PART II DETAILED DISCUSSIONS

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Chapter 1 Drilling Survey

1-1 Outline of Drilling

Drilling was carried out at three localities during this year. They are Jabal Sujarah, 4/6 Gossan Prospect, and another locality with geophysical anomalies ("new locality" in this report). A total of eight holes, two, two, and four holes were drilled in these localities respectively. The total length drilled was 2,340.65m as shown in the following table.

Hole No.	Area	Coordinates		Elevation	Azimuth	Inclination	Drilled Length
MJSU-9	Jabal Sujarah	N 2,620.800	E 707.175	966m	155°	-55°	380.00m
MJSU-10	South of UAD N	N 2,618.813	E 709.022	954m	300°	-55°	350.40m
MJSU-11	Southeast of UAD N	N 2,618.582	E 710.015	963m	150°	-55°	250.10m
MJSU-12	North of UAD S	N 2,617.557	E 709.947	965m	270°	-55°	250.00m
MJSU-13	Southwest of UAD S	N 2,617.122	E 709.841	965m	330°	-55°	250.00m
MJSU-14	4/6 Gossan	N 2,617.723	E 708.560	964m	245°	-55°	274.60m
MJSU-15	Jabal Sujarah	N 2,620.601	E 707.371	944m	335°	-70°	375.65m
MJSU-16	4/6 Gossan	N 2617.598	E 708.566	960m	245°	-55°	210.00m
Total							2,340.65m

UAD N : Umm ad Damar North Prospect, UAD S : Umm ad Damar South Prospect

At Jabal Sujarah, the original plan was to drill one hole MJSU-9, but another hole MJSU-15 was drilled further to the east after locating massive sulfide ores in MJSU-9. Originally, drilling to 250m depth was planned for MJSU-9, but 130m was added to a total length of 380m because strong pyrite dissemination continued after reaching the planned depth.

At the new locality, 250m drilling was first planned for each of the four holes to investigate the conditions of the four chargeability anomalies and the conductive plates. These anomalies and plates were confirmed by the work of the second year. Of these holes, MJSU-10 penetrated two conductive plates within the chargeability anomaly and thus the depth of this hole was extended for approximately 100m.

One hole MJSU-14 was planned originally for the 4/6 Gossan Prospect, but massive sulfide ores were confirmed by this hole and MJSU-16 was drilled further to the south of MJSU-14. The objective of the MJSU-14 was to investigate the extension of the massive sulfide mineralization confirmed by MJSU-2 during the second year and 375m depth was planned. But massive sulfide ores were confirmed at a depth shallower than expected and thus the drilling was stopped at 274.6m depth.

Ore assay was carried out for 455 drill core samples and contents of six elements Au, Ag, Cu, Pb, Zn, S were analyzed. The number of samples examined by thin section microscopy, polished section microscopy and X-ray diffractometry was 32, 20, and 60 respectively. Fifty samples were collected for resistivity and chargeability measurements in order to correlate the results of IP and TEM surveys and drilling.

1-2 Results of Drilling at Jabal Sujarah

1-2-1 Objective of the survey

A strong chargeability anomaly exceeding 50mV/V (800m elevation, 150m below surface) was detected by IP survey during the first year. MJSU-8 was drilled to this anomaly during the following year, and volcanogenic massive sulfide Cu-Zn mineralization was confirmed together with strong pyrite dissemination in the vicinity.

Detailed IP and TEM geophysical surveys were carried out after drilling MJSU-8. It was clarified that IP chargeability anomaly (800m elevation, exceeding 20mV/V) extends for approximately 400×350m. The TEM conductive plate was found at the central part of the chargeability anomaly and it extends in the NE-SW direction with 80° SE dip. The MJSU-8 hole, however, had not penetrated this conductive plate.

The MJSU-9 hole was planned as an inclined hole with 155° azimuth, –55° inclination, and 275m extension in order to clarify the details of the Au, Cu, and Zn mineralization conditions (Fig. 2-1-1). The result of drilling showed strong pyrite dissemination in the breccias near the surface (volcanic breccia and tuff breccia) and strong pyrite dissemination was observed at the planned depth. Thus drilling was extended to 380m.

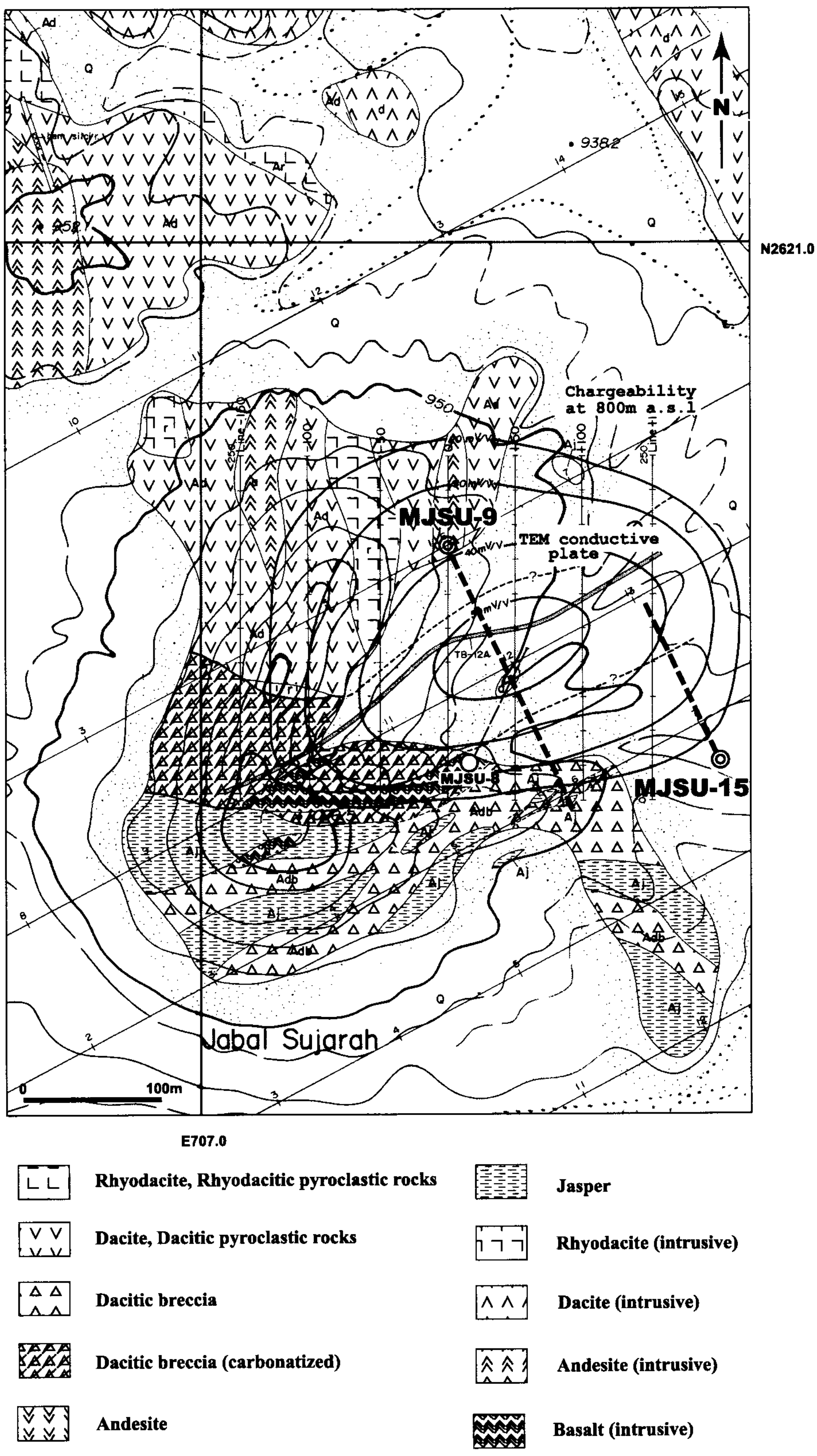


Fig.2-1-1 Detailed Geological Map of Jabal Sujarah

MJSU-15 hole was planned as an inclined hole with 335° azimuth, -70° inclination, and 250m extension in order to clarify the details of the mineralization at the northeastern extension of the massive sulfide ores found at the southwestern part of the chargeability anomaly mentioned above. After the start of drilling it was decided to penetrate the conductive plate and the length of the hole was extended to 375.65m.

1-2-2 Progress of drilling

Summary of drilling operation, record of drilling operation and chart of drilling progress regarding MJSU-9 and MJSU-15 are shown in the Appendix.

(1) MJSU-9

The drilling of MJSU-9 started on September 16 and completed on October 8. From the surface to 5.9m depth, drilling was done by PQ diamond bit, and HQ diamond bit was used from 5.9m to 41.7m depths. NQ diamond bit was used from 41.7m to the bottom at 380m. The work was carried out by wire-line method. HW and NW casings were inserted to 5.9m and 41.7m depth respectively.

The drilling was slowed by repeated occurrence of silicified zones and a total loss of circulation at the lower part of a weathered zone (19m～41m depth). Also oil pump of the drilling machine broke down and the drilling rate was 9.5m per shift. Core recovery was 99.9% with the exception of the talus deposits of the surface.

(2) MJSU-15

The drilling of MJSU-15 started on October 11 and completed on November 8. From the surface to 6.0m depth, drilling was done by PQ diamond bit, and HQ diamond bit was used from 6.0m to 35.9m depths. NQ diamond bit was used from 35.9m to the bottom at 375.65m. The work was carried out by wire-line method. HW and NW casings were inserted to 6.0m and 35.9m respectively.

The drilling was slowed by repeated occurrence of silicified zones and a total loss of circulation at the lower part of a weathered zone (35.9m～46.8m depth). It was slower than MJSU-9 to7.7m per shift. Core recovery was 100% with the exception of the talus deposits of the surface.

1-2-3 Geology and mineralization of drill holes

Drill-core columns (1:200 scale), ore assay results, thin section microscopy results, polished section microscopy results, and X-ray diffraction results are shown in the Appendix.

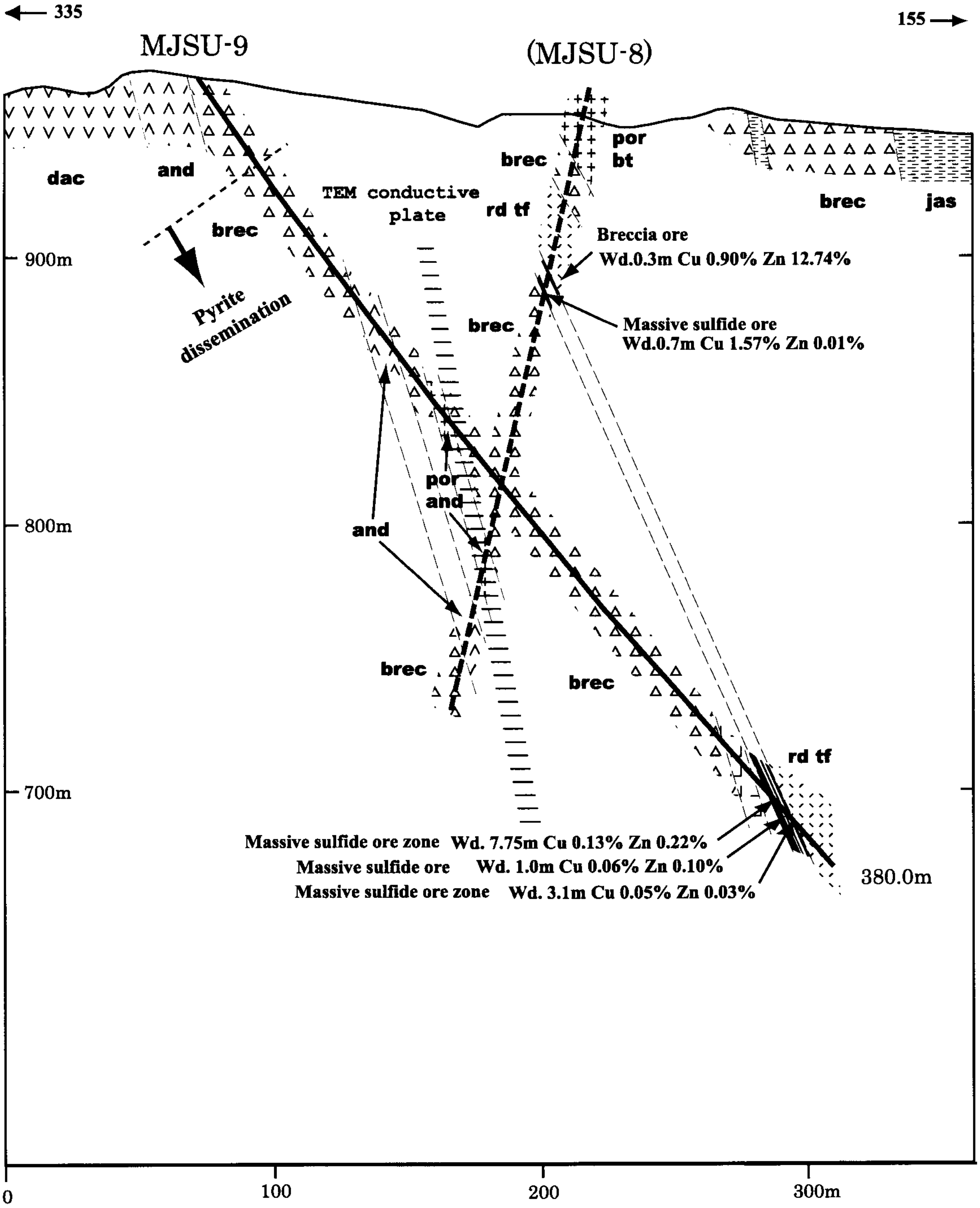
(1) MJSU-9

The geological section of this hole is shown in Figure 2-1-2.

Geology

The major geologic units of this hole are as follows.

Depth	Geologic units
0～1.5m	Talus deposits
1.5～32.4m	Lapilli tuff, volcanic breccia
32.4～52.0m	Lapillistone
52.0～103.7m	Volcanic breccia
103.7～127.4m	Andesite
127.4～148.7m	Volcanic breccia
148.7～166.0m	Porphyritic andesite
166.0～234.2m	Volcanic breccia
234.2～276.1m	Lapillistone
276.1～283.0m	Coarse tuff
283.0～318.5m	Volcanic breccia
318.5～334.6m	Dacite
334.6～341.25m	Breccia
341.25～349.0m	Massive sulfide and disseminated zone
349.0～350.8m	Dacite, lapillistone, chloritized rocks
350.8～351.8m	Massive sulfide ore
351.8～356.9m	Silicified rocks, chloritized rocks, tuff
356.9～357.7m	Massive sulfide ore
357.7～380.0m	Muddy tuff or rhyodacitic tuff



Abbreviation :

brec : volcanic breccia, lapilli tuff, lapillistone
rd tf : rhyodacitic tuff
dac : dacite
jas : jasper
por bt : porphyritic basalt
por and : porphyritic andesite
and : andesite

Fig.2-1-2 Geological Section along MJSU-9

Mineralization and alteration

Mineralization was confirmed at the following intervals of this drill hole (Fig. 2-1-3).

	Depth (m)	Interval Length (m)	Mineralization	Grade				
				Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	S (%)
①	341.25～343.4	2.15	Massive sulfide	0.3	87	0.09	0.45	23.7
②	343.9～345.0	1.10	Siliceous banded sulfide	0.5	33	0.29	0.11	9.6
③	347.3～349.0	1.70	Siliceous banded sulfide	0.3	32	0.06	0.18	18.3
④	350.8～351.8	1.00	Siliceous banded sulfide	0.2	21	0.06	0.10	15.0
⑤	356.9～357.7	0.80	Massive sulfide	0.2	9	0.08	0.03	21.8

Depth interval 341.25～343.4m consists of massive sulfide ores with banded texture and the ore minerals are large amount of pyrite with very minor content of chalcopyrite and sphalerite.

Depth intervals 343.9～345.0m and 347.3～349.0m consist of siliceous banded sulfide ore with banded texture. The ore minerals are large amount of pyrite with minor amounts of chalcopyrite and sphalerite.

These massive sulfide ores and banded sulfide ores contain intercalation of chloritized rocks, and pyrite lenses and dissemination occur within these chloritized rocks. The grade of all of the massive ores is low with Au less than 1g/t, Cu less than 0.3%, Zn less than 0.5. The grade of the intercalated chloritized rocks is also low.

Depth interval 350.8～351.8m consists of siliceous banded sulfide ores. It contains large amount of pyrite and the Au, Cu, and Zn grades are low.

Depth interval 356.9～357.7m consists of massive sulfide ores with weakly banded texture. It consists mainly of pyrite with minor content of chalcopyrite and sphalerite. The Au, Cu, and Zn grades are low.

The hanging wall and footwall of the above massive sulfide ores and banded sulfide ores are mainly chloritized rocks containing many lenses, dissemination and veinlets of pyrite. X-ray diffraction studies show that the chloritized rocks consist of large amounts of chlorite and smaller content of pyrite.

Also the rocks of this hole are silicified and pyritized with the exception of intrusive bodies. X-ray investigation showed that a strongly silicified part (70.1m depth) consists only of large amount of quartz and small amount of pyrite.

Depth	Log	Description	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	S (%)
337.5m – 339.7m		Chloritized rock with Pyrite lens / A quarter of core is composed of dacite.	0.1	43	0.02	0.06	16.0
339.7m – 339.9m		Silicified breccia filled with Pyrite					
339.9m – 341.25m		Chloritized rock with Pyrite lens	0.2	23	0.05	0.17	13.6
341.25m – 343.4m		Massive sulfide ore (Pyrite + Quartz)	0.3	87	0.09	0.45	23.7
343.4m – 343.9m		Chloritized rock with Pyrite lens	<0.1	18	0.02	0.13	7.7
343.9m – 345.0m		Banded ore (Pyrite + Quartz), with Quartz vein (width 2cm)	0.5	33	0.29	0.11	9.6
345.0m – 347.3m		Chloritized rock with Pyrite dissemination	0.2	34	0.16	0.11	16.7
347.3m – 349.0m		Banded ore (Pyrite + Chalcopyrite + Quartz), with Pyrite - Quartz veinlets	0.3	32	0.06	0.18	18.3
349.0m – 349.5m		Dacite with Quartz - Pyrite vein					
349.5m – 350.0m		Silicified breccia filled with Pyrite	0.1	16	0.04	0.15	14.1
350.0m – 350.3m		Chloritized rock with Pyrite lens					
350.3m – 350.8m		Chloritized rock with Pyrite dissemination					
350.8m – 351.8m		Banded ore (Pyrite + Quartz)	0.2	21	0.06	0.10	15.0
351.8m – 352.55m		Chloritized rock with Pyrite lens and dissemination	<0.1	28	0.02	0.15	7.6
352.55m – 353.4m		Silicified rock with Pyrite lens	0.3	20	0.07	0.22	10.0
353.4m – 354.6m		Laminated argillaceous tuff with Pyrite lens and dissemination	0.1	4	0.02	0.03	12.8
354.6m – 355.1m		Chloritized rock with Pyrite lens and dissemination	0.1	6	0.02	0.03	14.9
355.1m – 355.5m		Pyrite lens in Pyrite disseminated tuff	0.2	9	0.05	0.07	18.0
355.5m – 356.9m		Pyrite-disseminated rock	0.1	8	0.04	0.02	13.5
356.9m – 357.7m		Massive sulfide (Pyrite + Quartz)	0.2	9	0.08	0.03	21.8
357.7m – 358.5m		Muddy tuff with Pyrite dissemination	0.1	4	0.02	0.04	12.3
358.5m – 358.6m		Silicified rock with Pyrite dissemination					
358.6m – 359.7m		Muddy tuff with Pyrite dissemination					

Fig.2-1-3 Geologic Column of Mineralized Part of MJSU-9

Alteration minerals observed in other parts of this hole are quartz-sericite-chlorite combination. The amount of sericite tends to be larger than chlorite in the hanging wall of the massive sulfide ores while chlorite is richer in the hanging wall side.

Strong pyrite dissemination is observed in the footwall side, with the exception of intrusive bodies, of the above massive sulfide ores and banded sulfide ores. These are seen between 40 and 341.25m depth interval and the pyrite tends to increase with depth (Fig. 2-1-4). Ore minerals in the dissemination are large amount of pyrite with minor amount of chalcopyrite and sphalerite.

Chargeability anomalies and geology・mineralization

Strong chargeability anomaly exceeding 50mV/V occurs in the vicinity of this hole. This hole penetrates this anomaly zone from the northwestern side to the southeast. The relation between this anomaly values and mineralization is shown in Figure 2-1-5.

This hole penetrates anomalies of 15 - 21mV/V range at 100 - 120m interval and 21 - 50mV/V at 120 - 250m interval. Chargeability was not measured below 250m.

The geology of this hole consists of weathered and leached zone from the surface to 41.5m depth and of pyrite disseminated zone with less than 6.3% S content from 41.4m to 120m depth. These zones largely correspond to the zone with less than 21mV/V chargeability. Strong pyrite dissemination is observed below 120m with the exception of intrusive bodies. The S content of the disseminated zone was measured for every 50m depth interval, and the results are; S 4.3% between 41.5～90.0m, S 3.6% for 90.0～140.5m, S 7.0% for 140.5～191.5m, S 9.0% for 191.5～240.0m, and S 7.0% for 240.0～290.0m interval. These results agree with the increase of chargeability below 120m depth.

TEM resistivity・conductive plate and mineralization

The resistivity structure analyzed by TEM is a 3-layered structure, with intercalation of relatively low resistivity layer of less than several hundred ohm-m within high resistivity layer of several thousand ohm-m. This second layer with low resistivity occurs at 10～100m depth and its thickness was analyzed to be several tens of meters. This 3-layered structure occurs only at Jabal Sujarah area and 2-layered structures occur in other areas surveyed by TEM.

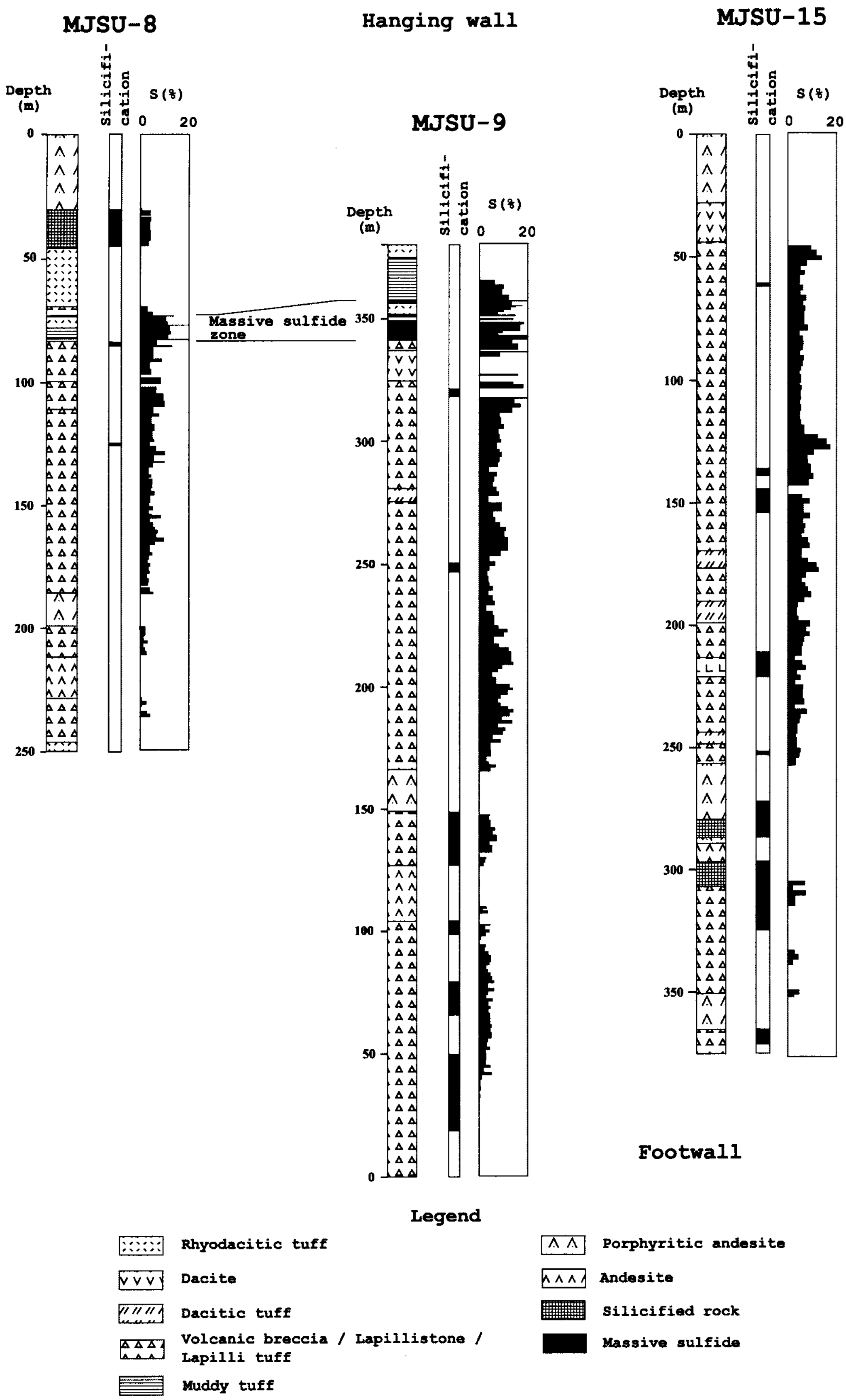
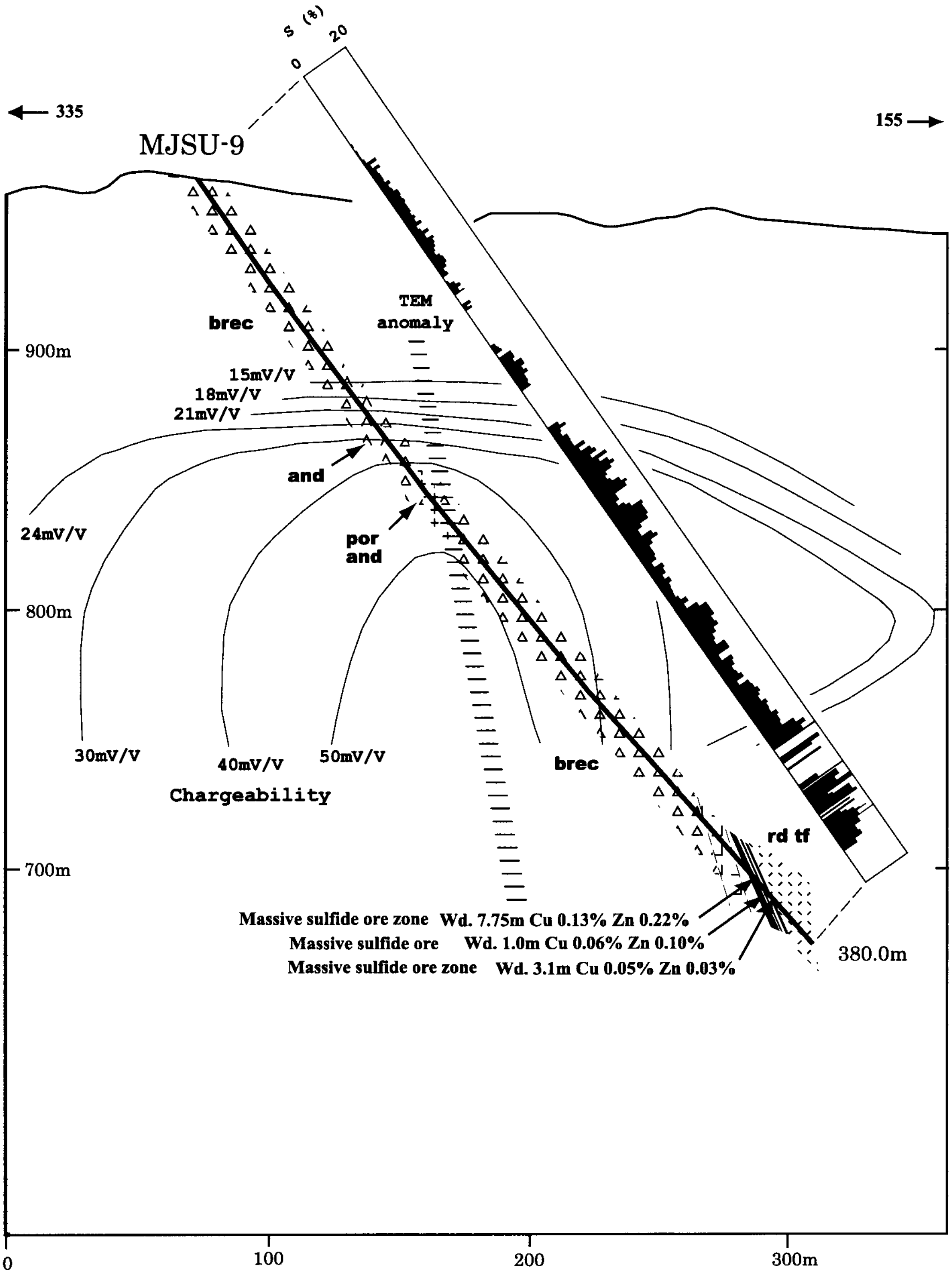


Fig.2-1-4 Correlation of Geologic Columns and Sulfur Contents of Drill Holes in Jabal Sujarah



Abbreviation :
brec : volcanic breccia, lapilli tuff, lapillistone
rd tf : rhyodacitic tuff
por bt : porphyritic basalt
por and : porphyritic andesite
and : andesite

Fig.2-1-5 Chargeability Section and Sulfur Contents of MJSU-9

Resistivity structure analysis shows that the resistivity of the vicinity of this hole is high at around 5,000 ohm-m from the surface (elevation 966m) to about 955m in elevation. The second low resistivity layer occurs between 955m and 940m in elevation.

In this hole, talus deposits are observed from the surface to 1.5m depth, leached-by-weathering zone from 1.5 to 41.5m depth (932m elevation), and pyrite dissemination below 41.5m depth. Thus it is possible to classify the rocks into three groups, namely talus deposits, leached zone, and pyrite dissemination. However, the depth and the resistivity values do not agree with this grouping.

Inferred model calls for a plate extending in the NE-SW direction passing about 60m south of the hole. The conductance of the plate is 1.1 - 2.0S and the dip is SE 80° . The plate, from east of this hole, deepens south-southeastward to 300m, and gradually becomes shallow to the south and to 100m in the southwest.

This hole intersects the plate at 160m depth. Low resistivity material near this depth is the pyrite dissemination, but this is massive and is not platy.

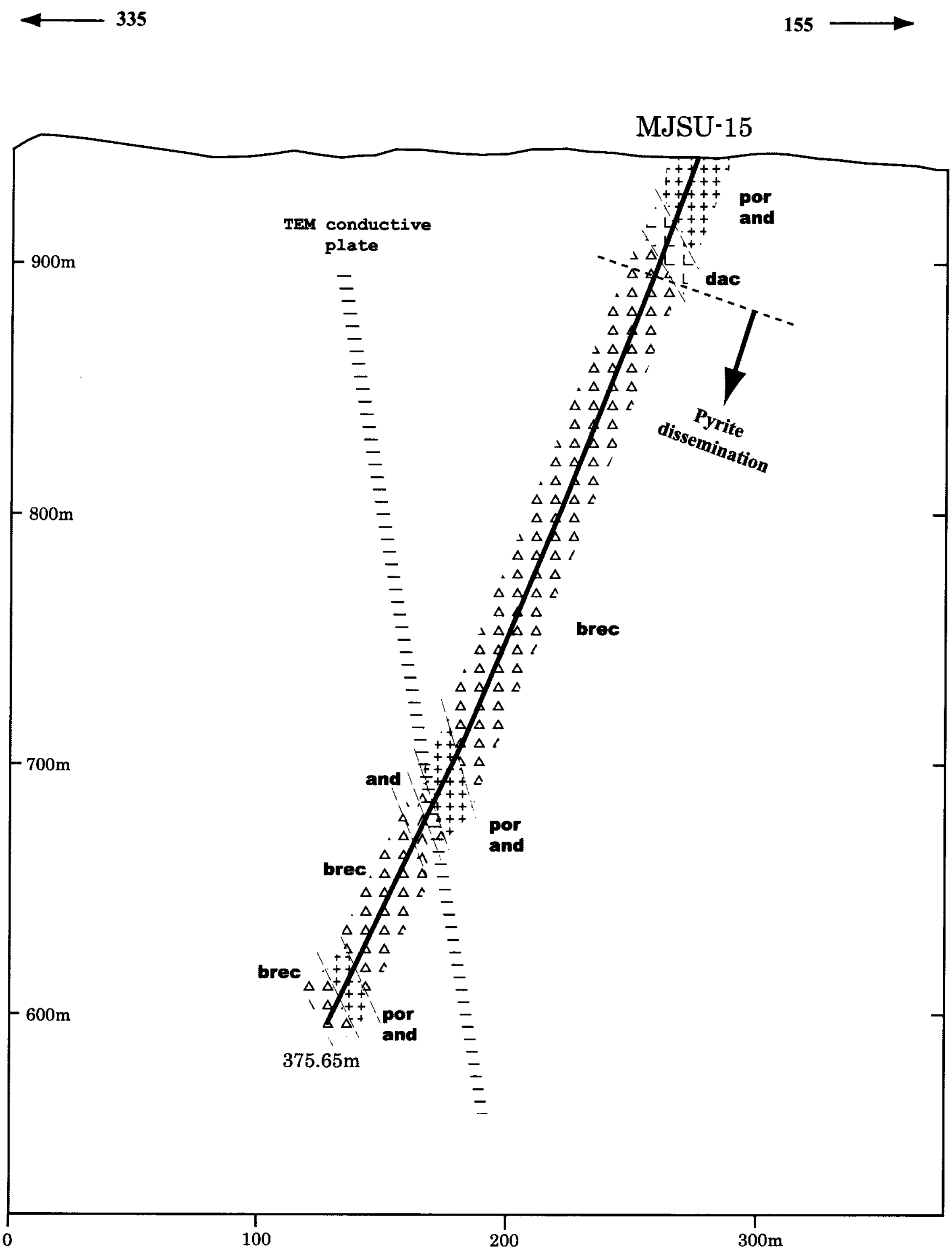
(2) MJSU-15

The geological section of MJSU-15 is shown in Figure 2-1-6

Geology

The major geologic units of this hole are as follows.

Depth	Geologic units
0～1.8m	Sand and gravel
1.8～28.0m	Porphyritic andesite
28.0～43.6m	Dacite
43.6～91.8m	Volcanic breccia or lapillistone
91.8～100.0m	Coarse tuff
100.0～137.8m	Lapillistone or volcanic breccia



Abbreviation :
dac: dacite
brec : volcanic breccia, lapilli tuff
rd tf : rhyodacitic tuff
por and : porphyritic andesite
and : andesite

Fig.2-1-6 Geological Section along MJSU-15

137.8～142.0m	Coarse tuff
142.0～145.4m	Dacite
145.4～169.0m	Lapillistone or volcanic breccia
169.0～179.1m	Dacitic tuff?
179.1～190.2m	Lapillistone
190.2～198.7m	Dacitic tuff
198.7～256.6m	Lapillistone or volcanic breccia
256.6～296.6m	Porphyritic andesite or andesite
296.6～306.9m	Silicified rock
306.9～345.5m	Volcanic breccia
345.5～365.1m	Andesite or Porphyritic andesite
365.1～375.65m	Silicified rock

Mineralization and alteration

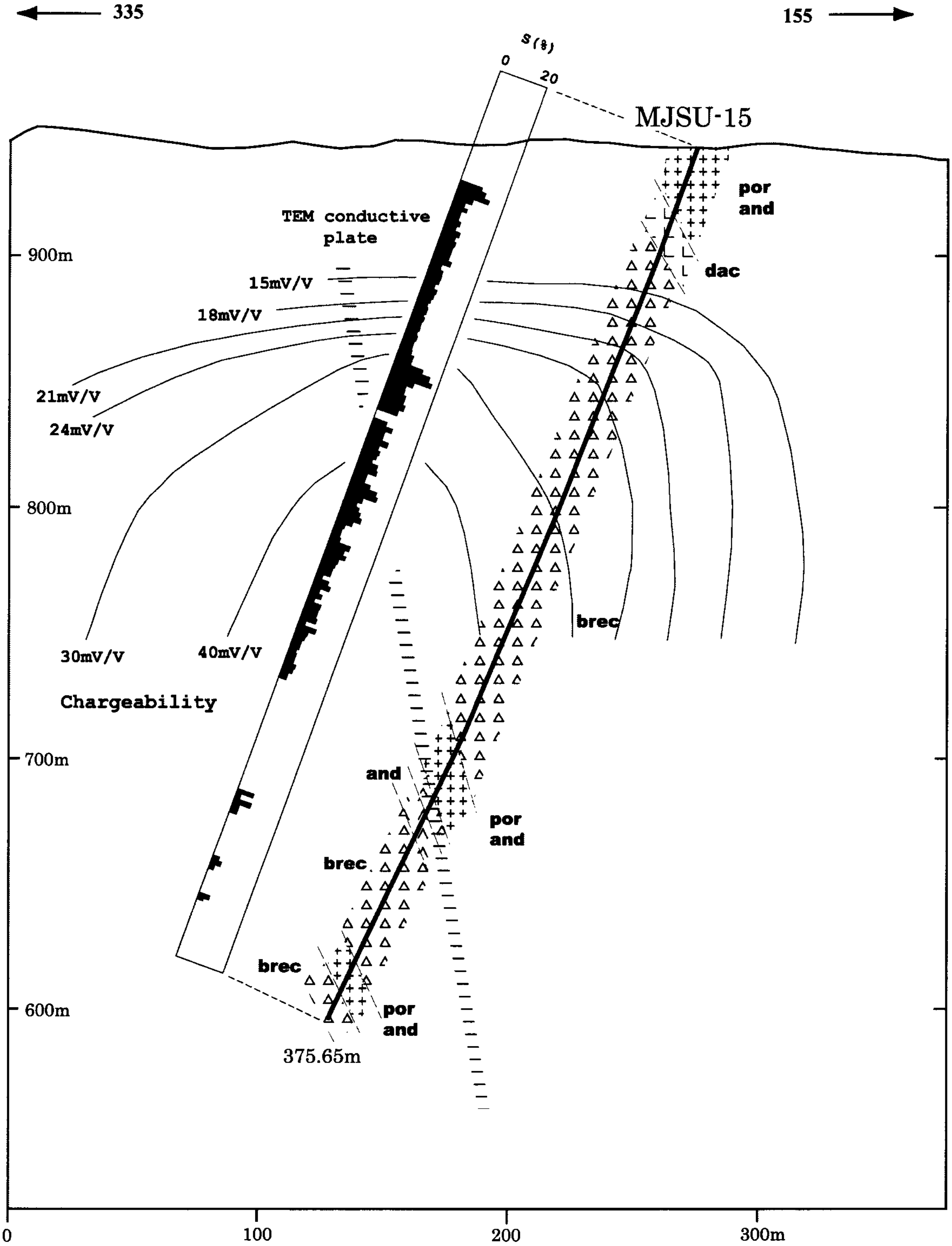
Massive sulfide ores were not encountered in this hole, but as in the case of MJSU-9, pyrite dissemination was observed in breccia. The amount of pyrite is larger in the shallower parts and smaller in the deeper zones (Fig. 2-1-4). Namely the tendency of decreasing pyrite from the hanging wall to the footwall side is similar to MJSU-8 and MJSU-9.

Chargeability anomaly and geology・mineralization

Strong chargeability anomaly occurs near MJSU-15. This hole penetrates the eastern side of this anomaly from the southeast. The relation between the chargeability anomaly and the geology and mineralization is shown in Figure 2-1-7.

Chargeability of interval 60 to 90m of this hole ranges from 15 to 21mV/V, that of interval 90～220m is 21 to 40mV/V. The chargeability below 220m was not measured.

The geology of this hole from the surface to 43.6m depth consists of intrusive body and dacite (very weak pyrite dissemination observed in parts), and pyrite dissemination zone occurs from 43.6m to 220m with S content between 2.6 - 15.8%. This fact indicates that the chargeability anomaly is caused by the pyrite dissemination below 43.6m.



Abbreviation :
dac: dacite
brec : volcanic breccia, lapilli tuff
rd tf : rhyodacitic tuff
por and : porphyritic andesite
and : andesite

Fig.2-1-7 Chargeability Section and Sulfur Contents of MJSU-15

TEM resistivity・conductive plate and mineralization

The relation between the resistivity and geology and mineralization of this hole is not clear because MJSU-15 was drilled outside the TEM geophysical survey area. However, the 3-layered structure observed by TEM survey in the northwest cannot be explained by the geology and mineralization of this hole.

This hole intersects the northeastern edge of the inferred plate near 280m below surface. Pyrite dissemination is observed near this depth, but the S grade and continuity are not good.

1-2-4 Discussions

The drilling carried out to date in the Jabal Sujarah area is; two drilled this year and another last year (MJSU-8). The geology and mineralization of the area including these three drill holes (henceforth, this area) are summarized as follows.

The rocks, which occur in this area, are; rhyodacitic tuff, muddy tuff, shale, dacite, and dacitic breccia. These rocks are intruded by andesite, porphyritic andesite, porphyritic basalt, and dacite. Dacitic breccia mainly consists of volcanic breccia, lapillistone, volcanic tuff, and coarse tuff. These rocks are believed to strike in approximately E-W direction with dip vertical to 60° S. The rocks of this area are, from the bottom upward, dacitic breccia or dacite, muddy tuff, rhyodacitic tuff.

The mineralization of this area is volcanogenic massive sulfide type and consists of massive ores, pebbly ores and pyrite dissemination (Figure 2-1-8).

Several bodies of massive and pebbly ores occur in proximity, and shale, muddy tuff, rhyodacitic tuff, and chloritized rocks are observed in between. The massive and pebbly ores contain; in some cases large amount of sphalerite (pebbly ore at MJSU-8, 73.25～73.55m depth), and small amount of chalcopyrite (massive ore at MJSU-8, 82.65～83.55m depth), but mostly pyrite and the Au, Cu, and Zn grades are low. The penetrated thickness of the individual massive and pebbly ore parts is 0.3 - 2.15m but the true thickness is probably less than 0.8m. The penetrated thickness of the mineralized parts consisting of several massive and pebbly ore groups is 12.6m in MJSU-8 and 21.0m in MJSU-9, but the thickness is

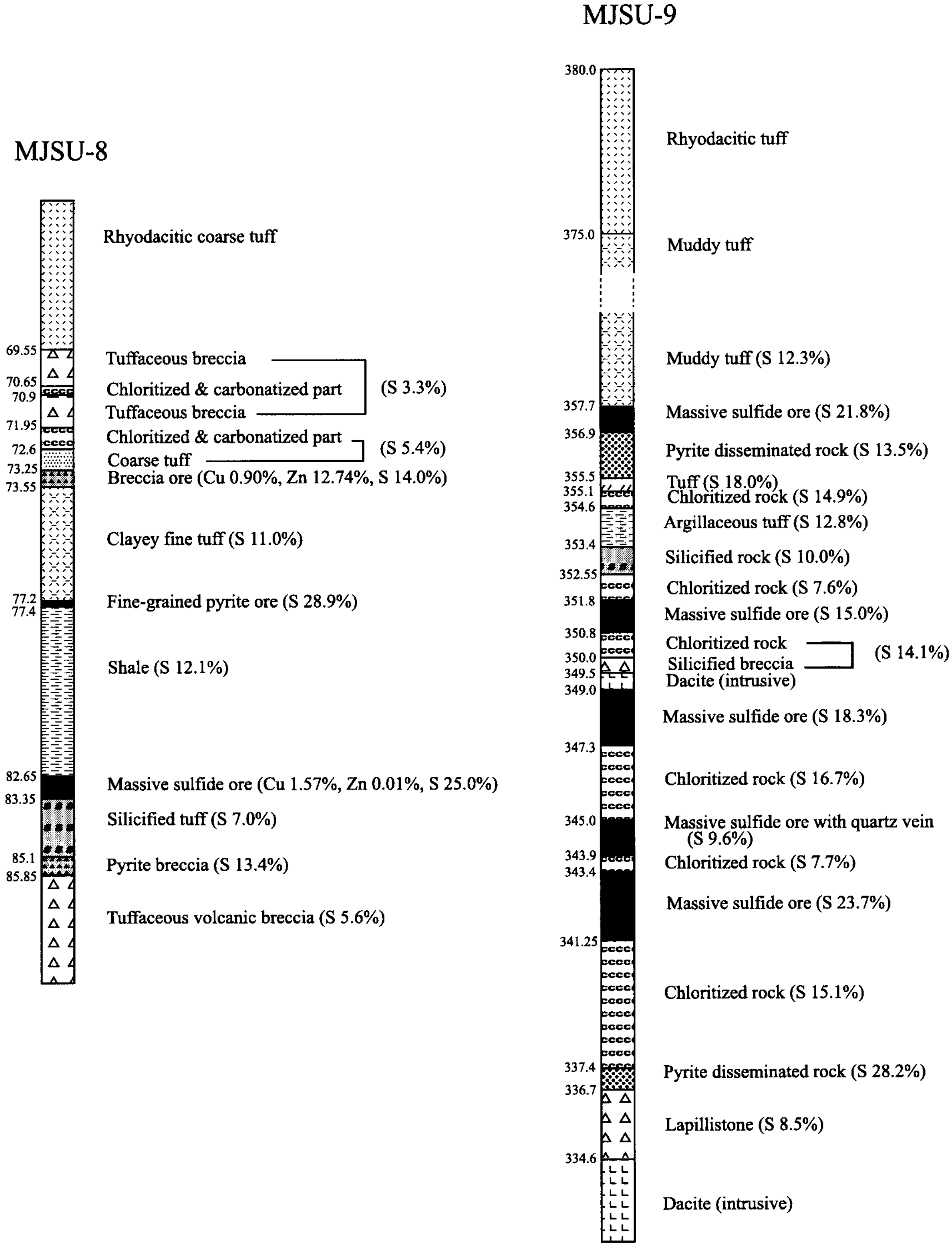


Fig.2-1-8 Correlation of Mineralized Parts of MJSU-8 and MJSU-9

estimated to be about 6m. The MJSU-15 drilled in the eastern part of the area have not encountered massive or pebbly ores, and thus these ores probably occur within around 200m in the E-W direction.

Pyrite dissemination is observed in the hanging wall and footwall sides as well as between the massive and pebbly ores mentioned above (Fig. 2-1-4).

There are strongly pyrite disseminated thick breccias on the footwall side of the mineralized zone containing massive and pebbly ores. The S content is 8.16% for 151.7m interval (excluding intrusive bodies between 166.0 and 317.7m depth) of MJSU-9. This value is higher than the 5.81% S of the 103m interval (excluding intrusive bodies between 83.35 and 186.05m depth) of MJSU-8. In MJSU-15, the S content is 6.32% for 210m interval (excluding intrusive bodies between 45.5 and 255.4m depth) and is slightly higher than the value of MJSU-8. A large amount of pyrite and small amounts of chalcopyrite and sphalerite occur in the pyrite dissemination zone.

Massive and pebbly ores occur macroscopically between dacitic breccias and rhyodacitic tuff. Dacitic breccia occurs stratigraphically lower than rhyodacitic tuff and jasper overlies both.

The massive and pebbly ores are accompanied by shale and muddy tuff and this is similar to the massive ores of 4/6 Gossan Prospect. However, thick dacitic breccia occurs on the footwall side of the massive sulfide, and this is different from the massive ores of the 4/6 Gossan Prospect. Also the occurrence of strong pyrite dissemination among massive sulfide ores, between massive and pebbly ores, and in the dacitic breccia of the footwall is a feature different from the massive ores of the 4/6 Gossan Prospect.

There are two types of alteration mineral combination, which occur among massive ores or between massive and pebbly ores. One is mainly chlorite and pyrite, and the other sericite and pyrite.

The alteration minerals occurring between massive ores, between massive and pebbly ores are mostly chlorite and pyrite and occasionally accompanied by sericite. The dominance of chlorite among the alteration minerals is similar to the alteration in the vicinity of the massive ores of 4/6 Gossan Prospect.

The Jabal Sayid Deposit located 20km north-northwest of this area is a stratabound massive sulfide deposit accompanied by stockwork ore body in the lower part. The Cu grade is around 2.7%. The footwall consists of crystalline tuff and pyroclastic flow deposit of the upper part of the felsic rocks of the Sayid Formation. The hanging wall is composed of fine to coarse rhyolitic rocks and rhyodacite containing quartz. And chert-carbonate rocks or jasper formed by chemical deposition overlie the orebody.

Pyroclastic rock, which is the host rock of the stockwork orebody below the massive sulfide deposit, is chloritized. The sulfide minerals of the massive sulfide orebody are mainly pyrite, pyrrhotite, sphalerite, and chalcopyrite. The sulfide minerals of the stockwork body are mainly pyrite and chalcopyrite with smaller amount of sphalerite.

The following similarities and differences between the mineralization of this area and the Jabal Sayid Deposit are noted.

They are both volcanogenic massive sulfide deposits with felsic host rocks, and the occurrence of chert or jasper above the ore horizon is similar.

Strong pyrite dissemination is developed in the footwall of the massive sulfide body of this area while stockwork ores are associated below the deposit of the Cabal Said.

Pyrrhotite does not occur with the sulfide minerals in this area. Also the grades of Cu and Zn is lower in this area relative to the Cabal Said deposit.

1-2-5 Summary

The geology of this area consists mainly of dacitic breccia of Upper Proterozoic Arj Group associated with rhyodacitic tuff, shale, muddy tuff, dacite, and jasper. These rocks are intruded by dacite, andesite, porphyritic andesite, and porphyritic basalt.

Mineralization of this area is volcanogenic massive sulfide type and massive ores, pebbly ores, and pyrite dissemination occur widely. The massive ores and pebbly ores are largely associated with dacitic breccia on the footwall side and rhyodacitic tuff on the hanging wall side.

Several layers of massive and pebbly ores are observed and the thickness of each layer is estimated to be less than 0.8m. The thickness of the mineralized zone including the above ores and intercalated pyrite dissemination is estimated to be about 6m.

Parts of the massive and pebbly ores are rich in Cu and Zn, but they are mostly low grade.

Pyrite dissemination occurs between the massive orebodies and between massive and pebbly ores, and also in footwall dacitic breccia with thickness exceeding 100m. A large amount of pyrite is included, but Cu and Zn grade is low in these disseminated zones.

1-3 Drilling Results in the 4/6 Gossan Prospect

1-3-1 Objective of the survey

(1) MJSU-14

MJSU-14 was drilled in order to confirm the downward continuity and conditions of the volcanogenic massive sulfide mineralized zone found at 125.15m～142.25m depth interval of MJSU-2 that was drilled during the second year. The drilling site is 80m in the 65° (N65° E) direction form the MJSU-2. The specifications of the drilling were the same as those of MJSU-2 , namely 245° , -55° (Fig. 2-1-9).

The mineralized zone located by MJSU-2 was expected to extend vertically downward, and the planned length of the hole was 375m. But the MJSU-14 confirmed that the beds were dipping about 60° E below the ore horizon of MJSU-2, and the horizon of the volcanogenic massive sulfide mineralization was penetrated by MJSU-14 at a shallower depth than expected and drilling was stopped at 274.6m depth.

(2) MJSU-16

MJSU-2 and 14 in the vicinity of this hole confirmed volcanogenic massive sulfide mineralization. Thick basaltic tuff occurs on the hanging wall side (apparent) of the massive sulfide ores in these two drill holes. On the other hand, basaltic tuff does not occur and volcanogenic massive sulfide mineralization is not found in the MJSU-1 (located 193m southwest of MJSU-2) drilled during the second year.

MJSU-1 was considered to have penetrated the footwall (apparent) of the massive sulfide ores. Thus MJSU-16 hole was planned with the aim of clarifying the continuity and conditions of the volcanogenic massive sulfide mineralization southward of MJSU-2 and 14. MJSU-16 is located 100m southeast of MJSU-2 and its specifications are; azimuth 245° , dip –55° , and total length 200m. Pyrite dissemination was found near the bottom of the hole and thus the drilling was extended for 10m to a total length of 210m.

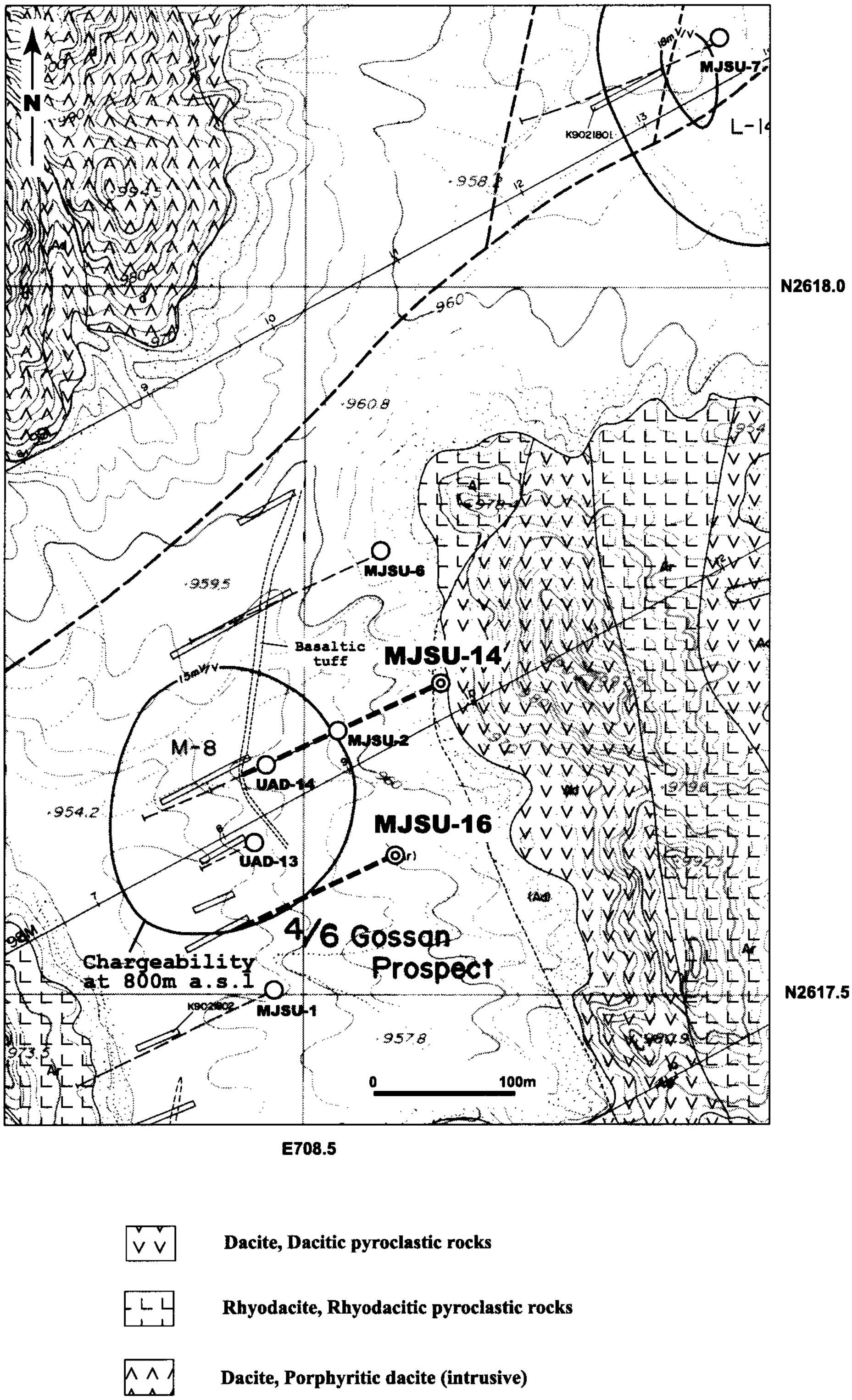


Fig.2-1-9　Detailed Geological Map of 4/6 Gossan Prospect

1-3-2 Progress of drilling

Summary of drilling operation, record of drilling operation and chart of drilling progress regarding MJSU-14 and MJSU-16 are shown in the Appendix.

(1) MJSU-14

The drilling of MJSU-14 started on September 4 and completed on September 14. From the surface to 5.95m depth, drilling was done by PQ diamond bit, HW casing was inserted and HQ diamond bit was used from to 32.75m depth. HW casing was inserted and NQ diamond bit was used to the bottom at 274.60m. The work was carried out by wire-line method. Core recovery was 100%.

Loss of circulation occurred near 19.05m and 21.85m depth and Stop Plus and powdered wood were added and stopped the circulation loss. There were no other notable problems and the operation was carried out smoothly. The rate of drilling was 13.7m per shift.

(2) MJSU-16

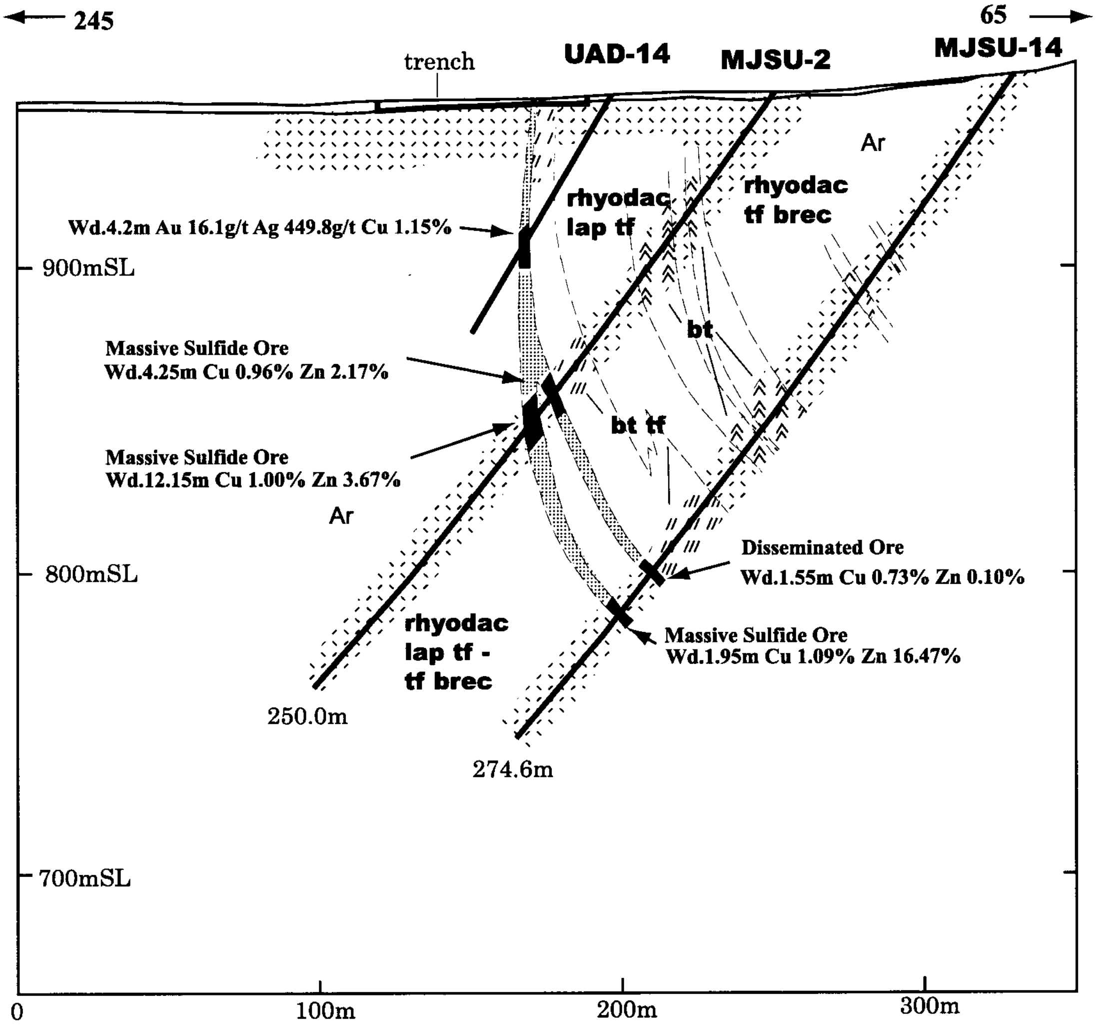
The drilling of MJSU-16 started on October 24 and completed on November 1. From the surface to 6.0m depth, drilling was done by PQ diamond bit, HW casing was inserted and HQ diamond bit was used from to 35.9m depth. HW casing was inserted and NQ diamond bit was used to the bottom at 210.0m. The work was carried out by wire-line method. Core recovery was 100%.

There were no notable problems during the drilling and the operation was carried out smoothly. The rate of drilling was 15.0m per shift.

1-3-3 Geology and mineralization・alteration of the drill holes

Geological map of the area in the vicinity of MJSU-14 and MJSU-16 are laid out in Figure 2-1-9 and geological sections in Figure 2-1-10 and 11.

Ore assay results, thin section microscopy results, polished section microscopy results, and X-ray diffraction results are shown in the Appendix.



Abbreviation:

Ar : Rhyodacite, Rhyodacitic pyroclastic rocks (Arj Group)
rhyodac lap tf : rhyodacitic lapilli tuff
rhyodac tf brec : rhyodacitic tuff breccia
bt tf : basaltic tuff
bt : basalt

Fig.2-1-10 Geological Section along MJSU-14

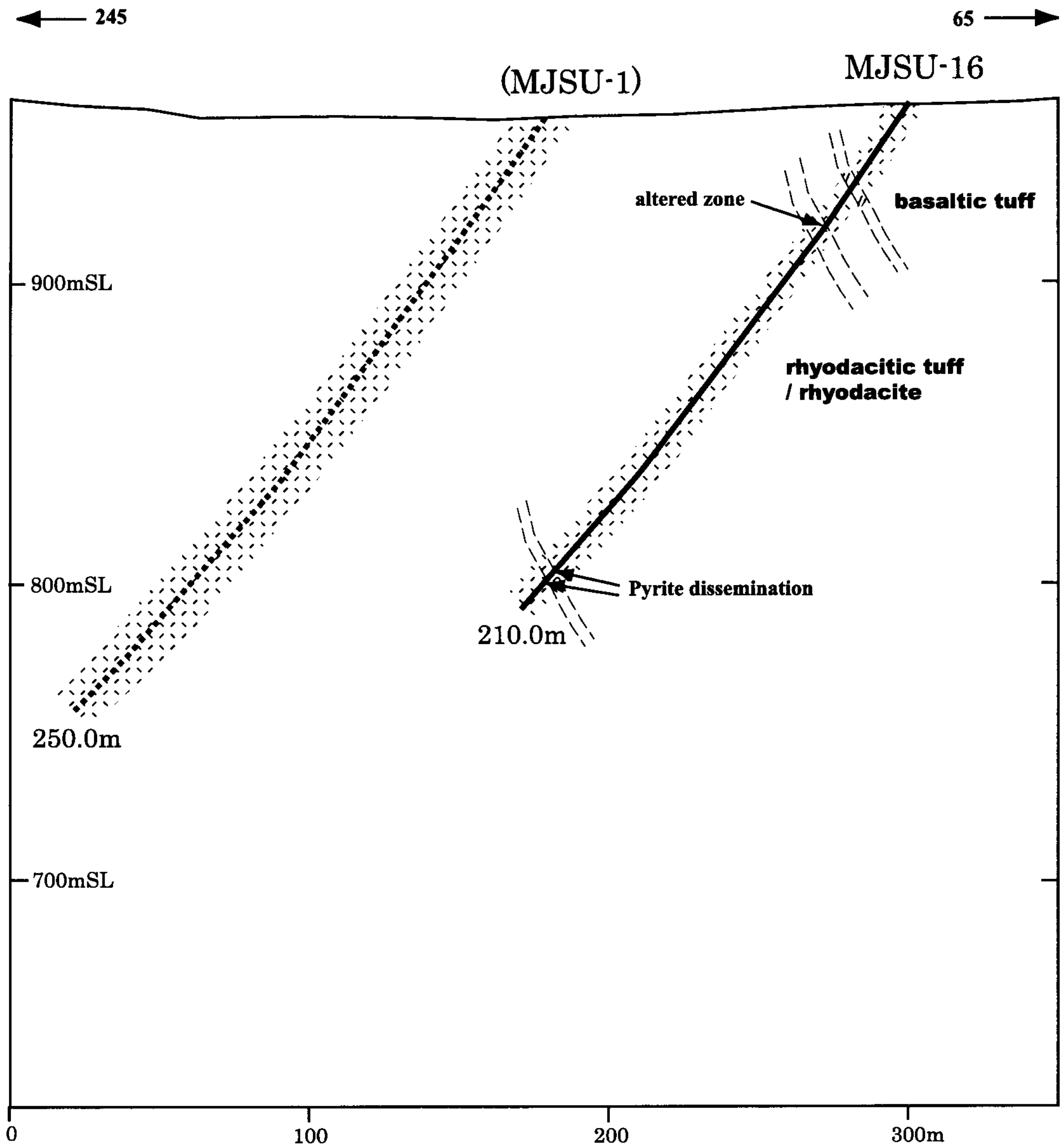


Fig.2-1-11 Geological Section along MJSU-16

(1) MJSU-14

Geology

The major geologic units of this drill hole are as follows.

Depth	Geology
0～1.00m	Strongly weathered rocks
1.00～90.00m	Rhyodacitic lapilli tuff～tuff breccia
90.00～98.60m	Rhyodacite
98.60～109.40m	Rhyodacitic lapilli tuff (contain patches of pelagic rock fragments)
109.40～115.00m	Rhyodacite
115.00～129.55m	Rhyodacitic tuff breccia～tuff
129.55～202.90m	Basaltic tuff~ basalt (contain rhyodacitic tuff to rhyodacitic lapilli tuff).
202.90~ 274.60m	Rhyodacitic tuff, lapilli tuff and tuff breccia. Lenses of pelagic rock fragments in some places.

Mineralization and alteration

Notable mineralization was observed at depth intervals of 202.90～204.45m and 219.80～221.75m. The above-mineralized zones are summarized below.

	Depth (m)	Interval Length (m)	Mineralization	Grade				
				Au(g/t)	Ag(g/t)	Cu(%)	Zn(%)	S(%)
①	202.9～204.45	1.55	Dissemination	<0.05	4.6	0.73	0.10	9.0
②	219.8～221.75	1.95	Massive sulfide (intercalation of disseminated ore)	0.19	29.0	1.09	16.47	22.6

① Mineralized zone consists of silicified zone 30cm wide, argillized tuff 90cm, and tuffaceous mudstone 35cm. Thin layers to lenses of sulfide minerals and sulfide dissemination occur in these host rocks. The ore minerals are mainly pyrite with smaller amounts of chalcopyrite and sphalerite.

② Mineralized zones consist of pyrite and chalcopyrite dissemination in 30cm-wide black mudstone, 10cm-wide quartz veins, 70cm-wide sphalerite-rich massive sulfide ore, 10cm-wide mudstone, 20cm-wide pelitic tuff, and 55cm-wide massive sulfide ore.

Aside from the above, pyrite-chalcopyrite lenses occur in rhyodacitic tuff at 195.7~ 196.3m depth interval, and their Cu grade is 0.53%.

Alteration minerals in the cores of this hole are quartz, chlorite, sericite, and calcite.

Regarding rock-forming minerals, plagioclase occur throughout the core except in the argillized tuff of the mineralized zone ①, muddy tuff of ②, and rhyodacitic tuff of the apparent footwall of the mineralize zone ②. These plagioclase-deficient parts often contain large amounts of chlorite. Thus deficiency of plagioclase and large amounts of chlorite characterize the alteration near the above-mineralized zones.

Chlorite is dominant in the shallow zones (apparent hanging wall of the mineralized zone) while sericite is the dominant alteration mineral in the deeper zones (apparent footwall of the mineralized zone). This tendency is also observed in MJSU-2 drilled last year.

(2) MJSU-16

<u>Geology</u>

The major geologic units of this drill hole are as follows.

Depth	Geology
0～1.7m	Sand and gravel
1.7～30.20m	Rhyodacitic tuff～tuff breccia
30.20～33.40m	Basaltic tuff
33.40～56.50m	Rhyodacite～dacitic tuff
56.50～73.80m	Rhyodacite (intercalation of rhyodacitic tuff)
73.80～133.90m	Rhyodacitic tuff, lapilli tuff and tuff breccia
133.90～154.00m	Rhyodacite, rhyodacitic tuff
154.00～162.10m	Dacite
162.10～210.00m	Rhyodacite and rhyodacitic tuff

Mineralization and alteration

Notable mineralization was not observed in this MJSU-16 except for pyrite dissemination with sulfur grade of S 9.8% and 8.9% at 193.8～194.3m depth interval and 198.2～199.2m interval respectively.

Alteration was also not noteworthy.

1-3-4 Discussions

Geologic columns of the six holes drilled in this area, namely MJSU-1, 2, 6, 7, 14, and 16 are laid out in Figure 2-1-12. Basaltic tuff is the key bed for correlating the stratigraphy of this area. Basaltic tuff occurs in five holes of this area with the exception of MJSU-1. Mineralization is observed immediately above, below or within this basaltic tuff.

Rhyodacite and rhyodacitic tuff occurs immediately above or below the basaltic tuff. There is intercalation of sedimentary rocks such as shale in parts of the mineralized zone.

The mineralization in this area is volcanogenic massive sulfide Cu-Zn mineralization. This mineralization was confirmed in four holes MJSU-2, 6, 7, and 14 (Fig. 2-1-13).

The ores found in these four holes are of the following four types.

1. Massive ore: Massive ore consisting of fine-grained sulfide minerals such as pyrite, sphalerite, and chalcopyrite. These sulfide minerals are not associated with gangue minerals.
2. Pebbly ore: Ore consisting of angular fragments mostly smaller than 1cm and maximum of 10cm. Fine-grained sulfide minerals constitute the pebbles. The matrix consists of quartz and chlorite.
3. Siliceous ore: Siliceous ore with dissemination of fine-grained sulfide minerals.
4. Banded ore: Several centimeters thick layers of chlorite and fine-grained sulfide mineral form banded structure.

The grade and characteristics of these four types of ores and associated dissemination zones and silicified zones are shown in Table 2-1-1.

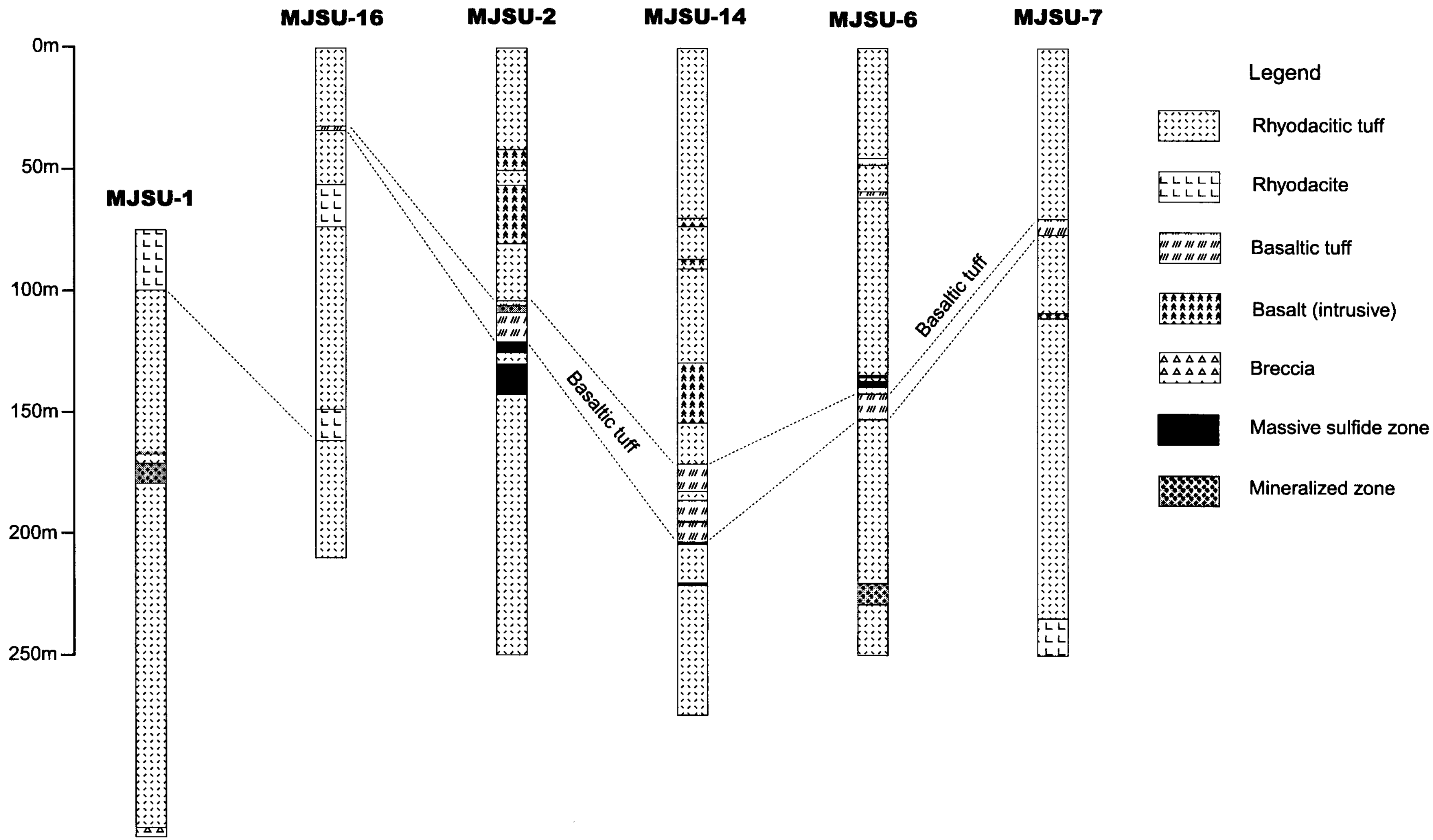


Fig.2-1-12 Comparison of Geologic Columns of Drill Holes in 4/6 Gossan Prospect

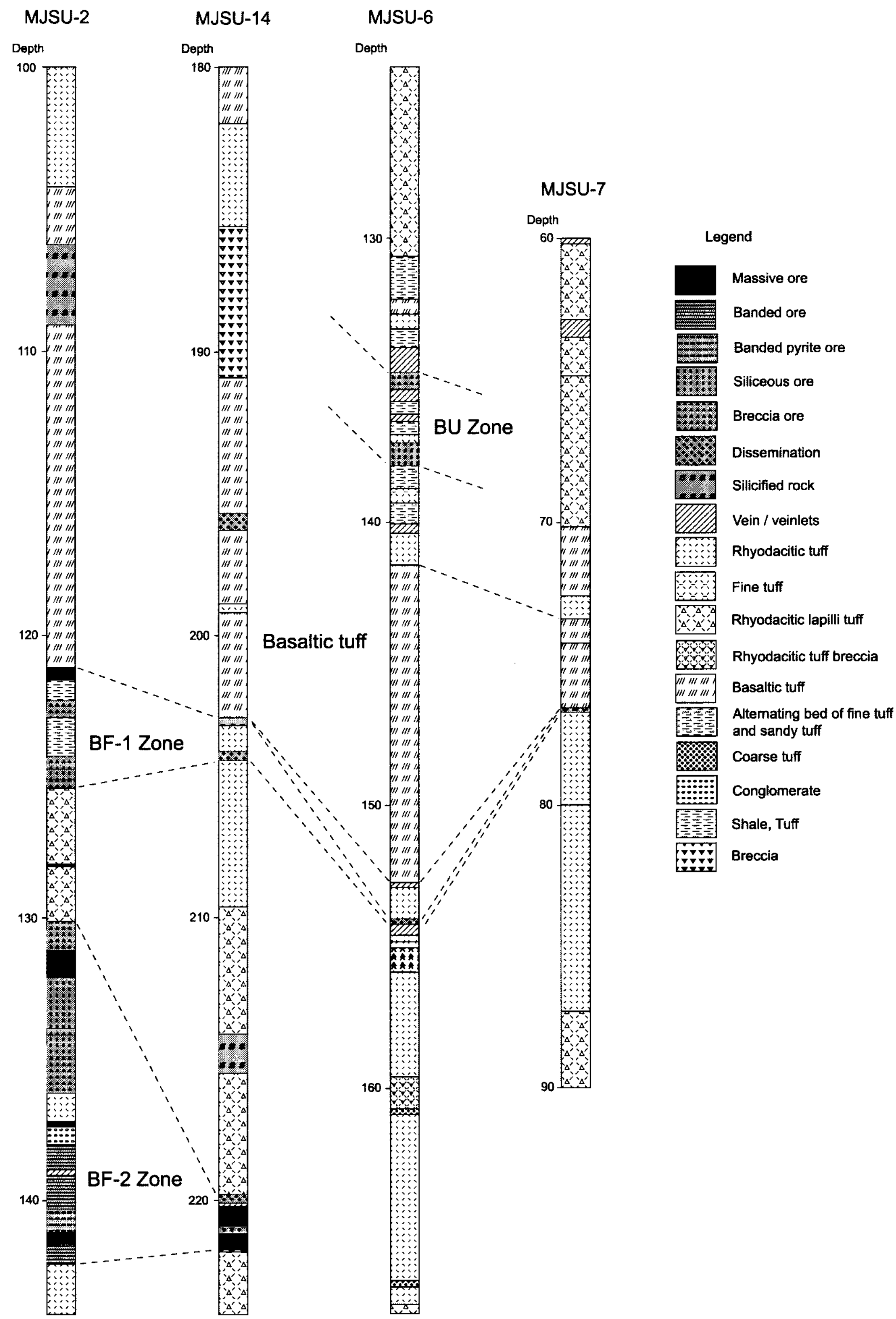


Fig.2-1-13 Correlation of Mineralized Parts of 4/6 Gossan Prospect

Table 2-1-1 Summary of Assay Results of 4/6 Gossan Prospect

Ore type	Drill hole	Depth (m)		Thickness (m)	Au(g/t)	Ag(g/t)	Cu(%)	Zn(%)	Pb(%)	S(%)
Massive ore	MJSU-2	121.15	121.60	0.45	0.12	14.90	1.70	0.18	0.02	18.05
	MJSU-2	128.10	128.20	0.10	0.30	12.60	0.96	0.19	<0.01	23.30
	MJSU-2	131.15	132.10	0.95	0.13	37.60	1.46	24.68	0.09	28.50
	MJSU-2	137.20	137.40	0.20	0.70	51.60	4.79	0.24	0.01	23.60
	MJSU-2	141.15	141.55	0.40	5.83	15.80	4.58	0.08	<0.01	33.83
	MJSU-14	221.20	221.75	0.55	0.17	51.00	2.28	11.00	<0.01	30.00
	MJSU-14	220.20	220.90	0.70	0.24	34.00	1.13	35.00	<0.01	25.90
Breccia ore	MJSU-2	122.30	122.90	0.60	0.28	10.70	2.71	0.08	<0.01	11.04
	MJSU-2	124.25	124.75	0.50	0.65	55.40	1.66	9.81	0.45	14.00
	MJSU-2	125.10	125.40	0.30	1.40	44.90	0.99	6.81	0.68	10.34
	MJSU-2	130.10	130.40	0.30	0.56	13.30	0.89	3.65	0.02	11.75
	MJSU-2	130.50	131.15	0.65	0.67	28.80	0.68	9.55	0.03	21.70
	MJSU-2	133.90	134.15	0.25	<0.05	7.60	0.48	1.97	0.02	23.00
	MJSU-2	134.90	136.20	1.30	<0.05	12.50	0.67	0.81	<0.01	26.55
	MJSU-6	134.75	135.35	0.60	<0.05	71.60	1.71	16.20	0.36	10.00
Siliceous ore	MJSU-2	124.75	125.10	0.35	1.00	63.10	1.03	5.90	1.30	7.96
	MJSU-2	132.10	133.90	1.80	0.21	21.70	1.78	4.41	0.57	6.40
	MJSU-2	134.15	134.90	0.75	<0.05	7.60	0.48	1.97	0.02	23.00
	MJSU-6	137.20	138.00	0.80	<0.05	40.30	0.97	3.17	0.06	10.70
Banded ore	MJSU-2	138.00	138.90	0.90	0.14	12.90	0.50	0.22	<0.01	11.25
	MJSU-2	139.10	140.30	1.20	0.19	11.10	1.17	0.50	<0.01	5.50
	MJSU-2	140.30	141.15	0.85	0.35	6.10	0.32	0.55	<0.01	13.83
	MJSU-2	141.55	142.25	0.70	<0.05	4.50	1.05	0.12	0.01	18.70
Dissemi-nation	MJSU-14	195.70	196.30	0.60	0.08	5.00	0.53	0.04	<0.01	3.44
	MJSU-14	204.10	204.45	0.35	0.19	12.50	3.10	0.08	<0.01	20.30
	MJSU-6	154.05	154.25	0.20	<0.05	1.50	0.05	0.22	<0.01	5.40
	MJSU-7	76.70	78.05	1.35	<0.05	0.60	0.05	0.03	<0.01	5.38
Silicified rock	MJSU-2	106.25	109.05	2.80	<0.05	1.82	<0.01	0.03	<0.01	7.07
	MJSU-14	202.90	203.20	0.30	<0.05	1.50	0.01	0.03	<0.01	17.60
	MJSU-14	219.80	220.10	0.30	0.27	7.50	0.09	0.05	<0.01	26.60
	MJSU-14	221.00	221.20	0.20	<0.05	<1.0	0.01	0.28	<0.01	1.19

Table 2-1-2 Mineralization Characteristics of Each Ore Zone

BF-1 Zone

Drill Hole	Depth (m)		Thickness (m)	Ore Type / Rock	Au(g/t)	Cu(%)	Zn(%)
MJSU-2	121.15	121.60	0.45	Massive ore	0.12	1.70	0.18
	121.60	122.30	0.70	Tuffaceous shale	0.14	0.17	0.03
	122.30	122.90	0.60	Breccia ore	0.28	2.71	0.08
	122.90	124.25	1.35	Shale	0.10	0.08	0.04
	124.25	124.75	0.50	Breccia ore	0.65	1.66	9.81
	124.75	125.10	0.35	Siliceous ore	1.00	1.03	5.90
	125.10	125.40	0.30	Breccia ore	1.40	0.99	6.81
MJSU-14	202.90	203.20	0.30	Silicified rock	<0.05	<0.01	0.03
	203.20	204.10	0.90	Tuff			
	204.10	204.45	0.35	Dissemination	0.19	3.10	0.08
MJSU-6	154.05	154.25	0.20	Dissemination	<0.05	0.05	0.22
MJSU-7	76.55	76.70	0.15	Silicified rock	<0.05	0.38	0.45

BF-2 Zone

Drill Hole	Depth (m)		Thickness (m)	Ore Type / Rock	Au(g/t)	Cu(%)	Zn(%)
MJSU-2	130.10	130.40	0.30	Breccia ore	0.56	0.89	3.65
	130.40	130.50	0.10	Conglomerate	0.74	0.23	0.03
	130.50	131.15	0.65	Breccia ore	0.67	0.68	9.55
	131.15	132.10	0.95	Massive ore	0.13	1.46	24.68
	132.10	133.90	1.80	Siliceous ore	0.21	1.54	4.21
	133.90	134.15	0.25	Breccia ore	<0.05	0.48	1.97
	134.15	134.90	0.75	Siliceous ore	0.18	0.29	4.13
	134.90	136.20	1.30	Breccia ore	<0.05	0.67	0.81
	136.20	137.20	1.00	Tuff	<0.05	0.20	0.10
	137.20	137.40	0.20	Massive ore	0.70	4.79	0.24
	137.40	138.00	0.60	Conglomerate	<0.05	0.20	0.09
	138.00	138.90	0.90	Banded ore	0.14	0.50	0.22
	138.90	139.10	0.20	Quartz veinlets	0.08	0.32	0.12
	139.10	140.30	1.20	Banded ore	0.19	1.17	0.50
	140.30	141.15	0.85	Banded pyrite ore	0.35	0.32	0.55
	141.15	141.55	0.40	Massive ore	5.83	4.58	0.08
	141.55	142.25	0.70	Banded ore	<0.05	1.05	0.12
MJSU-14	219.80	220.10	0.30	Dissemination	0.27	0.09	0.05
	220.10	220.20	0.10	Quartz vein	<0.05	0.03	0.02
	220.20	220.90	0.70	Massive ore	0.24	1.13	35.00
	220.90	221.00	0.10	Shale	0.25	0.51	15.00
	221.00	221.20	0.20	Muddy tuff	<0.05	<0.01	0.28
	221.20	221.75	0.55	Massive ore	0.17	2.28	11.00

BU Zone

Drill Hole	Depth (m)		Thickness (m)	Ore Type / Rock	Au(g/t)	Cu(%)	Zn(%)
MJSU-6	134.75	135.35	0.60	Breccia ore	<0.05	1.71	16.20
	135.35	135.75	0.40	Quartz-Calcite vein	<0.05	0.06	0.47
	135.75	136.20	0.45	Shale	<0.05	0.17	0.04
	136.20	136.45	0.25	Calcite-Quartz vein network	0.06	0.25	0.02
	136.45	136.90	0.35	Shale	<0.05	0.61	0.24
	136.90	137.20	0.30	Fine tuff	<0.05	0.03	0.02
	137.20	138.00	0.80	Siliceous ore	<0.05	0.97	3.17

The massive ores are divided into those with very high Zn grade (Zn 11.0~35.0%) and those with extremely low Zn grade. Pb content is low in both types. Cu grade is relatively high (average 2.11%). Au grade is generally low (less than Au 0.7g/t) with one part containing Au 8.5g/t.

Pebbly and siliceous ores have relatively high Zn content (Zn 0.8 - 9.8%), and the Pb grade is also relatively high in some parts (Pb 0.4 - 1.3%). Cu grade (average Cu 1.24%) of these ores is somewhat lower than the massive ore. Au grade is less than 1.5g/t.

Banded ores have low Zn and Pb grades, and Cu grade is lower than pebbly and siliceous ores. Au grade is less than 0.5g/t.

Dissemination ores have low Au, Cu, and Zn grades and none are worth consideration. Slightly high-grade Cu is observed in a part of MJSU-14.

Massive and banded ores occur only below (henceforth above or below will indicate apparent above or below) basaltic tuffs.

The mineralized zones that occur below basaltic tuffs can be divided largely into two parts, namely BF-1 in the upper part and BF-2 in the lower part.

BF-1 occurs immediately below the basaltic tuff. At MJSU-2, BF-1 consists of massive, pebbly and siliceous ores and is accompanied by shale and tuffaceous shale. At MJSU-14, BF-1 consists of siliceous and disseminated ores. At MJSU-6 it corresponds to disseminated zone, and to siliceous rocks at MJSU-7. BF-1 is inferred to be about 3.7m thick at MJSU-2, and it is thickest at this part. The grade of BF-1 at MJSU-2 is Au 0.4g/t, Cu 0.96%, and Zn 2.17% while at MJSU-14 the grade is Au less than 0.1g/t, Cu 0.73%, and Zn 0.03%.

BF-2 occurs below BF-1 with rhyodacitic tuff between the two mineralized zones. BF-2 consists of massive ore, pebbly ore, siliceous ore, and banded ore with intercalation of tuff and conglomerate at MJSU-2. At MJSU-14, it contains massive ore and disseminated ore with intercalation of muddy tuff and mudstone. Mineralized zone corresponding to BF-2 does not occur in MJSU-6 and 7. BF-2 is about 9.3m thick at MJSU-2 and is thickest in this hole. It is believed to be about 1.8m thick at MJSU-14, thus the thickness of BF-2 varies considerably. At UAD-14 drilled in the past, high-grade mineralized zone (Au 16.1g/t, Cu 1.15%, Zn 0.25%) is confirmed at 52.0～56.2m depth interval. From correlation with surface geology, it is inferred that joining of BF-1 and 2 formed this zone.

The grade of BF-2 is Au 0.4g/t, Cu 1.00%, and Zn 3.67% at MJSU-2, and Au 0.2g/t, Cu 1.09%, and Zn 16.47% at MJSU-14.

A mineralized zone also occurs in horizon higher than basaltic tuff (henceforth BU). BU is only found at MJSU-6 and shale and fine tuff occurs between the lower basaltic tuff. BU consists of pebbly ore and siliceous ore with intercalation of shale and fine tuff at MJSU-6. The average grade of BU at MJSU-6 is Au less than 0.1g/t, Cu 0.69%, and Zn 3.99%, and is believed to be about 2.5m thick.

The higher-grade part of BF-1 occur dipping eastward from UAD-14 to MJSU-2 (extension along the dip projected on map exceeds 60m). The extension of BF-1 in the N-S direction is inferred to be, at the most, about 100m. The higher-grade part of BF-2 occurs from UAD-1 to MJSU14 (extension along dip projected on map exceeds 120m, average dip about 75°). The N-S extension is believed to be at most 100m because it is not found in MJSU-6 and 16. BU is confirmed at MJSU-6, but not in MJSU-14 to the south and its size is probably similar to that of BF-1 and 2.

Strong alteration zones are found only in the vicinity of massive ores of this area (MJSU-2 and 14). These zones are characterized by large amount of chlorite.

1-3-5 Summary

The geology of this area is composed mainly of rhyodacitic pyroclastic rocks of the Late Proterozoic Arj Group with intercalation of basaltic tuff.

The mineralization of this area is volcanogenic massive sulfide Cu-Zn mineralization and consists of massive ore, pebbly ore, siliceous ore, and banded ore. These ores were confirmed at three (MJSU-2, 6, and 14) of the six holes drilled in this area.

Massive and banded ores are found in a horizon lower than basaltic tuff.

The mineralized zones that occur in horizons below basaltic tuff can be largely divided into two parts. The upper part occurs immediately below the basaltic tuff and mineralization worth consideration is found only at MJSU-2 where it is estimated to be about 3.7m thick with the grade of Au 0.4g/t, Cu 0.96%, and Zn

2.17%. The lower part has better grade at MJSU-2 and 14 and the thickness is inferred to be 1.8 - 9.3m and the grade is Au 0.2 - 0.4g/t, Cu around 1%, and Zn 3.67 - 16.47%. It is inferred that these two parts are joined at UAD-14 drilled in the past.

There is a mineralized zone consisting of pebbly ore and siliceous ore in a horizon above the basaltic tuff, and it is confirmed only at MJSU-6. There it is 2.5m thick and the grade is Au less than 0.1g/t, Cu 0.69%, and Zn 3.99%.

1-4 Results of Drilling in Geophysical Anomaly Zones

Four holes, MJSU-10, MJSU-11, MJSU12, and MJSU-13 were drilled in the "new locality". Namely zones with high chargeability anomalies and a number of conductive plates in localities other than the known prospects.

1-4-1 Objective of the survey

(1) MJSU-10

TEM survey was carried out during the second year survey on chargeability anomaly zone confirmed by the first year survey in the vicinity of this hole. The existence of three conductive plates (named TJ-18C, TJ-18A, and TJ-18B from the southeastern side) was inferred from the results of the TEM survey.

The objective of this drill hole was to clarify the geology and the details of the copper, zinc, and gold mineralization of TJ-18A plate. The drilling was planned for 300° azimuth, -55° inclination, and total length of 250m (Fig. 2-1-14).

Subsequently, it was considered that extending this hole by 100m would also penetrate TJ-18B plate in the northwestern side. And thus the objective of this hole was revised to clarify the above two plates by drilling 350m.

Remains of small ancient excavation are found on the surface near TJ-18A and hematitized rhyodacite is observed. The geology of the UAD-10 hole 300m east of these remains is rhyodacitic pyroclastic rocks. Therefore occurrence of rhyodacite and rhyodacitic pyroclastics was expected in the vicinity of MJSU-10.

And thus it was considered highly possible that conductive plate TJ-18A reflects volcanogenic massive sulfide type Cu-Zn mineralization.

(2) MJSU-11

Chargeability anomaly zone exceeding 24mV/V was confirmed by regional IP survey during the first year at a locality between the Umm ad Damar North and Umm ad Damar South Prospects. Detailed IP and TEM surveys were conducted on this chargeability anomaly during the second year of this project. It was clarified by this survey that chargeability anomaly exceeding 24mV/V at 800m elevation extends in the NE-SW direction over an area of approximately 300×200m, and it was inferred that a conductive plate extends in the NE-SW direction with 90° dip, at 200m depth, and conductance of 2.0 - 2.5S (Fig. 2-1-15).

Most of this anomaly zone is in Quaternary sand and gravel zone and rhyodacitic pyroclastic rocks do not occur in the vicinity. Thus this conductive plate was inferred to indicate the occurrence of vein-type mineralization. Ore showings were not observed within the anomaly zone, but copper oxide was found attached to parts of dacite in the north and tonalite in the south.

MJSU-11 was planned to clarify the geology of the chargeability anomaly and the conductive plate, and the Au, Cu, and Zn mineralization. The planned specification of this hole was 150° azimuth, -55° inclination, and total length of 250m.

(3) MJSU-12

Chargeability anomaly zone exceeding 15mV/V was confirmed by IP survey during the first year. Detailed IP and TEM surveys were carried out on this chargeability anomaly zone in the second year. The results of these surveys showed that the extent of chargeability anomaly exceeding 21mV/V in 800m elevation is elongated in the N-S direction over an area of 250×130m, and that the conductive plate was inferred to extend in the N-S direction with 90° dip at 270m depth with conductance of 1.2 - 1.5S (Fig. 2-1-16).

Most of this anomaly zone is located in Quaternary sand and gravel area, but it was inferred from the geology of the vicinity that andesite and andesitic pyroclastic rocks of the Arj Group occur in the area and that the occurrence of rhyodacitic pyroclastic rocks could be expected. From this the conductive plate was inferred to reflect a vein-type mineralization.

MJSU-12 was planned to clarify the geology of the chargeability anomaly zone and the conductive plate, and the conditions of Au, Cu, and Zn mineralization. The specification of the drill hole was 270° azimuth, -55° inclination, and a total length of 250m.

(4) MJSU-13

Chargeability anomaly zone exceeding 21mV/V was confirmed in the vicinity of this hole by detailed IP survey. This anomaly zone is located at the southwestern margin of the Umm ad Damar South Prospect and extends approximately in the NE-SW direction and its areal extent is 300×200m at 800m elevation. Two conductive plates were confirmed by TEM survey and they extend approximately in the NE-SW direction and are inferred to join at the central part of the anomaly zone. The depth of the plates is 120m with conductance of 1.3 - 2.9S, and 90° dip (Fig. 2-1-16).

The plate on the southeastern side is located at the southwestern extension of the Umm ad Damar South Prospect and is inferred to indicate the existence of vein-type Au, Cu, and Zn mineralization.

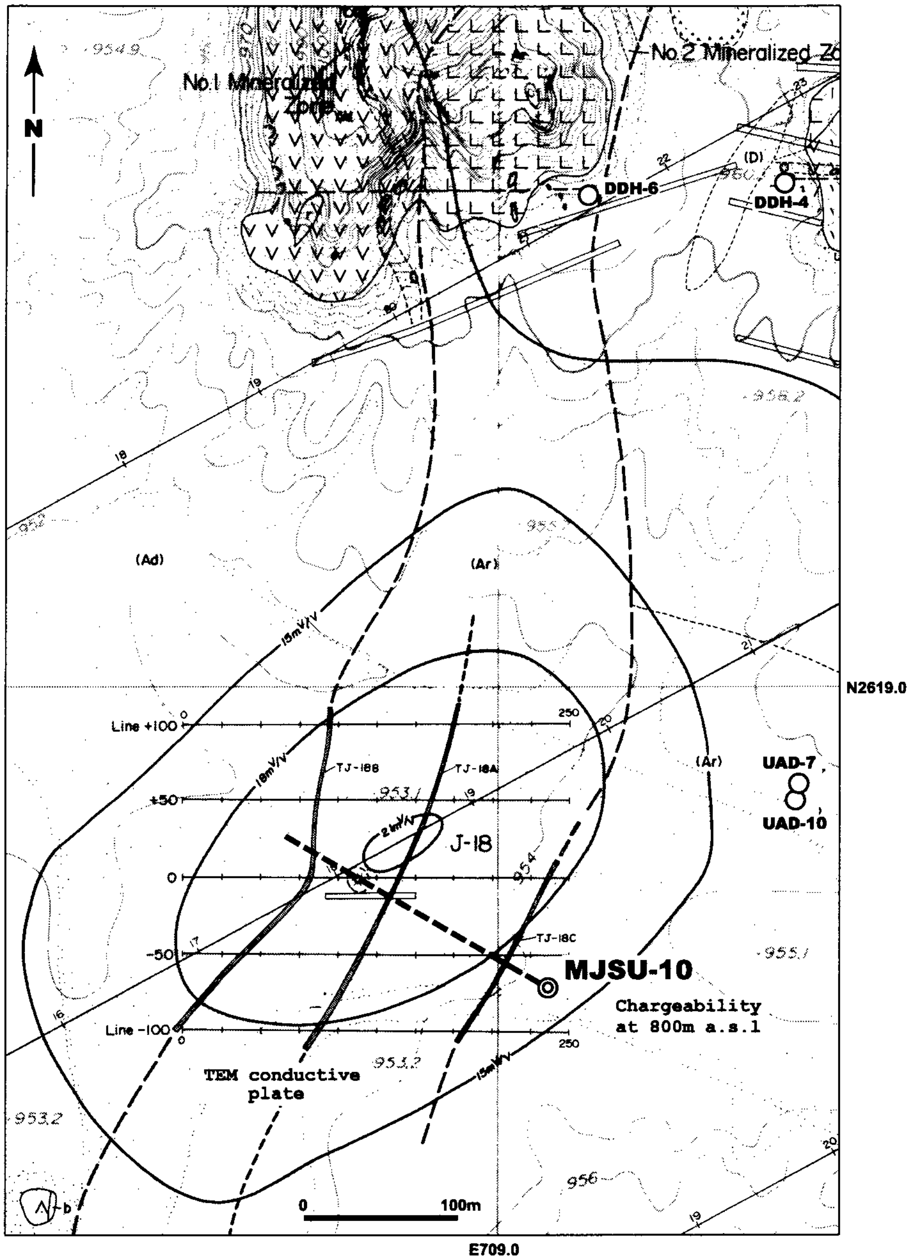
This hole was planned to clarify the geology of the chargeability anomaly and the conductive plates and also the Au, Cu, and Zn mineralization. The specifications are 330° azimuth, -55° inclination, and a total length of 250m (Fig. 2-1-16).

1-4-2 Progress of drilling

Summary of drilling operation, record of drilling operation and chart of drilling progress regarding MJSU-10, MJSU-11, MJSU-12, and MJSU-13 are shown in the Appendix.

(1) MJSU-10

The drilling of MJSU-10 started on September 5 and completed on September 20. From the surface to 13.6m depth, drilling was done by PQ diamond bit, and HQ diamond bit was used from 13.6m to 47.9m depth. NQ diamond bit was used from 47.9m to the bottom at 350m. The work was carried out by wire-line method. HW and NW casings were inserted to 13.6m and 47.9m depth respectively.



V V	Dacite, Dacitic pyroclastic rocks
L L	Rhyodacite, Rhyodacitic pyroclastic rocks
Λ Λ	Dacite, Porphyritic dacite (intrusive)

Fig.2-1-14 Detailed Geological Map around MJSU-10

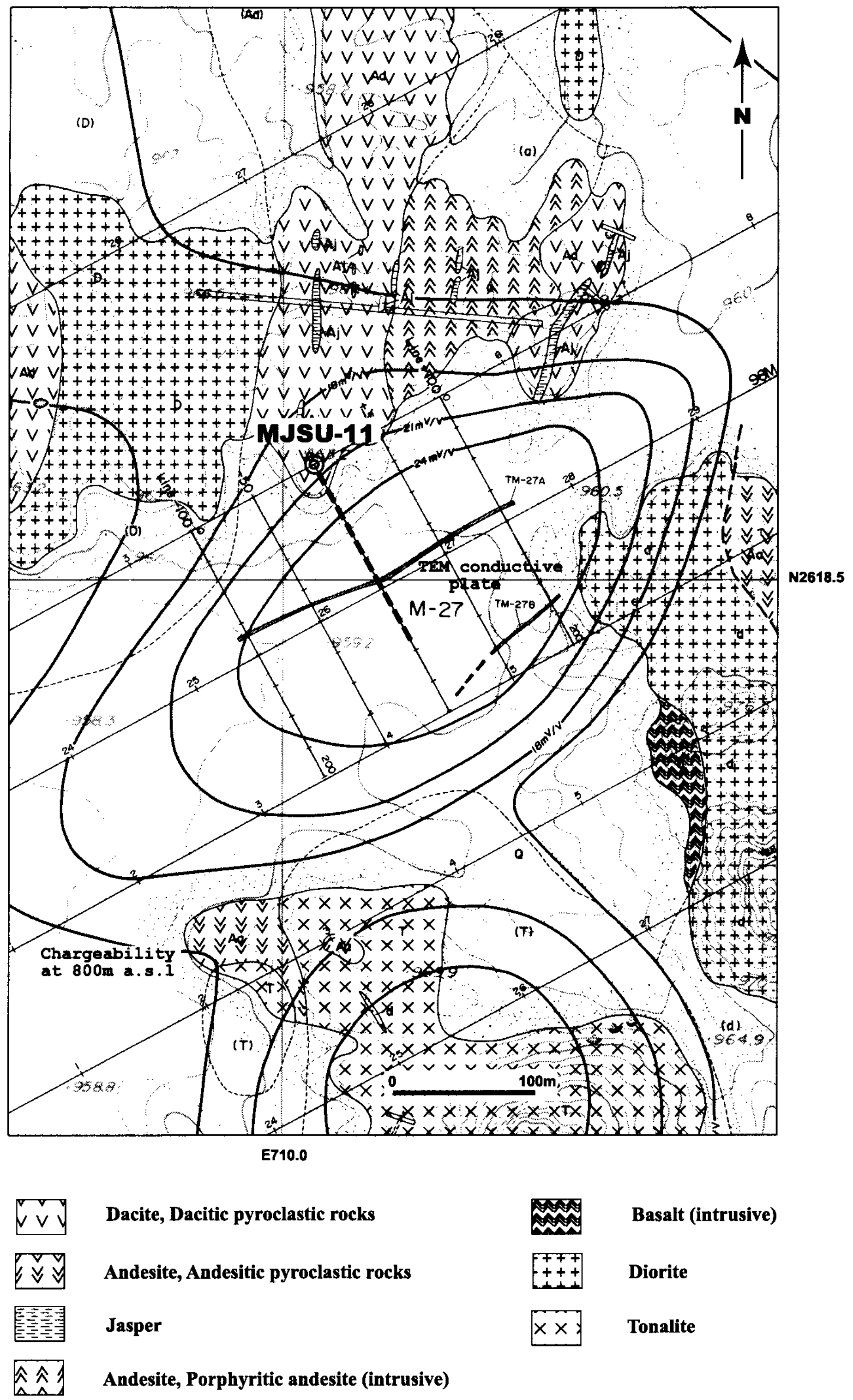
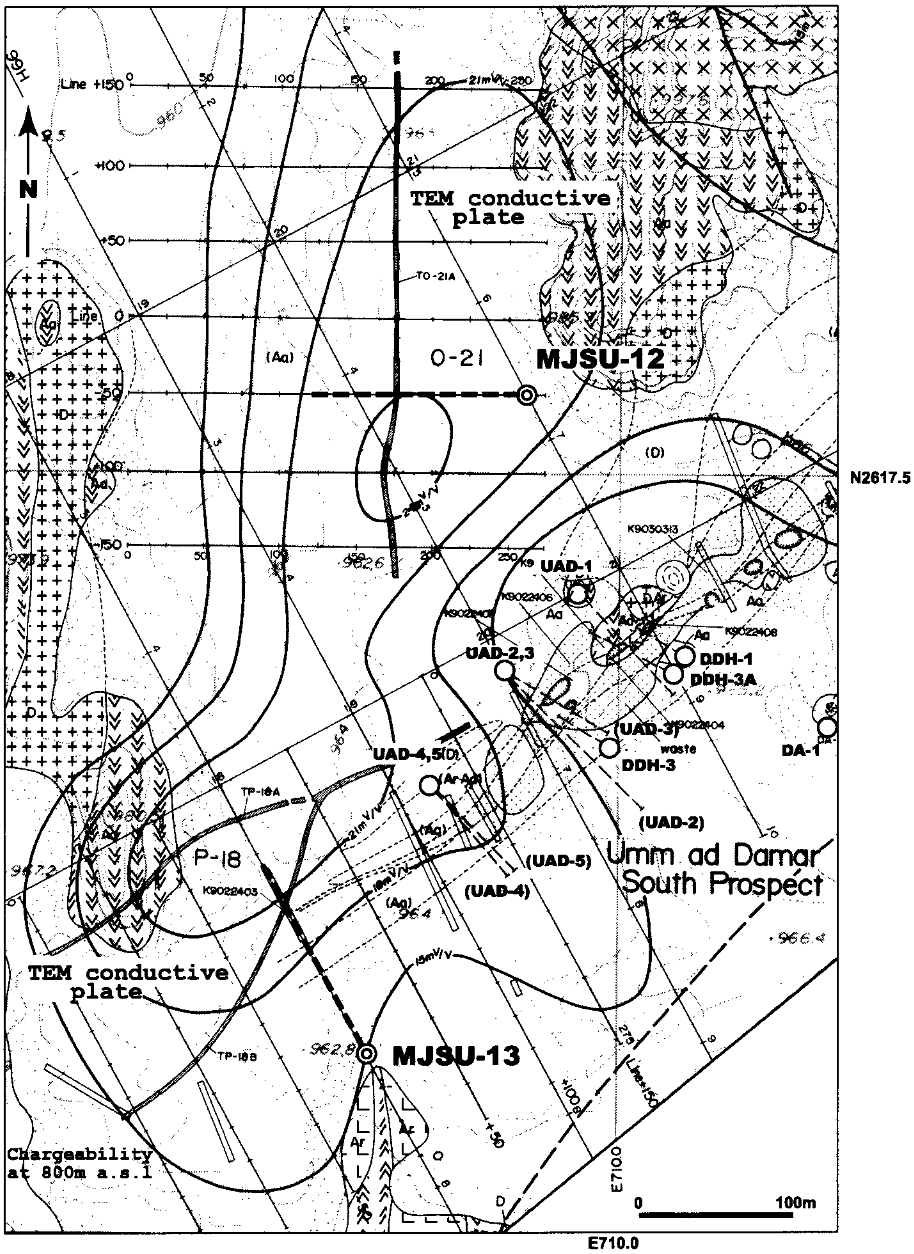


Fig.2-1-15　Detailed Geological Map around MJSU-11



Rhyodacite, Rhyodacitic pyroclastic rocks	Diorite
Andesite, Andesitic pyroclastic rocks	Tonalite
Andesite, Porphyritic andesite (intrusive)	

Fig.2-1-16 Detailed Geological Map around MJSU-12 and MJSU-13

Loss of circulation occurred at 38～45m depth at the lower part of the weathered zone, and Stop Plus and powdered wood were added and stopped the circulation loss. There were no other problems and the operation was carried out satisfactorily. The rate of drilling was 12.5m per shift. Core recovery, with the exception of the surface sand layer, was 100%.

(2) MJSU-11

The drilling of MJSU-11 started on September 21 and completed on October 2. From the surface to 10.1m depth, drilling was done by PQ diamond bit, and HQ diamond bit was used from 10.1m to 35.9m depth. NQ diamond bit was used from 35.9m to the bottom at 250m. The work was carried out by wire-line method. HW and NW casings were inserted to 10.1m and 35.9m depth respectively.

Small loss of circulation occurred to 35.9m depth, but drilling was not affected and the operation was carried out satisfactorily. The rate of drilling was 13.2m per shift. Core recovery, with the exception of the surface sand and gravel layer, was 100%.

(3) MJSU-12

The drilling of MJSU-12 started on October 2 and completed on October 11. From the surface to 4.0m depth, drilling was done by PQ diamond bit, and HQ diamond bit was used from 4.0m to 24.7m depth. NQ diamond bit was used from 24.7m to the bottom at 250m. The work was carried out by wire-line method. HW and NW casings were inserted to 4.0m and 24.7m depth respectively.

Loss of circulation occurred at 78～150m depth and Stop Plus and powdered wood were added and stopped the circulation loss. There were no other problems and the operation was carried out satisfactorily. The rate of drilling was 15.6m per shift. Core recovery, with the exception of the sand and gravel layer (1.2m long), was 100%.

(4) MJSU-13

The drilling of MJSU-13 started on October 9 and completed on October 23. From the surface to 3.0m depth, drilling was done by PQ diamond bit, and HQ diamond bit was used from 3.0m to 29.9m depth. NQ diamond bit was used from 29.9m to the bottom at 250m. The work was carried out by wire-line method. HW and NW casings were inserted to 3.0m and 29.9m depth respectively.

Complete loss of circulation occurred at 3 points to 34m depth and near 110m and 132m depth. Then silicified zones occurred repeatedly between 109 and 225m depth. Thus the rate of drilling was slowed to 9.6m per shift. Core recovery, with the exception of sand and gravel layer (0.9m long), was 100%.

1-4-3 Geology and mineralization・alteration of the drill holes

Drill-core columns, ore assay results, thin section microscopy results, polished section microscopy results, and X-ray diffraction results are shown in the Appendix.

(1) MJSU-10

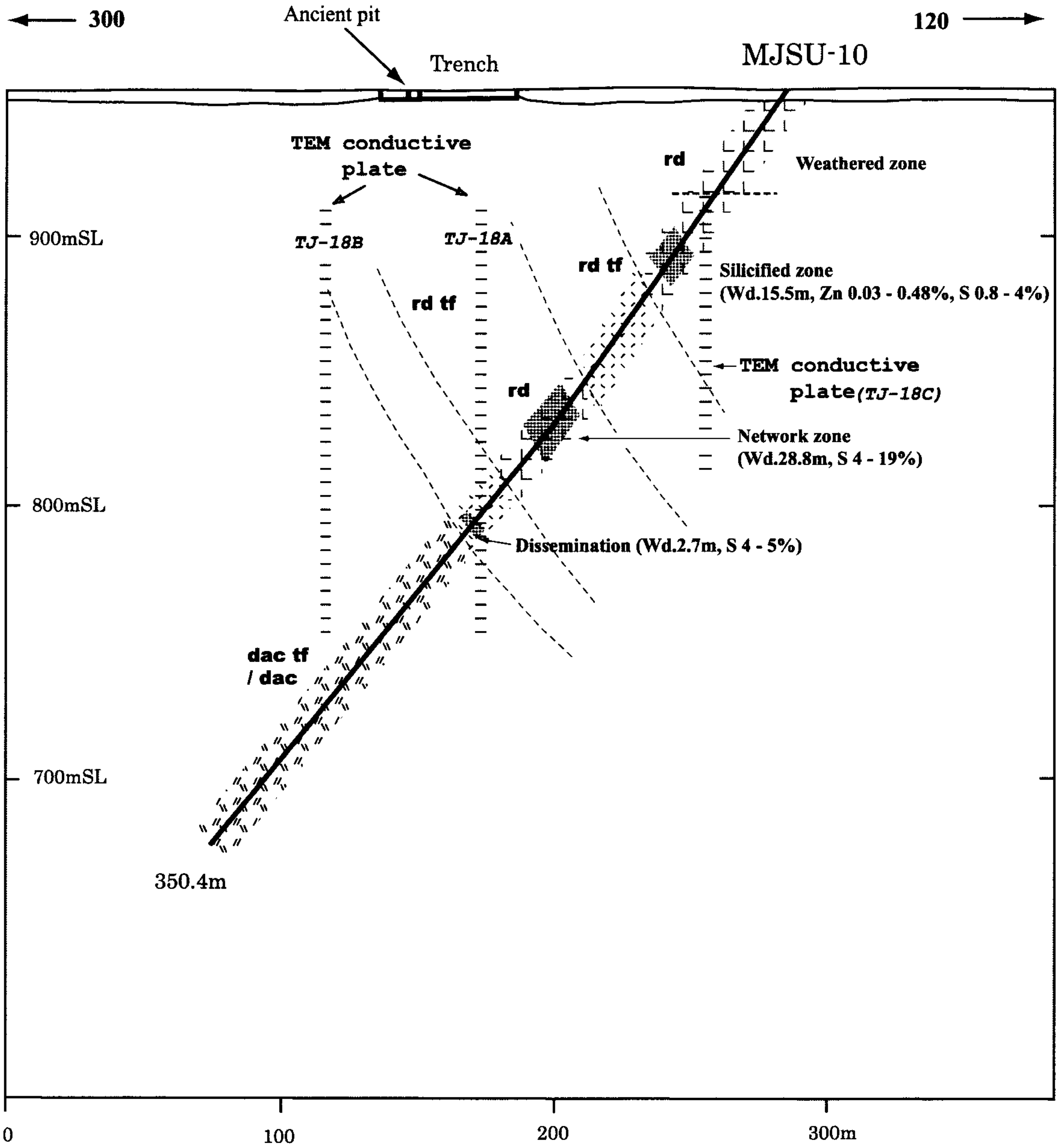
The geological section of this hole is shown in Figure 2-1-17. The geology of the vicinity of this hole is laid out in Figure 2-1-14.

Geology

The major geologic units of this hole are as follows.

Depth	Geology
0～4.9m	Sand and gravel
4.9～45.7m	Weathered rhyodacite
45.7～90.2m	Rhyodacite
90.2～132.6m	Rhyodacitic tuff
132.6～168.7m	Rhyodacite
168.7～205.3m	Rhyodacitic tuff breccia (with intercalation of rhyodacite)
205.3～350.4m	Dacitic tuff or dacite

This geology can be summarized as; rhyodacite or rhyodacitic tuff in the shallow parts (down to 205.3m) and dacite and dacitic tuff in the deeper parts (205.3～350.4m depth).



Abbreviation:

rd : rhyodacite
rd tf : rhyodacitic tuff
dac tf / dac : dacitic tuff or dacite

Fig.2-1-17 Geological Section along MJSU-10

Mineralization and alteration

Mineralization confirmed in this hole is pyrite veinlets and pyrite dissemination.

Pyrite veinlets are observed intermittently at 121.6～165.4m and 214.7～302.4m intervals. The thickness of the veinlets is 0.3 - 5mm containing large amount of pyrite and minor amounts of chalcopyrite and sphalerite. Those in 137.9～162.9m interval occur densely and veinlet network is observed at five points.

Pyrite dissemination is observed in 42.9～216.6m interval with the exception of intrusive bodies. Small-scale dissemination is also observed below 223.4m.

The maximum S content of these pyrite veinlets and disseminated parts is 18.9% at 158.6～159.6m depth interval. But the Au, Cu, and Zn grades are low in all of these high-pyrite zones. Alteration minerals of these high-sulfur zones are large amount of sericite and small amount of chlorite and quartz, while those of other zones are large amount of quartz and smaller amount of sericite and chlorite.

Pyrite dissemination is observed in the silicified zone at 67.5～85.1m depth interval and chalcopyrite and sphalerite are associated (Cu 0.02%, Zn 0.11%). This silicified zone contains large amount of quartz and small amount of sericite and chlorite.

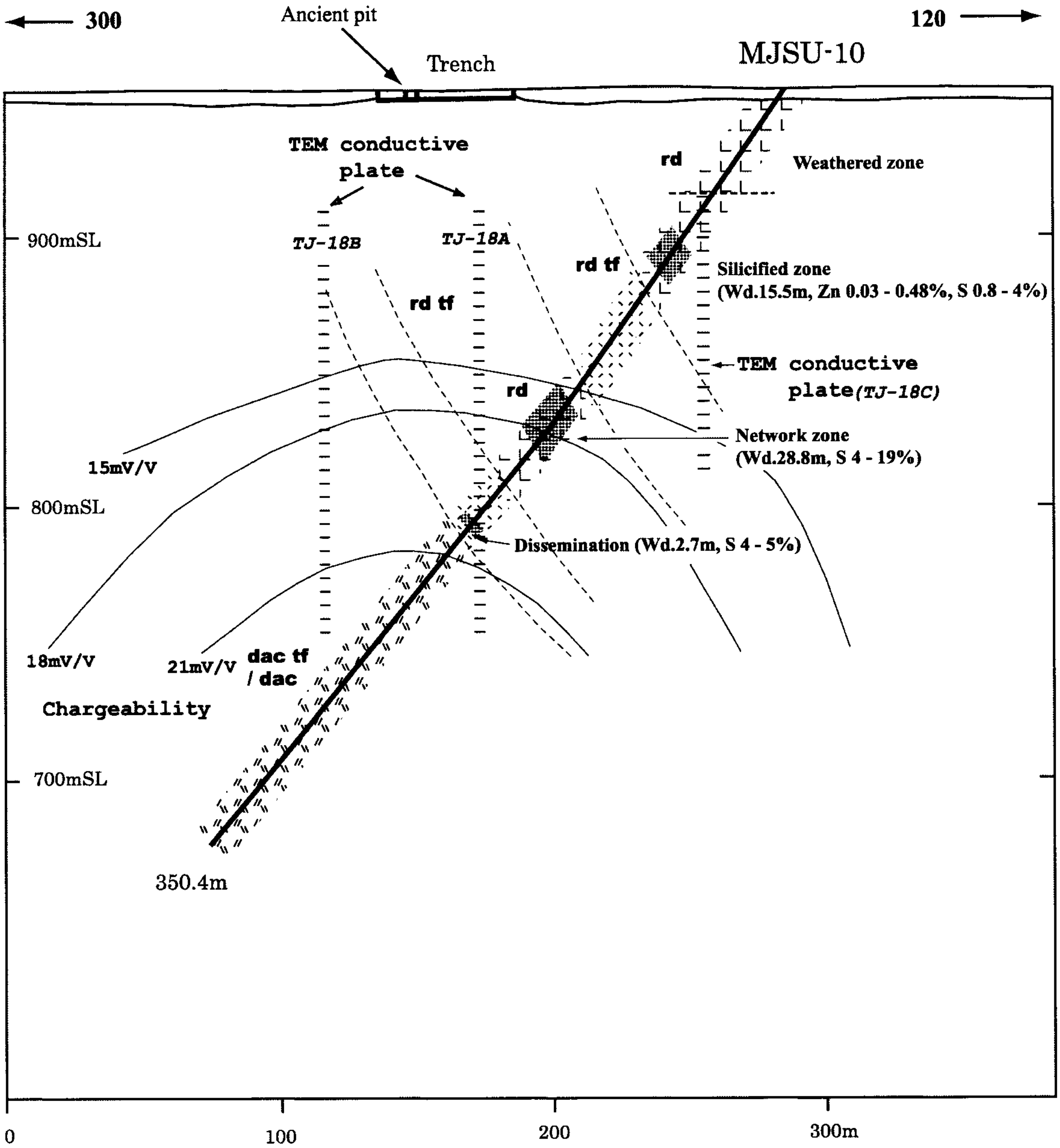
Chargeability anomalies, and geology and mineralization

The chargeability in the vicinity of this hole is around 18mV/V at 800m elevation and is relatively lower than that of the Jabal Sujarah area. Chargeability value exceeding 15mV/V is obtained below 140m depth of this hole (Fig. 2-1-18).

As pyrite dissemination is observed below 42.9m and pyrite veinlets below 121.6m depth, these dissemination and veinlets cause the rise of chargeability.

TEM resistivity structure・conductive plates and mineralization

Resistivity analyzed by TEM has two-layered structure, namely upper low-resistivity layer of less than



Abbreviation:

rd : rhyodacite
rd tf : rhyodacitic tuff
dac tf / dac : dacitic tuff or dacite

Fig.2-1-18 Chargeability Section along MJSU-10

100ohm-m and lower high-resistivity layer with more than 1,000ohm-m. The boundary between the two layers is constant at several tens of meters below the surface (910～950m elevation). The difference of the two layers is inferred to reflect the weathered and unweathered zones.

In MJSU-10, weathered zone extends to 45.7m depth (917m elevation), and coincides with the boundary of the two resistivity layers.

Occurrence of three plates is inferred from plate analysis, and they all extend in the NE-SW direction and are almost parallel. The dip is 90° . The depth of the plates are; the southeastern plate (TJ-18C) is approximately constant at 140m, while the central plate (TJ-18A) varies from 200m to 270m, and the northwestern plate (TJ-18B) also varies from 150～200m. The conductance ranges from 2.0 to 2.9S.

The location and depth of the plate are plotted on geological section (Fig. 2-1-17). MJSU-10 hole passes through the lower margin of the weathered zone near TJ-18C on the southeastern side. Pyrite dissemination is observed in rhyodacite below the weathered zone, but the dissemination is not particularly dense compared to the lower parts. Also loss of circulation occurred at 38～45m depth interval which correspond to the lowermost weathered zone. Three-dimensional extent of the zone of circulation loss is not clear, but a fault extending approximately in the N-S direction is inferred to occur through the conductive plate.

The plate in the center, TJ-18A, is penetrated by MJSU-10 near 200m depth. Mineralization observed near 200m depth is banded pyrite dissemination (S 4.8%) at 200.0～202.7m depth interval and pyrite-quartz network veinlets and pyrite dissemination (S 9.7%) at 137.9~ 165.4m depth interval. If the banded pyrite dissemination at 200.0～202.7m depth has 90° dip, its true width would be less than 1.5m. As the conductance of this plate is inferred to be 2.6S, it would be difficult to explain this plate by this pyrite dissemination alone. Most probably the mineralized zone at 137.9～165.4m depth interval is also contributing to the extraction of this plate.

Of the three plates, downward projection of the northwestern plate (TJ-18B) would intersect MJSU-10 at 290m depth. The only mineralization within plus or minus 50m of this depth is a pyrite dissemination zone (inferred S grade 1%) at 286.9～288.0m depth. Aside from the above, there is a fractured zone at 283～284m depth which would be expressed as conductive plate. Although definitive statement cannot be made because MJSU-10 has not directly penetrated the plate, the width of the above pyrite dissemination is thin and is insufficient to cause the 2.0 - 2.9S conductance.

(2) MJSU-11

The geological section of this hole is shown in Figure 2-1-19. The geology of the area near this hole is laid out in Figure 2-1-15.

Geology

The major geologic units of MJSU-11 are as follows.

Depth	Geology
0～2.5m	Sand and gravel
2.5～29.8m	Weathered dacite
29.8～250.1m	Dacite

Mineralization and alteration

Mineralization confirmed in this hole is quartz-pyrite veinlets and pyrite dissemination.

The quartz-pyrite veinlets are less than 2cm wide. The ore minerals are mainly pyrite with small amount of sphalerite. Chalcopyrite occurs rarely. Parts with dense occurrence of veinlets (veinlet groups) are found at 6 points between 132.4 and 182.4m depth and each group is 0.4 - 7.6m thick in this hole. The very densely concentrated parts occur at 132.4～140.0m (S 9.6%) and 161.7～165.8m (S 9.2%) depth intervals. The grade of these veinlet groups is less than Au 0.1g/t, Cu 0.05%, and Zn 0.01%.

Although weak, pyrite dissemination is observed throughout the length from 29.8m to the bottom of the hole. Pyrite is slightly more densely disseminated in the veinlet groups between 132.4 to 182.4m depth interval.

Alteration minerals within the veinlet groups are large amount of quartz and small amount of sericite and minor amount of chlorite. Those in parts without veinlets are large amount of quartz, small amount of chlorite and minor amount of sericite. Plagioclase is not observed in the veinlet group zone, and the large

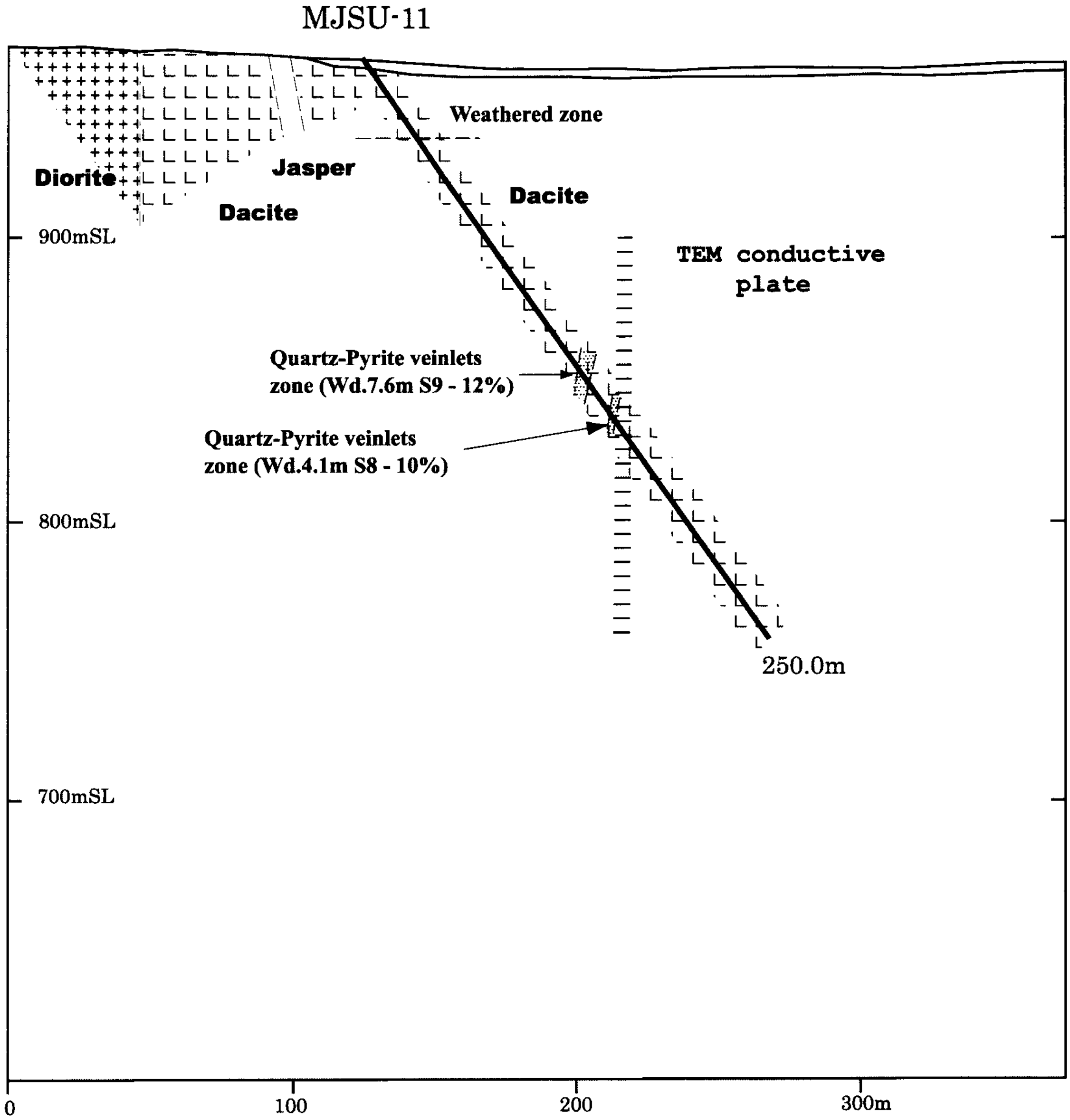


Fig.2-1-19 Geological Section along MJSU-11

amount of sericite and the disappearance of plagioclase characterizes the alteration of the veinlet groups.

Chargeability anomalies and geology・mineralization

Relatively high chargeability exceeding 24mV/V is obtained at 800m elevation in the vicinity of this hole.

Chargeability increases in this hole from near 110m depth (Fig. 2-1-20). The veinlet groups in 132.4～182.4m depth interval is inferred to contribute to the increase of chargeability, but these are not sufficient to cause the wide occurrence in the NW-SE direction of the chargeability exceeding 24mV/Vat 800m elevation. Although weak, the pyrite dissemination, which occurs throughout from 29.8m depth to the bottom of the hole, is possibly the cause.

TEM resistivity structure・conductive plates and mineralization

Conductive plates are generally considered to reflect the existence of faults, groundwater, alteration zones, and mineralized zones. In this hole, however, faults and notable alteration zones are not found in this hole. Regarding groundwater, small loss of circulation occurred at 35.9m depth but loss of circulation did not occur in the deeper parts, thus groundwater is also not the cause of the conductive plate.

This plate is inferred to extend almost vertically intersecting MJSU-11 near 190m depth. Mineralization found near this depth is quartz-pyrite veinlet groups at 132～182m depth interval. If these veinlet groups are distributed vertically as a whole, these are close to the inferred location of the conductive plate, and are interpreted to be expressed as this plate. But conductance of 2.0 - 2.5S cannot be explained by these veinlet groups.

TEM survey showed that the resistivity of this hole has two-layered structure with low-resistivity upper layer of less than 100ohm-m. This low-resistivity layer is located at 920m elevation near the surface of MJSU-11. The weathered zone extends to about 935m elevation and the lower boundary of the low-resistivity layer is deeper than the weathered zone.

(3) MJSU-12

The geological section of MJSU-12 is shown in Figure 2-1-21. The geology of the vicinity of this hole is

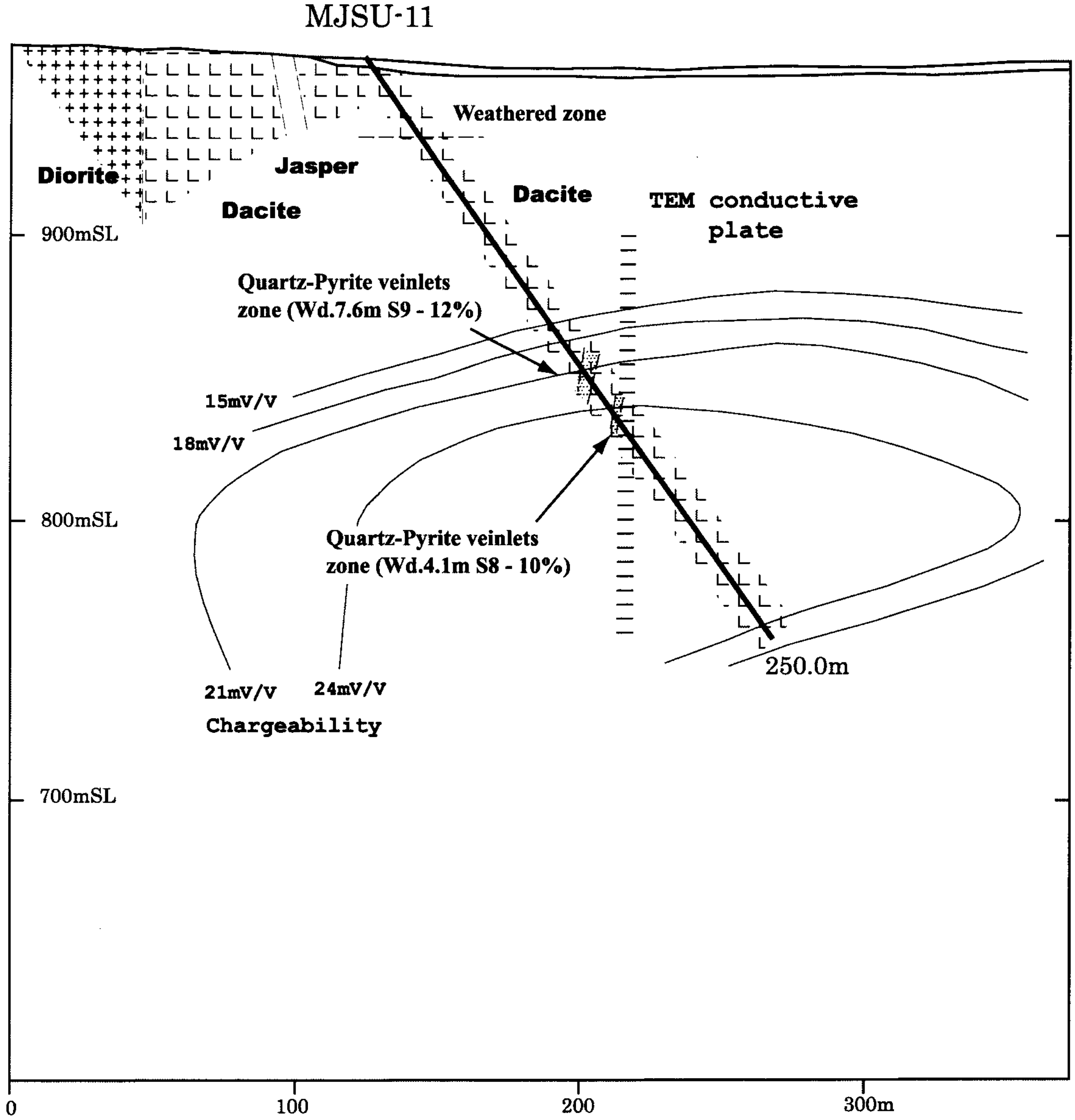
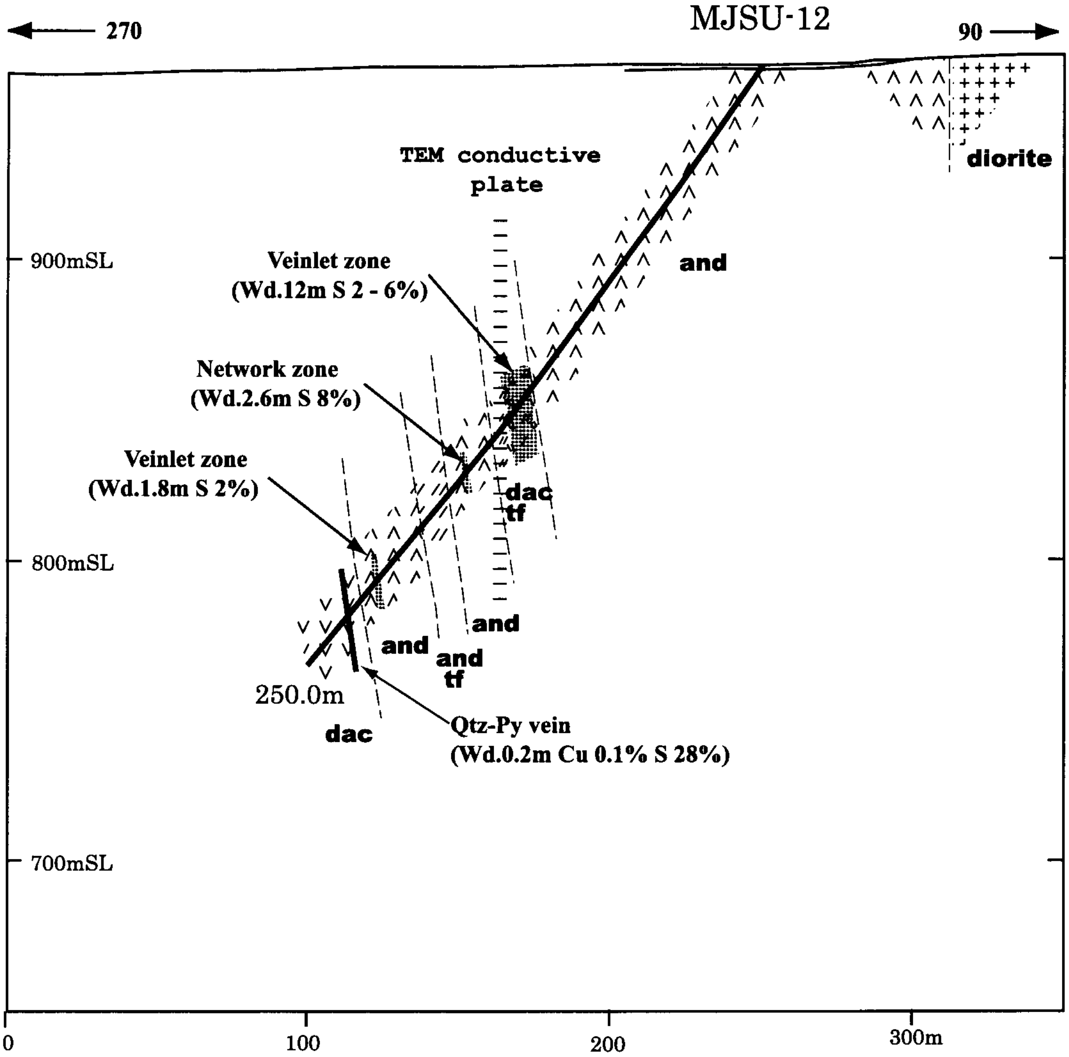


Fig.2-1-20 Chargeability Section along MJSU-11



Abbreviation:

dac : dacite
dac tf : dacitic tuff
and : andesite
and tf : andesitic tuff

Fig.2-1-21 Geological Section along MJSU-12

laid out in Figure 2-1-16.

Geology

The major geologic units of this hole are as follows.

Depth	Geology
0～1.2m	Sand and gravel
1.2～131.1m	Andesite
131.1～149.1m	Dacitic tuff or lava
140.1～143.1m	Dacite～andesitic tuff
143.1～147.6m	Dacite～andesite
147.6～150.8m	Andesitic fine tuff
150.8～175.1m	Andesite
175.1～185.2m	Andesitic tuff
185.2～223.1m	Andesite
223.1～247.3m	Dacite
247.3～250.1m	Porphyritic andesite

Mineralization and alteration

Mineralization observed in this hole is pyrite veinlets, pyrite network veins, quartz-pyrite veins, and pyrite dissemination.

The pyrite network veins occur at 163.3～165.8m depth interval (S 7.7%) and the ore minerals are mainly pyrite associated with minor amount of chalcopyrite and sphalerite. Assay results of this part are less than, 0.1g/t Au, 0.01% Cu, and 0.01% Zn.

Quartz-pyrite veins occur at 227.75～227.95m depth interval and the S content is high as 28.3%, but the Au, Cu, and Zn grades are low.

Pyrite dissemination (S 6.2%) is found at 231.6～232.0m depth interval, but the Au, Cu, and Zn grades are low.

Alteration minerals of the host rock associated with the pyrite veinlet groups (142m depth) and pyrite veins (164.7m depth) is, varying amounts of chlorite and small amount of quartz. These alteration minerals are observed in parts where veinlets are not developed, and thus the mineralization confirmed in this drill hole is not accompanied by characteristic alteration.

Chargeability anomalies and geology・mineralization

The chargeability of near MJSU-12 is somewhat higher than that of the vicinity at 15mV/V at 800m elevation.

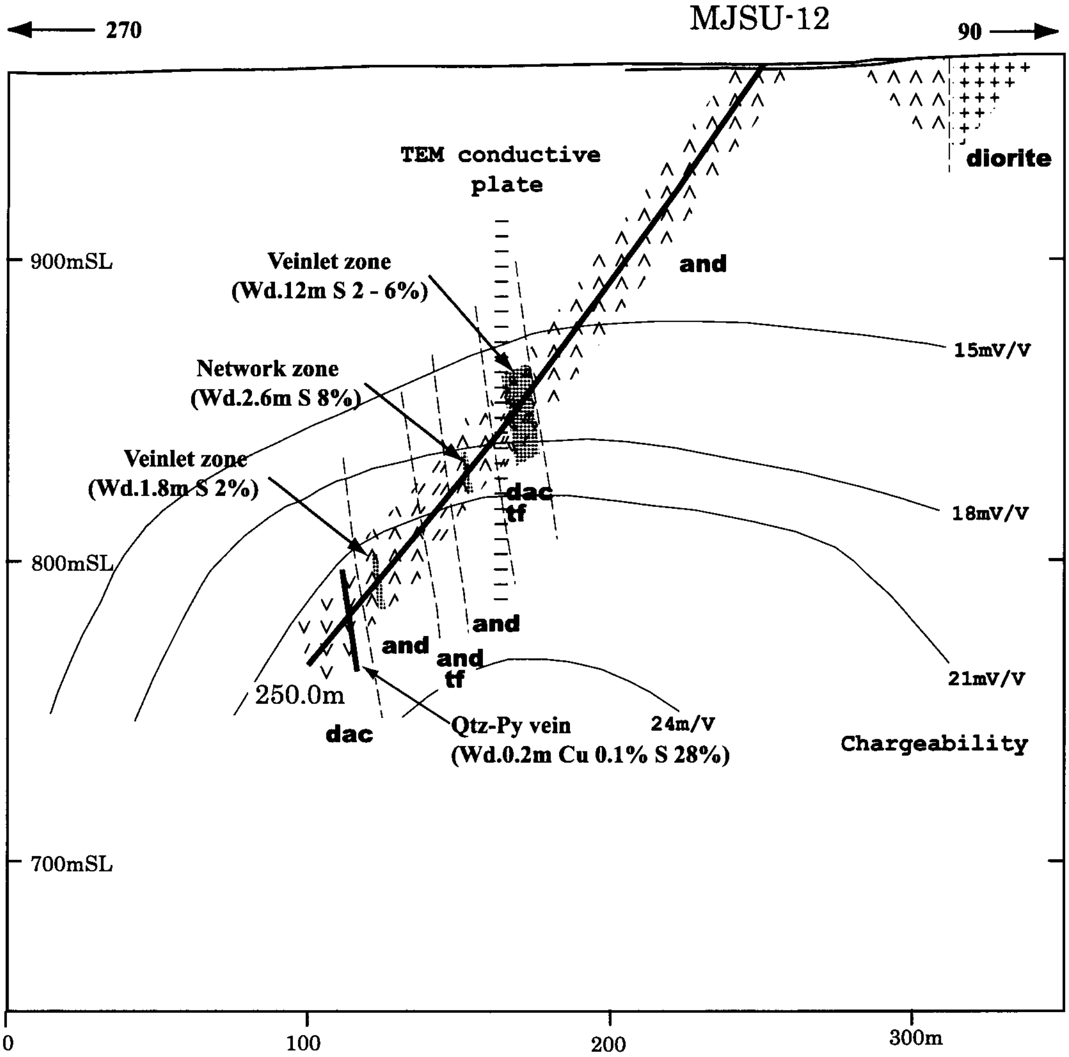
The chargeability increases from near 100m depth (Figure 2-1-22). Mineralization observed below this depth is veinlet groups at 131.1～143.1m and 211.0～212.8m depth intervals, pyrite network vein at 163.3～165.9m interval, and pyrite dissemination at 231.6～232.0m interval. The veinlet groups (131.1～143.1m depth) are believed to be sufficiently thick to cause the increase of chargeability. Aside from the above mineralization, pyrite dissemination occurs intermittently below 64m and these also are believed to have contributed in pushing up the chargeability.

TEM resistivity structure・conductive plates and mineralization

Conductive plates are generally considered to reflect the existence of faults, groundwater, alteration zones, and mineralized zones. However, faults and notable alteration zones were not found in this hole.

This plate is inferred to extend almost vertically intersecting MJSU-12 near 145m depth. Mineralization found near this depth is pyrite veinlet groups at 131.1～143.1m depth interval. If these veinlet groups are distributed vertically as a whole, these are close to the inferred location of the conductive plate, and are interpreted as the cause this plate. But conductance of 1.2 - 1.5S cannot be explained by these veinlet groups.

Regarding groundwater, loss of circulation occurred between 78 and 150m depth. It is possible that this conductive plate reflects this circulation-loss zone.



Abbreviation:

dac : dacite
dac tf : dacitic tuff
and : andesite
and tf : andesitic tuff

Fig.2-1-22 Chargeability Section along MJSU-12

TEM survey showed that the resistivity of this hole has two-layered structure with low-resistivity upper layer of less than 100ohm-m. This low-resistivity layer is located at 945m elevation near the surface of MJSU-12. The weathered zone extends to about 960m elevation and the lower boundary of the low-resistivity layer is deeper than the weathered zone.

(4) MJSU-13

The geological section of this hole is shown in Figure 2-1-23. The geology of the vicinity of this hole is laid out in Figure 2-1-16.

Geology

The major geologic units of MJSU-13 are as follows.

Depth	Geology
0～0.9m	Sand and gravel
0.9～10.8m	Andesite or porphyritic andesite
10.8～59.1m	Rhyodacitic tuff
59.1～88.4m	Rhyodacite (partly tuff)
88.4～98.1m	Chloritized rocks
98.1～129.0m	Andesite (partly silicified)
129.0～149.7m	Rhyodacite or chloritized rocks
149.7～225.1m	Mainly rhyodacite (partly chloritized)
225.1～250.0m	Andesite

Mineralization and alteration

Mineralization observed in MJSU-13 is pyrite veinlets and dissemination.

Pyrite veinlets occur throughout the hole with the exception of the weathered zone from the surface to 43.4m depth and andesite at 225.1～244.6m depth interval. The density of veinlet occurrence is less than

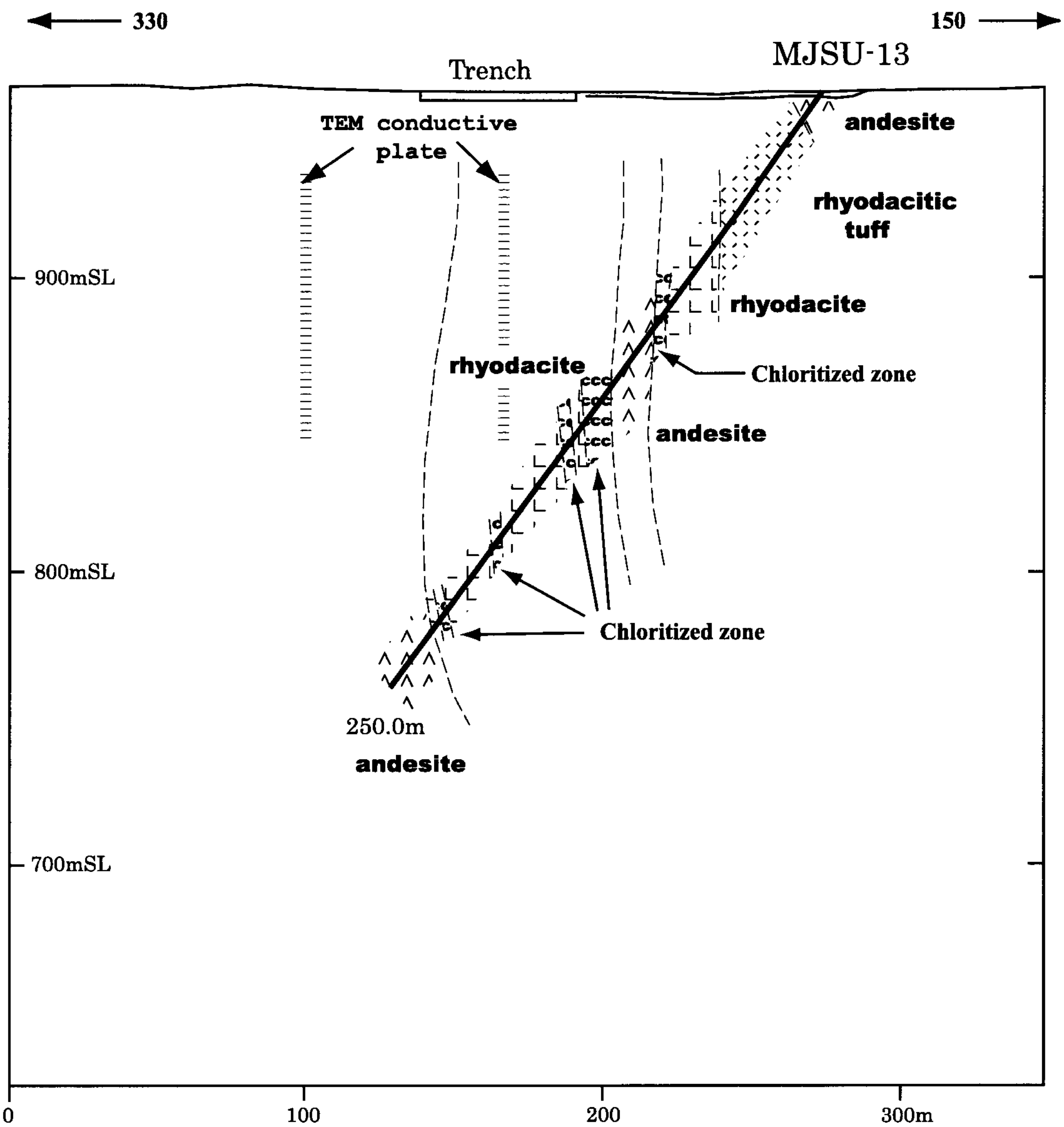


Fig.2-1-23 Geological Section along MJSU-13

5 veinlets per meter and densely packed zones are not observed with the exception of the chloritized rocks mentioned later. The constituent sulfide minerals of the veinlets are mainly pyrite with minor amount of associated chalcopyrite.

Although weak, pyrite dissemination has almost the same distribution as the veinlets.

Chloritized rocks occur at nine points within 89.5～188.4m depth interval. The individual thickness of these rocks are 1.0 - 8.6m. Pyrite veinlets occur more densely (S 3 - 7%) in these chloritized rocks than in the rocks of the vicinity. The Au, Cu, and Zn grades of these chloritized rocks are generally low, but the Cu grade of these rocks in 129.0～143.7m depth interval are slightly higher (about Cu 0.1%) than that in the surrounding rocks (Cu<0.04%).

Alteration minerals in the chloritized rocks are large amount of chlorite and small amount of quartz, and weakly chloritized rhyodacite contain large amount of quartz and small amounts of sericite and chlorite.

Results of the past exploration in the existing documents indicate that the mineralization observed in the Umm ad Damar South Prospect to the northeast of this hole is as follows. The mineralized zones consisting of pyrite-chalcopyrite dissemination to network occur as intermittent lenses in shear zones and they have partly massive form. Also the mineralized zones confirmed at the UAD-4 hole drilled in 1977 at 180m north-northeast of MJSU-13 consist of chalcopyrite-pyrite veinlet groups (6.1m interval, Cu 1.97%) in silicified zone and sphalerite-chalcopyrite-pyrite dissemination (2.95m interval, Au 1.1g/t, Cu 3.72%, Zn 3.07%) in chloritized rocks. These two mineralized zones are continuous.

Pyrite dissemination and veinlets is observed in this hole, but they occur sporadically and chloritized rocks also occur in this hole, but they are of low grade. It was anticipated that the mineralization of Umm ad Damar South would extend to this hole, but the southwestern extent of this mineralized zone is most probably near the UAD-4 located north-northeast of MJSU-13.

Chargeability and geology・mineralization

High chargeability exceeding 21mV/V is obtained near MJSU-13 at elevation of 800m. Chargeability increases downward from near 120m depth (860m elevation) (Fig. 2-1-24).

Pyrite veinlets occur throughout this hole with the exception of the leached-by-weathering zone from the

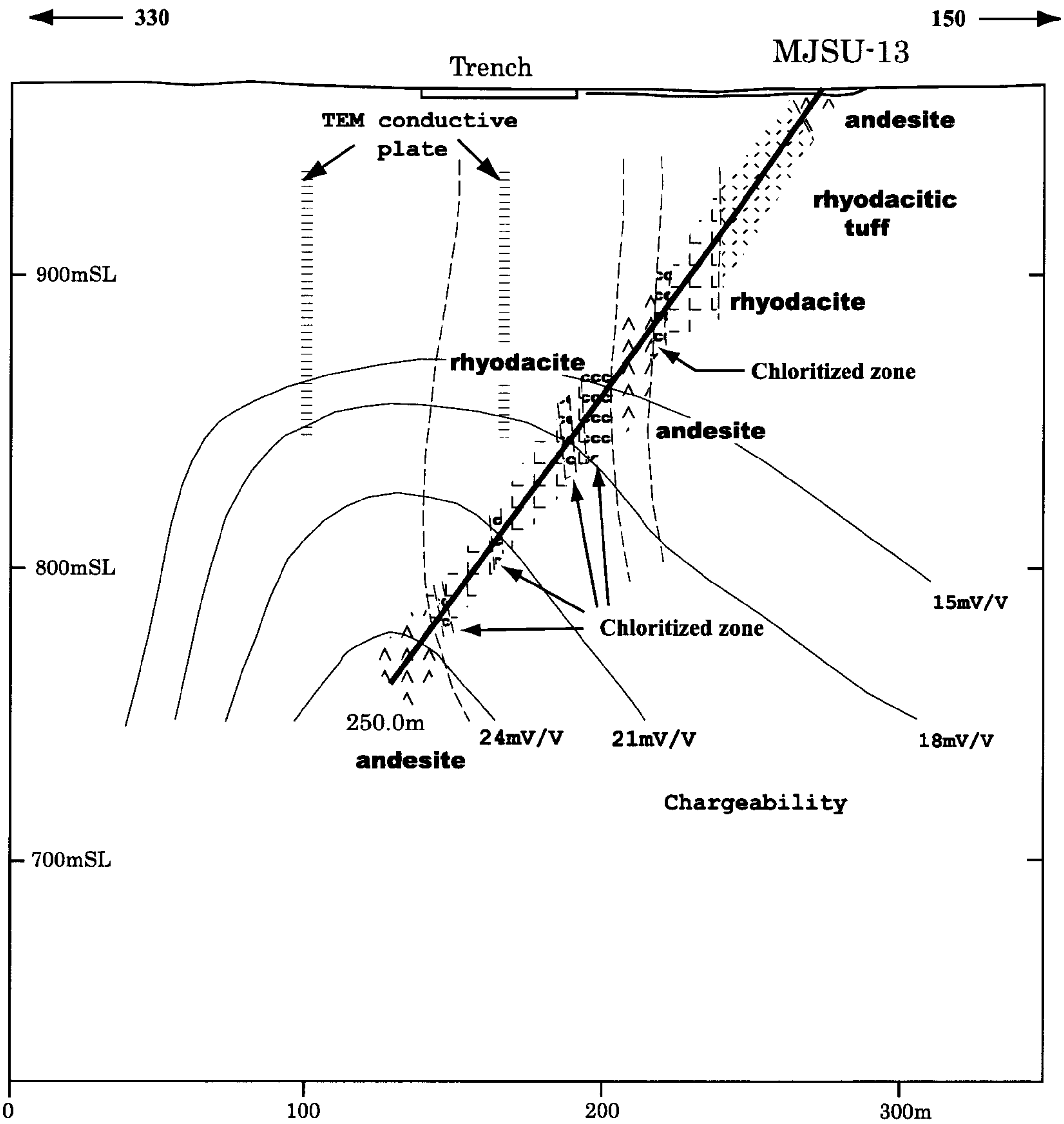


Fig.2-1-24 Chargeability Section along MJSU-13

surface to 43.4m depth and andesite intrusive body at 225.1～244.6m depth interval. Chloritized rocks that have more densely concentrated veinlets compared to the rocks of the vicinity occur intermittently between 89.5 and 188.4m interval. The total interval of the chloritized rocks is only 27.4m and this cannot be the sole cause of the more than 21mV/V chargeability.

TEM resistivity structure・conductive plate and mineralization

Resistivity analyzed by TEM has two-layered structure with low to medium resistivity upper layer of less than 500ohm-m and high resistivity lower layer of more than 1,000ohm-m. The boundary of these two layers varies between 20m and 100m below the surface (860～940m elevation), and tends to become deeper near 20m southeast of this hole. The two layers are believed to represent rocks of the weathered zone and fresh zone.

At MJSU-13, pyrite dissemination and veinlets are observed below 43m depth (926m elevation) and thus weathering is believed to reach this depth. Thus the low to medium resistivity layer near the surface is considered to reflect weathered rocks, but the uneven depth of the boundary appears to indicate the effect of factors other than weathering.

Existence of two plates is inferred from plate analysis. The two plates are inferred to extend in the NE-SW direction on the central and northwestern sides and join at a locality approximately 160m north-northwest of MJSU-13. The depth of both plates is about 120m, the conductance 1.3 - 2.9S, and the dip is 90° .

The location and the depth of the conductive plates are plotted on geological section (Fig. 2-1-19). MJSU-13 passes under the southeastern plate.

Conductive plates are generally considered to reflect faults, groundwater, alteration zones, and mineralized zones. Faults are not found in this hole. Regarding alteration zones, chloritized zones consisting of large amounts of chlorite occur at 89.5～98.1m, 122.1～160.6m, 184.6～188.4m, 215.2～219.0m depth intervals, but the resistivity of these zones are, as will be mentioned later, several thousand ohm-m. Thus these alteration zones cannot be the cause of the conductive plates. The mineralized zones, as mentioned earlier, do not have sulfide concentration that will lower resistivity.

1-4-4 Discussions

Chargeability anomaly exceeding 15mV/V continues from Umm ad Damar (UAD) North Prospect to UAD South Prospect. The anomaly changes its elongation from NW-SE (UAD North Prospect) through N-S to NE-SW (UAD South Prospect) (Fig. 1-5).

Whole UAD North Prospect is included in this chargeability anomaly zone (more than 15mV/V) while a part of the UAD South Prospect is in the anomaly zone.

The elongation of this chargeability anomaly zone, namely NW-SE in the northern part is the direction of the elongation of the vein-type mineralization of the UAD North Prospect, and the direction in the southern part (NE-SW) is close to the elongation of the vein-type mineralization of the UAD South Prospect.

MJSU-3 was drilled during the second year of the project and is located at the southeastern extension of the Mineralized Zone No.3 of the UAD North Prospect. Chargeability anomaly exceeding 24mV/V (elevation 800m) occur in the vicinity. Although of a small scale (thin interval), relatively high Cu-grade (Cu 1.6 - 5.1%) veinlet groups or network veinlets are confirmed in MJSU-3.

Three holes MJSU-11, MJSU-12, and MJSU-13 were drilled where the chargeability is high. The rocks of the above three high chargeability anomalies were expected to be dacites or andesites and together with the above conditions, mineralization of these localities was inferred to be of vein type.

The results of the above drilling confirmed the mineralization to be veinlets, network, and dissemination. These are associated with vein-type mineralization and the results were as expected. But the Au, Cu, and Zn grades were low.

Regarding the relation of the vein-type mineralization and geology, the UAD North Prospect lies on the western side of a diorite body (Fig. 1-5). The chargeability anomaly zone (exceeding 15mV/V) occurs in contact on the western side of the diorite body and extends southward. UAD South Prospect is located on the southern side of the intrusive body consisting of tonalite and diorite. The chargeability anomaly zone (over 15mV/V) near the UAD South Prospect includes these intrusive bodies and occurs extensively. From the above, it is inferred that UAD North and UAD South Prospects and the mineralization observed between these two have been formed by the activities of tonalite and diorite.

Host rocks of the veinlets and network veinlets of the UAD North Prospect contain large amounts of chlorite. The host rocks of the mineralization (dissemination) of the UAD South Prospect also contain large amount of chlorite.

The combination of alteration minerals of veinlet host rocks at MJSU-11 drilled at a locality between UAD North and UAD South Prospects is quartz-sericite-chlorite and is characterized by larger amount of sericite compared to the rocks of the vicinity. The alteration minerals in the host rocks of veinlets and network ores of MJSU-12 are quartz-chlorite, the same as the surrounding rocks, on the other hand MJSU-13 drilled at the southwestern extension of the UAD South mineralized zone confirmed chlorite-rich alteration similar to MJSU-12.

Thus it is established that alteration associated with vein-type Cu and Cu-Zn mineralization of the above two prospects is characterized by chlorite.

There is an isolated chargeability anomaly (over 15mV/V) approximately 500m west of the anomaly continuous from UAD North Prospect to UAD South Prospect. Three plates are inferred to exist in this anomaly and also rhyodacite is inferred to occur. Thus mineralization in the nature of the volcanogenic massive sulfide in the 4/6 Gossan Prospect was anticipated. The rhyodacite body expected in this anomaly extends in the N-S direction from UAD North Prospect to the 4/6 Gossan Prospect. Volcanogenic massive sulfide mineralization is observed in a part of the UAD North Prospect and in 4/6 Gossan Prospect.

MJSU-10 in this anomaly zone confirmed the occurrence of rhyodacite but volcanogenic massive sulfide mineralization could not be found. Mineralization found in this hole is pyrite veinlets and dissemination, namely vein-type mineralization.

Alteration minerals observed in this hole are large amount of sericite and small amount of chlorite and quartz. This mineral combination is similar to those of MJSU-11, and alteration associated with vein-type Cu and Cu-Zn mineralization at the UAD South Prospect was not observed in this hole.

Next, the relation between chargeability and mineralization and alteration will be considered. MJSU-10, 11, 12, and 13 were all drilled in the chargeability anomaly zones. With the exception of MJSU-13, pyrite dissemination and veinlets occurred in large amount in all the three holes. Thus the anomaly is believed to be closely associated the dissemination and veinlets. Evidences for the increase of chargeability cannot be found in MJSU-13. Chargeability anomalies and conductive plates will be reported later on the basis of resistivity and chargeability measurements of the cores.

1-4-5 Summary

Four holes were drilled to the conductive plates in the chargeability anomalies located in areas other than the known prospects. The objective was to clarify the geologic conditions and the Au, Cu, Zn mineralization of these areas.

The geologic units of the four holes are mainly rhyodacites, dacites, and andesites.

Veinlet groups and network veinlets and dissemination consisting mainly of pyrite were found to occur near the conductive plates, but the Au, Cu, and Zn grades were low.

1-5 Analysis of Geophysical Prospecting Results

1-5-1 Objective of analysis

Drilling was carried out this year with the main target on the conductive plates of the high-chargeability areas. These are at Jabal Sujarah area and localities between Umm ad Damar North and Umm ad Damar South Prospects. Satisfactory results were obtained with some drill holes by confirming existence of volcanogenic massive sulfide mineralized zones, but there are many drill holes which did not encounter sulfide mineralization.

Physical properties (resistivity, chargeability) of the drill cores were measured in order to clarify the significance of chargeability anomalies and conductive plates. The characteristics of the measured values and the examination of IP survey and TEM survey results will be reported below.

1-5-2 Results of laboratory tests

(1) Methods of measurements

A total of 50 core samples were collected from the six holes (MJSU-9, 10, 11, 12, 13, and 14) drilled during the third year of this project. These samples were prepared by halving or quartering the cores and cut to

3cm - 5cm length. IPR-12 receiver used during the first and second year was again used for measurement.

(2) Results of measurements

The results of the measurements are listed in Table 2-1-3. The following nature of the resistivity and chargeability of the rocks of the area was clarified from the measurements.

The resistivity of the rocks of this area is generally high at several thousand ohm-m with the exception of the surface and mineralized zones. The rocks of the leached-by-weathering zone have relatively low resistivity at several hundred ohm-m. The massive ore penetrated at MJSU-9 has very low resistivity of 18ohm-m, but that of the rocks with pyrite dissemination and pyrite veinlets is still high at several thousand ohm-m.

The host rocks of the area (andesite, dacite) have low chargeability of 2 - 5mV/V. That of pyrite dissemination and pyrite veinlets is considered to increase in proportion to the sulfide content from 5 to several hundred mV/V. The massive sulfide ore at MJSU-9 has a very high chargeability of 625mV/V.

1-5-3 Results of IP survey and drilling

Chargeability values obtained by the above measurements are plotted on the chargeability profile prepared from the results of IP survey for drill holes MJSU-9, 10, 11, 12, and 13 (Figs. 2-1-25～29). These holes were drilled in the areas where detailed IP survey was carried out during the second year.

(1) MJSU-9

Strong chargeability anomaly exceeding 50mV/V has been analyzed near this hole from the results of IP survey analysis. The 41.5～120m depth interval of this hole consists of pyrite dissemination with S grade of less than 6.3%, and below 120m strong pyrite dissemination is observed with the exception of intrusive bodies. Chargeability distribution by IP rises below 120m in correlation with the results of drilling. Thus the chargeability anomaly near this hole is believed to reflect pyrite dissemination. The physical measurements of the drill cores also show high chargeability such as 23.2mV/V at 100.2m depth, 15.9mV/V at 145.1m depth, and 180mV/V at 265.1m depth (Fig. 2-1-25).

The effective depth of the present IP survey is about 250m and thus the mineralized zone (chargeability

625mV/V) of this hole at 341.3～357.7m cannot be detected.

(2) MJSU-10

Relatively high chargeability anomaly of more than 15mV/V has been analyzed below 140m depth of this hole from the results of IP survey. Pyrite dissemination is found below 42.9m depth and pyrite veinlets below 120m depth. Also high chargeability of 170mV/V is obtained at 145.8m depth and 14.0mV/V at 189.2m depth by physical measurements (Fig. 2-1-26). These are believed to be caused by pyrite dissemination and pyrite veinlets. Significant alteration and mineralization are not observed in the deeper parts of this hole. And in spite of the relatively low chargeability of 5.71mV/V measured at 265.9m depth of the core and 5.08mV/V at 306.4m depth in the laboratory, the results of the IP survey show higher chargeability with depth. This is caused by the fact that data obtained by IP have only 4 levels (electrode separation index n = 1 - 4) in the depth direction and thus the lower limit of the chargeability anomaly could not be drawn.

(3) MJSU-11

High chargeability of more than 24mV/V near 800m elevation has been analyzed at this hole by IP survey results. Quartz-pyrite veinlet group occurs at 132.4～182.4m depth interval and pyrite dissemination is found from 29.8m depth throughout to the bottom although weak. Also from physical measurements, relatively high chargeability of 12.9mV/V is obtained at 200.3m depth and 11.6mV/V at 241.3m depth (Fig. 2-1-27). By IP survey it is seen that chargeability increases from near 110m depth, and the anomaly of this hole is believed to be caused by quartz-pyrite veinlets.

(4) MJSU-12

Relatively high chargeability anomaly exceeding 15mV/V at 800m elevation is obtained near this hole by analysis of IP results. In this hole, quartz-pyrite veinlet group occurs at 131.3～143.1m depth and 211.0～212.8m depth, pyrite network veinlets occur at 163.3～165.9m depth, and pyrite dissemination at 231.6～232.0m depth. Also physical measurements show relatively high chargeability of 11.4mV/V at 90.3m depth, 71.6mV/V at 132.4m depth, and 25.5mV/V at 142.0m depth (Fig. 2-1-28). Since chargeability increases from near 100m, the chargeability anomaly of this hole reflects the above quartz-pyrite veinlet group, pyrite network veinlets, and pyrite dissemination.

(5) MJSU-13

Analysis of IP survey results show relatively high chargeability anomaly exceeding 21mV/V at 800m elevation near this hole. Pyrite veinlets are found throughout this hole with the exception of leached-by-weathering zone from the surface to 43.4m depth and andesite intrusion at 225.1～244.6m depth. Although weak, pyrite dissemination is found in almost the same zone as the veinlets. Also chloritized rocks occur from 89.5m to 188.4m depth and here the pyrite veinlets are more concentrated than in the vicinity. The chargeability measured is relatively high with 13.2mV/V and 17.5mV/V in chloritized rocks at 91.8m and 100.5m depth respectively, and slightly higher values of 6.36mV/V, 7.35mV/V, and 8.05mV/V occur at depth of 125.2m, 150.2m, and 174.3m respectively (Fig. 2-1-29). Chargeability values by IP survey increases from near 120m depth and thus it is highly likely that the chargeability anomaly of this hole reflects the chloritized rocks with concentrated occurrence of pyrite veinlets.

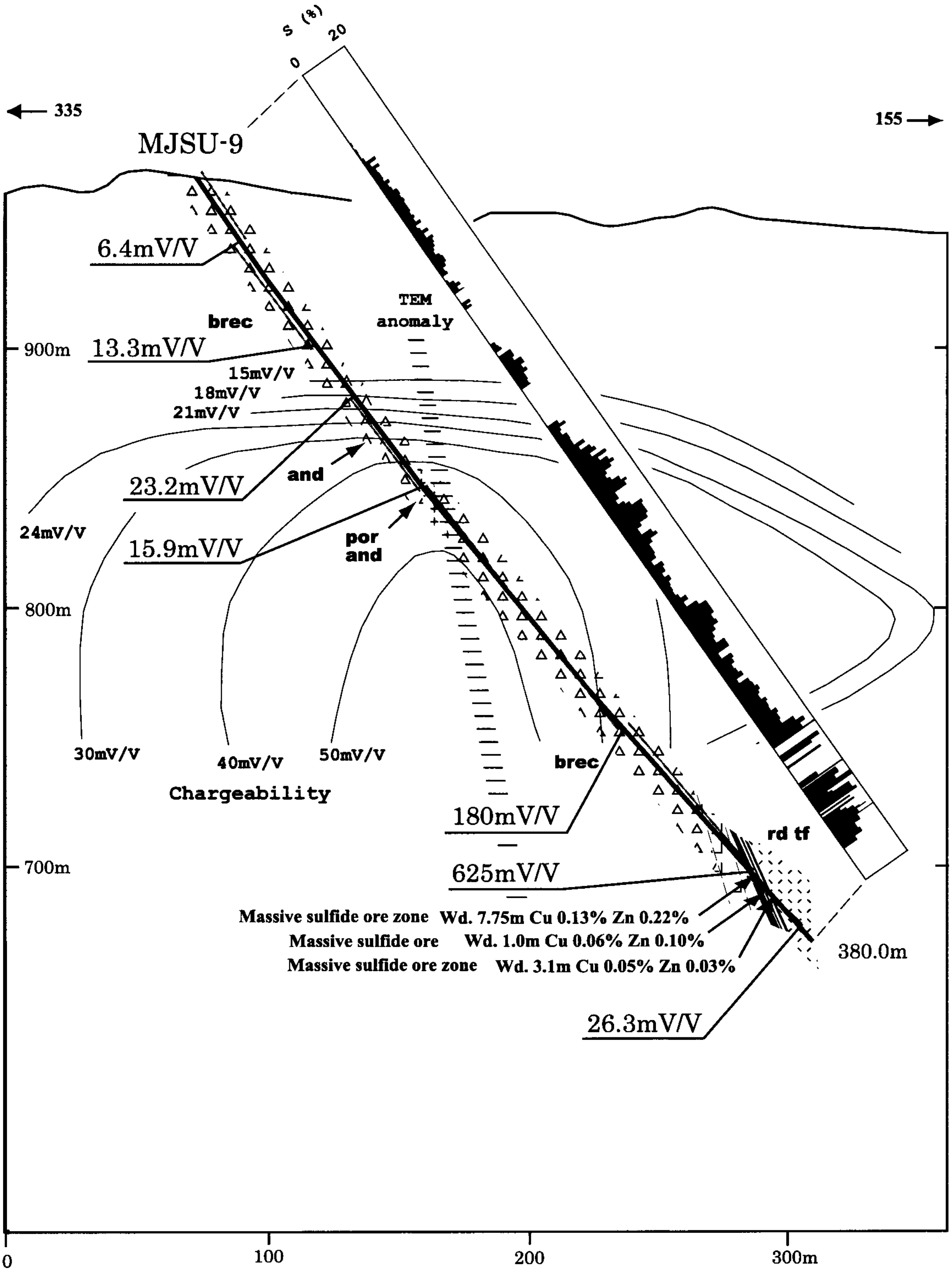
As in the case of MJSU-10, IP survey could not detect the lower limit of the chargeability anomaly.

(6) Discussions

The results of chargeability distribution obtained by IP survey, geology and mineralized zones clarified by drilling, and the chargeability measured from the cores was examined. It was shown that the chargeability obtained by IP survey and that of the drill cores generally agreed. Also the positive correlation between IP chargeability and pyrite distribution was observed, namely high chargeability was correlated to pyrite dissemination and veinlets. In other words, the chargeability anomalies, the target of the drilling, were reflection of the pyrite veinlets, network, and dissemination. The chargeability expressed the concentration of these mineralized rocks.

Table 2-1-3 Results of Laboratory Test

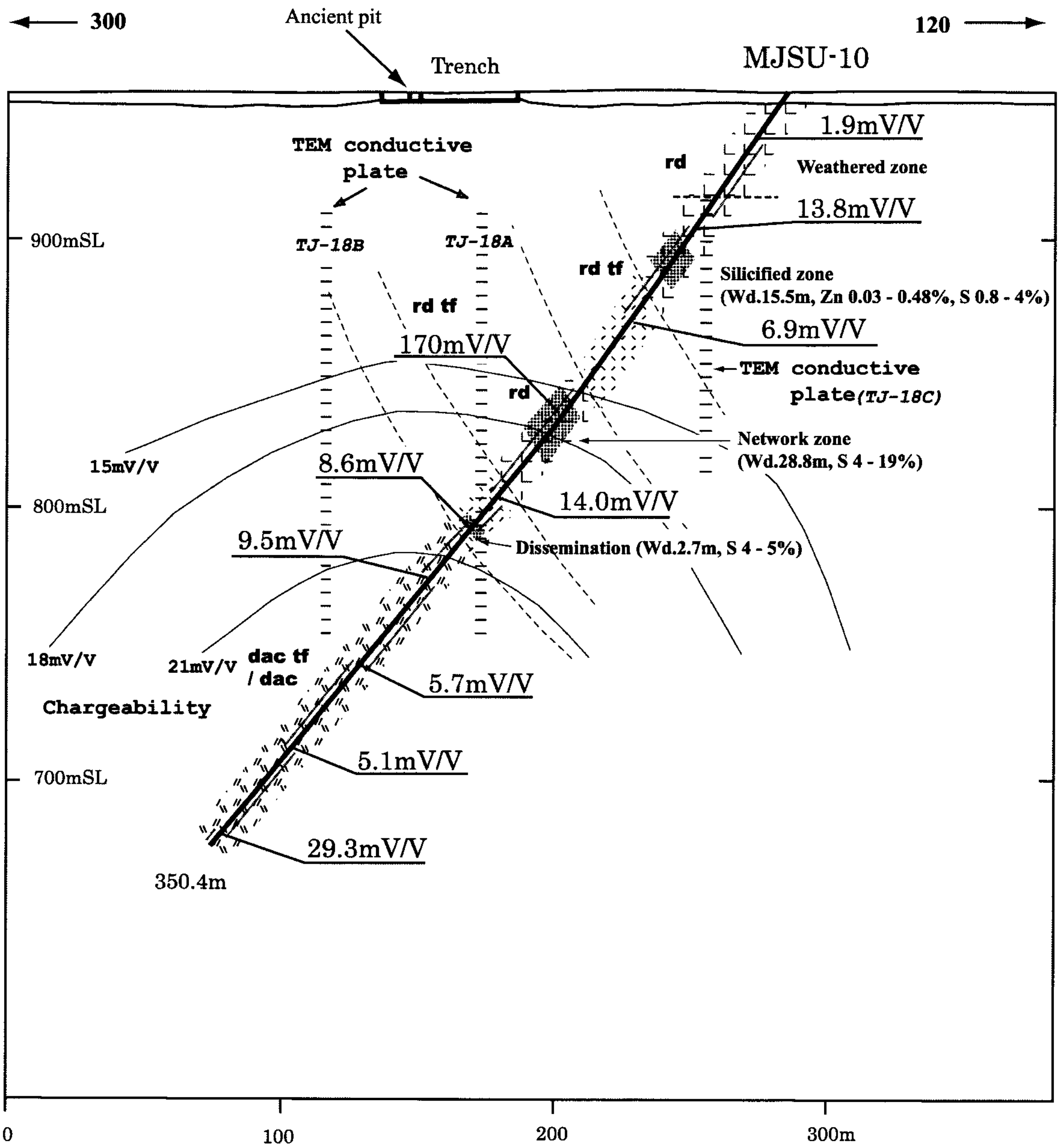
No.	Drill Hole	Depth (m)	Description	Resistivity (ohm-m)	Chargerbility (mV/V)
F-01	MJSU-9	28.3	Breccia filled with limonite	252	6.40
F-02	MJSU-9	68.0	Breccia with Qtz-Py	3,180	13.30
F-03	MJSU-9	100.2	Breccia with Qtz-Py	3,060	23.20
F-04	MJSU-9	145.1	Breccia with Qtz-Py	692	15.90
F-05	MJSU-9	265.1	Breccia with Py	123	180.00
F-06	MJSU-9	342.1	Py-Qtz ore	18	625.00
F-07	MJSU-9	370.1	Dacitic tuff with Py dissemination	825	26.30
F-08	MJSU-10	33.1	Rhyodacite, weakly limonitized	72	1.91
F-09	MJSU-10	64.4	Rhyodacite, Py weak dissemi.	2,600	13.80
F-10	MJSU-10	104.0	Rhyodacitic tuff, Py weak dissemi.	1,980	6.89
F-11	MJSU-10	145.8	Rhyodacite, with Qtz-Py network	2,320	170.00
F-12	MJSU-10	189.2	Rhyodacitic tuff with Py dissemi.	1,460	14.00
F-13	MJSU-10	202.2	Bedded tuff with Py dissemi.	1,820	8.59
F-14	MJSU-10	226.2	Dacitic fine tuff with Py dissemi.	2,660	9.53
F-15	MJSU-10	265.9	Dacite with Qtz-Py veinlets	8,120	5.71
F-16	MJSU-10	306.4	Dacitic tuff with Py dissemination	2,130	5.08
F-17	MJSU-10	346.0	Dacitic tuff with Py dissemination	2,600	29.30
F-18	MJSU-11	16.8	Dacite, weakly limonitized	157	3.52
F-19	MJSU-11	40.1	Dacite with Qtz-Py veinlets and Py dissemi.	7,030	6.94
F-20	MJSU-11	82.2	Dacite with Py dissemi.	2,650	7.02
F-21	MJSU-11	136.2	Dacite with Qtz-Py veinlets and Py dissemi.	856	4.72
F-22	MJSU-11	162.5	Dacite with Py veinlets and dissemi.	7,880	7.50
F-23	MJSU-11	200.3	Dacite with Py dissemi.	9,290	12.90
F-24	MJSU-11	241.3	Dacite with Py dissemi and Qtz-Py veinlets	1,290	11.60
F-25	MJSU-12	11.2	Andesite	195	1.60
F-26	MJSU-12	46.6	Andesite with limo veinlets	934	2.15
F-27	MJSU-12	90.3	Andesite with Py dissemi.	1,300	11.40
F-28	MJSU-12	132.4	Andesite with Py-Qtz veinlets	3,950	71.60
F-29	MJSU-12	142.0	Andesite with Py-Qtz veinlets and Py dissemi.	5,180	25.50
F-30	MJSU-12	168.4	Andesite	7,490	5.22
F-31	MJSU-12	208.3	Andesite	5,400	3.44
F-32	MJSU-12	248.8	Andesite with Py dissemi.	8,880	6.69
F-33	MJSU-14	30.2	Rhyodacitic tuff breccia with Py dissemi.	6,100	11.60
F-34	MJSU-14	76.0	Rhyodacitic tuff with Py dissemi.	2,430	4.11
F-35	MJSU-14	110.4	Rhyodacite with Py dissemi and Qtz veinlets	4,860	3.39
F-36	MJSU-14	151.4	Basaltic tuff with Py dissemi.	8,580	8.29
F-37	MJSU-14	190.0	Basaltic breccia with a few Py dissemi.	2,360	4.04
F-38	MJSU-14	231.0	Rhyodacitic lapilli tuff with Py dissemi.	3,560	4.06
F-39	MJSU-14	272.1	Rhyodacite with Py dissemi (W sili)	4,140	14.60
F-40	MJSU-13	31.0	Andesite	3,550	2.69
F-41	MJSU-13	49.8	Andesite	5,180	3.37
F-42	MJSU-13	74.9	Silicified rock	4,040	4.73
F-43	MJSU-13	91.8	Chloritized rock with Py dissemi and veinlets	8,350	13.20
F-44	MJSU-13	100.5	Chloritized rock with Py dissemi	7,930	17.50
F-45	MJSU-13	125.2	Silicified rock with Py dissemi	4,410	6.36
F-46	MJSU-13	150.2	Silicified rock with Py dissemi and veinlets	4,370	7.53
F-47	MJSU-13	174.3	Silicified rock with Py dissemi and veinlets	3,430	8.05
F-48	MJSU-13	200.1	Silicified rock with Py dissemi and veinlets	17,900	5.19
F-49	MJSU-13	220.8	Silicified andesite with Py dissemi and veinlets	4,820	5.39
F-50	MJSU-13	248.0	Andesite	7,710	2.02



Abbreviation :

brec : volcanic breccia, lapilli tuff, lapillistone
rd tf : rhyodacitic tuff
por bt : porphyritic basalt
por and : porphyritic andesite
and : andesite

Fig.2-1-25 Chargeability of Core Samples from MJSU-9



Abbreviation:

rd : rhyodacite
rd tf : rhyodacitic tuff
dac tf / dac : dacitic tuff or dacite

Fig.2-1-26 Chargeability of Core Samples from MJSU-10

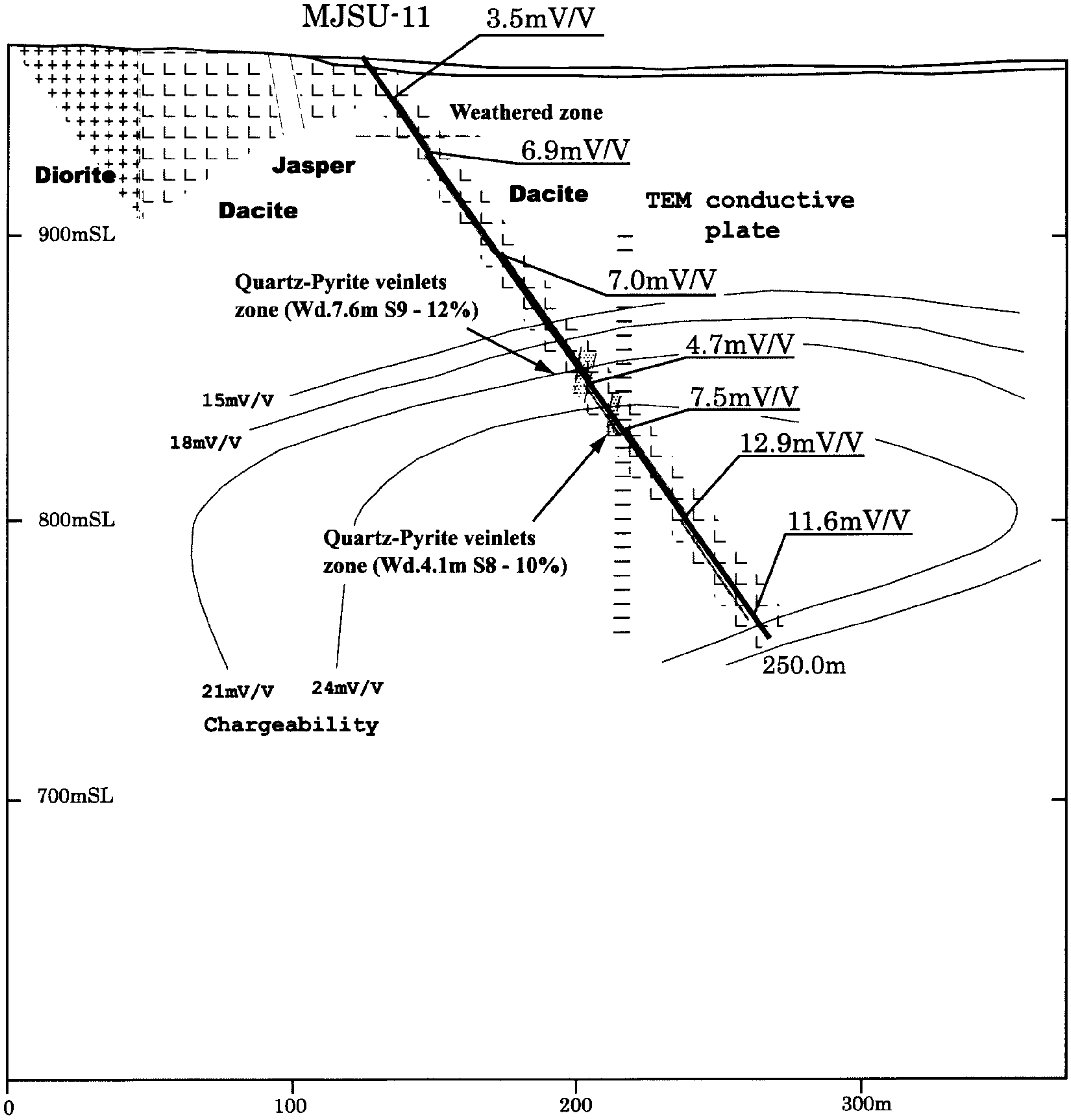
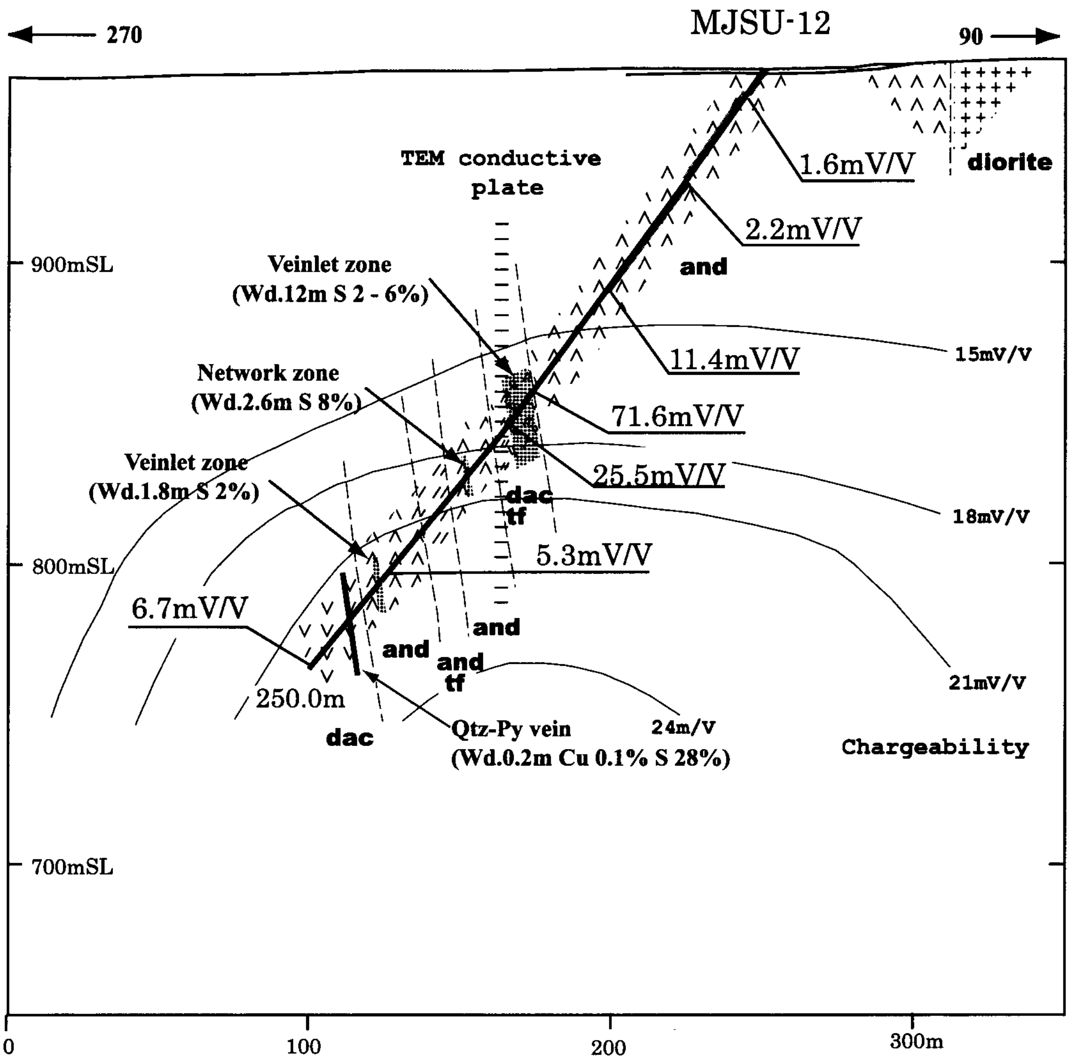


Fig.2-1-27 Chargeability of Core Samples from MJSU-11



Abbreviation:

dac : dacite
dac tf : dacitic tuff
and : andesite
and tf : andesitic tuff

Fig.2-1-28 Chargeability of Core Samples from MJSU-12

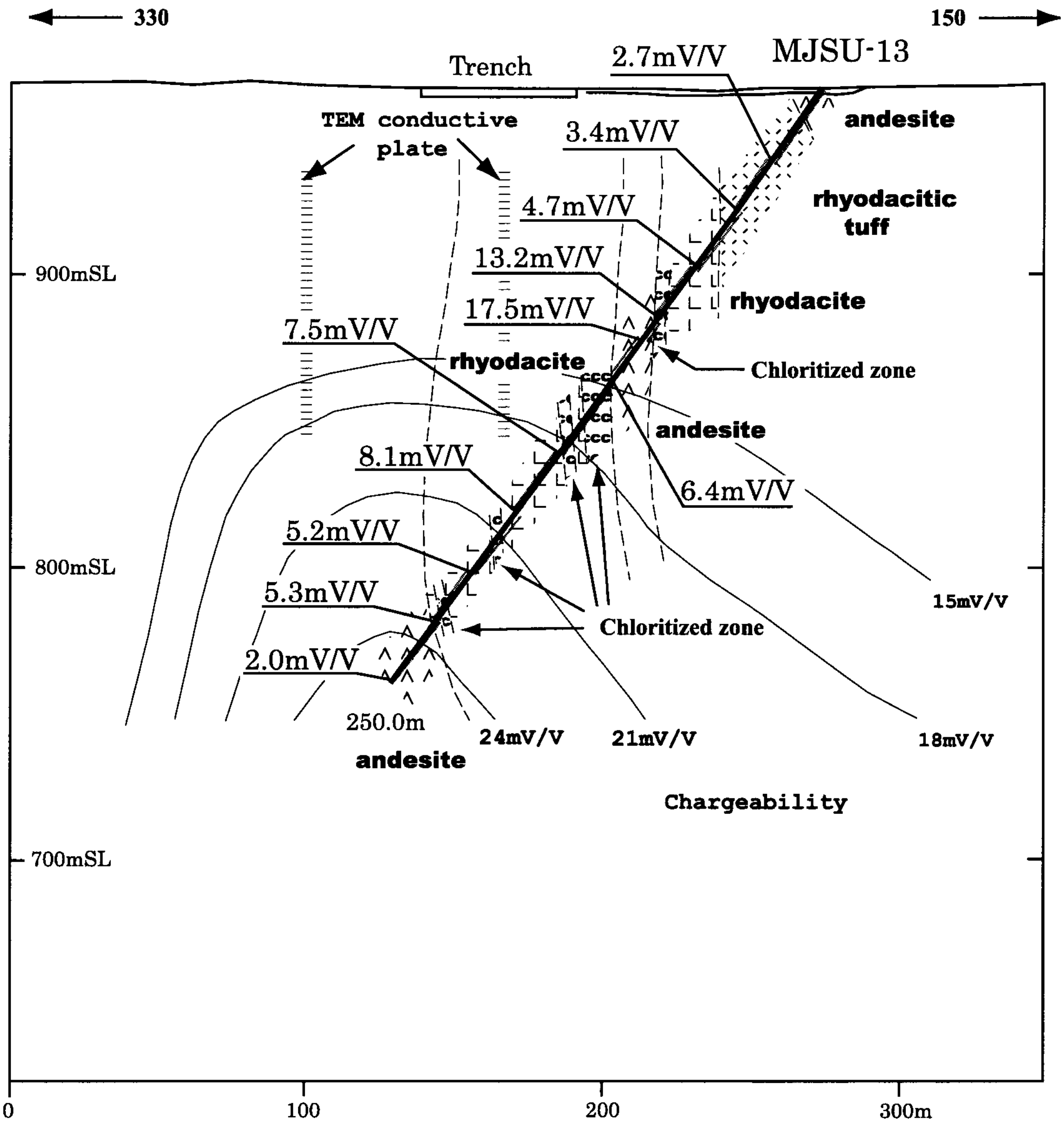


Fig.2-1-29 Chargeability of Core Samples from MJSU-13

1-5-4 Analysis of TEM data

The mineralized zones in this area are inferred to be platy and vertical from geological survey and the results of the past drilling. Thus plate analysis was applied to the obtained TEM data because it can best extract the shape of the mineralized zones.

Drilling was carried out this year with the purpose of confirming the structure of the resistivity and high chargeability extracted from geophysical prospecting. The conductivity plates coincided with the disseminated zones and ore veinlets in almost all of the drill holes. However the expected platy resistivity structure was not obtained and evidences for platy shape of the mineralized zones could not be found from the geology of the vicinity. Comparison of the expected locality of the conductive plates and the geology of the area obtained from drilling results are as follows.

Table 2-1-4 Geologic Characteristics of Each Conductive Plate

Conductive Plates	Drill Hole	Geology	Mineralization	Water Loss at Drilling Time	High Chargeability Pattern
TB-12	MJSU-9	Porphyritic andesite or dacitic breccia	Pyrite dissemination	None	Vertical
TB-12	MJSU-15	Porphyritic andesite or dacitic breccia	Pyrite dissemination	None	Vertical
TJ-18A	MJSU-10	Rhyodacitic tuff	Pyrite dissemination	None	Vertical
TJ-18B	MJSU-10	Dacitic tuff or dacite	None	None	Vertical
TJ-18C	MJSU-10	Rhyodacite	Zn0.03-0.48%, S0.8-4%	Notable	Vertical
TM-27	MJSU-11	Dacite	Quartz-Pyrite veinlets, width 7.6m+(10m)+4.1m	None	Horizontal
TO-20	MJSU-12	Dacitic tuff	Pyveinlets, S2-6% width 12m	Notable	Horizontal
TP-18A	MJSU-13	Drill Hole not reached			
TP-18B	MJSU-13	Drill hole not reached			

In the two-dimensional analysis, the dip of the early model was assumed to be vertical from the geologic structure. From the present drilling, however, it was clarified that there are low dip parts in the mineralized zones. Particularly the dip of the mineralized zone of TJ-18 is around 60° , this data was fed to the model and Track line 0 was recalculated. The results showed good coincidence of the structure with this dip with the measured values. From these results the location of the conductive plate was changed as shown in Figure 2-1-30.

Also regarding TB-12, a massive ore was confirmed to exist by drilling and a plate was assumed and calculated to exist through this ore, but the results did not match the measured data. The reason is believed to be that the thickness of the resistivity structure is not uniform.

The results of laboratory measurements indicate that low resistivity rocks are; massive ores (about 20ohm-m), veins of network ores and disseminated ores (40 - 100ohm-m), and gossan near the surface (about 200ohm-m). Of these, the resistivity of the network veins and disseminated rocks tend to decrease with the increase of sulfide content (pyrite 20%: 40ohm-m, pyrite 10%: 100ohm-m).

The location of the conductive plates reasonably coincides with dissemination and network mineralized zones and thus the plates are considered to reflect the mineralized zones. In these cases the conductance of the plates are 1 - 3 S, and thus, if the width of the mineralized zones is less than several tens of meters, their resistivity will be less than 30ohm-m. This value is close to the resistivity of massive ore obtained by laboratory tests (about 20ohm-m), but differs from that of the disseminated and network rocks (40 - 100ohm-m). The following is considered to be the reason for the disagreement of the values.

① The low resistivity anomalies detected by TEM are dependent on the conductance, which is the product of conductivity (inverse number of resistivity) and the thickness. Bodies with the same conductance, for example, 50m thick plate with 50ohm-m resistivity and 10m thick plate with 10ohm-m, are equivalent electro-magnetically and cannot be distinguished. In the present survey, existence of thin plate was surmised as a result of model simulation on the basis of 20ohm-m resistivity, which was measured during the second year on massive ore samples. It is, however, interpreted that electro-magnetically-equivalent thick disseminated mineralized zones occur.

② The resistivity of rock samples measured in the laboratory is generally higher than the values measured in the field. This discrepancy is believed to be caused by the difference of environment of measurement. Namely the resistivity is measured in air in laboratories, while in the field, average values of large rock bodies including fissures with groundwater are obtained.

③ The resistivity of conductive plates has homogeneous platy structure in 2-dimensional analysis, but in actual structure the resistivity is uneven and the product of thickness and resistivity varies significantly.

The above is believed to be the cause of the discrepancy between the results of electro-magnetic modeling and drilling.

TJ18

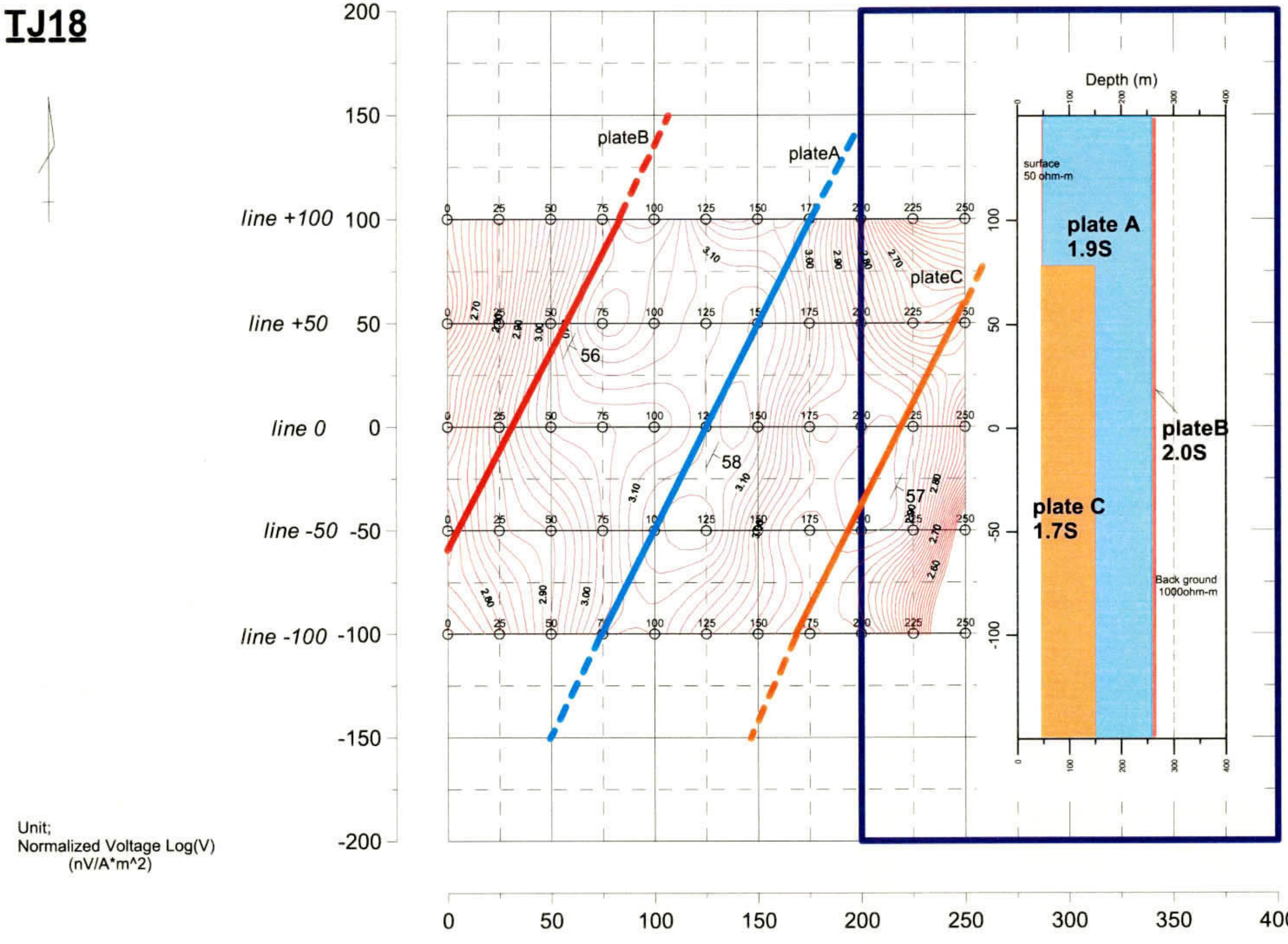


Fig.2-1-30 Estimated Plate Model Position Map (TJ-18)