5-3 Arlan Area

5-3-1 Survey area and scope of work

The Area is located approximately 10km north-northeast of Zalturbulak Area, occupying an area of about 32km^2 enclosed by the latitudes of 48° 33′ and 48° 34′ north, and by the longitudes of 68° 40′ and 68° 40′ east (Figure 5-44).

In the middle of the area, a range trending in the NNE-SSW direction for a distance of approximately 2 km stands out above the alluvial plan. The range comprises erosion resistive silicified rocks and diorite intrusions that appear to be spatially related to mineralization in the Area. Most of mineralized outcrops are located within or to the proximity of this range (the central mineralization zone).

Some samples of altered rocks and quartz veins which were collected from this range during the Phase I field campaign indicated relatively high gold assay results ranging between 0.83 and 1.76 g/t Au for 3 samples of the total 14 samples. In addition, a sizeable zone of hydrothermal alteration was outlined. Based on these results, it was judged that the central mineralization zone would have a fair potential for vein-type gold mineralization and warrant further exploration.

The objectives of Phase II survey2 were, therefore, to delineate rich portions of the mineralized zone accompanying gold bearing quartz veins.

5-3-2 Results

(1) Geology

The geology of the area comprises. Devonian andesitic volcanics, overlying dacitic volcanics and intrusions in descending order of their ages of formation (Figure5-44).

Andesitic Volcanics widely distribute in the northern part of the area and consist of lavas and pyroclastics. The lavas display grayish green or grey colour in fresh part and are often tinged with purple colour in weathered part. Their texture is generally fined grained and compact. The pyroclastics are similar in colour to the lavas and are composed of massive, coarse-grained essential tuffs and essential lapilli tuff, interbedded with massive, fine-grained tuffs and laminated tuffs.

Dacitic Volcanics distributes mainly in the southern part of the area and consists of lavas and pyroclastics. The lavas are medium grained and slightly porous, and show pink colour in fresh part. Phenocrysts of plagioclase and minute quartz are observed in vitreous groundmass. The pyroclastics are similar in colour to the lava and consist of fine-grained tuffs and lapilli tuffs.

Intrusions consist of melanocratic diorite , fine-grained andesite and andesitic porphyry. Melanocratic diorite has relation to the mineralization.

A number of elongated intrusive bodies of melanocratic diorite are well developed in the central mineralization zone. Numerous gold bearing quartz veinlets are often associated with crushed rocks adjacent to the contact to the intrusive bodies, which suggests that the intrusion may have played important role in for the gold mineralization in the Area. Sizes of the intrusive bodies are 2 to 3 m wide with length between more than 10 and 100m. The rocks are generally black in colour, and fine-grained and compact in texture, though a leucocratic medium to coarse grained variety is included in part.

(2) Mineralization

The mineralization occurs in a 100 to 300m wide zone, trending in the direction of N 20°W-S20°E, that includes the datum point and comprises a large number of gossanous outcrops accompanying quartz vein networks.

Gossanos are often developed along melanocratic diorite dikes, and indicate general trends of N5°to 15°W dipping 85°to east in most cases or rarely steeply to west. Sizes of individual gossans are several meters in width and range from about 15 m to several tens of meters in length. Quartz vein networks are mostly concentrated in one to two meter wide zones within gossans.

Major sulfide minerals are chalcopyrite, pyrite and arsenopyrite disseminated in quartz veins. In addition, spharelite, galena and tennantite have been observed under microscope in some of collected samples. Two grains of native gold free from other metallic minerals, have been also identified under microscope in two samples.

Data on homogenization temperature of fluid inclusions have been obtained from only one vein-quartz sample collected near the datum point. The homogenization temperatures range from 96.9 to 307.8℃ and are mostly concentrated between 160 and 210℃. The arithmetic mean is estimated at 183.7℃.

Two types of alteration have been visually recognized; silicification-argillization and green alteration. The silicification-argillization is developed spatially in association with numerous melanocratic diorite bodies and is zoned, for its type, into four alteration zones centering a melanocratic diorite body. They are from the center outwards; Quartz+sercite zone, Quartz+sericite±kaolinite zone, Quartz+sericite+ kaolinite+carbonates zone and Sericite–smectite mixed layer minerals zone. The gold mineralization is mainly accompanied with quart vein networks in quartz+sericite zone

Two samples show appreciably high gold values of 3.79 g/t and 4.16 g/t. In addition, several indicated gold contents exceeding 0.5 g/t. However, no notable

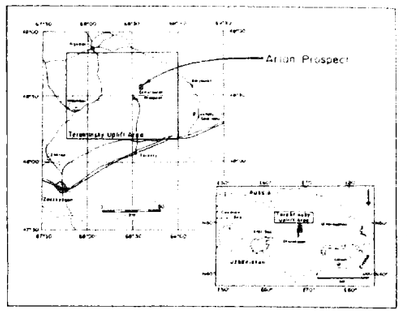
gold mineralization zones were not identified in the area.

(3) Follow up survey

Gold mineralization on the surface seems to be not continuous and follow up survey is recommended as a few samples show high gold content. However, priority of it is not high.

Plate Ⅲ-2-2-1

REPORT ON THE MINERAL EXPLORATION
IN
THE TEREKTINSKY UPLIFT AREA
REPUBLIC OF KAZAKHSTAN
(PHASE II)



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN
FEBRUARY 1999

0 500 1000m

LEGEND

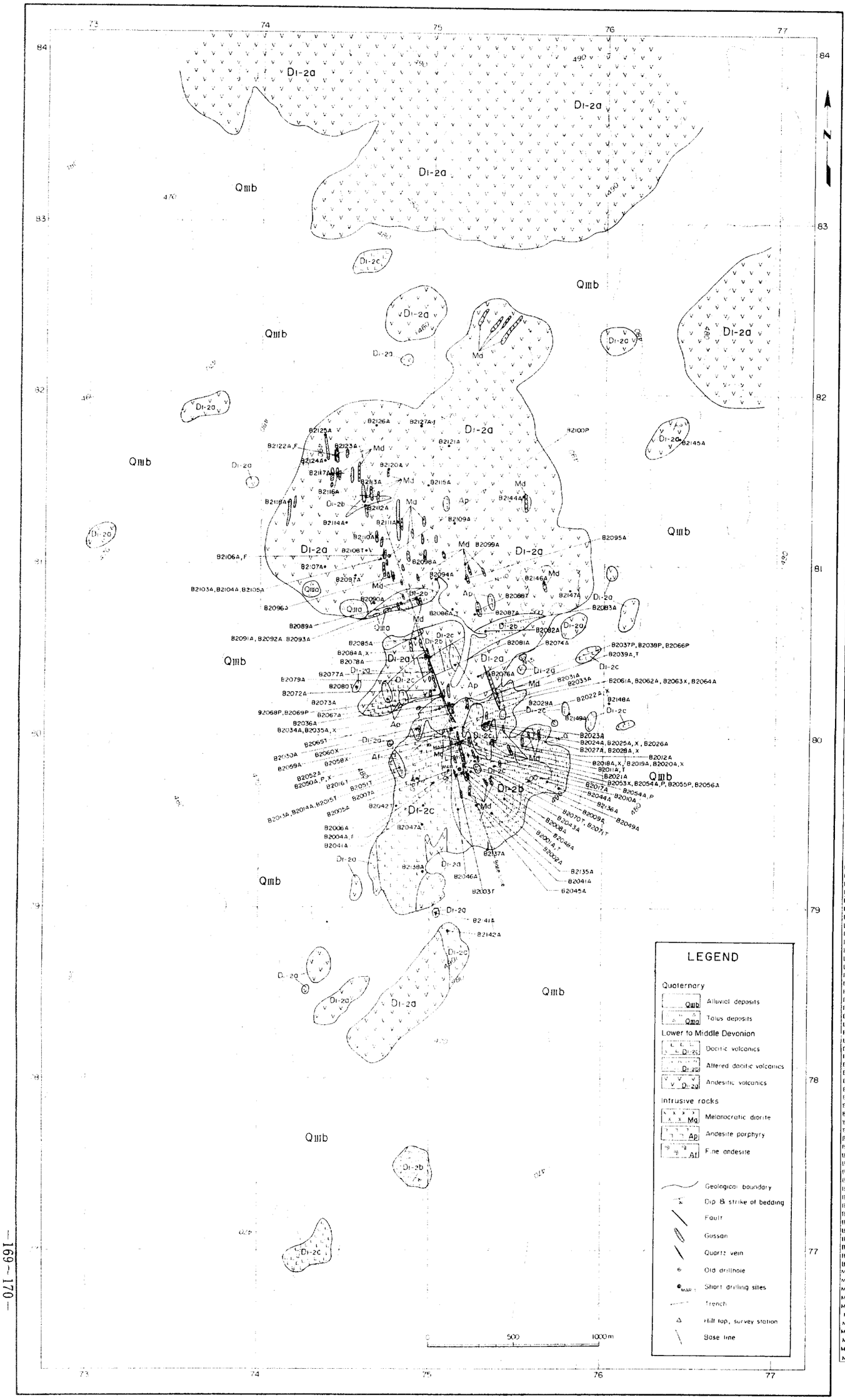
Quaternary
- Qmb Alluvial deposits
- Qmo Talus deposits

Lower to Middle Devonian
- Di-2c Dacitic volcanics
- Di-2b Altered dacitic volcanics
- Di-2a Andesitic volcanics

Intrusive rocks
- Md Metamorphic diorite
- Ap Andesite porphyry
- Af Fine diorite

- Geological boundary
- Dip & strike of bedding
- Fault
- Gossan
- Quartz vein
- Old drillhole
- Short drilling sites
- Trench
- Hill top, survey station
- Base line
- A — B Geological section

Figure 5-44 Geological Map of the Arlan Area



Sample No.	Au(g/t)	Ag(g/t)	Cu(ppm)	Pb(ppm)	Zn(ppm)	Mo(ppm)
B 2001	0.06	0.3	24.4	6	13.2	9
B 2002	0.01	1.7	12.1	3	4.9	4
B 2004	0.07	0.6	16.3	45	6.8	7
B 2006	0.06	0.4	7.7	7	52.3	4
B 2007	0.02	0.9	6.7	15	0.5	3
B 2008	0.02	1.6	43.5	1230	4.2	6
B 2009	0.02	0.5	14	3	24.9	7
B 2010	0.01	1.9	45.8	463	9.4	6
B 2011	0.04	1.6	13.6	7	6.4	6
B 2012	0.02	0.6	9.4	2	2.1	4
B 2013	0.45	13.5	142	1200	11	6
B 2014	0.71	9.8	166	1780	5.4	29
B 2017	0.01	1.1	14.8	39	4.6	4
B 2018	0.01	3.4	131	88	4.7	3
B 2019	3.79	33	122	478	20.2	9
B 2020	0.02	0.3	31.6	137	17.6	6
B 2021	0.01	0.2	17	5	47.5	4
B 2022	< 0.01	0.8	19.2	7	78.4	2
B 2023	0.31	9	36.4	4950	48.4	7
B 2024	0.01	0.9	8.2	1220	14.4	3
B 2025	0.01	2.1	25.7	727	71.4	3
B 2026	0.05	6.3	262	1340	35.2	8
B 2027	< 0.01	< 0.2	6.6	9	10.6	2
B 2028	< 0.01	0.3	9.6	2	12.4	2
B 2029	< 0.01	0.8	20.5	529	46.6	3
B 2030	< 0.01	0.3	17.6	4	45.3	2
B 2031	< 0.01	0.9	11.9	9	12.7	4
B 2033	0.02	0.8	25.2	4870	11.5	15
B 2034	0.01	1.4	34.9	1740	24.5	11
B 2035	0.01	1.1	24.3	2340	25.1	5
B 2036	4.16	10.8	216	3960	144	22
B 2039	0.02	0.6	18.8	134	13.7	8
B 2040	0.01	< 0.2	16	6	11.6	5
B 2041	< 0.01	< 0.2	18.2	3	29.1	2
B 2043	0.01	0.4	5.3	2	8.4	9
B 2044	0.02	0.5	10.8	3	7	4
B 2045	0.01	0.2	5.5	11	8.5	4
B 2046	< 0.01	0.6	4.2	3	8.5	4
B 2047	0.01	< 0.2	28.2	12	21.9	5
B 2048	0.01	0.4	2.3	2	1.9	2
B 2049	< 0.01	0.8	10.3	29	4.1	5
B 2050	0.03	13.9	52.1	1310	5.6	8
B 2052	0.8	12.1	306	2720	23.1	10
B 2053	0.23	0.6	51	5	18.2	5
B 2054	0.02	1	38.4	1120	5.2	7
B 2056	0.6	5.1	106	1360	7.5	20
B 2057	0.01	0.2	34	7	51.2	4
B 2059	0.04	1.5	31.9	1530	23.1	9
B 2061	0.64	1	59.6	183	12.4	5
B 2062	0.19	2.8	249	12260	84.2	41
B 2064	0.08	2.4	78.9	471	7.8	6
B 2067	0.06	3.9	61	3980	393	2
B 2072	0.01	0.6	108	1960	55.6	3
B 2073	< 0.01	0.5	21.2	13	38.2	4
B 2074	0.01	< 0.2	16.9	10	50	2
B 2076	0.01	< 0.2	24.3	182	34.1	5
B 2077	0.01	2	44.7	163	72.4	8
B 2078	0.01	0.5	23.6	15	16.3	3
B 2079	< 0.01	0.3	9.4	7	47.1	3
B 2081	< 0.01	< 0.2	21	4	33	4
B 2082	0.01	0.7	7.7	630	14.6	3
B 2083	0.01	0.3	4.6	2	5.6	< 1
B 2084	0.26	1.3	42.5	61	27.2	6
B 2086	0.01	0.6	98.3	21	23.7	2
B 2087	0.01	0.2	17.5	7	22.2	3
B 2089	0.08	17.4	294	5868	22.5	5
B 2090	0.01	< 0.2	3.8	2	7.7	1
B 2091	< 0.01	0.4	52.6	2220	11.5	8
B 2092	< 0.01	0.7	90.8	89	32.6	6
B 2093	0.02	2.9	63.6	58	49.2	17
B 2094	0.01	< 0.2	4.6	2	14.8	< 1
B 2095	< 0.01	0.5	14.9	35	13.1	4
B 2096	0.01	5.5	50.8	2770	80.9	16
B 2097	< 0.01	0.5	16.5	5	45.3	< 1
B 2098	0.5	12.8	42.2	4950	634	10
B 2099	0.01	< 0.2	7.6	15	55.3	3
B 2103	0.03	1.7	132	1990	63.2	18
B 2104	0.04	3.8	115	962	41.5	21
B 2105	0.02	1.8	254	506	62.2	23
B 2106	0.05	5.2	688	8960	304	13
B 2107	< 0.01	< 0.2	8.6	68	52.4	< 1
B 2109	< 0.01	< 0.2	6.1	5	48.2	< 1
B 2110	0.14	2.1	528	381	161	6
B 2111	< 0.01	2.4	50.9	3870	143	4
B 2112	0.02	2.2	148	290	58	6
B 2113	< 0.01	1.8	115	437	74.4	2
B 2114	< 0.01	< 0.2	2.3	3	31.6	< 1
B 2115	< 0.01	0.6	6.8	2	66.1	< 1
B 2116	0.01	2.7	39.7	176	46.9	7
B 2117	0.01	2.4	124	5160	384	17
B 2118	< 0.01	< 0.2	8.1	13	19	3
B 2120	< 0.01	0.4	91.7	31	32.4	4
B 2121	< 0.01	0.7	5	2	47.2	< 1
B 2122	0.73	9.8	218	14100	274	334
B 2123	0.02	6.6	61.5	4290	27.5	10
B 2124	0.10	10.8	81.5	9480	47.3	6
B 2125	0.02	3.4	50.7	208	34.7	8
B 2126	< 0.01	0.2	13.9	66	8.3	3
B 2127	< 0.01	< 0.2	5.2	2	51.5	< 1
B 2128	< 0.01	0.4	3.1	2	7.2	4
B 2129	0.15	6.2	3570	11100	481	9
B 2130	< 0.01	0.5	44	26	57.6	1
B 2131	< 0.01	< 0.2	7.5	31	7.2	4
B 2132	0.01	0.5	14.3	12	52.9	< 1
B 2133	< 0.01	0.3	23.9	12	27.6	3
B 2134	< 0.01	< 0.2	30	5	130	< 1
B 2135	< 0.01	0.3	2.5	9	7.6	3
B 2136	< 0.01	< 0.2	8	4	3.7	5
B 2137	< 0.01	< 0.2	3.1	3	2	2
B 2138	< 0.01	< 0.2	49.1	11	10.9	2
B 2139	< 0.01	< 0.2	40.7	5	27.4	2
B 2140	< 0.01	< 0.2	2.8	2	4.6	< 1
B 2141	< 0.01	< 0.2	3.2	4	11.3	3
B 2142	< 0.01	< 0.2	2.7	2	0.6	< 1
B 2143	< 0.01	0.3	2.3	2	1.7	1
B 2144	0.01	0.8	46.1	800	9.1	2
B 2145	0.04	< 0.2	7.2	4	68.2	4
B 2146	0.01	0.5	21.7	23	14.6	6
B 2148	0.13	< 0.2	2.5	2	26.9	2
B 2149	0.01	0.3	2.1	2	28.5	< 1
B 2150	0.01	0.3	5.1	7	6	3
B 2151	0.01	< 0.2	1.4	2	4.3	1
B 2152	0.01	< 0.2	4.3	4	1.4	< 1
MAR-1-15 A	0.07	0.8	79.9	2	29.4	2
MAR-1-16A	0.01	0.4	17.5	2	17.4	< 1
MAR-1-17A	< 0.01	0.6	50.1	2	29.6	2
MAR-1-18 A	0.01	0.9	9.8	2	8.6	2
MAR-1-19 A	0.07	0.7	3.7	2	2.6	2
MAR 2-7A	0.01	0.7	80.3	19	95.4	2
MAR-2-8A	0.08	0.6	76.9	19	62.3	2
MAR-2-9A	0.17	1.5	18.5	103	2.2	3
MAR 2-11A	0.04	0.4	12.7	2	5.8	2
MAR-2-11.5 A	0.01	0.4	8.9	2	4	2
MAR-2-12A	0.02	0.7	12.7	2	34.7	2

Figure 5-45 Geology, Sample Location and Assay Result in Arlan Area

5-4 Bidaik Area

5-4-1 Survey area and scope of work

The Bidaik Area, including the Bidaik, Taguloba and NE Bidaik Projects is situated 6 at the northeastern corner of the Telektinsky Uplift and has an area of approximately 32km^2 bounded by the latitudes of 48° 33′ and 48° 40′ N and by the longitudes of 8° 40′ and 68° 40′ E. An extensive alluvial plain spreads over the entire prospect with small hills sporadically distributing. These hills are mostly composed of silicified rocks and mineralized quartz veins. Two major zones of mineralization have been identified in the Area, namely the Bidaik and Taguloba Prospects (Figure 5-46). The 1st year's campaign (1997) of the current project returned analytical results for Au equal to or higher than 1.0 g/t in 6 out of a total 11 samples collected in the Bidaik Prospect. In addition, an extensive alteration-mineralization zone, including a number of quartz veins, was outlined in the Taguloba Prospect. Based on these results, it was expected that unrevealed mineralized bodies of economic importance would be still present in the Area.

In the second year's campaign (1998), detailed geological survey was carried out aiming at outlining the regional extent of the zones of gold quartz mineralization and determining their gold contents with a reasonable confidence.

5-4-2 Results

(1) Geology

The geology of this area comprises early Devonian granitoids, early Devonian volcano-sedimentary rocks and late Devonian sedimentary rocks (Figure5-46). It is, however, practically impossible to establish stratigraphic and intrusive Boundaries between the three groups of rocks as above mentioned trend roughly in the E-W or WNW-ESE direction. Thus, these groups are arranged from north to south in order of the oldest group, the grainitoids, the next oldest, the volcano-sedimentary rocks, and the youngest, the Devonian sedimentary rocks. The geologic description of each group is given below.

The early Devonian granitoids are distributed in the northern part of the area and are host rocks of Taguloba Prospect. They comprise mainly pinkish leucocratic granite which includes coarse and fine grained varieties. 339 Ma K-Ar age was obtained from this granitoids (Kostitsyn,1996).

Early Devonian volcano-sedimentary rocks distributed in the center of the area. Most mineralization-alteration occurs in this rock group. The volcano-sedimentary

rocks are grouped into sandstone-shale, dacite and andesite units. The sedimentary rocks distribute in the southwestern corner of the Bidaik Area and comprise dark brown to dark grey shale and wacke.

(2) Alteration-mineralization

The alteration-mineralization in this area occurs mostly within area underlain by the early Devonian granitoids and volcano-sedimentary rocks. Mineralized quartz veins run in the N-S to NW-SE directions. No intrusions which have genetical relations to the alteration-mineralization have been identified in the course of the field traverses. Alteration-mineralization associated with quartz veins are distributed in the three prospects, namely the Bidaik, the Bidaik NE and Taguloba.

1) Bidaik Prospect

The mineralization, hosted by andesite, occurs in a zone 275m long in the N-S direction and 20m wide, and consist of a number of gold quartz veins and veinlets. According to the past drilling result, the mineralized zone is, as a whole, enveloped in an alteration zone with the maximum width of 60m(Figure 5-47). The northern continuation of alteration zone under alluvial cover has been drill-confirmed, indicating a total strike length of more than 600m. Within the mineralized zone, five quartz veins have been recognized They have been confirmed for their down- dip continuation as 40～70m(Figure 5-48). One of them, No.1 vein, can be traced on the surface.

The mineralization is composed of porous, saccharoidal chalcedonic quartz veins, containing a fair amount of limonite in outcrops. Barite is often associated with quartz veins. The microscopic observation has identified ore minerals such as pyrite, chalcopyrite and native gold in a polished section of a quartz vein sample.

The host andesite is ubiquitously silicified, sericitized and hematitized on outcrops. Intense pyritization and chloritization have been observed in abandoned drill cores.

The result of fluid inclusion analysis for two seccharoidal quartz vein samples indicates the homogenization temperatures ranging from 129 to 257℃ (average 179℃) for one sample and from 207 to 288℃ (average 248℃) for the other (JICA/MMAJ 1997).

A total of 31 samples were submitted for chemical analysis. Of these, 15 samples returned gold values equal to or better than 1 g/t, and two indicated more than 10 g/t

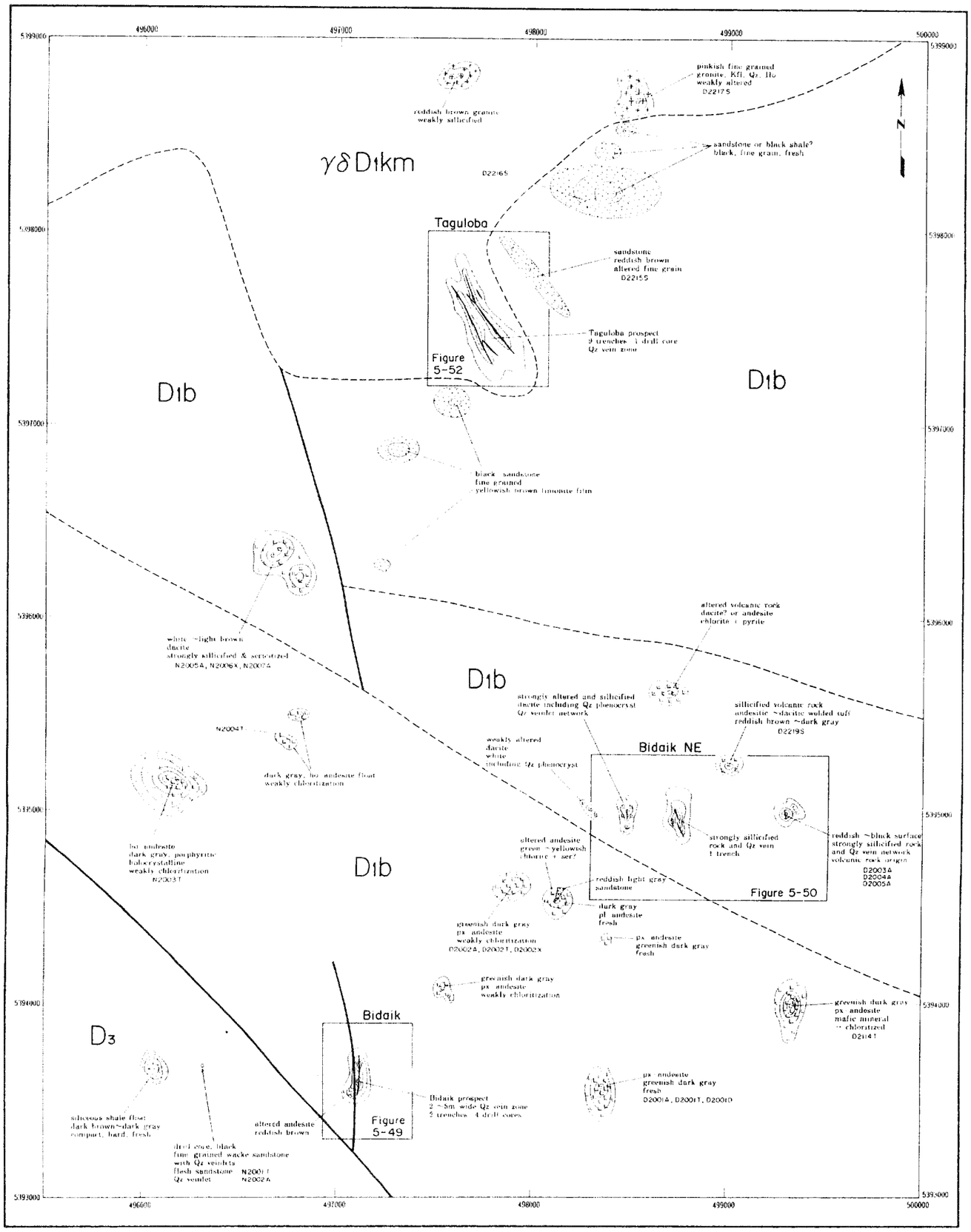
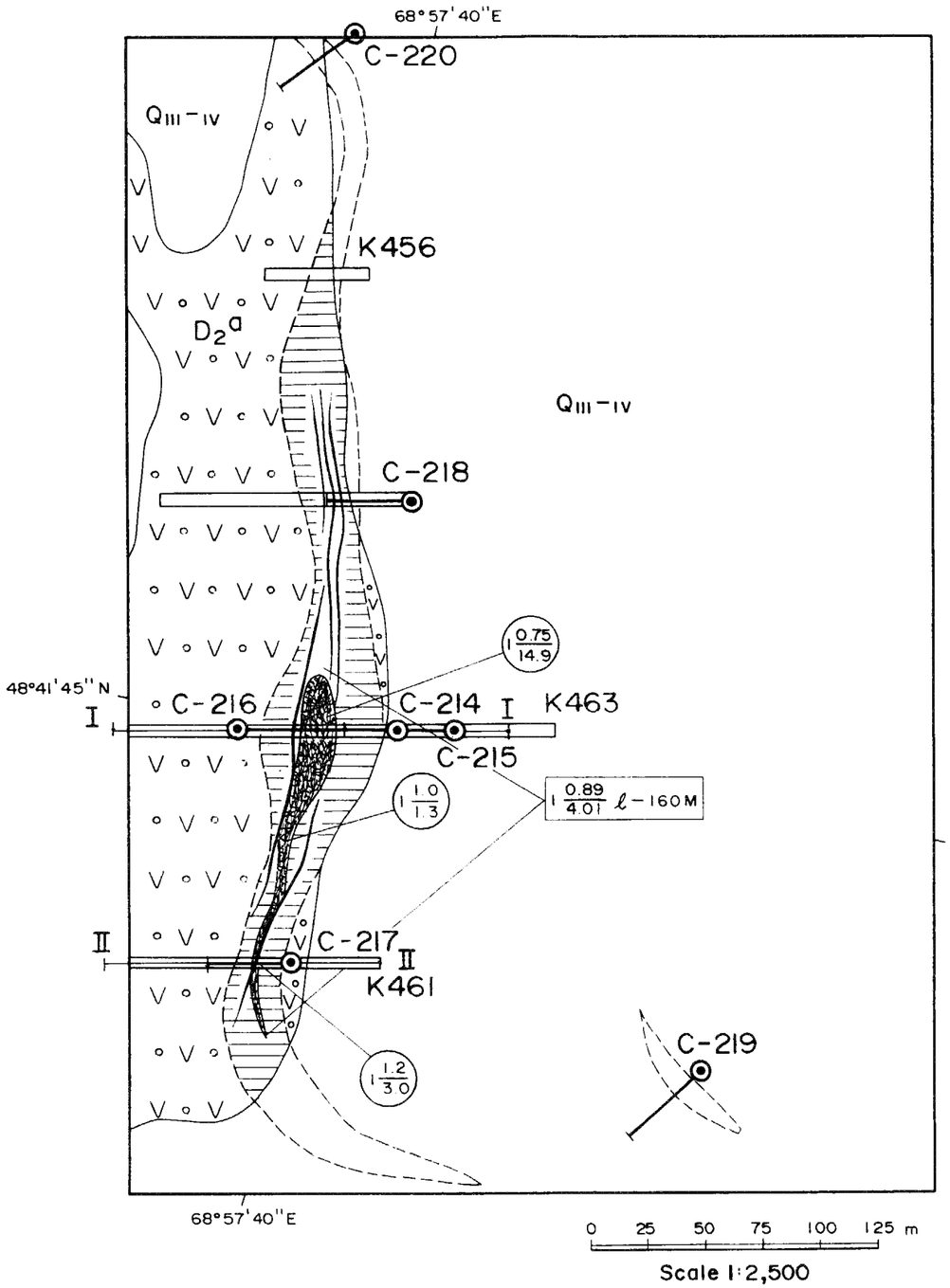
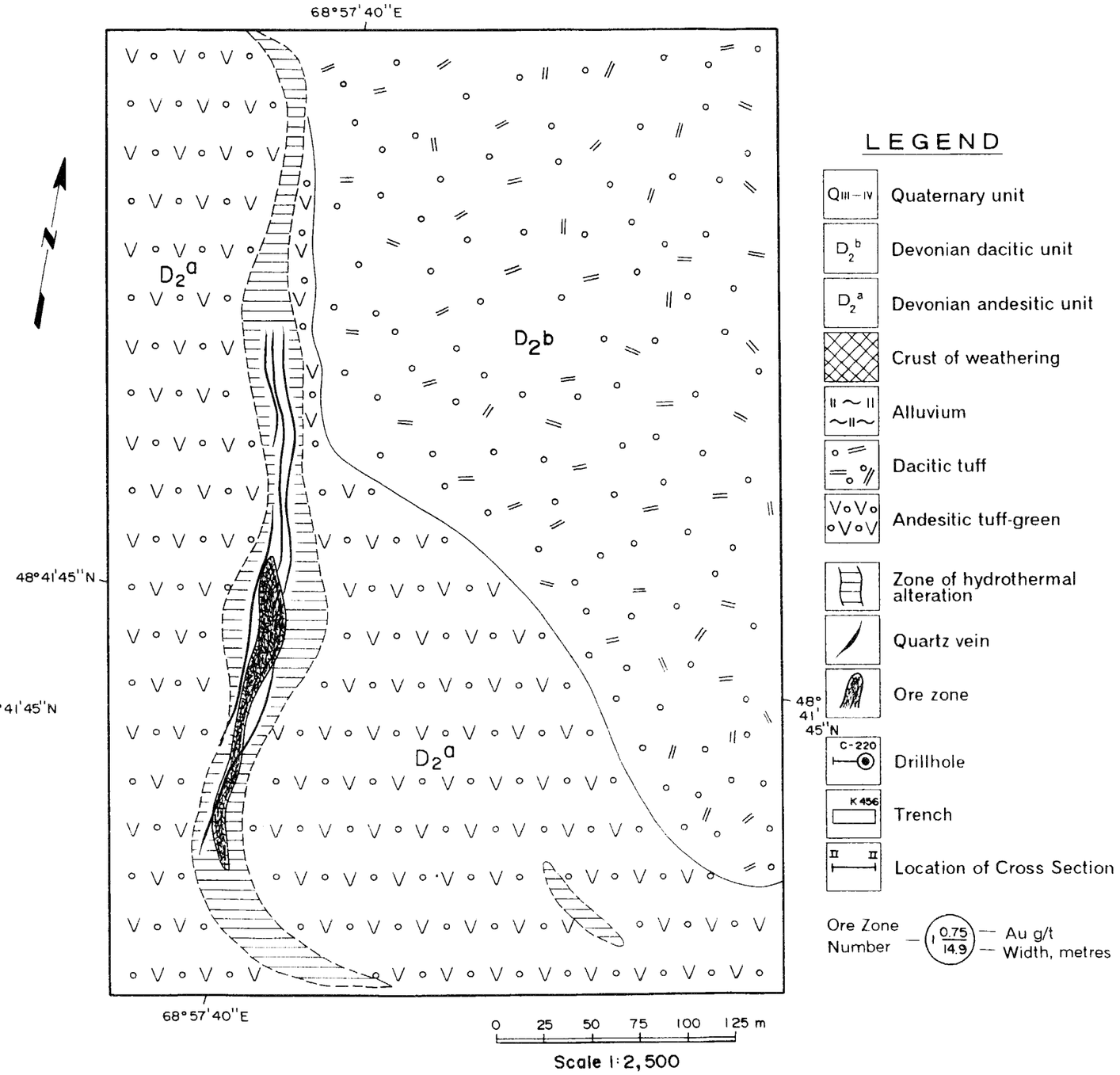


Figure 5-46 Geological Map of Bidaik Area

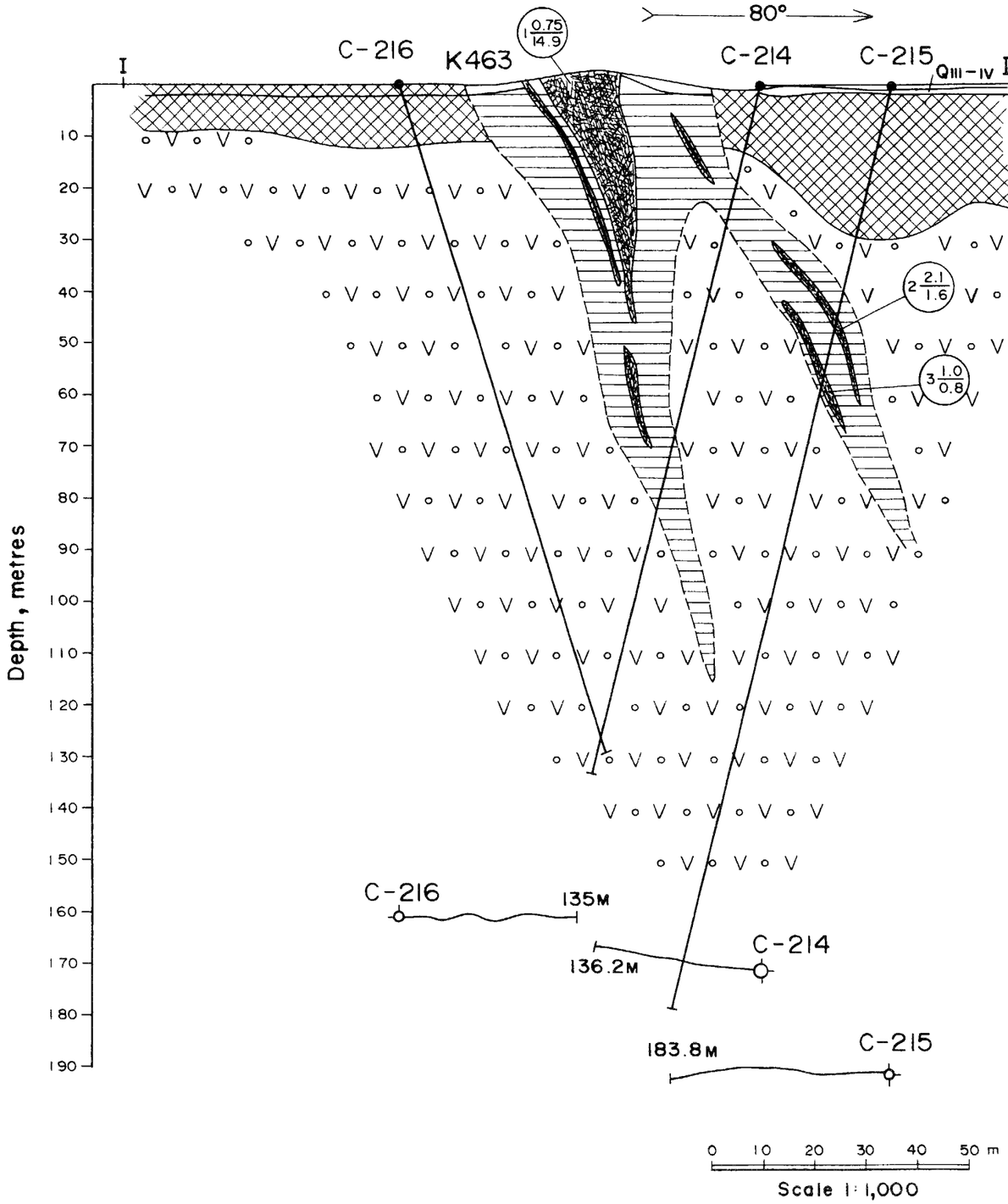


SURFACE GEOLOGY AND TRENCH AND DRILLHOLE LOCATION MAP, WITH SIGNIFICANT ASSAY RESULTS



INTERPRETATIVE GEOLOGY MAP BELOW ALLUVIAL COVER

Figure 5-47 Bidaik Prospect Geology Map and Trench and Drillhole Location Map
(Translated from Russian)



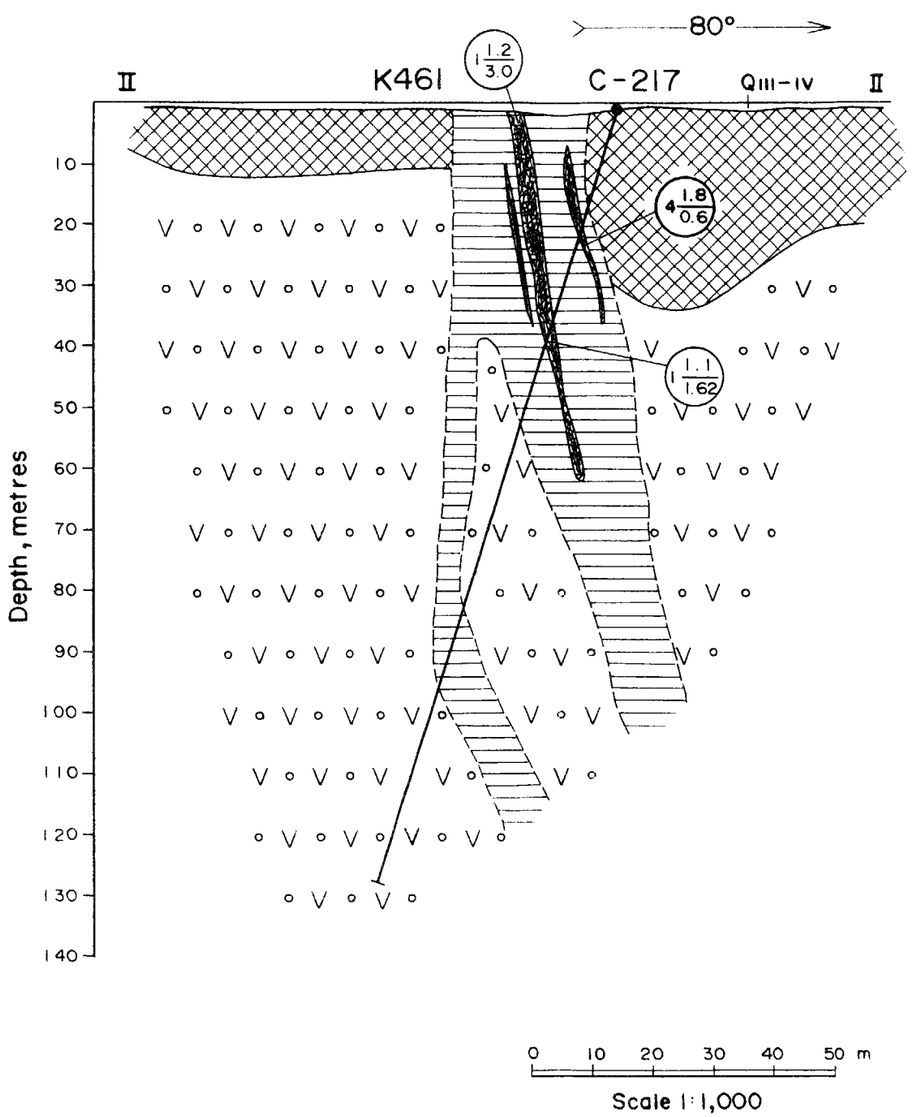
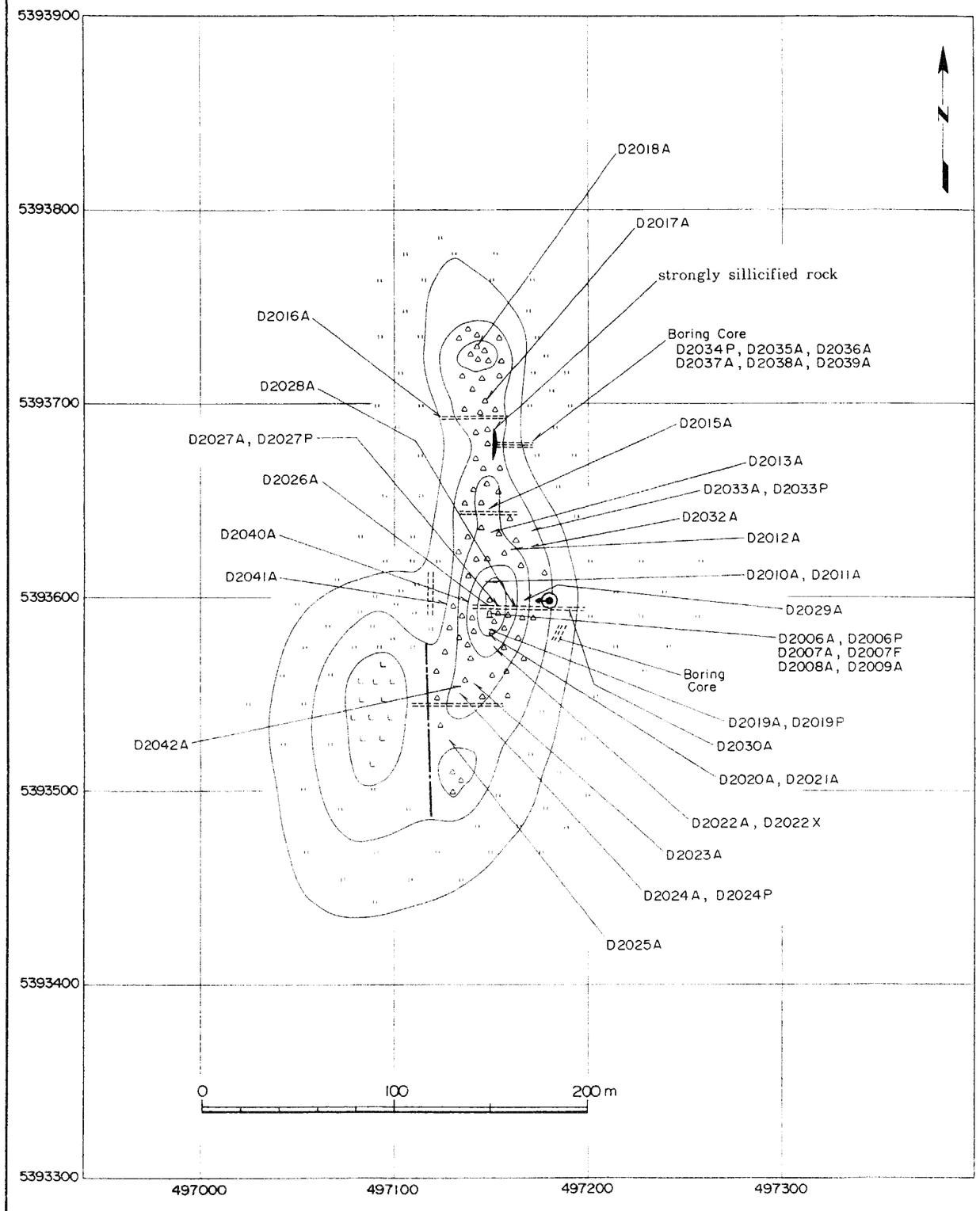


Figure 5-48 Bidaik Prospect Drill Sections I – I and II – II
(translated from Russian)



Sample No.	Description	Au(g/t)	Ag(g/t)	Cu(ppm)	Pb(ppm)	Zn(ppm)	Mo(ppm)
D2006 A	saccharoidal Qz vein	1.54	0.5	13	-2	7.5	7
D2007 A	drusy Qz vein agate	0.02	0.5	10	2	7.4	11
D2008 A	Qz vein with limonite film	5.17	2.9	80.5	8	75.9	13
D2009 A	greenish agate	0.03	0.7	31.5	7	33.3	5
D2010 A	saccharoidal Qz vein with limonite film	0.02	0.9	29.7	6	5.4	7
D2011 A	saccaroidal Qz vein	2.23	-0.2	7.9	-2	2.4	6
D2012 A	drusy Qz vein with limonite film	0.25	0.7	27.7	7	22.3	9
D2013 A	grayish amorphase Qz vein with limonite	0.03	0.2	59.4	8	8.4	7
D2014 A	strongly sillicified rock	0.01	1.4	34.4	21	2.8	13
D2015 A	strongly sillicified rock	0.01	0.3	44	-2	5	7
D2016 A	saccharoidal Qz vein	1.60	-0.2	5	-2	1.8	5
D2017 A	strongly sillicified rock	0.02	0.4	23.2	7	13.3	6
D2018 A	saccharoidal Qz vein with limonite film	4.12	1	31.4	18	5.5	39
D2019 A	saccharoidal Qz vein with limonite spot	3.09	1	10.3	-2	9.4	6
D2020 A	saccharoidal Qz vein	3.33	0.7	7.1	-2	11.2	7
D2021 A	platy crystalized Qz vein	15.30	5.3	9.6	5	4.4	7
D2022 A	saccharoidal drusy Qz vein with greenish	0.35	-0.2	7.5	-2	2.3	7
D2023 A	mussive amorphase Qz vein with limonite	2.76	0.4	16.2	-2	4.1	10
D2024 A	saccharoidal drusy Qz vein with limonite	29.08	11.4	16.1	-2	15.7	8
D2025 A	drusy Qz vein with limonite	0.88	0.5	66.2	3	14.6	11
D2026 A	greenish strongly sillicified rock with Qz	0.05	-0.2	21	2	4.9	5
D2027 A	saccharoidal Qz vein with black hematite	0.33	-0.2	8.6	-2	2.9	5
D2028 A	mussive saccharoidal Qz vein	0.33	-0.2	7.5	-2	2	5
D2029 A	saccharoidal Qz vein	0.06	-0.2	4.7	-2	4	5
D2030 A	white saccharoidal Qz vein	1.63	1	7.2	-2	3.4	6
D2031 A	white saccharoidal drusy Qz vein	1.96	0.6	4	-2	2.3	5
D2032 A	saccharoidal Qz vein with limonite	0.14	-0.2	45.4	8	38.8	10
D2033 A	black - reddish brown limonite	0.12	1	78.9	13	221	6
D2035 A	boring core; agate and Qz vein network	0.12	1.6	57	10	13	4
D2036 A	boring core; pyrite and Qz vein network	0.69	3.1	120	12	11.2	2
D2037 A	boring core; brecciated host rock	0.27	3.8	49.3	13	8.4	4
D2038 A	boring core; pyrite rich host rock	0.14	1.2	78.3	13	80.3	1
D2039 A	boring core; calcite and Qz vein	0.01	0.6	2.8	-2	1.9	-1
D2040 A	whote drusy Qz vein with limonite	8.97	2.1	9.9	-2	3.3	7
D2041 A	saccharoidal Qz vein with dusty limonite	1.79	0.3	7.9	-2	5.5	5
D2042 A	white saccharoidal Qz vein	1.42	0.5	9.8	-2	9.1	10

LEGEND

- Albium
- Qz vein float
- Qz vein
- Andesite lava
- Fault
- Boring core
- Drill hole

Figure 5-49 Fact Geology, Sample Location and Assay Results in Bidaik Prospect

Au. Although only outline of assay results was shown in the existence report (Figure 5-47), the assay results of this survey coincide with the previous data in general.

2) Bidaik NE Prospect

This Prospect, located 1.5 km northeast of the Bidaik, has been newly identified in the course of the 1998 campaign. Three parallel to sub parallel quartz vein systems, trending in the N-S to NNW-SSE directions, are identified in the prospect. They are No.1, No2 and No.3 vein system from west to east. An old trench is located in the No.2 vein system suggesting a prospecting work in the era of the former USSR.

Phase II survey confirmed the high content of gold in NE-2 vein of No.2 vein system. The vein runs for a traceable distance of about 100 m in the NNW-SSE to NW-SE directions, changing its direction in midway. The trench, as aforementioned, is located in the southern half of the vein, where the vein width is measured at approximately 2.0 m. The vein consists of milky white to light brown very fine-grained quartz, accompanying limonite veinlets or dissemination. Quartz veinlets networks are developed in intensely silicified wall rocks. Alteration minerals such as quartz, sericite/montmorillonite mixed layer minerals, kaolinite and carbonate are identified by the X-ray diffraction analysis of an intensely silicified well rock sample.

Of a total samples collected from the NE-2 vein, three samples returned extremely high gold values of 286, 320 and 364 g/t, and another sample also indicated a significant value of 8.25 g/t Au. In addition, a channel sample for a width of 2.0 m indicated a gold content of 0.93 g/t. Those samples, having indicated high gold values, contained a significant amount of lead (several hundreds ppm) as well. High values of barium were also obtained in some samples. Except on NE-2 vein, no samples showed any significant values for gold content.

3) Taguloba Prospect

This Prospect was prospect by the geology teams of the former USSR during the period of 1978 through 1981. At the present time, 9 trenches and abandoned drill cores can be observed at the site (Figure 5-51). A detailed geological mapping and sampling was carried out during the 1998's campaign of the current project in order to re-assess the lateral and down-dip potential of known mineralization.

A number of quartz veins trending in the NNW-SSE direction occur in an area approximately 700m long and 200 to 250m wide (Figure 5-5). Intense silicification and quartz veinlets networks are well developed along relatively continuous tabular quartz veins. Quartz veinlets vary in their appearances, showing milky, pinkish or dark greyish

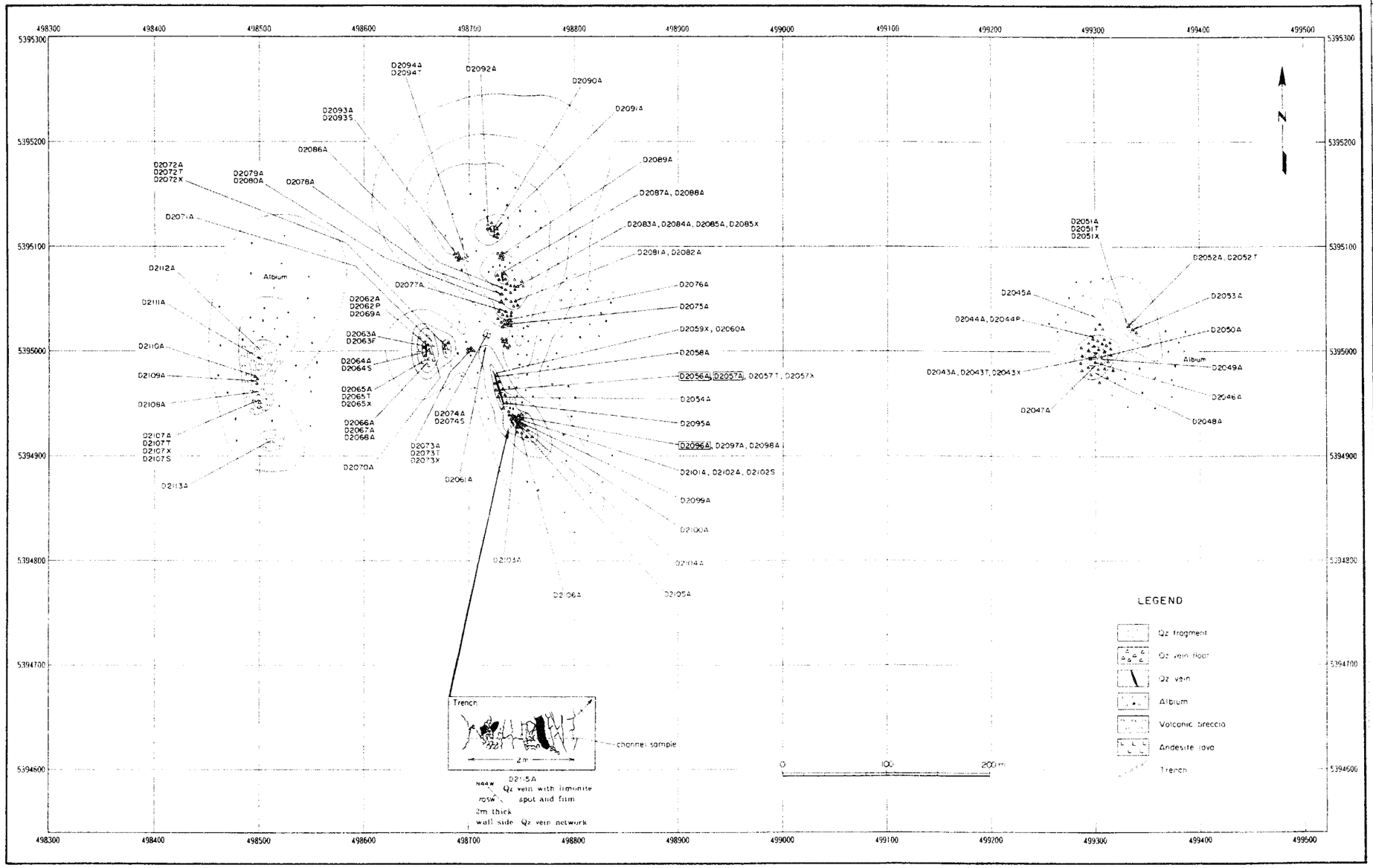


Figure 5-50 Fact Geology, Sample Location and Assay Results in Bidaik-NE Prospect

Sample No	Description	Au(g/t)	Ag(g/t)	Cu(ppm)	Pb(ppm)	Zn(ppm)	Mo(ppm)
D2043 A	light gray strongly silicified rock with limonite vein	2.04	2.5	40.9	17	21.1	5
D2044 A	limonite with Qz vein spot	0.02	<0.2	33.2	1020	31.9	34
D2045 A	white Qz vein with limonite film	0.01	0.1	22.8	12	10.1	4
D2046 A	light gray strongly silicified rock	0.02	0.2	85.7	24	27.9	4
D2047 A	light gray strongly silicified rock with Qz vein network	0.01	0.4	12.3	18	7.3	2
D2048 A	reddish light gray strongly silicified rock	0.01	0.4	15	11	8	3
D2049 A	light gray strongly silicified rock with limonite film	0.03	0.6	30	17	30.5	2
D2050 A	strongly silicified rock with limonite film	0.01	1	59.9	27	46.2	4
D2051 A	strongly altered volcanic rock with greenish clay minerals	< 0.01	0.2	101	6	40.6	2
D2052 A	strongly silicified rock, brecciated host rock	0.01	0.4	63.4	35	20	3
D2053 A	reddish light gray strongly silicified rock	0.01	0.6	88.3	15	18.5	3
D2054 A	reddish light gray strongly silicified rock with milky white Qz vein network	0.93	2.1	24	910	7.8	6
D2055 A	reddish light gray strongly silicified rock with Qz vein	0.01	0.5	20.5	37	3.2	9
D2056 A	reddish light gray strongly silicified rock with Qz vein	364.00	18.9	14.8	855	12.4	5
D2057 A	reddish strongly silicified rock with white clay mineral, brecciated	286.00	11.1	33.5	1910	17.6	5
D2058 A	white Qz vein with limonite spot(1-2mm)	0.72	0.6	4.7	47	1.1	6
D2060 A	milky white Qz vein	0.20	1.5	19.9	210	3.1	7
D2061 A	reddish brown limonite coated milky white Qz vein	0.02	0.3	19.2	3	2.9	5
D2062 A	Qz vein with brown limonite spot and film	0.07	0.5	27.2	83	3.2	17
D2063 A	Qz vein with reddish - yellowish limonite	0.01	0.3	15.2	3	2.8	18
D2064 A	strongly silicified rock with Qz	< 0.01	<0.2	22.7	5	3.5	11
D2065 A	hydrothermal altered rock	< 0.01	0.5	7.2	2	2.8	1
D2066 A	Qz vein with limonite film	0.09	0.4	20.9	6	3.5	14
D2067 A	strongly silicified rock	0.21	<0.2	13.3	4	2.2	10
D2068 A	strongly silicified rock with Qz and limonite vein network	< 0.01	0.5	75.8	5	12.3	6
D2069 A	Qz vein with limonite spot	0.06	1	24.4	19	2.2	26
D2070 A	white Qz vein	< 0.01	0.3	6.8	<2	1.8	8
D2071 A	white Qz vein with brown - yellow limonite	< 0.01	<0.2	6.9	2	2.1	7
D2072 A	reddish - brownish strongly altered volcanic rock with Qz vein	< 0.01	0.2	46.8	4	19.5	2
D2073 A	red colored volcanic rock with clay mineral vein	< 0.01	0.4	11.4	4	4	1
D2074 A	altered volcanic rock with banded Qz and hematite	< 0.01	0.3	205	21	27	9
D2075 A	white Qz vein with yellowish	< 0.01	<0.2	9.8	<2	2.5	6
D2076 A	strongly silicified rock with drusy Qz vein	< 0.01	0.3	9.7	4	4.7	6
D2077 A	strongly silicified rock with Qz vein and brown limonite	0.34	0.4	11.3	<2	2.4	5
D2078 A	Qz vein with yellowish limonite	0.01	0.4	11.8	3	4	6
D2079 A	Qz vein with clay mineral and reddish brown limonite film	0.03	0.3	20	3	2.9	6
D2080 A	Qz vein with clay mineral and reddish brown limonite film	0.01	<0.2	11	3	4.7	5
D2081 A	saccharoidal Qz vein with yellowish limonite	0.06	<0.2	7.2	3	1	5
D2082 A	saccharoidal Qz vein with yellowish limonite and chlorite	0.10	<0.2	7.2	<2	1.1	6
D2083 A	reddish pale brown Qz vein with limonite network	0.12	0.2	16.8	7	6.4	4
D2084 A	reddish pale brown Qz vein with limonite network and chlorite	0.03	0.3	13.2	6	3.4	3
D2085 A	Qz vein with limonite network and greenish clay mineral	0.05	0.2	13	7	3.2	3
D2086 A	saccharoidal Qz vein with yellowish limonite and clay mineral	< 0.01	0.3	15.8	3	2.5	4
D2087 A	transparency Qz vein with limonite spot and film	0.01	0.6	19.6	38	2.2	3
D2088 A	transparency Qz vein with limonite spot and film	0.02	0.5	24	5	3.2	5
D2089 A	pale brown Qz vein with limonite spot and network	0.10	0.4	18.2	6	3.8	3
D2090 A	pale brown Qz vein	0.03	0.7	18.8	10	10.3	2
D2091 A	strongly silicified rock with reddish brown Qz vein network	0.06	0.6	30.3	10	4.7	4
D2092 A	Qz vein with reddish - yellowish limonite spot and band	0.07	0.7	29.1	9	5.3	10
D2093 A	pale brownish white Qz vein with black - brown limonite	0.02	0.4	12.6	6	1.7	15
D2094 A	strongly altered volcanic rock	< 0.01	0.6	9.4	4	3.2	3
D2095 A	Qz vein with limonite film and spot	0.03	0.4	22.9	16	4.3	9
D2096 A	white Qz vein with reddish brown limonite	320.00	11.9	44.9	715	5.9	9
D2097 A	white Qz vein with reddish and yellowish brown limonite	0.28	0.4	36.3	305	3.2	4
D2098 A	saccharoidal Qz vein with yellow limonite	0.29	1.2	48.4	323	5	7
D2099 A	saccharoidal Qz vein with greenish clay mineral and yellow limonite	0.45	1.3	40.7	11	3.2	9
D2100 A	white Qz vein with limonite film	0.09	0.4	13.6	29	1.6	4
D2101 A	very fine grain Qz vein with reddish and yellowish brown limonite	0.20	0.9	35.4	49	4.2	33
D2102 A	very fine grain Qz vein with reddish and yellowish brown limonite	8.23	3.1	30.8	66	3.7	5
D2103 A	pale brown Qz vein with brown limonite	0.13	0.7	21.7	3	2.6	8
D2104 A	pale brown Qz vein with clay mineral and brown limonite	0.04	0.2	36.5	9	4	8
D2105 A	pale brown Qz vein with brown limonite	0.13	1.5	31.6	26	5.2	11
D2106 A	strongly silicified rock with white Qz vein network	0.04	1.2	26.5	5	4.1	9
D2107 A	strongly altered Qz bearing acidic tuff with reddish - yellowish brown limonite	0.01	0.2	31.9	2	5.9	7
D2108 A	reddish brown Qz bearing acidic	0.01	0.3	18.7	6	3.5	3
D2109 A	reddish brown Qz bearing acidic tuff with banded Qz vein	< 0.01	0.4	22.8	5	3.8	4
D2110 A	Qz vein with reddish - yellowish brown limonite	< 0.01	0.2	12.5	3	1.7	4
D2111 A	strongly altered Qz bearing acidic	< 0.01	0.3	32.7	4	7.9	13
D2112 A	strongly altered volcanic rock with Qz vein(1cm)	< 0.01	0.2	11.5	3	2.9	3
D2113 A	altered volcanic rock with black - brown limonite vein	< 0.01	0.2	114	11	26	3
D2114 A	trench channel sampling 1m wide Qz vein	0.95	0.7	42.9	36	3.5	7

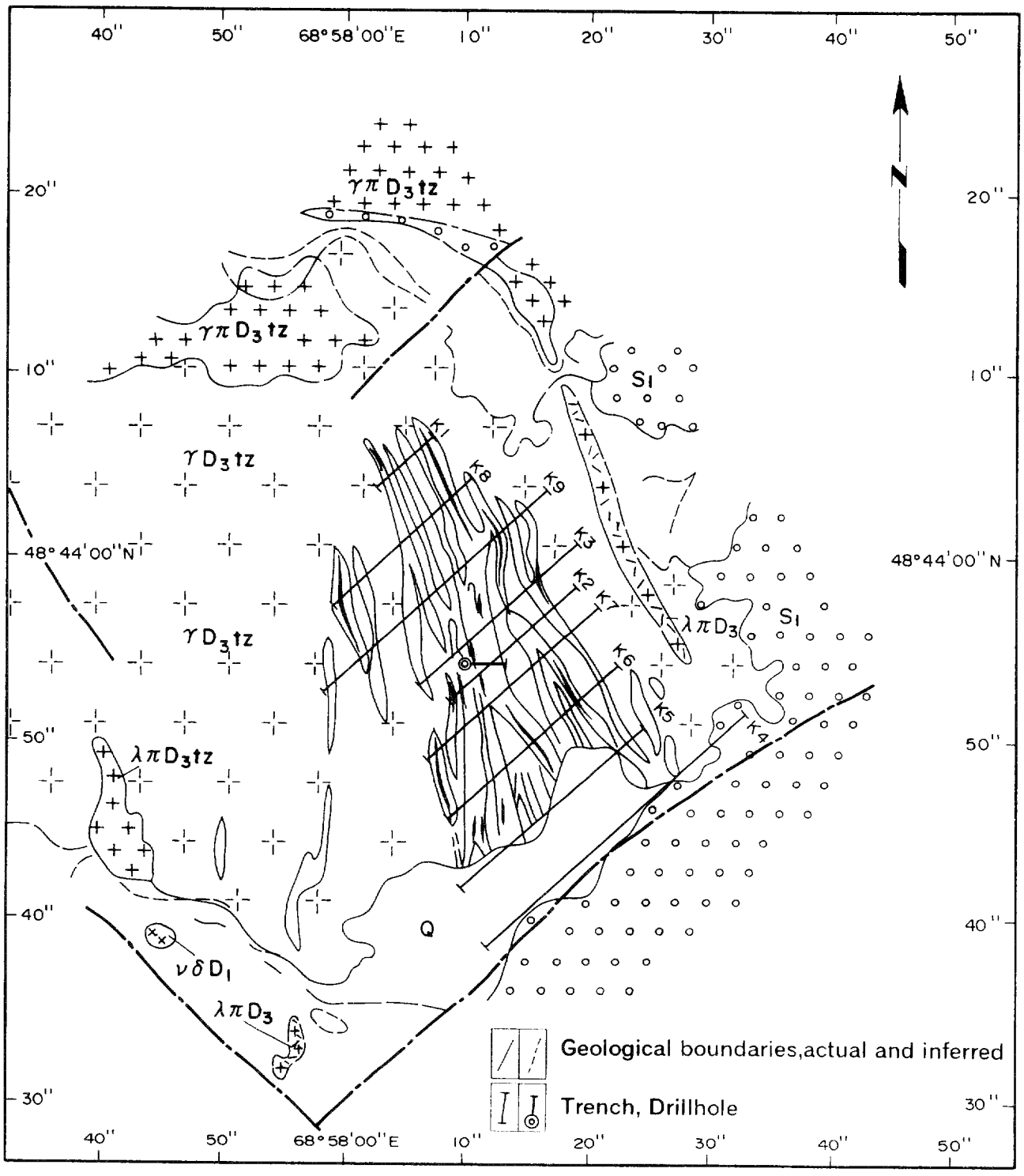
colour, and occasionally banded textures. Iron oxide minerals and a very minor chalcopyrite are observed in a quartz sample under microscope. The X-ray diffraction analysis has identified quartz and sericite/montmorillonite mixed layer minerals in an intensely silicified wall rock sample. The homogenization temperatures of fluid inclusions in a quartz sample has indicated a range between 114.7 and 189.4℃ with an average of 151.8℃

A large number of samples have been submitted for chemical analysis (Figure 5-51). However, only two samples returned gold values better than 1 g/t. No significant contents of other elements are indicated in anyone of these samples.

(c) Results and Follow up survey

The Bidaik Area has regionally undergone alteration-mineralization possibly of epithermal nature, judging from the homogenization temperatures of fluid inclusions and the occurrences of mineralization and alteration. However, the surface geological mapping and geochemical sampling during the 1998's campaign failed to locate any signs of significant gold mineralization except extremely high gold values in a few samples from the NE-2 vein system in the NE Bidaik Prospect. The NE-2 vein System, having been traced for a strike length of 100 m, is covered by alluvials for its northern and southern continuations and remains as a target for further the prospection. The vein system should be revealed by trenching for its northern and southern continuations and followed by drilling for its down dip continuation.

Although the result of the 1998's campaign is generally disappointing, the Bidaik Area is largely concealed by extensive alluvial covers. It is virtually impossible to regionally assess the mineral potential of the Area only based on surface works relying on extremely limited exposures. To date, no intrusion responsible for the alteration-mineralization has been identified. However, one small body of diorite (gabbro) is mapped in the Taguloba Prospect and, reportedly, shows a positive contrast in magnetics against surrounding geology. Such relatively basic to intermediate intrusions may be related to the mineralization, judging from the result in other areas (e.g. Zalturbulak). It may be expected that the mineralization be up-graded in size and metal concentration in the proximity of such intrusions. It will be, therefore, worthwhile (1) to review the existing magnetic maps and (2) carry out a ground magnetic survey in an area covered by alluvial, in the vicinity of known mineralization for the three Prospect.



LEGEND

- Q — Quaternary sand, loam, sandy loam clay
- S1 — Lower silurian band of metamorphosed dark green polymictic sandstone
- νδ D1 — Gabbro-diorite
- λπ D3 — Felsic granite porphyry
- γπ D3tz — Pink leucocratic granite with pegmatophyre texture
- γD3tz — Pink fine grained leucocratic granite porphyry
- Zone of beresitization
- Quartz vein
- Faults inferred from geological and geophysical data

Figure 5-51 Taguloba Prospect Schematic Geological Map

(After Results of Geological and Geophysical Survey Work of Taguloba Prospect, 1978-1981 original scale 1:5,000)

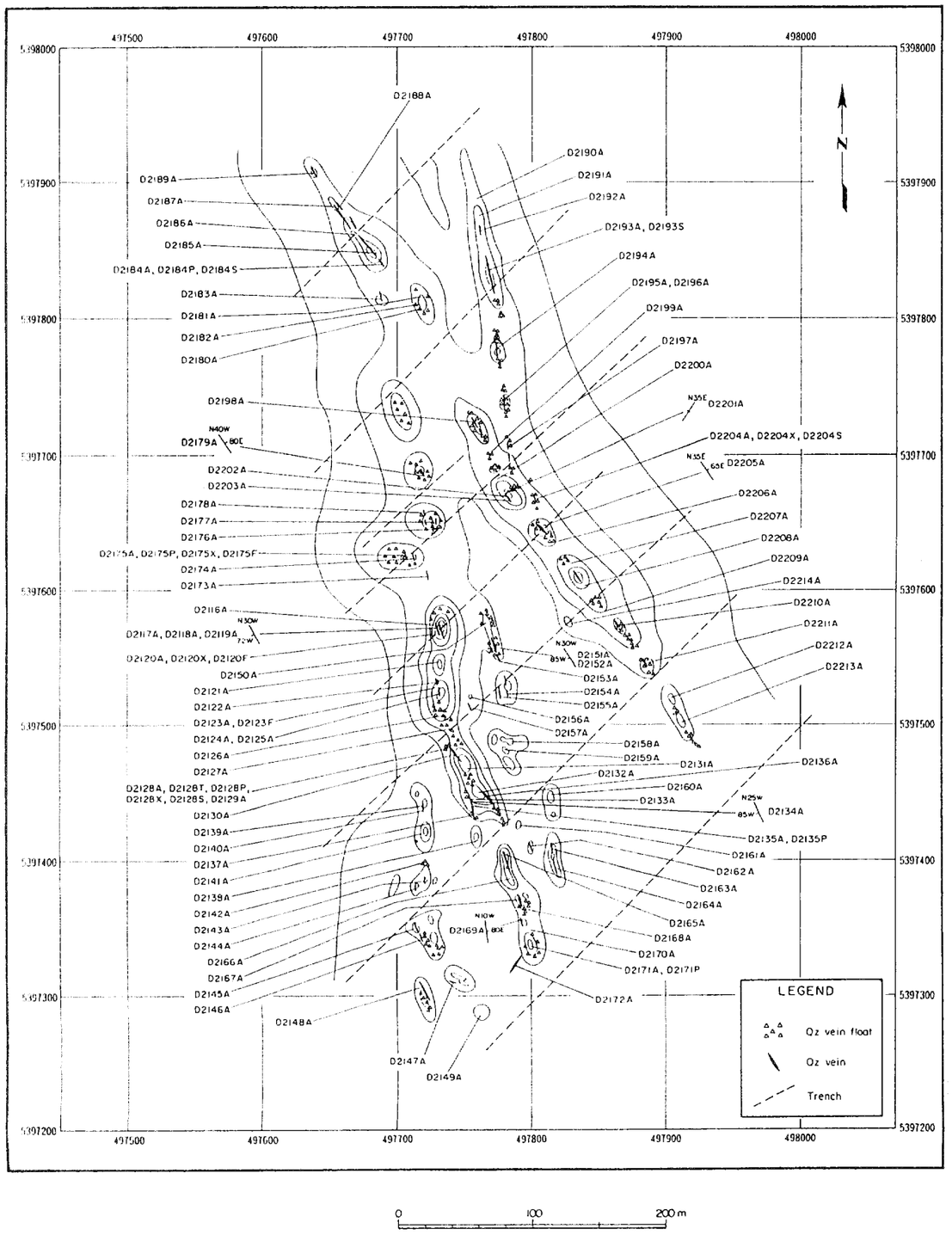


Figure 5-52 Fact Geology and Sample Location Map, Taguloba Prospect

Sample No.	Description	Au(g/t)	Ag(g/t)	Cu(ppm)	Pb(ppm)	Zn(ppm)	Mo(ppm)
D2116 A	strongly sillicified rock with reddish Qz vein network and limonite film	0.05	0.3	7	4	1	79
D2117 A	saccharoidal Qz vein with limonite film and pyrite	0.04	0.6	8.4	4	1.5	140
D2118 A	strongly sillicified rock with drusy Qz vein(1cm) and limonite film	0.01	0.7	4	2	2.1	15
D2119 A	Qz vein with reddish brown - black limonite spot	1.12	0.6	7.9	4	1.6	71
D2120 A	pinkish Qz vein with drusy and gray - black Qz vein and limonite	0.01	0.5	5.7	10	3.1	37
D2121 A	strongly sillicified rock Qz veinlet	0.02	0.2	5.7	3	1.4	45
D2122 A	pinkish - greenish Qz vein with drusy Qz vein (dark colored)	< 0.01	0.4	3.8	< 2	1.1	9
D2123 A	drusy white Qz vein (2 - 3cm)	< 0.01	0.3	7.3	< 2	1.1	9
D2124 A	coarse grain Qz vein with dark part of	< 0.01	0.4	4.8	4	1.4	7
D2125 A	strongly sillicified rock drusy Qz vein	< 0.01	<0.2	5.5	2	1.8	6
D2126 A	Qz vein with limonite film	< 0.01	<0.2	6.7	2	1.7	8
D2127 A	greenish altered rock with banded pink and black Qz vein	< 0.01	0.3	6.5	2	0.6	3
D2128 A	pinkish Qz vein with dark colored Qz	0.02	0.4	4.3	3	1.6	6
D2129 A	pinkish Qz vein with dark colored Qz	< 0.01	0.5	8	2	2.6	8
D2130 A	pinkish and black Qz vein with limonite	< 0.01	<0.2	4.1	2	1.4	7
D2131 A	strongly sillicified rock with Qz veinlet network	< 0.01	0.2	5.9	3	2	10
D2132 A	strongly sillicified rock with Qz veinlet network and limonite film	< 0.01	<0.2	4.6	4	2.2	6
D2136 A	white and black part banded Qz vein						
D2137 A	gossan; black - reddish brown limonite	0.01	0.4	27.5	4	14.5	23
D2138 A	strongly sillicified rock with limonite and Qz vein network	0.02	<0.2	8.7	3	3.7	22
D2139 A	reddish gray strongly sillicified rock with Qz vein network	0.01	0.3	8.9	4	1.1	9
D2140 A	white Qz vein with drusy Qz and black colored spot	1.70	0.4	9.4	4	2.4	10
D2141 A	strongly sillicified rock with limonite and drusy Qz spot	0.02	0.4	7.8	10	1.7	9
D2142 A	black Qz vein float	< 0.01	0.3	2.9	<.2	0.5	5
D2143 A	sillicified rock with Qz vein and limonite film and spot	0.61	0.5	6.8	<.2	0.9	7
D2144 A	drusy Qz vein with black Qz	0.02	0.6	6.6	5	1.4	9
D2145 A	pinkish Qz vein with black Qz vein	< 0.01	<0.2	6.4	3	0.8	7
D2146 A	black and white banded Qz vein	0.01	<0.2	5.3	12	0.8	4
D2147 A	strongly sillicified rock with Qz vein network	0.71	0.4	5.6	4	1.9	7
D2148 A	saccharoidal Qz vein with limonite film	0.02	<0.2	7.1	3	1.4	16
D2149 A	white Qz vein with limonite	0.02	0.3	6.9	3	1.4	20
D2150 A	strongly sillicified rock with Qz vein network	0.03	0.2	8.4	<.2	2.5	30
D2151 A	saccharoidal Qz vein with disseminated limonite	0.04	<0.2	5.6	3	1.1	16
D2152 A	brecciated host rock with Qz vein	0.03	0.4	4.9	3	2.3	71
D2153 A	drusy saccharoidal Qz vein with limonite film	0.01	0.5	7	38	1.8	157
D2154 A	strongly sillicified rock with Qz vein and disseminated limonite	0.02	0.4	5.7	5	1.3	33
D2155 A	strongly sillicified rock with euhedral Qz vein and limonite film and spot	0.01	0.6	6.2	14	1.3	41
D2156 A	strongly sillicified rock with Qz vein network	0.01	0.5	5.7	53	2.3	84
D2157 A	saccharoidal Qz vein with limonite film	< 0.01	0.4	6.6	11	1.4	11
D2158 A	strongly sillicified rock with limonite	0.01	0.3	8.3	7	3.3	103
D2159 A	white Qz vein with limonite film	0.01	<0.2	5.6	4	2.7	31
D2160 A	strongly sillicified rock with limonite	0.02	<0.2	3	<.2	1.8	28
D2161 A	strongly sillicified rock with euhedral Qz vein and pyrite	0.02	0.5	5.6	5	2.7	19
D2162 A	Qz vein with limonite spot and small	< 0.01	0.6	4.5	6	1.4	39
D2163 A	saccharoidal Qz vein with black Qz vein film	< 0.01	0.3	7.5	5	1.6	25
D2164 A	saccharoidal Qz vein with reddish brown limonite	0.01	<0.2	7	3	2.5	12
D2165 A	greenish host rock with drusy Qz vein and limonite film	0.03	0.4	4.1	4	1.4	16
D2166 A	strongly sillicified rock with limonite film and spot	0.01	<0.2	9.7	2	3.3	301
D2167 A	drusy Qz vein with white clay mineral	< 0.01	<0.2	7.1	5	1.2	22
D2168 A	black Qz vein with limonite network	0.07	0.3	11.9	4	1.8	11
D2169 A	saccharoidal Qz vein with limonite film	0.01	<0.2	6.3	3	1	20
D2170 A	strongly sillicified rock with drusy Qz vein network	< 0.01	<0.2	3.9	3	1.8	23
D2171 A	strongly sillicified rock with drusy Qz vein network and limonite spot	0.03	0.5	7.1	2	1.8	29
D2172 A	drusy white Qz vein network include banded dark colored Qz vein	< 0.01	<0.2	3.8	2	1	6
D2173 A	strongly sillicified rock with drusy Qz veinlet network	< 0.01	0.2	6.2	3	1.7	7
D2174 A	pinkish host rock with Qz vein network	< 0.01	0.5	3.1	5	2	5
D2175 A	white Qz vein with banded black Qz	< 0.01	0.4	6.8	4	0.7	7
D2176 A	drusy Qz vein with black Qz patch	< 0.01	0.4	2.5	< 2	0.5	4
D2177 A	drusy saccharoidal Qz vein with yellow clay minral	< 0.01	0.3	3.2	3	1.1	5
D2178 A	pinkish host rock with Qz vein network	< 0.01	<0.2	6.4	4	1.6	52
D2179 A	drusy saccharoidal Qz vein with white clay minral	< 0.01	0.4	2.7	< 2	0.9	6
D2181 A	strongly sillicified rock with limonite	< 0.01	0.3	2.1	4	1	3
D2182 A	strongly sillicified rock with Qz vein and limonite spot	1.31	0.3	8.3	3	2.1	8
D2183 A	strongly sillicified rock with drusy Qz	0.03	<0.2	9.8	6	5.7	10
D2184 A	Qz vein with disseminated pyrite and limonite film	0.32	<0.2	5.7	5	1.6	10
D2185 A	saccharoidal Qz vein with limonite spot	< 0.01	<0.2	6.8	3	1.2	15
D2186 A	drusy saccharoidal Qz vein with limonite spot	< 0.01	<0.2	2.9	8	-0.5	6
D2187 A	brownish saccharoidal Qz vein with disseminated limonite	0.32	0.8	31.4	25	3.1	74
D2188 A	dark colored host rock with disseminated limonite	0.01	0.3	6.1	4	1.5	9
D2189 A	saccharoidal Qz vein with limonite film	< 0.01	<0.2	9	7	1.7	31
D2190 A	strongly sillicified rock with limonite	< 0.01	0.3	12.5	2	3.1	8
D2191 A	strongly sillicified rock with drusy Qz vein and limonite film	0.02	0.3	8.5	4	1.8	23
D2192 A	drusy saccharoidal Qz vein with black Qz spot	< 0.01	0.3	4.5	4	2	66
D2193 A	saccharoidal Qz vein with limonite film network	< 0.01	<0.2	4.1	4	3.7	38
D2194 A	greenish host rock with drusy Qz vein network and black Qz	0.01	0.5	7.7	6	3	10
D2195 A	mussive saccharoidal Qz vein with limonite spot	0.02	<0.2	6.2	18	1.4	75
D2196 A	greenish host rock with Qz vein network and drusy Qz veinlet film	< 0.01	0.4	2.3	6	1.5	5
D2197 A	greenish host rock with drusy Qz vein network	< 0.01	0.2	7.8	10	1.4	8
D2198 A	greenish host rock with drusy Qz vein network and reddish brown limonite disseminated	0.70	0.5	7.9	< 2	2	22
D2199 A	fine grain mussive Qz vein with limonite disseminated spot	0.05	0.2	5.7	7	1	101
D2200 A	dark colored Qz vein with banded	< 0.01	0.5	6.7	< 2	0.5	15
D2201 A	brecciated host rock with Qz vein	< 0.01	<0.2	2.4	4	1	8
D2202 A	reddish brown Qz vein with dark colored Qz and limonite spot	0.59	-1	2.4	-5	12	0.4
D2203 A	reddish brown Qz vein with dark colored Qz and limonite spot	< 0.01	-1	1.9	-5	-3	-0.2
D2204 A	white Qz vein with black mineral and marcacite spot	< 0.01	0.2	9.1	7	2.4	15
D2205 A	Qz vein network	0.38	<0.2	2.7	4	2.6	6
D2206 A	saccharoidal Qz vein with drusy Qz vein	0.05	<0.2	7.1	4	1.4	20
D2207 A	strongly sillicified rock with Qz vein network	0.01	0.2	3.4	3	2	11
D2208 A	strongly sillicified rock with reddish brown limonite film	< 0.01	<0.2	8.1	< 2	1.1	21
D2209 A	strongly sillicified rock with yellowish brown limonite film	0.03	<0.2	3.9	< 2	1.7	33
D2210 A	saccharoidal Qz vein with smoky Qz	0.02	0.2	7.3	4	1.3	23
D2211 A	pinkish brown host rock with Qz vein network	0.01	<0.2	3.4	14	1	22
D2212 A	pinkish brown host rock with Qz vein network and yellowish brown limonite	0.01	<0.2	7.2	10	1.6	9
D2213 A	reddish brown weathered host rock with limonite spot	0.01	<0.2	5.3	2	1.1	10
D2214 A	strongly sillicified rock with limonite	0.01	<0.2	12.9	2	4.4	58

5-5 Kuzultas Area

5-5-1 Survey area and Scope of work

Kuzultas prospect is located in the southeast of the survey area centered on 48°21'45"N, 68°55'30"E. The Kuzultas covers an area of approximately 40km^2. The prospect may be divided into three main zones: Kuzultas NE zone in the southwest, Kuzultas SE in the northeast and Kuzultas NW in the northwest (Figure 5-53). The detailed geological survey was carried out in Kuzultas SE and Kuzultas NW by phase I and the survey in Kuzultas SW zone was completed by the phase I field campaign (JICA/MMAJ,1998).

5-5-2 Results

(1) Geology

The prospect is hosted by Lower Devonian fine grained, extrusive volcanic rocks of rhyodacite, andesite-dacite, andesite, and basalt compositions. These units are underlain by Lower Devonian tuff-conglomerate (Figure 5-53).

Several NW and EW trending faults are mapped or inferred from geology and the Landsat image. Most faults appear to post-date mineralization, although, as vein zones follow similar trends, some faults may have been active during the mineralizing event.

(2) Mineralization

The mineralization zones consist of quartz-hematite-barite veins or networks of quartz veinlets within intensely silicified Lower Devonian volcanics. Many veins of this zone trend in E-W or NW-SE directions.

1) Kuzultas SW Prospect(Figure 5-54)

This prospect is approximately 300 meters long by 100 meters wide and consists of 3 vein sets which trend in an NW direction. The veins generally form sheeted sets which are from 30 to 70 meters long and 1 to 10 meters wide. Individual quartz veins and veinlets are composed of milky white fine grained quartz and may have limonitic center lines and selvages. The veins are from 1mm to 50 cm wide.

Wallrock adjacent to veins are a yellow-brown color and have been intensely altered to clay and green illite (sericite). Original rock textures may be completely destroyed. In parts wallrock is stained red by disseminated hematite. X-ray diffraction analysis confirms that quartz, sericite, hematite and kaolinite, with traces of pyrite and chlorite, are the main alteration minerals.

Examination of polished sections indicates goethite, hematite, limonite, magnetite and traces of lepidocrocite, pyrite, chalcopyrite, and gold are present in the weathered

quartz veins at surface.

Analyzable fluid inclusions were found in only one of two specimens submitted to the laboratory. Homogenization temperatures ranged from 183-243 °C.

The best gold result was 0.9 g/t for a 3 meter channel sample of stockwork quartz veins with limonite coating fractures and cavities.

2) Kuzultas SE Prospect (Figure 5-55)

This prospect consists of E-W, WNW-ESE and NW-SE trending quartz-hematite-barite veins .

E-W veins are discontinuously distributed over a distance of approximately 1200 meters intersected by the WNW-ESE veins of 800 meters longs in the eastern part. NW-SE trending quartz veins are distributed in the western and southern part of the prospect.

E-W veins have been extensively trenched with trench intervals of 10 to 40 meters. Wallrock adjacent to veins are a yellow-brown color and have been intensely altered to clay and green illite (sericite). Original rock textures may be completely destroyed. In parts, wallrock is stained red by disseminated hematite. X-ray diffraction analysis confirms that quartz, sericite-smectite mixed layered and calcite.

Examination of polished sections indicates oxide iron minerals and traces of chalcopyrite, and gold are not present in the samples examined in phase II survey.

Analyzable fluid inclusions were found in only one specimen from WNW-SES quartz vein submitted to the laboratory. Homogenization temperatures ranged from 183-190 °C.

Gold results are very low (Figure 5-55). With regard to other elements, barium is weakly anomalous in a few samples, while silver, copper, molybdenum, lead and zinc are not anomalous.

3) Kuzultas NW

This prospect was discovered by phase II survey. Intensely silicified rocks with quartz vein network form the hills. E-W, NS and NW-SE trending quartz veins are observed in the area. Quartz veins are white fine grained with yellowish brown to reddish brown limonite selvages.

Wallrock adjacent to veins are a light grey color and have been intensely altered to silicified rock and sericite.

Gold is anomalous at 0.23g/t and 0.46g/t. Other elements are at background levels.

(3) Resource estimation and Recommendations

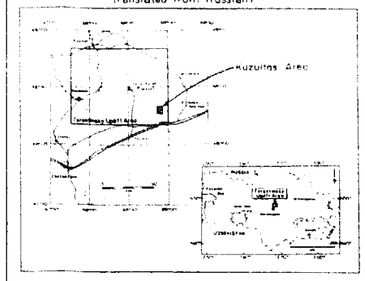
Soviet geologists estimated the potential gold resource at Kuzultas SW Prospect to be 5330 kg Au, in category P2 (1,066,650 metric tonnes @ 5 g/t Au, assuming a specific gravity of 2.6, and a depth of 15 meters). Phase I trench sampling results indicate the average grade of mineralization at surface is <1.0 g/t Au. As such, the potential resource would be <1000 kg Au.Gold mineralization were not identified in this area in spite of detailed survey. No further work is recommended.

Plate III-4-2-1

REPORT ON THE MINERAL EXPLORATION IN THE TERSEKTINSKY UPLIFT AREA, REPUBLIC OF KAZAKHSTAN (PHASE II)

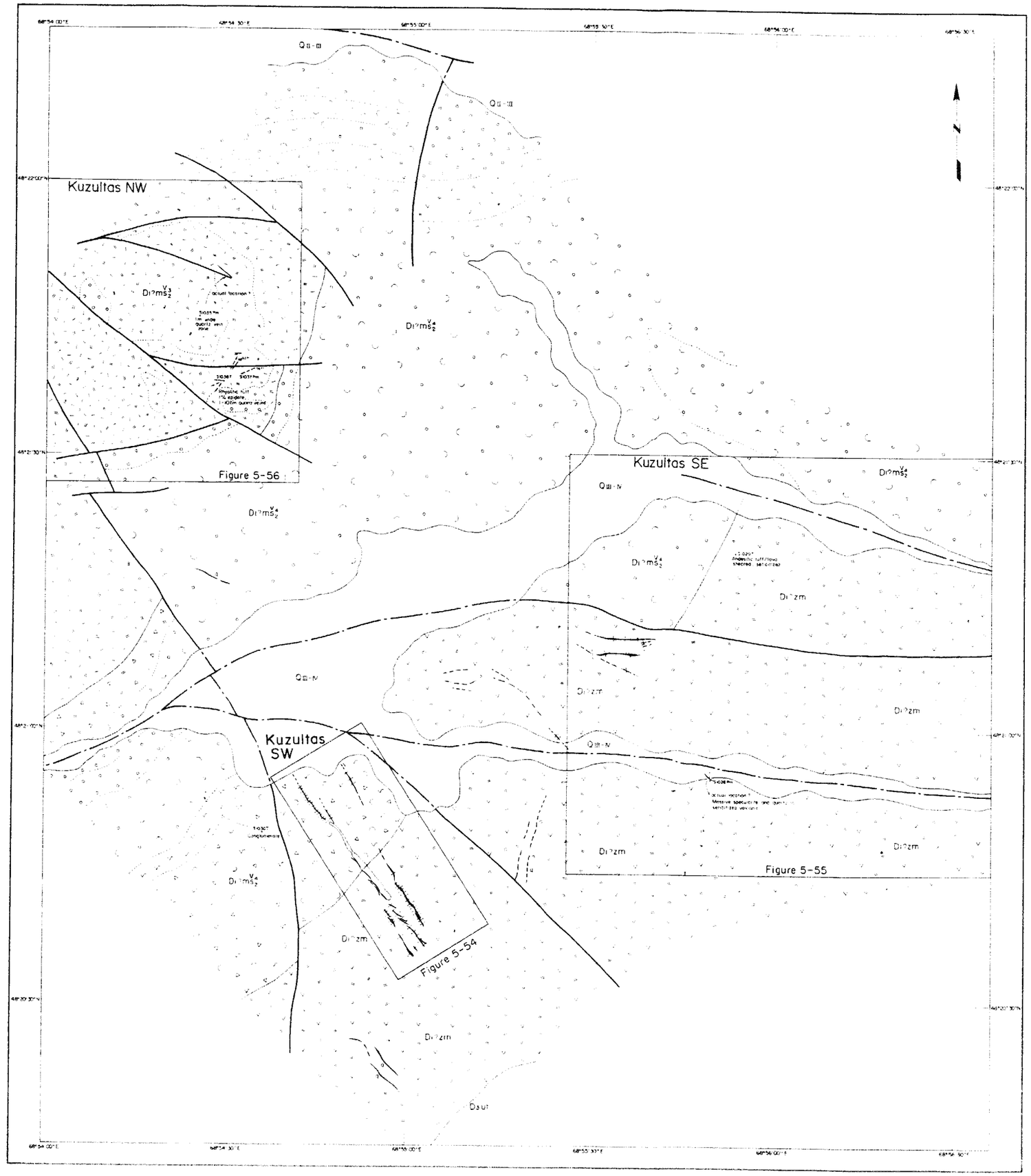
Geological Map of Kuzultas Area

(after Schematic Geology of Kuzultas Area '97.2 translated from Russian)



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

FEBRUARY 1999

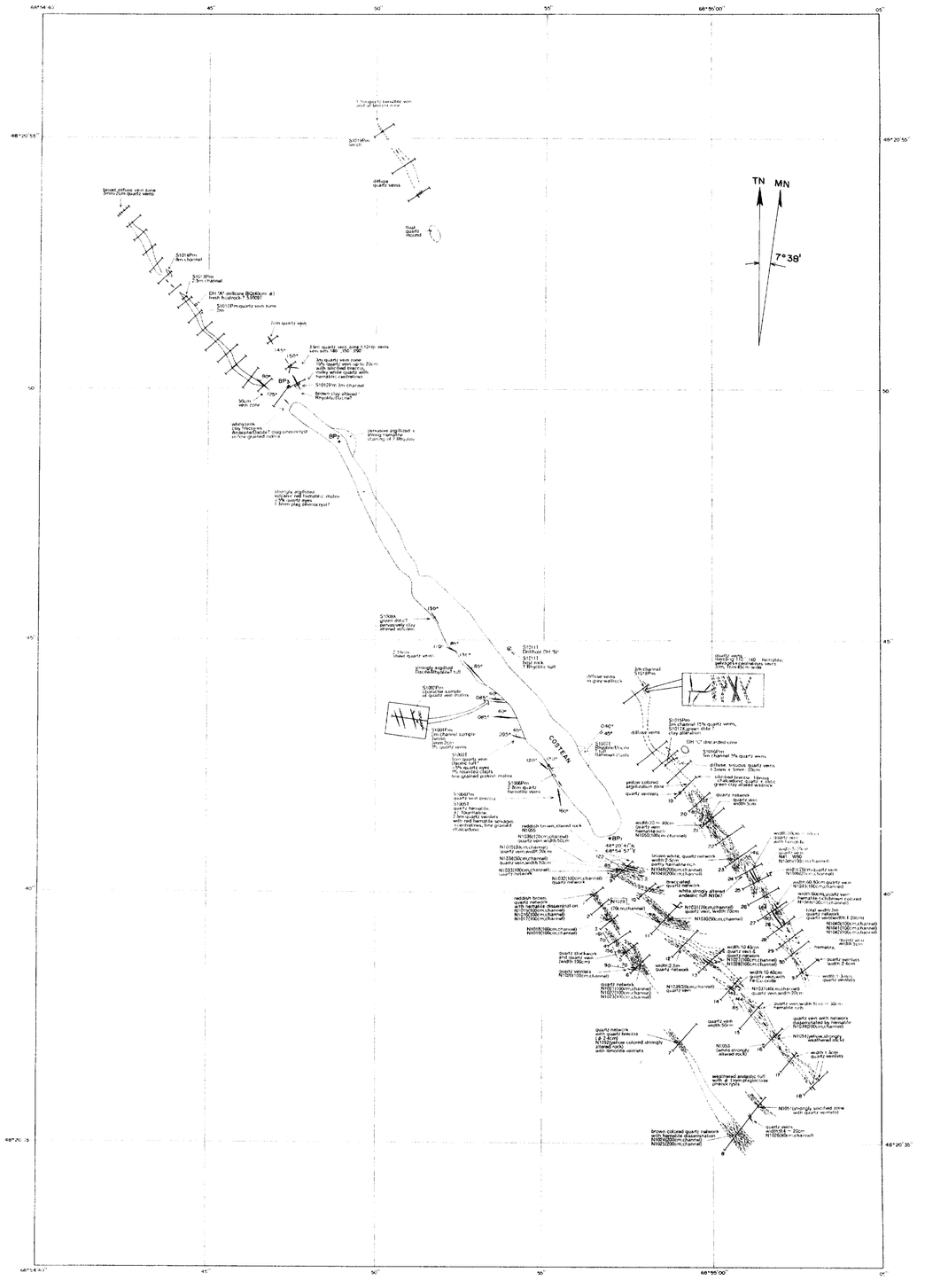


0 100 200 300 400 500m

LEGEND

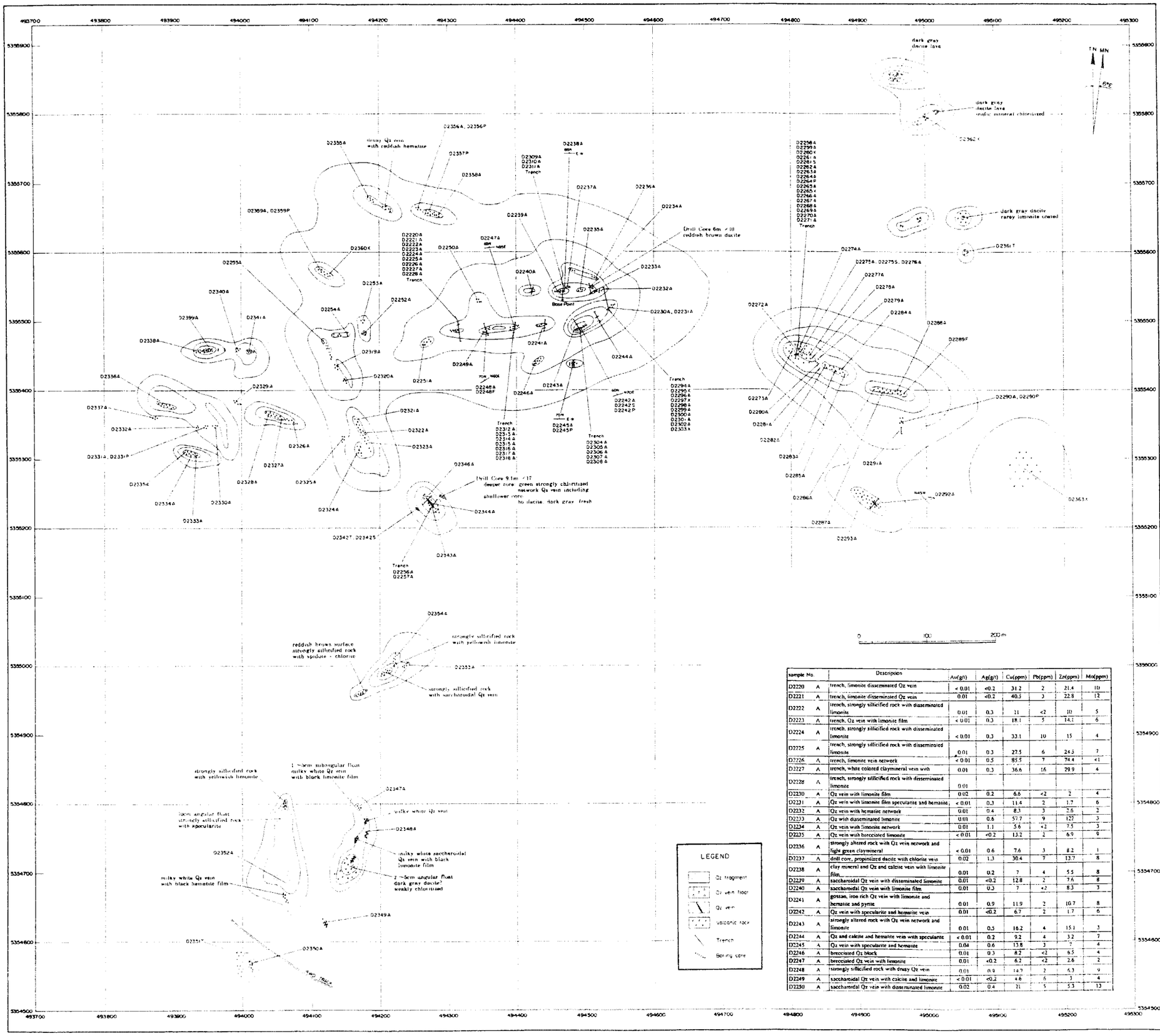
- Qu-IV : Quaternary — alluvial and eolian deposits
- Qu-III
- Dsul : Upper Devonian — Ulitass Formation ; sandstone
- Dl?zm : Lower Devonian — Zeltumess Formation ; Rhyolite, rhyo-dacite, andesite-dacite
- $Dl?ms_2^{V4}$: Lower Devonian ④ Turgaisyn Formation ; Tuff-conglomerate and andesitic volcanic breccia
- $Dl?ms_2^{V3}$: Lower Devonian ③ Turgaisyn Formation ; Rhyodacite lava
- Alluvial and eolian : sand, sandy loam, and lacustrine clays
- Sandstone
- Conglomerate
- Tuff
- Tuff-conglomerate
- Rhyodacite-Andesite-dacite ?
- Rhyodacite
- Dacitic volcanic breccia ?
- Andesite ?
- Andesitic tuff, tuff and volcanic breccia ?
- Andesite-dacite ?
- Quartz vein
- Inferred projection of quartz vein zone
- Fault
- Inferred fault
- Lithological boundary
- Inferred lithological boundary
- Trench
- Lineation
- Rock sample location

Figure 5-53 Geological Map of Kuzultas Area



Sample Number	Au ppm	Ag ppm	As ppm	Cu ppm	Mo ppm	Pb ppm	Sb ppm	Zn ppm	Ba ppm	Sample Type
N1015	0.02	-0.3	100	44.3	23	6	7	10.0	56	T
N1016	0.06	0.2	73	49.7	14	6	-5	6.7	107	T
N1017	-0.01	-0.2	79	50.5	6	2	-5	6.9	46	T
N1018	0.01	-0.2	27	22.1	5	5	-5	3.0	35	T
N1019	0.25	1.4	183	56.3	21	-2	9	7.7	80	T
N1020	0.05	-0.2	70	25.3	6	6	-5	5.7	176	T
N1021	-0.01	0.2	56	33.3	15	10	6	12.9	40	T
N1022	0.02	0.2	25	27.6	4	3	-5	2.9	53	T
N1023	0.02	0.3	35	17.5	5	4	-5	4.6	55	T
N1024	0.05	-0.2	23	16.0	5	2	-5	5.6	1430	T
N1025	0.05	-0.2	28	18.0	4	4	-5	4.6	973	T
N1026	-0.01	-0.2	31	24.5	3	4	7	6.1	448	T
N1027	0.05	0.3	75	36.0	8	8	-5	10.8	229	T
N1028	0.05	0.4	76	33.0	10	13	6	11.1	122	T
N1029	0.22	0.3	26	24.9	5	3	-5	4.6	293	T
N1030	0.74	1.0	45	45.1	17	9	7	9.6	426	T
N1031	0.05	-0.2	22	21.1	3	3	-5	4.4	726	T
N1032	0.07	0.6	51	37.6	6	5	7	6.2	34	T
N1033	0.07	0.4	52	23.5	4	5	-5	4.7	29	T
N1034	0.70	1.5	29	20.0	6	3	-5	3.5	42	T
N1035	0.03	0.6	9	17.3	1	3	-5	1.8	59	T
N1036	0.07	1.0	127	29.1	6	2	6	6.0	44	T
N1037	0.07	-0.2	31	13.2	12	8	10	4.7	77	T
N1038	0.04	0.5	38	18.4	18	5	6	4.5	184	T
N1039	0.01	0.5	42	31.0	15	19	6	3.9	101	T
N1040	0.01	-0.2	18	17.4	2	-2	7	4.7	180	T
N1041	0.04	0.2	27	21.3	4	21	6	5.8	145	T
N1042	0.10	0.6	46	22.1	22	7	7	5.2	1470	T
N1043	0.11	0.7	36	19.8	8	4	-5	6.0	132	T
N1044	0.21	0.5	12	13.5	5	3	6	2.6	141	T
N1045	0.26	0.8	20	17.7	11	7	9	2.7	85	T
N1046	0.09	-0.2	22	19.0	7	4	6	2.8	93	T
N1048	0.22	1.6	21	21.0	8	4	7	3.8	95	T
N1049	0.04	0.9	36	15.9	7	4	13	3.9	129	T
N1050	0.25	-0.2	9	10.7	2	3	5	2.4	109	T
N1051	0.02	-0.2	78	20.5	3	28	6	9.1	247	T
S1001	-0.01	-0.2	12	9.0	-1	5	-5	4.6	22	T
S1002	0.19	0.3	18	23.3	2	-2	5	4.1	27	T
S1004	0.10	0.5	52	46.7	9	5	10	3.2	46	T
S1006	0.05	-0.2	14	25.3	5	3	-5	3.4	38	T
S1010	0.36	2.4	176	46.5	18	12	10	7.3	1340	T
S1012	0.02	-0.2	11	19.8	2	5	-5	2.5	30	T
S1013	0.01	-0.2	21	27.0	5	3	-5	4.5	892	T
S1014	0.02	-0.2	17	15.6	1	5	-5	3.7	92	T
S1015	0.90	-0.2	28	17.5	3	3	-5	13.0	65	T
S1016	0.01	-0.2	46	27.8	2	3	-5	18.5	627	T
S1018	0.16	-0.2	30	21.2	3	4	5	9.6	102	T
S1019	0.01	0.2	13	8.7	3	2	-5	2.2	381	T
S1020	-0.01	-0.2	34	20.3	5	6	-5	6.8	320	O
S1023	-0.01	0.2	23	20.5	-1	8	8	31.0	1300	T
S1025	-0.01	-0.2	18	10.4	-1	5	19	5.8	100	T
S1028	-0.01	-0.2	57	12.4	1	18	21	10.5	4410	T
S1033	0.29	2.1	-3	15.3	5	18	-5	3.7	84	O
S1035	-0.01	-0.2	7	11.6	10	4	-5	2.5	97	O
S1037	-0.01	-0.2	4	12.2	4	-2	-5	1.9	74	O

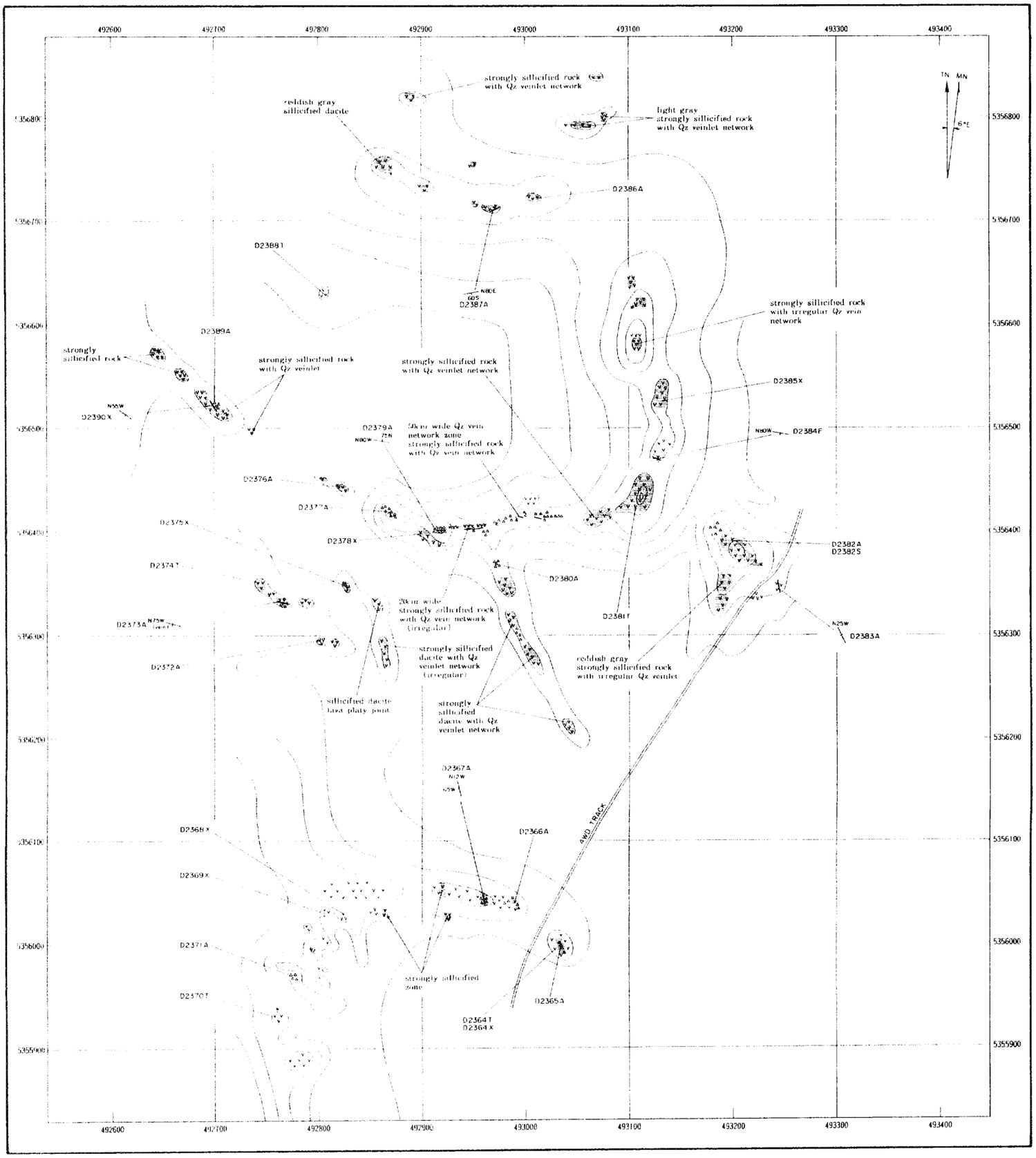
Figure 5-54 Fact Geology and Sample Location Map, Kuzultas-SW Prospect



sample No.		Description	Au(g/t)	Ag(g/t)	Cu(ppm)	Pb(ppm)	Zn(ppm)	Mo(ppm)
D2220	A	trench, limonite disseminated Qz vein	< 0.01	<0.2	34.2	2	21.4	10
D2221	A	trench, limonite disseminated Qz vein	0.01	<0.2	40.5	3	22.8	12
D2222	A	trench, strongly silicified rock with disseminated limonite	0.01	0.3	11	<2	10	5
D2223	A	trench, Qz vein with limonite film	< 0.01	0.3	18.1	5	14.1	6
D2224	A	trench, strongly silicified rock with disseminated limonite	< 0.01	0.3	33.1	10	15	4
D2225	A	trench, strongly silicified rock with disseminated limonite	0.01	0.3	27.5	6	24.5	7
D2226	A	trench, limonite vein network	< 0.01	0.5	85.5	7	76.4	<1
D2227	A	trench, white colored claymineral vein with	0.01	0.3	36.6	16	29.9	4
D2228	A	trench, strongly silicified rock with disseminated limonite	0.01					
D2230	A	Qz vein with limonite film	0.02	0.2	6.8	<2	2	4
D2231	A	Qz vein with limonite film specularite and hematite	< 0.01	0.3	11.4	2	1.7	6
D2232	A	Qz vein with hematite network	0.01	0.4	8.3	3	2.6	2
D2233	A	Qz with disseminated limonite	0.01	0.6	57.7	9	122	3
D2234	A	Qz vein with limonite network	0.01	1.1	5.6	<2	7.5	3
D2235	A	Qz vein with brecciated limonite	< 0.01	<0.2	13.2	2	6.9	9
D2236	A	strongly altered rock with Qz vein network and light green claymineral	< 0.01	0.6	7.6	3	8.2	1
D2237	A	drill core, propinitized dacite with chlorite vein	0.02	1.3	30.4	7	13.7	8
D2238	A	clay mineral and Qz and calcite vein with limonite film	0.01	0.2	7	4	5.5	8
D2239	A	saccharoidal Qz vein with disseminated limonite	0.01	<0.2	12.8	2	7.6	8
D2240	A	saccharoidal Qz vein with limonite film	0.01	0.3	7	<2	8.3	3
D2241	A	gossan, iron rich Qz vein with limonite and hematite and pyrite	0.01	0.9	11.9	2	10.7	8
D2242	A	Qz vein with specularite and hematite vein	0.01	<0.2	6.7	2	1.7	6
D2243	A	strongly altered rock with Qz vein network and limonite	0.01	0.5	16.2	4	15.1	3
D2244	A	Qz and calcite and hematite vein with specularite	< 0.01	0.2	9.2	4	3.2	7
D2245	A	Qz vein with specularite and hematite	0.04	0.6	13.8	3	7	4
D2246	A	brecciated Qz block	0.01	0.3	8.2	<2	6.5	4
D2247	A	brecciated Qz vein with limonite	0.01	<0.2	6.2	<2	2.6	2
D2248	A	strongly silicified rock with drusy Qz vein	0.01	0.9	14.7	2	6.3	9
D2249	A	saccharoidal Qz vein with calcite and limonite	< 0.01	<0.2	4.6	6	3	4
D2250	A	saccharoidal Qz vein with disseminated limonite	0.02	0.4	21	5	5.3	13

Sample No.		Description	Au(g/t)	Ag(g/t)	Cu(ppm)	Pb(ppm)	Zn(ppm)	Mo(ppm)
D2251	A	porous and drusy Qz vein with limonite	0.01	<0.2	5	5	4.5	2
D2252	A	saccharoidal Qz vein with limonite	0.01	0.5	11.2	12	2.8	14
D2253	A	Qz vein with specularite and hematite network	< 0.01	<0.2	8.5	7	5.8	6
D2254	A	Qz vein with limonite network	0.01	0.5	6.1	25	2.1	17
D2255	A	hematite with limonite	0.01	0.4	6.3	20	5.2	10
D2256	A	Qz vein with disseminated limonite	< 0.01	<0.2	14.6	6	3.4	10
D2257	A	strongly silicified rock with Qz vein network	0.01	<0.2	14.2	30	5.5	7
D2258	A	Qz vein with hematite and limonite and brecciated Qz block	0.01	0.4	5.5	61	9.2	3
D2259	A	limonite vein with Qz veinlet	< 0.01	<0.2	5.7	51	8.5	2
D2261	A	hematite vein with barite and Qz	< 0.01	<0.2	5.7	43	8.5	11
D2262	A	channel, hematite and Qz vein network	< 0.01	<0.2	6.6	47	10.1	7
D2263	A	hematite vein with Qz	< 0.01	<0.2	8.1	60	16.4	7
D2264	A	hematite vein network with Qz	< 0.01	0.5	6.6	24	9.5	7
D2265	A	white colored clay mineral vein	< 0.01	<0.2	5	31	13.8	<1
D2266	A	hematite vein network with yellowish brown limonite	< 0.01	0.5	15.5	20	22.7	1
D2267	A	channel, hematite vein with Qz and barite	< 0.01	<0.2	8.7	15	7.8	5
D2268	A	clay mineral vein	< 0.01	0.2	7.1	9	8.1	1
D2269	A	channel, hematite and Qz vein network	< 0.01	<0.2	8.4	6	9	3
D2270	A	Qz and hematite vein	< 0.01	0.3	8.8	10	13.7	2
D2271	A	amorphase Qz vein with limonite	< 0.01	0.6	19.7	7	25.1	5
D2272	A	Qz and hematite with clay mineral vein	< 0.01	<0.2	11.2	6	9.4	5
D2273	A	silicified rock with Qz vein and hematite and clay	0.01	<0.2	7	<2	10.9	3
D2274	A	Qz vein with red hematite spot	< 0.01	0.3	12.3	256	1.8	6
D2275	A	black hematite with drusy Qz and barite	< 0.01	<0.2	36.5	35	149	11
D2276	A	fish egg like hematite, barite and specularite with limonite	0.01	<0.2	4.7	10	6.2	11
D2277	A	brecciated Qz vein with reddish brown Qz	< 0.01	0.4	5.9	2	6.3	4
D2278	A	drusy Qz vein with hematite, limonite and	< 0.01	<0.2	8	<2	6.6	4
D2279	A	porous Qz vein with limonite and clay mineral	< 0.01	<0.2	17.1	<2	8.8	6
D2280	A	massive Qz vein with reddish brown hematite	< 0.01	<0.2	4.5	<2	3.2	2
D2281	A	drusy Qz vein with hematite and limonite	< 0.01	0.6	14.1	<2	5.5	8
D2282	A	Qz vein with specularite	< 0.01	<0.2	5.8	5	4.5	3
D2283	A	Qz vein with limonite	0.01	0.4	19	2	10.2	7
D2284	A	purplish colored Qz vein	0.01	<0.2	4	5	3.2	3
D2285	A	Qz vein with limonite network	< 0.01	<0.2	14.6	<2	5.7	6
D2286	A	Qz vein with limonite film	0.01	0.2	8.5	3	3.1	3
D2287	A	Qz vein with limonite film	< 0.01	<0.2	9.6	4	1.7	6
D2288	A	Qz vein with specularite film	< 0.01	<0.2	6.5	7	4.8	4
D2290	A	Qz vein with hematite and limonite	< 0.01	0.5	22.7	4	7.4	10
D2291	A	drusy Qz vein with limonite	< 0.01	<0.2	6.3	10	4.1	3
D2292	A	drusy Qz vein with specularite and barite	0.04	0.2	17	10	3.1	12
D2293	A	reddish brown Qz vein with specularite	0.04	<0.2	6.3	<2	3.1	16
D2294	A	channel, Qz, clay and limonite vein	0.01	<0.2	9.1	3	9.7	2
D2295	A	Qz vein network	0.01	0.3	6.3	7	4.9	1
D2298	A	Qz vein with limonite	< 0.01	0.4	7.9	10	3.3	<1
D2299	A	irregular Qz veinlet network	0.01	<0.2	16.1	6	14.2	1
D2300	A	Qz vein with limonite and clay mineral	0.01	0.5	9.8	5	8.9	4
D2301	A	irregular Qz vein network	0.01	0.6	9.9	2	4.5	4
D2302	A	Qz vein with limonite	0.01	0.3	5.1	<2	2.9	1
D2304	A	white Qz vein with reddish brown limonite	< 0.01	<0.2	5.1	9	2.3	1
D2305	A	Qz vein with black hematite	0.01	0.5	11.4	3	3.2	3
D2306	A	Qz vein network with limonite and specularite	0.01	0.2	15.3	6	7.5	7
D2307	A	Qz vein with disseminated limonite	< 0.01	0.4	16.4	<2	5	10
D2308	A	drusy Qz vein with limonite	0.01	0.5	16.9	4	3.1	6
D2309	A	Qz vein with disseminated limonite	0.01	<0.2	9.9	5	7.2	6
D2310	A	Qz vein with limonite	< 0.01	0.4	8.1	2	14.9	1
D2311	A	Qz vein with limonite	0.01	0.2	11	7	8	3
D2312	A	smoky Qz vein amorphase	< 0.01	0.6	10.7	4	9.1	5
D2313	A	amorphase white Qz vein with yellowish brown limonite	< 0.01	1.1	22.9	2	15.9	12
D2314	A	amorpase smoky Qz vein with yellowish brown limonite	< 0.01	0.5	11.2	3	7.3	13
D2315	A	Qz vein with limonite	< 0.01	0.2	7.6	5	3.5	3
D2316	A	strongly silicified rock with Qz veinlet	0.01	0.8	12.8	<2	3.9	5
D2317	A	amorpase smoky Qz vein with limonite film	< 0.01	<0.2	8.4	3	3.7	2
D2318	A	amorpase Qz vein with disseminated limonite	< 0.01	0.4	10.9	5	8.3	4
D2319	A	drusy Qz vein with red hematite	0.04	0.7	11.6	2	2.4	8
D2320	A	smoky Qz vein with yellowish brown limonite and reddish brown hematite	< 0.01	<0.2	4.3	4	2.5	6
D2321	A	saccaroidal Qz vein with yellowish brown limonite and reddish brown hematite	< 0.01	<0.2	10.2	2	2.3	6
D2322	A	saccaroidal Qz vein with black limonite spot	< 0.01	0.3	10.9	<2	2.6	25
D2323	A	saccaroidal Qz vein with reddish brown hematite	< 0.01	<0.2	10.8	<2	3.2	11
D2324	A	drusy and saccaroidal Qz vein with yellowish brown limonite	< 0.01	0.2	8.9	<2	7.2	5
D2325	A	white Qz vein with yellowish brown limonite	< 0.01	<0.2	11.1	9	4	6
D2326	A	smoky Qz vein with limonite film	< 0.01	0.5	14.9	11	4.8	22
D2327	A	white Qz vein with limonite film	0.36	1	15.7	6	8	23
D2328	A	smoky Qz vein with limonite film	0.11	0.9	10.3	8	1.9	15
D2329	A	smoky Qz vein with epidote and hematite	0.01	<0.2	5.9	2	1.4	13
D2330	A	Qz vein with red to brown hematite and limonite	0.05	0.3	10.4	9	1.6	12
D2331	A	Qz vein with hematite and specularite	0.06	0.9	35.3	<2	5.5	37
D2332	A	platy banded Qz vein	< 0.01	<0.2	1.9	<2	0.6	1
D2333	A	white Qz vein with hematite, weakly sericitized	< 0.01	<0.2	11.2	3	3.4	8
D2334	A	brecciated Qz vein with reddish brown hematite	< 0.01	<0.2	5.5	<2	1.2	10
D2335	A	smoky Qz vein with disseminated hematite	0.01	0.6	8.1	2	5.7	5
D2336	A	drusy Qz vein with disseminated limonite	0.03	<0.2	9	8	1.7	8
D2337	A	saccaroidal Qz vein with yellowish brown limonite	0.02	<0.2	7.1	3	1.1	36
D2338	A	drusy Qz vein with yellowish brown limonite	< 0.01	0.5	12.9	2	4.2	10
D2339	A	smoky and white Qz vein	0.01	<0.2	4.9	9	0.6	4
D2340	A	drusy Qz vein with black limonite	0.15	0.5	10.3	3	0.5	10
D2341	A	saccaroidal Qz vein with black to yellowish brown limonite	< 0.01	0.4	10.6	5	3.8	6
D2343	A	drusy Qz vein including black spot	0.01	0.7	10.9	5	10.1	6
D2344	A	Qz vein with disseminated limonite	< 0.01	0.4	15.9	4	6	10
D2345	A	Qz vein with disseminated limonite	< 0.01	0.7	18.2	3	10.3	10
D2346	A	drusy saccaroidal Qz vein with disseminated limonite	< 0.01	<0.2	12	3	8.3	6
D2347	A	drusy and saccaroidal Qz vein with yellowish brown limonite film	0.01	0.4	9.8	<2	1.4	7
D2348	A	saccaroidal Qz vein including smoky dark spot	< 0.01	0.4	15.1	<2	1.4	3
D2349	A	saccaroidal Qz vein with yellowish brown limonite film	0.07	<0.2	11	3	3.9	12
D2350	A	black limonite coated Qz vein	< 0.01	<0.2	9.1	9	4.3	2
D2352	A	Qz vein with specularite	0.02	<0.2	10.8	10	2.8	6
D2353	A	brecciated strongly silicified rock and Qz vein with hematite and specularite	< 0.01	<0.2	4.8	<2	2.7	3
D2354	A	milky white Qz vein including dark spot with reddish brown hematite	< 0.01	<0.2	10	5	1.9	7
D2355	A	drusy milky white Qz vein with limonite	< 0.01	<0.2	19.9	6	12.2	4
D2356	A	dark brown strongly silicified rock with Qz veinlet	0.02	0.3	33.7	<2	22.5	3
D2358	A	light brown Qz vein with hematite network	0.02	0.2	13.6	9	12.2	3
D2359	A	Qz vein with hematite and limonite network	0.02	<0.2	26.9	4	24	9

Figure 5-55 Fact Geology and Sample Location Map, Kuzultas-SE Prospect



Sample No.	Description	Au(g/t)	Ag(g/t)	Cu(ppm)	Pb (ppm)	Zn(ppm)	Mo(ppm)
D2365 A	strongly silicified rock with Qz veinlet and limonite film	0.01	<0.2	5.8	2	3.6	6
D2366 A	strongly silicified rock with Qz vein and yellowish brown limonite	0.02	0.5	26.6	<2	2.2	18
D2367 A	pinkish white Qz vein	0.01	<0.2	4.5	3	<0.5	6
D2371 A	reddish gray to white strongly silicified rock for smoky Qz vein	0.01	0.4	11.5	4	<0.5	11
D2372 A	strongly silicified rock with Qz veinlet	< 0.01	0.3	3.2	3	3.7	3
D2373 A	strongly silicified rock with Qz veinlet network	0.01	<0.2	6.3	3	2.5	7
D2376 A	strongly silicified rock with drusy Qz vein and limonite film	0.01	0.2	5.2	3	1.5	8
D2377 A	strongly silicified rock with Qz vein network and limonite film	0.02	<0.2	7.6	<2	1.2	14
D2379 A	saccaroidal Qz vein with limonite film	0.01	<0.2	2.8	10	1.9	28
D2380 A	Qz vein with black limonite spot	0.01	0.6	22.2	<2	1.2	9
D2382 A	strongly silicified rock with irregular Qz veinlet network	0.01	<0.2	2.7	14	1.8	4
D2383 A	Qz vein with reddish brown limonite film	0.23	1.5	10.2	<2	1.3	58
D2386 A	strongly silicified rock with Qz veinlet network	0.01	0.3	5	<2	1.8	28
D2387 A	smoky Qz vein with limonite film	0.01	<0.2	6.8	<2	1.2	10
D2389 A	reddish gray smoky fine grain Qz vein	0.46	<0.2	9.1	5	3.2	7

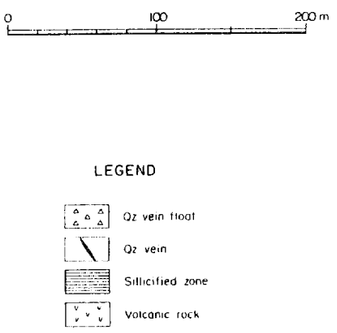


Figure 5-56 Fact Geology and Sample Location Map, Kuzultas-NW Prospect