MINERAL

UUDAM
THE MONGOLIA

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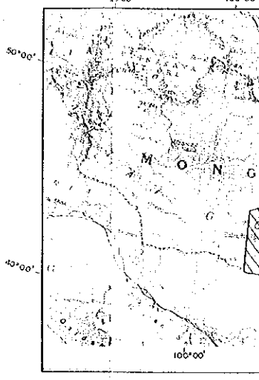

JAPAN INTERNATIONA
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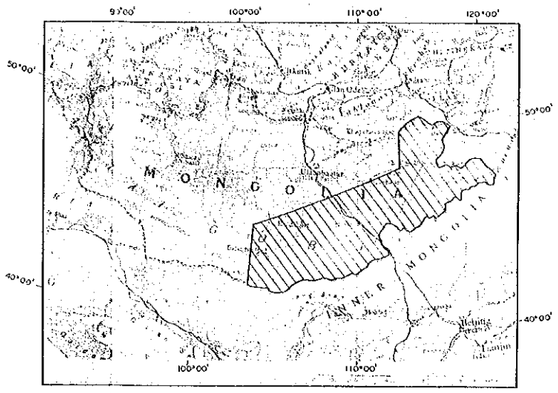
PL. II-1-2

MINERAL EXPLORATION
IN
UUDAM - TAL AREA
THE MONGOLIAN PEOPLE'S REPUBLIC

DISTRIBUTION MAP OF LINEAMENTS ON LANDSAT IMAGERY



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

JANUARY 1992

LEGEND

- fault
- inferred fault
- major lineament
- minor lineament
- drainage
- lake
- cloud cover
- town

MANDAL
OLGOY

DALANZADGAD

SAYNSHAND

NOVSGOL

48°
43°
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110°
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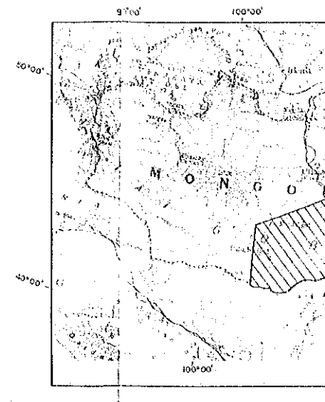
ON LANDSAT I



JAPAN INTERNATIONAL COOP
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JANUARY 19

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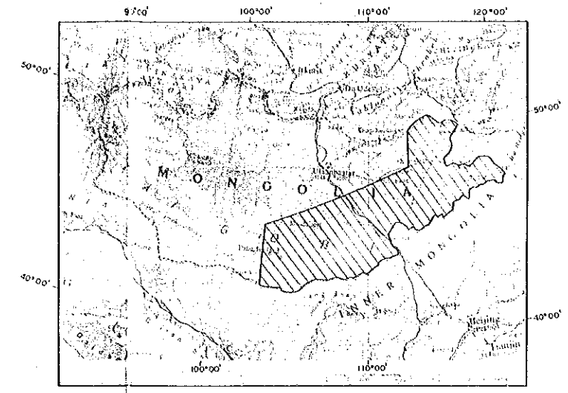
ON LANDSAT IMAGERY



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

JANUARY 1992

LEGEND

- fault
- inferred fault
- major lineament
- minor lineament
- drainage
- lake
- cloud cover
- town

0 50 100 km

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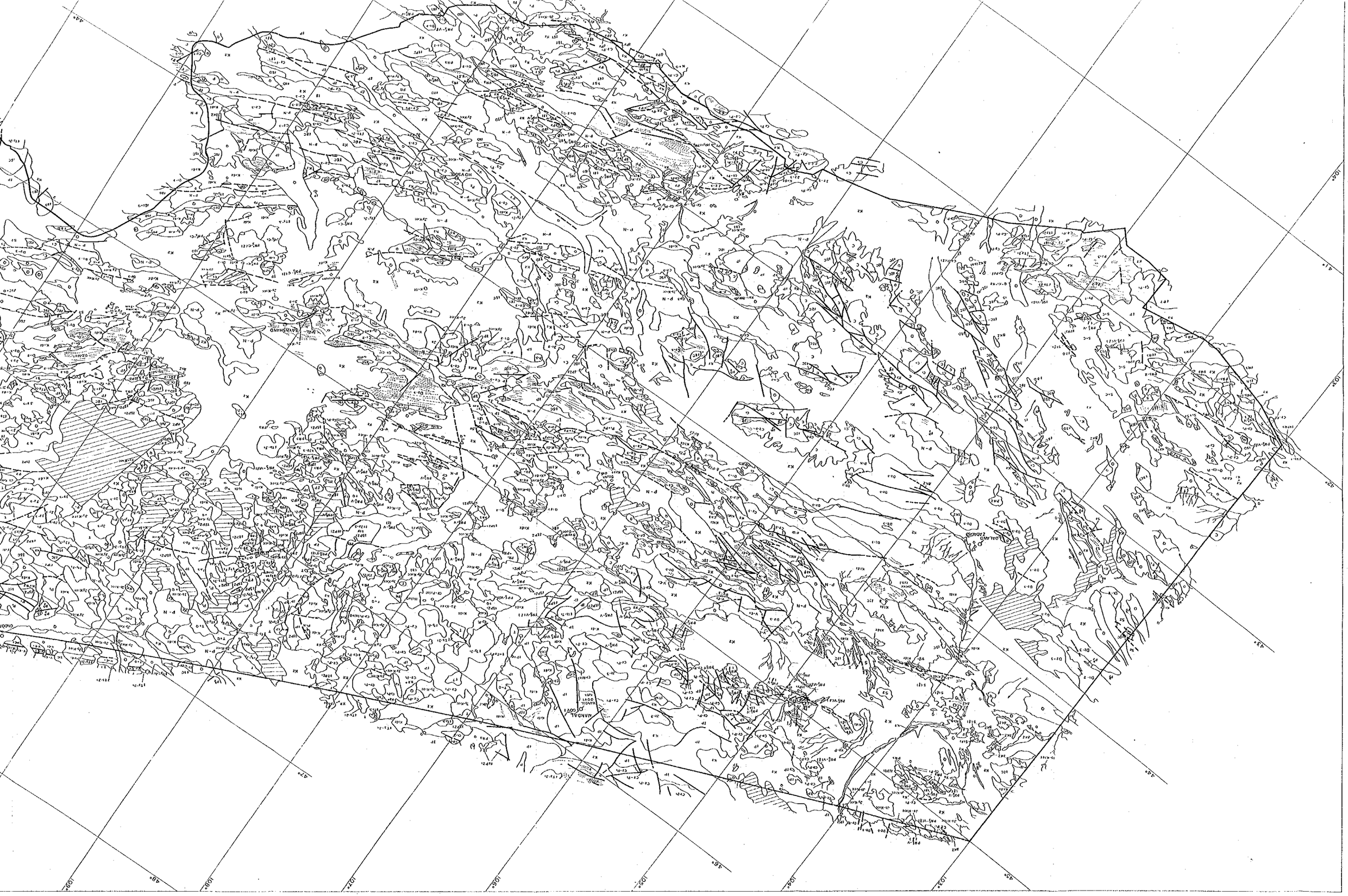

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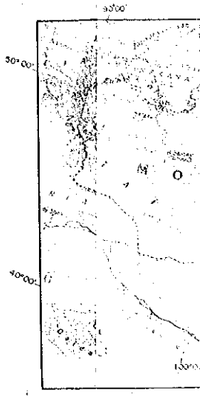
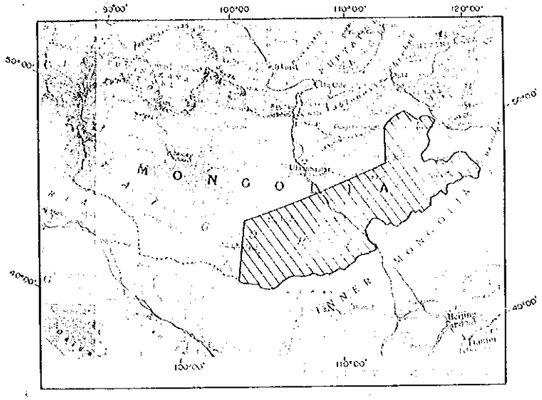


JAPAN INTERNA
METAL M

PL. II-1-3

MINERAL EXPLORATION
IN
UUDAM - TAL AREA
THE MONGOLIAN PEOPLE'S REPUBLIC

GEOLOGICAL INTERPRETATION MAP OF LANDSAT IMAGERY



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

JANUARY 1992

LEGEND

Erathem	System	Series or Subsystem	Rock Types
Cenozoic	Quaternary	Holocene	Q — gravel, sand, loam, sandy loam, clay, mud, sandy soil, loess
		Pleistocene	Q_1 — basaltic rocks
	Tertiary	Pliocene	N — clay, sand, silt, gravel, conglomerate, marl, travertine, limestone
		Neogene	
		Paleocene	P–N — clay, silt, sand, sandstone, conglomerate
		Paleocene	P — silt, sand, conglomerate, marl
Mesozoic	Cretaceous	U. Cretaceous	K_2 — siltstone, argillite, clay, sandstone, conglomerate, sand
		L. Cretaceous	K_1 — grey sandstone, clay, silt, conglomerate, clayey shale, coal seam
			K_1d_2 — dark greenish grey clay, clayey bituminous shale
		L. Cretaceous	J_3K_1 — greenish grey and light grey sandstone, clay, tuffstone, conglomerate seam, marl, basalt, andesite, rhyolite
		U. Jurassic	J_3 — conglomerate, sandstone, clay seam, siltstone
	Jurassic	M.–U. Jurassic	J_2K_1 — rhyolite, tuff, basalt, andesite, tuffaceous conglomerate, tuffaceous sandstone
		L.–M. Jurassic	J_1J_2 — sandstone, conglomerate, siltstone, carbonaceous clayey shale, coal, basalt seam, rhyolite
	Triassic		T — sandstone, conglomerate, clayey shale, siltstone
		L. Triassic	T_1 — andesite, basalt, rhyolite, tuff
	Permian	U. Permian	P — andesite, dacite, rhyolite, tuff, tuffaceous conglomerate, tuffaceous sandstone, sandstone, conglomerate, siltstone
		U. Permian	P_2 — andesite, dacite, basalt, tuff, tuffite, tuffaceous conglomerate, sandstone, siltstone, conglomerate
			P_2^b — sandstone, conglomerate, siltstone
Paleozoic	Carboniferous	L.–U. Permian	P_1+P_2 — sandstone, siltstone, conglomerate, rhyolite, andesite, tuff, dacite, tuffite
		L. Permian	P_1 — rhyolite, andesite, tuff, sandstone, conglomerate, siltstone
		L. Permian	P_1-C_3 — andesite, dacite, tuff, rhyolite, sandstone, conglomerate
		M. Carboniferous	C_2+C_3l — limestone
			C — andesite, rhyolite, tuff
		M.–U. Carboniferous	C_2-C_3 — sandstone, conglomerate, carbonaceous clayey shale, coal, argillite, siltstone, andesite, dacite, tuff
		L.–M. Carboniferous	C_1-C_2 — sandstone, siltstone, argillite, conglomerate (rare), andesite, dacite, rhyolite, tuff
		L. Carboniferous	C_1 — sandstone, siltstone, conglomerate, limestone (rare), carbonaceous clayey shale, coal, tuffite, jasper
	Devonian		D — sandstone, siltstone, clayey shale, jasper, andesite, tuff (rare), rhyolite, conglomerate, dacite, siliceous shale
		M.–U. Devonian	D_2-C_1 — sandstone, siliceous siltstone, clayey shale, conglomerate (rare), tuffite, rhyolite, jasper, andesite, tuff
			D_2+C_1l — limestone
		M. Devonian	D_2 — rhyolite, andesite, tuff, sandstone, siltstone, conglomerate, limestone
		L.–M. Devonian	D_1-D_2 — andesite, dacite, rhyolite, tuff, sandstone, conglomerate, siltstone, clayey shale, siliceous shale, jasper, altered extrusive rocks
			D_1+C_1l — limestone
		L. Devonian	D_1 — andesite, dacite, rhyolite, tuff, tuffaceous conglomerate, sandstone, clayey shale, siltstone, conglomerate
			S — siliceous clayey shale, sericite – chlorite slate, jasper, sandstone, basic extrusive rocks
			$S+C_1l$ — limestone
Proterozoic	Sinian	U. Sinian	S_2 — altered extrusive rocks, siliceous shale, sandstone, clayey shale
			S_2+C_1l — limestone
		L. Sinian	S_1 — sericite – chlorite slate, clayey shale, sandstone, basic altered extrusive rocks
			S_1+C_1l — limestone
	Qidaliao		Q — sandstone, conglomerate, phyllite, clayey shale, metasiltstone, metasandstone, basic – intermediate altered extrusive rocks
	Qingbaikou		$Q+C_1l$ — limestone
	Changcheng		C_1-C_2 — sandstone, siltstone, contaminated extrusive rocks and tuff, clayey shale, limestone, rhyolite
			C_1-C_2 — basic – intermediate altered extrusive rocks and tuff, limestone, sandstone, phyllite, chert, andesite, dacite, tuff
			Pt_1^{ch} — phyllite, metasandstone, chert, basic altered extrusive rocks
			C_1+C_2l — limestone
	Archean		PR — gneiss, crystalline schist, amphibolite
			PR_2^{ch} — metasandstone, siltstone, acidic – intermediate extrusive rocks and tuff
			$C+Pl$ — limestone
			PR_2 — gneiss, metaslate, limestone
			PR_2^{ch} — metaslate, metasandstone, siltstone, limestone
			PR_2^{ch} — crystalline limestone, marble, chert, crystalline schist
			PR_2^{ch} — gneiss, crystalline schist, amphibolite

Intrusive Rocks

Eratem	Period	Subperiod	Rock Types
Mesozoic	Jurassic	L. Jurassic	γJ_3 — granite, alaskite, granosyenite, alkali granite (rare), adamellite, diorite, monzonite
			$\delta\beta J_3$ — diorite, gabbro, monzonite, syenite
		E. Jurassic	γJ_2 — granite, alaskite
		E. Jurassic – L. Triassic	γJ_2-T_3 — granite, adamellite, alaskite
	Triassic		$\eta\delta T$ — granodiorite, granite, adamellite, diorite (rare), monzonite, granosyenite, syenite
			$\alpha\delta T$ — gabbro, diorite
Late Paleozoic	Permian	L. Permian	$\alpha\beta P_1$ — serpentinite, peridotite, dunite
			$\gamma\beta P_1$ — granite, granosyenite, granodiorite, monzonite (rare), syenite, alkali granite, diorite
	Carboniferous		$\eta\gamma C$ — granodiorite, granite, adamellite, plagiogranite, quartz diorite, monzonite, syenite (rare)
			$\alpha\beta C$ — gabbro, diorite
Middle Paleozoic	Devonian		$\alpha\beta D_2$ — serpentinite, peridotite, dunite
			$\gamma\delta D$ — granodiorite, granite, adamellite, plagiogranite, quartz diorite, diabase
		E.–M. Devonian	γD_1-S — granite, granodiorite, quartz syenite, syenite (rare) adamellite, alkali granite
	Silurian		$\gamma\delta S$ — granodiorite, adamellite, granite, quartz diorite, plagiogranite, diorite
Early Paleozoic			$\gamma\delta\rho\gamma\sigma$ — granodiorite, granite, plagiogranite, adamellite, quartz diorite, granosyenite
			$\nu\gamma\delta\sigma$ — diorite, gabbro, pyroxenite
		E. Cambrian	$\nu\sigma\in$ — gabbro, diabase
Late Proterozoic			$\gamma\delta Pt_3$ — gneissose granite, granodiorite, granite gneiss, granodiorite gneiss, gneissose diorite and gabbro

ive Rocks

Rock Types

granite, alaskite, granosyenite, alkali granite trace), adamellite, diorite, monzonite

diorite, gabbro, monzonite, syenite

granite, alaskite

granite, adamellite, alaskite

granodiorite, granite, adamellite, diorite trace), monzonite, granosyenite, syenite

gabbro, diorite

serpentinite, peridotite, dunite

granite, granosyenite, granodiorite, monzonite (trace), syenite, alkali granite, diorite

granodiorite, granite, adamellite, plagiogranite, quartz diorite, monzonite, syenite (trace)

gabbro, diorite

serpentinite, peridotite, dunite

granodiorite, granite, adamellite, plagiogranite, quartz diorite, diabase

granite, granodiorite, quartz syenite, syenite (trace) adamellite, alkali granite

granodiorite, adamellite, granite, quartz diorite, plagiogranite, diorite

granodiorite, granite, plagiogranite, adamellite, quartz diorite, granosyenite

diorite, gabbro, pyroxenite

gabbro, diabase

gneissose granite, granodiorite, granite gneiss, granodiorite gneiss, gneissose diorite and gabbro

unit boundary and symbol

bedding trace with dip direction

strike and dip direction

schistosity, joint or fracture

fault

inferred fault

anticlinal axial trace with direction of plunge

synclinal axial trace with direction of plunge

drainage

lake

cloud cover

0 50 100km

1 : 1,000,000

unit boundary and symbol

bedding trace with dip direction

strike and dip direction

schistosity, joint or fracture

fault

inferred fault

anticlinal axial trace with direction of plunge

synclinal axial trace with direction of plunge

drainage

lake

cloud cover

0 50 100km

1 : 1,000,000

104°00'
104°30'
105°00'
105°30'
44°30'
104°00'
104°30'
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105°30'
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LEGEND

Geologic age		Correlation	Possible rock type
Quaternary	Q_3	QIII–IV	sand
	Q_2		gravel, sand
	Q_1	QII–III	gravel
	Vc_2	?	dacite – andesite
Tertiary	T	P–N	sand, silt, gravel
Late Cretaceous	K_2c	K_2b	sandstone, siltstone
	K_2b	K_2bs	sandstone
	K_2s	K_2ss	siltstone
Early Cretaceous	K_1b	K_1dr	shale, siltstone
	K_1s		
Jurassic	J_3	J_3–K_1sc	basalt and basaltic tuff
	J_2		andesite
	J_1		tuff
Permian	Pd	P	granodiorite, diorite, syenite
	Pg		
Carboniferous	C_2d	?C	granite, granodiorite
	C_2g		

Devonian	D_{1-2}^{tb}	D_{1-2}	tuff
	D_2^{ss}		shale, sandstone
	D_2^{s}		shale, sandstone
	D_2^{ls}		limestone
	D_2^{sh}		sand-tone, shale
	D_1^{d}		rhyolite
	D_1^{s}		shale
	D_1^{sc}		shale
	D_1^{ss}		sandstone
	D_1^{sh}		sable, sand-tone
	D_1^{l}		
Devonian ? Silurian	SD_3	S ? S_2	limestone
	SD_2		shale, slate
	SD_1		basalt, andesite

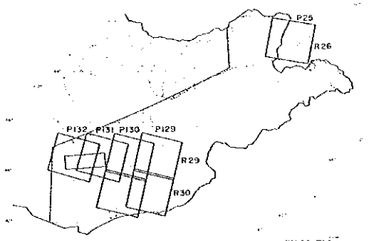
Silurian	S_6	S	basalt
	S_5		tuffac-shale
	S_4		shale
	S_3		sandstone
	S_{2-3}		sandstone or lime-stone
	S_2		lime-stone
	S_1		shale, sandstone
	S_1		lime-stone
	S_1		shale, sandstone

- unit boundary
- conjectural unit boundary
- bedding trace or schistosity with dip direction
- strike and dip direction
- fault
- inferred fault
- basement
- anticline
- syncline
- drainage
- road
- village

PL. II-1-4

MINERAL EXPLORATION
IN
UUDAM - TAL AREA
THE MONGOLIAN PEOPLE'S REPUBLIC

GEOLOGICAL INTERPRETATION OF LANDSAT IMAGERY OF ULZIIT AREA



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

JANUARY 1992

104°30' 105°00' 105°30' 44°30'

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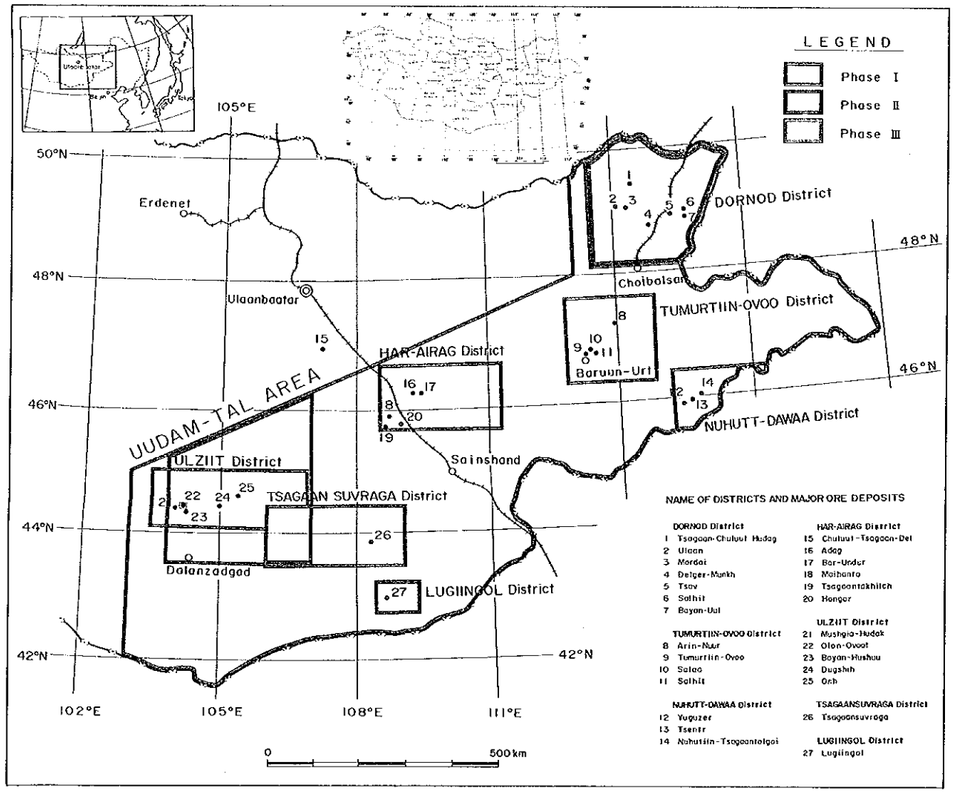
	Cgb				S_6	basalt	lineament
	Cc_3				S_5	tuffaceous shale	anticline
	D_3b	tuff			S_4	shale	synecline
	D_{3-1}	shale, sandstone			S_3	sandstone	drainage
	D_{1-3}	shale, sandstone		Silurian	S_{2-3}	sandstone or limestone	road
	D_2	limestone			S_2	limestone	village
	D_2	sandstone, shale			S_1	shale, sandstone	
Devonian	D_2l	rhyolite	D_{2-3} D_{1-2}		S_2	limestone	
	D_2	shale			S_1	shale, sandstone	
	D_2s	shale					
	D_2b	sandstone				unit boundary	
	D_2d	sable, sandstone				conjectural unit boundary	
	D_2					bedding trace or schistosity with dip direction	
	SD_3	limestone				strike and dip direction	
Devonian	SD_2	shale, slate	S_2			fault	
Silurian	SD_1	basalt, andesite				inferred fault	

GEOLOGY AND ORE DEPOSITS OF THE UUDAM TAL AREA, MONGOLIA

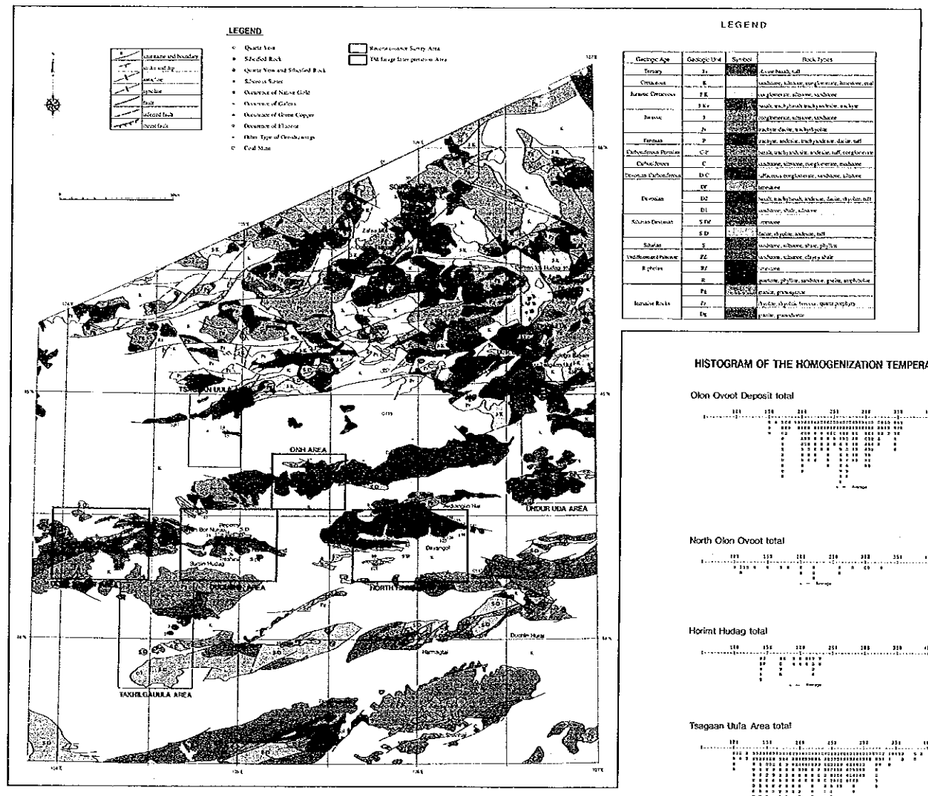
THE COOPERATIVE MINERAL EXPLORATION BY JICA/MMAJ-(MGMR). 1991—1993

EXPLANATORY NOTE ON THE GEOLOGY AND DEPOSITES OF THE UUDAM TAL AREA, MONGOLIA

INDEX MAP OF THE SURVEY AREA



GEOLOGIC MAP OF THE ULZIIT AREA (PHASE II)



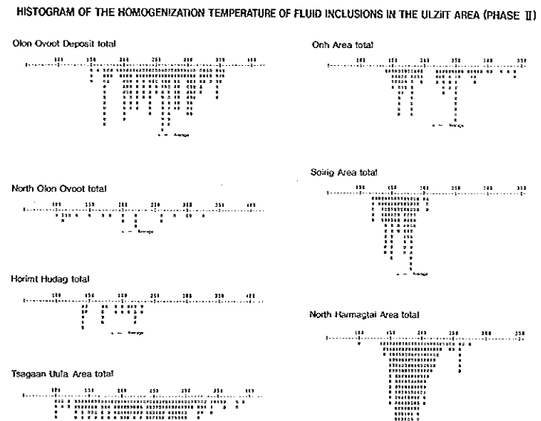
REPORT ON THE MINERAL EXPLORATION IN THE UUDAM TAL AREA MONGOLIA

PREPARED BY JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) AND METAL MINING AGENCY OF JAPAN (MMAJ) IN COOPERATION WITH THE MINISTRY OF GEOLOGY AND MINERAL RESOURCES OF MONGOLIA (MGMR) FEBRUARY, 1994.

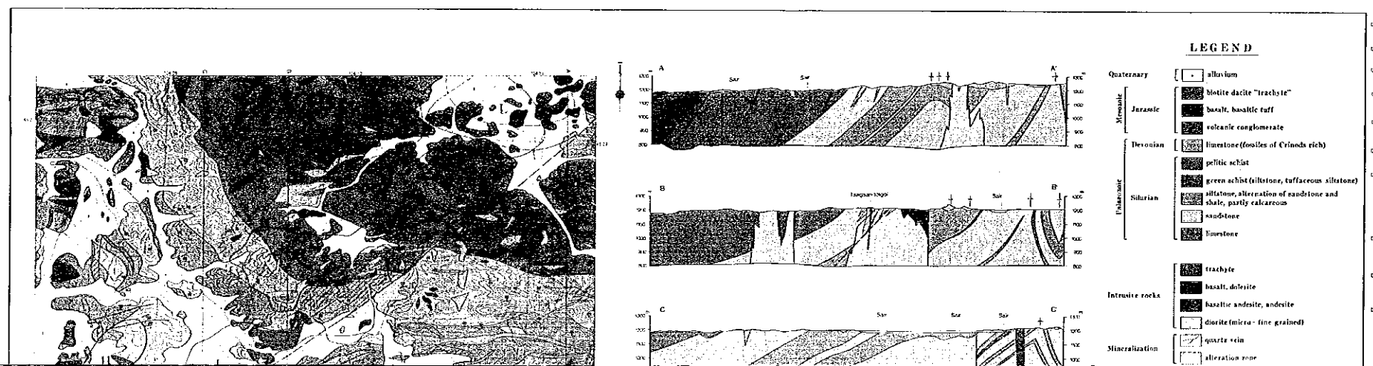
LIST OF FIELD TEAM MEMBERS

JICA/MMAJ	MGMRM
– Geology –	– Geology –
Mr. Eitaro SATO	Mr. J. TSEND-AYUSH
Mr. Kiyoshi NAKAMURA	Mr. D. BATBOLD
Mr. Hideo SUZUKI	Mr. Kh. ENKHTUVSHIN
Mr. Shigeyuki YAMASAWA	Mr. Ts. BAASANDORJ
Mr. Kazuhiro ADACHI	Mr. D. GARAMJAV
Mr. Haruo HARADA	Mr. D. TSETSENPIL
– Geochemistry –	– Geochemistry –
Mr. Eitaro SATO	Mr. D. BATBOLD
Mr. Kazuhiro ADACHI	Mr. Kh. ENKHTUVSHIN
Mr. Haruo HARADA	Mr. Sh. BAASANDORJ
– Geophysics –	– Geophysics –
Mr. Kazushige WADA	Mr. M. DUINHARJAV
Mr. Hidehiko ISHIKAWA	Mr. Ts. CHULUNBAATAR
Mr. Koichi OKUZUMI	Mr. D. LAVDANSUREN
– Drilling –	– Drilling –
Mr. Tsutomu AOYAMA	Mr. D. GANBUD
Mr. Shigeo ECHIZENYA	Mr. D. BATCHULUUN
Mr. Yukio CHIBA	Mr. J. ERDENECHIR

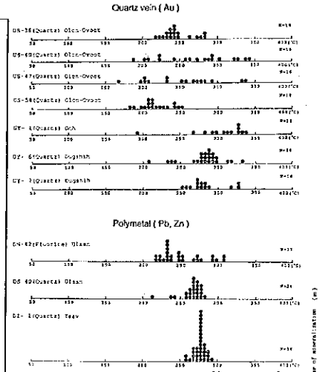
HISTOGRAM OF THE HOMOGENIZATION TEMPERATURE OF FLUID INCLUSIONS IN THE ULZIIT AREA (PHASE II)



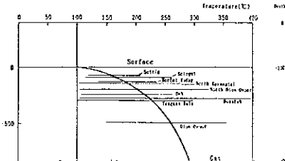
GEOLOGIC MAP OF THE SEMIDETAILED SURVEY AREA (PHASE II)



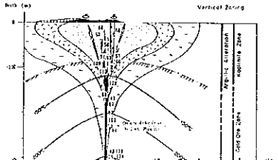
HISTOGRAM OF THE HOMOGENIZATION TEMPERATURE OF FLUID INCLUSIONS IN THE UUDAM TAL AREA (PHASE II)

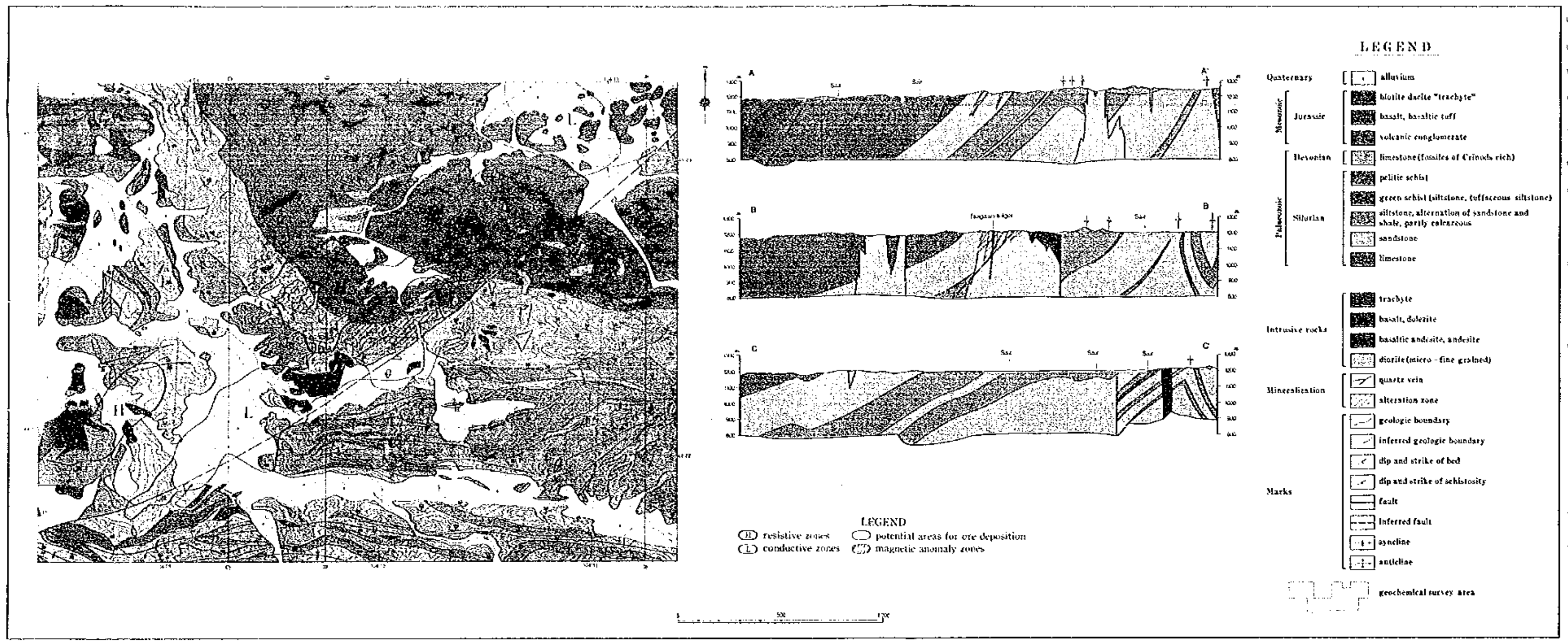


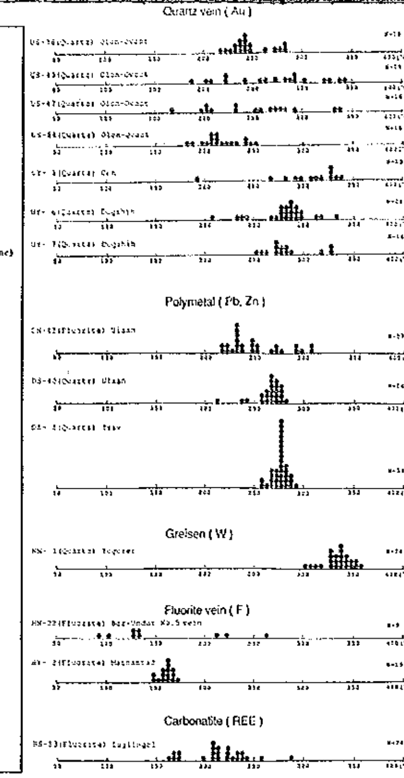
INFERED DEPTH OF ORE FORMATION IN RELATION TO THE FILLING TEMPERATURES OF FLUID INCLUSIONS IN SELF-SEALING MODEL



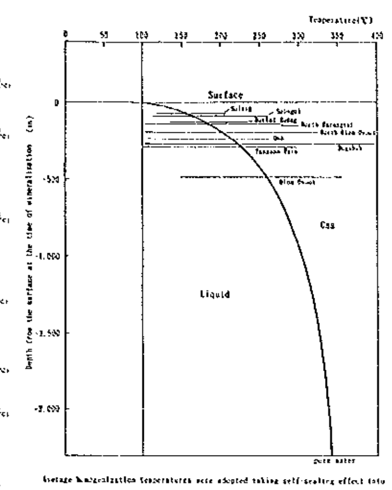
INFERRED EROSION LEVEL OF THE ORE-SHOWINGS IN THE ULZIIT AREA



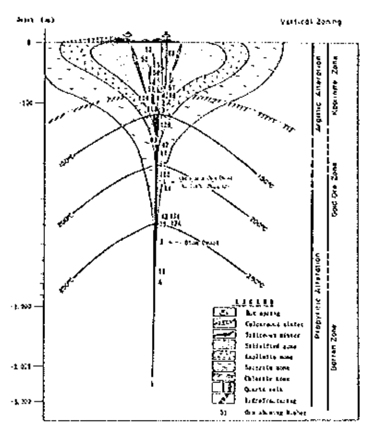




INFERRED DEPTH OF ORE FORMATION IN RELATION TO THE FILLING TEMPERATURES OF FLUID INCLUSIONS IN SELF-SEALING MODEL



INFERRED EROSION LEVEL OF THE ORE-SHOWINGS IN THE ULZIIT AREA



RESULTS OF DATING BY K-Ar, Pb-Pb METHOD (PHASE Ⅰ)

No.	SAMPLE No.	LOCALITY	COORDINATES NORTH	COORDINATES EAST	ROCK	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
(K-Ar method)									
1	[illegible]	Tsagaan-Chuluut Bud	[illegible]	[illegible]	Granite porphyry	K-feldspar	154 ± 8	M~U Jur	[illegible]
2	[illegible]	Tsav	[illegible]	[illegible]	Hornblendite	Hornblende	158 ± 8	M~U Jur	[illegible]
3	[illegible]	Tsav			Granite porphyry	Whole rock	142 ± 7	U Jur~L Cret	[illegible]
4	[illegible]	Tsav			Schistose granite	Biotite	161 ± 8	M Jur	[illegible]
5						Whole rock	161 ± 8	M Jur	
6	[illegible]	Ulaan area	[illegible]	[illegible]	Granite	K-feldspar	[illegible] ± 10	L Jur	[illegible]
7	[illegible]	Lugiingol	[illegible]	[illegible]	Nepheline syenite	Biotite	231 ± 12	L~M Tri	[illegible]
8	[illegible]	Lugiingol	[illegible]	[illegible]	Syenite	Biotite	220 ± 11	M~U Tri	[illegible]
9						Hornblende	234 ± 12	M~U Tri	
10						K-feldspar	242 ± 12	U Perm~M Tri	
11						Whole rock	233 ± 12	U Perm~U Tri	
12	[illegible]	Lugiingol			Nepheline syenite	Nepheline	234 ± 12	L~M Tri	[illegible]
13						Biotite	224 ± 11	M~U Tri	
14	[illegible]	Tsagaansuvarga	[illegible]	[illegible]	Greisen	Muscovite	[illegible] ± 10	U Dev~L Carb	Ore stock pile
15	[illegible]	Tsagaansuvarga	[illegible]	[illegible]	Quartz monzonite	K-feldspar	315 ± 16	L~M Carb	[illegible]
16	[illegible]	Tsagaansuvarga area	[illegible]	[illegible]	Quartz monzonite	Hornblende	333 ± 17	U Dev~L Carb	[illegible]
17	[illegible]	Salaa	[illegible]	[illegible]	Granite	K-feldspar	191 ± 10	L Jur	[illegible]
18	[illegible]	Tumurtiin-Ovoo area	[illegible]	[illegible]	Granite	K-feldspar	191 ± 10	L Jur	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	Alkali granite	Hornblende	[illegible] ± 15	U Carb~L Perm	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	Syenite	Nepheline	132 ± 7	U Jur~L Cret	[illegible]
21	[illegible]	Olon-Ovoot area	[illegible]	[illegible]	Graphic granite	Albite	[illegible] ± 15	L Ord~U Carb	[illegible]
22	[illegible]	Olon-Ovoot area	[illegible]	[illegible]	Gabbro	Whole rock	270 ± 14	U Carb~L Perm	[illegible]
23	[illegible]	[illegible]	[illegible]	[illegible]	Granite	K-feldspar	245 ± 12	U Perm~M Tri	[illegible]
24	[illegible]	Olon-Ovoot area	[illegible]	[illegible]	Granodiorite	Biotite	282 ± 15	U Carb~L Perm	[illegible]
25	[illegible]	[illegible]	[illegible]	[illegible]	Granite	Whole rock	229 ± 11	M~U Tri	[illegible]
(Pb-Pb method)									
26	[illegible]	Tsav	[illegible]	[illegible]	Plymetl vein ore	Galena	111.0	L Cret	[illegible]
27	[illegible]	Tsav	[illegible]	[illegible]	Plymetl vein ore	Galena	114.1	L Cret	Ore stock pile
28	[illegible]	Tsav			Plymetl vein ore	Galena	[illegible]	L Cret	[illegible]
29	[illegible]	[illegible]	[illegible]	[illegible]	Plymetl bre-pip ore	Galena	179.1	M Jur	Ore stock pile
30	[illegible]	Salhit	[illegible]	[illegible]	Gar-mgt sk ore	Galena	125.5	L Cret	[illegible]

(ABBREVIATIONS) [illegible] U:Upper, M:Middle, L:Lower
Cret:Cretaceous, Jur:Jurassic, Tri:Triassic, Perm:Permian, Carb:Carboniferous, Ord:Ordovician
[illegible] Plymetl:Polymetal, Gar-mgt sk:Garnet-magnetite skarn, Bre-pip:Breccia pipe
*:Coordinates of core storage yard or ore stock pile.
**:Pb-Pb age were calculated using the formula taken from "Principles of Isotope Geology" by Gunter Faure, 1977.

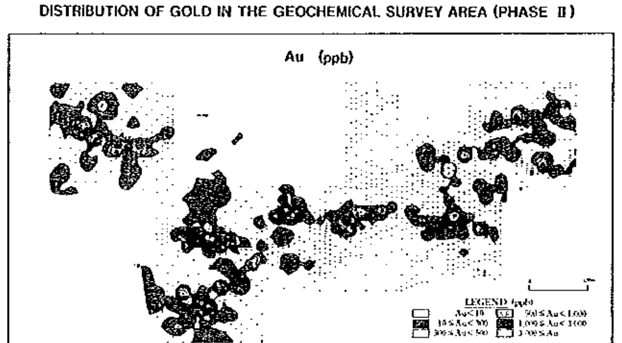
RESULTS OF DATING BY K-Ar METHOD (PHASE Ⅱ)

No.	SAMPLE No.	LOCALITY	COORDINATES NORTH	COORDINATES EAST	ROCK	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
1	[illegible]	Geochemical survey area	co-ordinated on the detailed survey grid (refer to Pl. [illegible])		Schist	Whole rock	[illegible] ± 15	Upper Carboniferous	
2	[illegible]	Sub regional survey area			Muscovite quartz vein	〃	[illegible] ± 14	Lower Permian	
3	[illegible]	Olon ovoot regional survey area	[illegible]	[illegible]	Biotite rhyolite	〃	[illegible] ± 7	Upper Jurassic	Sub regional co-ordinate [illegible]
4	[illegible]	Sub regional survey area	[illegible]	[illegible]	Sericite schist	〃	276 ± 14	Lower Permian	
5	[illegible]	Sub regional survey area	[illegible]	[illegible]	Andesite	〃	[illegible] ± 12	Lower Permian	
6	[illegible]	[illegible] regional survey area	[illegible]	[illegible]	Granodiorite	〃	171 ± 9	Middle Jurassic	
7	[illegible]	[illegible] regional survey area	[illegible]	[illegible]	Andesite	〃	[illegible] ± 11	Upper Triassic	
8	[illegible]	Sologoi regional survey area	[illegible]	[illegible]	Aplite	〃	[illegible] ± 10	Lower Jurassic	
9	[illegible]	Sologoi regional survey area	[illegible]	[illegible]	Muscovite granite	〃	[illegible] ± 12	Middle Triassic	
10	[illegible]	[illegible] North regional survey area	[illegible]	[illegible]	Sericite schist	〃	[illegible] ± 15	Lower Permian	

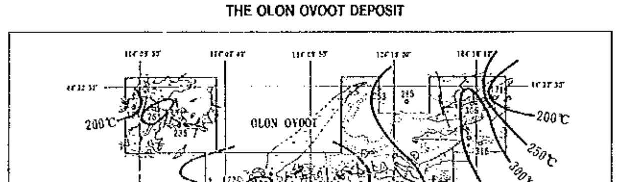
RESULTS OF DATING BY K-Ar METHOD (PHASE Ⅲ)

No.	SAMPLE No.	LOCALITY Boring No.	LOCALITY Depth (m)	ROCK NAME	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
1	[illegible]	[illegible]-1	15.50	White clay	Whole rock	245 ± 12	Lower Triassic	hydrothermal
2	[illegible]	[illegible]-7	87.20- 88.10	Wit microdio	Whole rock	281 ± 14	Lower Permian	cng-py dissem
3	[illegible]	[illegible]-8	95.20- 96.50	Grey-grn colored fresh microdio	Whole rock	325 ± 16	Lower Carboniferous	

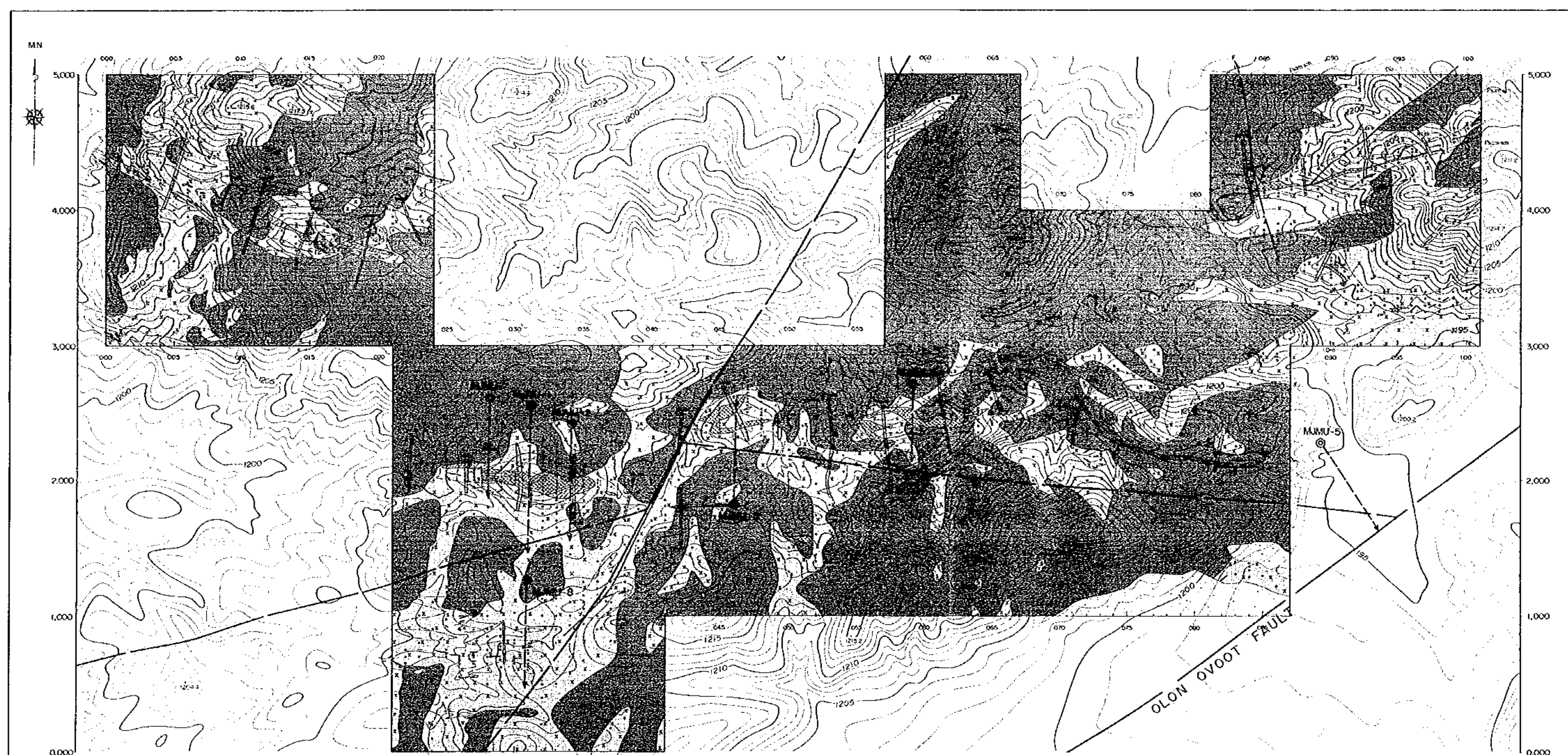
DISTRIBUTION OF GOLD IN THE GEOCHEMICAL SURVEY AREA (PHASE Ⅱ)

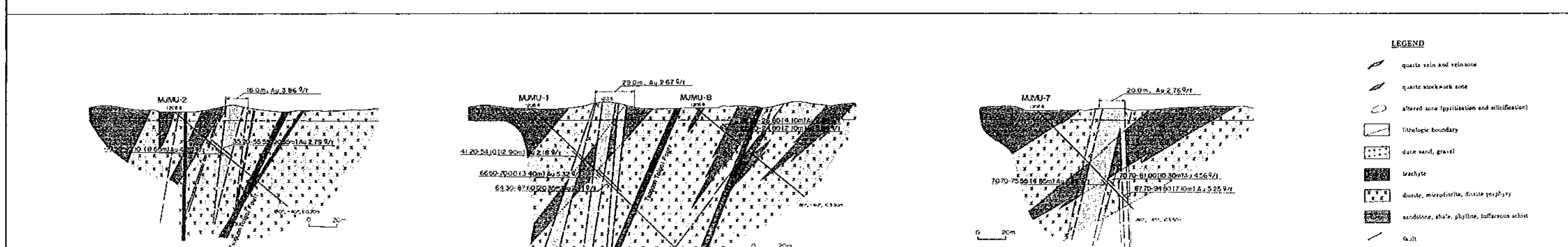


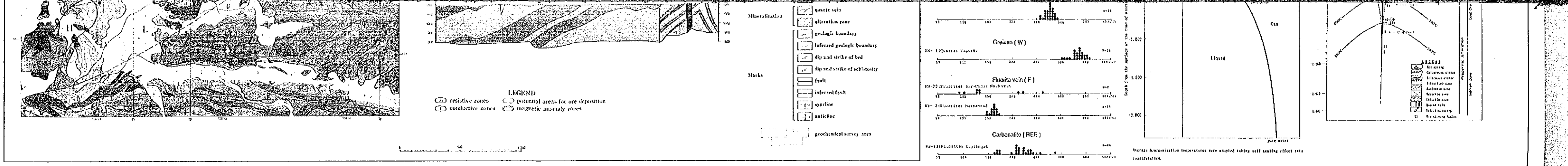
HOMOGENIZATION TEMPERATURE OF THE FLUID INCLUSIONS AT THE SURFACE OF THE OLON OVOOT DEPOSIT



GEOLOGIC MAP OF THE GEOCHEMICAL SURVEY AREA







RESULTS OF DATING BY K-Ar, Pb-Pb METHOD (PHASE I)

No.	SAMPLE No.	LOCALITY	COORDINATES NORTH	COORDINATES EAST	ROCK	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
1	[illegible]	[illegible]	[illegible]	[illegible]	Granite porphyry	K-feldspar	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	Monzodiorite	Hornblende	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]			Granite porphyry	Whole rock	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]			[illegible] granite	Biotite	[illegible]	[illegible]	[illegible]
5						Whole rock	[illegible]	[illegible]	
6	[illegible]	[illegible]	[illegible]	[illegible]	Granite	K-feldspar	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]	[illegible]	Nepheline syenite	Biotite	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	[illegible]	Syenite	Biotite	[illegible]	[illegible]	[illegible]
9						Hornblende	[illegible]	[illegible]	
10						K-feldspar	[illegible]	[illegible]	
11						Whole rock	[illegible]	[illegible]	
12	[illegible]	[illegible]			Nepheline syenite	Nepheline	[illegible]	[illegible]	[illegible]
13						Biotite	[illegible]	[illegible]	
14	[illegible]	[illegible]	[illegible]	[illegible]	Greisen	Muscovite	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	[illegible]	[illegible]	Quartz monzonite	K-feldspar	[illegible]	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	Quartz monzonite	Hornblende	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	Granite	K-feldspar	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	[illegible]	[illegible]	Granite	K-feldspar	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	Alkali granite	Hornblende	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	Syenite	Nepheline	[illegible]	[illegible]	[illegible]
21	[illegible]	[illegible]	[illegible]	[illegible]	Graphic granite	Albite	[illegible]	[illegible]	[illegible]
22	[illegible]	[illegible]	[illegible]	[illegible]	Gabbro	Whole rock	[illegible]	[illegible]	[illegible]
23	[illegible]	[illegible]	[illegible]	[illegible]	Granite	K-feldspar	[illegible]	[illegible]	[illegible]
24	[illegible]	[illegible]	[illegible]	[illegible]	Granodiorite	Biotite	[illegible]	[illegible]	[illegible]
25	[illegible]	[illegible]	[illegible]	[illegible]	Granite	Whole rock	[illegible]	[illegible]	[illegible]
Pb-Pb method									
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(ABBREVIATIONS) [illegible]

*Coordinates of core storage yard or ore stock pile.

**Pb-Pb age were calculated using the formula taken from "Principles of Isotope Geology" by Gunter Faure, 1977.

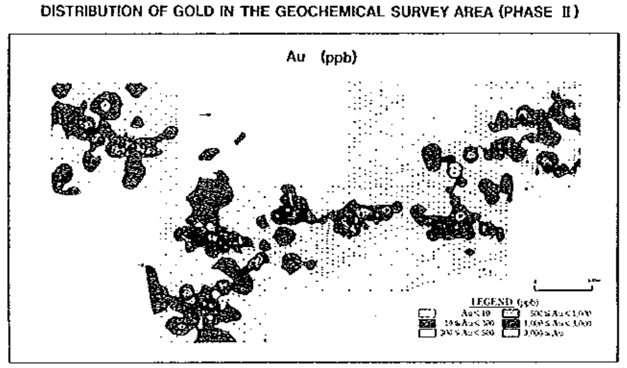
RESULTS OF DATING BY K-Ar METHOD (PHASE II)

No.	SAMPLE No.	LOCALITY	COORDINATES NORTH	COORDINATES EAST	ROCK	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
1	[illegible]	Geochemical survey area	co-ordinated on the detailed survey grid (refer to [illegible])		Schist	Whole rock	[illegible]	Upper Carboniferous	
2	[illegible]	Sub regional survey area			Muscovite quartz vein	"	[illegible]	Lower Permian	
3	[illegible]	Olon ovoot regional survey area	[illegible]	[illegible]	Biotite rhyolite	"	[illegible]	Upper Jurassic	Sub regional co-ordinate [illegible]
4	[illegible]	Sub regional survey area	[illegible]	[illegible]	Sericite schist	"	[illegible]	Lower Permian	
5	[illegible]	Sub regional survey area	[illegible]	[illegible]	Andesite	"	[illegible]	Lower Permian	
6	[illegible]	[illegible] regional survey area	[illegible]	[illegible]	Granodiorite	"	[illegible]	Middle Jurassic	
7	[illegible]	[illegible] regional survey area	[illegible]	[illegible]	Andesite	"	[illegible]	Upper Triassic	
8	[illegible]	[illegible] regional survey area	[illegible]	[illegible]	Aplite	"	[illegible]	Lower Jurassic	
9	[illegible]	[illegible] regional survey area	[illegible]	[illegible]	Muscovite granite	"	[illegible]	Middle Triassic	
10	[illegible]	[illegible] regional survey area	[illegible]	[illegible]	Sericite schist	"	[illegible]	Lower Permian	

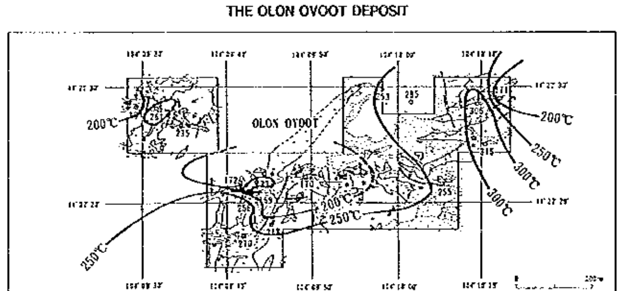
RESULTS OF DATING BY K-Ar METHOD (PHASE III)

No.	SAMPLE No.	LOCALITY Boring No.	LOCALITY Depth (m)	ROCK NAME	MEDIA	RESULT DETERMINED AGE (Ma)	RESULT GEOLOGIC TIME	NOTE
1	[illegible]	[illegible]	48.55	White clay	Whole rock	245 ± 12	Lower Triassic	hydrothermal
2	[illegible]	[illegible]	57.70- 58.70	Alt microdio	Whole rock	284 ± 14	Lower Permian	asp-py dissem
3	[illegible]	[illegible]	55.20- 55.55	Gry-grn colored fresh microdio	Whole rock	325 ± 15	Lower Carboniferous	

DISTRIBUTION OF GOLD IN THE GEOCHEMICAL SURVEY AREA (PHASE II)



HOMOGENIZATION TEMPERATURE OF THE FLUID INCLUSIONS AT THE SURFACE OF THE OLON OVOOT DEPOSIT



GEOLOGIC MAP OF THE GEOCHEMICAL SURVEY AREA