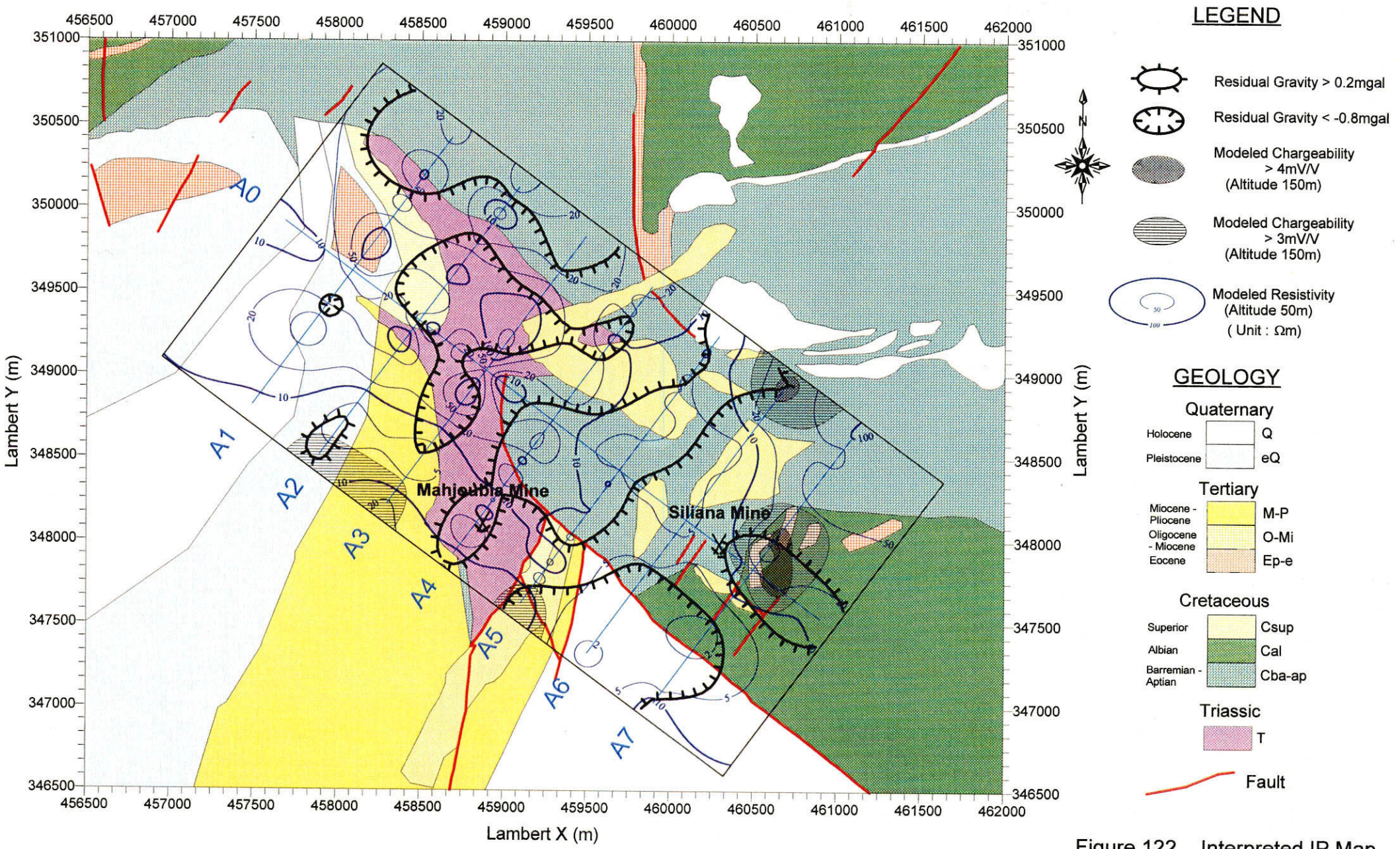
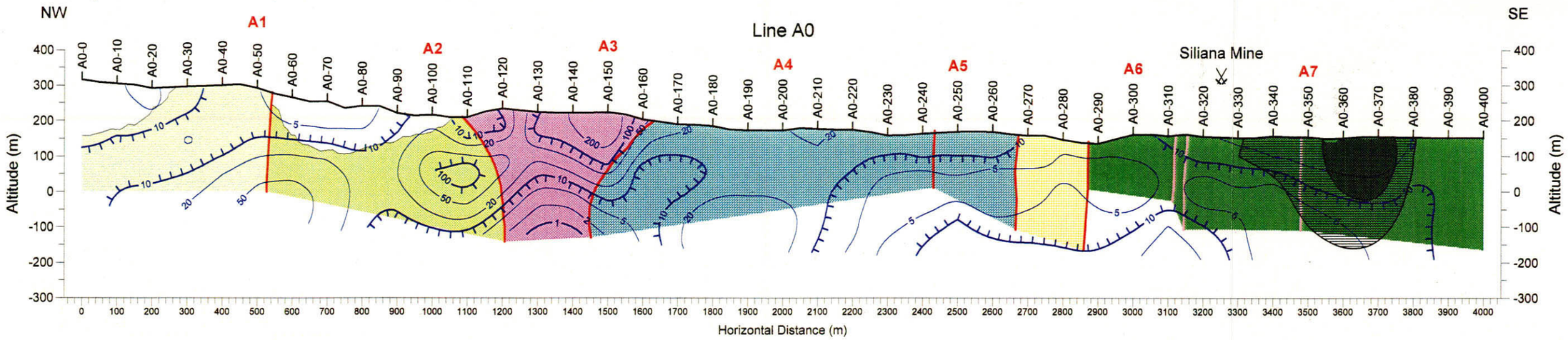
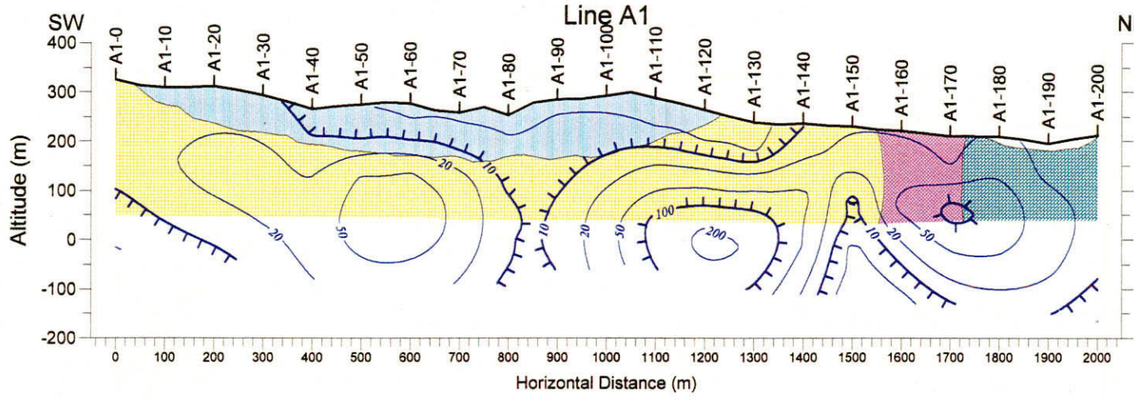
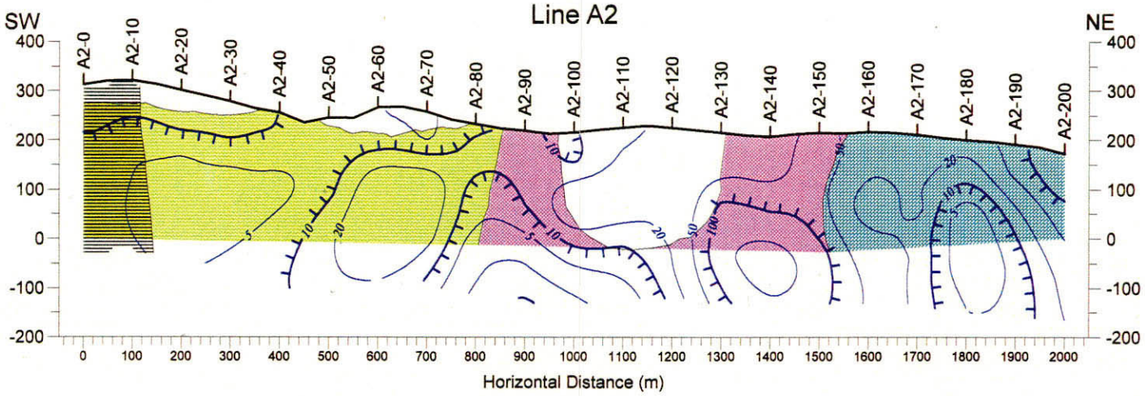
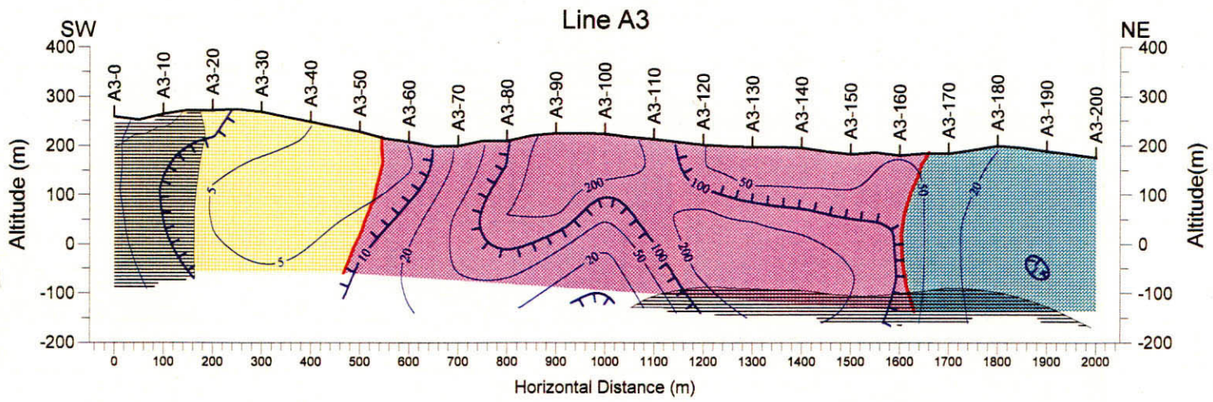


Figure 122 Interpreted IP Map in Siliana Prospect









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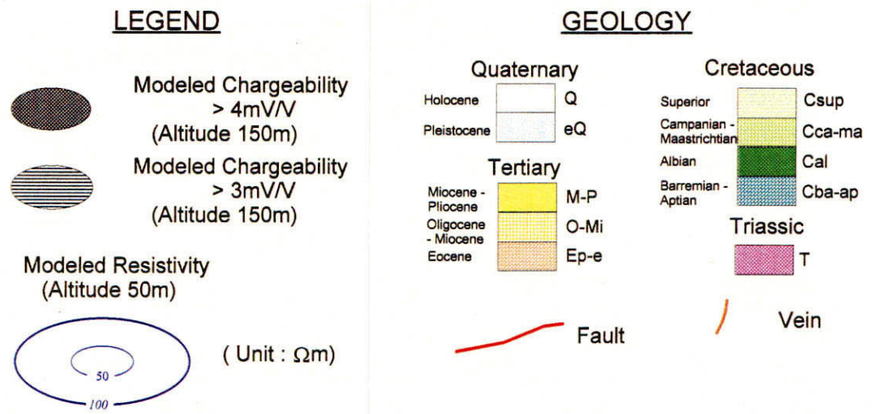
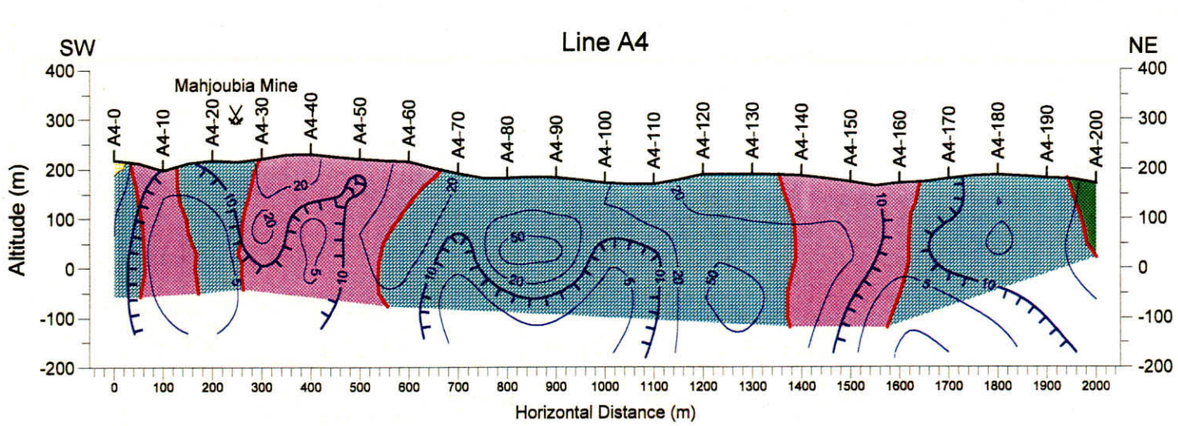
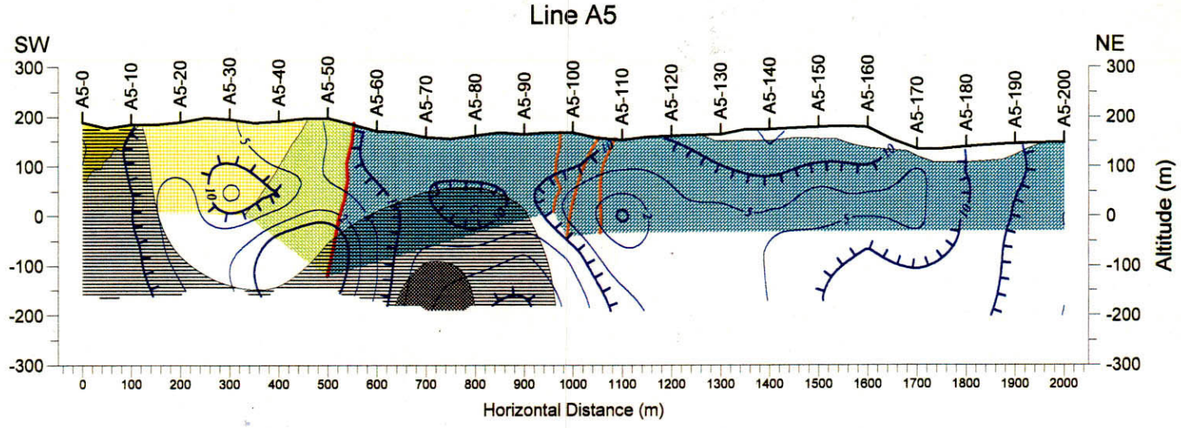
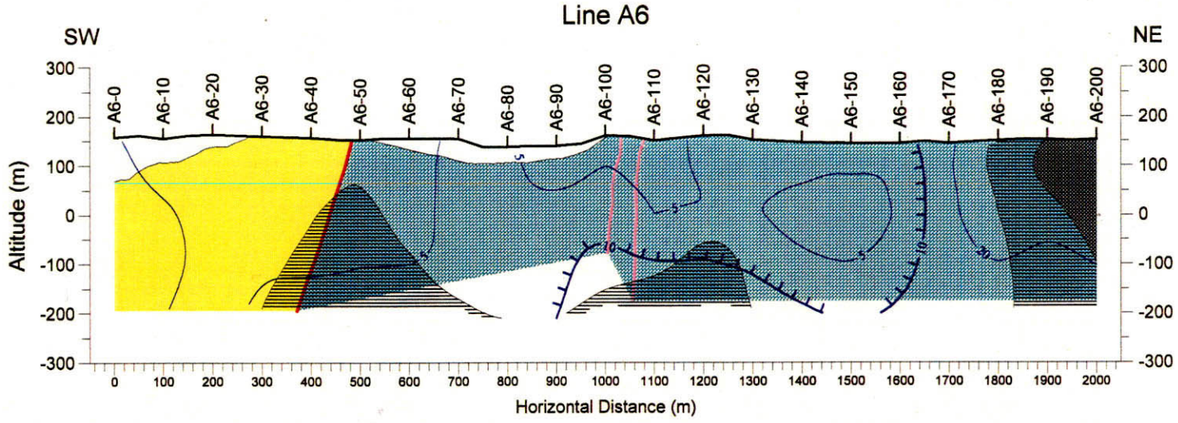
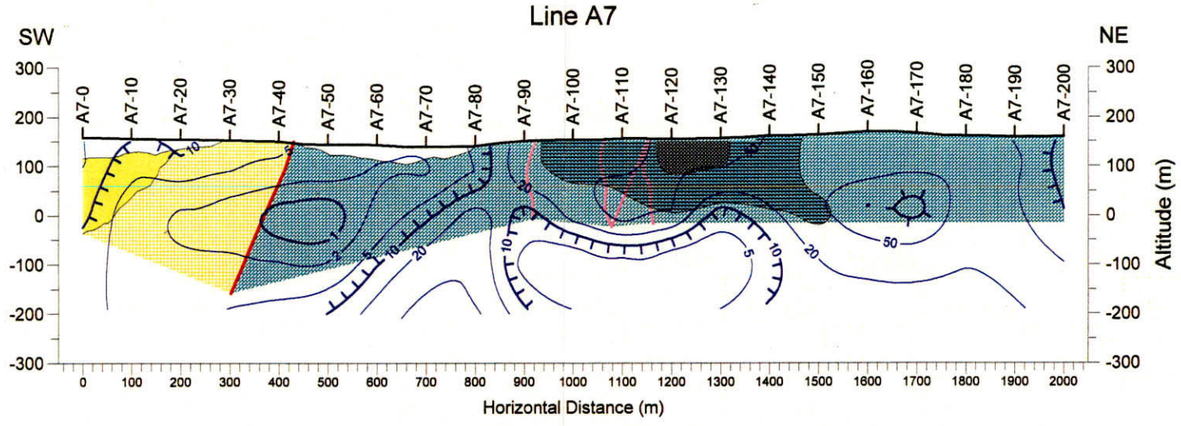


Figure 123 Interpreted IP Section
(Line A0, A1, A2, A3)









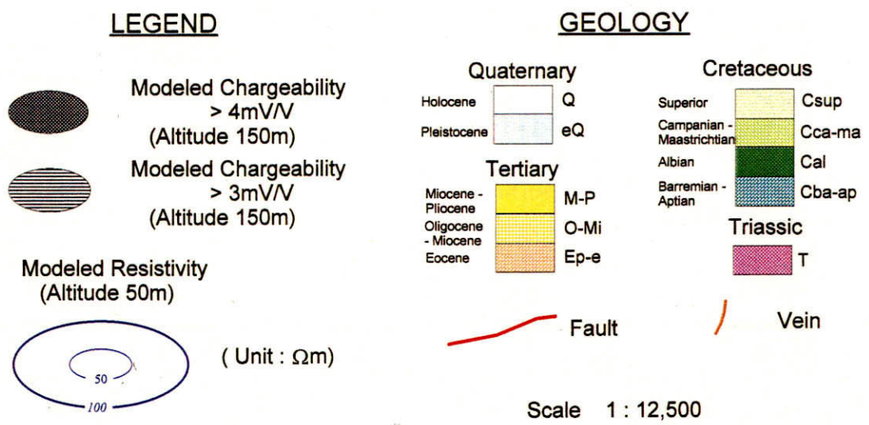


Figure 124 Interpreted IP Section
(Line A4, A5, A6, A7)

on the plan the same as that of the Bazina and Kebira prospects. However the low resistivity layer extends towards upper at the lower parts of the high resistivity section in the distribution zone of the Triassic system. Therefore the zone of the low density and high resistivity is possibly correlated to the Diapir with low density. The low resistiviy is dominated over the survey area and the fault can not be easily inferred on the plan. However the inferred faults are detected as a line of the resistivity discontinuity on the cross section and the resistivity distribution is considered to reflect rather well the geological strata.

The chargeability obtained in this prospect is considerably low and the chargeability anomaly is not detected at the known mineralized site. The chargeability anomalies exceeding 4mV/V detected in the vicinity of the southeastern end of the line A6 in the northeastern parts of the survey area and at shallow depth around an intersection between the lines A0 and A7. The vein accompanied by the weak mineralization is recognized for the latter anomaly. Notwithstanding that an indication of the mineralization is not recognized in the former anomaly zone, which is also considered an interesting anomaly, because this anomaly is situated in the vicinity of the high resistivity zone and the gravity basement rise correlated to the Triassic system. The chargeability anomalies exceeding 4mV/V detected at deeper part of the intersection by the lines A0 and A5 in the central parts of the survey area. This anomaly is also considered a promising anomaly, because this is situated in the vicinity of the high resistivity zone and the gravity basement rise correlated to the Triassic system and furthermore the weakly mineralized vein is recognized at near the surface around the anomaly zone.

1.3.4 El Akhouat-Argoub Adama Prospect

(1) Gravity survey

The geophysical survey of the prospect was carried out partly in 2 lines of the L1 and the L2 in the southwest part in order to follow up the last year's survey. Bouguer anomaly observed in the gravity survey is not so much different from the last year's result. Little valid difference between this year and last year is recognized in the estimated residual gravity and the vertical first derivative. Only the results of the cross section analysis are described below.

Such as the Siliana prospect, three layers model is assumed. Each layer from the lowermost to the upper most is the Triassic system with density difference of 0.00 g/cm^3 as a gravity basement, the Cretaceous limestone with density difference of 0.10 through 0.40 g/cm^3, the Quaternary system 0.20 g/cm^3. In the line L2 which magnetic survey was applied to last year the structure is estimated by using both density and magnetic susceptibility.

・L1 Cross Section (Figure 125)

This section crosscuts the southwestern end of the prospect from the northwest to the southeast. Broadly the top depth of the gravity basement in the section tends to increase as follows; 250 m above sea level in the northwestern end and deeper than 500 m below sea level. The gravity basement rises to around 350m above sea level in the central part of the section, and the result that overlaying high-density layer is pushed up leads the lack of the Quaternary in the surface part. The steep slopes in the both sides of the rise of the gravity basement suggest the fault structures.

・L2 Cross Section (Figure 126)

This section runs in the southwest of the El Akhouat working apart from 250m in the NW-SE direction. The top depth of the gravity basement in the section tends to increase as follows; 450 m above sea level in the northwestern end and deeper than 100 m below sea level. The drop of the top of the gravity basement suggesting the fault is estimated around the station L2-15, and the steep slopes around the L2-45 and around the L2-85 suggest the fault structures. The surface layer corresponded to the Cretaceous limestone indicates high density with density difference of 0.40 g/cm^3 in the northwestern side from the center of the section, and relative low density with density difference of 0.40 g/cm^3 in the other southeastern side. The variation within the surface layer may reflect increase of maar content in the Cretaceous system. In consideration of the broad plain area in the southeastern extension of the section, the low-density layer with density difference of -0.20 g/cm3, which overlies the high-density layer and is corresponded to the Quaternary system, is assumed such as the cross section L1.

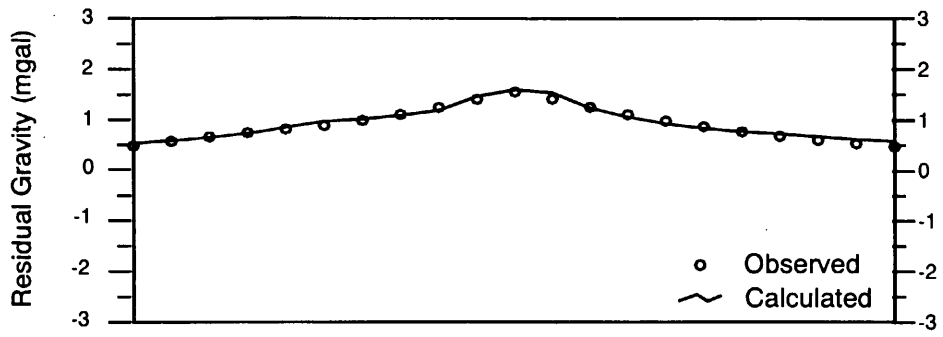
(2) IP survey

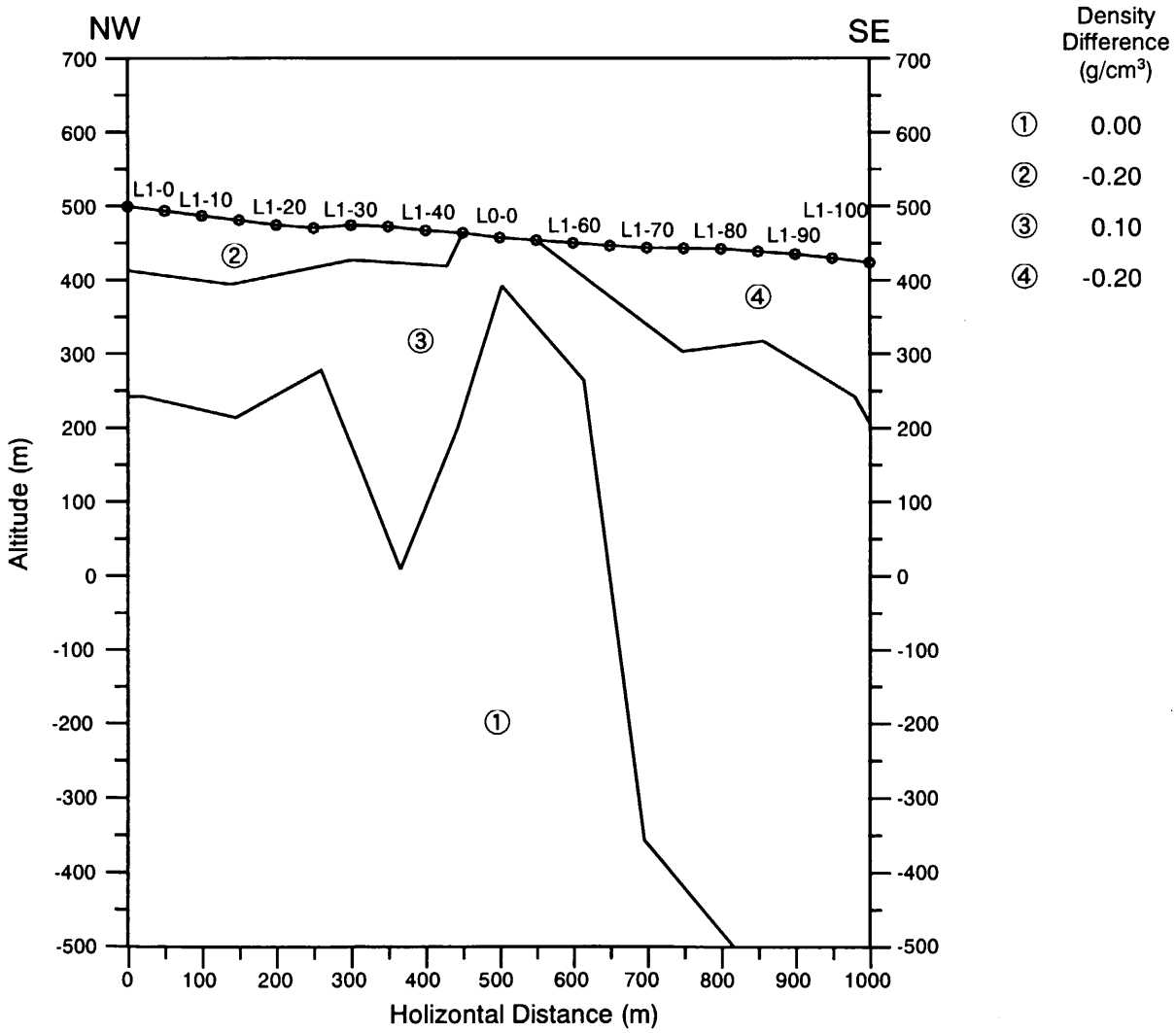
① Apparent resistivity and observed chargeability

In the results of the last year's survey, chargeability anomalies are observed in the central part of the line in the southwest area of the prospect and around the southwestern end of the baseline L0. Because the borehole MJLTK-2 aiming toward the former anomaly exceeding 20 mV/V caught mineralized zones, IP survey was carried out in the southwestern side of the borehole in order to estimate the southwestward extension of the mineralized zone.

Such as the line L3 the high apparent resistivity of several hundreds ohm-meters, which is corresponded to the Cretaceous limestone, is observed in the L2 in the southwest of the L3 apart from 500m. The apparent resistivity in the line L1 indicates the maximum of scores ohm-meters. In the line L2 the chargeability anomalies exceeding 10 mV/V are observed, there is no valid anomaly in the L1.

Characteristics of apparent resistivity and observed chargeability in each section are





Density Difference (g/cm^3)

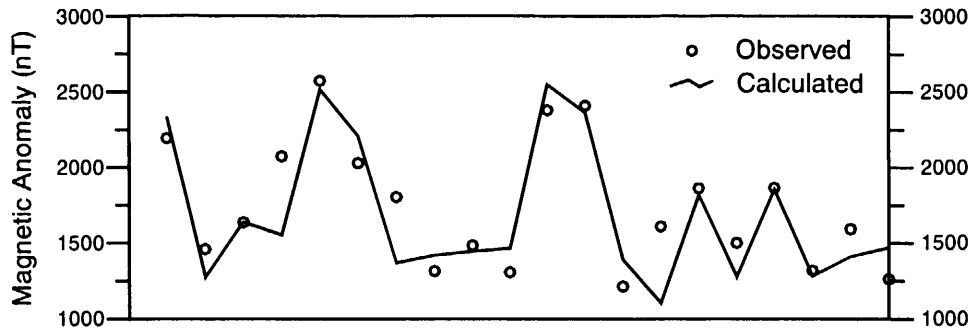
①	0.00
②	-0.20
③	0.10
④	-0.20

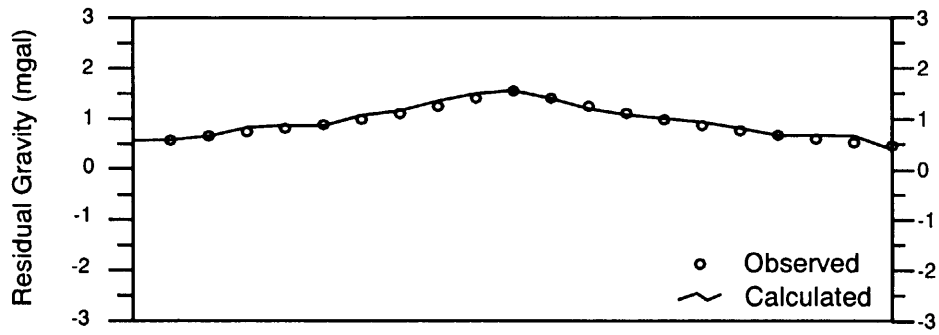
Figure 125

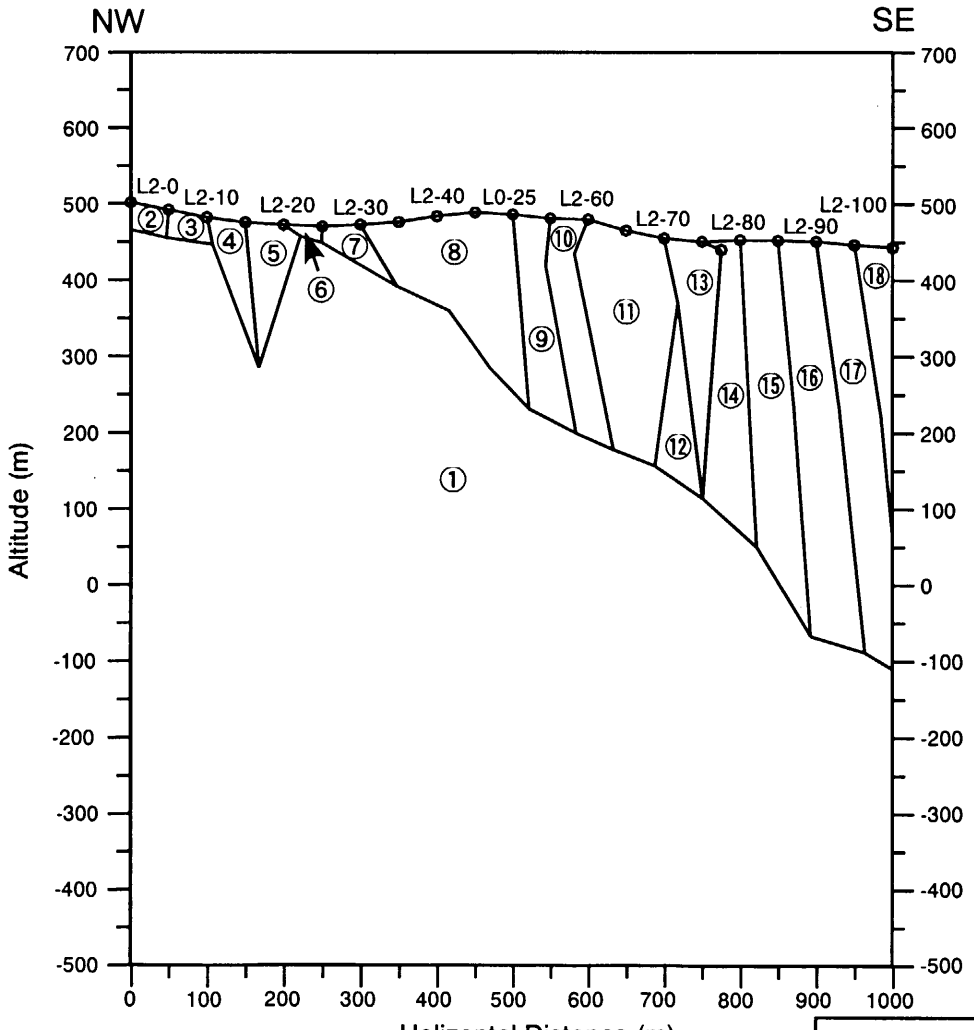
Result of 2-D Gravimetric analysis (Line L1)

Scale : 10,000

March, 2001







	Density Difference (g/cm³)	Magnetic Susceptibility (cgsemu)
①	0.00	0.000
②	0.25	0.000
③	0.25	0.003
④	0.25	0.000
⑤	0.30	0.001
⑥	0.40	0.000
⑦	0.40	0.005
⑧	0.25	0.000
⑨	0.30	0.001
⑩	0.10	0.004
⑪	0.10	0.005
⑫	0.10	0.000
⑬	0.10	0.003
⑭	0.10	0.000
⑮	0.00	0.000
⑯	0.10	0.003
⑰	0.10	0.000
⑱	0.10	0.002

Figure 126

Result of 2-D Gravimetric and Magnetic Analysis (Line L2)

Scale : 10,000

December, 2000

described below.

・L1 Cross Section (Figure 127)

This section crosscuts the southwestern end of the prospect from the northwest to the southeast. The variation of apparent resistivity, ranging from 19 to 67 Ωm, is relatively small. The anomalies of high apparent resistivity around the station L1-40 and the L1-70 suggest resistivity high in the central part of the section.

Observed chargeability is low as a whole except for the weak anomaly beyond 5 mV/V in the southeastern part of the section.

・L2 Cross Section (Figure 128)

This section runs in the southwest of the El Akhouat working apart from 250m in the NW-SE direction. Apparent resistivity in the section, ranging between 20 and 339 Ωm, is high than the L1. The high anomaly of apparent resistivity exceeding 200 Ωm is observed at the shallow depth in the central part of the section, the low anomaly less than 50 Ωm underlies.

High observed chargeability 5 or more mV/V extends, large anomaly above 10 mV/V is stretched from the central to the lower southeast part of the section.

② Modeled resistivity and chargeability

The southwest end of the extended resistive anomaly above 100 Ωm at the shallow depth around the El Akhouat working reaches up to between the line L2 and the L1. As the depth level becomes lower, the resistive anomaly moves the southeastern parts of the line L1 and the L2. The line L3 where unknown mineralized zone was found is centered in the extended chargeability anomaly, which tends to become the lager as the deeper. The strong chargeability anomaly beyond 10 mV/V extends up to the line L2, and it does not reach to the L1 in the southwest end of the prospect.

Characteristics of resistivity and chargeability, as the result of modeling, are described below for each of the cross sections and the plans at elevations of 200, 300 and 400 m.

・L1 Cross Section (Figure 129)

This section crosscuts the southwestern end of the prospect from the northwest to the southeast. The northwestern part of the section indicates low resistivity below 50 Ωm, and the thin conductive layer less than 50 Ωm overlies above the high resistivity exceeding 100 Ωm. High resistivity is corresponded to the Cretaceous limestone, the thin conductive surface layer the Quaternary system. The low resistivity supposed the Triassic systems push from the lower to upper and continues to the low resistivity in the northwestern part.

Though the weak anomaly of 5 or up mV/V is estimated in the southeastern part of the

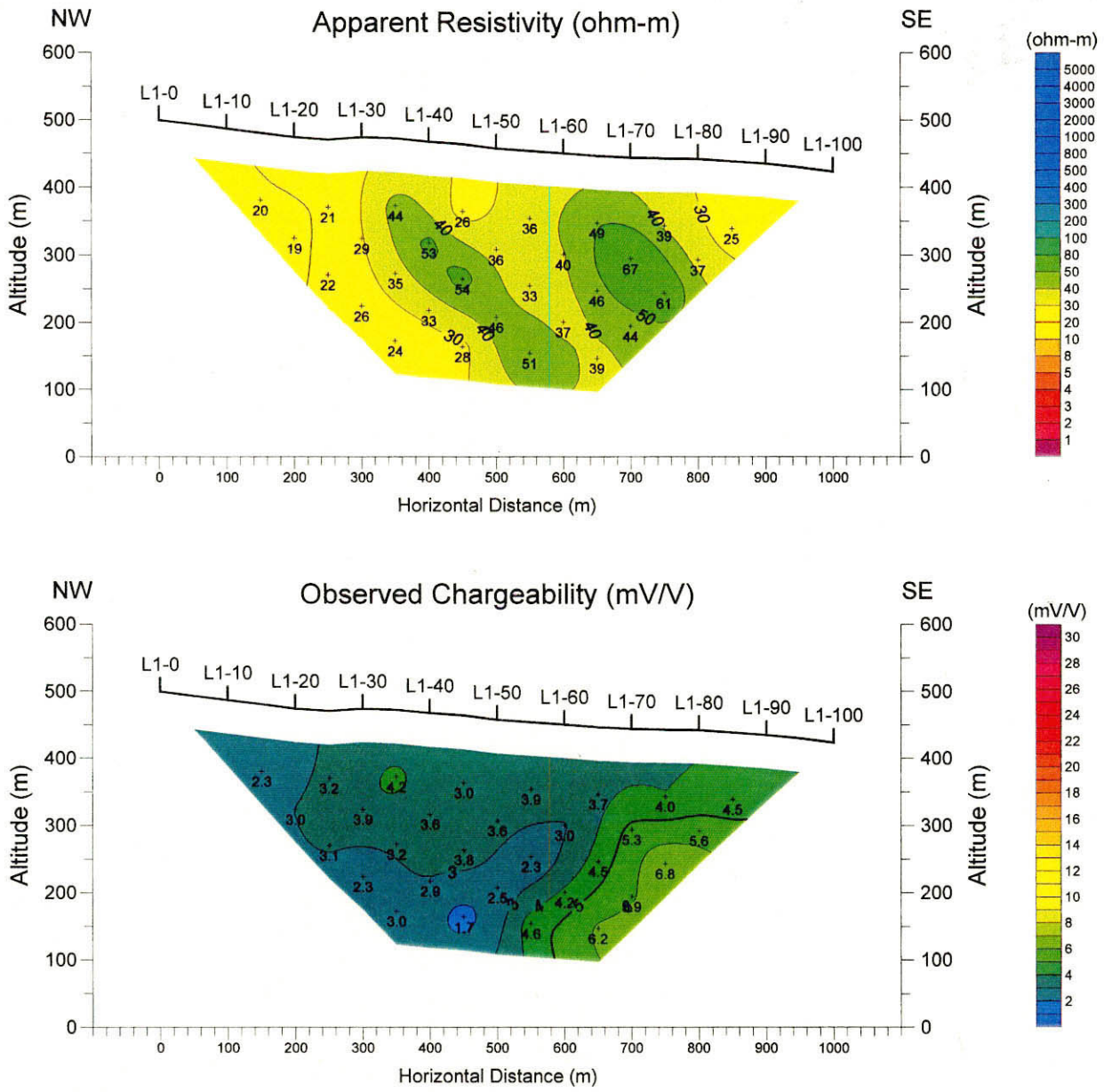


Figure 127 Observed IP pseudo-section (Line L1)

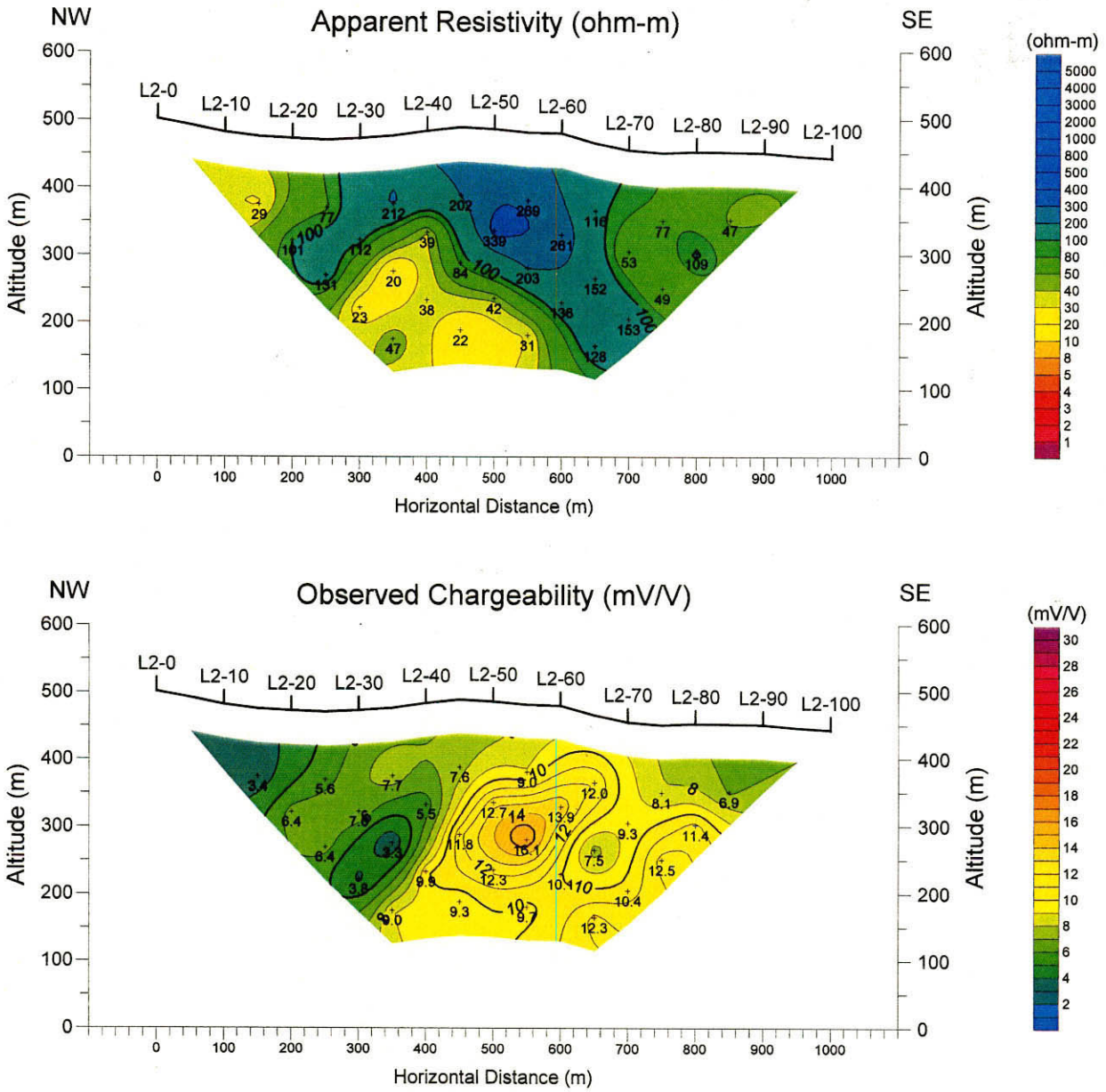


Figure 128 Observed IP pseudo-section (Line L2)

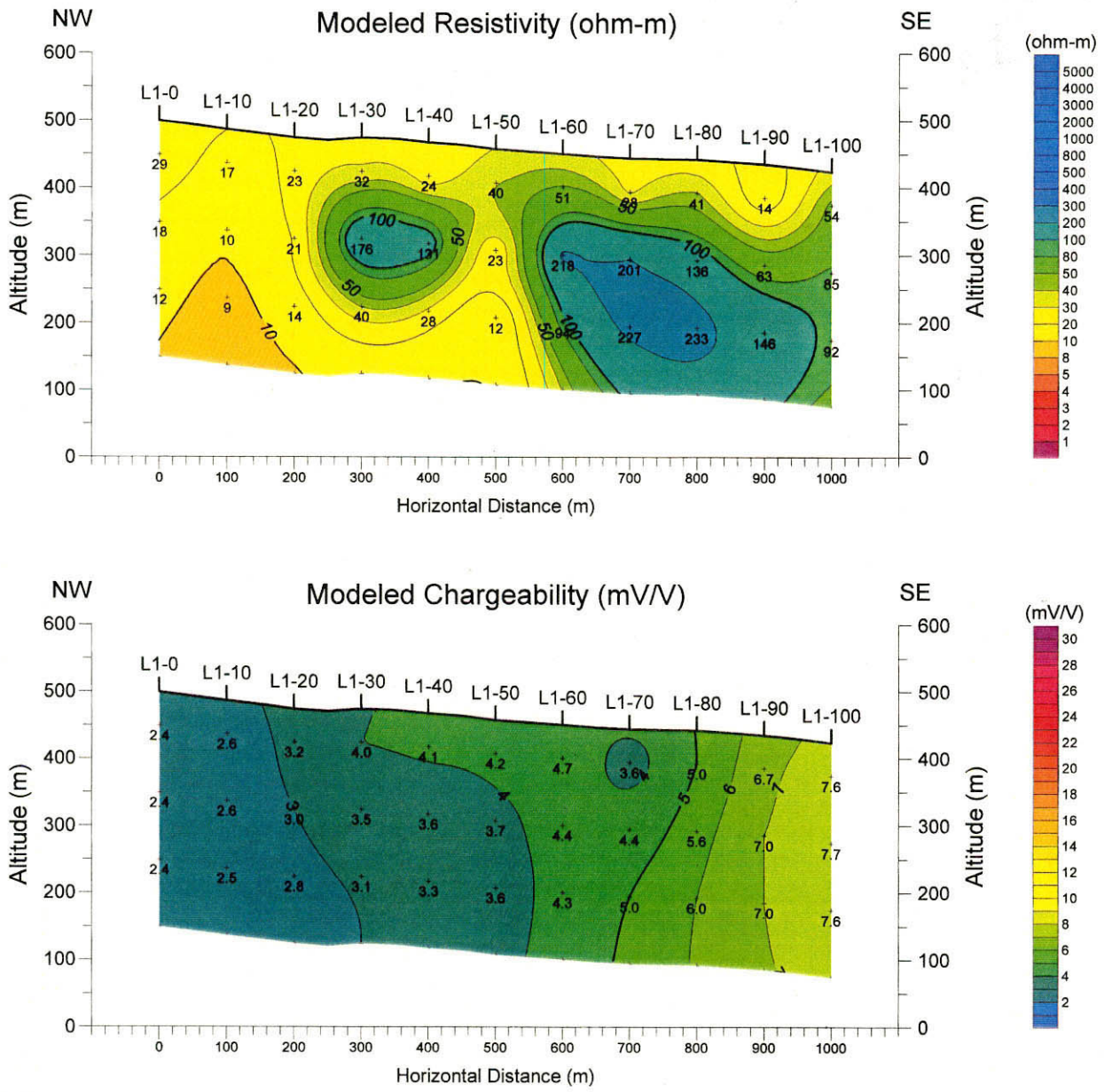


Figure 129 Modeled IP section (Line L1)

section, it is not considered valid in the prospect where several anomalies beyond 10 mV/V is recognized

・L2 Cross Section (Figure 130)

This section runs in the southwest of the El Akhouat working apart from 250m in the NW-SE direction. High resistivity above 50 Ωm corresponded to the Cretaceous system stands the majority of the section. Within the resistive zone resistivity between the station L2-20 and the L2-70 become beyond 100 Ωm, and the southeast from the L2-70 indicate relative low resistivity between 50 and 100Ωm. It is supposed that the former may is corresponded to limestone mainly and the latter may reflect increase of marr contents. The conductive anomaly below 30 Ωm rise from the deeper upward around the station L2-40 in the central part of the section such as the line L1. It is supposed that low resistivity in the southeast end of the section is corresponded to the Quaternary system and the conductive anomaly at the surface between the station L2-10 and 20 in the northwestern part may suggest a shear zone accompanied with a fault.

Chargeability in the majority of the section indicates high above 10 mV/V exception for the northwestern part. Especially, higher resistivity exceeding 15 mV/V is estimated at the lower part around the station L2-70.

・Plan map of modeled resistivity altitude=200m (Figure 131)

The south end of resistive anomaly above 100 Ωm extending in the central part of the line L3 through L5 along the baseline L0 is located in the line L2, and the line L1 indicates low resistivity. The former resistive anomaly is corresponded to the Cretaceous limestone forming the hill, and the latter low resistivity may reflect the Quaternary system in the plain area.

・Plan map of modeled resistivity altitude=300m (Figure 132)

The resistive anomaly mentioned above extends to the southeastern part of the line L1. The anomaly becomes broader in the southwestern area of the prospect.

・Plan map of modeled resistivity altitude=400m (Figure 133)

The resistive anomaly mentioned above is divided in two anomalies in the northwestern part from the line L2 to the L3 and in the southeastern part of the line L1 and the L2 by the conductive anomaly below 10Ωm, which appears between the station L0-0 and 25 in the southwestern end of the baseline. It is supposed that the conductive anomaly is corresponded to the rise of the Triassic system.

・Plan map of modeled chargeability altitude=200m (Figure 134)

In the southwestern part of the prospect the changeability anomaly above 10 mV/V

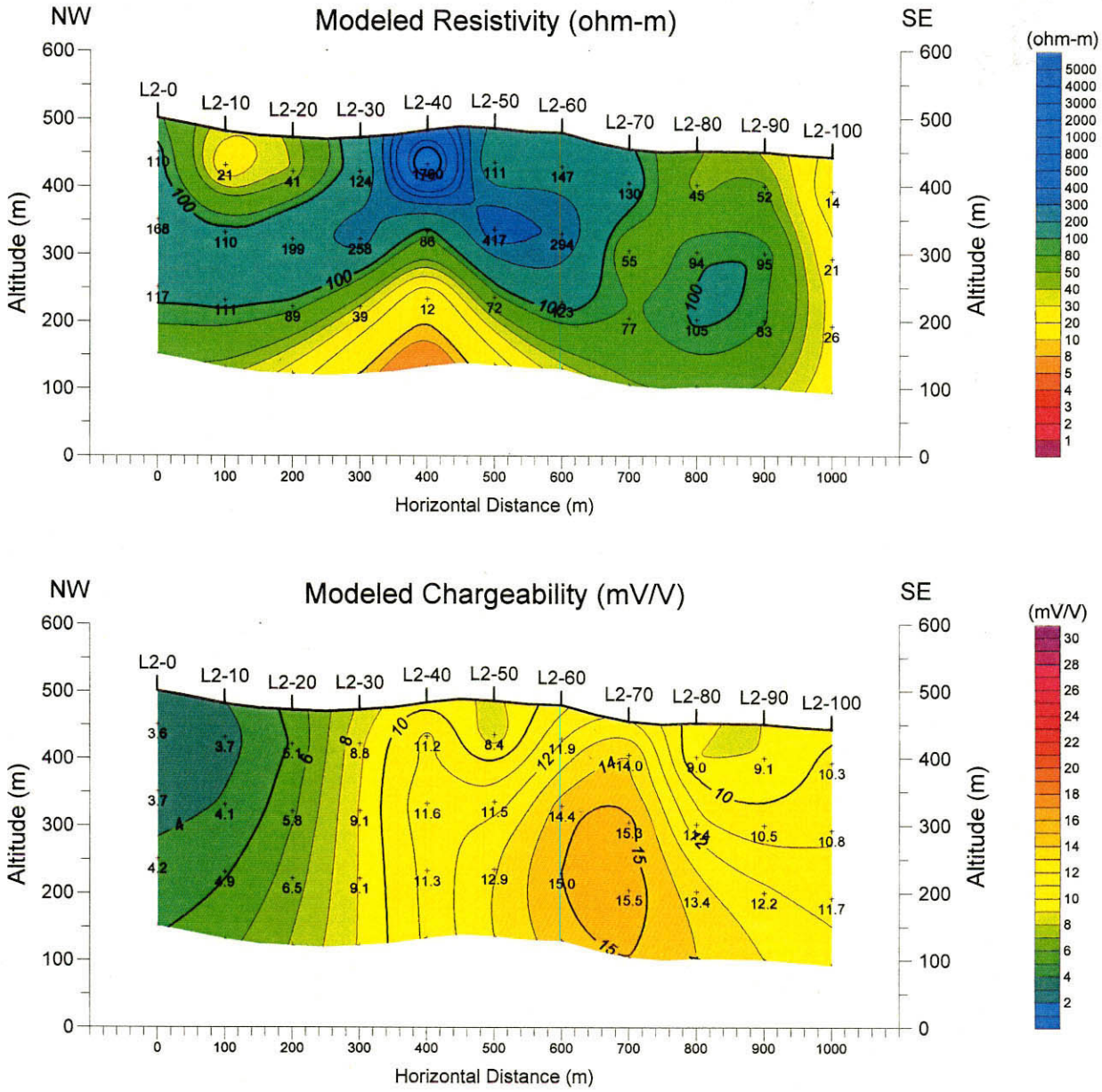
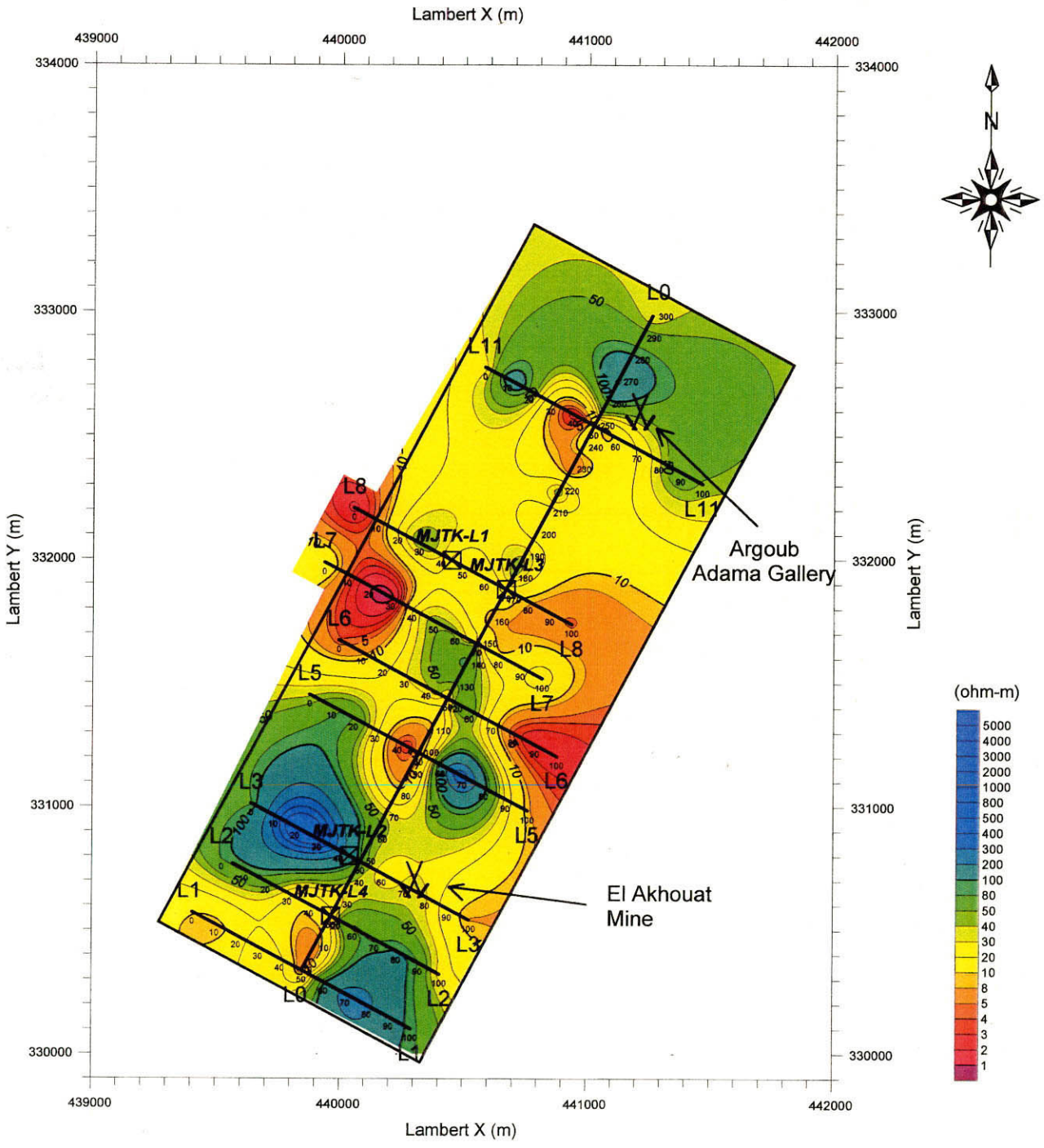


Figure 130 Modeled IP section (Line L2)



LEGEND

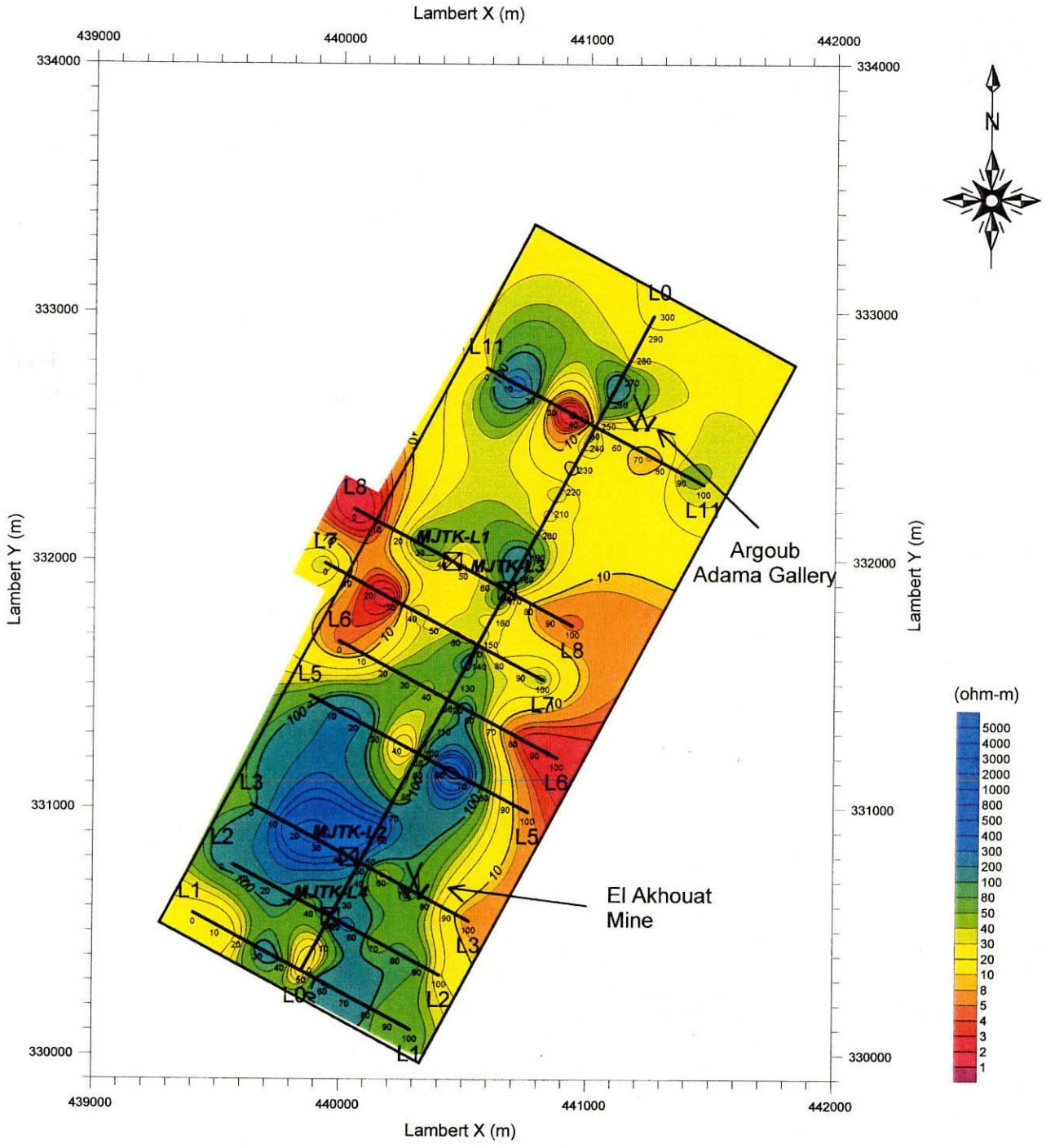
— : IP survey Line

□ : Survey Area

XX : Closed Mine

⊠ : Diamond Drill-Hole

Figure 131
Plan map of modeled resistivity in El Akhouat-Argoub Adama prospect (Altitude=200m)
Scale 1 : 25,000
March, 2001



LEGEND

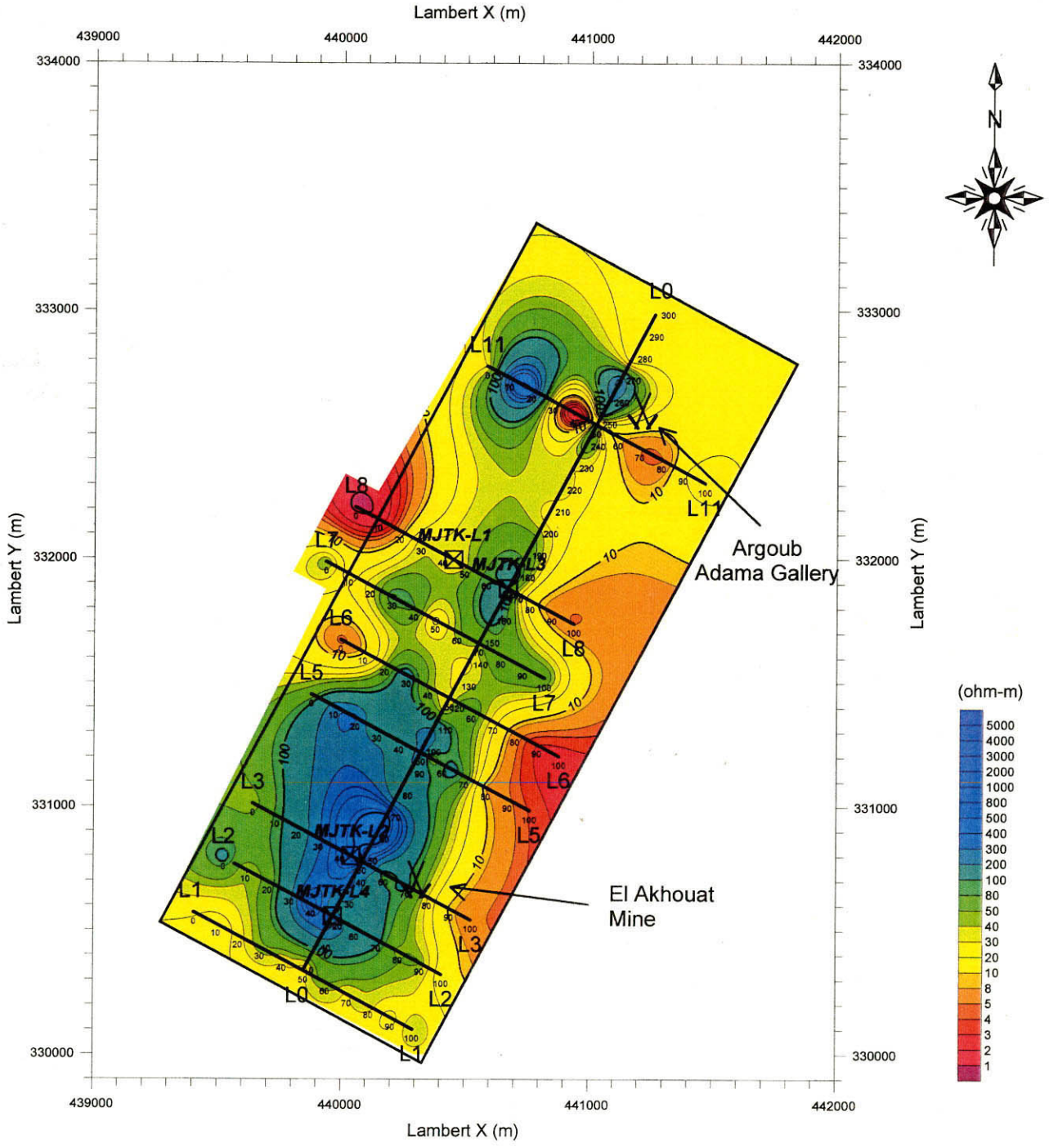
— : IP survey Line

□ : Survey Area

✕ : Closed Mine

⊠ : Diamond Drill-Hole

Figure 132
Plan map of modeled resistivity in El Akhouat-Argoub Adama prospect (Altitude=300m)
Scale 1 : 25,000
March, 2001



LEGEND

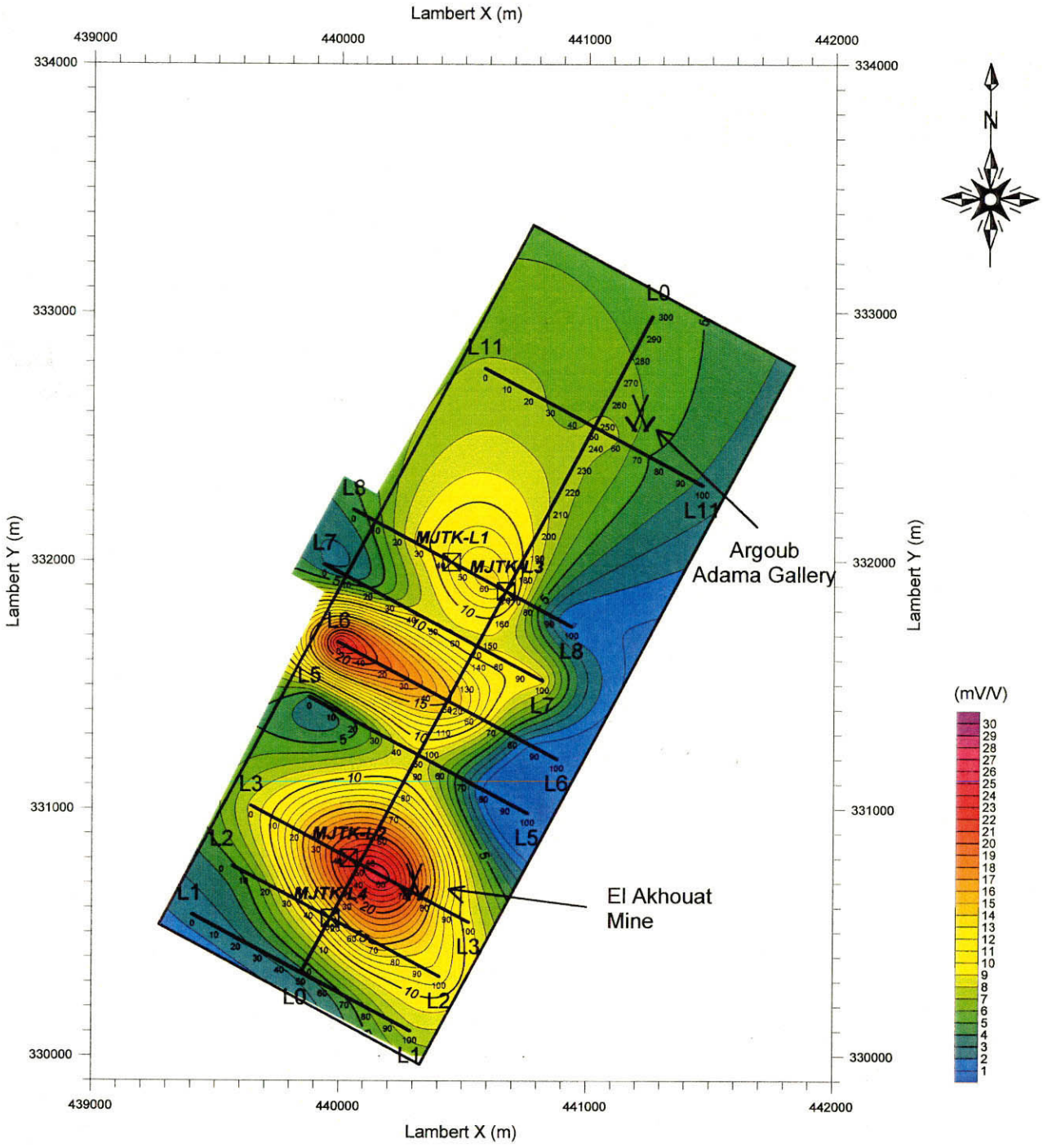
— : IP survey Line

□ : Survey Area

XX : Closed Mine

⊠ : Diamond Drill-Hole

Figure 133
Plan map of modeled resistivity in El Akhouat-Argoub Adama prospect (Altitude=400m)
Scale 1 : 25,000
March, 2001



LEGEND

— : IP survey Line

□ : Survey Area

XX : Closed Mine

⊠ : Diamond Drill-Hole

Figure 134
Plan map of modeled chageability in El Akhouat-Argoub Adama prospect (Altitude=200m)
Scale 1 : 25,000
March, 2001

extends along the baseline L0 between the line L2 and the L4. The anomaly doesn't reach up to the line L1 in the southwestern end of the prospect. The small chargeability anomaly beyond 20 mV/V is recognized around the line L3.

・Plan map of modeled chargeability altitude=300m (Figure 135)

The changeability anomaly above 10 mV/V in the southwestern part of the prospect is united into one with that in the northwestern end of the line L6 in the central part of the prospect. Though the zone indicating above 15 mV/V extends to the station L2-70 within the anomaly, the higher zone beyond 20 mV/V is limited in the central part of the line L3.

・Plan map of modeled chargeability altitude=400m (Figure 136)

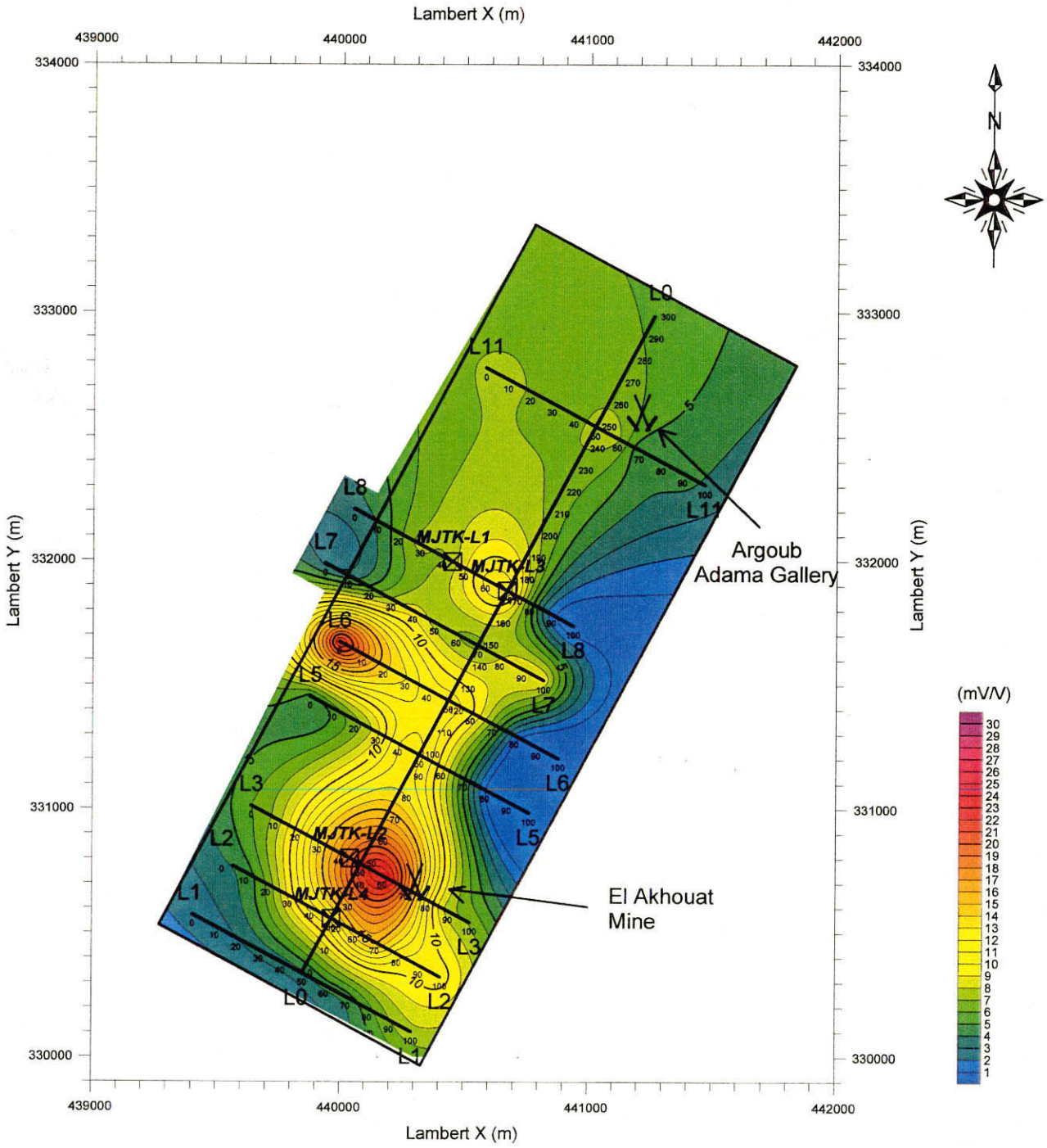
The chargeability anomaly exceeding 10mV/V mentioned above is divided into 2 anomalies around the central part of the line L3 and around the northwestern part of the L6 again. Within both anomalies the higher zone indicating beyond 20mV/V extends. The line L2 investigated in this year, however, is located the southwestern marginal zone of the high chargeability above 15 mV/V, and the anomaly doesn't extend to the line L1.

③ Interpretation

In comparison between the cross sections L1 and the L2, the high resistivity, which may reflect the Cretaceous limestone, is corresponded to the high-density layer. The density variation within the high-density layer is similar to the resistivity variation in the high resistivity. The zone with density difference of 0.10 g/cm^3 approximately agreed with that ranging between 50 and 100 Ωm.

The conductive layer below 30 Ωm, which push up the overlying resistive layer from the lower, corresponded to the rise of the Triassic gravity basement. The rise of the Triassic system is sifted southeastward around the station L3-70 in the line L3 of the northeast neighbor of the L2. The feature is consistent with the geological structure that a transforming fault runs between the line L2 and the L3.

The chargeability anomaly above 10 mV/V extends up to the line, and is not recognized around the line L1. The boundary of the anomaly is corresponded to the small valley runs through between the line L1 and the L2 toward the northwestern part of the L3. It is supposed that the valley limits the area of the chargeability anomaly related to the mineralization. In the 3 boreholes of the MJLTK-1 at the station L8-40, the MJLTK-3 at the L8-60 and the MJLTK-4 at the L2-40, which are drilled within the chargeability anomalies above 10mV/V, the rocks are not mineralized so much and include a lot of pyrite. The borehole MJLTK-2 at the station L3-40, which caught mineralized zones, is located in the higher chargeability anomaly beyond 20 mV/V, and some of the specimens collected from the



LEGEND

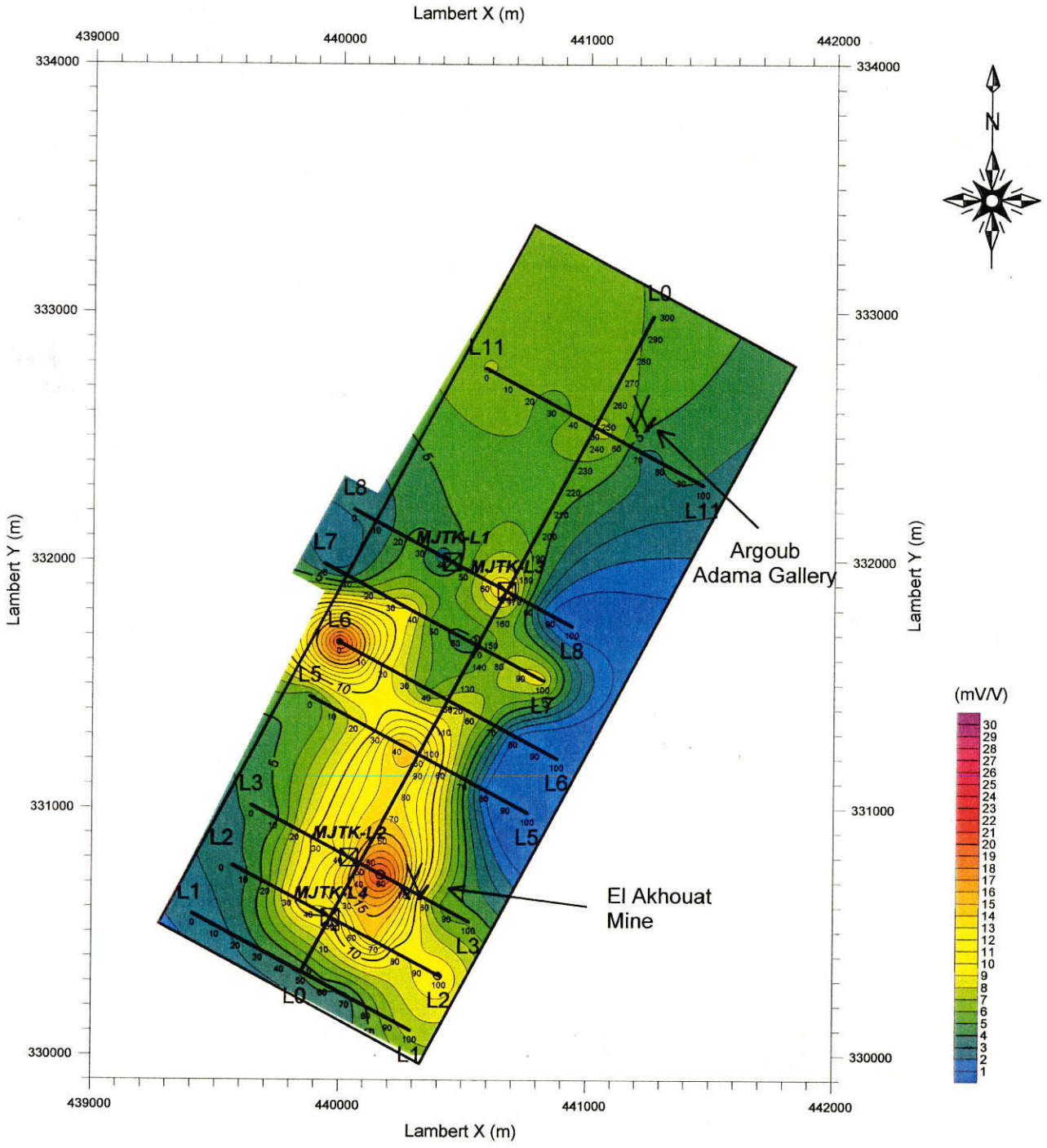
— : IP survey Line

□ : Survey Area

XX : Closed Mine

⊠ : Diamond Drill-Hole

Figure 135
Plan map of modeled chageability in El Akhouat-Argoub Adama prospect (Altitude=300m)
Scale 1 : 25,000
March, 2001



LEGEND

— : IP survey Line

□ : Survey Area

✕ : Closed Mine

⊠ : Diamond Drill-Hole

Figure 136
Plan map of modeled chageability in El Akhouat-Argoub Adama prospect (Altitude=400m)
Scale 1 : 25,000
March, 2001

mineralized zones indicate considerably higher chargeability exceeding 100 mV/V. From the good understanding on the relationships of chargeability anomaly to mineralization, it is supposed that chargeability becomes a effective parameter, which specifies the exploration area and classifies mineralization.

Chapter 2 Drilling Investigation

2.1 Summary of the Drilling Operation

The drilling operation of the 2nd year campaign comprised two holes for the Bou Khil prospect (MJTK-B1 and B2) and four holes for the El Akhouat-Argoub Adama prospect (MJTK-L1, L2, L3 and L4).

The drilling operation results are summarized in Table 11. The drilling program had been originally planned to drill four holes, two holes each for the Bou Khil and El Akhouat-Argoub Adama, totaling 1,600m in length. The program was altered, in the course of the operation, to add two more holes with the length of 400m each for the El Akhouat-Argoub Adama and to increase the total meterage to 2,400m. However, the two holes in the Bou Khil prospect failed to reach the intended depth of 400m due to operational accidents, such as jamming, and unfavorable ground conditions, such as unconsolidated sandstones. Accordingly, these holes were immaturely terminated at 216.80m and 142.10m respectively. In addition, in the El Akhouat-Argoub Adama prospect, the hole MJTK-L3 was completed at the depth of 374.50m, having penetrated the basement Triassic system at the shallower depth than originally estimated. The achieved total length of drilling resulted in 1,933.50m for the six drill holes compared to the planned 2,400m.

Table 11 Drilling Operation Result

	MJTK-B1	MJTK-B2	MJTK-L1	MJTK-L2	MJTK-L3	MJTK-L4
Preparation Phase	7/11/2000	11/1/2001	21/9/2000	20/10/2000	25/12/2000	2/2/2001
Number of Days	4.5	3.0	6.0	2.5	5.5	3.5
Drilling (From)	11/11/2000	14/1/2001	27/9/2000	21/10/2000	30/12/2000	5/2/2001
(To)	9/1/2001	29/1/2001	17/10/2000	4/11/2000	30/1/2001	27/2/2001
Drilling Days	63.5	16.0	21.0	14.5	31.5	22.0
Mobilization Phase	10/1/2001	30/1/2001	18/10/2000	5/11/2000	31/1/2001	28/2/2001
Number of Days	1.0	1.0	2.0	2.0	2.0	2.0
Total of Days	69.0	20.0	29.0	19.0	39.0	27.5
Planned Depth	400.00m	400.00m	400.00m	400.00m	400.00m	400.00m
Drilled Depth	216.80m	142.10m	400.10m	400.00m	374.50m	400.00m
Overburden	1.50m	9.00m	21.70m	0.80m	0.60m	0.50m
Core Length	169.00m	58.90m	351.10m	375.50m	344.10m	372.10m
Recovery	78.4%	44.3%	92.8%	94.0%	86.1%	93.1%
HW Casing	—	60m	—	—	—	15m
HQ Casing	—	—	—	—	—	—
NW Casing	189m	126m	54m	33m	81m	60m
Meters/Day	3.41m	8.88m	19.05m	27.58m	11.88m	18.18m
Meters/Total Days	3.14m	7.10m	13.79m	21.05m	9.60m	14.54m

2.2 Procedure of the Drilling Operation

2.2.1 Operation Schedule

The achieved drilling schedule for each drill hole is shown in Table 12. The drilling operation was initially carried out by only one drill machine. However, the second machine was introduced at the end of December when it was decided to drill additional two holes in the El Akhouat-Argoub Adama prospect.

Table 12 Drilling Schedule

	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
MJTK-B1			11/7 ———	———	——— 1/10		
MJTK-B2					1/11 ———	——— 1/30	
MJTK-L1	9/21 ———	——— 10/18					
MJTK-L2		10/20 ———	——— 11/5				
MJTK-L3				12/25 ———	———	——— 1/31	
MJTK-L4					2/2 ———	———	——— 2/28

2.2.2 Drilling Work and Work Force

The drilling work was carried out using a wire-line method, being contracted to two drilling companies stationed in Tunis, the Republic of Tunisia. The contractors were Sondages Service Travaux for the originally planned four holes and Tunisian Mineral Services for the additional two holes.

Two drill machines were employed for the drilling work, each of which was operated on 2-shifts/20-hours a day basis in principle. The work force for each shift comprised one drill engineer and two assistants, together with a worker to take care of drill water supply.

2.2.3 Machines, Tools and Drill Water Supply

The used drill machines and tools are listed in Table 13. The numbers and types of used drill bits, together with the consumed amounts of consumables, are indicated in Table 14. The two drill machines used are both RESKA30, made in Italy.

Drill water was supplied from a spring at the portal of the abandoned Bou Khil mine for the operation in the Bou Khil prospect and from the El Akhouat mineral processing plant for that in the El Akhouat-Argoub Adama prospect. However, water supply from the plant was refused for drilling of the additional two holes in the El Akhouat-Argoub Adama prospect. Therefore, drill water sources were sought elsewhere, such as wells or irrigation ponds in the vicinity of the drilling sites.

Table 13 List of Drill Machines and Tools

Drilling Machines:
-RESKA (2 set): model R30, made in Italy, with diesel engine (137HP),
Water Supply Pomp:
-HATZ (1 set): made in Tunisia, with diesel engine,
-NENZI (1 set): made in Tunisia, with diesel engine,
Water Tank:
-2 set (6m3), iron,
-2 set (3,000L), iron,
Tractor:
-Kubota (2 set): made in Japan,

Table 14 List of Drill Bits and Consumables

Specification	Unit	MJTK-B1	MJTK-B2	MJTK-L1	MJTK-L2	MJTK-L3	MJTK-L4
Diamond bit (HQ)	pcs.	2	1	1			
Diamond reamer (HW)	pcs.	2	1	1			
Diamond bit (NQ)	pcs.	2	1	1	1	2	2
Diamond reamer (NW)	pcs.	2	1	2	2	1	1
Dieseloil	l	1,420	700	920	900	2,920	5,000
Lubricant oil	l	140	60	60	80	110	75
Grease	kg	38	20	17	21	30	25
Cement	kg	1,150					
Bentonite	kg	900	1,800				

2.2.4 Drill Core Sampling and Storage

Drill cores of each drilling run was recovered from the core tube and placed in a wooden core box. The drill cores in the core boxes were then photographed, geologically observed and sampled at intervals. The core boxes, bundled in a 30-box batch, was transported to and stored in the storage owned by ONM, after completion of the photographing, geological observation and sampling. The drill core samples were submitted for chemical analysis at the ONM's analytical laboratory in Tunis.

2.3 Result of Drilling Investigation

2.3.1 Bou Khil Prospect

The geological summary plan of the Bou Khil prospect is shown in Figure 137, incorporating the drill hole locations. As shown in the figure, the geology of the prospect comprises the Triassic diapir, the Cretaceous carbonates (limestone and limestone-marl alternations), the transition zone consisting of brecciated dolomitic carbonates, sedimentary rocks (marl, sandstone, argillite and conglomerate) of the Tertiary system (Eocene, Oligocene and Miocene) and the Quaternary system. The Cretaceous system

contains the Bou Khil ore deposit that was mined in the past and produced some 400 thousand tons of ores with the average grade of combined lead and zinc at about 10 %. Celestite deposits, such as Chantier 2 and Saint-Pierre, have been located in the transition zone trending in the NE-SW direction.

Two drill holes, MJTK-B 1 and B 2, were put down along the two geophysical survey lines, B3 (A-A') and B5 (B-B'), of the 1st Year Campaign in this prospect, in order to explore the Chantier 2 deposit and to verify the IP anomaly outlined by the geophysical survey. The columnar section of each hole is shown in the figure 144 to 145.

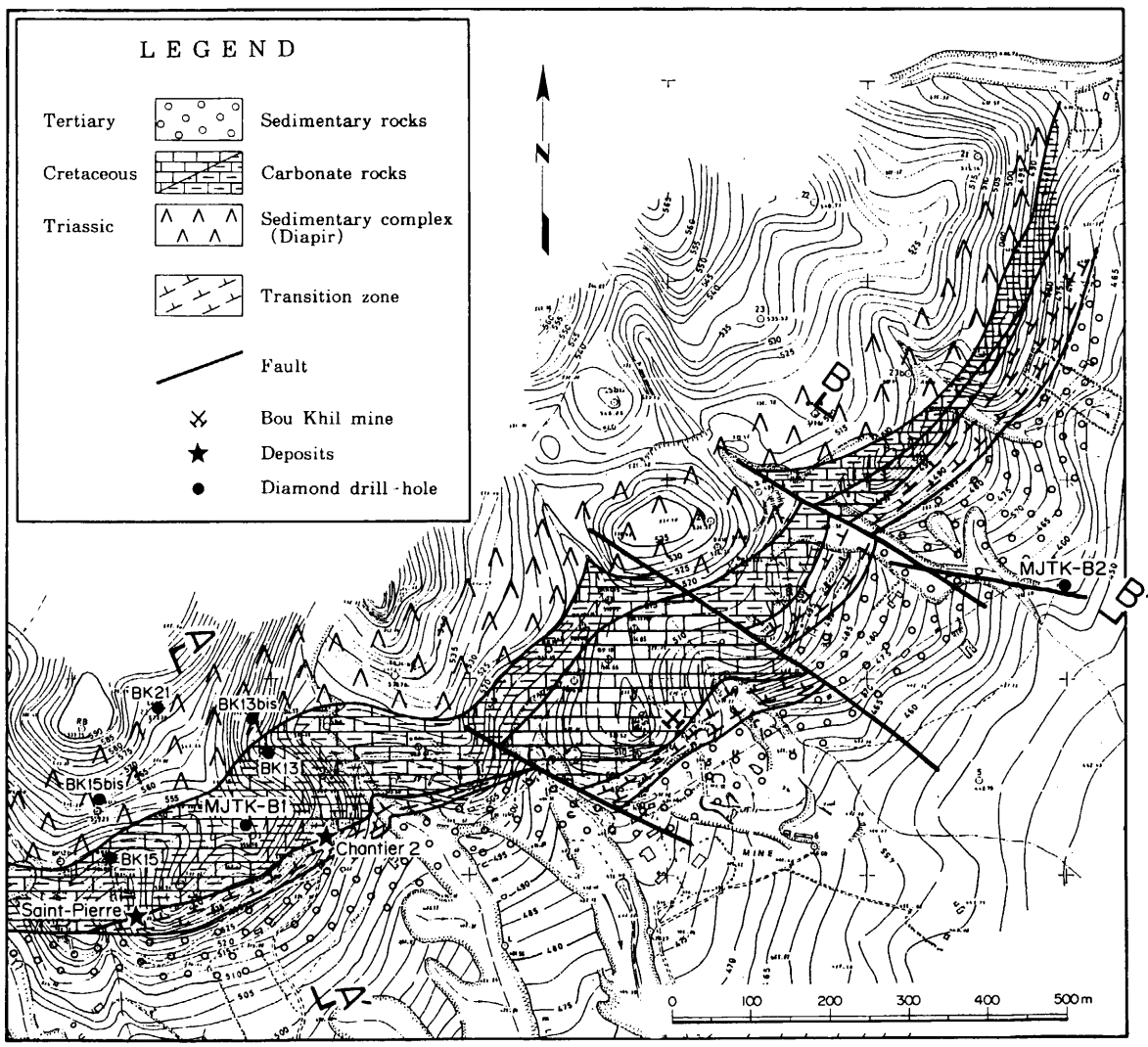


Figure 137 Geology and Drill Hole Location of the Bou Khil Prospect

(1) MJTK-B 1

This hole was drilled along the geophysical survey line B3 (A-A'), as shown in Figure 137, to verify the IP anomaly outlined in the course of the 1st Year Campaign and to explore the southwestern extension of the Chantier 2 deposit. The columnar section of the hole and the geological profile along the survey line are presented in Figures 144 and 138 respectively.

The IP survey in the 1st Year Campaign identified an IP anomaly along the survey line B3 where the transition zone distributed. Since celestite mineralization had been known to occur associated with the transition zone, a celestite ore sample was collected and submitted for laboratory testing. The test result indicated that the celestite ore was very low in its chargeability at around 3.5 mV/V or less, which made it difficult to effectively interpret the field measurement in terms of the relationship between the celestite mineralization and its chargeability. It is, therefore, one of the purposes of this hole to clarify the ground nature that produced the IP anomaly, specifically for its relationship with the celestite mineralization.

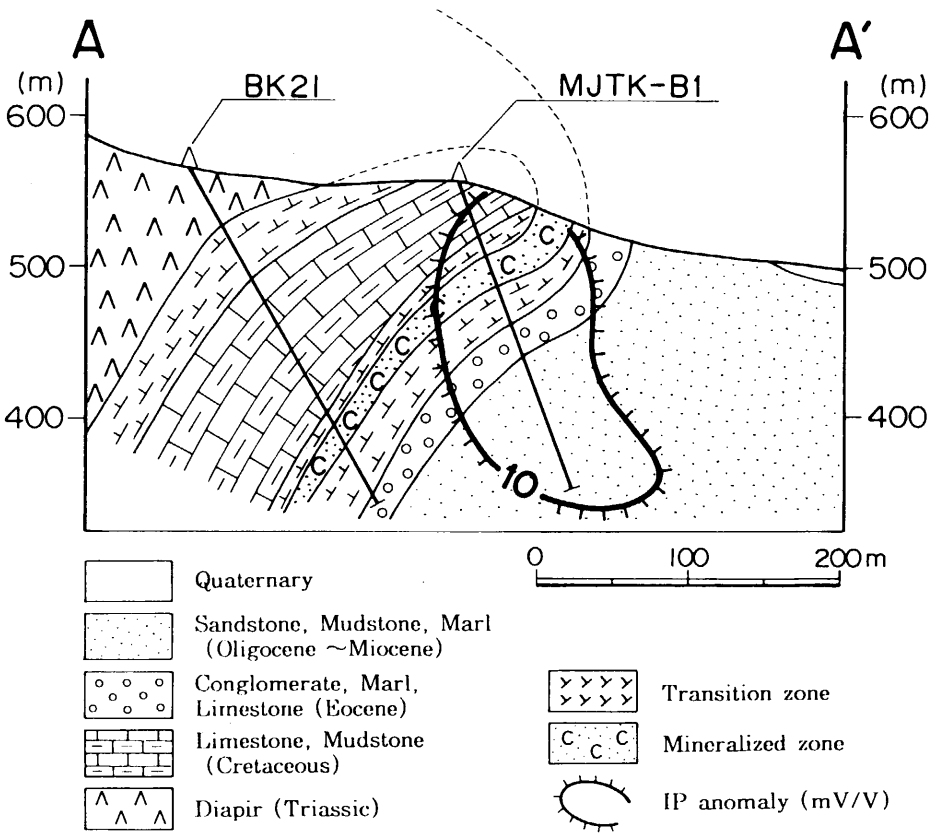


Figure 138 Geological Profile along the Hole, MJTK-B1

The Chantier 2 deposit had been explored by 5 drill holes with the total length of 970.85 m (Figure 137 and Table 15) in the past. A probable reserve of 3 million tons with an average grade of 70 % $SrSO_4$ had been estimated based on the drilling result. Of the five, drill holes, the hole, BK13bis, intersected a celestite ore zone of 22m in width with an average grade of 72 % $SrSO_4$ as shown in Table 15. However, the exploration to the southwest of the section BK13bis-BK13 had been very much limited with a scarce number of drill holes. In addition, the celestite ore zone had been intersected by only two of the five holes, BK13bis and BK21. Taking account of these past exploration results, the southwest of the section BK13bis-BK13 was selected for the drilling target in the current operation.

Table 15 Ore Intersections of Past Drill Holes in the Bou Khil Prospect

Drill Hole	Depth (m)	Thickness (m)	Grade (%)		Length (m)	Direction (°)	Inclination (°)	Elevation (m)
			Pb+Zn	$SrSO_4$				
BK13	87.00-96.00	9.0	8.3	-	169.50	160	-65	530.66
BK13bis	138.00-160.00	22.0	-	72.64	209.50	160	-65	538.44
BK15	66.55-71.55	5.0	18.7	-	127.20	170	-70	540.18
BK15bis	-	-	-	-	210.00	170	-70	559.23
BK21	194.00-207.00	13.0	-	38.01	254.65	160	-60	572.38

The geology of this hole is composed of a unit of limestone-argillite alternation (Cretaceous) from 0.00 to 33.00m, the transition zone from 33.00 to 103.10m, a unit of conglomerate-marl-limestone (Eocene) from 103.10 to 121.80m and a unit of semi- or non-consolidated sandstone interbedded with adhesive argillite layers (Oligocene -Miocene) from 121.80 to 216.80m. The transition zone consists mainly of gray to dark gray dolomite, being occasionally brecciated and including pyrite, marcasite and celestite mineralization in places. Under microscope, dolomite (<0.2 mm), calcite (<0.2mm), quartz (<0.8mm), wollastonite (<1.0mm) and opaques are observed in rock specimen of the transition zone.

Celestite mineralization occurs in breccias and veins in the interval between 47.50 and 73.80m. The brecciated celestite contains a minor amount of sphalerite and is inter-fragmentally filled with black and compact dolomite accompanying abundant euhedral pyrite. The celestite mineralization of vein-form comprises celestite and calcite as major constituents, accompanying such ore minerals as pyrite, marcasite and sphalerite. Celestite forms euhedral to subhedral crystals with sizes up to 0.05mm. Pyrite occurs as subhedral crystals with sizes of $\pm$0.02mm. Marcasite also forms euhedral to subhedral crystals with sizes ranging from 0.05 to 0.2mm and indicates framboidal textures. Sphalerite occurs as subhedral crystals with sizes of $\pm$0.05mm. The analytical results of the celestite section are indicated in Table 16.

Table 16 Analytical Results of the Celestite Section in MJTK-B1

Drill Hole	Depth (m)	Thickness (m)	Type of Ore	Grade (%) $SrSO_4$
MJTK-B1	47.5-58.5	11.0	Brecciated, Vein	16.89
	59.5-65.5	6.0	Brecciated	20.33
	67.8-73.8	6.0	Brecciated, Vein	7.80

The IP anomaly that was outlined by the geophysical survey in the 1st Year Campaign is correlated to the transition zone intersected between 40 and 120m of this hole. Pyrite-marcasite mineralization is intense in the transition zone, which may be attributed to the cause of the IP anomaly. The investigation results to date and the celestite intersection of this hole suggest that the celestite mineralization of the Chantier 2 continues southwestward for a distance of at least 75m from the BK13bis-BK13 section.

(2) MJTK-B 2

This hole was drilled along the geophysical survey line B5, as shown in Figure 137, to verify the IP anomaly outlined in the course of the 1st Year Campaign. The columnar section of the hole and the geological profile including the hole are presented in Figures 145 and 139 respectively.

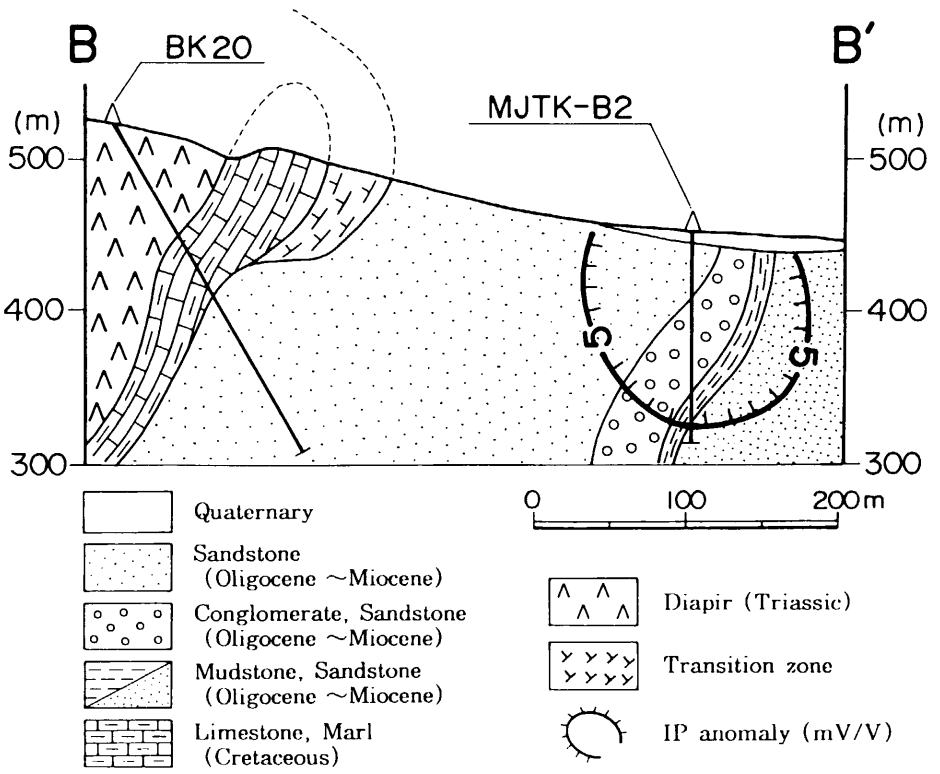


Figure 139 Geological Profile along the Hole, MJTK-B2

The geology of this hole is composed of a unit of non-/semi-consolidated sandstone from 0.00 to 40.10m, a unit of conglomerate interbedded with sandstone layers from 40.10 to 109.70m and a unit of non-consolidated sandstone interbedded with adhesive argillite layers from 109.70 to 142.10m, all of which are sedimentary rocks of the Tertiary Oligocene to Miocene ages, as shown in Figures 139 and 145.
The IP anomaly that was outlined by the geophysical survey in the 1st Year Campaign is correlated to the conglomerate unit interbedded with sandstone layers that is intersected between 70.00 and 110.00m of this hole. The calcareous sandstone layers are intensely mineralized with pyrite, which is considered the main cause of the IP anomaly.

2.3.2 El Akhouat-Argoub Adama Prospect

The geological summary plan of the El Akhouat-Argoub Adama prospect is shown in Figure 140, incorporating the drill hole locations. As shown in the figure, the geology of the prospect comprises the Triassic diapir, the Cretaceous limestone and marl, the Tertiary system (Eocene, Oligocene and Miocene) consisting mainly of limestone, sandstone, argillite and conglomerate, and the Quaternary system. The Cretaceous system contains the El Akhouat ore deposit that was mined in the past and produced some 55 thousand tons of ores.

Four drill holes, MJTK-L1, L2, L3 and L4, were put down along the geophysical survey lines, L2, L3 and L8, of the 1st Year Campaign in this prospect as shown in Figure 142, in order to locate new prospective ore deposits and to verify the IP anomaly outlined by the geophysical survey. The columnar section of each hole is shown in the figure 146 to 149.

(1) MJTK-L1

The objectives of this hole were to characterize the mineralization associated with the Cretaceous system distributing in close proximity to the Triassic diapir and to verify the IP anomaly outlined by the geophysical prospecting in the 1st Year Campaign. The hole was drilled along the geophysical survey line, L8, as shown in Figure 140. The columnar hole section and the geological profile along the section including the hole are shown in Figures 146 and 141 respectively.

The hole geology comprises the Triassic diapir and the Cretaceous system. The Triassic diapir is intersected in the intervals between 0.00 and 137.40m and between 364.10 and 400.10m, and consists of sedimentary complex including gypsum, limestone, dolomite and argillite. The Cretaceous system is principally composed of marl occurring in the interval between 137.40 and 364.10m.

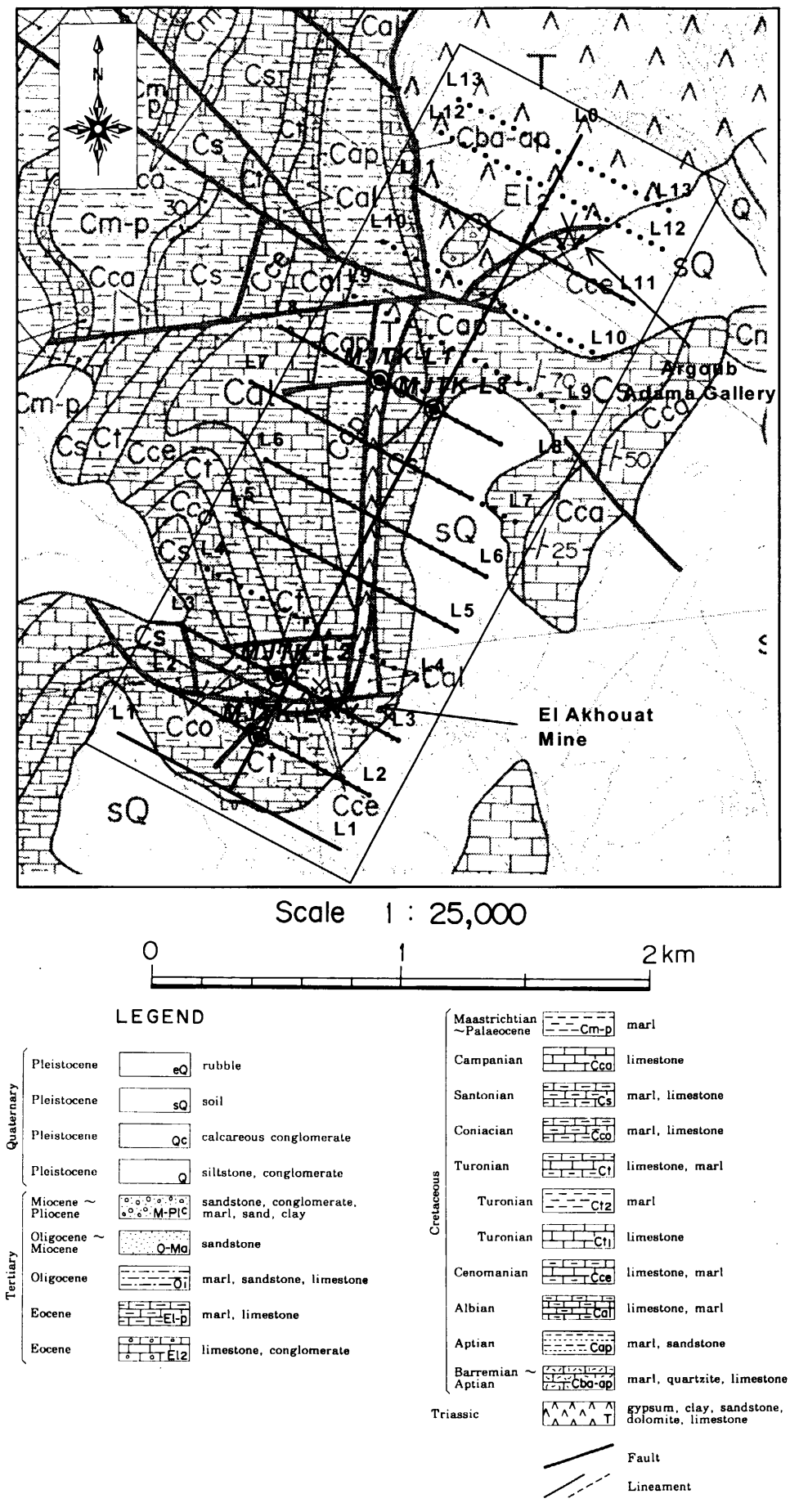


Figure 140 Geology and Drill Hole Location of the El Akhouat - Argoub Adama Prospect

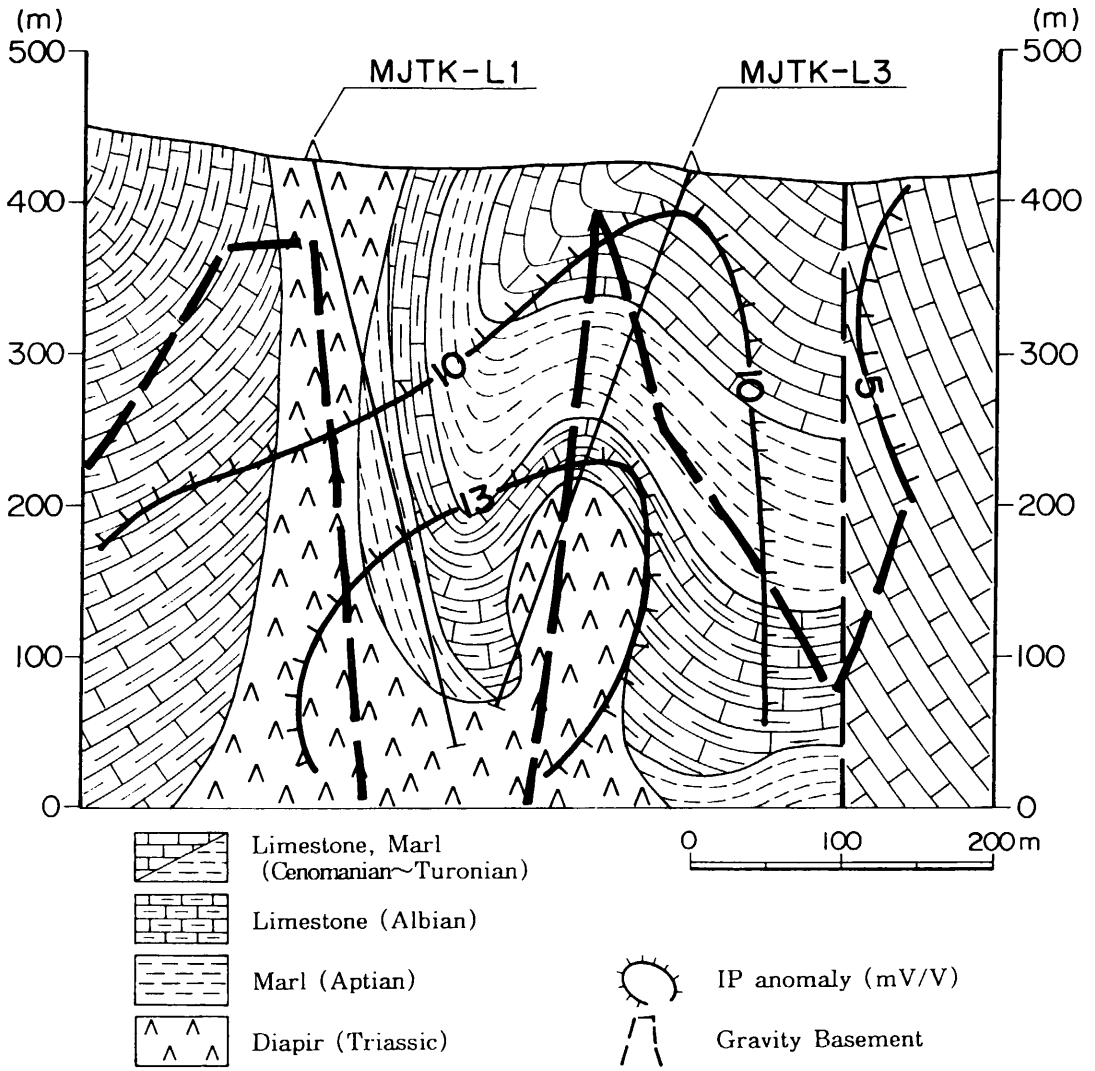


Figure 141 Geological Profile along the Hole, MJTK-L1 and L3

The hole aimed at testing the mineralization associated with the Cretaceous system in the interval between 137.40 and 364.10m, however, failed to locate Pb-Zn mineralization of any significance. Fossil remains were washed out and collected from 10 drill core samples in order to determine the geologic age and stratigraphic divisions of the marl intersected in the interval between 137.40 and 364.10m. The fossil examination identified the stratigraphic position of the marl at the stage ranging from the upper Aptian to the Albian base of the upper Cretaceous system. The major ore deposits in the general area of the El Akhouat-Argoub Adama prospect are mostly located in association with Cretaceous formations of the Albian, Cenomanian or Turonian stage. Therefore, the stratigraphic position of the marl in question is different from any of those which contain prospective mineralization (Table 17).

The IP anomaly that was identified in the 1st Year Campaign, is correlated to the section deeper than 250m in this hole. The marl deeper than 250m is intensely pyritized and contains abundant framboidal pyrite, which is considered the cause of the IP anomaly.

Table 17 Geologic Age and Stratigraphic Division of the Marl in MJTK-L1

No.	Depth (m)	Rock Name	Sedimentary Environment	Stratigraphic Division
1	150.00	dolosparite	lagoon	Upper Aptian~Lower Albian
2	170.00	dolosparite	lagoon	Aptian
3	180.00	dolosparite	lagoon	Upper Aptian~Lower Albian
4	200.00	dolosparite	lagoon	Aptian
5	250.00	mudstone	lagoon	Upper Aptian~Lower Albian
6	280.00	mudstone	lagoon	Upper Aptian~Lower Albian
7	300.00	dolosparite	lagoon	Aptian
8	320.00	marl	lagoon	Upper Aptian~Lower Albian
9	350.00	marl	lagoon	Aptian
10	360.00	marl	lagoon	Upper Aptian~Lower Albian

(2) MJTK-L2

This hole was drilled along the geophysical survey line, L3, as shown in Figure 142 in order to verify the new mineral indication that had been located in the 1st Year Campaign. The columnar hole section and the geological profile along the section including the hole are shown in Figures 147 and 142 respectively.

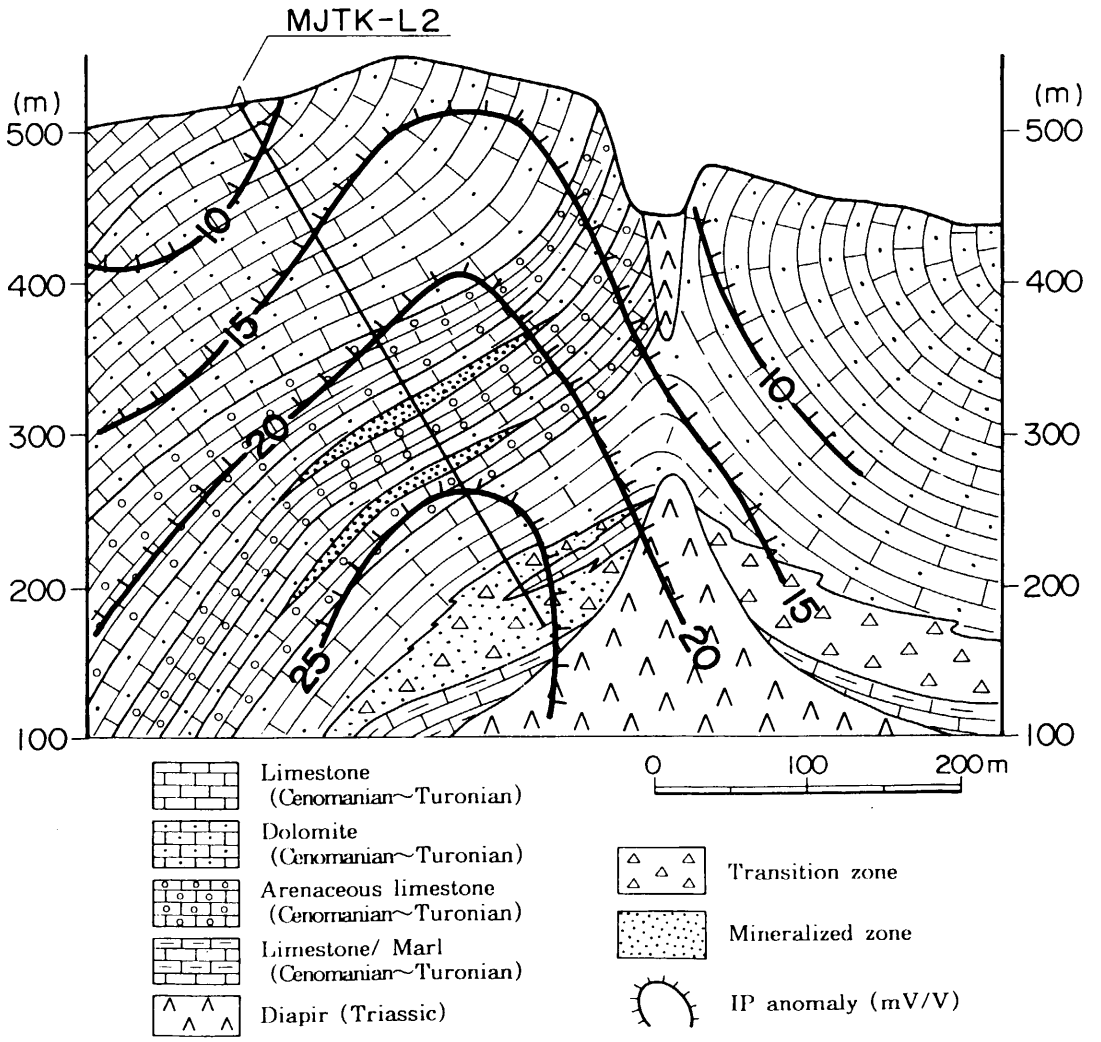


Figure 142 Geological Profile along the Hole, MJTK-L2

The geology of this hole comprises dolomite from 0.00 to 84.00 m, foliated dolomite from 84.00 to 173.50m, calcareous sandstone-dolomitic limestone alternation from 173.50 to 290.60m, dolomitic limestone from290.60 to 334.80m and brecciated dolomitic limestone from 334.80 to 400.00m, end of the hole, all of which are correlated to the carbonates of the Cenomanian to Coniacian stages of the Cretaceous system. A metamorphic mineral, wollastonite is formed in the brecciated dolomitic limestone. Nine drill core samples are collected and submitted for microscopic observation of thin sections. The observation result is presented in Table 18.

Table 18 Microscopic Observation Result of Thin Sections (MJTK-L2)

No.	Location (Depth) (m)	Rock Name	Minerals											
			Primary							Secondary and Alteration				
			Qz	Dol	Pl	Bio	Mus	Cal	Oq	Qz	Ch	Cal	Oq	Others
1	19.30	Dolomite		◎				◎		+				layered structure
2	33.00	Dolomite		◎				○						layered structure
3	50.00	Dolomite		◎				○						
4	66.00	Dolomite		◎				○				△		
5	85.00	Dolomite		◎				○				○	△	
6	138.20	Dolomite		◎		?		○	+		?			
7	275.00	Limestone		△				◎				○	+	
8	280.70	Dolomite/Sandstone	○	◎	○	?	?	○	+		?	○		layered structure
9	356.40	Metamorphosed Dolomite	+	◎				◎	○			○		wollastonite

◎:abundant, ○:moderate, △:a few, +:rare,
Qz:quartz, Dol:dolomite, Pl:plagioclase, Bio:biotite, Mus:muscovite, Cal:calcite, Oq:opaque minerals,

The mineralization occurs intermittently in the drill section between 225.50 and 382.90m, in banded, veinlets/ veinlet network or brecciated forms. The major ore minerals are sphalerite, galena and marcasite associated with such gangues as calcite and quartz. The sphalerite ranges from 0.01 to 0.5mm in sizes, occasionally reaching 7mm, and forms euhedral to subhedral crystals indicating colloform, poikilitic (main crystals) or spherulitic textures. The galena forms anhedral crystals with sizes ranging from 0.01 to 0.5mm. The marcasite is less than 0.3mm in sizes, mostly ranging from 0.01 to 0.3 mm, and forms euhedral crystals indicating poikilitic (sub-crystals) or spherulitic textures. The microscopic observation result of polished sections is summarized in Table 19.

Table 19 Microscopic Observation Result of Polished Sections (MJTK-L2)

No.	Depth (m)	Ore Type	Opaque Minerals					
			Ga	Sph	Mar	Py	Others	Texture
1	277.00	Veinlet		◎(anh-subh)	◎(euh)			Sph-Mar:spherulite
2	297.60	Banded	◎(anh)	○(anh-subh)	△(euh)	+(subh)		Py:framboidal
3	298.60	Network veins	+ (anh)	◎(anh-subh)	○(euh)	+(subh)		
4	299.60	Brecciated	△(anh)	○(anh-subh)	◎(euh)			Sph-Mar:poikilitic
5	300.60	Brecciated	○(anh)	◎(anh-subh)	△(euh)			Sph:colloform
6	301.60	Banded		◎(anh-subh)	○(euh)	+(subh)	Goethite	Sph:colloform
7	380.60	Brecciated	○(anh)	○(anh-subh)	△(subh)	△(euh)		

◎:abundant(>50%), ○:moderate(50-20%), △:a few(20-5%), +:rare(<5%),
anh:anhedral, subh:subhedral, euh:euhedral, Sph:sphalerite, Mar: marcasite, Py:Pyrite,

This hole intersected three ore zones in the interval between 225.50 and 382.90m of the total depth of 400m. Within the ore zones, the three 1-m sections of mineralized carbonate rocks, from 237.50 to 238.50m, from 275.60 t0 276.60m and from 379.90 to 380.90m, indicated assay results of 0.7% Pb and 20.0% Zn, 1.92% Pb and 36.0% Zn, and 3.45% Pb and 16.0% Zn respectively. The analytical results are presented in Table 20.

Table 20 Analytical Results of Drill Core Samples (MJTK-L2)

Drill Hole	Depth (m)	Thickness (m)	Type of Ore	Grade (%)		
				Pb	Zn	Pb+Zn
MJTK-L2	222.5-238.5	16.0	Network~Veinlets	0.21	4.06	4.27
	265.8-277.6	11.8	Network~Veinlets	0.40	6.00	6.30
	346.3-369.3	23.0	Brecciated	0.45	2.48	2.93
	373.9-382.9	9.0	Brecciated	2.02	5.18	7.20

The IP anomaly that was identified by the geophysical prospecting in the 1st Year Campaign can be correlated to the section deeper than 160m of this hole. Since a number of drill sections deeper than 225.50m contain significant amounts of pyrite, sphalerite and galena, the cause of the IP anomaly may be attributed to the mineralization.

(3) MJTK-L3

This hole was drilled along the geophysical survey line, L8, as shown in Figure 142 in order to verify the IP anomaly that had been identified by the geophysical prospecting in the 1st Year Campaign. The columnar hole section and the geological profile along the section including the hole are shown in Figures 148 and 141 respectively.

The hole, MJTK-L1, was drilled to test mineralization associated with the Cretaceous system in the vicinity of the Triassic diapirs. As aforementioned, however, the Cretaceous system in this hole was correlated to upper Aptian to the base of Albian and was proved to be different in the stratigraphic division from the mineralized Cretaceous formations in the general area. The geological structure was fully reviewed based on the result of this hole in order to estimate locations where prospective Cretaceous formations would distribute. The hole location of MJTK-L3 was thus determined along the geophysical survey line, L8, along which the hole, MJTK-L1, had been also located. Another objective of the hole, MJTK-L3, was to identify subsurface diapir bodies interpreted along L8 according to the gravity cross-section analysis in the 1st Year Campaign.

The geology of this hole comprises the Triassic diapirs and the Cretaceous system that are often brecciated. The Triassic system is observed in sections of the intervals from 216.70 to 334.20m and from 372.80 to 374.50m, consisting of sedimentary complexes that include gypsum, limestone, dolomite, arenite and argillite. The Cretaceous system

occurs in sections of the intervals from 0.00 to 204.00m and from 341.40 to 372.80m and consists of limestone and marl. The brecciation is developed in the intervals from 204.00 to 216.70m and from 334.20 to 341.40m.

Two mineralized zones are intersected in this hole, in the intervals from 178.40 to 180.80m and from 198.40 to 201.60m, and consist of pyrite-calcite veinlets or networks carrying minor amounts of sphalerite and galena. In addition, celestite-calcite veins carrying minor sphalerite and pyrite-calcite-(sphalerite) veinlets are observed in association with the brecciated zones, however, without forming any significant concentrations.

The IP anomaly that was identified in the 1st Year Geophysical Prospecting can be correlated to the depth deeper than 240m of this hole, as shown in Figure 143. The hole deeper than 240m mainly comprises diapirs in which black compact dolomite, carrying an appreciable amount of pyrite, is ubiquitously observed. Particularly in the interval between 260.80 and 271.80m, abundant euhedral pyrite is contained in the black compact dolomite. Therefore, the cause of the IP anomaly can be attributed to this black compact dolomite containing abundant pyrite. Besides, the subsurface diapir interpreted by the gravity cross-section analysis is correlated to that in the interval between 216.70 and 334.20m.

(4) MJTK-L4

This hole was drilled along the geophysical survey line, L2, as shown in Figure 140 in order to explore the southwestern extension of the new mineral indication that had been confirmed by the hole, MJTK-L2. The columnar hole section and the geological profile along the section including the hole are shown in Figures 149 and 143 respectively.

The geology of this hole comprises limestone from 0.00 to 143.30m, alternation of marl and limestone from 143.30 to 207.80m and marl from 334.80 to 400.00m, end of the hole, all of which are correlated to the carbonates of the Albien to Turonian stages of the Cretaceous system.

Mineralized sections are identified in the intervals from 109.10 to 143.30m and from 173.20 to 188.20m, consist of pyrite-calcite veinlets and networks carrying minor galena and sphalerite, however, without any significant concentration.

The IP anomaly that was identified in the 1st Year Geophysical Prospecting can be correlated to the depth deeper than 230m of this hole, as shown in Figure 145. The hole deeper than 240m mainly comprises pyretic marl, containing abundant framboidal pyrite. Therefore, the cause of the IP anomaly along L2 can be attributed to this marl containing abundant pyrite.

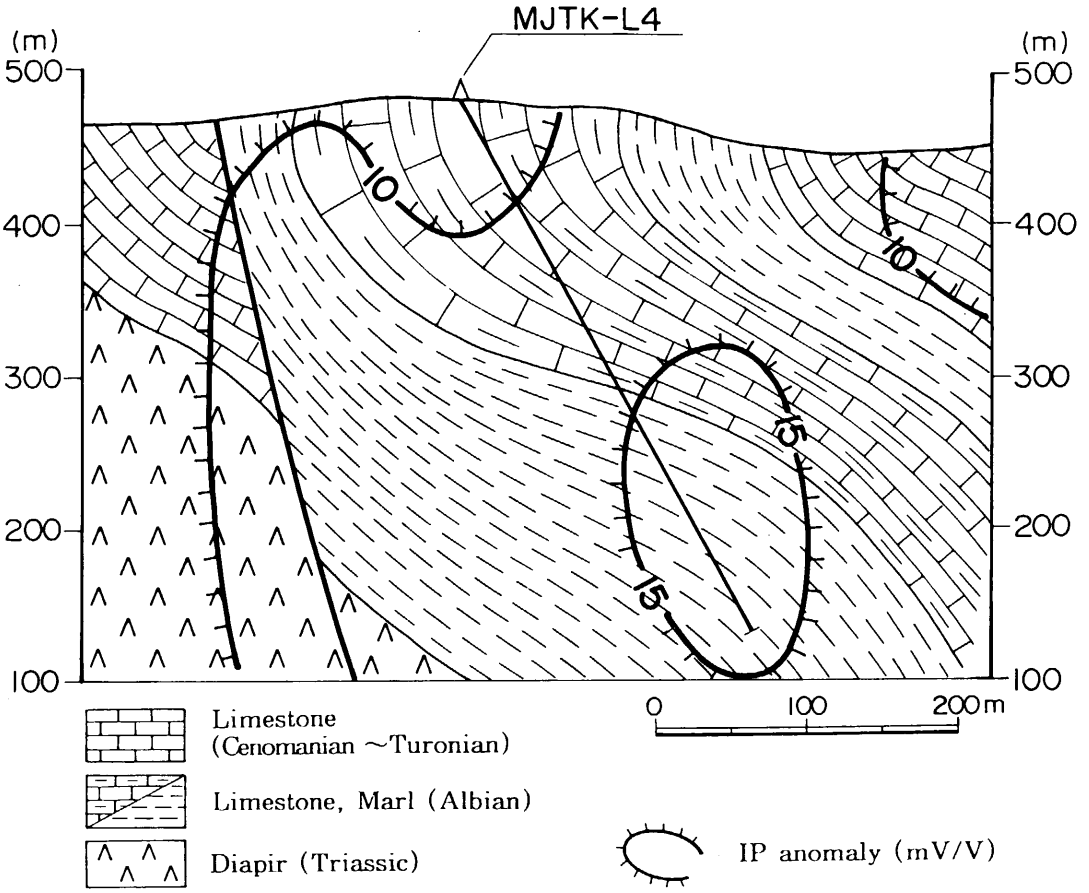


Figure 143 Geological Profile along the Hole, MJTK-L4

GEOLOGIC LOG

Hole : MJTK−B1
Machine Model : RASKA30
Elevation : 557. 31m
Drilled Length : 216. 80m

Site Name : Bou Khil
Period : 2000. 11. 11～2001. 1. 9
Inclination : 70°
Direction : 158°

Depth (m)	Description	Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr(%)	Ba	Depth (m)	Core Rec. (%)
	Limestone light grayish white, compact, finely calcite matrix, weathered and oxicidized, limonite is found in the fissures.												50.0
													86.7
6.00	6.00～6.40m yellowish brown mudstone.												100.0
6.40	Limestone yellowish brown, weathered, oxicidized, brecciated, brown mud matrix, contains a small amount of celestite.												73.3
													83.3
13.70	Mudstone yellowish brown, weathered, oxicidized.												83.3
													80.0
													23.3
21.50	Mudstone greenish gray, pyrite disseminated.												100.0
23.70	Brecciated zone gray～dark gray, partially brecciated, dolomite-pyrite matrix. 23.70～23.80m, 28.20～28.50m celestite-pyrite-(sphalerite) vein～veinlets.												100.0
													100.0
28.80	Limestone greenish gray, finely calcite cement, pyrite disseminated.												100.0
32.00	Mudstone, greenish gray.												100.0
33.00	Brecciated zone gray～dark gray, dolomite-pyrite matrix, brecciaes are composed of limestone and calcareous mudstone (brecciaes are as much as 2-3cm in diameter), with calcite-celestite vein. 33.00～36.00m contains a small amount of celestite. 42.60～44.30m contains a small amount of celestite.												100.0
36.00													93.3
													93.3
42.60													100.0
44.30													
46.60													
47.50	Mudstone, pale gray.												100.0
	Mineralized zone gray～dark gray, brecciated, dolomite-pyrite matrix, contains a minor amount celestite and a small amount of sphalerite, pyrite and sphalerite are scattered. 53.50m celestite-calcite-sphalerite-pyrite veinlets.	38.52	25.36	55.34	4.23	829.3	<2.0	2.50	6.70	4.8	148.9	47.50	
		26.96	<5.0	39.25	2.91	512.7	<2.0	1.10	5.30	13.5	229.5	48.50	
		19.47	38.69	51.81	4.82	380.4	<2.0	1.00	1.50	20.2	34.55	49.50	100.0
		23.01	9.87	91.07	3.38	779.8	<2.0	1.60	5.40	12.7	16.70	50.50	
		40.95	271.8	15.38	4.01	231.2	<2.0	1.00	1.50	25.6	58.69	51.50	
		49.45	28.70	67.29	4.34	145.1	<2.0	0.80	0.30	3.5	163.6	52.50	100.0
		17.27	195.0	11.96	2.37	665.4	<2.0	2.10	3.60	23.3	13.20	53.50	
		27.66	6.07	30.33	2.91	410.8	<2.0	1.70	2.50	17.4	95.58	54.50	
		14.36	<5.0	23.32	1.44	26.3	<2.0	0.20	0.10	28.2	135.5	55.50	100.0
		55.16	<5.0	9.34	2.85	177.6	<2.0	0.80	1.20	18.4	125.6	56.50	
58.00		39.47	78.48	16.72	2.28	290.1	<2.0	1.20	1.50	18.2	127.4	57.50	
	Mudstone, pale green, partially brecciated.											58.50	100.0
59.50		48.97	8.49	24.54	3.92	490.8	<2.0	1.40	2.00	19.2	95.19	59.50	

Figure 144 Columnar section of the drill hole, MJTK-B1

GEOLOGIC LOG

Hole : MJTK−B1
Machine Model : RASKA30
Elevation : 557. 31m
Drilled Length : 216. 80m

Site Name : Bou Khil
Period : 2000. 11. 11～2001. 1. 9
Inclination : 70°
Direction : 158°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr(%)	Ba	Depth (m)	Core Rec. (%)
60				48.97	8.49	24.54	3.92	490.8	<2.0	1.40	2.00	19.2	95.19	60.50	100.0
			Mineralized zone light gray～gray, brecciated, dolomite-pyrite in breccia matrix, contains a minor amount of celestite and massive pyrite,	58.27	127.6	7.80	6.57	349.5	<2.0	0.60	1.40	21.6	0.95	61.50	
				49.15	221.6	16.15	7.47	305.4	2.47	0.70	1.00	25.4	0.33	62.50	100.0
				51.95	102.5	15.34	4.54	122.5	<2.0	0.30	0.18	21.8	61.19	63.50	
				42.42	<5.0	14.66	2.47	324.6	<2.0	1.40	1.80	17.5	155.1	64.50	93.3
65				29.76	531.9	9.30	2.48	415.9	<2.0	1.70	2.47	16.5	130.9	65.50	
		65.20	Mudstone greenish gray, pyrite disseminated, contains calcareous sandstone breccia,												
		67.80	Mineralized zone light gray～gray, brecciated, dolomite-pyrite in breccia matrix, contains a minor amount of celestite, 72.30～72.50m drusy celestite-(calcite) vein with petrole materials,	41.55	85.77	8.83	1.68	1672.7	<2.0	5.90	14.70	8.4	4.64	67.80	93.3
				68.08	107.1	25.38	3.56	849.9	<2.0	3.60	5.70	1.3	338.6	68.80	
70				38.18	368.3	11.65	2.96	523.2	<2.0	2.80	4.80	8.5	11.9	69.80	
				60.80	0.18%	17.03	4.43	415.1	<2.0	1.70	2.50	9.2	52.8	70.80	100.0
				55.73	254.0	23.08	3.43	843.6	<2.0	2.80	4.40	13.9	11.6	71.80	
				99.50	72.87	26.14	5.43	1308.7	<2.0	4.00	6.90	5.3	2.39	72.80	
		73.80	Marl, dark gray, brecciated,											73.80	100.0
75		75.00	Mudstone pale green～pale gray, calcareous, partially brecciated,												100.0
															100.0
80		79.70	Brecciated zone dark gray～gray, contains a small amount of celestite and sphalerite,												100.0
		82.50	Limestone, gray, compact, mostly crushed,												86.7
		83.90	Brecciated zone dark gray～gray, brecciaes are composed of dolomitic marl, calcite-celestite vein,												100.0
85		86.50	Limestone light gray, finely crystalline, with pyrite striation and drusy calcite crystal, limonite is found in the fissures,												73.3
90		90.70	Brecciated zone dark gray～gray, brecciaes are composed of carbonate rocks, celestite matrix,												73.3
		94.00	Mudstone, pale green, calcareous,												100.0
95		95.00	Marl, dark gray, dolomitic, celestite matrix,												
		96.00	Limestone, pale gray, finely crystalline,												100.0
		97.40	Marl gray～dark gray, dolomitic, friable and crumbly, interbeded with thin beded mudstone and limestone, partially brecciated, pyrite disseminated,												100.0
100															100.0
		103.10	Conglomerate gray, brecciaes are composed mainly of carbonate rocks and fossiliferous sandstone (brecciaes are as much as 1-20cm in diameter), 108.50m with drusy calcite veinlets,												100.0
105															100.0
		109.40													100.0
110		110.20	Marl, dark gray,												
			Conglomerate gray～brownish gray, with drusy calcite veinlets,												100.0
		112.70	Sandstone light greenish white, coarse-grained, sub-rounded quartz pebble, fossiliferous,												100.0
115															100.0
		116.40	Marl dark gray～greenish gray, arenaceous, interbeded with thin beded limestone,												100.0
120		119.70													

Figure 144 Columnar section of the drill hole, MJTK-B1

GEOLOGIC LOG

Hole : MJTK−B1
Machine Model : RASKA30
Elevation : 557. 31m
Drilled Length : 216. 80m

Site Name : Bou Khil
Period : 2000. 11. 11~2001. 1. 9
Inclination : 70°
Direction : 158°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
120															100.0
		121.80	Limestone dark gray~dark brown, compct,												100.0
125			Marl dark greenish gray~dark gray, arenaceous, extremly friable and crumbly, 126.00m interbeded with compact limestone,												100.0 78.6
130		129.50	Sandstone dark gray, fine-grained, calcareous,												80.0
		131.80	Mudstone dark gray~gray, very pasty,												93.3
135		135.40	Sandstone grayish white, fine to medium-grained, sub-angular~sub-rounded quartz pebble,												93.3
		137.95	Marl dark gray~black, arenaceous,												100.0
140		142.50	Sandstone dark gray~black, fine-grained, sub- angular quartz pebble, calcareous, glauconite bearing,												100.0 86.7
145		147.10	Marl, dark gray, arenaceous,												
		148.00	Sandstone grayish white, glauconite bearing,												86.7
150		150.00	Marl dark gray, arenaceous, friable and crumbly,												93.3
		153.20	Conglomerate gray, brecciaes are composed mainly of glauconite sandstone and siltstone,												100.0
155		156.30	Sandstone grayish white, fine-grained, calcareous, glauconite bearing,												83.3
		159.30	Sand, light gray, unconsolidated,												
160		160.30	Mudstone dark gray~gray, very soft and pasty,												100.0
		162.20	Sandstone, light grayish white, calcareous,												
		163.20	Mudstone dark gray~gray, very soft and pasty,												100.0
165		165.20	Sandstone reddish brown, fine to medium-grained, sub-rounded quartz pebble, oxicidized, loosely consolidated,												76.7 50.0
170		174.30													3.3
175			Non core												0.0
		178.30	Sandstone gray, fine-grained, glauconite bearing,												14.3
180															

Figure 144 Columnar section of the drill hole, MJTK-B1

GEOLOGIC LOG

Hole : MJTK−B1
Machine Model : RASKA30
Elevation : 557. 31m
Drilled Length : 216. 80m

Site Name : Bou Khil
Period : 2000. 11. 11～2001. 1. 9
Inclination : 70°
Direction : 158°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
180			Sandstone dark greenish gray, fine-grained, sub-angular quartz pebble, glauconite bearing, loosely consolidated.												14.3
185															30.0
															43.3
190															36.7
															53.3
		193.00	Mudstone black, loosely consolidated.												26.7
195		196.80	Sand grayish white～light brownish white, unconsolidated, sub-rounded quartz pebble.												40.0
200															33.3
															33.3
205															26.7
															23.3
210															16.7
															25.0
215		216.80													
220															
225															
230															
235															
240															

Figure 144 Columnar section of the drill hole, MJTK-B1

GEOLOGIC LOG

Hole : MJTK−B2
Machine Model : RASKA30
Elevation : 454. 81m
Drilled Length : 142. 10m

Site Name : Bou Khil
Period : 2001. 1. 14~1. 29
Inclination : 90°
Direction : −

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
			Overburden												
		9.00	Sandstone yellowish brown, coarse-grained, sub-rounded quartz pebble, weathered.												20.0
		12.00	Sand yellowish brown, fine to medium-grained, loosely consolidated, sub-rounded quartz pebble.												0.0
															0.0
															0.0
															0.0
															0.0
															0.0
															0.0
															0.0
		37.00	Mud grayish black~black, loosely consolidated,												30.0
		40.10	Sandstone reddish brown, fine to medium-grained, oxicidized, contains breccia,												20.0
		43.10	Conglomerate reddish brown, oxicidized, loosely consolidated, brown mud matrix, brecciaes are as much as 0.5-2.0cm in diameter and composed mainly of calcareous sandstone and limestone,												20.0
															10.0
															30.0
															60.0
															90.0
															100.0
															86.7

Figure 145 Columnar section of the drill hole, MJTK-B2

GEOLOGIC LOG

Hole : MJTK−B2
Machine Model : RASKA30
Elevation : 454. 81m
Drilled Length : 142. 10m

Site Name : Bou Khil
Period : 2001. 1. 14~1. 29
Inclination : 90°
Direction : −

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
60			Conglomerate												86.7
		61.10	Sandstone yellowish brown, medium-grained,												93.3
65		62.70	Conglomerate light yellowish brown, brown mud matrix, brecciaes are as much as 3~4cm in diameter and composed mainly of Tertiary carbonate rocks, garnet crystal bearing,												56.7
		67.20	Sandstone yellowish brown, coarse-grained, sub-rounded quartz pebble, contains breccia,												33.3
70		70.00	Conglomerate reddish brown, oxicidized, loosely consolidated, brown mud matrix, brecciaes are as much as 2-3cm in diameter and are composed mainly of Tertiary carbonate rocks,												40.0
75															100.0
															53.3
80															53.3
															100.0
85															80.0
															36.7
90															100.0
															46.7
95															80.0
															10.0
100															100.0
															43.3
105		106.70	Sandstone yellowish brown, fine~medium-grained, calcareous, sub-rounded~sub-angular quartz pebble, strongry pyritized,												100.0
		109.70	Mudstone yellowish gray~brown, weathered, oxicidized, loosely consolidated, contain brecciaes (brecciaes are composed of grayish white limestone and are as much as 2-10cm in diameter,												36.7
110															20.0
		117.70	Mudstone blackish gray, loosely consolidated,												100.0
115															
120															

Figure 145 Columnar section of the drill hole, MJTK-B2

GEOLOGIC LOG

Hole : MJTK−B2
Machine Model : RASKA30
Elevation : 454. 81m
Drilled Length : 142. 10m

Site Name : Bou Khil
Period : 2001. 1. 14～1. 29
Inclination : 90°
Direction : −

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
120			Mudstone blackish gray, loosely consolidated, very pasty, contain brecciaes of carbonate rocks.												100.0
125															80.0
		127.10													36.7
			Sand yellowish brown, unconsolidated, medium-grained, sub-rounded quartz pebble.												6.7
130															16.7
135															20.0
															16.7
140		142.10													20.0
145															
150															
155															
160															
165															
170															
175															
180															

Figure 145 Columnar section of the drill hole, MJTK-B2

GEOLOGIC LOG

Hole : MJTK−L1
Machine Model : RASKA30
Elevation : 429. 12m
Drilled Length : 400. 10m

Site Name : El Akhouat
Period : 2000. 9. 27～10. 17
Inclination : 75°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
			Overburden												33.3
															60.0
5															36.7
															53.3
10															37.0
															90.0
15															43.3
															46.7
20		21.70	Gypsum-Mudstone complex grayish white～gray (partially reddish brown),												53.3
25		25.10	Mudstone blackish gray, calcareous, with gypsum,												86.7
		27.70	Gypsum-Mudstone complex												83.3
30		28.90	Mudstone blackish gray, calcareous, contains gypsum crystal,												93.3
		31.70	Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated,												56.7
35		33.70	Mudstone reddish brown～gray, calcareous,												100.0
		36.05	Dolomite black～grayish white, finely crystalline, organic material matrix, with gypsum, 36.70～37.10m gypsum-mudstone complex,												33.3
40		39.95	Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2～5cm in diameter),												90.0
45															86.7
50			51.70～52.80m with gypsum,												83.3
		52.80	Gypsum, white, massive,												86.7
		53.50	Mudstone, gray, calcareous,												
55		54.80	Mudstone-Gypsum-Dolomite complex reddish brown, contains gray dolomite breccia, with gypsum veinlets,												86.7
		57.80	Mudstone reddish brown, with gypsum vein,												86.7
60															

Figure 146 Columnar section of the drill hole, MJTK-L1

GEOLOGIC LOG

Hole : MJTK−L1
Machine Model : RASKA30
Elevation : 429. 12m
Drilled Length : 400. 10m

Site Name : El Akhouat
Period : 2000. 9. 27～10. 17
Inclination : 75°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
60			Mudstone, reddish brown, calcareous.												86.7
		60.70	Gypsum-Carbonate rocks-Mudstone complex grayish white, contains dolomite and mudstone breccia, with gypsum vein.												100.0
		63.50													83.3
65			Mudstone-Gypsum-Dolomite complex grayish white (partially reddish brown), brecciated, composed mainly of calcareous mudstone, gypsum veinlets and brecciated dolomite.												100.0
															100.0
70															96.7
		71.70	Mudstone reddish brown, with gypsum veinlets.												
		73.70	Gypsum, grayish white, massive.												100.0
75		74.70	Dolomite, gayish black, with gypsum.												
		76.00	Mudstone reddish brown, with gypsum veinlets. 78.70～79.00m mussive gypsum.												93.3
		78.70													
		79.00	Dolomite, grayish white, finely crystalline.												
80		80.20	Mudstone reddish brown, with gypsum veinlets. 82.20～83.40m brecciated.												93.3
		83.40	Gypsum, grayish white, massive.												83.3
85		85.00	Mudstone reddish brown, with gypsum veinlets. 85.00～86.15m with grayish white dolomite brecciaes												100.0
															96.7
90															93.3
															100.0
95		94.70	Mudstone-Gypsum-Dolomite complex blackish gray～reddish brown, brecciated, composed mainly of calcareous mudstone, gypsum veinlets and brecciated dolomite.												100.0
		99.30	Limestone gray, brecciated, breccia consists of Cretaceous carbonate rocks, calcite and gypsum cement.												100.0
100				81.54	0.15%	0.98	0.31	159.1	<2.0	5.25	16.00	2972.0	61.1	102.60	100.0
		103.60	Dolomite black, finely crystalline, contains aboundan of hydrozincite.	23.05	308.20	8.02	1.18	175.3	<2.0	4.35	10.60	2798.7	112.0	103.60	
105		106.30		<10	76.09	3.71	0.55	100.1	<2.0	2.50	10.00	2479.2	100.2	104.60	
			Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish black), brecciated, composed mainly of calcareous mudstone, gypsum veinlets, brecciated dolomite and limestone.											105.60	100.0
110															100.0
															100.0
115		114.10	Dolomite grayish black, brecciated, with gypsum.												100.0
		116.60	Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish black).												100.0
120															

Figure 146 Columnar section of the drill hole, MJTK-L1

GEOLOGIC LOG

Hole : MJTK−L1
Machine Model : RASKA30
Elevation : 429. 12m
Drilled Length : 400. 10m

Site Name : El Akhouat
Period : 2000. 9. 27～10. 17
Inclination : 75°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
120			Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish black),												100.0
		123.10													100.0
			Mudstone reddish brown, with gypsum veinlets,												
125		125.60													100.0
			Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish black),												
		128.10													96.7
			Dolomite gray, brecciated, with gypsum,												
130		130.10													100.0
			Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish black), brecciated, composed mainly of calca- reous mudstone, gypsum veinlets, brecciated dolomite and limestone,												
135			135.80～136.30m massive gypsum,												100.0
		137.40													96.7
			Marl (Aptien age) grayish black, calcareous, homogeneous, lime mud matrix, sparry calcite cement, contains brown limestone breccia, vitrinite and peloid bearing, with carbonate network, a small amount of pyrite is almost invariably present,												
140															93.3
145			137.40～142.70m mostly crushed,												80.0
			151.10～151.79m micropyrite rich,												
			156.50m carbonate network dominant,												100.0
150															100.0
															100.0
															83.3
155															100.0
															100.0
160															100.0
															100.0
165															100.0
															100.0
			169.10～172.10m carbonate network dominant,												
170															100.0
															96.7
175															96.7
															100.0
180															

Figure 146 Columnar section of the drill hole, MJTK-L1

GEOLOGIC LOG

Hole : MJTK−L1
Machine Model : RASKA30
Elevation : 429. 12m
Drilled Length : 400. 10m

Site Name : El Akhouat
Period : 2000. 9. 27～10. 17
Inclination : 75°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
180			Marl (Aptien age) grayish black, homogeneous, calcareous, lime mud matrix, sparry calcite cement, fossiliferous (gasteropodes bearing), contains brown limestone breccia, vitrinite and peloid bearing, with carbonate network, a small amount of pyrite is almost invariably present,												100.0
															100.0
185															100.0
															100.0
190			180.00～181.00m carbonate network dominant,												100.0
															100.0
195			193.60～195.10m carcite veinlets with a trace amount of galena and sphalerite,												100.0
															100.0
200															100.0
															100.0
205															100.0
		207.70													100.0
210			Marl (Aptien age) grayish black, calcareous, contains limestone nodule and framboidal pyrite, with carbonate network, crack dominant,												100.0
			209.00m cointains brown limestone,												100.0
215			214.10～216.10m calcareous marl,												96.7
			217.20～217.50m carbonate network dominant,												100.0
220			220.10m calcite−(galena) network,												100.0
			218.40m cointains organic materials,												100.0
225															93.3
230															100.0
		233.20													100.0
235			Marl (Aptien age) grayish black, argillaceous, contains limestone breccia and framboidal pyrite, with carbonate network, crack dominant,												100.0
			233.90m contains brown limestone breccia with calcite−(galena) veinlets,												100.0
240															

Figure 146 Columnar section of the drill hole, MJTK-L1

GEOLOGIC LOG

Hole : MJTK−L1
Machine Model : RASKA30
Elevation : 429. 12m
Drilled Length : 400. 10m

Site Name : El Akhouat
Period : 2000. 9. 27～10. 17
Inclination : 75°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
240			Marl (Aptien age) grayish black, argillaceous, contains limestone nodule and framboidal pyrite, with carbonate network, crack dominant.												100.0
															100.0
245			240.10～244.60m mostry crushed.												100.0
															100.0
250															100.0
															100.0
255															73.3
			259.30～260.00m mostry crushed.												
260		260.00	Marl (Aptien age) grayish black, calcareous, lime mud matrix, sparry calcite cement, with carbonate network,												60.0
															83.3
265			262.30～262.50m calcite-hydrozincsite veinlets, 266.00～266.50m sheared zone,												93.3
															100.0
270			271.40～273.20m carbonate network dominant,												100.0
															100.0
275															73.3
		278.00	Marl (Aptien age) grayish black, argillaceous, fossiliferous, contains limestone breccia and framboidal pyrite,												100.0
280			278.00～279.80m sheared zone,												100.0
															100.0
285															100.0
		287.00	Marl (Aptien age) grayish black, calcareous, lime mud matrix, sparry calcite cement, contains black woody material, framboidal pyrite is locally found, with carbonate veinlets (width 1mm),												100.0
290															100.0
															100.0
295															100.0
															100.0
300															

Figure 146 Columnar section of the drill hole, MJTK-L1

GEOLOGIC LOG

Hole : MJTK−L1
Machine Model : RASKA30
Elevation : 429. 12m
Drilled Length : 400. 10m

Site Name : El Akhouat
Period : 2000. 9. 27～10. 17
Inclination : 75°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
300			Marl (Aptien age) grayish black, calcareous, lime mud matrix, sparry calcite cement, contains vitrinite and framboidal pyrite, with carbonate veinlets.												100.0
															100.0
305			301.30m carbonate-pyrite veinlets (width 5mm).												100.0
			310.00m calcite-(galena) veinlets.												100.0
310															100.0
															100.0
315															96.7
		318.80													
320			Marl (Aptien age) grayish black～gray, dolomitic, altanating of argillaceous marl and thin beded limeatone, contains vitrinite fragment and framboidal pyrite, partilly brecciated, cruck dominant.												100.0
															100.0
325			323.30m calcite-(galena) veinlets. 324.70m calcite-(sphalerite) veinlets.												90.0
			327.80～328.20m calcite-pyrite-(sphalerite) veinlets.												100.0
330			336.00m calcite-pyrite-(galena) veinlets. 338.50m calcite-pyrite-(galena) veinlets.												100.0
			338.60m a trace amount of galena is found in the fissures.												100.0
335															100.0
															100.0
340															100.0
															100.0
345															100.0
															100.0
350		349.80	Marl (Aptien age) grayish black～gray, dolomitic, contains vitrinite and peloid (pyrite coating), a minor amount of framboidal pyrite is almost invariably present.												100.0
															100.0
355			356.30～364.10m sheared.												100.0
															90.0
360															

Figure 146 Columnar section of the drill hole, MJTK-L1

GEOLOGIC LOG

Hole : MJTK−L1
Machine Model : RASKA30
Elevation : 429. 12m
Drilled Length : 400. 10m

Site Name : El Akhouat
Period : 2000. 9. 27～10. 17
Inclination : 75°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
360			Marl (Aptien age) grayish black～gray, dolomitic, contains vitrinite and peloid (pyrite coating), with minor amounts of pyrite,												90.0
															96.7
		364.10													
365			Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish white), composed mainly of calcareous mudstone, gypsum veinlets, limestone, dolomite and marl,												100.0
		368.60													100.0
370			Carbonate rocks-Gypsum complex gray, calcite and gypsum cement, contains Cretaceous marl and limestone breccia,												100.0
		373.10													
375			Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish white), brecciated (brecciaes are composed mainly of calcareous mudstone, gypsum veinlets, limestone and dolomite,												100.0
															96.7
380			379.70～380.50m massive limestone, 380.50～381.10m marl, calcite cement,												100.0
															100.0
385			384.00～384.90m dolomitized limestone, 384.90～385.50m marl, calcite cement,												100.0
			374.20～374.30m contains hydrozincite, 375.20～375.50m contain marl brecciaes,												100.0
390															100.0
		392.90													
			Dolomite-Limestone-Mudstone complex gray～grayish white, gypsum cement, brecciated (brecciaes are composed mainly of Cretaceous limestone and dolomite,												100.0
395															100.0
															100.0
400		400.10													

Figure 146 Columnar section of the drill hole, MJTK-L1

GEOLOGIC LOG

Hole : MJTK−L2
Machine Model : RASKA30
Elevation : 519. 01m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2000. 10. 21～11. 4
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
			Overburden												
		0.80	Limestone (Coniacian age) brownish light gray～yellowish light brown, compact, finely calcite matrix, weekly oxicidized, pyrite are scattered, with calcite-(pyrite) veinlets, limonite is found in the fissures. 5.50m, 15.50m drusy calcite vein (width 5cm).												69.4
5															93.3
															100.0
10															93.3
															100.0
15															100.0
		17.70	Dolomite (Turonian age) grayish brown～yellowish brown, compact, finely dolomite matrix, weekly oxcidized, contains organic materials, with calcite-(pyrite) veinlets, limonite is found in the fissures. 24.60m drusy calcite vein (width 5cm). 26.00～30.60m wholly crushed.												100.0
20															100.0
															60.0
25															46.7
															100.0
30															100.0
		32.60	Dolomite (Turonian age) gray～grayish brown, finely dolomite matrix, with calcite-pyrite veinlets, limonite is found in the fissures. 32.60～35.30m brecciated, fossiliferous.												96.7
35		38.00	Dolomite (Turonian age) brownish gray, compact, finely dolomite matrix, with calcite network. 40.00m calcite vein (width 7cm).												100.0
		43.00	Calcite-limonite-hematite vein												100.0
40		43.60	Dolomite (Turonian age) brownish gray～light brownish gray, compact, fossilliferous, finely dolomite matrix, partially brecciated, with calcite veinlets～network. 45.40～47.80m with calcite-pyrite-(galena) veinlets.												100.0
															100.0
45															100.0
		51.40	Calcite-limonite-hematite-(sphalerite) vein												100.0
50		53.10	Dolomite (Turonian age) gray～grayish brown, finely crystalline, finily dolomite cement, with calcite veinlets～network, weakly oxicidized. 53.10～53.70m, 57.80～60.40m brecciated, pyrite are scattered, contains a trace amount of galena.												100.0
															100.0
55															100.0
															100.0
60															

Figure 147 Columnar section of the drill hole, MJTK-L2

GEOLOGIC LOG

Hole : MJTK−L2
Machine Model : RASKA30
Elevation : 519. 01m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2000. 10. 21～11. 4
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
60		60.40													100.0
			Dolomite (Turonian age) gray～light yellowish brown, finely dolomite matrix, with calcite veinlets, limonite is found in the fissures.												100.0
65		65.00	Dolomite (Turonian age) light yellowish brown～grayish white, weakly oxicidized, finely dolomite matrix, contains Mn-oxicide material, limonite is found in the fissures. 66.20～66.90m with calcite-pyrite network. 69.80m drusy calcite vein (width 5cm), contains a trace amount of galena. 75.00～75.20m calcite-hematite vein.												100.0
															90.0
70															100.0
															100.0
75															100.0
		76.60	Dolomite (Turonian age) light yellowish brown～gray, compact, lime mud matrix.												100.0
80															100.0
		81.30	Dolomite (Turonian age) light brown～light gray, pyrite are scattered, with calcite vein.												90.0
		84.00	Dolomite (Turonian age) grayish black～grayish brown, organic, lamina is recognized, interbeded with light brown limestone, a minor amount of pyrite is locally found, with calcite-(pyrite) veinlets (width 1～2cm). 85.40～86.00m light brown limestone part. 89.00～90.70m light brown limestone part. 89.70m drusy calcite-hematite vein (width 15cm). 94.20～94.70m light brown limestone part, with calcite-(pyrite) veinlets. 100.90～101.00m with calcite-(galena) network. 101.00m calcite-galena-(sphalerite) vein (width 10cm). 104.70m calcite-pyrite vein (width 5cm). 114.90～115.00m mostly crushed, limonite is found in the fissures. 116.80～117.00m calcite-pyrite-galena vein (width 20cm).												90.0
85		85.40													90.0
		86.00													90.0
		89.00													100.0
90		90.70													100.0
		94.20													100.0
95		94.70													100.0
															100.0
100															100.0
															100.0
105															100.0
															100.0
110															100.0
															100.0
115															100.0
		116.80													100.0
		117.00													100.0
120															

Figure 147 Columnar section of the drill hole, MJTK-L2

GEOLOGIC LOG

Hole : MJTK−L2
Machine Model : RASKA30
Elevation : 519. 01m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2000. 10. 21～11. 4
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
120			Dolomite (Turonian age) dark gray～dark brown, lamina is recognized, organic, lime mud matrix, with calcite vein～veinlets, a minor amount of pyrite is locally found,												100.0
125			121.60～123.00m with calcite-(pyrite) vein～network,												93.3
130															100.0
135			132.70～132.90m calcite vein (width 20cm), 133.60～133.75m calcite vein (width 15cm), 138.10～138.60m with calcite network,												100.0
140			139.10m drusy calcite veinlets (width 2cm) with petorole nodule, 140.00m calcite-(pyrite) veinlets (width 3cm), 140.20m drusy calcite veinlets (width 2cm), 142.80m calcite veinlets (width 3cm), 142.90m calcite veinlets (width 3cm),												100.0
145															100.0
150															100.0
155			155.60m calcite vein (width 10cm),												100.0
160															100.0
165			163.80～164.00m with calcite veinlets, 167.10～168.10m brecciated, calcite-pyrite matrix,												100.0
170		169.40	Dolomite (Turonian age) grayish white～gray, altanating of grayish white compact dolomite and brownish gray lamina dolomite,												90.0
175		173.50	Sandstone (Turonian age) grayish white～gray, fine-grained, calcareous, with coarse-grained calcite pebble, interbeded with thin beded dolomitic black marl, with calcite-pyrite veinlets～network, pyrite are scattered,												100.0
180															100.0

Figure 147 Columnar section of the drill hole, MJTK-L2

GEOLOGIC LOG

Hole : MJTK−L2
Machine Model : RASKA30
Elevation : 519. 01m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2000. 10. 21～11. 4
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
180			Sandstone (Turonian age) grayish white～light brownish white, calcareous, fine to medium-grained, interbeded with thin beded dolomitic marl, pyrite are scattered, with calcite-(pyrite) network.												100.0
185			179.50～180.60m calcite-(pyrite) veinlets, 181.80～181.90m calcite-pyrite vein(width 10cm), 184.80～184.95m calcite-pyrite-spharelite vein(width 15cm), 189.60～189.80m calcite-pyrite-(galena) vein(width 20cm),												100.0
190															100.0
195															100.0
200			201.50m calcite-galena veinlets(width 1cm), 204.70～205.10m with calcite-(pyrite) veinlets(width 1cm), 208.00m drusy calcite veinlets(width 2cm), 212.00m calcite vein, 212.50m calcite vein,												100.0
205															100.0
210															100.0
215		213.50	Limestone (Turonian age) gray～dark gray, finely crystalline, organic, dolomitized, weakly mineralized, 213.80m calcite-pyrite-(galena)-(sphalerite) veinlets (width 3cm), 216.80～217.00m with calcite-pyrite-(galena) network, 217.60～218.00m, 218.90～219.30m calcite-pyrite-(galena) veinlets(width 1-3cm), 219.70～223.00m with calcite veinlets～network,												100.0
220															100.0
225		223.00	Mineralized zone limestone-hosted, brownish dark gray, dolomitized, lime mud-organic material matrix, 223.00～225.50m with calcite-(pyrite)-(sphalerite) network, 225.50～226.50m calcite-pyrite-sphalerite-galena veinlets and network, 226.50～227.10m calcite-pyrite-sphalerite-galena matrix, 227.30～231.65m calcite-pyrite-sphalerite-galena veinlets and network, 232.50～235.00m calcite-sphalerite-(pyrite)-(galena) veinlets～network, 235.00～235.20m calcite-(pyrite)-(sphalerite) veinlets, 236.05～237.45m calcite-sphalerite-pyrite-(galena) vein, 237.45～238.40m massive pyrite and sphalerite ore.	186.9	2.00	6.26	1.41	1318.9	83.58	6.09	24.20	395.1	11.15	222.50	
				566.5	1.82	8.93	1.59	1203.5	73.62	8.00	20.70	435.8	13.58	223.50	100.0
				330.5	2.45	12.18	2.03	1441.4	101.41	8.00	18.70	441.1	30.20	224.50	
				691.2	2.35	13.95	2.43	1164.9	88.53	11.93	24.92	828.1	60.47	225.50	
				1772.1	4.62	7.02	2.55	1318.4	189.9	6.79	35.70	518.4	64.47	226.50	100.0
				1.53%	3.52	1.40	2.05	1277.7	138.3	3.31	44.10	127.5	7.19	227.50	
				1053.1	3.07	7.05	1.59	1583.9	124.0	13.51	35.00	328.0	25.91	228.50	
230				2451.3	2.82	6.43	0.94	1191.6	124.5	12.43	31.22	269.8	37.48	229.50	100.0
				3252.9	3.70	11.61	2.73	1160.8	99.13	9.04	31.60	452.0	151.8	230.50	
				103.7	1.54	13.55	0.93	764.6	56.94	14.42	28.00	463.2	31.88	231.50	
				115.8	3.30	7.38	0.98	912.1	161.88	8.30	21.60	319.4	30.45	232.50	100.0
				303.6	2.30	14.32	1.22	1049.7	41.97	7.30	21.10	570.3	53.39	233.50	
235				137.6	1.40	7.55	1.11	1054.6	29.19	8.30	21.20	493.6	13.32	234.50	
				209.0	1.70	11.52	2.09	1010.6	16.47	7.00	20.50	633.1	14.51	235.50	100.0
				1321.7	8.42	9.11	5.14	677.8	57.17	1.32	35.42	511.3	26.28	236.50	
				6988.0	20.00	61.79	21.00	373.0	132.8	0.08	11.62	69.1	113.3	237.50	
		238.60	Sandstone (Turonian age)	120.3	0.68	8.82	1.22	644.8	9.92	0.33	44.10	1257.5	25.22	238.50	100.0
240														239.50	

Figure 147 Columnar section of the drill hole, MJTK-L2

GEOLOGIC LOG

Hole : MJTK−L2
Machine Model : RASKA30
Elevation : 519. 01m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2000. 10. 21～11. 4
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
240			Sandstone (Turonian age) brownish white～light gryish brown, fine to medium-grained, calcareous, interbeded thin beded dolomitic black marl, with calcite-(pyrite) veinlets, pyrite are scattered.												100.0
			242.00～243.00m calcite-pyrite matrix.												100.0
245			243.40～243.50m calcite cavity sediment.												100.0
			245.20～246.60m pyrite-calcite veinlets.												100.0
250			250.50m pyrite-calcite veinlets.												100.0
			252.20m pyrite-calcite veinlets.												100.0
			254.60m calcite-pyrite-galena brecciae.												100.0
255			258.80～258.90m calcite-(galena)-(sphalerite) network.												100.0
			262.70m sphalerite-calcite-pyrite veinlets (width 3cm).												100.0
260		261.70	Dolomite (Turonian age) brownish gray～gray, finely crystalline, lamina is recognized, with calcite-pyrite -(galena) veinlets and sphalerite-calcite -pyrite veinlets (width 3cm).												100.0
265		266.80	Mineralized zone limestone-hosted, brownish gray～gray, lime mud-organic material matrix.	776.7	0.81	11.03	2.27	824.5	12.08	6.70	22.70	489.9	74.70	265.80	100.0
			265.80～266.80m, 270.30～270.60m calcite-pyrite-sphalerite-galena network.	516.5	9.46	22.79	2.75	744.1	103.1	5.33	32.20	346.1	111.0	266.80	
			266.80～267.80m with calcite-sphalerite- pyrite veinlets (width 1cm±)～network.	518.8	0.79	13.35	3.35	672.4	15.48	0.91	38.50	825.7	393.6	267.80	
			271.40～271.70m massive pyrite.	874.9	0.69	11.68	4.67	798.0	10.90	3.81	37.10	693.7	328.3	268.80	100.0
270			272.60～275.40m with calcite-sphalerite- pyrite veinlets (width 0.5-1.0cm).	5314.9	1.21	16.64	8.55	560.6	32.03	0.41	34.62	582.9	394.3	269.80	
			275.40～277.10m sphalerite-galena massive ore.	3064.3	1.03	19.82	5.49	765.7	34.03	1.40	39.20	432.9	71.91	270.80	
			277.20～277.60m calcite-pyrite-sphalerite vein.	1061.5	0.58	12.51	1.39	822.4	15.77	13.70	31.08	685.7	338.8	271.80	100.0
				677.7	1.79	16.67	1.30	889.9	43.22	11.61	33.04	628.6	85.68	272.60	
				1871.2	3.47	28.68	3.09	965.0	43.14	7.21	33.60	805.5	182.1	273.60	
275				5089.4	3.59	43.85	5.53	822.7	61.40	6.47	31.22	503.1	113.8	274.60	96.7
				1.92%	36.00	281.5	7.50	292.1	506.8	0.66	11.20	83.07	7.91	275.60	
		277.60		2622.0	11.30	50.87	6.60	532.8	156.7	0.16	33.46	524.0	46.70	276.60	
			Sandstone (Turonian age) light gray～brownish white, calcareous, fine-grained, altanating of compact sandstone and dolomitic black marl, with calcite-(pyrite) veinlets～network, marl, pyrite are scattered.	144.4	0.59	14.09	1.64	346.6	3.92	0.25	39.90	991.5	58.65	277.60	100.0
														278.60	
280															100.0
															100.0
285			280.20m, 280.90m calcite-pyrite-sphalerite-(galena) veinlets.												100.0
			286.70m calcite-(pyrite)-(sphalerite) vein(width 7cm).												100.0
			288.40～286.80m, 289.00～290.60m interbeded with thin beded black marl.												100.0
290		291.60													
			Mineralized zone limestone-hosted, light brown, partially dolomitized, pyrite are scattered.	1812.0	1.50	18.00	1.05	612.0	14.00	0.17	27.14	954.0	225.0	291.60	100.0
			291.60～293.60m calcite-(pyrite)-(sphalerite) veinlets～vein.	2049.3	0.89	16.32	3.46	560.2	20.45	0.10	20.90	801.2	109.7	292.60	
			294.10～296.70m calcite-pyrite-sphalerite-(galena) matrix.	805.22	0.60	7.86	1.54	529.5	16.34	0.10	24.10	615.3	107.8	293.60	
295			296.90～299.85m calcite vein with massive pyrite.	186.59	1.28	8.90	1.50	712.8	23.51	0.10	33.00	423.6	270.4	294.60	
				1690.4	0.59	12.74	2.62	579.9	13.93	0.10	30.30	799.1	322.8	295.60	100.0
														296.60	
300															100.0

Figure 147 Columnar section of the drill hole, MJTK-L2

GEOLOGIC LOG

Hole : MJTK−L2
Machine Model : RASKA30
Elevation : 519. 01m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2000. 10. 21～11. 4
Inclination : 60°
Direction : 118°

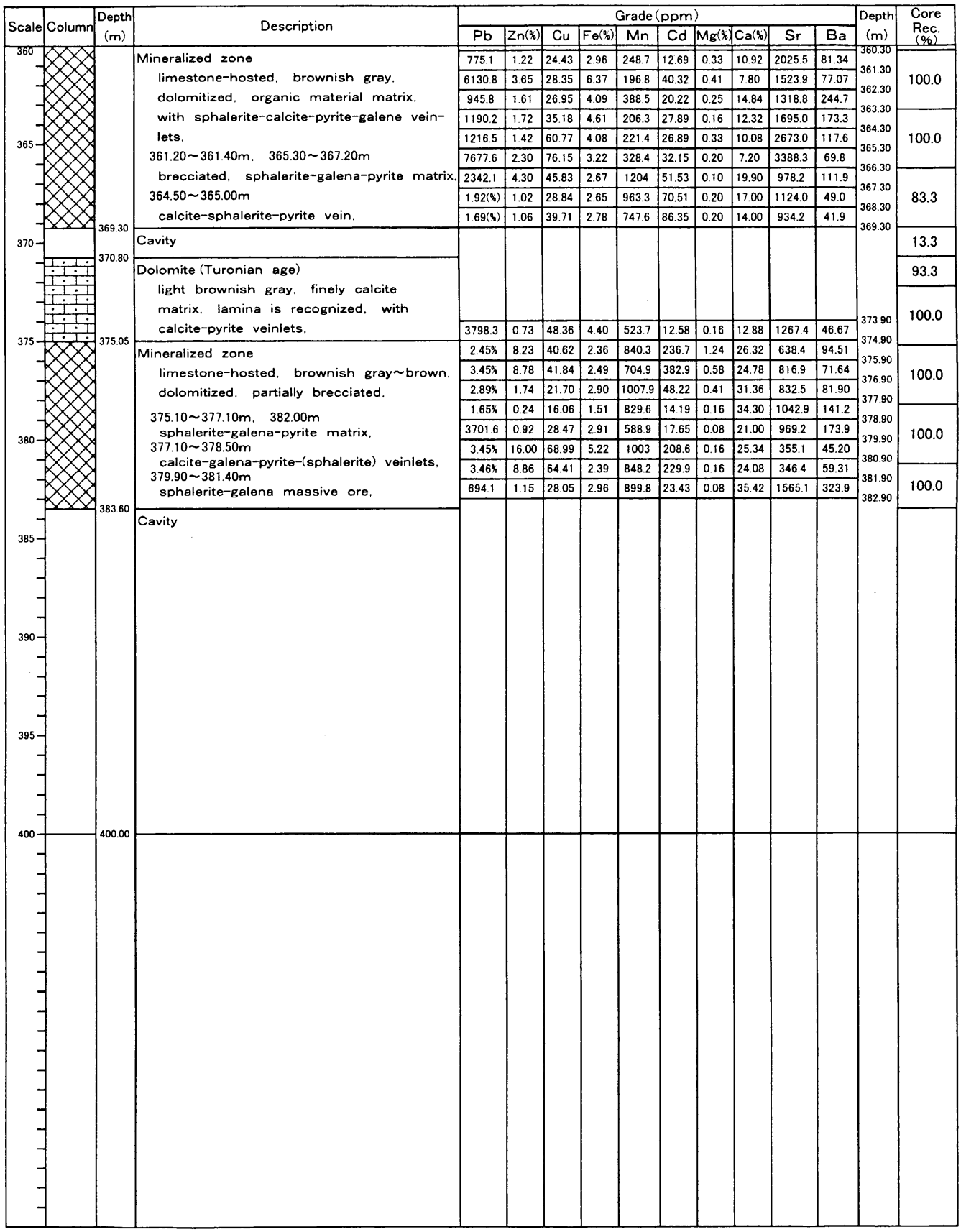
Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
													100.0
	Mineralized zone											300.60	
	limestone-hosted, light brown, partially	132.00	0.54	9.24	1.36	505.6	5.29	0.20	31.30	903.6	227.5		
	dolomitized, pyrite are scattered,	131.21	0.51	10.24	1.32	496.0	5.11	0.20	30.30	877.3	216.7	301.60	100.0
	299.85～304.00m	327.53	0.31	7.84	1.69	592.7	6.32	0.30	31.80	494.2	130.0	302.60	
	calcite-sphalerite-pyrite-(galena) vein,	418.05	1.65	19.37	3.06	542.2	10.17	0.90	26.40	732.8	53.01	303.60	
304.60												304.60	100.0
	Dolomite (Turonian age)												
306.20	brownish gray～gray, lime mud matrix,												
306.30	lamina is recognized, with calcite-pyrite												100.0
	-(sphalerite) veinlets～network,												
	306.20～306.30m fault												100.0
	314.20～315.30m												
	brecciated, calcite-pyrite cement,												100.0
													100.0
													100.0
	322.60m calcite-pyrite vein (width 10cm),												100.0
													100.0
													100.0
													100.0
334.80													100.0
	Dolomite (Turonian age)												
	brownish gray, weakly mineralized,												
	organic, lime mud matrix,												
	with calcite-pyrite-(sphalerite)-(galena)	1.89%	0.87	30.02	3.07	1709.2	27.92	0.25	30.52	933.7	76.66	337.60	100.0
	network, contains calcite-sphalerite	4969.2	1.49	15.00	1.92	955.2	27.87	0.25	34.44	1348.2	67.13	338.60	
	breccia, with pyrite striation,	751.4	0.55	24.11	2.55	709.8	12.88	0.25	32.90	992.1	225.9	339.60	
	335.10～337.60m											340.60	100.0
	brecciated, with calcite breccia,												
	337.60～339.30m												100.0
	calcite-galena-(sphalerite) veinlets,												
		433.4	0.39	17.99	1.98	538.9	8.13	0.83	30.80	1150.6	162.2	345.30	
346.30		401.4	1.44	23.33	3.83	502.9	11.07	0.25	23.94	1631.9	72.94	346.30	100.0
	Mineralized zone	3628.0	4.56	18.34	16.00	431.2	37.51	0.16	21.28	1181.0	35.96	347.30	
	limestone-hosted, dark brownish gray,	1944.3	8.95	15.59	9.40	348.6	58.03	0.25	17.92	989.7	55.22	348.30	
	dolomitized, brecciated, finely crystalline,	1537.6	4.01	6.16	4.30	845.6	47.21	0.16	40.60	840.2	30.20	349.30	100.0
	lime mud-organic material matrix,	2994.3	0.67	12.88	2.41	855.4	6.71	0.33	36.40	833.3	163.8	350.30	
	346.40～357.30m	1291.6	2.21	16.95	3.18	677.2	50.11	0.74	26.04	1396.6	211.5	351.30	
	brecciated, sphalerite-pyrite matrix,	2735.1	0.63	22.51	3.18	372.6	9.09	0.74	21.98	1920.9	167.0	352.30	100.0
	357.30～360.30m	1.74%	1.08	16.80	7.12	429.9	52.13	0.83	20.36	1573.7	69.61	353.30	
	calcite-sphalerite network～veinlets and	1882.1	0.70	15.71	2.30	600.7	4.41	0.74	33.60	1771.9	165.9	354.30	
	sphalerite-galena-pyrite matrix,	1026.5	1.20	12.39	2.43	697.6	14.32	0.41	39.90	1291.2	111.3	355.30	100.0
		2752.5	2.91	23.70	4.36	417.0	41.02	0.75	22.12	1867.9	238.0	356.30	
		662.5	1.13	17.08	4.03	535.2	17.01	3.80	17.08	1635.2	104.5	357.30	
		6637.1	5.94	26.26	7.39	251.1	62.10	0.82	10.92	1637.8	72.98	358.30	100.0
359.70		2818.7	3.37	26.28	3.91	310.5	36.96	0.41	12.32	1678.2	108.6	359.30	

Figure 147 Columnar section of the drill hole, MJTK-L2

GEOLOGIC LOG

Hole : MJTK−L2
Machine Model : RASKA30
Elevation : 519. 01m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2000. 10. 21～11. 4
Inclination : 60°
Direction : 118°



Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
360			Mineralized zone	775.1	1.22	24.43	2.96	248.7	12.69	0.33	10.92	2025.5	81.34	360.30	
			limestone-hosted, brownish gray,	6130.8	3.65	28.35	6.37	196.8	40.32	0.41	7.80	1523.9	77.07	361.30	100.0
			dolomitized, organic material matrix,	945.8	1.61	26.95	4.09	388.5	20.22	0.25	14.84	1318.8	244.7	362.30	
			with sphalerite-calcite-pyrite-galene veinlets,	1190.2	1.72	35.18	4.61	206.3	27.89	0.16	12.32	1695.0	173.3	363.30	
365				1216.5	1.42	60.77	4.08	221.4	26.89	0.33	10.08	2673.0	117.6	364.30	100.0
			361.20～361.40m, 365.30～367.20m	7677.6	2.30	76.15	3.22	328.4	32.15	0.20	7.20	3388.3	69.8	365.30	
			brecciated, sphalerite-galena-pyrite matrix,	2342.1	4.30	45.83	2.67	1204	51.53	0.10	19.90	978.2	111.9	366.30	
			364.50～365.00m	1.92(%)	1.02	28.84	2.65	963.3	70.51	0.20	17.00	1124.0	49.0	367.30	83.3
			calcite-sphalerite-pyrite vein,	1.69(%)	1.06	39.71	2.78	747.6	86.35	0.20	14.00	934.2	41.9	368.30	
		369.30												369.30	
370			Cavity												13.3
		370.80													93.3
			Dolomite (Turonian age)												
			light brownish gray, finely calcite												100.0
			matrix, lamina is recognized, with												
			calcite-pyrite veinlets,	3798.3	0.73	48.36	4.40	523.7	12.58	0.16	12.88	1267.4	46.67	373.90	
375		375.05		2.45%	8.23	40.62	2.36	840.3	236.7	1.24	26.32	638.4	94.51	374.90	
			Mineralized zone	3.45%	8.78	41.84	2.49	704.9	382.9	0.58	24.78	816.9	71.64	375.90	
			limestone-hosted, brownish gray～brown,												100.0
			dolomitized, partially brecciated,	2.89%	1.74	21.70	2.90	1007.9	48.22	0.41	31.36	832.5	81.90	376.90	
			375.10～377.10m, 382.00m	1.65%	0.24	16.06	1.51	829.6	14.19	0.16	34.30	1042.9	141.2	377.90	
			sphalerite-galena-pyrite matrix,	3701.6	0.92	28.47	2.91	588.9	17.65	0.08	21.00	969.2	173.9	378.90	
380			377.10～378.50m											379.90	100.0
			calcite-galena-pyrite-(sphalerite) veinlets,	3.45%	16.00	68.99	5.22	1003	208.6	0.16	25.34	355.1	45.20	380.90	
			379.90～381.40m	3.46%	8.86	64.41	2.39	848.2	229.9	0.16	24.08	346.4	59.31	381.90	
			sphalerite-galena massive ore,	694.1	1.15	28.05	2.96	899.8	23.43	0.08	35.42	1565.1	323.9	382.90	100.0
		383.60													
			Cavity												
385															
390															
395															
400		400.00													

Figure 147 Columnar section of the drill hole, MJTK-L2

GEOLOGIC LOG

Hole : MJTK−L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

Site Name : El Akhouat
Period : 2000. 12. 30～2001. 1. 30
Inclination : 70°
Direction : 298°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
		0.60	Overburden												93.3
			Limestone light brownish white, compact, homogeneous, finely calcite matrix, weathered and weakly oxicidized, limonite and pyrite are scattered, with pyrite striation and a small amount of calcite veinlets, limonite is found in the fissures. 4.60～4.80m coarsely calcite cement. 30.60～32.80m crushed.												78.6 100.0 93.3 93.3 86.7 100.0 100.0 100.0 96.7 86.7 96.7
		34.30	Limestone light brown～light brownish gray, compact, homogeneous, finely calcite matrix, weekly weathered, altanating of light brown limestone and thin beded black marl, limonite is found in the fissures. 34.30～34.90m crushed.												93.3 93.3 100.0 100.0 93.3
		48.60	Limestone grayish white, finely calcite matrix, altanating of grayish white limestone and thin beded black marl, with pyrite striation and calcite-limonite veinlets～network. 50.50～50.80m limonite-hematite-calcite are found in the fissures. 57.80～58.00m coarsely calcite cement.												96.7 100.0 93.3 100.0

Figure 148 Columnar section of the drill hole, MJTK-L3

GEOLOGIC LOG

Hole : MJTK−L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

Site Name : El Akhouat
Period : 2000. 12. 30～2001. 1. 30
Inclination : 70°
Direction : 298°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
60			Limestone grayish white, finely calcite matrix, homogeneous, partially interbeded with thin beded black marl, with calcite-(pyrite) veinlets, limonite is found in the fissures.												100.0
65			61.00～61.20m black marl, 61.30～61.90m black marl,												100.0 80.0 96.7
70															96.7
75															90.0 93.3
80			80.80～80.90m calcite-(pyrite) vein,												96.7
		81.10	Limestone whitish gray, compact, finely calcite matrix, homogeneous, altanating of limestone and thin beded black marl, with calcite network～veinlets, 83.30m calcite-(pyrite) vein (width 2cm), 88.80～88.90m with calcite-(pyrite) veinlets (width 3cm),												96.7
85															100.0
90															90.0
		91.00	Marl gray～blackish gray, lime mud matrix, partially interbeded with dark gray mud-stone, with calcite veinlets～network, 91.00～91.80m crushed, 94.70～95.20m crushed, 95.20～96.40m with calcite veinlets,												100.0
95															100.0
100			98.80～99.30m with calcite veinlets～network, 102.00～102.10m with calcite-(pyrite) veinlets,												100.0 96.7
105															100.0
110															100.0 96.7
115			113.60～113.80m with calcite veinlets, 116.20m calcite veinlets (width 5cm), 117.20m calcite-(pyrite) veinlets (width 5cm), 118.20～118.50m with drusy calcite vein,												100.0 100.0
120															100.0

Figure 148 Columnar section of the drill hole, MJTK-L3

GEOLOGIC LOG

Hole : MJTK−L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

Site Name : El Akhouat
Period : 2000. 12. 30～2001. 1. 30
Inclination : 70°
Direction : 298°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
120			Marl dark gray～black, lime mud matrix, partially interbeded with mudstone, with calcite-(pyrite) veinlets～network.												100.0
															100.0
125			123.00～128.00m dark gray mudstone, 126.40m calcite veinlets (width 2cm), 128.00m calcite veinlets (width 3cm), 129.60～129.80m with calcite-(pyrite) vein,												100.0
															100.0
130			132.70m calcite veinlets (width 2cm), 133.10～133.50m with calcite-(pyrite) veinlets, 134.30～135.90m dark gray mudstone,												100.0
135															100.0
															100.0
140			141.35～141.50m with calcite-(pyrite) network,												100.0
															100.0
145			145.20～145.50m dark gray mudstone, 147.00～147.20m with calcite veinlets, 147.80～151.40m mostly crushed, 150.80m calcite- (pyrite) vein (width 7cm), 153.30～153.70m with calcite network,												100.0
150															100.0
		154.00													100.0
155			Marl dark gray, lime mud matrix, fossiliferous, altanating of black marl and gray limestone, with calcite network～veinlets.												100.0
															100.0
160			164.20m ammonite bearing, 165.80～168.80m mostly crushed,												100.0
165															80.0
170															53.3
		171.90													46.7
175			Limestone light brownish white, compact, finely calcite matrix, lamina is recognized, with pyrite striation and calcite veinlets～network, 174.90～175.10m sphalerite network, 178.40～180.80m calcite-(pyrite) veinlets with a trace amount of galena.												13.3
180															66.7

Figure 148 Columnar section of the drill hole, MJTK-L3

GEOLOGIC LOG

Hole : MJTK—L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

Site Name : El Akhouat
Period : 2000. 12. 30～2001. 1. 30
Inclination : 70°
Direction : 298°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
180			Limestone light brownish white～light brownish gray, compact, finely calcite matrix, partially interbeded with thin beded black marl, lamina is recognized, with pyrite striation and calcite veinlets～network, pyrite are scattered.												66.7
			181.20～181.40m with calcite network～veinlets.												100.0
185			182.70m calcite-pyrite veinlets (width 3cm).												100.0
			187.80～190.40m, 192.80～193.80m mostly crushed, calcite-pryite network.												90.0
190			192.70m calcite-(pryite) veinlets (width 5mm) with a trace amount of galena.												76.7
			198.40～201.60m calcite-pyrite vein～network with a trace amount of sphalerite and galena.												93.3
195			202.00～203.40m with calcite-(pryite) veinlets.												100.0
															86.7
200															100.0
		204.00	Brecciated zone dark gray～blackish gray, black mud and pyrite matrix, brecciaes are composed mainly of Cretaceous and Triassic carbonate rocks (brecciaes are as much as 2-20cm in diameter).												90.0
205			209.60m limestone breccia with calcite-pyrite-(sphalerite) veinlets.												73.3
			212.30～214.20m contains brownish gray limestone breccia with small amounts of celestite.												73.3
210															76.7
		216.70	Gypsum-Carbonate rocks complex whitish gray～gray, gypsum-calcite matrix, brecciated (brecciaes are composed mainly of Cretaceous limestone and Triassic carbonate rocks), dolomitized.												100.0
215			218.10～220.00m massive gypsum.												100.0
															100.0
220															63.3
		226.50	Gypsum-Mudstone-Carbonate rocks complex purpule～purpulish gray, brecciated (brecciaes are composed mainly of Triassic limestone, dolomite and calcareous mudstone), with gypsum vein.												86.7
225															80.0
		233.30	Mudstone-Gypsum-Carbonate rocks complex grayish white～pale greenish white, brecciated (brecciaes are composed mainly of Triassic limestone, dolomite and calcareous mudstone), with gypsum vein.												86.7
230															100.0
235															
240															

Figure 148 Columnar section of the drill hole, MJTK-L3

GEOLOGIC LOG

Hole : MJTK−L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

Site Name : El Akhouat
Period : 2000. 12. 30～2001. 1. 30
Inclination : 70°
Direction : 298°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
240			Mudstone-Gypsum-Carbonate rocks complex light greenish white, brecciated (brecciaes are composed mainly of calcareous sandstone, mudstone, limestone and dolomite, with gypsum vein～veinlets.												100.0
															100.0
245															100.0
															100.0
250															100.0
															100.0
255															100.0
															93.3
260		260.80													
			Dolomite-Gypsum-Mudstone complex gray～blackish gray, strongly dolomitized and pyritized, brecciated (brecciaes are composed mainly of dolomite, calcareous sandstone and mudstone, with gypsum vein～veinlets, contains hydrozincite,												100.0
265															100.0
			267.40～268.40m contains pyrite crystal,												100.0
270															100.0
		271.80													
			Mudstone-Gypsum-Carbonate rocks complex pale green～gray, brecciated (brecciaes are composed mainly of mudstone, dolomite and calcareous sandstone, with gypsum vein～veinlets, contains hydrozincite,												100.0
275															100.0
															100.0
280															100.0
															100.0
285															100.0
															100.0
290			291.80～292.80m wholly crushed, 294.80～296.20m massive gypsum,												53.3
															100.0
295															100.0
		298.90													
300			Mudstone-Carbonate rocks-Gypsum complex												

Figure 148 Columnar section of the drill hole, MJTK-L3

GEOLOGIC LOG

Hole : MJTK−L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

Site Name : El Akhouat
Period : 2000. 12. 30～2001. 1. 30
Inclination : 70°
Direction : 298°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
300			Mudstone-Carbonate rocks-Gypsum complex dark gray, gypsum cement, brecciated (brecciaes are composed mainly of dolomite and limestone),												100.0
															83.3
305															73.3
		307.80													96.7
310			Gypsum-Mudstone-Carbonate rocks complex dark gray～gray, brecciated (brecciaes are composed mainly of dolomite, mudstone, calcareous sandstone and Ccretaceous limestone), dolomite matrix and gypsum cement,												100.0
															100.0
315															100.0
															100.0
320															100.0
															100.0
325															100.0
															100.0
330															100.0
		334.20													100.0
335			Brecciated zone dark gray～gray, brecciaes are composed mainly of marl and limestone (with calcite-pyrite veinlets～network), marl matrix,												76.7
340															83.8
		341.40													66.7
345			Limestone gray～brownish gray, finely calcite matrix, partially interbeded thin beded black marl, with calcite-pyrite veinlets～network, 341.50～341.70m with calcite-pyrite-sphalerite veinlets, 342.40～342.80m with calcite-pyrite-sphalerite veinlets, 348.70m calcite vein (width 5cm), 351.70m calcite-massive pyrite vein (width 50cm), 355.90～356.50m with calcite-pyrite vein, 358.80～359.00m with calcite veinlets, 360.30～360.80m with calcite vein,												100.0
															100.0
350															100.0
															46.7
355															100.0
															100.0
360															

Figure 148 Columnar section of the drill hole, MJTK-L3

GEOLOGIC LOG

Hole : MJTK−L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

Site Name : El Akhouat
Period : 2000. 12. 30～2001. 1. 30
Inclination : 70°
Direction : 298°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
360			Limestone												100.0
			gray～brownish gray, finely calcite matrix, partially interbeded thin beded black marl, with calcite-pyrite veinlets～network.												100.0
365															53.3
			361.20～363.40m sheared zone,												
			366.80～367.00m contains massive pyrite,												43.3
370															66.7
															61.1
		372.80													
			Mudstone-Carbonate rocks complex												100.0
375		374.50													

Figure 148 Columnar section of the drill hole, MJTK-L3

GEOLOGIC LOG

Hole : MJTK−L4
Machine Model : RASKA30
Elevation : 487. 53m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2001. 2. 5～2. 27
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
			Limestone gray, compact, finely calcite matrix, weathered, with calcite-(pyrite) veinlets, limonite is found in the fissures.												66.7
															38.9
5															53.3
															53.3
10															76.7
		11.00	Limestone yellowish brown, weathered, altanating of limestone and marl, with calcite-hematite veinlets～network and pyrite striation, limonite is found in the fissures.												80.0
15															80.0
															66.7
20															66.7
															66.7
25															96.7
		27.90	Limestone light gray～gray, argillaceous, altanating of limestone and marl, crack dominant, limonite is found in the fissures.												86.7
30															66.7
															23.3
35															83.3
		39.00	Limestone brownish gray～gray, finely calcite matrix, with calcite veinlets～network and pryite striation, limonite is found in the fissures. 46.30m calcite vein (width 2-3cm). 46.70m calcite vein (width 5cm) with a trace amount of galena.												83.3
40															100.0
															90.0
45		48.80	Limestone light brownish gray～light gray, finely calcite matrix.												70.0
		51.40	Breciated zone brecciaes are composed mainly of limestone, calcite and limonite, with oxicidized vein.												46.7
50		55.80	Limestone brownish gray～gray, finely calcite matrix, with calcite veinlets～network and pryite striation.												96.7
55															
60															

Figure 149 Columnar section of the drill hole, MJTK-L4

GEOLOGIC LOG

Hole : MJTK−L4
Machine Model : RASKA30
Elevation : 487. 53m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2001. 2. 5～2. 27
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
60			Limestone brownish gray～gray, finely calcite matrix, with calcite veinlets～network, limonite is found in the fissures.												100.0
65			62.20m calcite vein (width 10cm). 67.10m calcite veinlets (width 3cm). 68.00m calcite veinlets (width 2cm).												90.0
70			71.80～72.00m with calcite-(pyrite) vein.												100.0
		71.80	Limestone light gray～light brownish gray, altanating of limestone and very thin beded black marl, with calcite veinlets～network and pyrite striation.												100.0
75			74.30～74.90m calcite network with a trace amount of galena. 77.50～82.70m calcite veinlets～network dominant.												100.0
80															100.0
85															100.0
90															100.0
95			91.50m calcite vein (width 20cm). 92.90m calcite vein (width 3cm) with a trace amount of sphalerite. 95.30～95.70m calcite veinlets with a trace trace amount of galena. 96.70～97.80m calcite veinlets dominant. 98.90～99.30m calcite vein (width 20cm).												100.0
		99.30													93.3
100			Limestone brownish gray～gray, altanating of limestone and very thin beded marl, with calcite veinlets and pyrite striation. 106.70m calcite vein. 106.90m calcite vein with a trace amount of galena. 109.20～110.00m calcite-(barite)-(galena) matrix.												80.0
															100.0
105															100.0
															100.0
			113.00～113.30m brecciated, calcite-(barite) matrix with a small amount of galena. 113.80m calcite-(galena) network. 114.40m calcite-(galena) veinlets (width 1cm). 115.60m calcite-(galena) veinlets (width 1cm).	2338.2	371.9	8.63	1.09	1599	2.63	0.30	31.0	1268.8	>20000	109.10	93.3
110				6732.9	553.1	21.9	1.72	1217	<2.0	0.86	22.8	1397.7	>20000	110.10	
				379.27	216.3	22.8	0.72	2222	<2.0	0.20	20.0	2175.7	>20000	111.10	
				704.09	511.7	5.61	0.69	1183	<2.0	0.22	19.2	1797.1	>20000	112.10	100.0
				1713.5	1657	8.42	0.91	1853	5.14	0.29	27.5	1917.0	>20000	113.10	
			117.30m calcite veinlets with a trace amount of galena. 119.30m calcite vein. 119.50m calcite vein with a trace amount of galena.											113.70	100.0
115															100.0
120															

Figure 149 Columnar section of the drill hole, MJTK-L4

GEOLOGIC LOG

Hole : MJTK−L4
Machine Model : RASKA30
Elevation : 487. 53m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2001. 2. 5～2. 27
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
120			Limestone brownish gray～gray, argillaceous, with calcite veinlets and pyrite striation, 121.90m calcite vein with a trace amount of galena and sphalerite, 122.90～124.20m calcite-(pyrite) vein with a trace amunt of galena and sphalerite, 126.80～127.30m calcite-pyrite veinlets with a small amount of sphalerite and galena, 128.10～128.30m calcite veinlets with a trace amount of sphalerite.												100.0
125															100.0
130															100.0
															100.0
		132.20	Marl dark gray, calcareous, lime mud matrix, with calcite veinlets～network, 137.70～138.90m calcite vein with a trace amount of sphalerite,												86.7
135															100.0
		138.80	Limestone light brownish gray～brownish gray, finely calcite matrix, with calcite veinlets ～network and pyrite striation,												100.0
140															100.0
		143.30	Marl dark gray, calcareous, lime mud matrix, with calcite veinlets～network,												100.0
145															100.0
															100.0
150			152.30～152.70m with calcite vein～veinlets, 154.50～154.70m calcite vein～veinlets with a trace amount of galena,												100.0
															100.0
155															73.3
															86.7
160			159.20～160.40m brecciated, oxcidized, wholly crushed, calcite-pyrite matrix, 160.40～164.90m calcite-(pyrite) vein～network with a trace amount of galena,												93.3
			167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena,												100.0
165															100.0
170															90.0
		172.80	Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets～network, 174.00m calcite-pyrite vein with a trace amount of galena,	446.3	2549.5	15.6	1.37	1339	8.40	0.56	30.0	891.6	>20000	173.20	
				1131.1	2776.2	15.0	1.53	907.6	6.50	1.00	29.0	780.8	>20000	174.20	
175				734.9	1059.0	15.0	1.07	1213	2.95	0.81	39.5	1089.8	>20000	175.20	90.0
				1349.4	1285.0	4.94	2.19	2703	3.83	1.28	39.0	785.6	>20000	176.20	
				455.2	1006.2	9.76	0.98	792.1	<2.0	0.69	35.0	718.4	>20000	177.20	
				174.5	1790.5	11.8	0.94	960.8	<2.0	0.67	32.0	1013.7	>20000	178.20	100.0
180				2105.4	3061.1	10.0	0.27	2378	4.15	2.15	31.0	590.2	>20000	179.20	

Figure 149 Columnar section of the drill hole, MJTK-L4

GEOLOGIC LOG

Hole : MJTK−L4
Machine Model : RASKA30
Elevation : 487. 53m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2001. 2. 5～2. 27
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
180			Limestone brownish gray, argillaceous,	662.1	2201.4	12.3	0.12	1246	2.85	0.64	33.0	745.6	>20000	180.20	
				1562.5	2501.0	13.6	4.85	3213	<2.0	2.70	28.9	995.3	>20000	181.20	86.7
		182.20	Marl dark gray, partially brecciated, barite-calcite-galena-spharelite matrix, mostly crushed,	9373.6	1184.0	20.0	3.59	2167	2.76	1.97	9.2	423.7	>20000	182.20	
				6838.9	1634.0	11.1	4.64	2698	<2.0	2.05	8.6	590.1	>20000	183.20	
185				1.40%	1380.9	26.1	3.85	2053	6.72	1.60	8.4	612.4	>20000	184.20	73.3
				1.40%	1381.5	66.8	6.25	3480	2.06	1.65	13.7	806.5	>20000	185.20	
		186.70	Limestone brownish gray, argillaceous, altanating of limestone and marl, with calcite veinlets～network and pyrite striation,	5807.0	1949.0	19.5	0.39	2966	<2.0	3.50	18.0	1125.0	>20000	186.20	
				736.0	1549.1	22.9	1.34	1182	2.70	1.00	37.0	1182.5	>20000	187.20	100.0
														188.20	
190															100.0
		191.90	Marl dark gray, calcareous, lime mud matrix, with calcite veinlets,												100.0
195		195.40	Limestone brownish gray, argillaceous, altanating of limestone and marl, with calcite veinlets～network and pyrite striation,												100.0
															100.0
200			205.10m calcite vein(width 5cm) with a trace amount of galena,												100.0
205		205.20	Brecciated zone dark gray, calcite-pyrite matrix,												100.0
		207.80	Marl dark gray, lime mud matrix, with calcite veinlets～vein,												96.7
210			214.30～214.40m brecciated, calcite matrix, 219.30～219.00m mostly crushed,												96.7
215															96.7
															90.0
220															86.7
															96.7
225			227.30m calcite vein (width 10cm),												100.0
															100.0
230															100.0
			233.90～234.70m brecciated, 234.90～235.40m calcite-pyriye vein with a trace amount of galena,												100.0
235															100.0
240															

Figure 149 Columnar section of the drill hole, MJTK-L4

GEOLOGIC LOG

Hole : MJTK−L4
Machine Model : RASKA30
Elevation : 487. 53m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2001. 2. 5～2. 27
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
240			Marl dark gray, lime mud matrix, with calcite veinlets～vein, pryite is found in the fissures.												100.0
245		246.00													100.0
			Marl brownish gray～dark gray, homogeneous, calcareous, with calcite-pyrite veinlets～vein,												100.0
250			250.60～251.50m calcite-pyrite vein～veinlets,												93.3
															100.0
255															100.0
260															100.0
															100.0
265															100.0
															100.0
270															100.0
															100.0
275			275.3m calcite veinlets, 276.5m calcite veinlets,												100.0
															100.0
280															100.0
															100.0
285			288.10～288.70m calcite-(pyrite) network～veinlets, 291.30～291.70m calcite-(pyrite)-(chalcopyrite) veinlets,												100.0
290															100.0
		292.30													76.7
			Marl dark gray, lime mud matrix, calcareous, with calcite veinlets, pyrite is found in the fissures,												83.3
295															96.7
300															

Figure 149 Columnar section of the drill hole, MJTK-L4

GEOLOGIC LOG

Hole : MJTK−L4
Machine Model : RASKA30
Elevation : 487. 53m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2001. 2. 5~2. 27
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
300			Marl dark gray, lime mud matrix, calcareous, with calcite veinlets, pyrite is found in the fissures.												90.0
305															100.0
															100.0
310															100.0
															100.0
315			315.00m calcite vein (width 3cm), 315.30m calcite veinlets, 315.60m calcite veinlets,												100.0
			318.30m calcite vein (width 3cm),												100.0
320			321.30m calcite vein, 326.20m calcite vein (width 5cm),												100.0
325															96.7
															100.0
330			330.50~331.90m with calcite network~veinlets,												100.0
															100.0
335		336.40													100.0
			Marl dark gray, lime mud matrix, calcareous, with calcite veinlets,												100.0
340			336.40~337.40m calcite-(sphalerite) veinlets with a trace amount of galena, 339.30~340.50m with calcite-(sphalerite) veinlets,												100.0
345			341.90~342.00m with calcite network~veinlets,												100.0
			344.20~347.10m brecciated, with a trace amount of galena, 347.50~348.30m with calcite veinlets,												100.0
350			352.40m calcite vein (width 2cm),												100.0
															91.7
355			357.00m calcite veinlets,												93.3
															100.0
360															

Figure 149 Columnar section of the drill hole, MJTK-L4

GEOLOGIC LOG

Hole : MJTK−L4
Machine Model : RASKA30
Elevation : 487. 53m
Drilled Length : 400. 00m

Site Name : El Akhouat
Period : 2001. 2. 5～2. 27
Inclination : 60°
Direction : 118°

Scale	Column	Depth (m)	Description	Grade (ppm) Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
360			Marl dark gray, lime mud matrix, calcareous,												100.0
			365.60m calcite-pyrite vein (width 10cm),												100.0
365			369.50m calcite network, 370.10m calcite-(pyrite) veinlets,												100.0
370		370.40	Marl dark gray, lime mud matrix, with calcite veinlets,												90.0
			373.80m calcite-(pyrite) veinlets,												93.3
375															80.0
															100.0
380			380.50～380.70m with calcite veinlets, 381.30m calcite veinlets (width 1cm),												86.7
			384.10～384.30m with calcite veinlets, 386.10～386.40m with calcite veinlets,												
385			386.70～386.90m with calcite veinlets,												96.7
															84.0
390															76.7
			393.30m calcite veinlets, 393.70～398.50m with calcite veinlets,												100.0
395			397.90～398.50m mostly crushed, 399.10～400.00m mostly crushed,												100.0
															100.0
400		400.00													

Figure 149 Columnar section of the drill hole, MJTK-L4