

PART I

OVERVIEW

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Chapter 1 Introduction

1 -1 Objectives of the Survey

In response to the request from the Government of the Republic of Indonesia to conduct mineral exploration, the Japanese Government sent a mission for Scope of Work Consultation to Indonesia in September 2001. And as a result of consultation with the Directorate General of Geology and Mineral Resources of Indonesia, an agreement was reached for cooperative mineral exploration of the East Java area and the Scope of Work was concluded by representative of both Governments in 19 September 2001. The objective of this project is to assess the mineral potential of the area through analysis of existing data, analysis of satellite images, geological survey, geochemical survey, geophysical exploration, and drilling during the three-year period from fiscal 2001 to 2003. The counterpart organization in accordance with this Scope of Work is the Directorate of Mineral Resources Inventory.

During the first year of the project, regional geochemical surveys were carried out over an area of 5,000km². The fieldwork of geochemical survey was done from 18 September 2001 to 22 December 2001.

During the second year of the project, regional geochemical and semi-detailed geochemical surveys and geological survey were carried out over an area of 3, 6000km², 800km² and 70 km², respectively. The fieldwork of geochemical survey was done from 26 August 2002 to 13 November 2002. The fieldwork of geological survey was done from 26 January 2002 to 28 February 2003.

During the third year of the project, geological survey was carried out over an area of 260km², comprised of four districts. The fieldwork of geological survey was done from 30 June 2003 to 4 September 2003. The purpose of this year is to evaluate the mineral potential of the districts and delineate the drilling target within the districts. As a result of the geological survey, Seweden and Tempursari districts were selected to conduct geophysical survey with the aim of delineating drilling targets, while targets for drilling in the Prambon district was selected without conducting geophysical survey.

1 -2 Conclusions and Recommendations of Phase 2

1-2-1 Conclusions of Phase 2

Geochemical reconnaissance survey, geochemical semi-detailed survey, and geological survey was carried out during the second year of the East Java cooperative mineral exploration project, and arrived at the following conclusions.

(1) Conclusions of the regional geochemical survey

The following districts are concluded to be the major mineralized zones.

- (a) Selogiri district: Selogiri deposit in the eastern margin of the western area and auriferous quartz veins in the vicinity.
- (b) Prambon district: Quartz veins (gold, silver anomalies) to the north of Trenggalek in the southwestern part of the eastern area of the district.
- (c) Sentul district: Silicified zones to the southwest of Trenggalek.
- (d) Seweden district: Alteration zones associated with gold, copper mineralization to the south of Blitar in the central part of eastern area of the district.
- (e) Purwodadi district: Copper, gold mineralized and altered zones to the southeast of Malang.
- (f) Tempursari district: Gold, copper mineralized and altered zones.
- (g) K. Jinggring district: Gold anomalous zones to the south of Tulungagung in the western part of the eastern area.
- (h) Seweden East district: Geochemical anomalies, quartz veinlets, alteration zones near the Royal Indotama Concession
- (i) Purwoharjo district: Copper anomaly zone continuing northeastward from this district.

Of the above, surface mineralization is confirmed as well as geochemical anomalies in 6 districts from (a) to (f). Mineral potential is considered to be particularly high at the following 3 districts, namely in Selogiri district (a) mineralized alteration zones are distributed around presently working small mine, in Prambon district (b) gold mineralization, although of low grade, is found in epithermal quartz veins, and in Seweden district (d) alteration occurs widely and gold and copper mineralization occurs in quartz veinlets.

(2) Conclusions of the semi-detailed geochemical survey

- (a) Ponorogo south district: Au, Ag, Pb anomalies occur near widely developed silicified zone with

pyrite dissemination to the south of Ponorogo. The area may extend over the Slahung South anomalies zone identified by the Phase 1 regional survey.

(b) Lorok district: Au, Ag, As anomalies occur in the alteration zone identified by phase 1 survey.

(c) Kasihan district: Cu, Pb, Zn anomalies occur near the Kasihan skarn deposit.

(d) Pacitan district: Ag, As, Mo anomalies occur to the east of Pacitan. Micro-granodiorite intrudes into Oligocene-Miocene sediments and volcanics.

(e) Nawangan district: Cu, Pb, Zn and Mo occur in the Oligocene-Miocene volcanics rocks.

Many quartz veins are exposed in this area. Quartz veins are accompanied by chalcopyrite, galena and sphalerite.

(f) Purwoharjo district: Au, Ag, As anomalies occur in the silicified zone identified during this survey. In this area, quartz veins are also exposed.

(3) Conclusions of the geological survey

Deposits consisting mainly of copper-bearing quartz veins can be expected to occur in the Ponorogo South district. The past survey confirmed only one such quartz vein with 1-1.5 m thickness and 1-2km strike direction extension, but existence of quartz veins are anticipated in the silicified zones in the footwall side and/or northward extension of the Salak River.

In the Prambon district, lead-zinc-bearing quartz veins along the Sumurup River, the lead-zinc-bearing quartz veins along the Beloran River and the silicified veins (gold mineralization is inferred) near the summit of the mountain between the above two rivers, and further gold-copper-bearing quartz vein zone along the Suren River are believed to be most promising regarding metal potential.

(4) Summary of conclusions

Two districts were selected for the geological survey by the reconnaissance geochemical survey

The mineral potential of the following six areas are considered to be particularly high.

-Ponorogo South district; chalcopyrite-bearing quartz vein zone near the Nepo River.

- Prambon district; gold-lead-zinc-bearing quartz vein zone along the Suren, Sumurup, Beloran Rivers.

Four districts were selected for the next-step survey by semi-detailed geochemical survey area. Gold, copper and pathfinder element geochemical anomalies in semi-detailed geochemical area concentrate in the following six areas: tentatively named as Ponorogo South, Lorok, Kasihan,

Pacitan, Nawangan and Purwoharjo district.

Two districts were interesting within the regional geochemical survey area

- Vicinity of Selogiri gold deposit.
- Southern extension of the alteration zone near Seweden.

1-2-2 Recommendations

It is recommended that geological survey be carried out in the following (1) and (3)~(6) districts on the basis of the conclusions regarding geochemical reconnaissance area, and it is also recommended that detailed geochemical survey of soil and rocks be carried out and drilling targets be extracted simultaneously. Then mineral potential of each district should be comparatively examined and drilling be carried out in the most promising zones. Where the high-potential targets are not confined only to veins and are extensive in area, it is recommended that IP electric survey (profile line length in the order of 10km) be carried out before drilling. (Geophysical survey: pyrite dissemination is expected to occur in mineralized zones expected in the area such as epithermal hydrothermal deposits and porphyry copper bodies, and IP electric is considered to be the best method to apply). Also scout survey should be carried out in the following (g)~(i) districts for understanding the cause of the geochemical anomalies in conjunction with semi-detailed geological survey. Geological survey of (b) district will be mentioned in 5-2-3.

- (a) Selogiri district: Selogiri deposit in the eastern margin of the western area and auriferous quartz veins in the vicinity.
- (b) Prambon district: Quartz veins (gold, silver anomalies) to the north of Trenggalek in the southwestern part of the eastern area of the district.
- (c) Sentul district: Silicified zones to the southwest of Trenggalek.
- (d) Seweden district: Alteration zones associated with gold, copper mineralization to the south of Blitar in the central part of eastern area of the district.
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1 -3 Survey Methods

(1) Outline of the survey

The survey of the third year of the project consisted of geological surveys in the four districts: Tempursari, Purwoharjo, Seweden and Tempursari districts, geophysical survey in Seweden and Tempursari districts and drilling in the Prambon and Seweden. As part of geological survey, soil geochemical samples were collected, analyzed and interpreted for the three districts: Tempursari, Seweden and Prambon. the area extents of which were 5.4. km², 6.5 km² and 5.0 km² , respectively.

(2) Amount of work carried out

The total work carried out in the field and in the laboratories is laid out in Tables 1-1

Table 1-1(a) Amount of Work: Field Work

District	Amount	
	Geological Survey	Geochemical Survey
Tempursari	Area: 50km ²	Area: 5.4km ² Soil sampling localities: 320
Purwoharjo	Area: 70km ²	-
Seweden	Area: 90km ²	Area: 6.5km ² Soil sampling localities: 680
Prambon	Area: 50km ²	Area: 5.0km ² Soil sampling localities: 419
Total	Area: 260km ²	Area: 16.9km ² Soil sampling localities: 1,447

Table 1-1(b) Amount of Work: Laboratory Tests

Work Items	Amount
Observation of thin section of rock samples	50 samples
Observation of polished section of ore samples	40 samples
Powder X-ray diffraction analysis	80 samples
Chemical analyses of rock and ore samples (Elements: Au, Ag, Cu, Mo,Pb, Zn, As, Hg, Sb)	160 samples
Chemical analyses of soil sediments (35 Elements: Au, Al, Ag, As, Ba, Be, Bi, Ca, Cd, Cr, Co, Cu, Fe, Ga, Hg, K, Mg, Mn, Mo, Na, Ni, P, Pb, Rb, S, Sb, Sc, Sr, Th, Ti, Tl, U, V, W, Zn)	1,447 samples
Fluid inclusion measurement (Homogenization temperature and salinity)	10 samples
Whole rock chemical analysis	50 samples

Table 1-1 (c) Amount of Work of Geophysical Survey and Drilling (Field Work)

Survey	District	Areal Extent		Survey Line Length	
Geophysical Survey	Tempursari	3.9km ²		10.4km	
	Seweden	7.9km ²		19.8km	
	Total	11.8 km²		30.2km	
Drilling	District	Hole	Direction	Inclination	Length
	Prambon	MJIE-P1	N70° E	-60°	250m
		MJIE-P2	N70° E	-60°	253m
		MJIE-P3	S70° W	-60°	250m
		MJIE-P4	S70° W	-60°	250m
	Seweden	MJIE-S1	E	-80	400m
Total				1,403m	

Table 1-1 (d) Amount of Work of Geophysical Survey and Drilling (Laboratory Work)

Survey	Study Item	Amount
Geophysical Survey	Resistivity, IP measurement	20 samples
Drilling	Observation of thin sections	24 samples
	Observation of polished sections	24 samples
	X-ray diffractometry	90 samples
	Chemical analysis (Au,Ag,Cu,Pb,Mo,Zn,As,Hg,S,Fe)	180 samples
	Fluid inclusion study	14 samples

1 - 4 Members of the Survey Team

Six scientists from Japan and seven scientists from Indonesia formed the field survey team. The Indonesian Project Leader Mr. Dwi Nugroho Sunuhadi supported the fieldwork through logistics and other various matters from his office in Bandung and provided significant guidance.

(Geological survey)

[Indonesian Side]	[Japanese Side]
Widodo Wahyu.	Osamu Miyaishi(Team leader)
R. Simpwee Soeharto	Masataka Ochi
Atok Sukandar Prapto	Susumu Takeda
Sukmana	Tetsuo Sato
Bambang Nugroho Widi	Norio Tsushima
Syahya Sudarya	Toru Maruyama
Rachmat Effendi	

(Drilling)

[Indonesian Side]	[Japanese Side]
Widodo Wahyu.	Osamu Miyaishi(Team leader
R. Simpwee Soeharto	Susumu Takeda

(Geophysical Survey)

[Indonesian Side]	[Japanese Side]
Atok Sukandar Prapto	Toshio Ishibashi
Sukmana	Kazuyo Hirose
Bambang Nugroho Widi	Shinichi Sugiyama
Syahya Sudarya	Tadanori Iwasaki

(Field Survey Supervision)

Koji Yamamoto	(Global Minerals Exploration Group, Mineral Resources Survey Department, MMAJ)
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1 - 5 Duration of Survey

The duration of survey was from 30 June 2003 to 19 March 2004. The duration of the fieldwork of the geological survey, geophysical survey and drilling was from 30 June to 26 August, 2003, from 9 November to 18 December, 2003 and from 9 November to 18 February, 2004, respectively.

(Geological survey-Japanese first party: Osamu Miyaishi, Toru Maruyama)

Work	June	July	August	September	October
Mobilization (Narita->Jakarta)	30				
Discussions at JICA Courtesy call to Embassy of Japan, DGGMR) Moving (Jakarta-> Bandung)		1-..			
Discussion with DMRI, Preparation		2-4			
Mobilization (Bandung-> Surabaya -> Base camp)		5-..			
Geological Survey (including Geochemical sampling)		6	25		
Moving (Base camp->Surabaya->Bandung)				.. 26	
Data Analysis, Discussions with DMRI				27-2	
Moving (Bandung->Jakarta)				3	
Reporting of Survey Results to JICA				4	
Demobilization				4-5	
Laboratory work				==	=====
Data analysis and Report writing					=====