

LEGEND

BUILDING	---
ROAD, HARD SURFACE	---
ROAD, LOOSE SURFACE	---
CART TRACK	---
TRAIL	---
RAILROAD BED	---
RIVER	---
STREAM, DEFINITE	---
STREAM, APPROXIMATE	---
SPLIT	---
LAKE	---
WATER LEVEL	---
SWAMP	---
BEAVER DAM	---
TREE LINE	---
CUT LINE	---
CONTOURS, INDEX	---
CONTOURS, 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

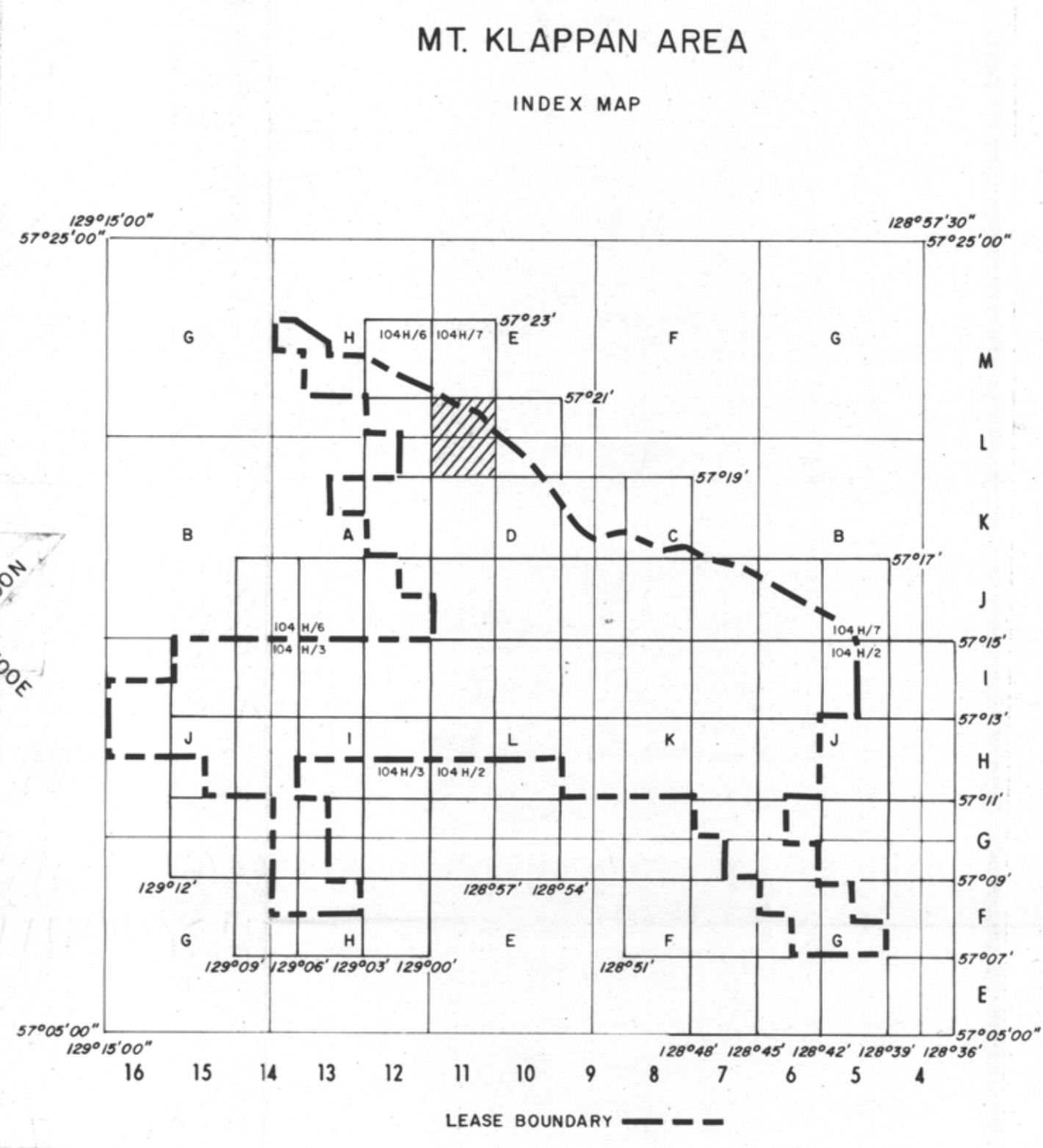
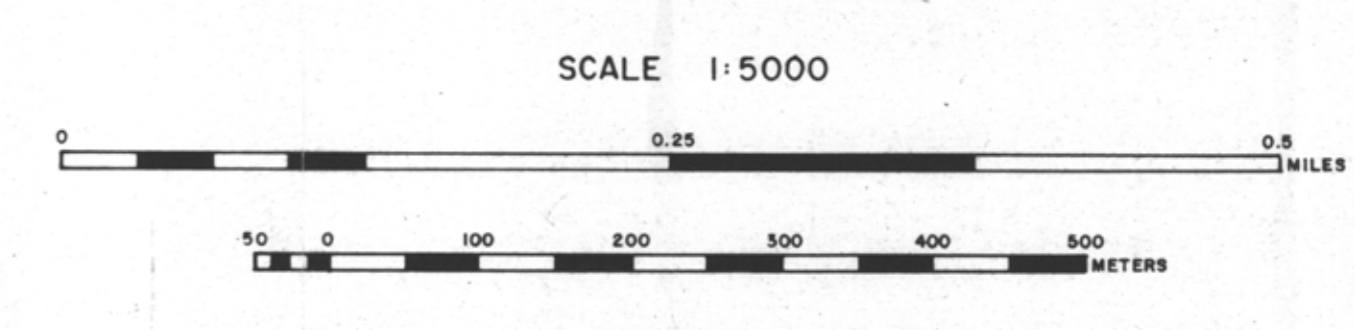
CONTOUR INTERVAL - 10 M., WITH FORM LINES INTERVAL - 5 M.

ACCURACY OF 5M FORM LINES IS EQUAL TO THE ACCURACY OF THE 10M CONTOURS - 15.0 METERS FOR GROUND NOT OBSERVED 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 MCELLAN LTD., FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67 AT A SCALE OF 1:60,000 (APPROXIMATE).



- 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 UP THRUST SIDE
↔	FAULT (DEFINED, APPROXIMATE) UP THROWN, DOWN THROWN 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

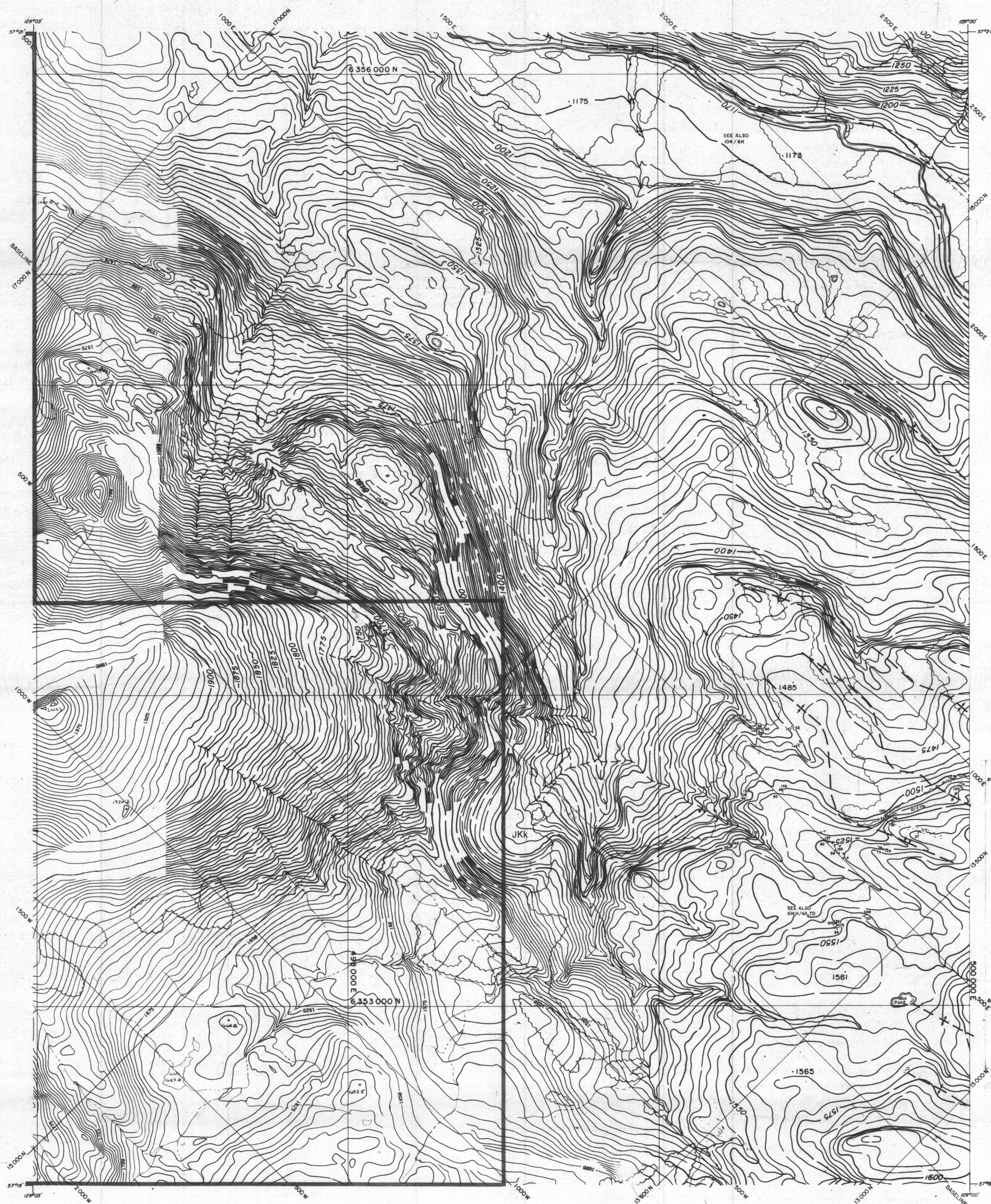
748

GULF CANADA RESOURCES LTD.
Coal Division

MT. KLAPPAN ANTHRACITE PROPERTY
1988

GEOLOGY MAP
SUMMIT AREA
MAP L-II

PREPARED BY: G.P./L.S. SCALE 1:5000
APPROVED BY: E.S. DATE: SEPT. 1988 DRAWING No. KPNSA-10



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

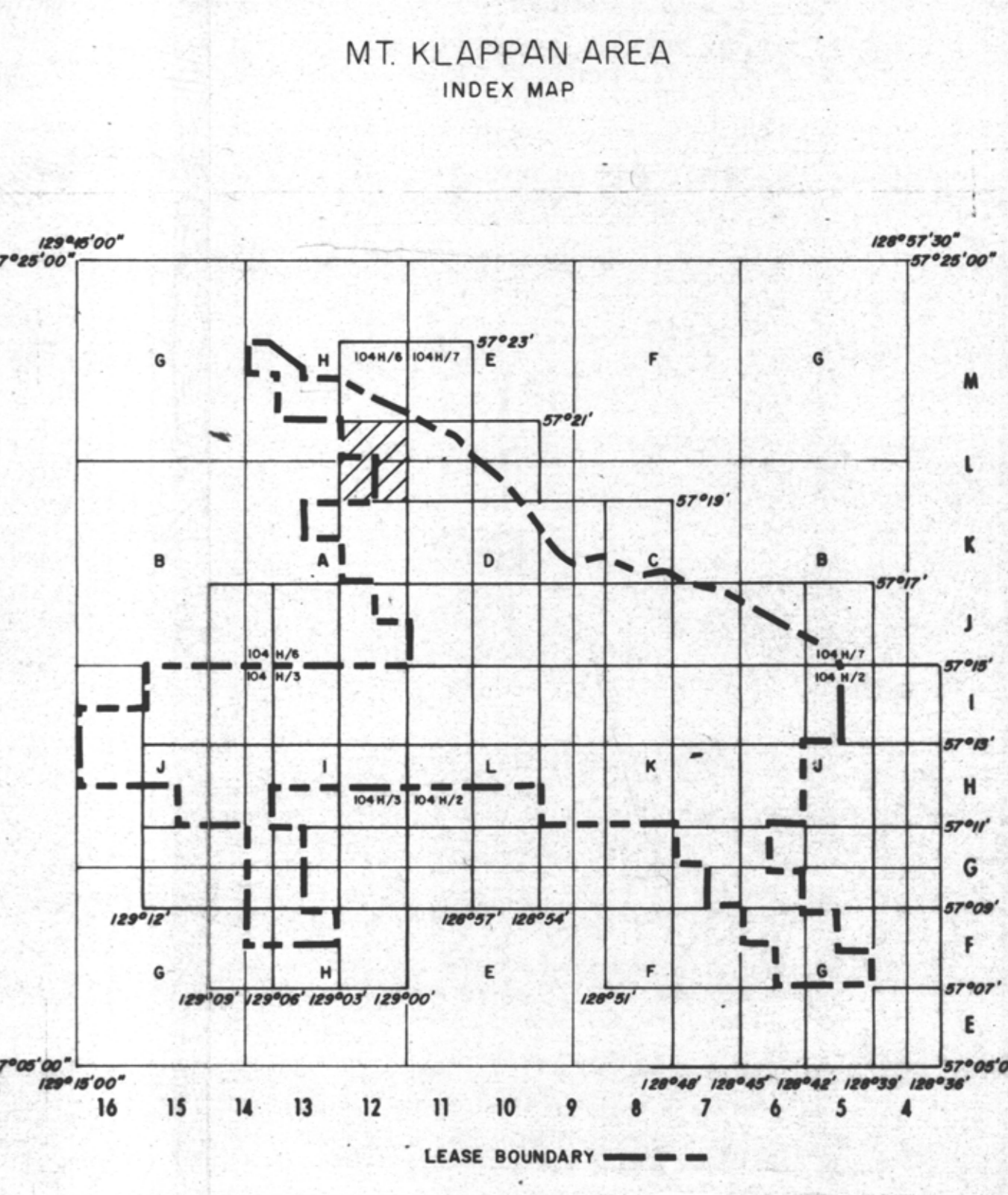
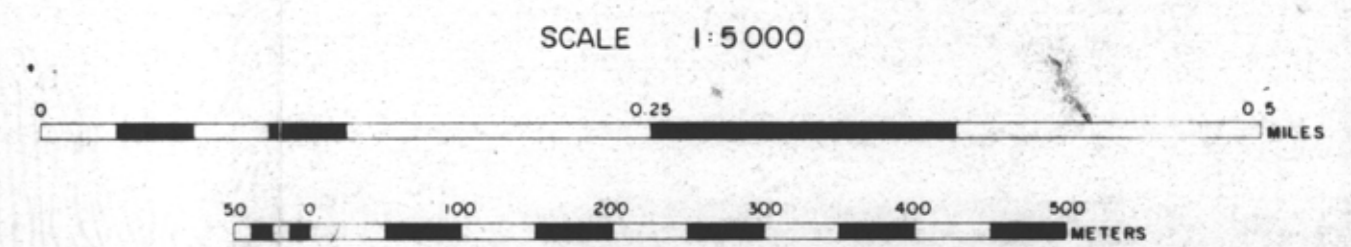
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LEGEND

---	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 UP THRUST 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

748

GULF CANADA RESOURCES LTD.

CALGARY Coal Division ALBERTA

MT. KLAPPAN ANTHRACITE PROPERTY

1988

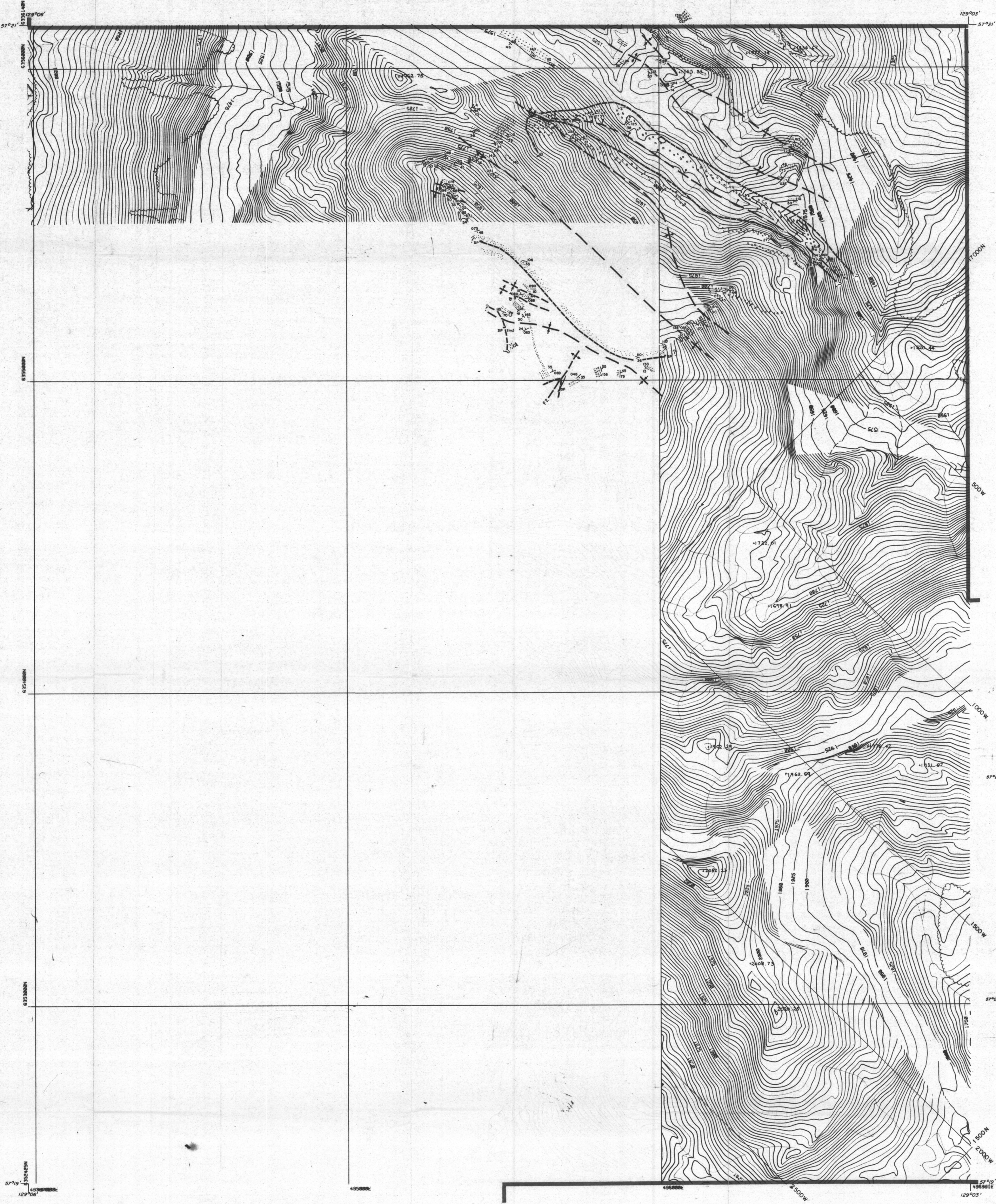
GEOLOGY MAP

SUMMIT AREA

MAP L-12

PREPARED BY: G.P./L.S. SCALE 1:5000

APPROVED BY: E.S. DATE: SEPT, 1988 DRAWING No. KPNSA-11



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 1:10000 NEGATIVES.

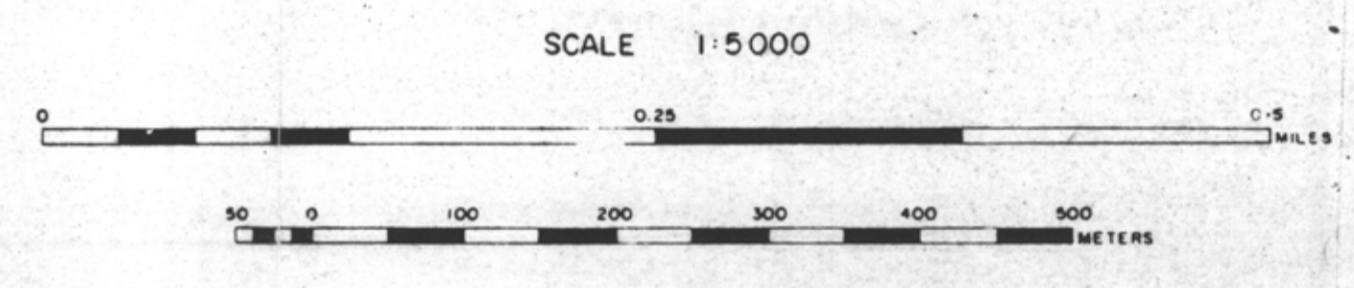
SM FORM LINE

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

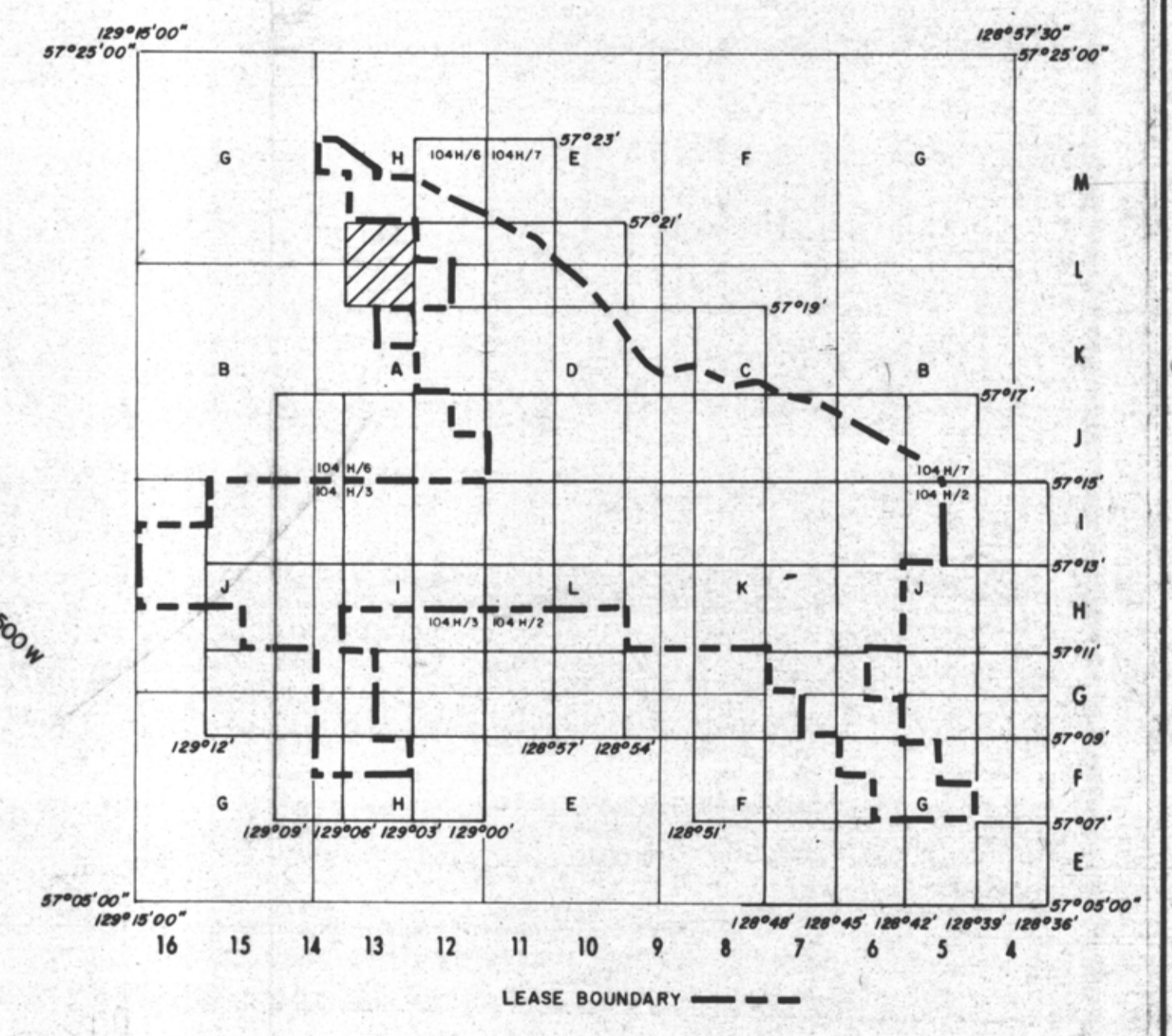
SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND T.S. MARKS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

RAILROAD BED LOCATION BASED ON SEPT. 82 AERIAL PHOTOGRAPHY

COMPILED BY THE CRTHOSOP FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST 1977 AT A SCALE OF 1:60000 (APPROXIMATE).



MT. KLAPPAN AREA INDEX MAP



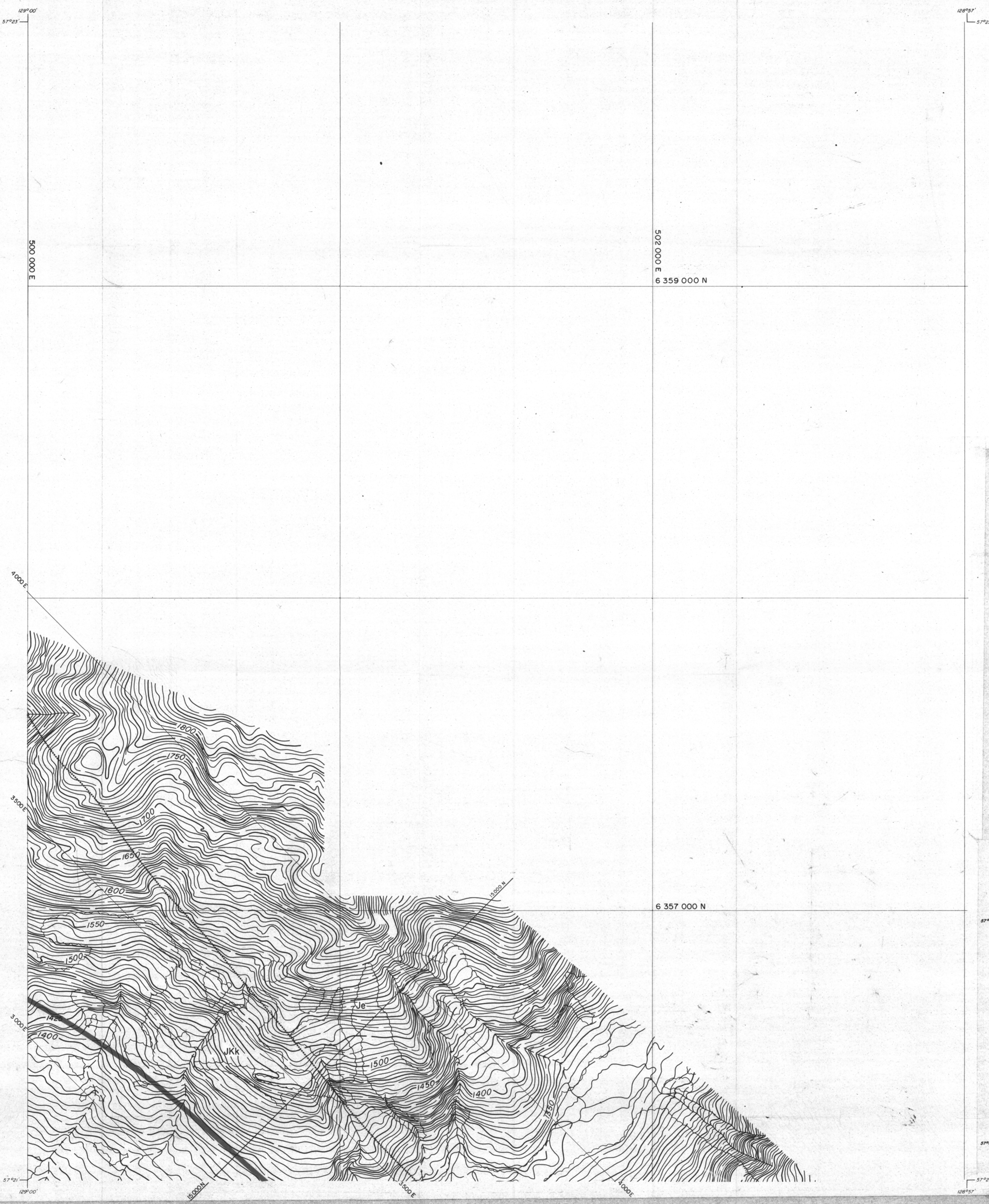
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LEGEND

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---	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)
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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

748

GULF CANADA RESOURCES LTD.	
CALGARY	ALBERTA
MT. KLAPPAN ANTHRACITE PROPERTY	
1988	
GEOLOGY MAP	
SUMMIT AREA	
MAP L-13	
PREPARED BY: G.P./L.S.	SCALE 1:5000
APPROVED BY: E.S.	DATE: SEPT, 1988 DRAWING No. KPN SA - 12



LEGEND

BUILDING	---
ROAD, HARD SURFACE	---
ROAD, LOOSE SURFACE	---
CART TRACK	---
TRAIL	---
RAILROAD BED	---
RIVER	---
STREAM, DEFINITE	---
STREAM, APPROXIMATE	---
SPLIT	---
LAKE	---
WATER LEVEL	FL. 500
SWAMP	---
BEAVER DAM	---
TREE LINE	---
CUT LINE	---
CONTOURS, INDEX	---
CONTOURS, INTERMEDIATE	---
CONTOURS, DEPRESSION	---
CONTOURS, APPROXIMATE	---
SPOT ELEVATION	---
FORM LINES	---
CUT/FILL	---
FIELD CONTROL POINT	---
COAL LICENCE	---

NOTES

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

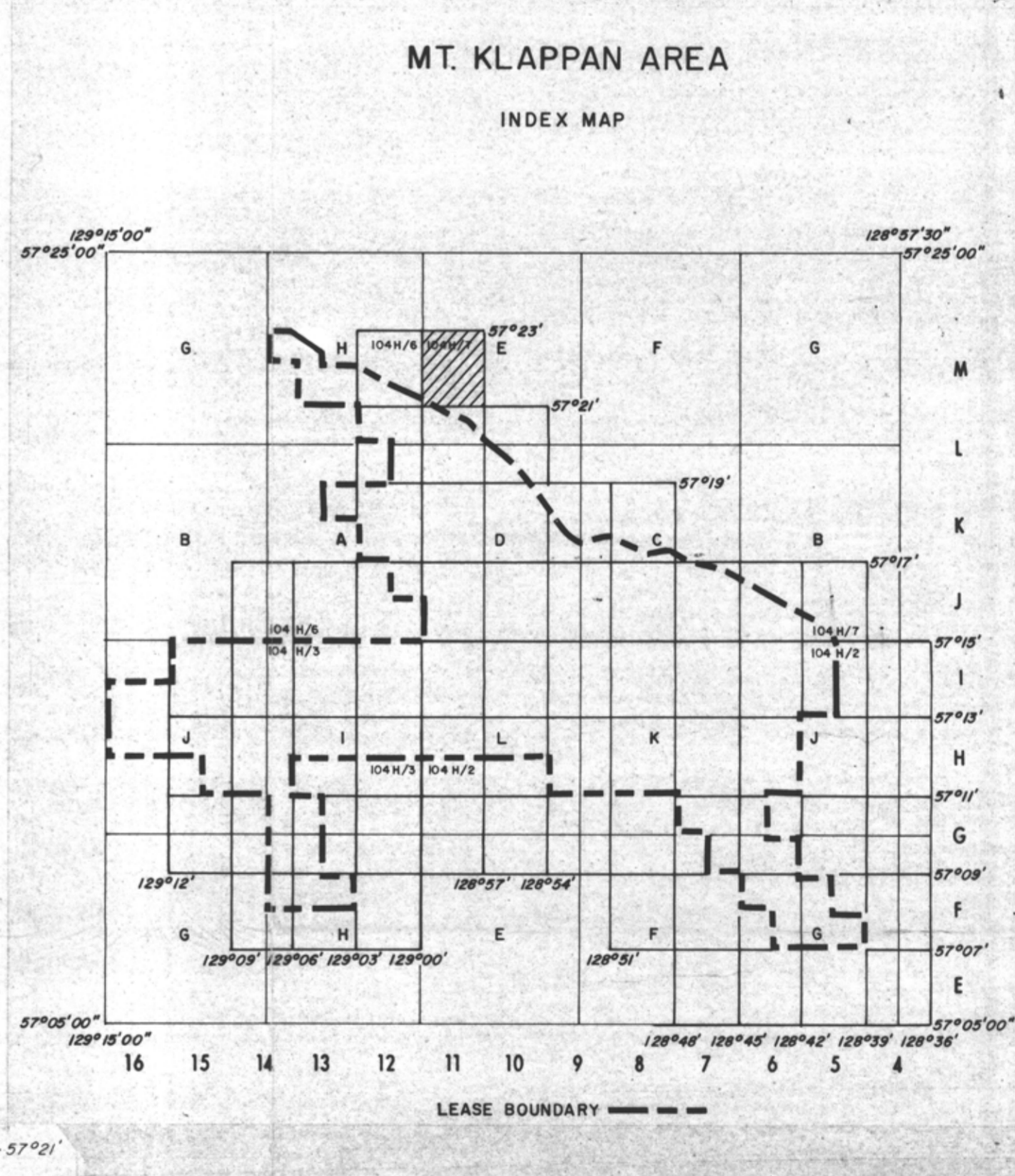
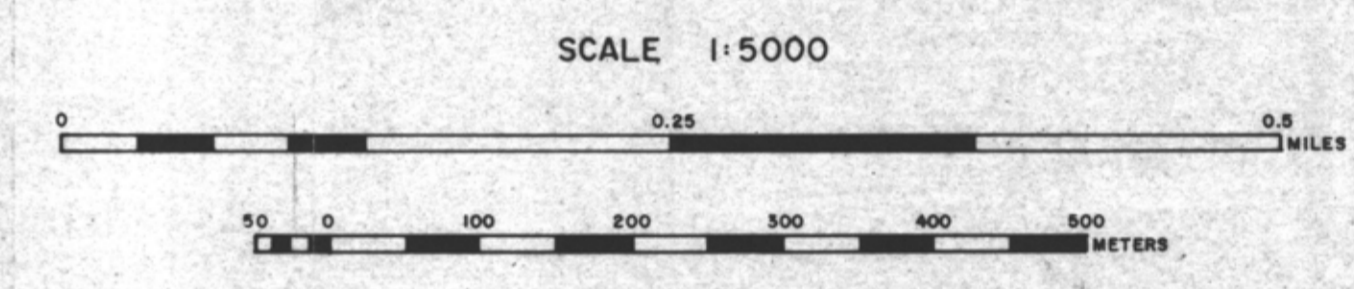
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FROM FEDERAL GOVERNMENT AERIAL PHOTOGRAPHY FLOWN IN AUGUST/67
AT A SCALE OF 1:60,000 (APPROXIMATE).



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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SPATSIZI SEQUENCE

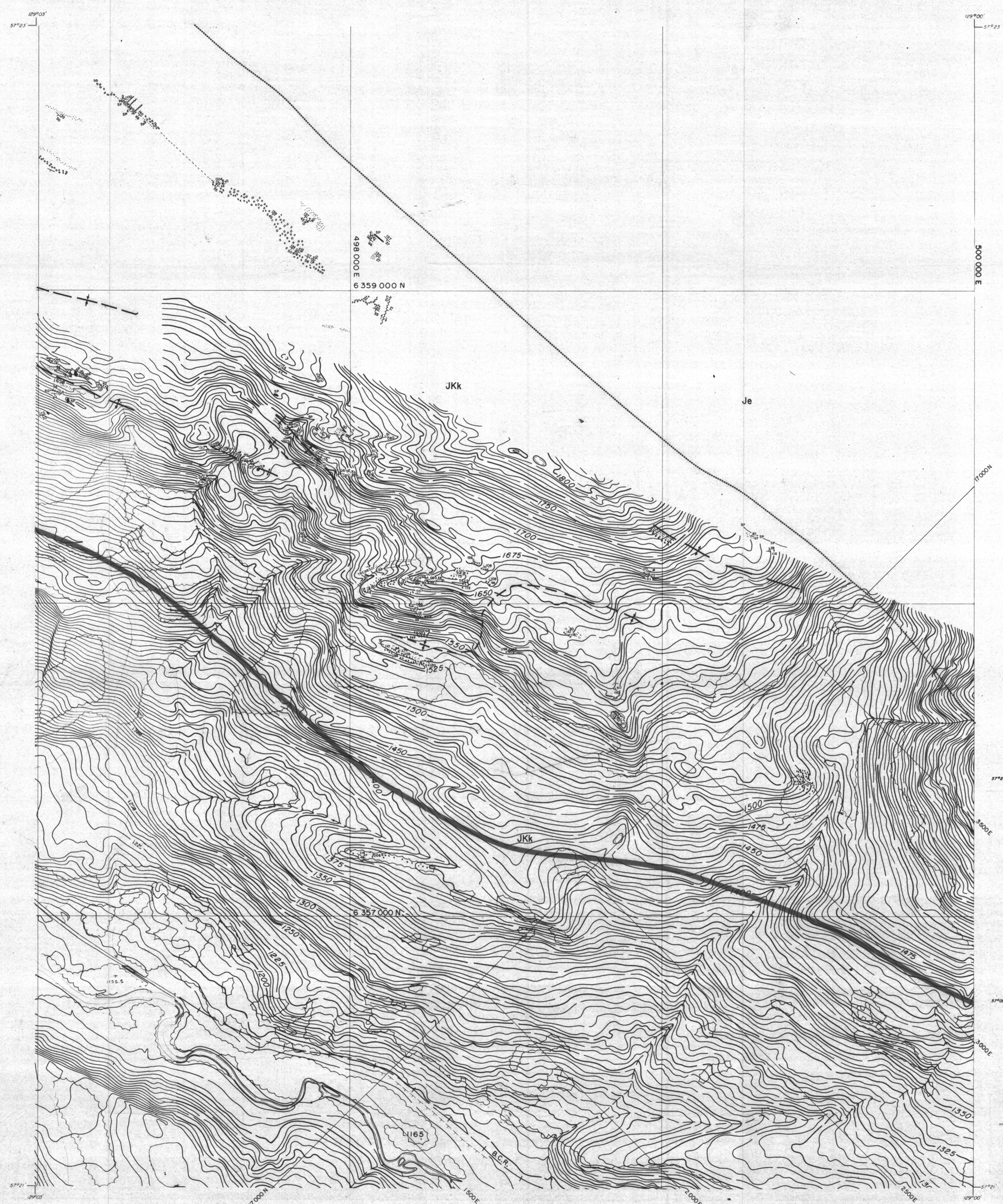
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---	GEOLOGICAL CONTACT (APPROXIMATE, INFERRED)
---	COAL SEAM (DEFINED, INFERRED)
---	ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
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---	MEASURED SECTION
---	SURVEY CAIRN
---	CROSS SECTION LINE

748

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CALGARY	ALBERTA
MT. KLAPPAN ANTHRACITE PROPERTY	
1988	
GEOLOGY MAP	
SUMMIT AREA	
MAP M-II	
PREPARED BY: G.P./L.S.	SCALE 1:5000
APPROVED BY: E.S.	DATE: SEPT. 1988 DRAWING NO. KPN SA-13



LEGEND

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

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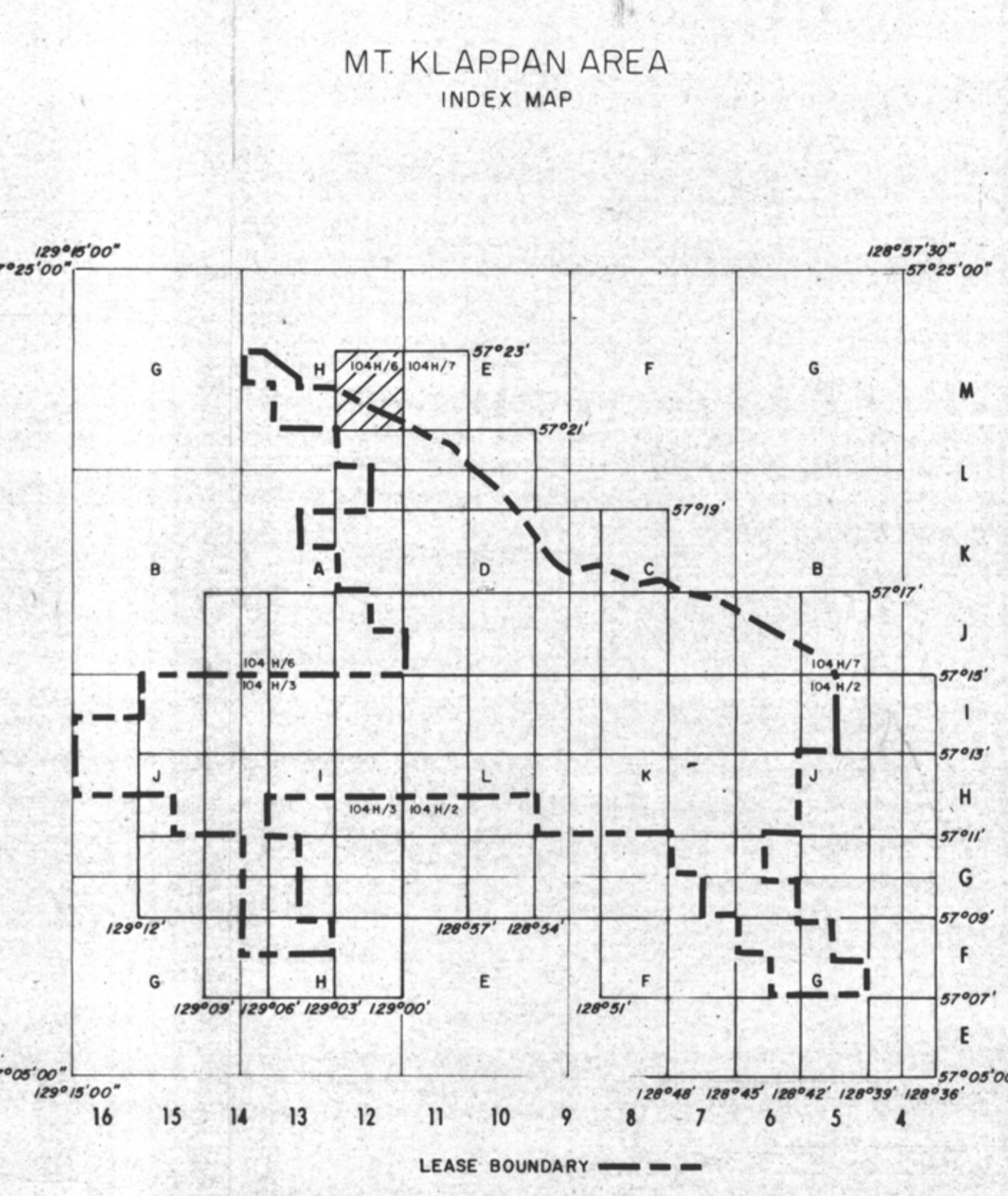
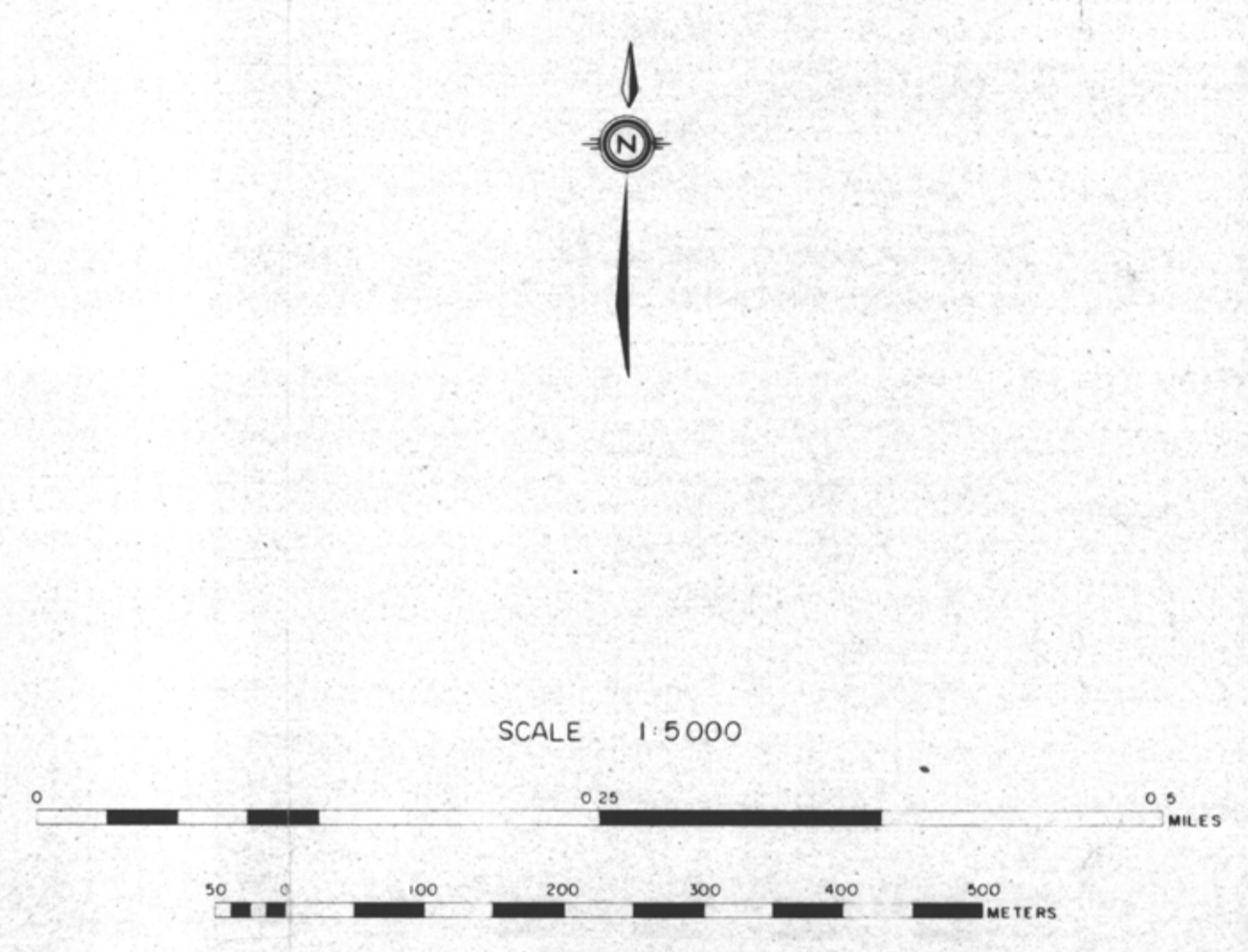
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LEGEND

[Symbol]	LICENCE BOUNDARY
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[Symbol]	COAL SEAM (DEFINED, INFERRED)
[Symbol]	ANTICLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
[Symbol]	SYNCLINE (DEFINED, APPROXIMATE) ARROW INDICATES PLUNGE DIRECTION
[Symbol]	OVERTURNED ANTICLINE (DEFINED, APPROXIMATE)
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[Symbol]	THRUST FAULT (DEFINED, APPROXIMATE) TEETH INDICATE UP THRUST SIDE
[Symbol]	FAULT (DEFINED, APPROXIMATE) UPTHROWN, DOWNTHROWN SIDE
[Symbol]	FAULT (DEFINED, APPROXIMATE) SHOWING RELATIVE MOVEMENT
[Symbol]	ADIT TRENCH COAL SPOIL
[Symbol]	DIAMOND, ROTARY, WINKIE DRILL HOLE (VERTICAL, INCLINED WITH SURFACE PROJECTION)
[Symbol]	MEASURED SECTION
[Symbol]	SURVEY CAIRN
[Symbol]	CROSS SECTION LINE

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GULF CANADA RESOURCES LTD.	
CALGARY	ALBERTA
MT. KLAPPAN ANTHRACITE PROPERTY	
1988	
GEOLOGY MAP	
SUMMIT AREA	
MAP M-12	
PREPARED BY: G.P./L.S.	SCALE 1:5000
APPROVED BY: E.S.	DATE: SEPT. 1988 DRAWING No. KPNSA-14