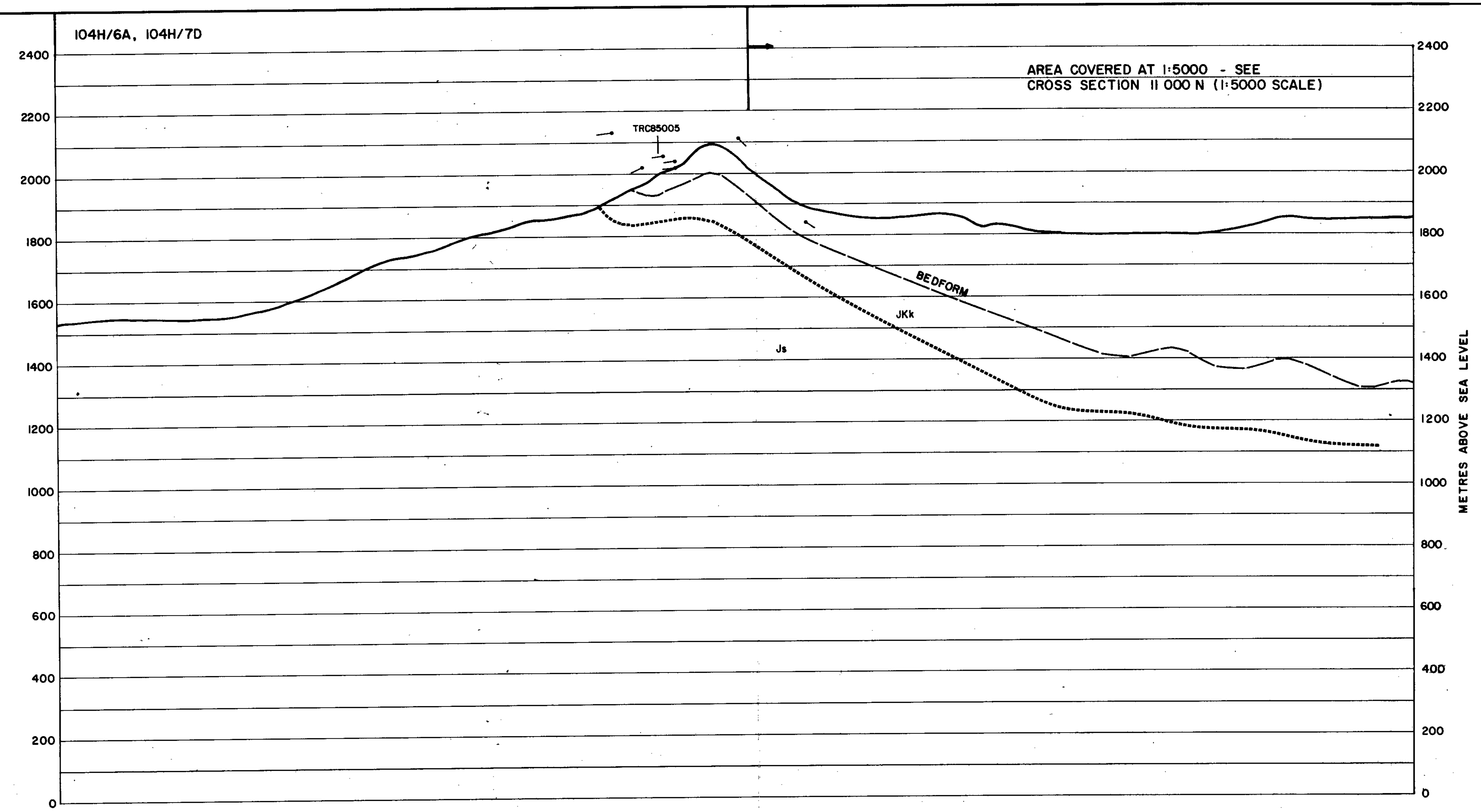
GEOLOGICAL CROSS SECTION

SUMMIT AREA

13 000 N (EAST & WEST)

PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-27

104H/6A, 104H/7D



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams Conglomerate beds grade laterally into sandstone Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence Twenty-three species of bivalves and up to twenty-five species of plants occur throughout Petrified wood and rare coquina may be present towards the upper contact

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence Nineteen species of bivalves are present Belemnites are rare Plant debris may occur near the upper gradational contact

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 100 200 300 400 500

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

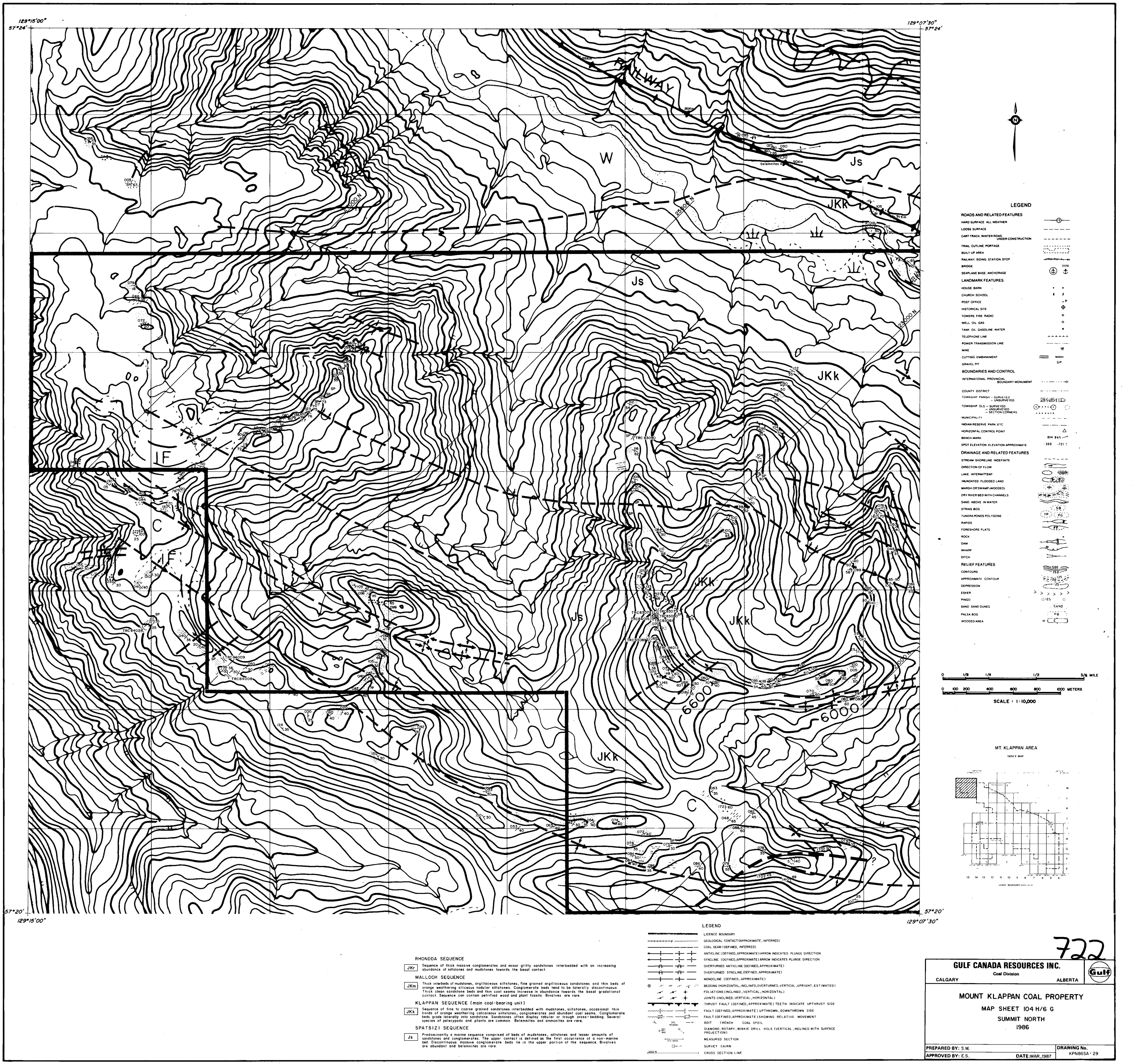
1986

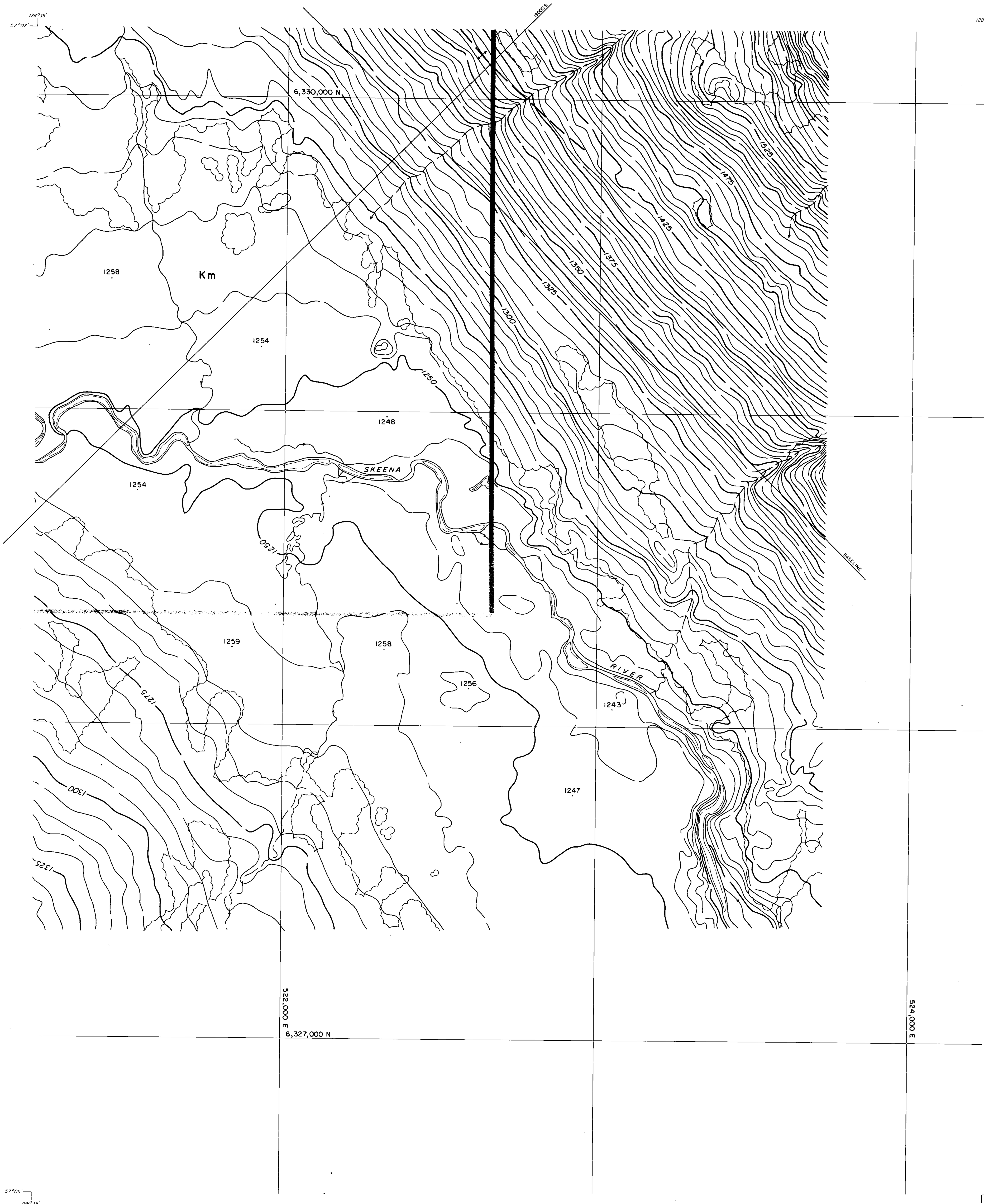
GEOLOGICAL CROSS SECTION

SUMMIT AREA

11000 N (WEST)

PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SA-28


129°15'00"
57°24'
129°07'30"
57°20'
RAILWAY
W
Js
JKk
IF
C
6600
6000
LEGEND
ROADS AND RELATED FEATURES
LANDMARK FEATURES
BOUNDARIES AND CONTROL
DRAINAGE AND RELATED FEATURES
RELIEF FEATURES
SCALE = 1:10,000
MT. KLAPPAN AREA
RHONDDA SEQUENCE
JKr Sequence of thick massive conglomerates and minor gritty sandstones interbedded with an increasing abundance of siltstones and mudstones towards the basal contact.
MALLOCH SEQUENCE
JKm Thick interbeds of mudstones, argillaceous siltstones, fine grained argillaceous sandstones and thin beds of orange weathering siliceous nodular siltstones. Conglomerate beds tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Sequence can contain petrified wood and plant fossils. Bivalves are rare.
KLAPPAN SEQUENCE (main coal-bearing unit)
JKk Sequence of fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross-bedding. Several species of pelecypods and plants are common. Belemnites and ammonites are rare.
SPATSIZI SEQUENCE
Js Predominantly a marine sequence comprised of beds of mudstones, siltstones and lesser amounts of sandstones and conglomerates. The upper contact is defined as the first occurrence of a non-marine bed. Discontinuous massive conglomerate beds lie in the upper portion of the sequence. Bivalves are abundant and belemnites are rare.
LEGEND
LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE
722
GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf
MOUNT KLAPPAN COAL PROPERTY
MAP SHEET 104 H/6 G
SUMMIT NORTH
1986
PREPARED BY: S.M.
APPROVED BY: E.S.
DATE: MAR., 1987
DRAWING No.
KPN86SA - 29



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505?
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — 7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES.

CONTOUR INTERVAL = 10 M; WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1 60 000 (APPROXIMATE)

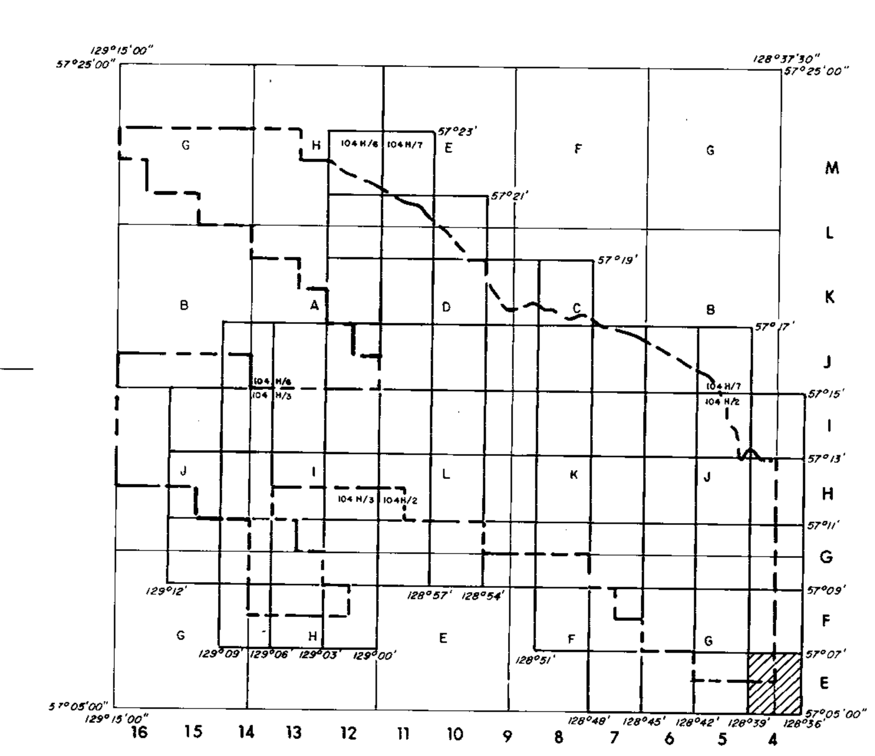
SCALE 1:5000

0 0.25 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY — — —

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

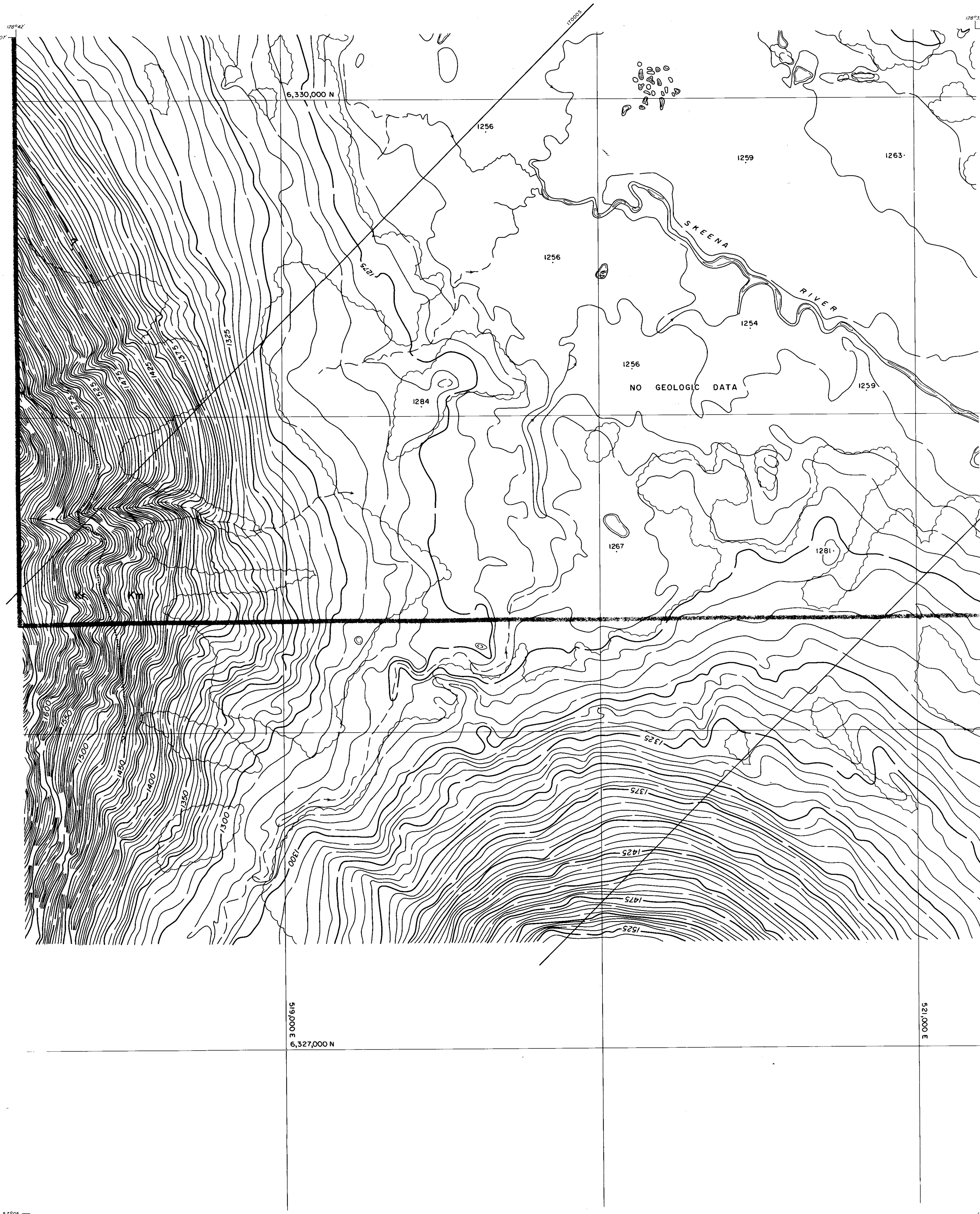
LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA
Gulf

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SKEENA AREA
MAP E-4

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR.1987	DRAWING No. KPN86SK-01



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 305
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

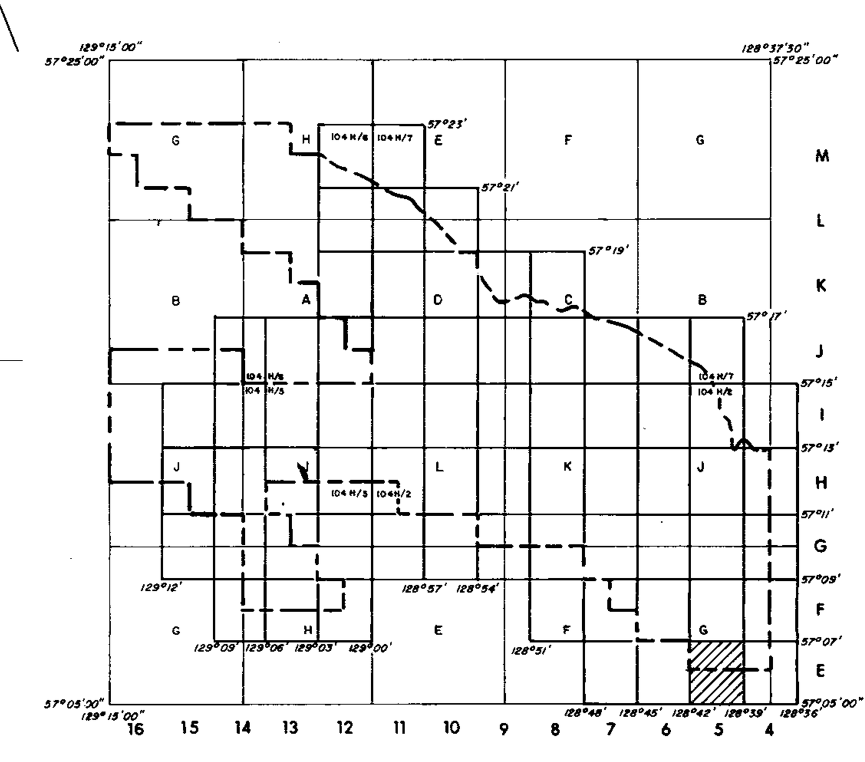
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1 60 000 (APPROXIMATE).

SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

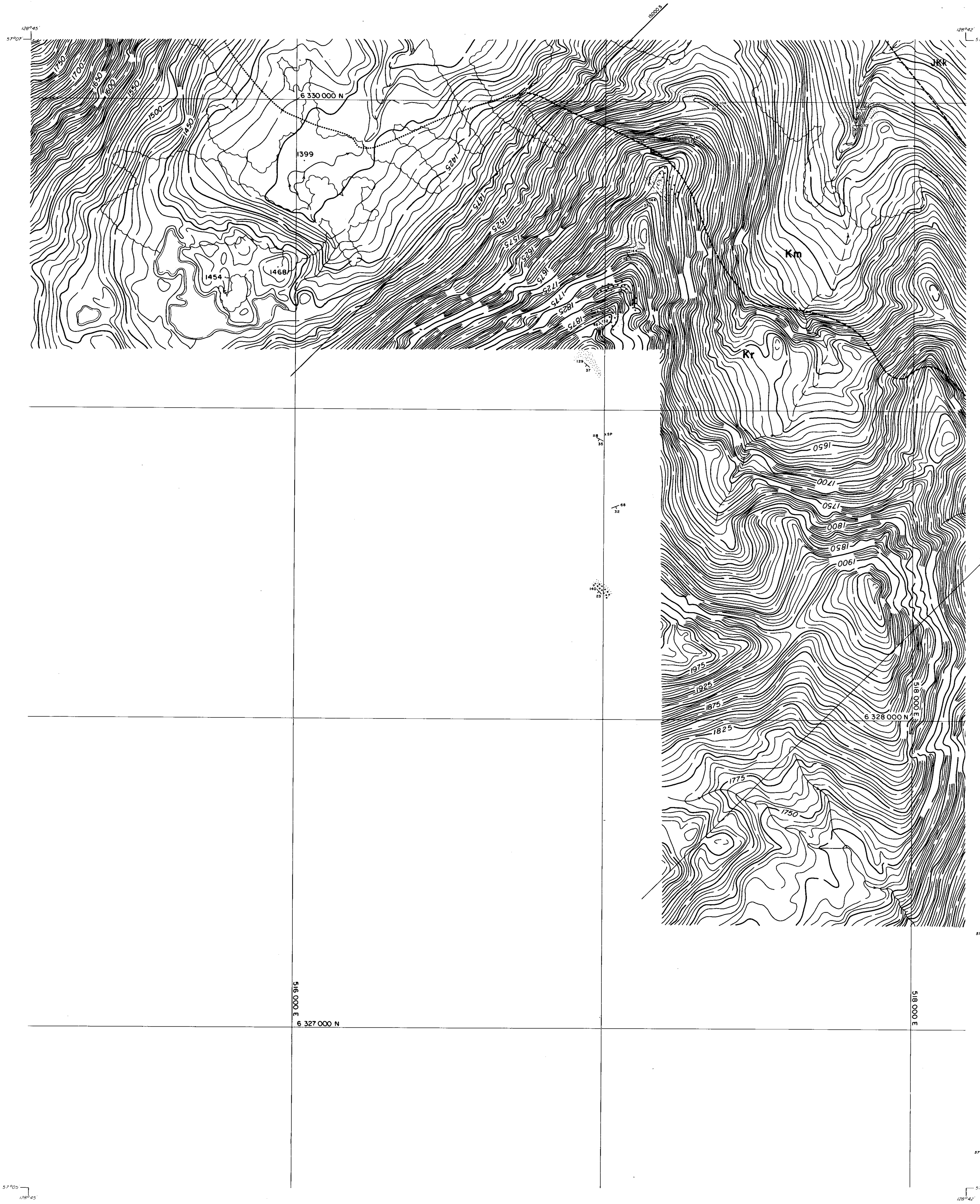
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP E-5	
PREPARED BY: S.M. / L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-02



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES.

CONTOUR INTERVAL = 10 M; WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5·0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE).

N

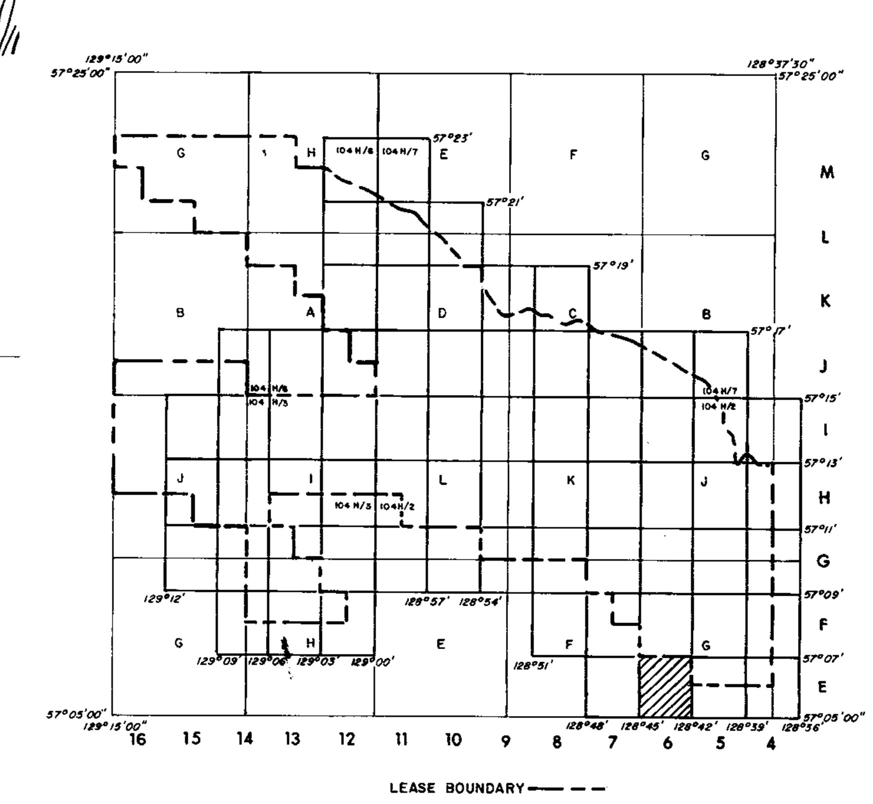
SCALE 1:5000

0 0.25 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY — — —

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

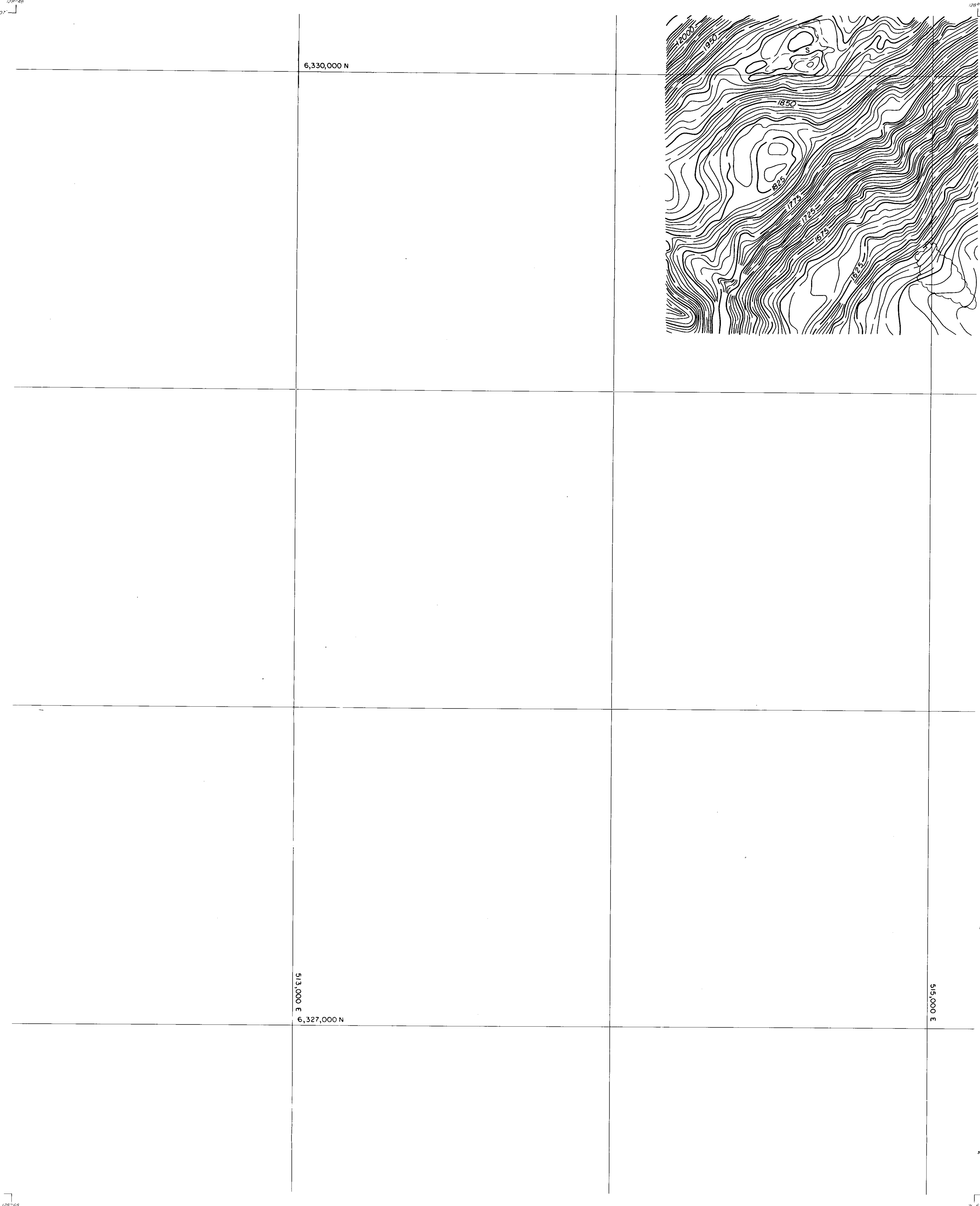
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP E-6	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-03



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505
SWAMP
BEAVER DAM — B.D. BD
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — 7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT/82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60,000 (APPROXIMATE)

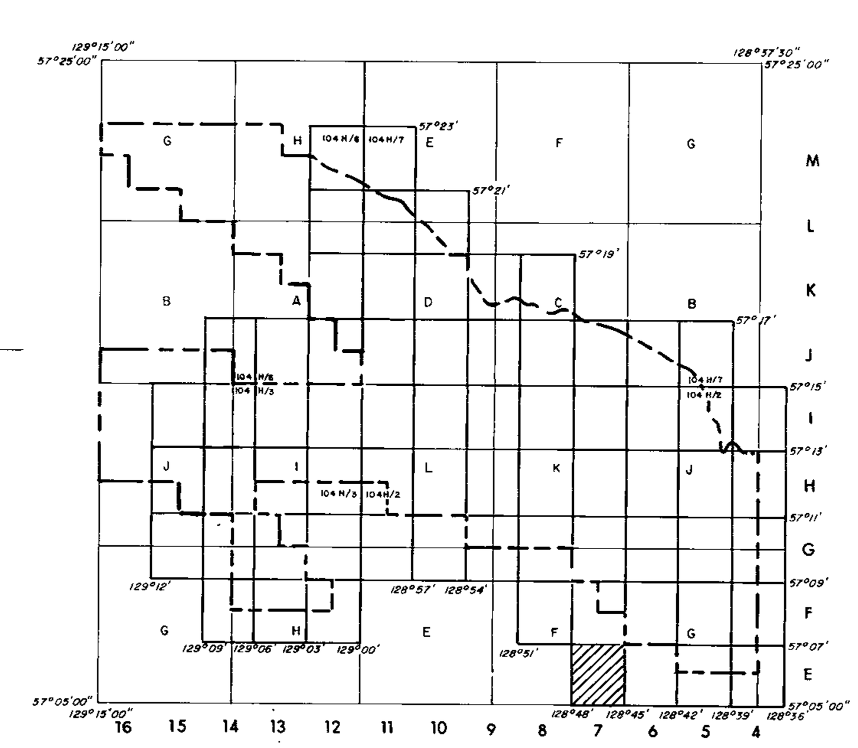
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY — — —

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

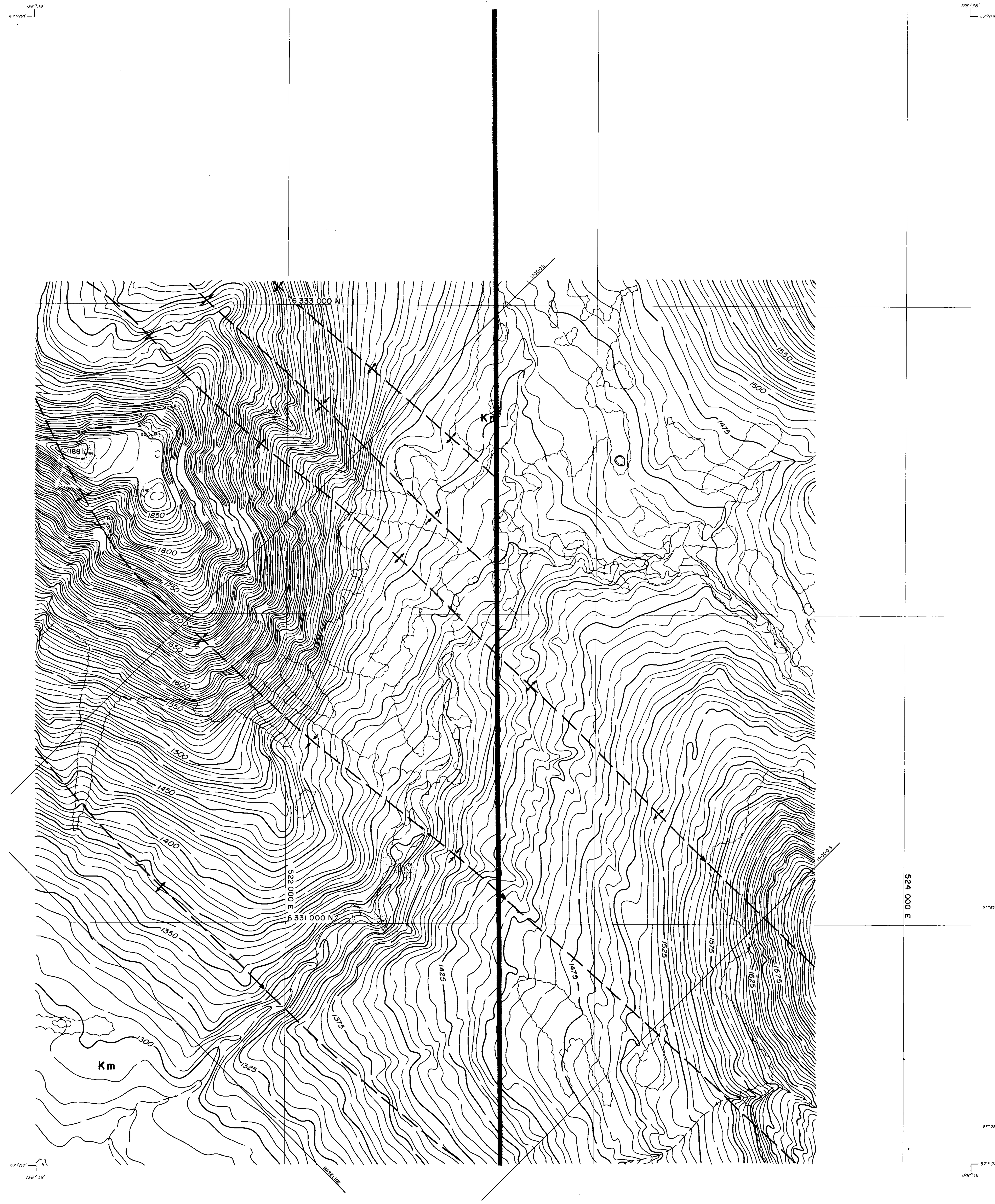
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 — SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP E-7	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-04



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505±
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

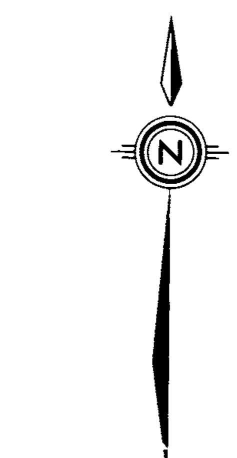
CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURED BY TREES OR VEGETATION.

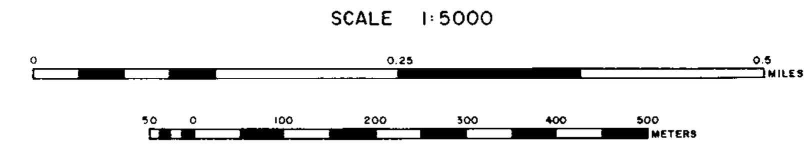
SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

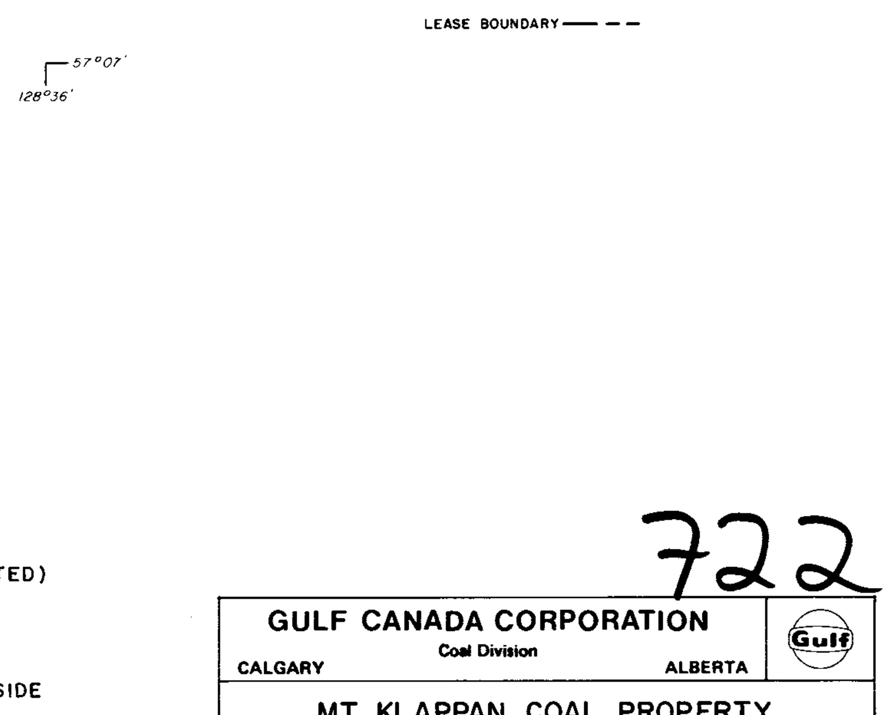


SCALE 1:5000



MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

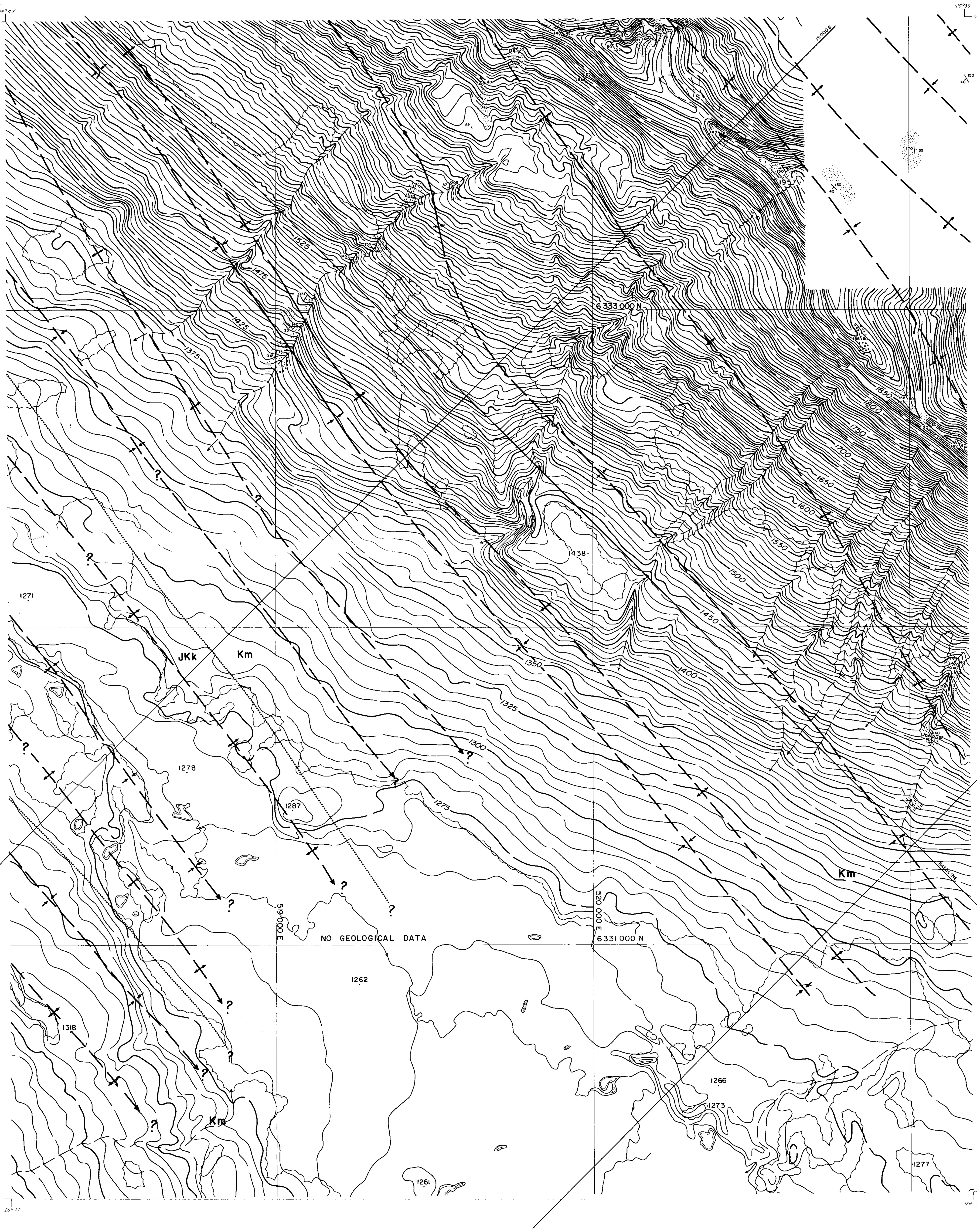
Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 — SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP F-4	
PREPARED BY: S.M. / L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-05



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

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COMPILED BY
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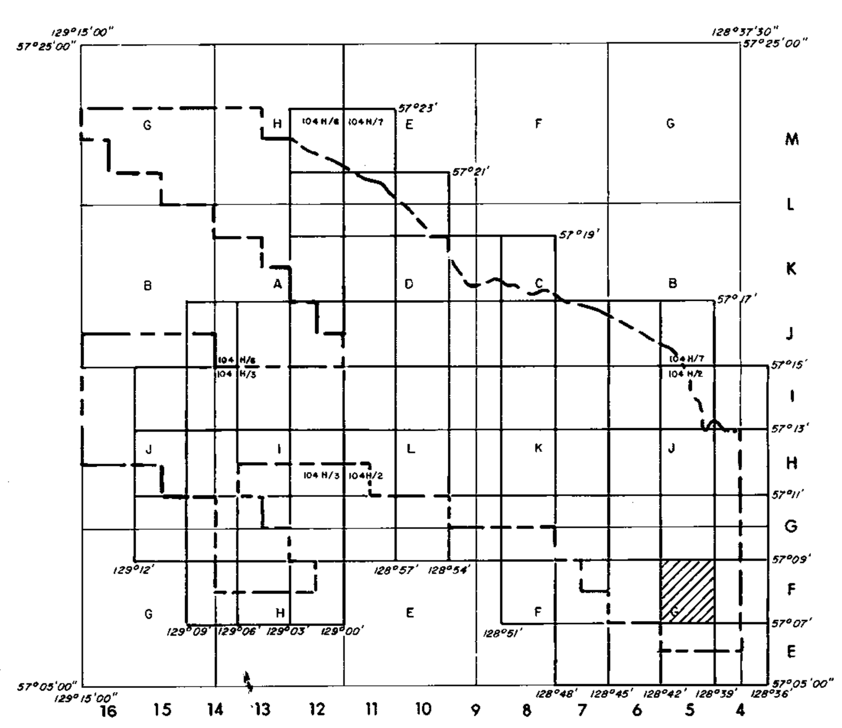
SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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LEGEND

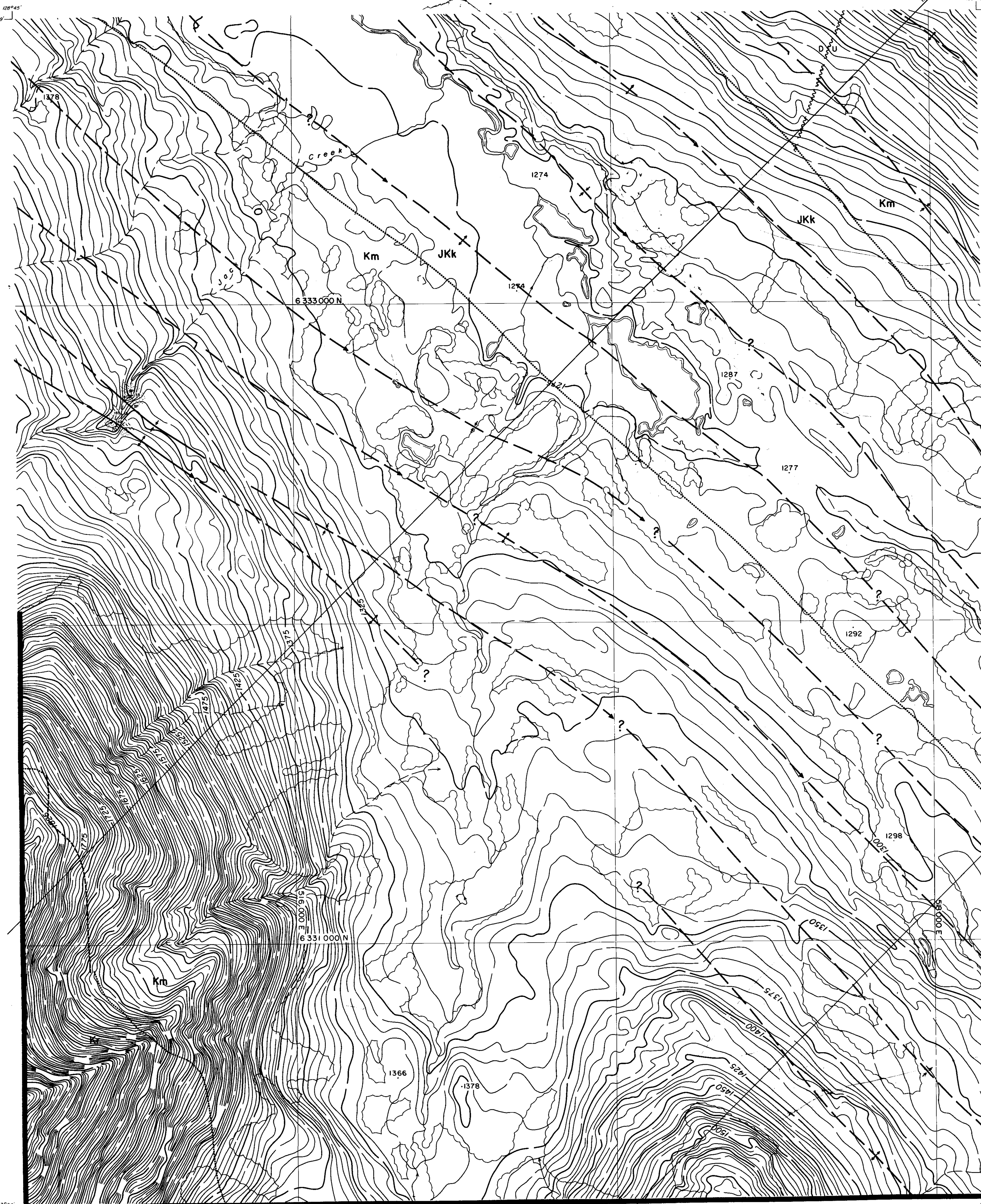
LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 ADIT TRENCH SP COAL SPOIL
DDH RDH WKD DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 MEASURED SECTION
SC-17 SURVEY CAIRN
3000 N CROSS SECTION LINE

722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA
Gulf

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SKEENA AREA
MAP F-5

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-06



LEGEND

- BUILDING
- ROAD, HARD SURFACE
  - LOOSE SURFACE
  - CART TRACK
  - TRAIL
- RAILROAD BED
- RIVER
- STREAM, DEFINITE
  - APPROXIMATE
  - SPLIT
- LAKE
- WATER LEVEL — EL 505'
- SWAMP
- BEAVER DAM — B.D. B.D.
- TREE LINE
- CUT LINE
- CONTOURS, INDEX — 1750
  - INTERMEDIATE
  - DEPRESSION
  - APPROXIMATE
- SPOT ELEVATION — ·7654
- FORM LINES
- CUT/FILL
- FIELD CONTROL POINT — CP 121
- COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

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RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
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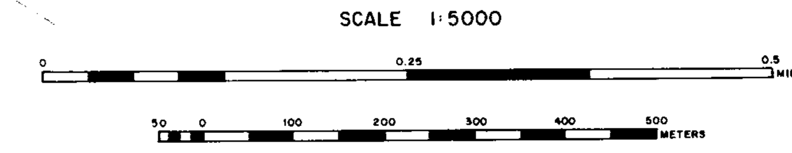
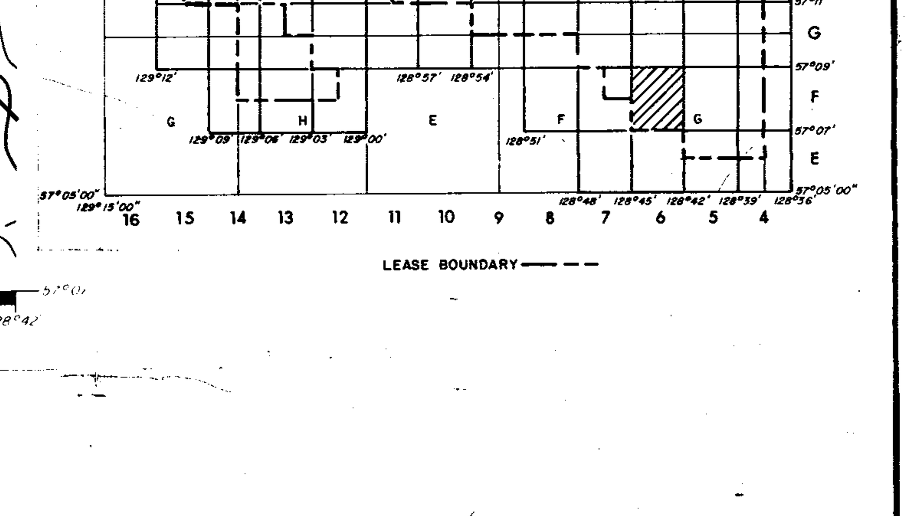
SCALE 1:5000



MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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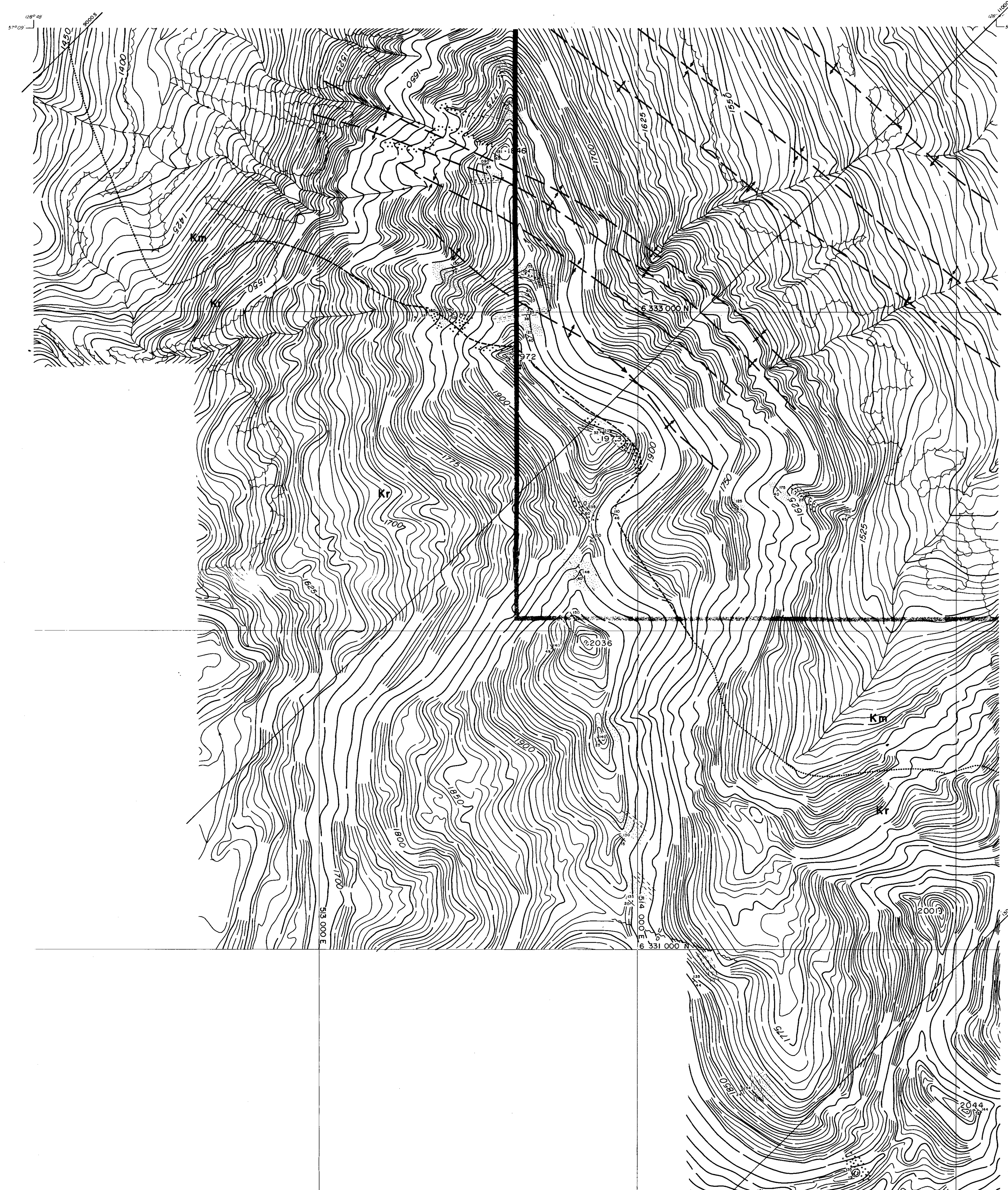
LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE — U D
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT TRENCH COAL SPOIL — TRC84001, SP
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION) — DDH RDH WKD
- MEASURED SECTION — OTC 84001
- SURVEY CAIRN — SC-17
- CROSS SECTION-LINE — 3000 N

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP F-6	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-07



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505'
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP (2)
COAL LICENCE

NOTES

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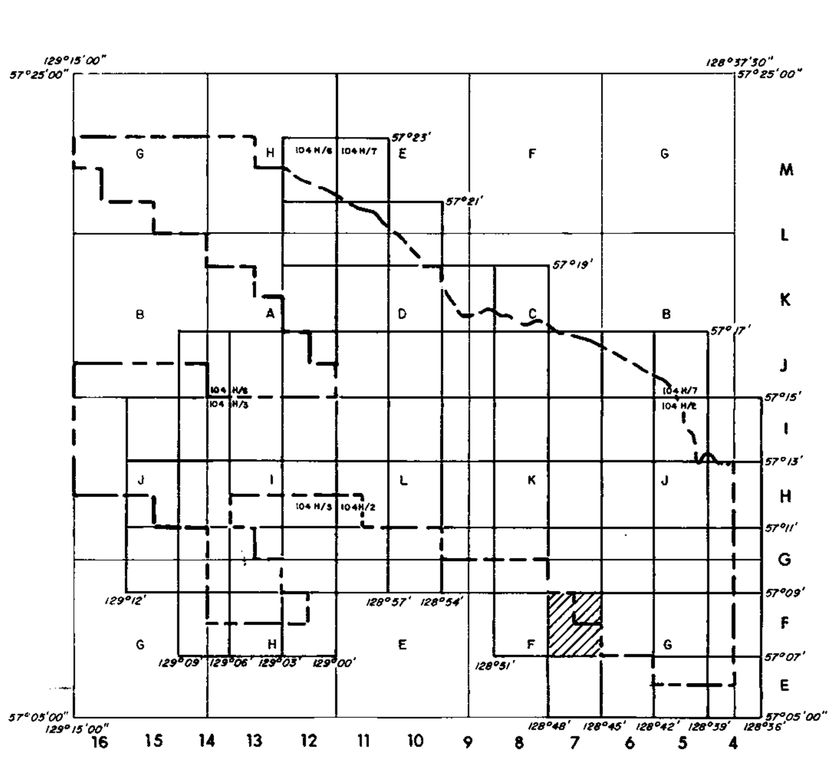
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 — 0 — 100 — 200 — 300 — 400 — 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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LEGEND

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ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
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OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE — U D
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT — TRENCH (TRC84001) — COAL SPOIL (SP)
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION) — DDH RDH WKD
MEASURED SECTION — OTC 84001
SURVEY CAIRN — SC-17
CROSS SECTION LINE — 3000 N

722

GULF CANADA CORPORATION Coal Division CALGARY, ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP F-7	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-08

LEGEND

- BUILDING
- ROAD, HARD SURFACE
- LOOSE SURFACE
- CART TRACK
- TRAIL
- RAILROAD BED
- RIVER
- STREAM, DEFINITE
- APPROXIMATE
- SPLIT
- LAKE
- WATER LEVEL — EL 505.1
- SWAMP
- BEAVER DAM
- TREE LINE
- CUT LINE
- CONTOURS, INDEX — 1750
- INTERMEDIATE
- DEPRESSION
- APPROXIMATE
- SPOT ELEVATION — ·7654
- FORM LINES
- CUT/FILL
- FIELD CONTROL POINT — CP 121
- COAL LICENCE

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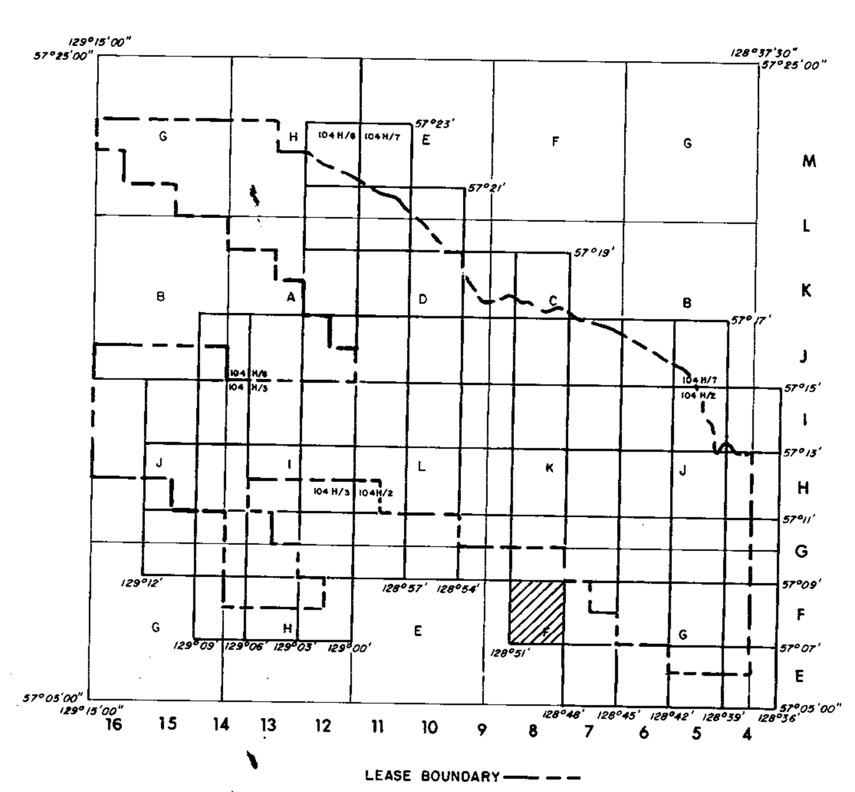
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY — — —

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LEGEND

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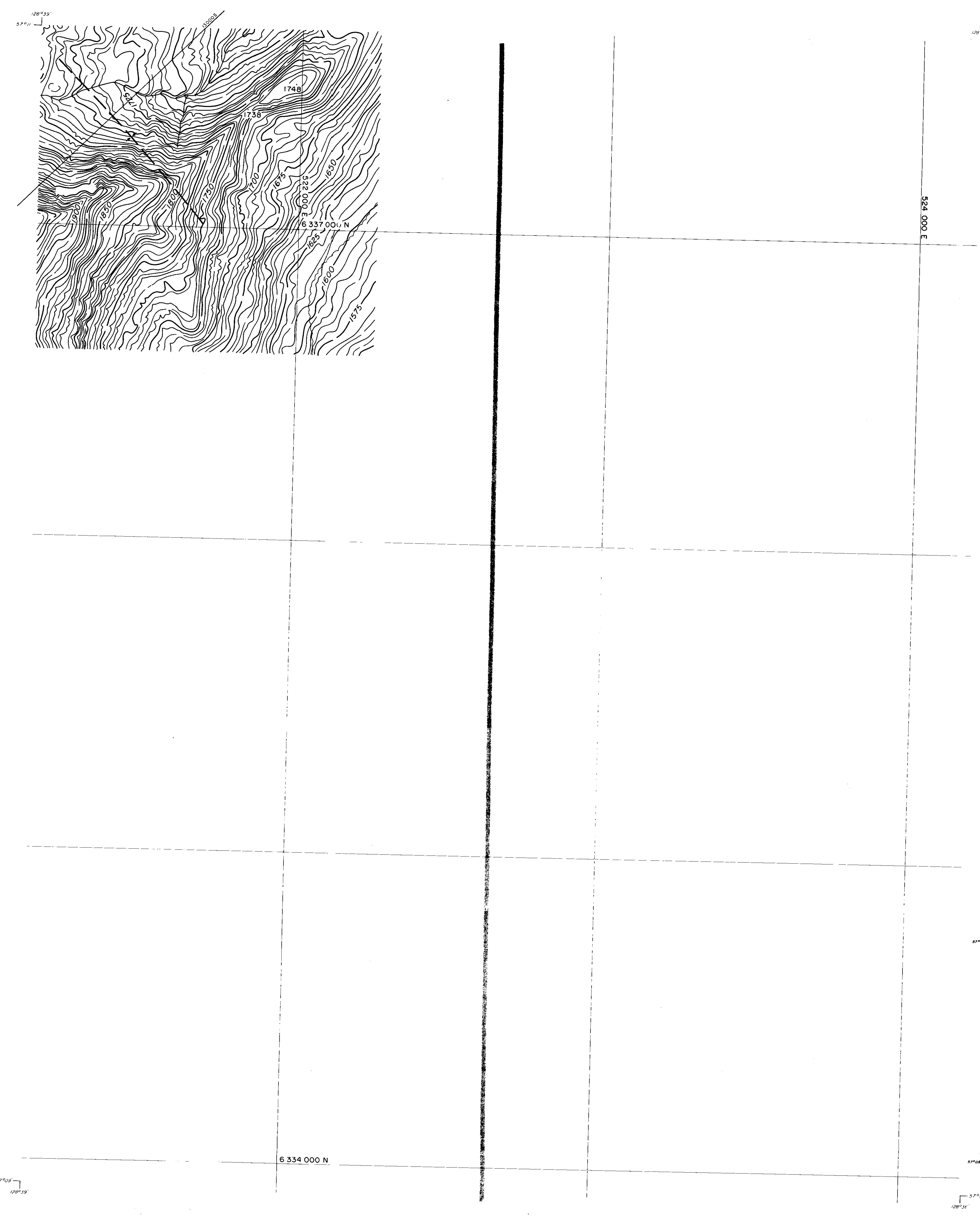
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT TRENCH COAL SPOIL
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- MEASURED SECTION
- SURVEY CAIRN
- CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP F-8	
PREPARED BY: S.M. / L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-09



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF ... NEGATIVES

CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)

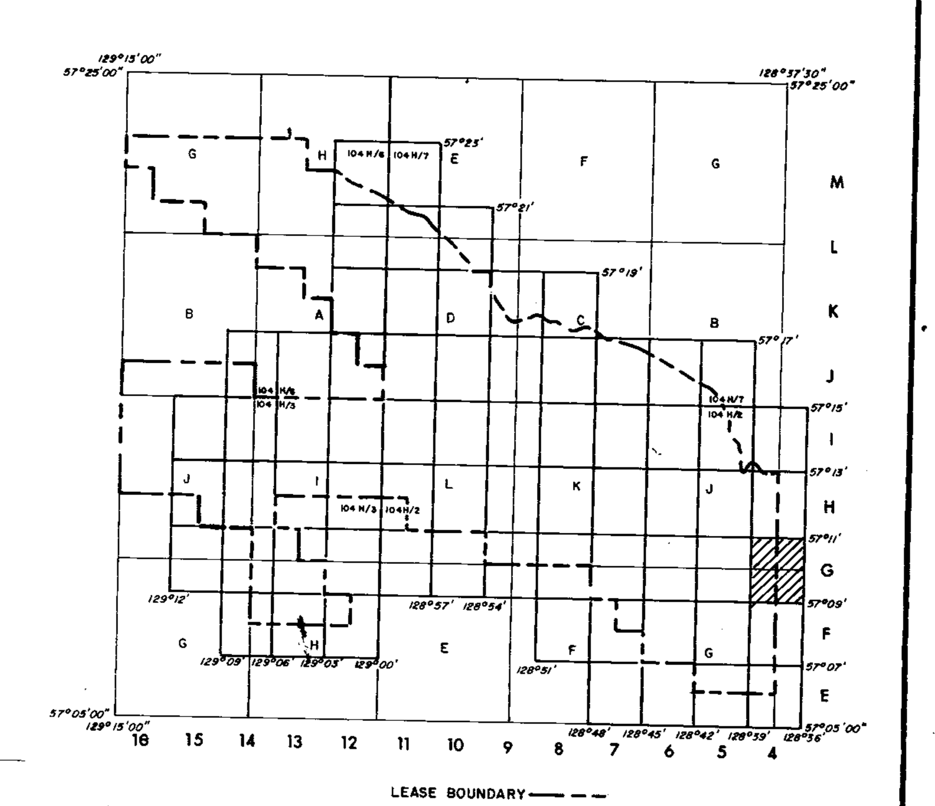
SCALE 1:5000

0 0.25 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

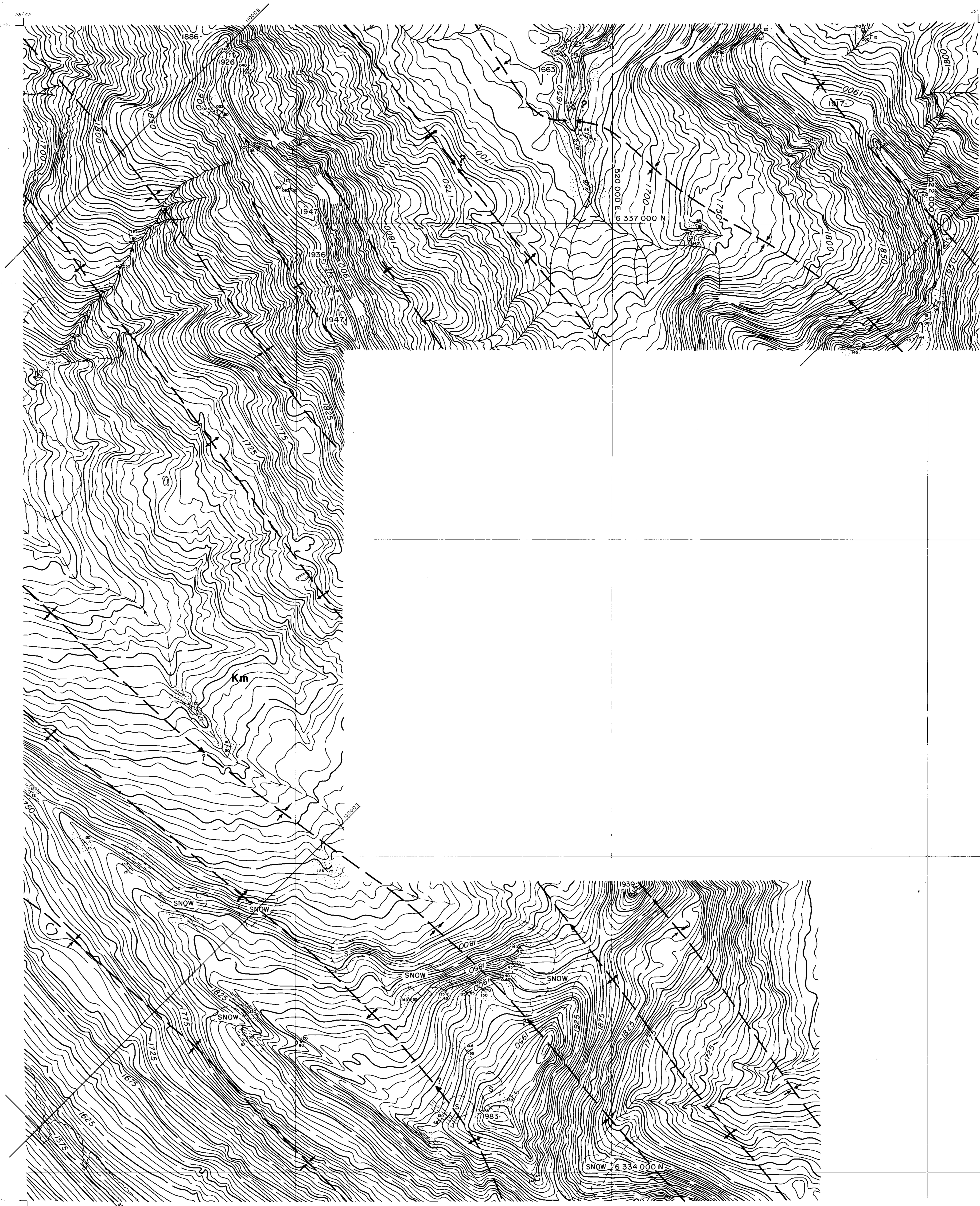
LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
MEASURED SECTION
SURVEY CAIRN
CROSS SECTION LINE

722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT. KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SKEENA AREA
MAP G-4

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-10



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505
SWAMP
BEAVER DAM — B.D. BD
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES.

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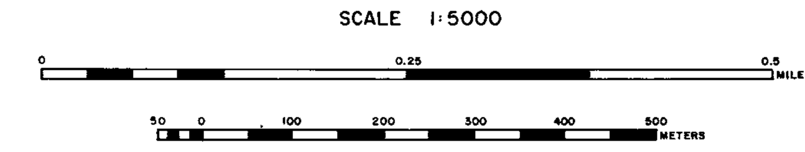
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

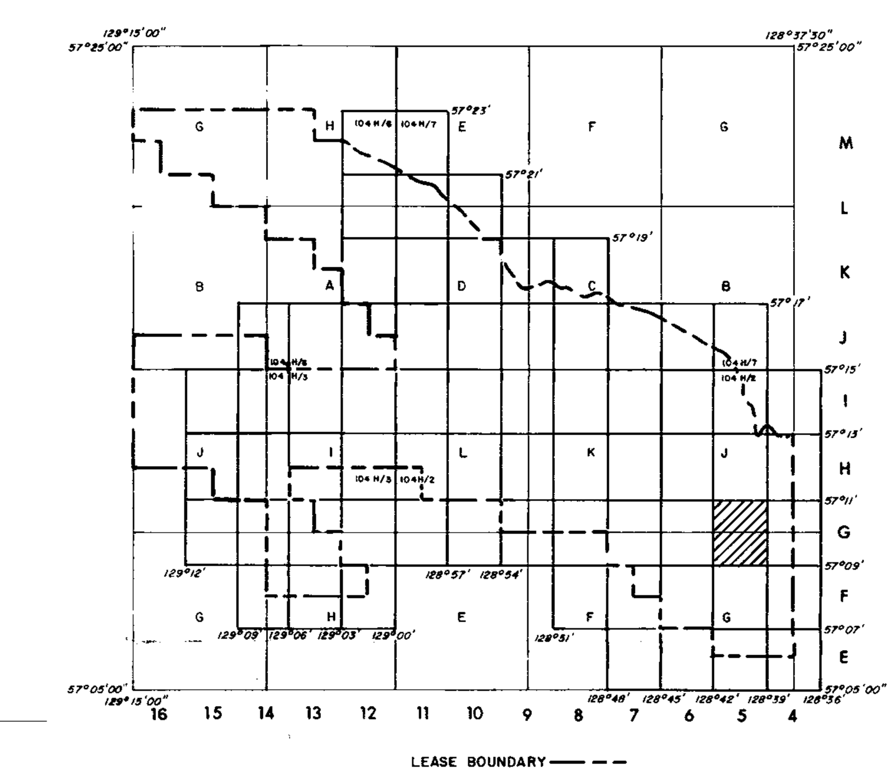
COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1 60 000 (APPROXIMATE)

SCALE 1:5000



MT. KLAPPAN AREA

INDEX MAP



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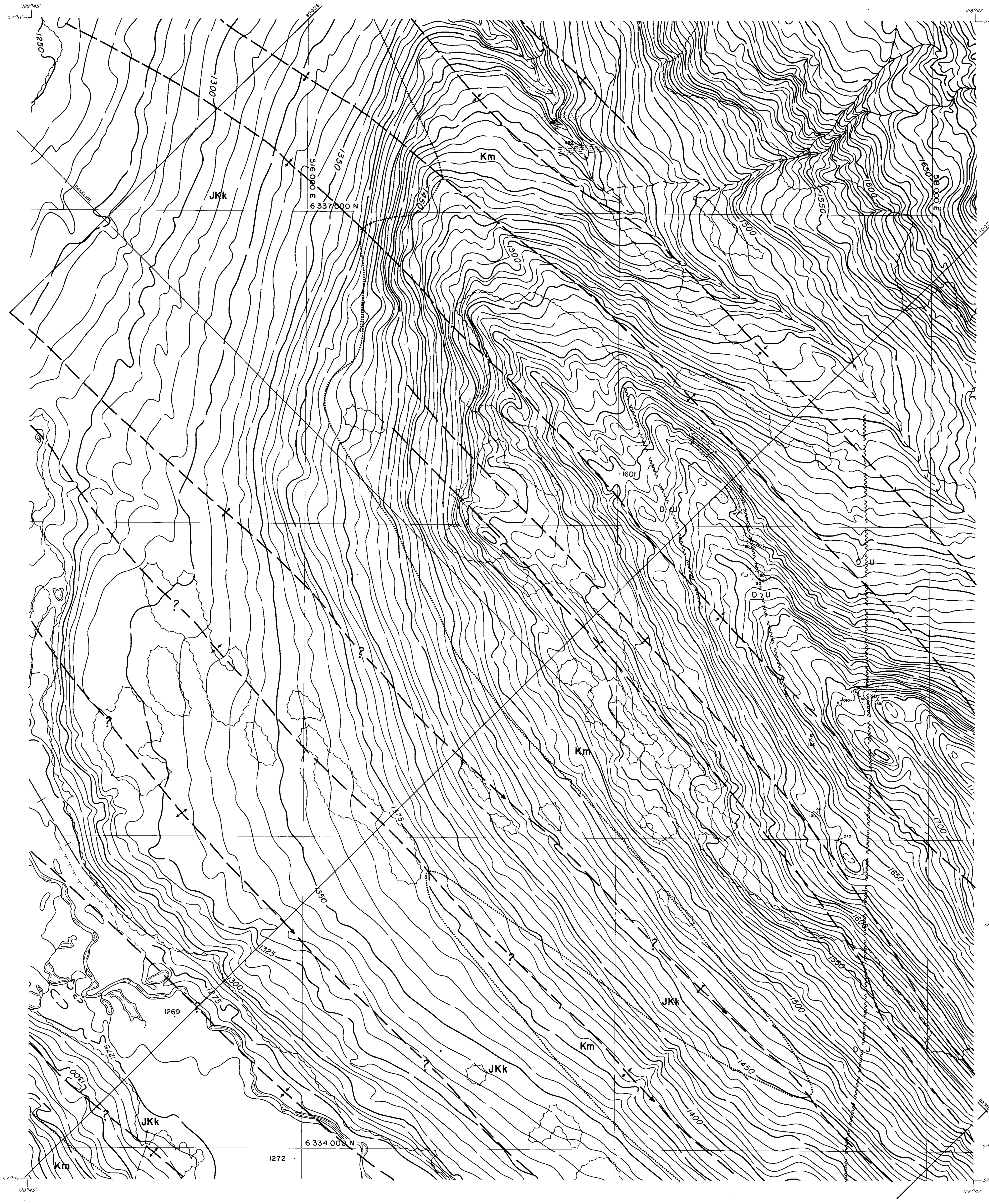
LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
U D — FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP G-5	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-11



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

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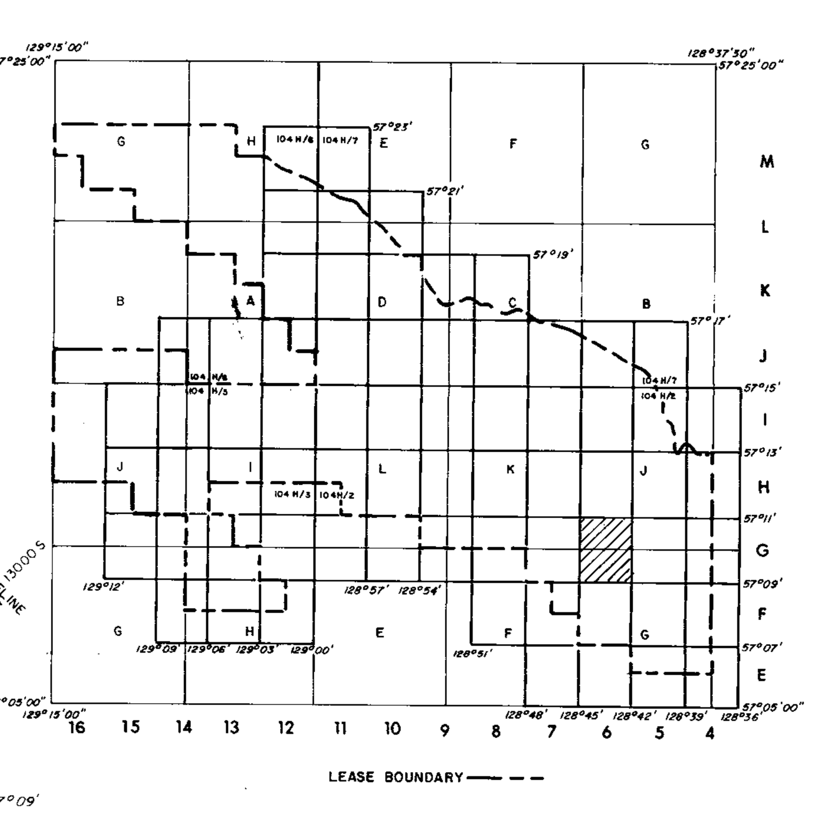
SCALE 1:5000

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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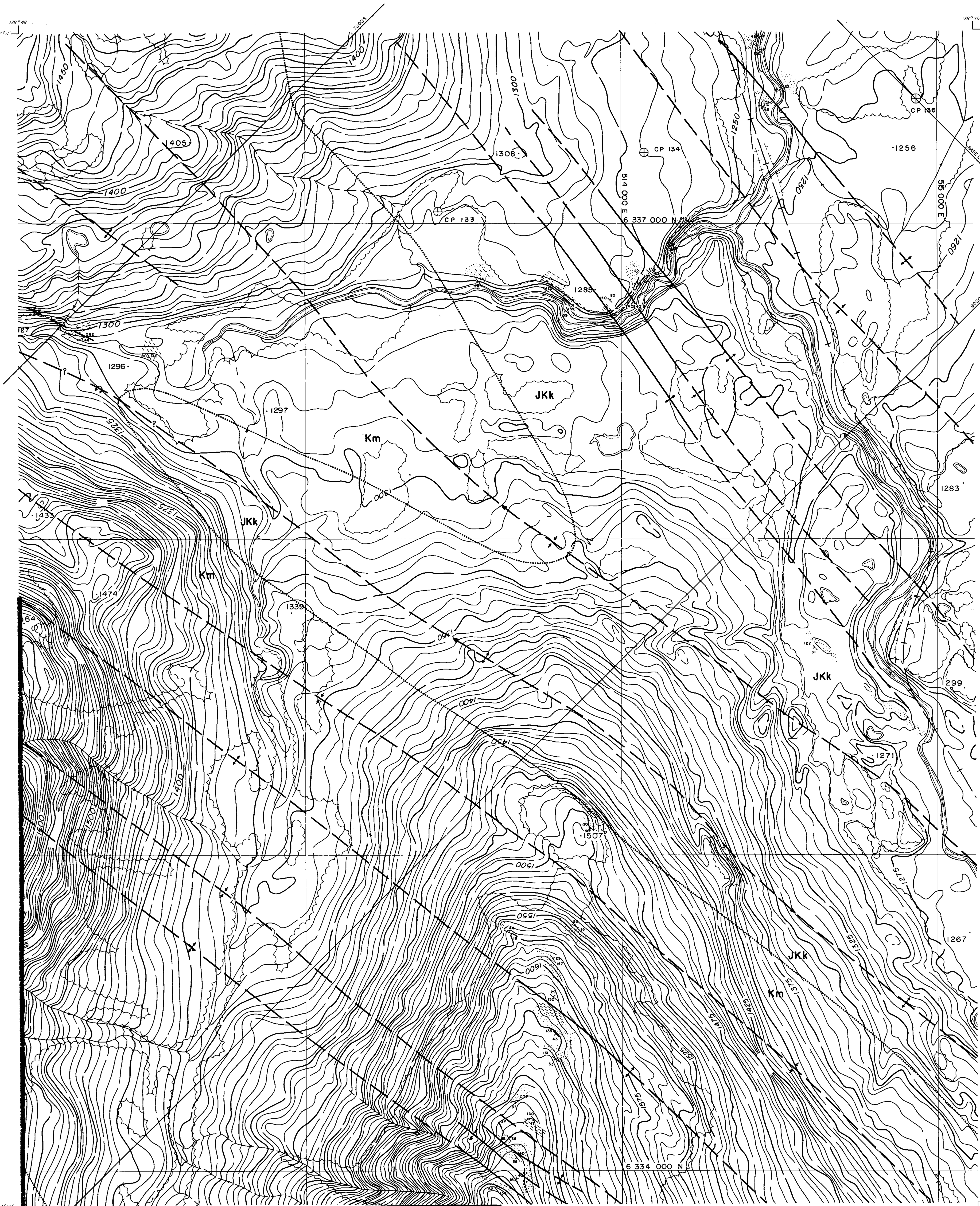
LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 — SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP G-6	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-12



LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL — EL 505
SWAMP
BEAVER DAM — B.D.
TREE LINE
CUT LINE
CONTOURS, INDEX — 1750
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION — ·7654
FORM LINES
CUT/FILL
FIELD CONTROL POINT — CP 121
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

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RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD, FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1 60 000 (APPROXIMATE).

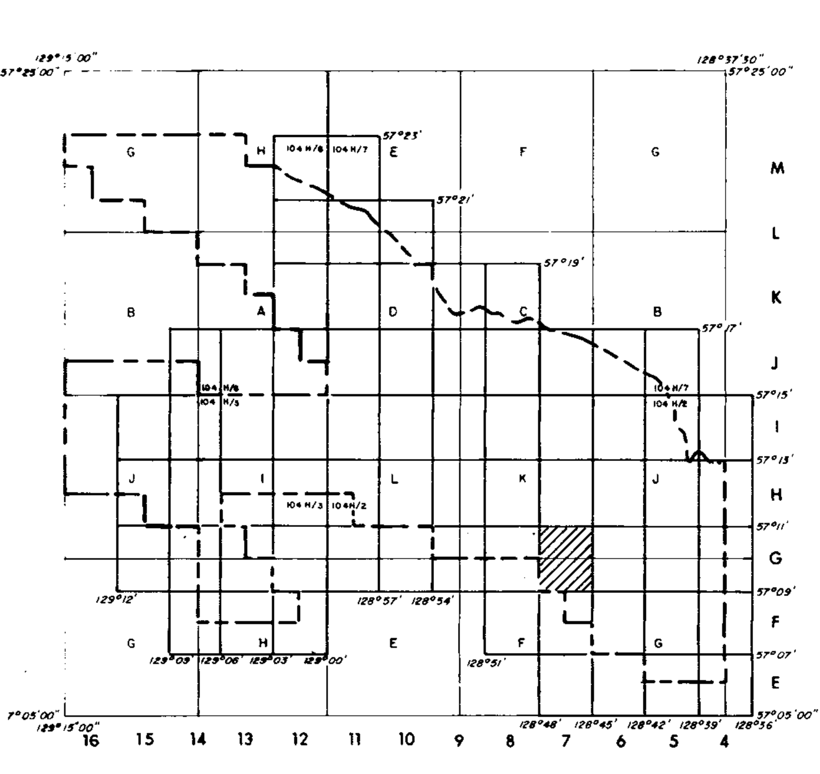
SCALE 1:5000

0 0.25 0.5 MILES

50 0 100 200 300 400 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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KLAPPAN SEQUENCE (main coal-bearing unit)

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LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
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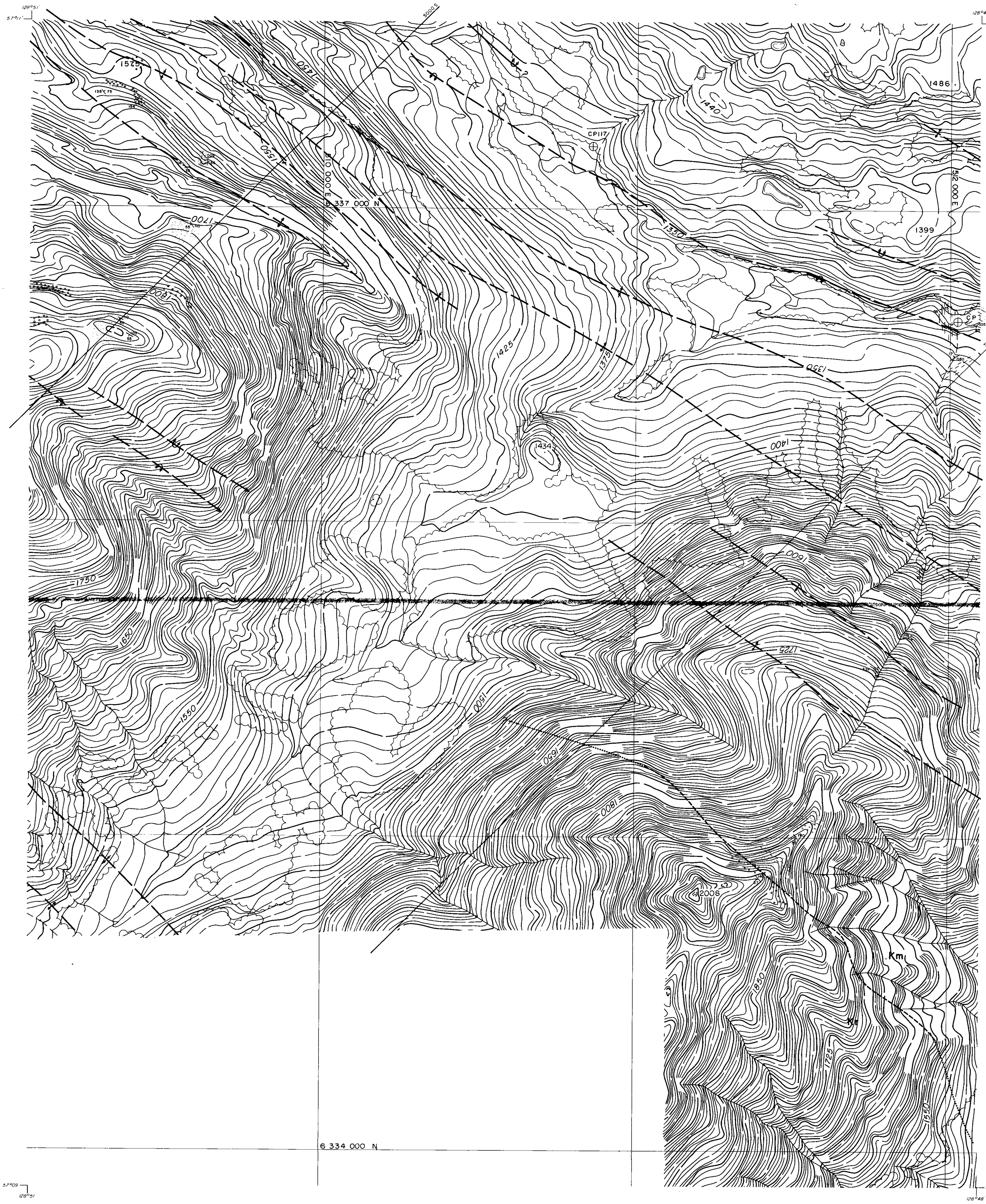
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
TRC84001 SP — ADIT TRENCH COAL SPOIL
DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
OTC 84001 — MEASURED SECTION
SC-17 — SURVEY CAIRN
3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP G-7	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-13



LEGEND

BUILDING

ROAD, HARD SURFACE

LOOSE SURFACE

CART TRACK

TRAIL

RAILROAD BED

RIVER

STREAM, DEFINITE

APPROXIMATE

SPLIT

LAKE

WATER LEVEL — EL 505±

SWAMP

BEAVER DAM — B.D. B.D.

TREE LINE

CUT LINE

CONTOURS, INDEX — 1750

INTERMEDIATE

DEPRESSION

APPROXIMATE

SPOT ELEVATION — ·7654

FORM LINES

CUT/FILL

FIELD CONTROL POINT — CP121

COAL LICENCE

NOTES

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COMPILED BY
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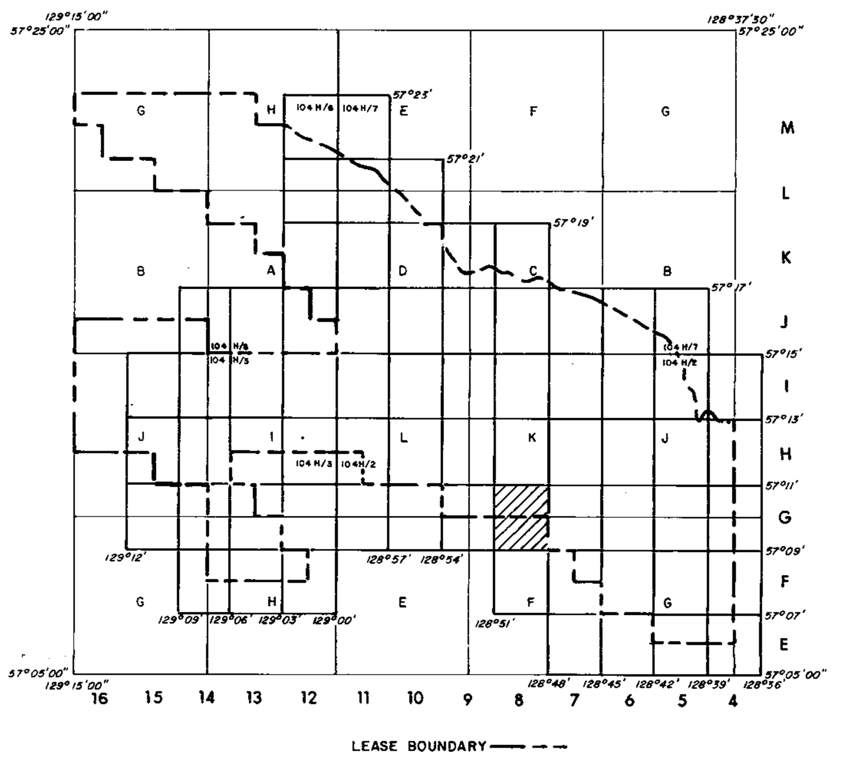
SCALE 1:5000

0 — 0.25 — 0.5 MILES

50 — 0 — 100 — 200 — 300 — 400 — 500 METERS

MT. KLAPPAN AREA

INDEX MAP



LEASE BOUNDARY

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LEGEND

LICENCE BOUNDARY

GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)

COAL SEAM (DEFINED, INFERRED)

ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION

SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION

OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)

OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)

MONOCLINE (DEFINED, APPROXIMATE)

BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)

FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)

JOINTS (INCLINED, VERTICAL, HORIZONTAL)

THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE

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FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT

TRC84001 — SP — ADIT TRENCH COAL SPOIL

DDH RDH WKD — DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)

OTC 84001 — MEASURED SECTION

SC-17 — SURVEY CAIRN

3000 N — CROSS SECTION LINE

722

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MT. KLAPPAN COAL PROPERTY 1986 GEOLOGY MAP SKEENA AREA MAP G-8	
PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK - 14

LEGEND

BUILDING
ROAD, HARD SURFACE
LOOSE SURFACE
CART TRACK
TRAIL
RAILROAD BED
RIVER
STREAM, DEFINITE
APPROXIMATE
SPLIT
LAKE
WATER LEVEL
SWAMP
BEAVER DAM
TREE LINE
CUT LINE
CONTOURS, INDEX
INTERMEDIATE
DEPRESSION
APPROXIMATE
SPOT ELEVATION
FORM LINES
CUT/FILL
FIELD CONTROL POINT
COAL LICENCE

NOTES

MAPPING PRODUCED FROM PHOTOGRAPHIC ENLARGEMENTS OF 1:10,000 NEGATIVES

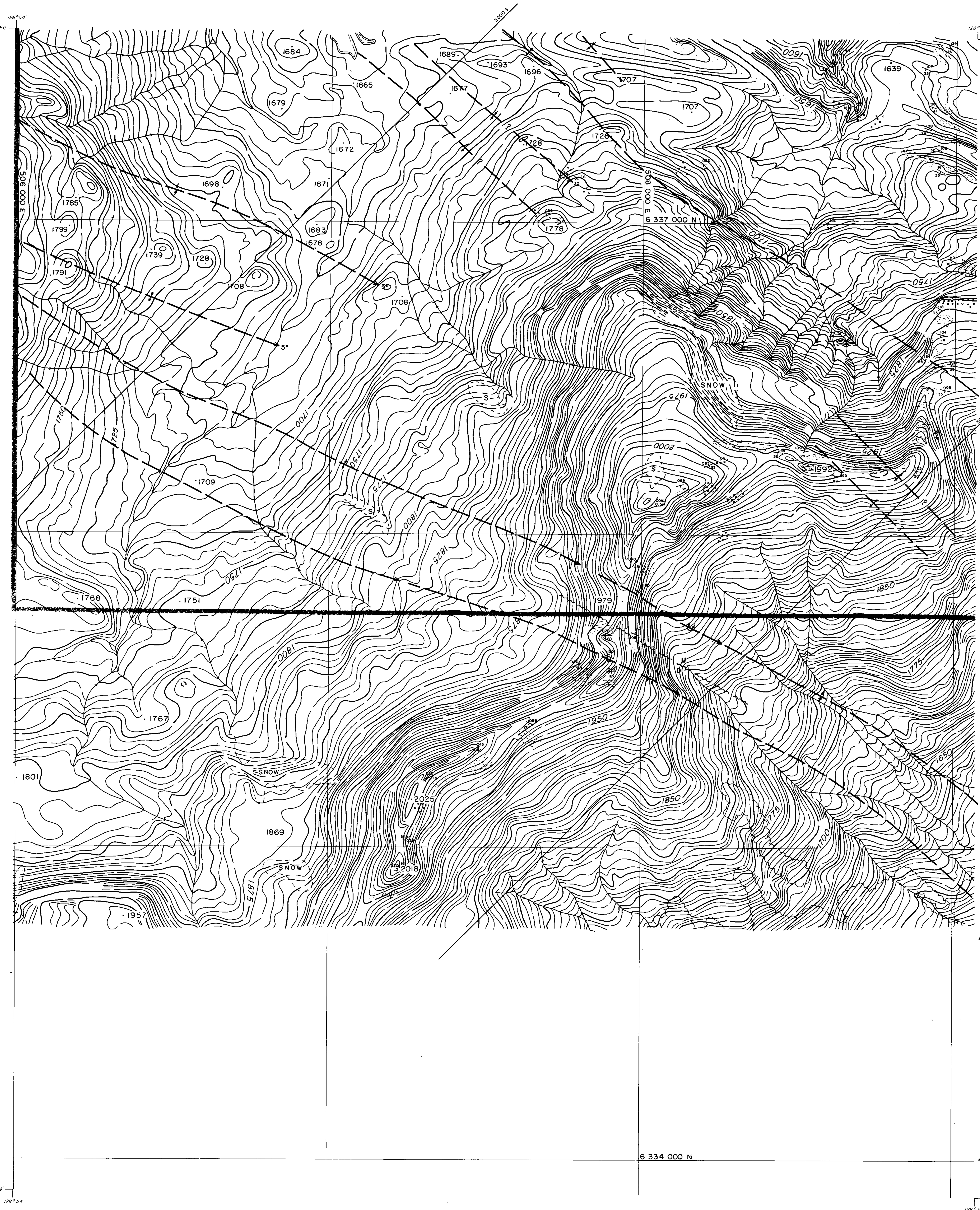
CONTOUR INTERVAL = 10 M, WITH FORM LINES INTERVAL = 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - ±5.0 METERS FOR GROUND NOT OBSCURRED BY TREES OR VEGETATION.

SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

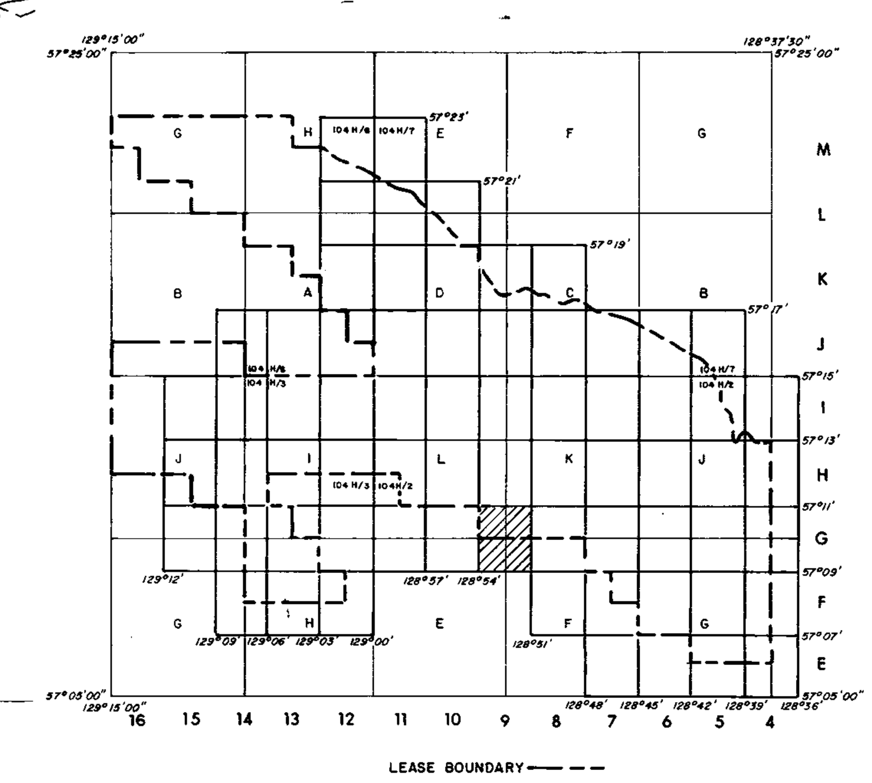
RAILROAD BED LOCATION BASED ON SEPT./82 AERIAL PHOTOGRAPHY

COMPILED BY
WESTERN PHOTOGRAMMETRY, A DIVISION OF UNDERWOOD McLELLAN LTD, FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60 000 (APPROXIMATE)



MT. KLAPPAN AREA

INDEX MAP



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LEGEND

LICENCE BOUNDARY
GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
COAL SEAM (DEFINED, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
MONOCLINE (DEFINED, APPROXIMATE)
BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
JOINTS (INCLINED, VERTICAL, HORIZONTAL)
THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
ADIT TRENCH COAL SPOIL (TRC84001, SP)
DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION) (DDH, RDH, WKD)
MEASURED SECTION (OTC 84001)
SURVEY CAIRN (SC-17)
CROSS SECTION LINE (3000 N)

722

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MT KLAPPAN COAL PROPERTY
1986
GEOLOGY MAP
SKEENA AREA
MAP G-9

PREPARED BY: S.M./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR.1987	DRAWING No. KPN86SK-15


E5
E4
E4
F4
MAP BOUNDARY
BASELINE
SKEENA RIVER
AREA OF NO GEOLOGICAL DATA
BEDFORM
METRES ABOVE SEA LEVEL
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
RHONDDA SEQUENCE
Kr
Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.
MALLOCH SEQUENCE
Km
Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact Twenty-three species of plant fossils occur within the sequence
KLAPPAN SEQUENCE (main coal-bearing unit)
JKk
Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams Conglomerate beds grade laterally into sandstone Sandstones often display tabular or trough cross bedding Rhythmites occur in the middle of the sequence Twenty-three species of bivalves and up to twenty-five species of plants occur throughout Petrified wood and rare coquina may be present towards the upper contact
SPATSIZI SEQUENCE
Js
Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present Belemnites are rare Plant debris may occur near the upper gradational contact
LICENCE BOUNDARY
COAL SEAM TRACE (DEFINED, INFERRED)
GEOLOGICAL CONTACT (APPROX, INFERRED)
FAULT TRACE (DEFINED, APPROX.)
BEDFORM
BEDDING ATTITUDE
DDH 85001
DIAMOND DRILL HOLE WITH ATTITUDE CONTROL
722
METRES
0 50 100 150 200 250
GULF CANADA CORPORATION
Coal Division
CALGARY
ALBERTA
MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SKEENA AREA
19 000 S (EAST & WEST)
PREPARED BY: A.P./L.S.
SCALE 1:5000
APPROVED BY: E.S.
DATE: MAR. 1987
DRAWING No. KPN86SK-17

LEGEND

- LICENCE BOUNDARY
- GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
- COAL SEAM (DEFINED, INFERRED)
- ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
- OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
- OVERTURNED SYNCLINE (DEFINED, APPROXIMATE)
- MONOCLINE (DEFINED, APPROXIMATE)
- BEDDING (HORIZONTAL, INCLINED, OVERTURNED, VERTICAL, UPRIGHT, ESTIMATED)
- FOLIATIONS (INCLINED, VERTICAL, HORIZONTAL)
- JOINTS (INCLINED, VERTICAL, HORIZONTAL)
- THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UPTHRUST SIDE
- FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
- FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
- ADIT TRENCH COAL SPOIL
- DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
- MEASURED SECTION
- SURVEY CAIRN
- CROSS SECTION LINE

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

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LEGEND

ROADS AND RELATED FEATURES
- HARD SURFACE, ALL WEATHER
- LOOSE SURFACE
- CART TRACK, WINTER ROAD, UNDER CONSTRUCTION
- TRAIL, CUTLINE, PORTAGE
- BUILT UP AREA
- RAILWAY, SIDING, STATION, STOP
- BRIDGE
- SEAPLANE BASE, ANCHORAGE

LANDMARK FEATURES
- HOUSE, BARN
- CHURCH, SCHOOL
- POST OFFICE
- HISTORICAL SITE
- TOWERS FIRE, RADIO
- WELL OIL GAS
- TANK OIL GASOLINE WATER
- TELEPHONE LINE
- POWER TRANSMISSION LINE
- MINE
- CUTTING, EMBANKMENT
- GRAVEL PIT — GP

BOUNDARIES AND CONTROL
- INTERNATIONAL, PROVINCIAL, BOUNDARY MONUMENT
- COUNTY DISTRICT
- TOWNSHIP PARISH — SURVEYED — UNSURVEYED
- TOWNSHIP DLS — SURVEYED — UNSURVEYED — SECTION CORNERS
- MUNICIPALITY
- INDIAN RESERVE, PARK ETC
- HORIZONTAL CONTROL POINT
- BENCH MARK — BM 965
- SPOT ELEVATION, ELEVATION APPROXIMATE — ·390 ·721

DRAINAGE AND RELATED FEATURES
- STREAM, SHORELINE INDEFINITE
- DIRECTION OF FLOW
- LAKE, INTERMITTENT
- INUNDATED, FLOODED LAND
- MARSH OR SWAMP (WOODED)
- DRY RIVER BED WITH CHANNELS
- SAND, ABOVE, IN WATER
- STRING BOG — SB
- TUNDRA PONDS POLYGONS — TP PG
- RAPIDS
- FORESHORE FLATS — FF
- ROCK
- DAM
- WHARF
- DITCH

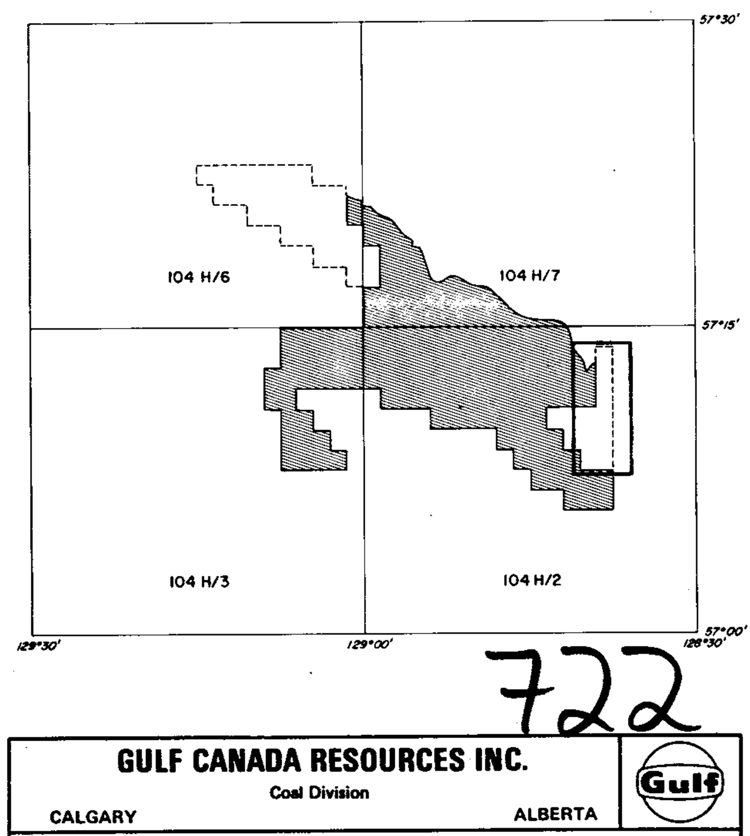
RELIEF FEATURES
- CONTOURS — 500 350
- APPROXIMATE CONTOUR — 125 100
- DEPRESSION — 25
- ESKER
- PINGO — 125
- SAND, SAND DUNES — SAND
- PALSA BOG — PB
- WOODED AREA — W C

- LICENCE BOUNDARY
- LICENCE UNDER APPLICATION

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS

SCALE : 1:10,000



722

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

MOUNT KLAPPAN COAL PROPERTY
MAP SHEET 104H/2 G,J
ELLIS RIDGE
GEOLOGY

PREPARED BY: L.S./S.M.	DRAWING No.
APPROVED BY: E.S. DATE: MAR. 1987	KPN86SK-16

RHONODA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

SKEENA AREA

17 000 S (EAST & WEST)

PREPARED BY: A.P./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-18

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

SKEENA AREA

15000 S (EAST & WEST)

PREPARED BY: A.P./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-19

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES
0 50 100 150 200 250

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SKEENA AREA
13000 S (EAST & WEST)

PREPARED BY: A.P./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-20


F7
G6
G6
G5
G5
H5
KI
Km
JKk
BEDFORM
CREEK
RIVER
SYNCLINE
DEPTH OF FAULT ?
METRES ABOVE SEA LEVEL
RHONDDA SEQUENCE
Kr
Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.
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KLAPPAN SEQUENCE (main coal-bearing unit)
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Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.
SPATSIZI SEQUENCE
Js
Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.
LICENCE BOUNDARY
COAL SEAM TRACE (DEFINED, INFERRED)
GEOLOGICAL CONTACT (APPROX, INFERRED)
FAULT TRACE (DEFINED, APPROX.)
BEDFORM
BEDDING ATTITUDE
DDH 85001
DIAMOND DRILL HOLE WITH ATTITUDE CONTROL
722
METRES
0 50 100 150 200 250
GULF CANADA CORPORATION
Coal Division
CALGARY
ALBERTA
Gulf
MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SKEENA AREA
11 000 S (EAST & WEST)
PREPARED BY: A.P./L.S.
SCALE 1:5000
APPROVED BY: E.S.
DATE: MAR. 1987
DRAWING No. KPN86SK-21

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js — Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY

1986

GEOLOGICAL CROSS SECTION

SKEENA AREA

9 000 S (WEST)

PREPARED BY: A.P./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK - 22

RHONDDA SEQUENCE

Kr	Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION

Coal Division

CALGARY ALBERTA

Gulf

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SKEENA AREA
7000 S (WEST)

PREPARED BY: A.P./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE MAR.1987	DRAWING No. KPN86SK-23

RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact. Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones. Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous. Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact. Twenty-three species of plant fossils occur within the sequence.

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk — Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams. Conglomerate beds grade laterally into sandstone. Sandstones often display tabular or trough cross bedding. Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout. Petrified wood and rare coquina may be present towards the upper contact.

SPATSIZI SEQUENCE

Js — Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates. Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence. Nineteen species of bivalves are present. Belemnites are rare. Plant debris may occur near the upper gradational contact.

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA
Gulf

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SKEENA AREA
5000 S (WEST)

PREPARED BY: A.R./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE MAR. 1987	DRAWING No. KPN86SK - 24

RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact Twenty-three species of plant fossils occur within the sequence

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams Conglomerate beds grade laterally into sandstone Sandstones often display tabular or trough cross bedding Rhythmites occur in the middle of the sequence Twenty-three species of bivalves and up to twenty-five species of plants occur throughout Petrified wood and rare coquina may be present towards the upper contact

SPATSIZI SEQUENCE

Js Predominantly a marine sequence of interbedded mudstones, siltstones, sandstones and conglomerates Carbonaceous mudstones, coarsening upward sequences and chert pebble conglomerates are more abundant in the upper part of the sequence Nineteen species of bivalves are present Belemnites are rare Plant debris may occur near the upper gradational contact

LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

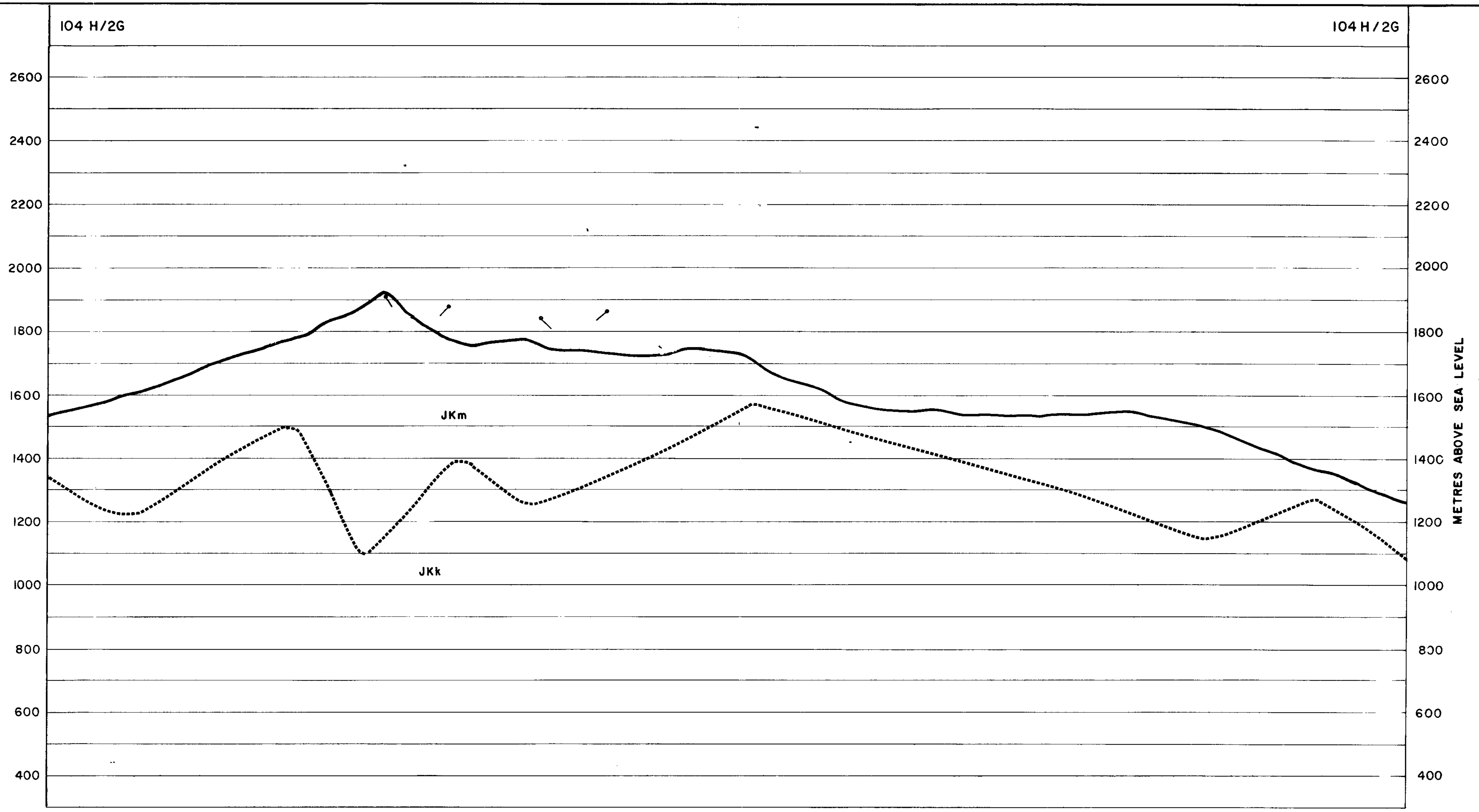
DDH 85001 DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 50 100 150 200 250

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MOUNT KLAPPAN COAL PROPERTY 1986 GEOLOGICAL CROSS SECTION SKEENA AREA 3000 S (WEST)	
PREPARED BY: A.P./L.S.	SCALE 1:5000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK - 25



RHONDDA SEQUENCE

Kr — Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km — Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact Twenty-three species of plant fossils occur within the sequence

KLAPPAN SEQUENCE (main coal-bearing unit)

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SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX)

BEDFORM

BEDDING ATTITUDE

DDH 85001 — DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

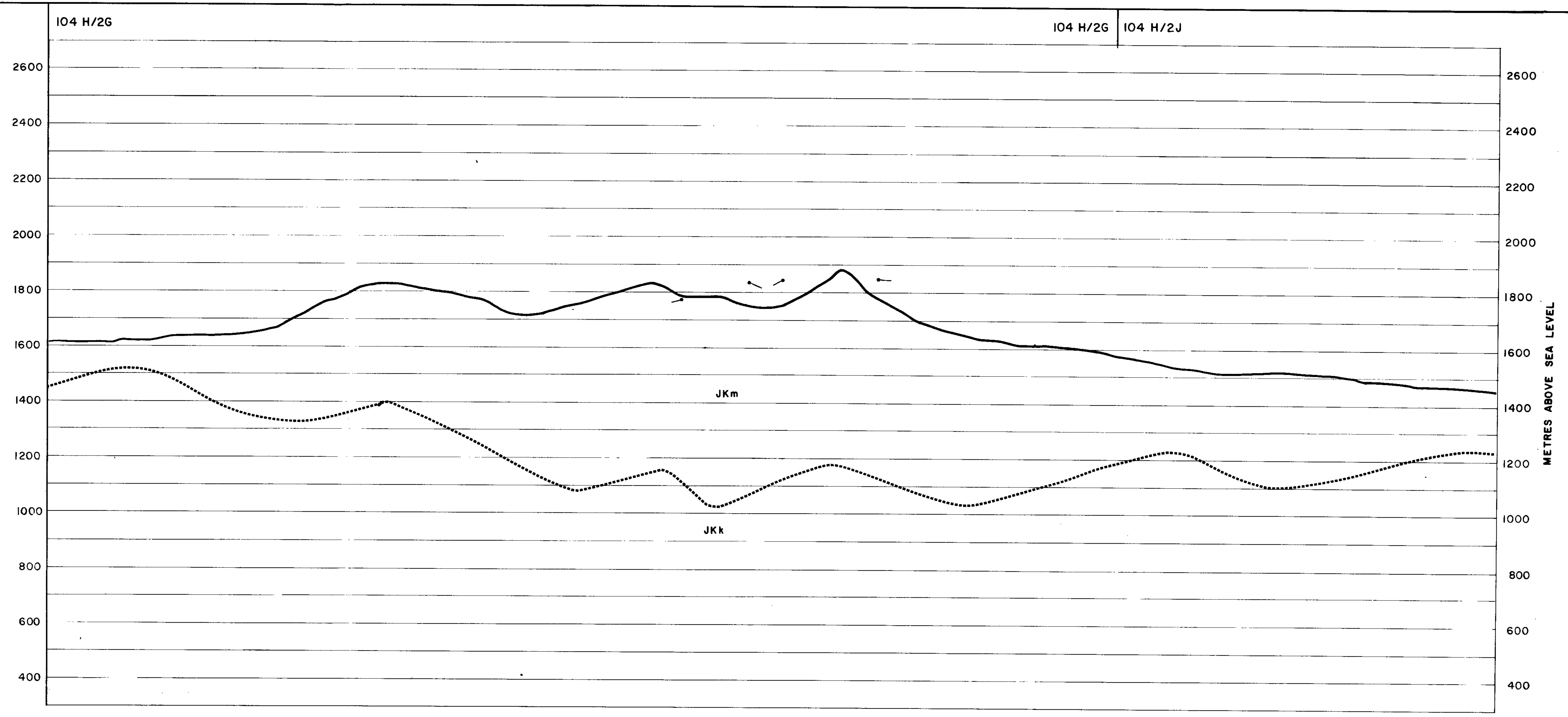
METRES

0 100 200 300 400 500

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA
Gulf

MOUNT KLAPPAN COAL PROPERTY
1986
GEOLOGICAL CROSS SECTION
SKEENA AREA
15 000 S (EAST)

PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE: MAR. 1987	DRAWING No. KPN86SK-26



RHONDDA SEQUENCE

Kr Sequence of thick chert pebble conglomerates and minor gritty sandstones interbedded with an increasing number of siltstones and mudstones towards the basal contact Large scale trough and tabular cross beds are common. Six species of plant fossils are found at the base of the sequence.

MALLOCH SEQUENCE

Km Thick interbeds of mudstones, argillaceous siltstones, fine grained sandstones and thin interbeds of orange weathering nodular siltstones Many conglomerate beds display large scale cross bedding and tend to be laterally discontinuous Thick clean sandstone beds and thin coal seams increase in abundance towards the basal gradational contact Twenty-three species of plant fossils occur within the sequence

KLAPPAN SEQUENCE (main coal-bearing unit)

JKk Fine to coarse grained sandstones interbedded with mudstones, siltstones, occasional thin bands of orange weathering calcareous siltstones, conglomerates and abundant coal seams Conglomerate beds grade laterally into sandstone Sandstones often display tabular or trough cross bedding Rhythmites occur in the middle of the sequence. Twenty-three species of bivalves and up to twenty-five species of plants occur throughout Petrified wood and rare coquina may be present towards the upper contact

SPATSIZI SEQUENCE

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LICENCE BOUNDARY

COAL SEAM TRACE (DEFINED, INFERRED)

GEOLOGICAL CONTACT (APPROX, INFERRED)

FAULT TRACE (DEFINED, APPROX.)

BEDFORM

BEDDING ATTITUDE

DDH 85001 DIAMOND DRILL HOLE WITH ATTITUDE CONTROL

722

METRES

0 100 200 300 400 500

GULF CANADA CORPORATION Coal Division CALGARY ALBERTA	Gulf
MOUNT KLAPPAN COAL PROPERTY 1986 GEOLOGICAL CROSS SECTION SKEENA AREA 13 000 S (EAST)	
PREPARED BY: E.S.	SCALE 1:10 000
APPROVED BY: E.S. DATE MAR. 1987	DRAWING No. KPN86SK-27