REPORT
ON
THE MINERAL EXPLORATION
IN
THE KRIB-MEJEZ EL BAB AREA
THE REPUBLIC OF TUNISIA

(PHASE Ⅱ)

MARCH 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Preface

In response to the request of the Government of the Republic of Tunisia, the Japanese Government decided to conduct a Mineral Exploration in the Krib-Mejez el Bab Area Project and entrusted the survey to the Japan International Cooperation Agency (JICA) and the Metal Mining Agency of Japan (MMAJ).

The JICA and MMAJ sent to the Republic of Tunisia a survey team consisting of one geologist and three geophysicists from September 12, 2000 to March 5, 2001.

The team conducted a field survey in the Krib-Mejez el Bab Area and completed it in cooperation with the Ministry of Industry and National Office of Mines.

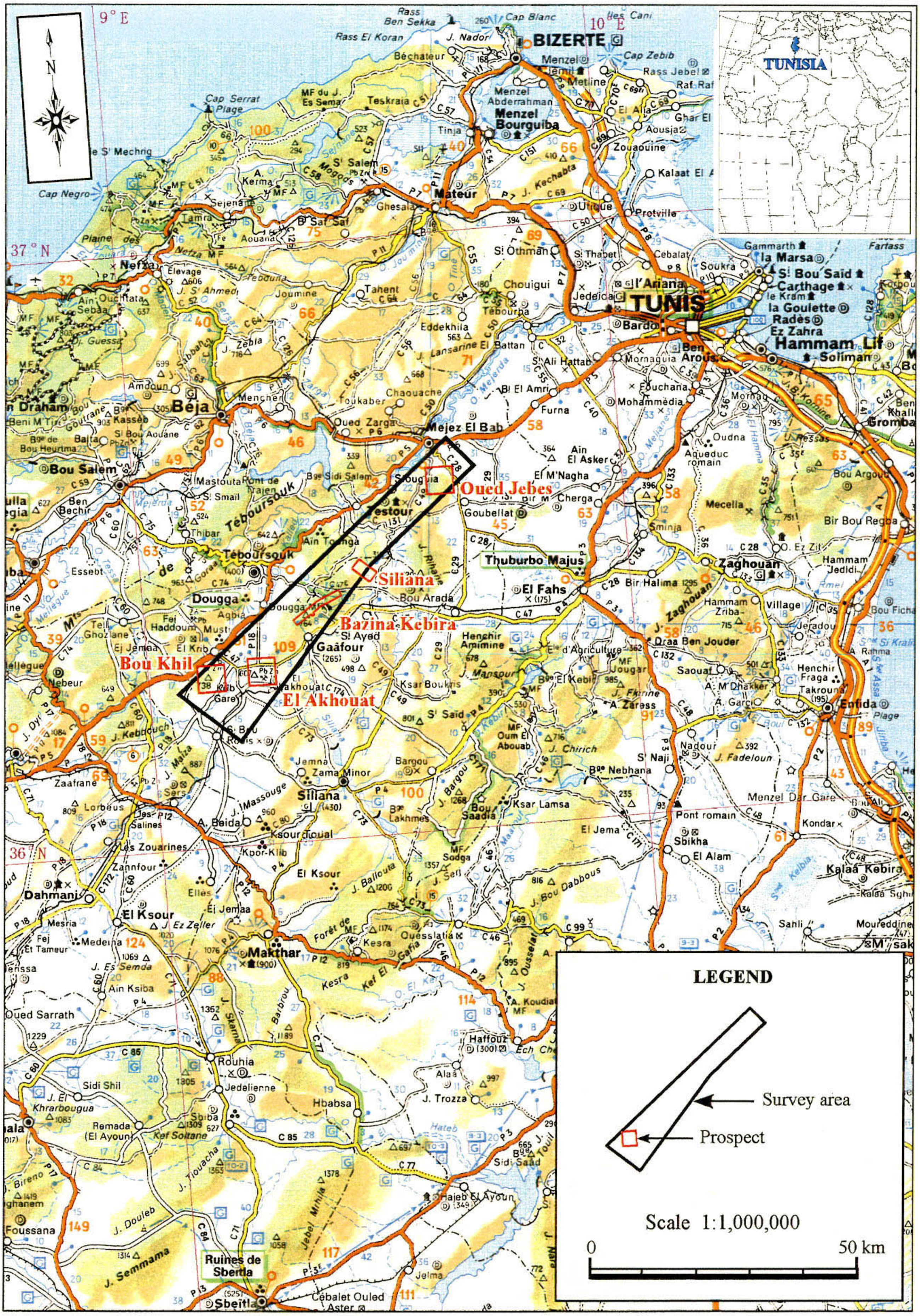
We hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

We wish to express our deep appreciation to the officials concerned of the Government of the Republic of Tunisia for their close cooperation extended to the team.

March 2001

Kunihiko SAITO
President
Japan International Cooperation Agency

Naohiro TASHIRO
President
Metal Mining Agency of Japan



Location Map of Survey Area

Summary

This report is prepared to describe the result of the 2nd Year Campaign of the Mineral Exploration Project for the Krib-Mejez el Bab Area, the Republic of Tunisia.

The on-site investigation of the 2nd Year Campaign was carried out in the period between September 12, 2000 and March 5, 2001, by the Survey Team dispatched by Japan International Agency and Metal Mining Agency of Japan, in cooperation with the Ministry of Industry, the Republic of Tunisia.

The 2nd Year's exploration work comprised the geophysical prospecting (gravity and IP methods) and the drilling investigation. The geophysical prospecting was conducted in the Bazina Kebira and the Siliana prospects for total areas of 11.25 km^2, which included known mineral indications. The drilling investigation was carried out in the Bou Khil and the El Akhouat-Argoub Adama prospects for the targets that had been identified based on the result of the 1st Year Campaign. Six drill holes, totaling 1933.50m in length, were completed during the 2nd Year Campaign. Of the six holes, the hole MJTK-L2 encountered three mineralized zones with the widths of 16.0m (the average grade of 4.27% Pb+Zn), of 11.8m (the average grade of 6.30% Pb+Zn) and of 32.0m (the average grade of 4.14% Pb+Zn) in the host rocks of Cretaceous carbonates.

The mineralization in the Project Area is of a Mississippi Valley or Carbonate Hosted Pb-Zn type. The ultimate objective of the current exploration project is to identify direct indications leading to discovery of new ore deposits or to expansion of known mineralization in sizes and grades. With this objective, the geophysical anomalies that had suggested new ore zones or indicated signatures for mineralization were selected as the exploration targets from those which had been identified in the 1st Year geophysical prospecting. The exploration work to date has demonstrated that anomalous chargeability, one of the factors for the target selection, is sometimes caused by a considerable amount of pyrite associated with marls or transition zones as well as directly by ore deposits or mineralized zones.

The fact that significant mineralization was intersected by the holes drilled to the targets selected according to the result of the geophysical prospecting has proved that the geophysical methods employed in the current exploration project are effective to locate mineralization, in particular of subsurface, worth for detailed exploration.

In the 3rd Year program, it is worthwhile to drill-explore the mineralized zones intersected by the 2nd Year's drill holes for their extension as well as the geophysical anomalies delineated in the 2nd Year for verification of their subsurface occurrences. In addition, extended geophysical prospecting followed by drilling is also recommended

for the 3rd Year Program in the El Akhouat-Argoub Adama prospect where the chargeability anomaly exceeding 20 mV/V still remains to be delineated.

In the general area, no geophysical prospecting has been applied to the mineral indications at Jebel Bou Mouss, Dar Chebka, Kef Lasfer and Oued Jebes located in the vicinity of Mejez el Bab in the northeastern part. It will be recommended to carry out geological and geophysical surveys for an area including these four mineral indications.

Contents

List of Figures, Tables and Appendixes

PART Ⅰ

PART I Project Overview

Chapter 1 Introduction

1.1 Background and Objectives

In response to the request by the Government of the Republic of Tunisia, Japanese Government decided to execute a mineral exploration project in the Krib- Mejez el Bab Area in accordance with the Scope of Work agreed upon between the two Governments on the day of 17th December, 1999. The details of implementation program were further discussed between the two Governments, represented by Japan International Cooperation Agency (JICA) and Metal Mining Agency of Japan (MMAJ) for Japanese side and by Ministry of Industry and National Office of Mines for Tunisian side, and were signed by both sides upon agreement. The Mineral Exploration Project in the Krib- Mejez el Bab Area was commenced for its second year's investigation according to the agreed implementation program in the Japanese fiscal year of 2000 ending March 31th, 2001.

The objectives of the Project are to comprehend the geology and mineralization in the Krib- Mejez el Bab Area and to transfer technology for mineral resource development to engineers and scientists of pertinent institutions of the Republic of Tunisia.

1.2 Conclusions and Recommendation of the Phase I Survey in 1999.

1.2.1 Conclusions

Potential mineralization in the Project Area is categorized into the Mississippi Valley or Carbonate Hosted Pb-Zn type.

Exploration principles are set up based on the first Year's result as follows;

(1) Structural highs, such as domes and horsts, are regionally regarded as primary targets, because they play a role of traps for hydrocarbons generating reducing environment favourable for precipitation of sulfides. Such structural highs are demonstrated as areas of gravity high in the regional gravity map.

(2) Steep gradient zones in the regional gravity highs may indicate extensive development of fractures that have provided conduits for ascending hydrothermal solutions.

(3) It is necessary to specify targets based on detailed subsurface structures

constructed by adequate interpretation of geology and geological, gravity and resistivity structures.

1.2.2 Recommendation

According to the conclusions, a primary regional target for the second Year Programme will be the area of gravity high located in the central-northeast of the Project Area. Steep gravity gradient zones associated with this gravity high are appreciated for mineral potential, since known mineral occurrences, such as Assioud, Siliana and Mahjoubia, are included. It will become possible by carrying out detailed geological and geophysical surveys for selected targets to estimate precise subsurface structures, locations and sizes of mineralization and geological circumstances.

The outcomes of the current year programme are, however, still hypothetical, without elaborated examination on the processes of geological evolution and of ore genesis, and should be proved by further investigations in the second year onward. In order to prove the hypothesis, it is also recommended to explore by drilling the target identified as the result of the geophysical work in the El Akhouat- Argoub Adama prospect.

1.3 Outline of Project

1.3.1 Project Area (Krib-Mejez el Bab)

The Project Area is located approximately 50 km southwest of Capital, Tunis, in the northern part of the Republic of Tunisia (Figure 1). It occupies an area of about 500 km² bounded by the latitudes of 36° 10′ and 36° 39′ N and by the longitudes of 09° 03′ and 09° 43′ E.

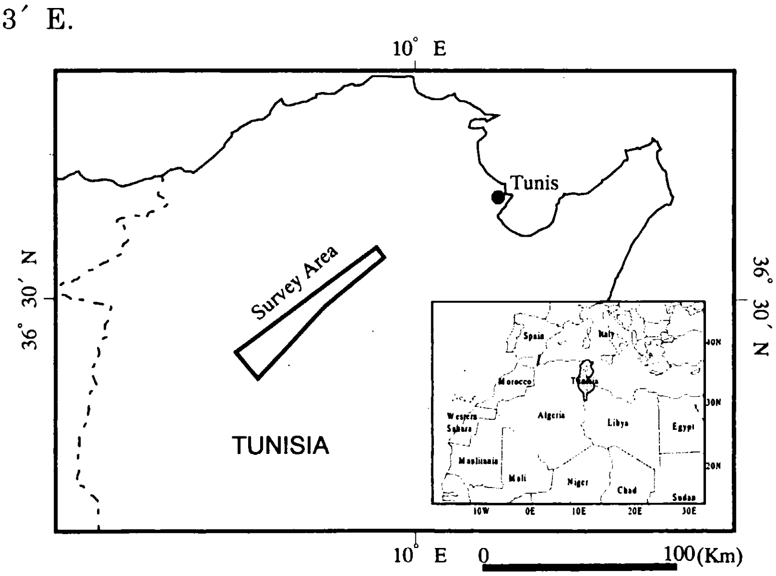


Figure 1 Location map of the survey area

1.3.2 Implementation Program

The kinds and amounts of work, which were implemented in the second Year's program, are presented in Table 1 for the geophysical prospecting and drilling investigation and in Table 2 for the laboratory tests.

Table 1 Drilling Investigation and Geophysical Prospecting

Kind of Work	Amount			
(1) Drilling Investigation	Drill Hole	Depth	Inclination	Direction
Bou Khil Prospect	MJTK-B1	216.8m	-70°	158°
	MJTK-B2	142.1m	-90°	-
El Akhouat-Argoub Adama Prospect	MJTK-L1	400.1m	-75°	118°
	MJTK-L2	400.0m	-60°	118°
	MJTK-L3	374.5m	-70°	298°
	MJTK-L4	400.0m	-60°	118°
(2) Gravity Survey	Survey Area	Rectangular Grid		Number of Measuring Points
Bazina Kebira & Siliana Prospects	11.25km²	250m×250m		810
El Akhouat-Argoub Adama Prospect	-	250m×250m		10
(3) IP Survey	Total Traverse Length		Number of Measuring Points	
Bazina Kebira & Siliana Prospects	38.0km		1,254	
El Akhouat-Argoub Adama Prospect	2.0km		60	

Table 2 Laboratory Tests

Kind of Work	Test Item	Amount
Drill Investigation	Microscopic Observation : Thin Sections	10 rock samples
	Polished Sections	10 ore samples
	Chemical Analysis (Cu, Pb, Zn, Fe, Mn, Cd, Mg, Ca, Sr, Ba)	100 ore samples
Geophysical Prospecting	Density Measurement	30 rock samples
(Gravity, IP)	Apparent Resistivity & Chargeability	30 rock samples

1.4 Project Team

The members, who have participated in the Project, are as follows.

(1) Field Operation Team

(a) Japanese Side

Atsushi Takeyama: Team Leader, General Assignment (Sumiko Consultants Co., Ltd.)

Akihiko Chiba: Geophysical Prospecting (Sumiko Consultants Co., Ltd.)

Akira Kikuchi: Geophysical Prospecting (Sumiko Consultants Co., Ltd.)

Noboru Matsumoto: Geophysical Prospecting (Sumiko Consultants Co., Ltd.)

(b) Tunisian Side

Hammami Mongi (National Office of Mines)

Gharasallah Hedi (National Office of Mines)

Sellami Ahmed (National Office of Mines)

Djebbi Mongi (National Office of Mines)

(3) Supervision of Field Operation

Yasunori Nuibe (MMAJ)

1.5 Project Duration

The Scond Year's program was implemented in the periods between Sep. 12th, 2000 and March 5th, 2001 for the field operation and between March 6th and 23th, 2001 for preparation of the report.

Chapter 2 Geography of Project Area

2.1 Location and Access

The Project Area is located to the southwest of the Capital, Tunis, in the northern part of the Republic of Tunisia and is bounded by the latitudes of 36° 10' N and 36° 39' N and by the longitudes of 9° 03' E and 9° 43' E. The base for this year's field campaign was set in the town of Gaafour, approximately 90 km south east of Tunis.

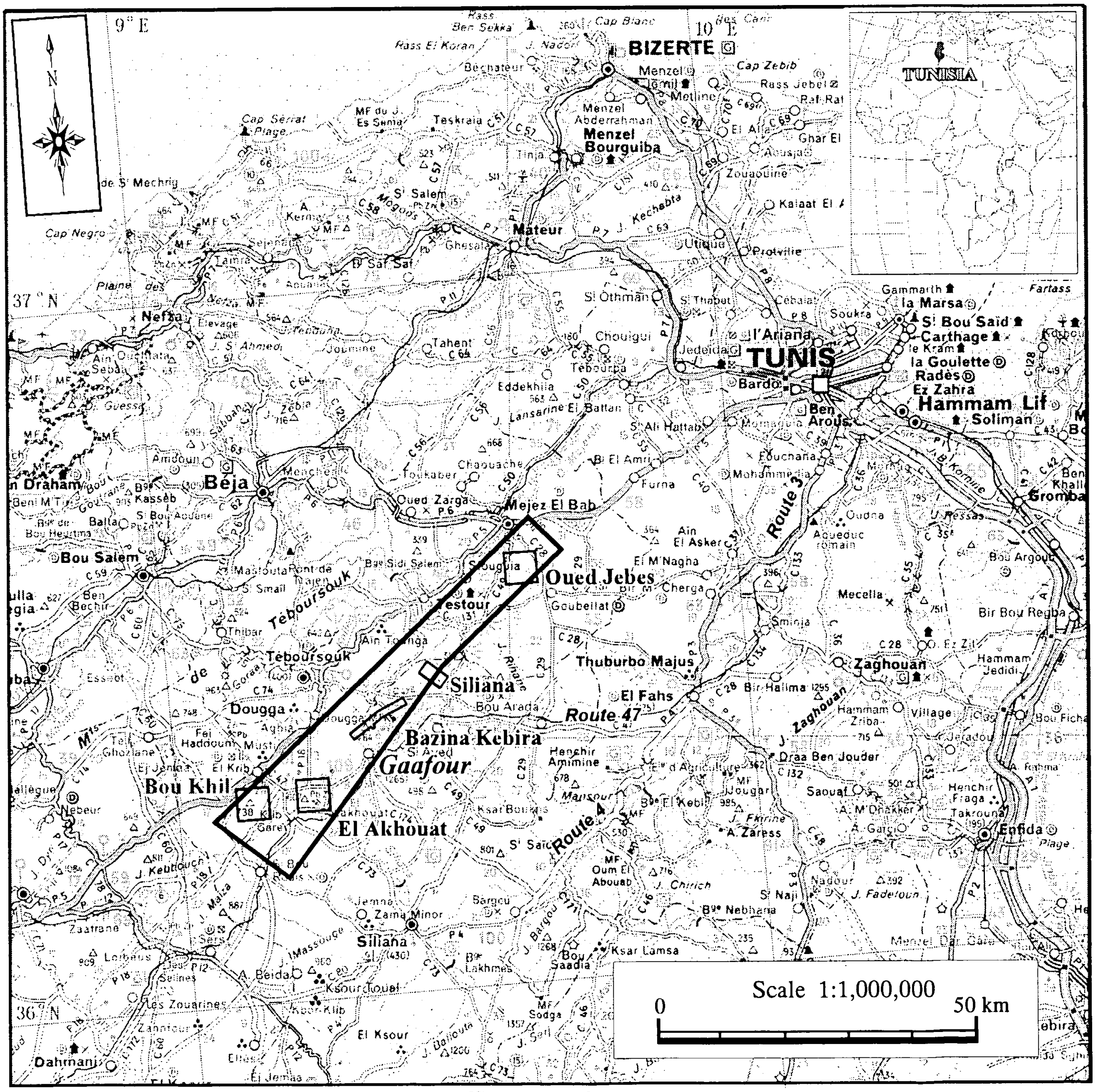


Figure 2 Traffic map of the survey area

The national route No. 4, as well as associated trunk roads, runs through from Tunis to Gaafour, via le Fahs. It takes about one and a half hours from Tunis to Gaafour by driving. Trunk roads are available for the accesses from Gaafour to each prospect. It takes about 20 minutes for a distance of 20 km to Bou Khil to the west, about 15 minutes for a distance of 10 km to Lakhout-Argoub Adama to the southwest, about 15 minutes for a distance of 5 km to Bazina Kebira to the north, and about 25 minutes for a distance of 25 km to Siliana to the northeast, from Gaafour by driving (see the location map of the survey area).

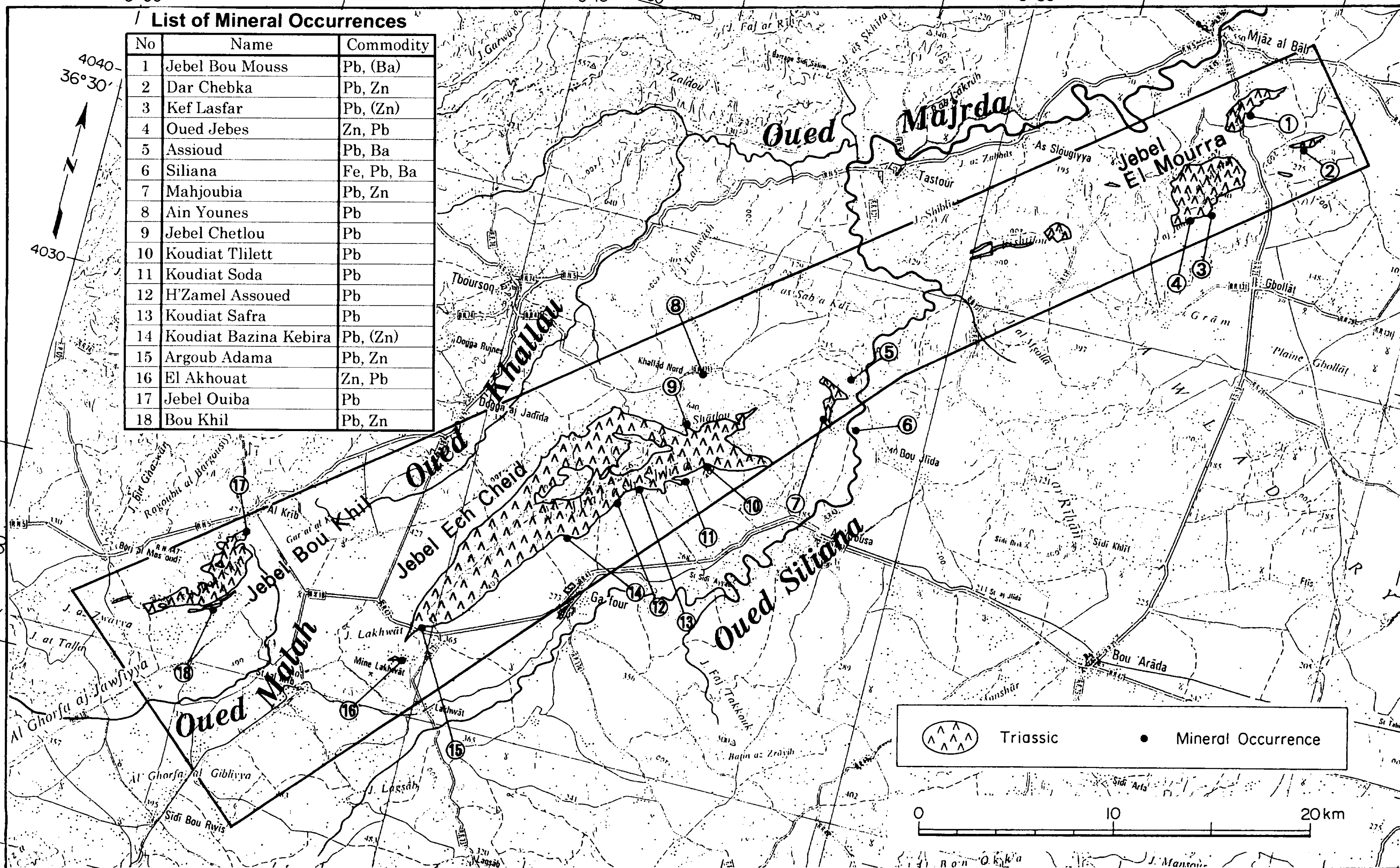
2.2 Topography and River System

The Project Area consists of mountainous or hilly areas, composed mainly of Triassic and Cretaceous systems, and low, flat lands. The mountainous-hilly areas are divided by major water courses into three districts, namely Jebel Ech Chied, Jebel Bou Khil and Jebel Mourra. Peaks of these mountainous- hilly areas range from 400 to 750 m in their elevations, with elevation differences of 200 to 550 m from their bottoms. The highest peak is the triangulation point of Jebel Ech Cheid at an elevation of 764 m above mean sea level, which is located in the southwestern corner of the central part of the Area. Taluses and colluvial slopes are often formed at foothills, while low, flat lands are largely composed of alluvial deposits (Figure 3).

Oued Silyana, Oued Khllau and Oued Malah are major rivers in the Area, which take considerably meandering courses. Oued Silyana runs northward for a distance of more than 6 km within the Area, changes its course eastward and then joins Oued Madjerda to the northeast. Oued Khllau flows northeastward along the northwestern flank of Jebel Ech Cheid and also joins Oued Madjerda. Oued Malah takes, on the contrary, a southeasterly course along the northwestern flank of Jebel Bou Khil (Figure 3).

2.3 Climate and Vegetation

The land of the Republic of Tunisia is divided into four climatic regions, namely Tell Atlas, the northwestern axial range, the eastern steppe and the southern desert. The Project Area, belonging to Tell Atlas, is characterized by a number of hills with affluent vegetation. Its climate is typically mediterranean with the hot-dry summer and mild-wet winter. Rainfall is annually totaled to 400 mm or more, with monthly precipitation exceeding 50 mm for the period from October to February and declining to 10 mm or less in the three month period of summer. Seasonal average temperatures are 24° C for spring, 30° C for summer, 25° C for autumn and 16° C for winter. The



List of Mineral Occurrences

No	Name	Commodity
1	Jebel Bou Mouss	Pb, (Ba)
2	Dar Chebka	Pb, Zn
3	Kef Lasfar	Pb, (Zn)
4	Oued Jebes	Zn, Pb
5	Assioud	Pb, Ba
6	Siliana	Fe, Pb, Ba
7	Mahjoubia	Pb, Zn
8	Ain Younes	Pb
9	Jebel Chetlou	Pb
10	Koudiat Tlilett	Pb
11	Koudiat Soda	Pb
12	H'Zamel Assoued	Pb
13	Koudiat Safra	Pb
14	Koudiat Bazina Kebira	Pb, (Zn)
15	Argoub Adama	Pb, Zn
16	El Akhouat	Zn, Pb
17	Jebel Ouiba	Pb
18	Bou Khil	Pb, Zn

Figure 3 Topographical Map of the Survey Area

The vegetation is typically of a wet-winter climatic zone, characterized by evergreen, broad leaf species. Although individual trees may shed their leaves for a week or two in a year, no defoliation of forest as a whole is observed. The Project Area is generally well vegetated except in the circumstances of abandoned mine sites. Reforestation is being vigorously practiced around such mine sites.

Table 3 Climatic Record in Tunis

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp. (° C)	11.4	11.8	13.2	15.4	19.1	22.9	26.3	26.6	24.1	20.1	15.8	12.4
Precip. (mm)	56.4	59.0	45.3	38.2	24.3	10.7	2.4	6.3	35.3	69.8	57.8	61.9

Temp.; Monthly average temperature of daily mean

Precip.; Monthly total precipitation

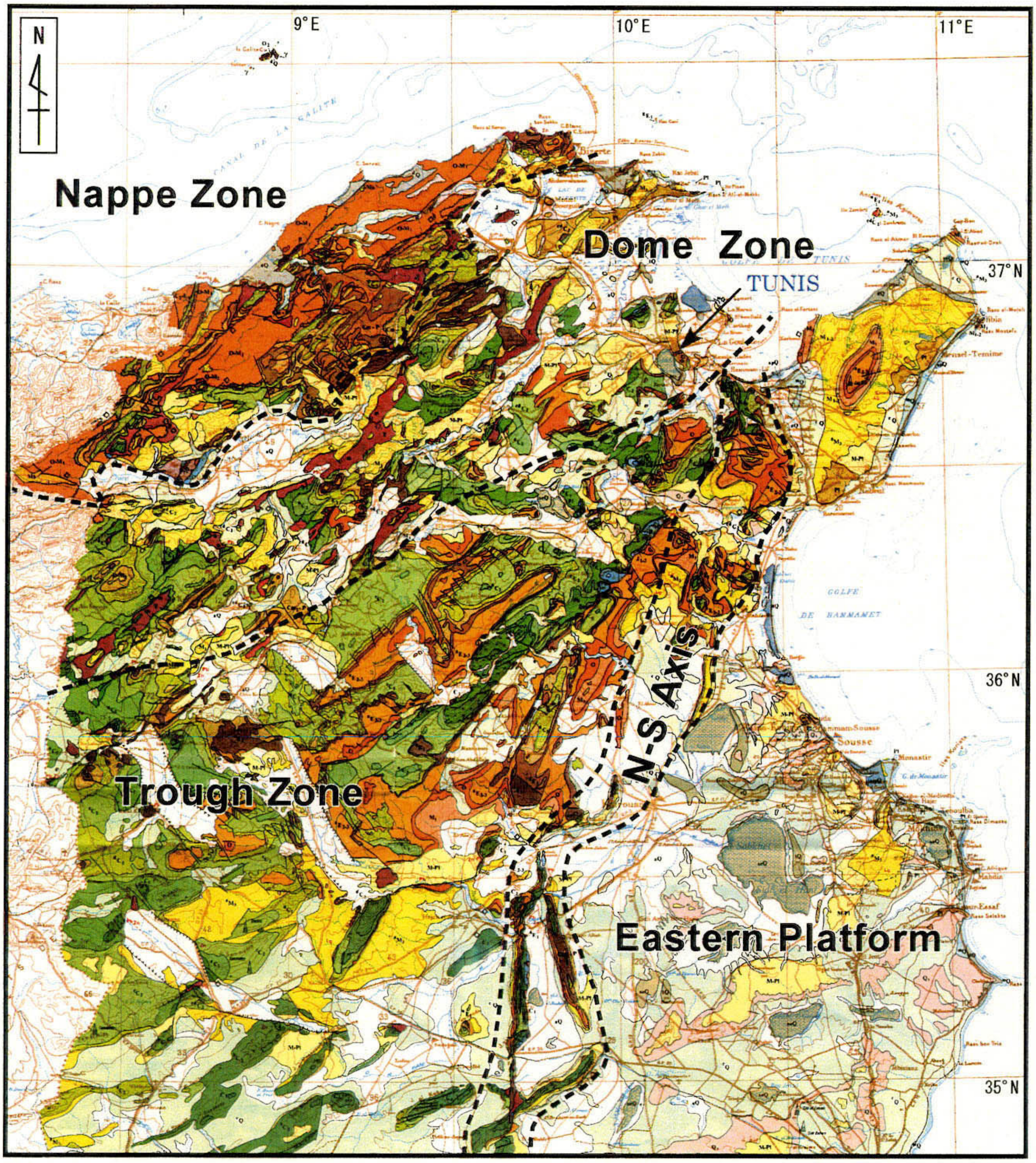
Chapter 3 General Geology of the Krib-Mejez el Bab Area

The Krib- Mejez el Bab Area is situated within the Dome zone, to the southwest of Tunis. The Dome zone is about 50 km wide and some 200 km long in the NE-SW direction, bounded by the Mediterranean Coast to the northwest, and continues southwestward across the international border to Algeria (Figure 4). A number of Triassic diapirs are discontinuously aligned in the NE-SW direction within the Dome zone, forming 3 or 4 major diapir alignments. The Project Area is located in the middle part of the southeastern-most alignment.

The geology of this Area comprises Triassic, Cretaceous, Palaeogene, Neogene and Quaternary systems in stratigraphically ascending order. The Triassic system forms diapirs which have intrusive contacts with the Cretaceous, Palaeogene and Neogene systems or partly overlie these systems. The geology is shown in Figure 5.

The Triassic system, comprising gypsum, clay, dolomite, argillite, sandstone and limestone, is generally inhomogeneous in its facies and often indicates disturbed sedimentary structures. No Jurassic system crops out in the Area. The Cretaceous system consists of stratigraphycally continuous successions of Barremian through Maastrichtian comprising limestone, marl, argillite, sandstone and dolomite. Beddings of these sedimentary rocks strike generally in the NE-SW direction, however, are often disturbed near contacts to diapirs or along faults. The Tertiary system also consists of stratigraphically continuous successions of Palaeocene, Eocene, Oligocene, Miocene and Pliocene series. The Palaeocene series is composed of argillite, the Eocene, of conglomerate and limestone, and the Oligocene, the Miocene and the Pliocene, of sandstone. The general strikes of beddings run in the NE-SW direction, however, vary near contacts to diapirs or according to structures of sedimentary basins. Strata of the Cretaceous and Tertiary systems are extremely turned over in the vicinity of diapir bodies, indicating vertical or reversed attitudes. The Quaternary system comprises sandstone, conglomerate, alluvial deposits, talus deposits and so forth.

There are three sizable diapir bodies in the Project Area and called Mourrha, Jebel ech Cheid and Bou Khil respectively from northeast to southwest. Several smaller diapir bodies are also known around these major diapirs and are mostly elongated in the NE-SW direction. A number of Pb-Zn ore deposits or mineral occurrences are located in association with these diapirs. They indicate specific spatial relationship with the diapirs, being mostly positioned at either edge of elongated diapirs or along their southeastern flanks. The modes of occurrences of the three major diapirs are summarized below.



Structural division simplified is quoted from J.J. Orgeval (1994).

Geological base map is published in 1985 by Ministere de L'economie Nationale. (Legend of the map is shown in Figure 2)

Figure 4 Structural Zones of Northern Tunisia

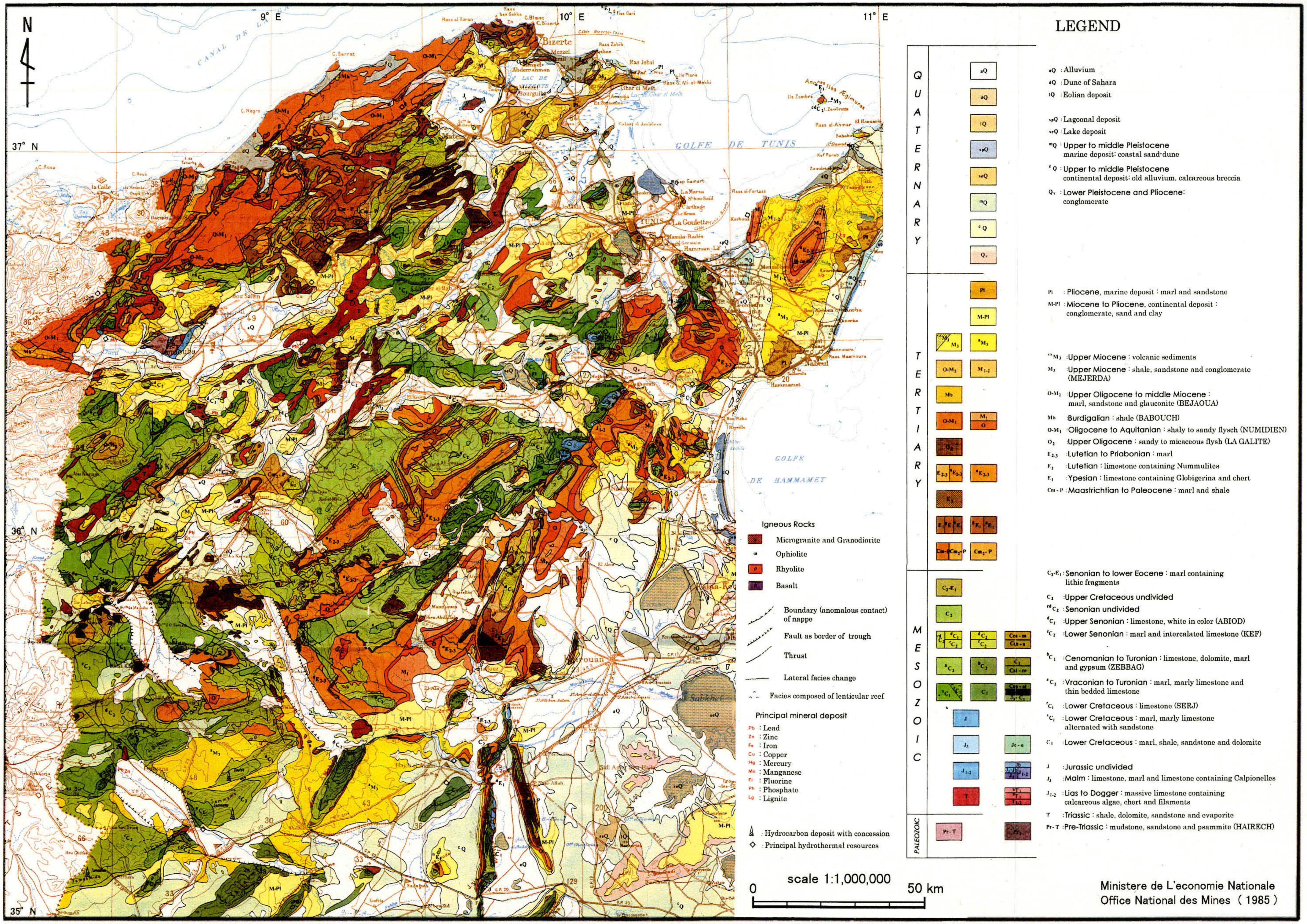


Figure 5 Geologic Map of Northern Tunisia

- Mourrha: This diapir shows a 5x3 km rectangular form with rounded corners on plan and a mushroom shape on cross section. Its southeastern flank contacts mainly with the Cretaceous system and partly with Eocene or Oligocene series. Other parts of its outer limit are covered by the Quaternary system. Kef Lasfar and Oued Jebes ore deposits are located along the southeastern flank.
- Jebel ech Cheid: This diapir is 23 km long and 5 km wide, and by far the largest of all in the general area. It takes a bamboo leaf form on plan and a mushroom shape on cross section. Its northeastern half contacts with the Eocene, Oligocene or Miocene series, while the southwestern half mostly contacts with the Cretaceous system. A roof-pendant of the Oligocene and Miocene series covers the top of the diapir body in its center. There are known a number of ore deposits and mineral occurrences along the southeastern flank of the diapir, such as Koudiat Tlilett, Koudiat Soda, H'Zamel Assoued, Koudiat Bazina Kebira and Argoub Adama. El Akhouat deposit is located in the vicinity of the diapir body, to the southwest of its southwestern edge.
- Bou Khil: This diapir body forms a crescent shape, 7 km long and 3 km wide. Its southeastern flank contacts with the Cretaceous system, Oligocene series or Pliocene series, while the northwestern flank is covered by the Cretaceous system. There is located Bou Khil deposit in the central southeast of the diapir body and Jebel Ouiba mineral occurrence at its northeastern edge.

In addition, Fedj el Adoum Mine, one of the two Pb-Zn mines being currently operated in Tunisia, is located about 10 km northwest of Bou Khil diapir, outside of the Project Area, and is associated with Fedj el Adoum diapir.

The diapirism, which initiated in mid-Cretaceous in this region, was upheaval of the Triassic system, containing evaporite components, into the overlying Cretaceous system mainly due to difference in density between the two systems. The upheaval in its early stage may have taken place in accordance with the morphology of the sedimentary basins or the prevailing stress field in those days. Most diapirs were emplaced during the period of late Cretaceous, as aforementioned. As the diapirism proceeded, sedimentation of the late Cretaceous sequences became slower nearing diapir bodies and faster away from them. It is also reported that some of diapirs emerged out of the sea bottom through the overlying Cretaceous system at some stages of the diapirism. The Alpine diastrophism reached its climax in Oligocene and tectonically affected the entire region and therefore emplacement of diapirs. Simple original forms of diapirs, such as domes or mushrooms, were deformed and dislocated by faulting, thrusting and folding under the compressive stress field in the NW-SE direction before taking the present forms and positions.

The Pb-Zn mineralization is categorized into the 'Mississippi Valley' or 'Carbonate Hosted' type. It is interpreted that the mineralization is formed in the process that (1)intra-strata water dissolves Pb, Zn and other metals in sediments, (2) moves laterally along stratification, (3) ascends along diapirs and then (4) precipitates these metals in fractures, cavities or other open spaces within or in the vicinity of diapirs. Most Pb-Zn mineral occurrences are localized in the southeastern flanks of diapirs (in the right hand side in Figure 3). This implies that minor faults and fractures for sites of mineralization are well developed in the Cretaceous and Tertiary strata under diapir overhangs in the southeastern flanks due to over-folding. Another possibility may be that the southeastern flanks provide conduits favorable for ascending mineralized solutions and pressure and temperature conditions suitable for precipitation of metals.

PART Ⅱ

PART II Result of the Second Year's Investigation

Chapter 1 Geophysical Prospecting

Geophysical surveys using a gravity and IP methods are carried out in the Bazina Kebira prospect and the Siliana prospect located in the center of the project area. In addition, the geophysical surveys applied in the El Akhouat prospect where there is a borehole encountering mineralized zones. The methodology and the results of the geophysical surveys are described below.

1.1 Outline of Survey

1.1.1 Survey Prospect

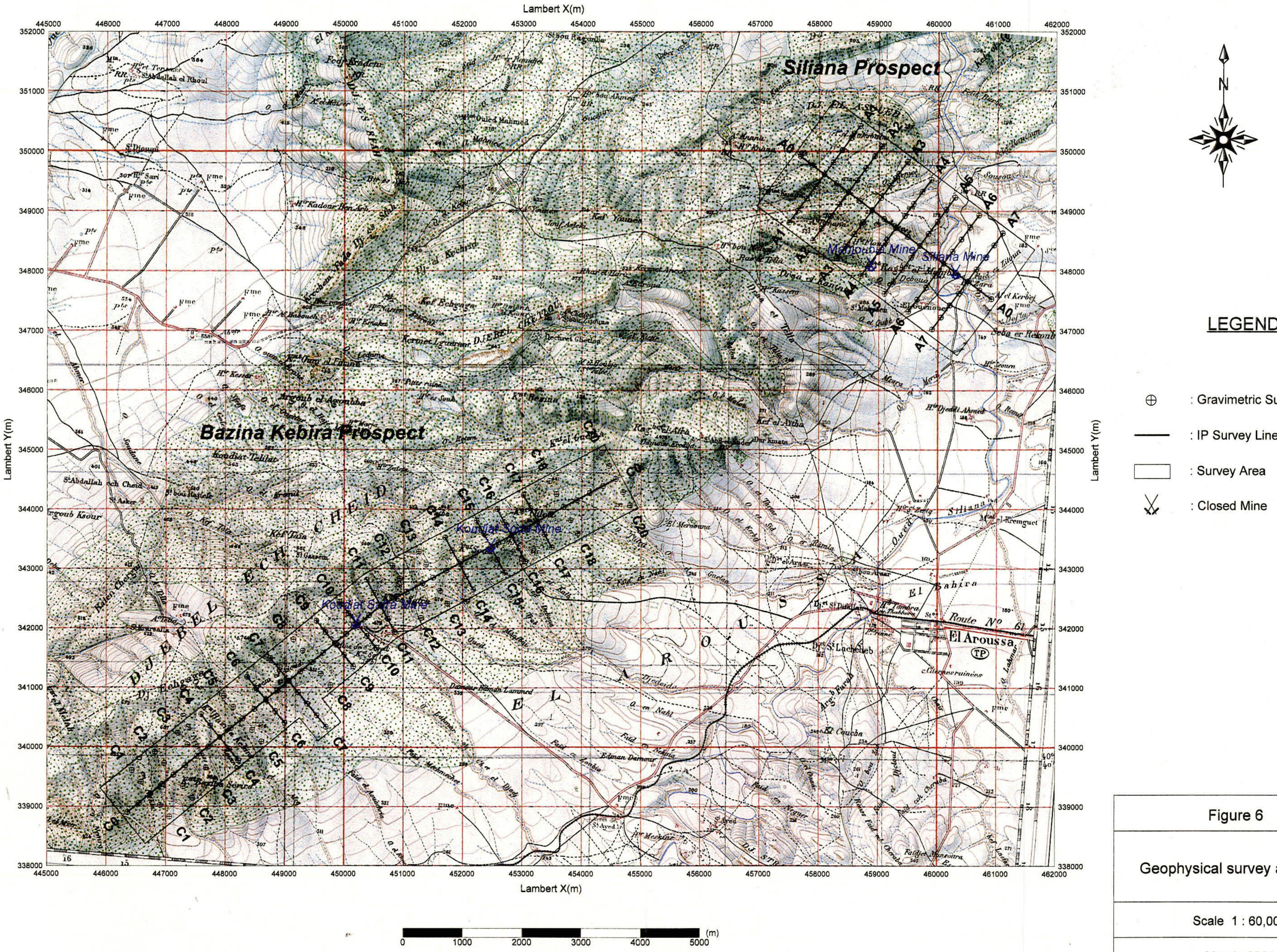
The Bazina Kebira prospect and the Siliana prospect applied geophysical prospecting are shown on the figure 6 as the geophysical survey area map.

(1) Bazina Kebira prospect (Figure 7)

The Bazina Kebira prospect is located in the southeast side slope of the Jebel Ech Chied hills of 600 to 800 meters high in the center of the Krib – Mejez Elbab area. The El Arrous plain of 250 to 300 meters high is extended on the southeast of the prospect. It is an approximate rectangular area of 10 km long in the NE-SW direction and 1km wide in the NW-SE direction and almost centered the Sidi Ayed ancient mine. National coniferous forests dominats the prospect and become sparse toward the southwest direction. There are wheat and olive fields on the top of the hills in the northwest side and on the foot of them in the southeast side.

The Jebel Ech Chied hills are formed by triassic diapirs and their southeast side slopes are around 20 degrees steep relatively on average. Streams run from them toward the El Arrousa plain in the southeast direcion. Though these almost streams rush only in the rainy season, they washed out narrow and deep valleys because of soft rocks near surface of triassic diapirs and quaternary layers. There are many points where their both sides are steep slope from 40 to 90 degrees.

5 mineral occurrences of the Bazina Kebira, the H'Zamel Assoued , the Kodiat Safra, Kodiat Soda and Kodiat Tlilette are distiributed along contact zones between triassic system and cretaceous or tertiary systems from the southwest to the northeast in the prospect. The Kodiat Safra and the Kodiat Soda were main ore deposits of the Sidi Ayed old mine producing



LEGEND

- ⊕ : Gravimetric Survey Station
- ─ : IP Survey Line
- ▭ : Survey Area
- ⚒ : Closed Mine

Figure 6
Geophysical survey area map
Scale 1 : 60,000
March, 2001

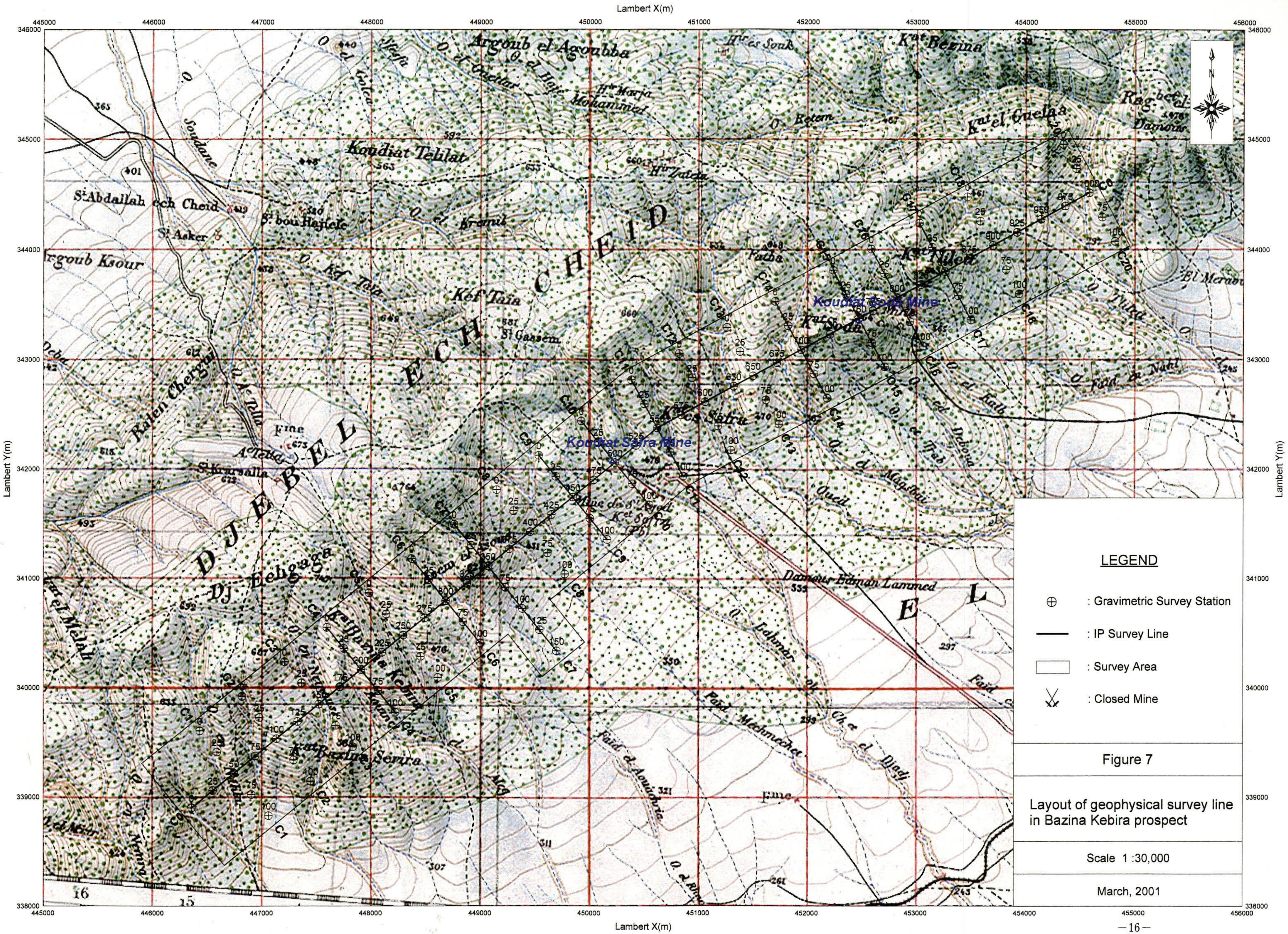


Figure 7

Layout of geophysical survey line in Bazina Kebira prospect

28,000 tons of ore. Ancient galleries and pits were left in these ore deposits. There are small workings in other mineral occurences of the Koudiat Tliletteand so on.

(2) Siliana Propect (Figure 8)

The Siliana prospect is located approximately 5 km northeast of the Bazina Kebira prospect. Its boundary is a rectangular of 4 km long in the WNW-ESE direction and 2 km wide in the NNE-SSW direction. A hilly area of 250 to 300 m from the center to northwest part of the prospect ranges with the Djebel Ech Chied hills, the southwast part is located at the north edge of the El Aroussa plain of 150 to 200 meters high. The Siliana river runs from south to north crossing the southeast part of the prospect. It is one of the biggest river in the Krib-Mejez el Bab area and water flows always. The rise of the river cause by a heavy rain during this survey delayed the survey schedule. Other small streams runs towards the Siliana river from west-northwest to east-southeast dirction. Wheat and Olive fields are extended in the prospect except for sparse bushes along a river and streams.

Topography in this prospect is not ragged as much as the Bazina Kebira prospect. Erosion of small streams formed cliffs.

2 mineral occurrences, the Mahjobia on a hill in the ceter part and the Siliana in plain area in the southeast part are known, there are old workings both area. The latter is located on the east side of the Siliana river and named from that river. Floats including ores of galena and so on are found in cultivated land.

1.1.2 Applied Technique and Amount

Geophysical surveys using a gravity and IP methods are applied for the both prospects. Their survey amount is shown in the following Table 4 .

In ordert to carry out geophysical sureveys, a baseline is set through each prospect and traveres are laid out perpendicularly to baselines. Their identifications of stations, length, position and so on are shown from the Table 5 to 6.

Table 4 Applied Geophysical Technique and Amount

Technique	Specification	Bazina Kebira	Siliana	Total
Gravity	Station	120	74	194
IP	Line	20.5km	18km	38.5km
	Measurement	805	740	1,545

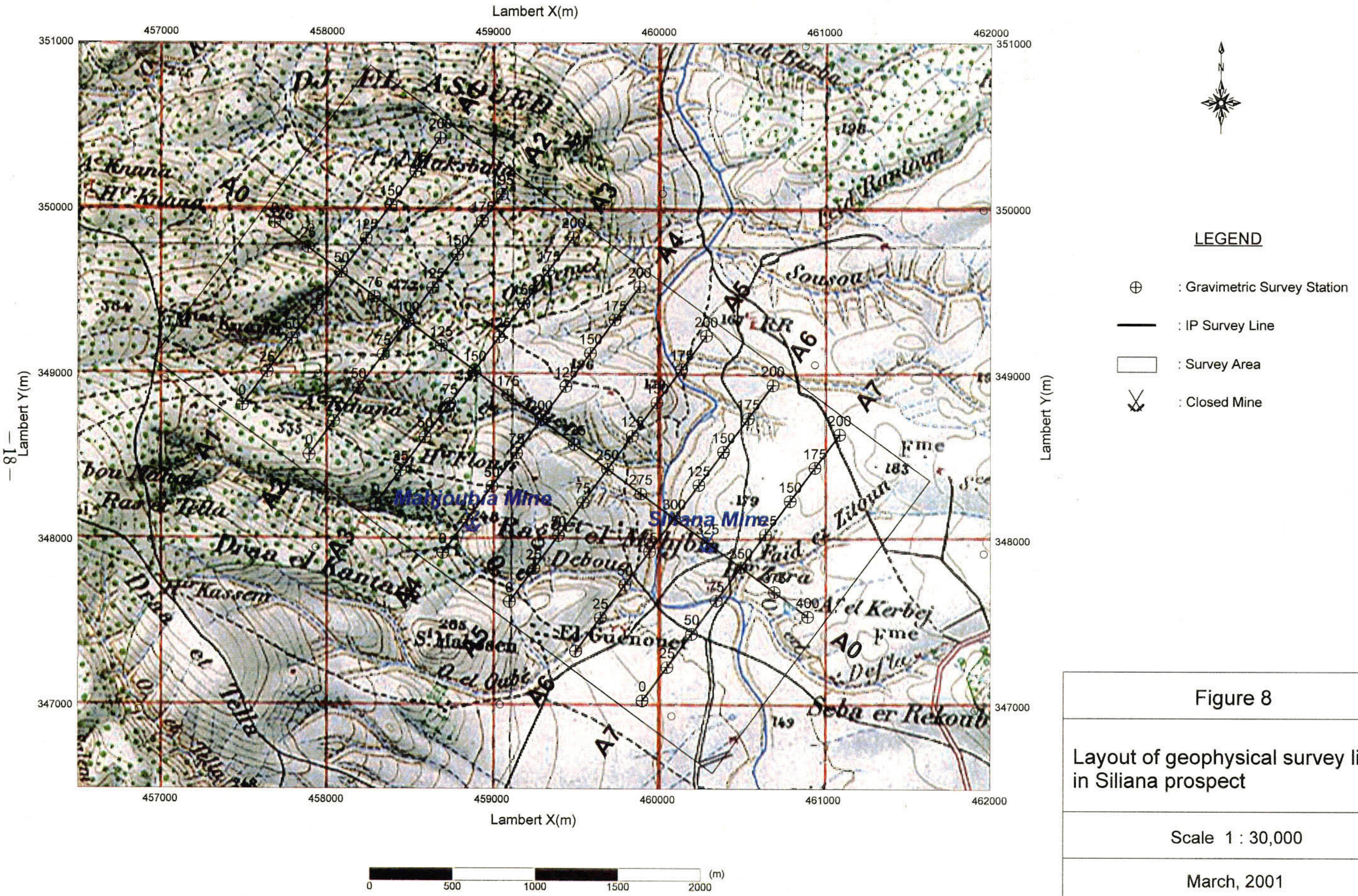


Figure 8

Layout of geophysical survey line in Siliana prospect

Scale 1 : 30,000

March, 2001

Table 5 Specification of Geophysical Survey Lines in Bazina Kebira Prospect

Line	Stations	Length (km)	Angle	Crossing to C0	x(UTM)	y (UTM)	Applied Survey
C0	201 (0~1,000)	10	N50°E (0~550)		527119.84	4022441.49	Gravity IP
			N60.5°E (550~1000)		535289.27	4028128.31	
C1	21 (0~125)	1	N40°W	C0-50	527185.53	4023145.52	Gravity
					527823.86	4022375.80	
C2	21 (0~100)	1	N40°W	C0-100	527570.89	4023463.90	Gravity
					528208.57	4022694.97	
C3	21 (0~100)	1	N40°W	C0-150	527956.26	4023782.27	Gravity
					528593.28	4023014.13	
C4	21 (0~100)	1	N40°W	C0-200	528341.62	4024100.65	Gravity IP
					528977.99	4023333.30	
C5	21 (0~100)	1	N40°W	C0-250	528726.99	4024419.02	Gravity
					529362.70	4023652.46	
C6	21 (0~130)	1	N40°W	C0-300	529112.35	4024737.40	Gravity IP
					529747.42	4023971.63	
C7	26 (0~150)	1.5	N40°W	C0-350	529497.72	4025055.77	Gravity IP
					530449.33	3894721.32	
C8	21 (0~100)	1	N40°W	C0-400	529883.08	4025374.15	Gravity
					530516.84	4024609.96	
C9	21 (0~100)	1	N40°W	C0-450	530268.45	4025692.52	Gravity IP
					530901.55	4024929.12	
C10	21 (0~100)	1	N40°W	C0-500	530653.81	4026010.90	Gravity IP
					531286.26	4025248.29	
C11	21 (0~100)	1	N29.5°W	C0-550	531110.12	4026390.08	Gravity IP
					531593.78	4025514.86	
C12	21 (0~100)	1	N29.5°W	C0-600	531547.60	4026631.84	Gravity
					532031.26	4025756.62	
C13	21 (0~100)	1	N29.5°W	C0-650	531985.08	4026873.60	Gravity
					532468.74	4025998.38	
C14	21 (0~100)	1	N29.5°W	C0-700	532422.56	4027115.36	Gravity IP
					532906.22	4026240.14	
C15	21 (0~100)	1	N29.5°W	C0-760	532947.54	4027405.47	Gravity IP
					533431.20	4026530.25	
C16	21 (0~100)	1	N29.5°W	C0-800	533297.53	4027598.88	Gravity IP
					533781.18	4026723.66	
C17	21 (0~100)	1	N29.5°W	C0-850	533735.01	4027840.64	Gravity IP
					534218.66	4026965.42	
C18	21 (0~100)	1	N29.5°W	C0-900	534172.49	4028082.40	Gravity
					534656.14	4027207.18	
C20	21 (0~100)	1	N29.5°W	C0-1000	535047.45	4028565.92	Gravity
					535531.10	4027690.70	

Table 6 Specification of Geophysical Survey Lines in Siliana Prospect

Line	Stations	Length (km)	Angle	Crossing to A0	x(UTM)	y (UTM)	Applied Survey
A0	81 (0~400)	4	N54.5°W		538344.16	4033557.90	Gravity
					541583.02	4031210.59	IP
A1	41 (0~200)	2	N35.5°E	A0-50	538162.20	4032454.81	Gravity
					539335.79	4034074.18	IP
A2	41 (0~200)	2	N35.5°E	A0-100	538567.05	4032161.40	Gravity
					539740.74	4033780.91	IP
A3	41 (0~200)	2	N35.5°E	A0-150	538971.89	4031867.99	Gravity
					540145.69	4033487.64	IP
A4	41 (0~200)	2	N35.5°E	A0-200	539376.74	4031574.59	Gravity
					540550.64	4033194.37	IP
A5	41 (0~200)	2	N35.5°E	A0-250	539781.59	4031281.18	Gravity
					540955.58	4032901.10	IP
A6	41 (0~200)	2	N35.5°E	A0-300	540186.43	4030987.77	Gravity
					541360.53	4032607.83	IP
A7	41 (0~200)	2	N35.5°E	A0-350	540591.28	4030694.36	Gravity
					541765.48	4032314.56	IP

Density, resistivity and chargeability as base data for interpreting results of the geophysical surveys are measured in laboratory for 49 samples collected from outcrops, boreholes and mines within and around the prospects.

Mineralized zones are found in a borehole within the El Akhouat prospect applied geophysical surveys last year. In order to identify their extension toward the southwestdirection, Gravity and IP surveys were carried out additionaly along the lines L1 and L2 of 1 km long. These lines were not applied the surveys last year.

1.2 Methodology

1.2.1 Layout of Measuring Lines

The 20 survey lines, the line numbers from C0 through C20, within the Bazina Kebira propect and the 8 lines, the line numbers from A0 through A7, within the Siliana propect are laid out by open traverse surveying using an electro-optical distance meter and a transit compass. Measuring stations are set along each line principally at an interval of 50 m and marked by wooden pickets. Each measuring station identifies itself by the number of relevant line and one tenth of the distance from the initial station of the line, that is, the measuring station C0-125 indicates its position at 1250 m from the initial station of the line C0.

Within the Bazina Kebira prospect, the baseline C0 with a total length of 10,000 m is set centering the old mine site of Sidi Ayed along the boundary of Triassic systems with Cretaceous or Tertiary systems where ore bodies are located. Since the boundary is curving, the baseline, being bent at its middle, runs in the N 50° E direction from the initial station

C0-0 at its southwestern end through the station C0-550 and then turns its direction in N 60.5° E between the stations of C0-550 and C0-1000. Other 19 survey lines, principally 1,000 m long each, are laid out perpendicularly to the baseline at an interval of 500 m with the initial stations at their northwestern ends. The line C7, which runs at its middle in the vicinity of the mineral occurece of H'Zamel Assoued, is extended for a distance of 500 m southeastwards. The line C15 is moved for a distance of 100m northeastwards along the baseline C0.

Within the Siliana prospect, the baseline A0 with a total length of 4,000 m runs in the N 54.5° E direction. Other 7 survey lines 2,000 m long each are laid out perpendicularly to the baseline at an interval of 500 m with the initial stations at their southwestern ends. They crosscut the baseline A0 in the center of themselves.

The coordinates of these survey lines are correlated by surveying to the bench marks which has been located by the National Office of Topography. Since the coordinate system used for the surveying is the northern Tunisia surveying coordination by the Lambert Projection (hereinafter called Lambert Coordinate System), all coordinates are transformed to the UTM (Universal Transverse Mercator Projection) and the Geographical Coordinate Systems with the courtesy of ONM. of all outputs of the current investigation, the geophysical maps are prepared in accordance with the Lambert Coordinate System, on which all existing topographic, geologic, regional Bouguer anomaly maps are based. The elevation of each measuring station is determined by leveling using a digital auto-level, Model SDL30-1, manufactured by Sokia Co., Ltd., in order to achieve the accuracy of 10 cm ± required for the gravity survey.

1.2.2 Gravity Survey

The flow chart of the current gravity survey is shown in Figure 9.

The gravity measurement is taken principally at an interval of 250 m along all 20 survey lines laid out in the Bazina Kebira prospect and all 8 lines laid out in the Siliana prospect as above explained. In the neighboring area, the gravity survey project, CG-01, was carried out with a density of one measuring point for an approximately one square kilometer by ONM in 1991. Its result is published in gravity Bouguer anomaly maps at a scale of 1 to 50,000. The Bazina Kebira prospect of the current program is located at the center part of the Teboursouk gravity quadrangle. The Siliana prospect is located at the eastern part of the same quadrangle. The regional gravity map in the nabouring area of the current prospects, which is extracted from the compiled bouguer anomaly map at a scale of 1 to 200,000, is shown in

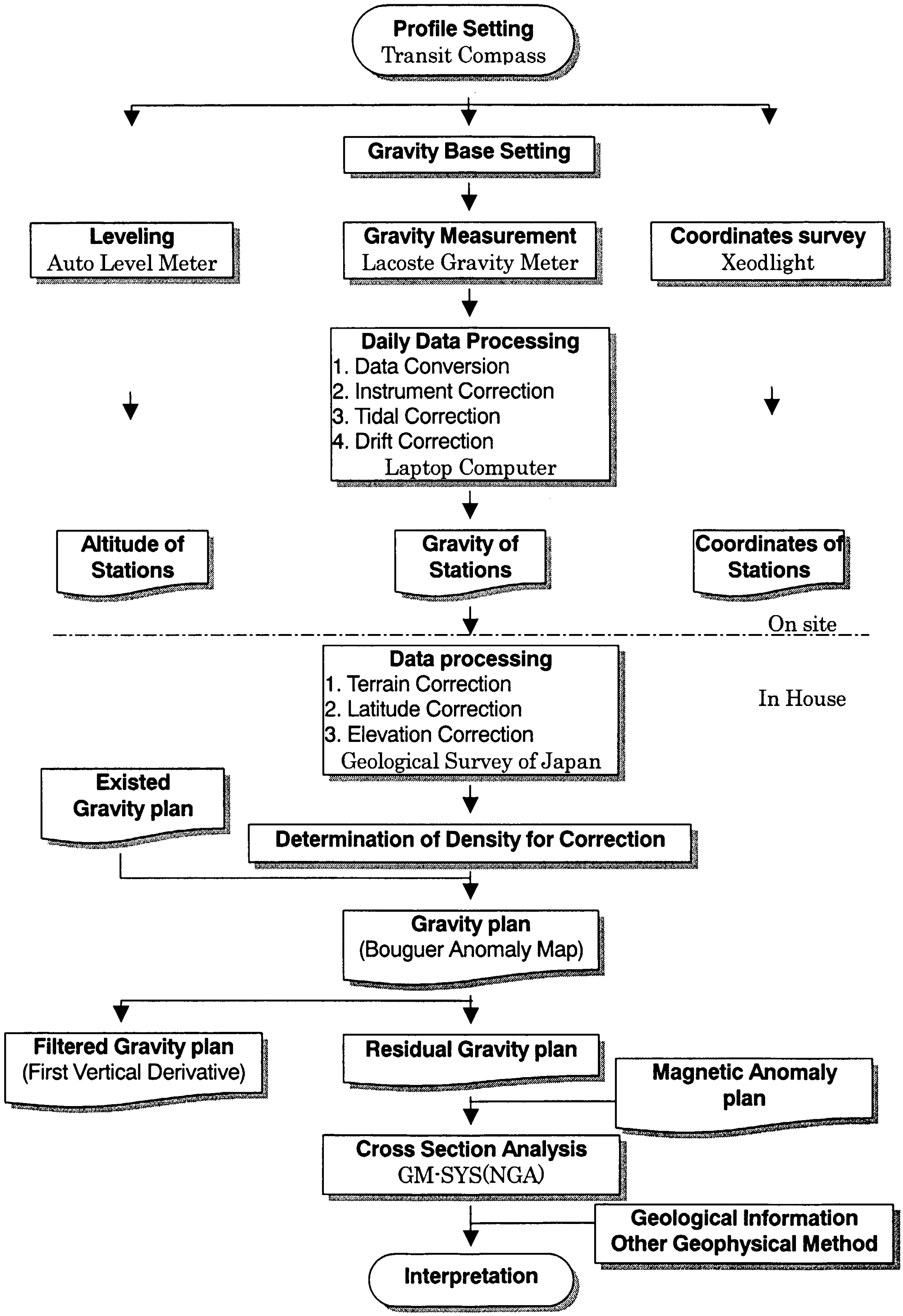


Figure 9 Flow chart of gravimetric survey