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NICOR MINERAL VENTURES

One of the NICOR basic energy companies

2659-G Pan American Freeway, N.E. Albuquerque, New Mexico 87107 Phone 505 344 7803

September 22, 1982

To: Dr. R. J. Miller

From: G. A. Parkison

Subject: Review of Silver Spring project submittal of Occidental Minerals Corporation

A report regarding the Silver Spring project of Occidental Minerals was presented to NICOR in early September, 1982. Occidental Minerals is attempting to farm out/joint venture the property.

The Silver Spring property is about 5 miles south of Jerome in north-central Arizona. The property comprises about 240 claims, most of which are under lease from Verde Exploration, Ltd. An annual rental of $20,000 is required in addition to a substantial and increasing work committment.

A massive sulfide ore body similar to that of the Jerome deposit is the target within the project area. Host strata are altered felsic volcanic and volcaniclastics of Precambrian age. These strata have been intensely deformed.

Work to date on the project by Occidental has included geologic mapping, grid geochemical sampling and an induced polarization survey. These activities have defined two fairly small target areas. These targets are both buried up to 400 feet. No ore grade mineralization has been noted as yet from the claim block.

Based on work done to date drilling targets of sufficient interest to NICOR have not been defined. The Copper Chief Mine is within one-half mile from the project area and has served as a model for the mineralized targets which may be present in the area. However, this mine and other smaller adjacent mines, have produced only a small total tonnage (<200,000 Tons) of moderate grade Cu-Au-Ag ore. Significant Au-Ag values are restricted to gossan which is of very limited tonnage. Extensive exploration has been performed in the entire Jerome district within the last ten years and has not resulted in any significant discoveries. The anticipated grades are not exceptional and mining costs could be high.

I recommend that NICOR pass on this submittal.

Occidental Minerals Corporation
Irongate Building IV
777 South Wadsworth Boulevard
Lakewood, Colorado 80226 U.S.A.

SILVER SPRING PROJECT

YAVAPAI COUNTY, ARIZONA

June, 1982

CONFIDENTIAL

Dale G. Armstrong
Exploration Geologist

SILVER SPRING PROJECT

Yavapai County, Arizona

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SILVER SPRING PROJECT

Yavapai County, Arizona

ABSTRACT

The Silver Spring property is located in north-central Arizona approximately four miles west of the town of Cottonwood, the nearest source of industrial water, power, and transportation. The property is in the Verde Mining District, which is famous for the United Verde and United Verde Extension mines. Total production from the volcanogenic massive sulfide deposits was approximately 40 million tons of high-grade copper, gold and silver ore.

The district is located in the Black Hills which have a core of 1.8 b.y. old Precambrian meta-volcanic, meta-sedimentary and meta-igneous rocks. These have been subjected to lower greenschist metamorphism coupled with poly-phase deformation.

INTRODUCTION

General - The Silver Spring Project is located in north-central Arizona approximately five miles south of the mining camp of Jerome (Figure 1). The project area is situated on the eastern slopes of Mingus Mountain. Elevations vary from about 6,000 to 4,000 feet. Vegetation consists primarily of scrub oak and manzanita, however, the higher elevations host some Ponderosa and Pinyon pines.

OxyMin controls 243 unpatented lode mining claims in a lease agreement with Verde Exploration Ltd., a Delaware corporation (Plate 2).

History - Historically, Jerome is one of the premier massive sulfide camps in the U.S. with a production record of nearly 40 million tons averaging 4.68% Cu; 1.78% Zn; 2.38 opt Ag; .037 opt Au, of which the United Verde Extension mine contributed 3.1 million tons of highly enriched ore averaging better than 10% Cu and 1.6 opt Ag and .04 opt Au.

Numerous other mines in the area contributed to the overall camp total, with individual production usually totaling less than 1 million tons. Grades, however, were occasionally high due to secondary enrichment such as the Copper Chief mine which produced over 150,000 tons of 2.0% Cu; 10.0 opt Ag; and 0.5 opt Au. Production in the camp is reported to have started near 1914 and ended sometime between 1951 and 1953.

Exploration Program - The Jerome Camp is located at the northern end of the Yavapai Greenstone belt, which is comprised of schists and gneissic rocks approximately 1.8 b.y. old. Numerous regions of abundant meta-felsites are common in the belt and are distributed within a thick sequence of interlaminated metabasalts and metasediments (Figure 2). Each ore occurrence mentioned above is associated with a domain of meta-felsites. Alteration of the felsics adjacent to the mineralization consists of the classic massive sulfide hydrothermal products. Chlorite-talc-sericite development is most abundant in the feeder zones, while sericite-silica-carbonates form in the proximal region of the hydrothermal systems. True zoning of alteration is complicated by over-printing, metamorphic recrystallization and poly-phase deformation.

The Silver Spring target area was conceptualized on a model of repeated favorable lithologic assemblages. The host lithologies at the Copper Chief mine were thought to be repeated in the Silver Spring-Oak Wash area (Plates 1 & 3). This favorable package consists of highly sericitized and chloritized sequence of meta-rhyolite flows plus pyroclastics and their epiclastic by-products.

Upon the completion of 1:6000 scale geologic mapping, it became apparent that the Copper Chief stratigraphy was indeed repeated via a sequence of tight, second generation folds (F_2) (Plate 3).

Alteration and mineralization observed in the Silver Spring portion of this favorable stratigraphy are consistent with the assemblages seen at the Copper Chief mine. Certain expected lithologic variations are apparent in Silver Spring, i.e., the epiclastic-pyroclastic components predominate over the flow material.

Based on the results of mapping, an outcrop geochemical sampling program was started. Approximately 450 samples were collected and analyzed. All samples were collected on a 200' x 200' grid (also used for mapping controls). Results of this geochem program indicate anomalous responses for the elements copper and zinc over the "belt" of favorable stratigraphy (Plates 4, 5 & 6). It was also noted that the highest geochem values correspond to the regions of strongest alteration.

Based on these favorable results, an induced polarization survey was conducted over the areas of interest (Plate 8). This survey utilized 400 foot dipole and line spacings. Upon the completion of this program, at least two areas show anomalous responses that coincide with geochem anomalies and/or favorable geology. These targets are individually discussed below as the Oak Wash target and Mormon Tank target.

The Oak Wash target contains a thick sequence of felsic volcaniclastic rock interlayered with numerous greywacke-type sediments. Both volcanics and sediments show varying degrees of alteration and mineralization that correspond with the geochemical and I.P. anomalies. Alteration consists of moderate to strong chlorite development in very restricted areas with a pervasive weak to moderate chlorite-sericite zone surrounding these highs (Plate 7). The chlorite is usually a high Mg ++ variety.

Sulfide occurrences seen at the surface consist of disseminated pyrrhotite and chalcopyrite, usually not greater than 5-7% content.

Limonite staining (Plate 7) is strong to moderate throughout the entire target area (1000' x 400') and moderate to weak in the remainder of the Oak Wash favorable stratigraphy.

The Mormon Tank target differs from the Oak Wash target in that the stratigraphic positioning is interpreted to be different, plus the very obvious signs of mineralization seen in Oak Wash are not as apparent. The concept for this target is similar to tectonic controls observed at the United Verde mine. Sulfide mineralization at the United Verde is localized in a zone of dialation created during deformation. The ore now forms a boudin and occupies the hinge of a major tight fold structure. The strike of the axial plane is N20°W with a plunge of 65° to the NW. Very little ore exists outside of this structural feature.

A similar structure exists in Silver Spring and is in part responsible for the repeated stratigraphy seen in Oak Wash. Located along the axial trace of this feature is a moderate to strong I.P. response (Plate 8). The estimated depth to the top of the feature is between 200 and 400 feet. Strike length is estimated to be at least 1,000 feet with a width of 400 to 800 feet. It is not known if the hinge of this fold feature actually contains appreciable sulfide mineralization or not. The geochemical expression of this target is subtle in that only a small copper signature is detectable (Plate 4). The felsic rocks which are apparently associated with the polarizable body are altered and weakly mineralized rhyolites. Alteration consists of weak to moderate chlorite plus minor sericite (Plate 7). Mineralization is seen as disseminated pyrite plus occasional chalcopyrite in concentrations less than 3%.

Exploration Target - OxyMin's target goal for the Silver Spring property is the discovery of three or more massive sulfide ore bodies of not less than five million tons each, having grades consistent with that of other ore bodies already in the Jerome camp.

This is an ambitious program with better than average chances for success based on the history of the Verde District.

GEOLOGY

General - The Precambrian core of Mingus Mountain, which comprises the Verde District, is flanked on the east by a thick sequence of Paleozoic sediments composed of conglomerates, limestones, dolomites and shales. Ages for these units range from Cambrian to Permian. These are in turn unconformably overlain by Tertiary gravels and basalt flows. The Verde fault currently separates the Precambrian from these younger rocks. Displacement on the Verde fault is thought to be approximately 2,200 feet of normal dip-slip movement. No data is on hand to calculate a strike-slip component. For more detail of the regional geology, the reader is referred to Anderson and Creasey (1958) and Lindgren (1926).

Anderson and Creasey (1958) divide the Precambrian Yavapai schist-Ash Creek group into several lithologic assemblages, from south to north, Gaddes basalt, Buzzard rhyolite, Shea basalt, Brindle Pup andesite, dacite of Burnt Canyon, Deception rhyolite and Grapevine Gulch formation. The Shea basalt, Buzzard rhyolite and Gaddes basalt are exposed in the Silver Spring area. The lithologics seen on cross-section and geologic maps are not categorized into the units of Anderson and Creasey. More work would be needed before these, or new groupings, could be used.

Stratigraphy - No time-ordered stratigraphy can be given for the units at Silver Spring due to the complexity of folding. Numerous sedimentary facing indicators exist in the pyroclastics and epiclastics, however, axial plane-facing vergance relationships cannot be extended for more than a few tens of feet in any direction. If more information were available for the F_1 deformation, time-ordered stratigraphy could possibly be constructed. The inter-relationships of units in the Silver Spring area are based on similarities observed chemically, petrographically, or petrologically.

Metasediments - Two classes of metasedimentary material are present in the area. One type is a sub-greywacke consisting of chlorite, quartz sericite and various post-metamorphic clays. Graded bedding and cross-lamination features are present in several exposures. Grain size ranges from fine to coarse and is usually quartz or quartz-felspar combinations set in a matrix of the various phylosilicates. The provenance of this unit

is thought to be primarily andesitic, however, a felsic terrain may have contributed some of the quartz and orthoclase clasts.

The second class of sediments are seen as an intricately interlaminated sequence of felsic lapilli pyroclastics and felsic fine-grained epiclastics. Near the source area for the pyroclastics, the epiclastic component makes up only a small portion of the overall unit. As the lateral extent of the unit increases, so does the epiclastic content. The composition of this lapilli pyroclastic unit is apparently rhyolitic, however, post-depositional alteration makes determination of the parent lithology difficult. The lapilli are usually cryptocrystalline texturally, but are also thought to be felsic.

Both sedimentary assemblages contain occurrences of iron formation. The sub-greywacke unit contains a well laminated, high iron variety, while the felsic epiclastic-pyroclastic unit contains a low iron, poorly laminated style of iron formation. This distinction is perhaps a function of the proximity to the source for both units.

Metavolcanics - Three individual groupings represent the metavolcanics in the Silver Spring area; metabasalt flows, meta-andesite pyroclastics and meta-rhyolite flows and pyroclastics.

The metabasalts are seen as flow sequences made up of massive zones of amphibolite pillows, pillow breccias plus various flow-top and/or flow-bottom breccias. The unit, as a whole, is composed of chlorite, hornblende, plagioclase, epidote, and quartz and is most likely a tholeiite. Several occurrences of this unit are present in the map area. They are, however, all thought to have a common source.

The meta-andesite is seen as a major single occurrence of very fine-grained andesitic pyroclastics or ash. This unit is highly foliated and is composed of chlorite, sericite, quartz, epidote, and magnitite.

Minor post-depositional alteration has, in certain areas, produced secondary chlorite, however, this over-printing is minor. Graded bedding is seen in only a few areas where clastic contamination is present.

The felsic metavolcanics and meta-rhyolites are observed in several phases defined by phenocryst composition and abundance. Chemical data from two of these phases indicate a calc-alkaline parentage. These two phases are represented by quartz-plagioclase phenocrysts in an aphanitic quartz-

feldspathic matrix. Feeder dikes of the quartz-plagioclase periphry are seen intruding other felsics in the Silver Spring area.

Alteration of all the felsics by secondary chlorite and sericite is common and, as in Oak Wash, occasionally strong.

Exposures of these units are usually discontinuous due, in part, to depositional characteristics and to subsequent deformation.

Intrusives - A single exposure of an equigranular to sub-porphyritic hornblende granodiorite is present throughout the center of the map area. It has invaded the metamorphics and exhibits only a slight structural cleavage due either to its intrusive event or late-stage Precambrian deformation. It has pushed the adjacent stratigraphy aside while consuming only a small portion of country rock. Its elongated orientation is sub-parallel to the Verde fault, and it may have been injected along a remnant of an ancestral Verde fault system.

Structure - Precambrian-aged poly-phase deformation is evidenced by three axial plane foliations. F_1 has apparently produced short isoclinal folds which generated an S_1 axial plane cleavage. Exposed remnants of these F_1 features are rare. The orientation and magnitude of this event is questionable because of the scarcity of exposures.

F_2 features are the result of the major deformation in Silver Spring and are tight, large-scale folds which produced the S_2 axial plane cleavage. The intensity of the F_2 features decline as one moves northward away from Silver Spring.

F_3 folding overprints F_2 in the project area and creates egg carton, or basin and culmination interference geometries. North of the project area F_3 predominates over F_2 in intensity, however, the interference folding patterns are still present. The United Verde ore body is controlled by an F_3 feature.

Faulting in the area aside from the Verde fault mentioned above is seen as either east-west trending, vertical strike-slip faults, or as north trending sub-horizontal faults with minor normal movement (these are in the vicinity of the Copper Chief mine and are not shown on the map).

Alteration - Significant pre-metamorphic hydrothermal alteration is seen as magnesium-chlorite development and sericitization of feldspars in the meta-rhyolite flows and felsic pyroclastics. Secondary chlorite is strongest in the Oak Wash region, while sericite is uniformly distributed throughout this and other alteration zones in the project area. Chlorite is usually seen replacing original iron chlorites plus the numerous feldspar phenocrysts. Matrix mineralogy, i.e., quartz, feldspar, sericite, etc. also show varying degrees of chlorite replacement. Certain regions of the Oak Wash target show almost 100% chlorite-sericite replacement.

Geochemistry - Approximately 450 outcrop chip samples were taken during the mapping program. Samples were collected on grid points which are spaced at 200 foot intervals. The geochemical data is based on 424 analyses, not 450, due to contamination of a few samples by multiple rock types.

Samples were assayed for gold, silver, copper, lead and zinc. Only copper and zinc showed valid trends or associations.

Background values for each element were calculated by first determining the medium of the population and then multiplying that value by 2.5. The factor of 2.5 was used to reduce the amount of "noise" in the data and to eliminate the weakest regions of response.

Copper and zinc both show anomalous responses along the felsic pyroclastics of Oak Wash, the stratigraphy of which may be the time-stratigraphic equivalent of the host rocks for the Copper Chief mine. These anomalous values also correspond with the main alteration features of Oak Wash, owing to the validity of this target.

Geophysics - So far, there have been 12 line-miles of dipole-dipole induced polarization conducted on the property. The dipole and line spacing were both 400 feet. Maximum depth penetration is less than 600 feet. A major portion of the survey located in the eastern region of Silver Spring was adversely affected by a well grounded fence line. The fence is made up of barbed wire and steel posts and forms a closed loop around approximately 100 acres. I.P. data from this survey is not reliable and is, therefore, not discussed.

Data from the western survey is clean and unaffected by cultural features. Plate 8 shows the location of the Mormon Tank target and the Oak

Wash target responses. The Mormon Tank zone ranges from 8 to 30 milli-second response with resistivities from 500 to 2000 ohmmeters. Depth to the top for this zone ranges from 200 to 400 feet, with no estimate for a bottom depth extent. The nature of this zone implies multiple bodies of responsive material having a minimum width of 800 feet and a minimum strike length of 1,000 feet.

The Oak Wash zone is not as strong as the Mormon Tank zone as values of 14 - 15 milli-seconds were the maximum, while resistivities are in the 1,000 ohmmeter range. This zone is interpreted to be shallow (less than 200 feet) and to have a finite depth extent with a strike length of 600 feet and a width of 400 to 600 feet.

Additional I.P. may be of value north of the Mormon Tank target. However, the granodiorite intrusive is only a few hundred feet away and would be a geologic boundary for the response at any rate.

LAND STATUS

OxyMin has located 28 unpatented lode mining claims situated in Oak Wash (Plate 2). These claims overlap the large block of Verde claims leased to Oxy and a smaller block of Verde claims to the west also covered by the Verde-Oxy lease. All claims leased to Oxy by Verde Exploration (215) are adjacent to a large patented claim block owned by Phelps Dodge (see Plate 2).

The lease between OxyMin and Verde Exploration consists of an annual rental of $20,000 plus a work commitment of:

$ 50,000 in 1982
$100,000 in 1983
$150,000 in 1984
$250,000 in 1985
$350,000 in 1986
$350,000 in 1987
$350,000 in 1988

DRILL RESULTS

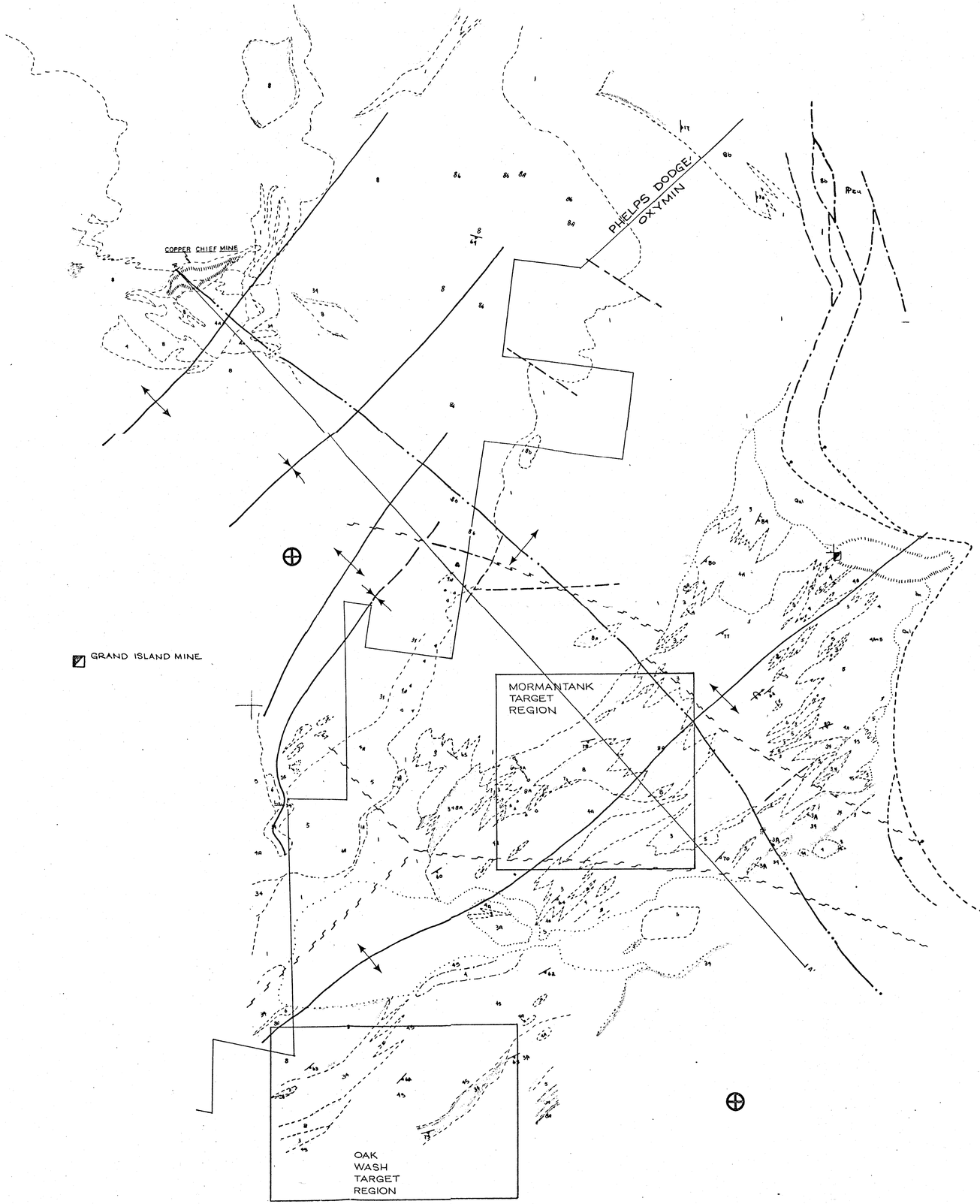
OxyMin has not yet undertaken a drilling program at Silver Spring.

EXPENDITURES

Expenditures on the Silver Spring massive sulfide exploration project from inception to April 30, 1982 are given in the following table:

TABLE 1
EXPLORATION EXPENDITURES
April 30, 1982

Geochemistry	$ 10,378
Geophysics	41,709
Land & Legal	20,074
General & Administrative . .	54,959
Other	4,632
TOTAL	$131,752



EXPLANATION

PRECAMBRIAN

(1) EQUIGRANULAR TO SUBPORPHYRITIC HORNBLENDE GRANODIORITE TO QUARTZ MONZONITE INTRUSIVE. EASTERN BOUNDARY IS AN INTRUDED FAULT ZONE. THIS CONTACT CONTAINS NUMEROUS XENOLITHS OF VARIOUS COUNTRY ROCK LITHOLOGIES. THE INTRUSIVE HAS AN APHANITIC, APLITIC PHASE (1A) ALONG ITS SOUTHWEST MARGIN. CONTACT RELATIONSHIPS AT THE VERDE FAULT INDICATE THAT THE INTRUSIVE PREDATES THE LATEST EPISODE OF MOVEMENT ON THE VERDE FAULT. UNIT (1) IS ITSELF CUT BY FELSIC DIKES OF TERTIARY AGE HICKEY BASALT. A WEAK CONTACT(?) FOLIATION IS PRESENT NEAR THE WESTERN MARGINS AND SPORADICLY ALONG THE EASTERN MARGIN.

(3) CHLORITE QUARTZ EPIDOTE MAGNETITE SERICITE SCHIST ± ACTINOLITE AND HORNBLENDE. UNIT IS OF PROBABLE ANDESITIC PYROCLASTIC OR EPICLASTIC PARENTAGE. UNIT IS FINE-TO VERY FINE-GRAINED AND USUALLY WELL LAMINATED. THESE LAMINATIONS MAY IN FACT BE REMNANT S_0 FEATURES; MINUTE GRADED BEDDING FEATURES CAN SOMETIMES BE SEEN. (3A) IS A VESICULAR PHASE OF (3) VESICLES ARE 3-5 M.M. DIA., ELONGATED PARALLEL TO MAXIMUM STRAIN ELONGATION AND ARE USUALLY FILLED WITH QUARTZ, EPIDOTE AND CALCITE IN ANY COMBINATION THEREOF. OCCASIONALLY EUHEDRAL MAGNETITE CYRSTALS ARE ALSO FOUND WITHIN THESE VUGS.

(4) QUARTZOFELDSPATHIC GRANOBLASTIC META RHYOLITE. UNIT IS COMPOSED OF QUARTZ PHENOCRYSTS PLUS RARE PLAGIOCLASE PHENOCRYSTS SET IN A MATRIX OF POTASSIUM FELDSPAR QUARTZ SERICITE CHLORITE AND MAGNETITE. UNIT SHOWS ONLY SLIGHT FOLIATION EXCEPT WHERE SECONDARY PHYLLOSILICATE DEVELOPMENT IS ABNORMALLY HIGH. PHENOCRYSTS ARE USUALLY LESS THAN 4 M.M. DIA. UNLESS AN EXCESSIVE AMOUNT OF SECONDARY SILICA HAS BEEN DEPOSITED AS OVERGROWTHS. MATRIX AND PHENOCRYSTS FELDSPAR SHOW VARYING DEGREES OF SERICITE REPLACEMENT. UNIT (4A) IS A NON-PORPHYRITIC PHASE OF (4)

(5) QUARTZOFELDSPATHIC GRANOBLASTIC META RHYOLITE. THIS UNIT DIFFERS FROM UNIT 4 IN THAT IT CONTAINS NO VISIBLE QUARTZ PHENOCRYSTS BUT DOES, HOWEVER, CONTAIN CONSIDERABLE QUARTZ IN THE MATRIX. PLAGIOCLASE PHENOCRYSTS ARE COMMON. UNITS (5) (4) AND (4A) ARE THOUGHT TO BE GENETICALLY RELATED WITH THEIR DIFFERENCES BEING DUE TO MODE AND/OR TIMING OF EMPLACEMENT. PARENTAGE FOR THESE UNITS IS THOUGHT TO BE A CALC-ALKALINE ERUPTIVE COMPLEX CONTAINING BOTH INTRUSIVE AND MULTIPLE EXTRUSIVE PHASES WHICH ARE COMPLEXLY INTERLAYERED.

(6) CALC-SILICATE-PELSITE-HORNFELS, A COMPLEXLY INTERLAYERED UNIT CONSISTING OF NUMEROUS CALC-SILICATE MINERALS PLUS QUARTZ INTERMIXED WITH SILICIFIED FELSIC LAYERS. INDIVIDUAL LAMINATIONS ARE USUALLY NO THICKER THAN A FEW MILLIMETERS. A COMPLEXLY INTERLAMINATED SEQUENCE OF FELSIC ASH AND CALCIUM RICH EXHALITE IS INVISIONED AS THE PARENTAGE FOR THIS UNIT.

(7) FERRUGINOUS QUARTZITE. VARYING AMOUNT OF IRON IN OXIDE FACIES IN LAMINATED META CHERTS. TWO VARIATIONS ARE NOTED BUT ARE NOT NUMERICALLY DISTINGUISHED ON THE GEOLOGY MAP. THE POORLY LAMINATED MAROON TO DARK RED QUARTZITES USUALLY CONTAINING LESS THAN 15% TOTAL Fe ARE USUALLY ASSOCIATED WITH THE VOLCANIC UNITS EITHER BASALTS OR RHYOLITES. THE WELL LAMINATED HIGH IRON, 15 TO 50% TOTAL Fe, UNITS ARE ASSOCIATED WITH THE NUMEROUS EPICLASTIC SEQUENCES PRESENT THROUGHOUT THE AREA. MINOR SULFIDE MINERALIZATION HAS BEEN NOTED WITH BOTH TYPES. LATERAL CONTINUITY IS USUALLY LESS THAN 200 FEET.

(8) CHLORITE HORNBLENDE PLAGIOCLASE EPIDOTE AMPHIBOLITE-META BASALT. NUMEROUS BRECCIA TEXTURES WITHIN THIS UNIT INDICATE A FLOW-BRECCIA ORIGIN. PILLOW RIND STRUCTURES ARE PRESENT IN A STATE OF SHATTERED DISARRAY, HOWEVER THEY ARE STILL RECOGNIZABLE. CLUSTERS OF AMYGDULES WITHIN PILLOWS AND INTERPILLOW DEBRIS ARE OBSERVABLE IN NUMEROUS LOCALITIES. UNIT (8A) IS A MASSIVE NON PILLOWED AMYGDALOIDAL FACIES OF UNIT (8) AND APPEARS TO BE THE INTERIOR OF A MAJOR BASALT FLOW SEQUENCE. AMYGDULES ARE USUALLY FILLED WITH RADIATING OR RANDOMLY ORIENTED CYRSTALS OF ACTINOLITE OR HORNBLENDE RESPECTIVELY. A PARENTAGE OF THOLEIITIC BASALT IS INVISIONED.

(34) CHLORITE SERICITE QUARTZOSE SCHIST. THIS IS THE EPOSIONAL BY-PRODUCT OF UNITS (3) (4) AND (5) PLUS THIN SUBUNITS. THE UNIT IS WELL LAMINATED, OCCASIONALLY SHOWS SOME GRADING FEATURES, HOWEVER THEY ARE POORLY FORMED. MOST FELDSPAR CLASTS SHOW VARYING DEGREES OF SERICITE-CHLORITE REPLACEMENT.

(45) QUARTZ FELDSPAR SERICITE CHLORITE SCHIST. THIS UNIT IS PROBABLY THE EPOSIONAL-BY-PRODUCT OF UNITS (7) AND (5) PLUS ALL THEIR SUBUNITS AND PERHAPS A MINOR AMOUNT OF MAFIC VOLCANICLASTIC. THE UNIT HAS AN ABUNDANCE OF DEFORMED LAPILLI AS WELL AND SO IS NOT ENTIRELY EPICLASTIC. FRAGMENTS SEEN IN THIS UNIT ARE RHYOLITIC, USUALLY LESS THAN 3 CM LONG AND SHOW A MODERATE DEGREE OF DEFORMATION. SULFIDE CONTENT IS VARIABLE RANGING FROM 1-4% AND CONSISTS OF PYRRHOTITE PYRITE AND CHALCOPYRITE. SECONDARY CHLORITE AND SERICITE DEVELOPMENT ARE OCCASIONALLY STRONG.

(Qal) ALLUVIUM

Approximate Contact

Fault, doshed where approximate dot on down-thrown side.

Shear zone (minor offset)

23 46 75 20 — Foliations; S_1, $S_1 = S_0$, S_2; Lineation in S_2

Shaft or decline, adit

A — A' Line of cross section

F_2 Antiform axial trace

F_2 Synform axial trace dashed where projected

F_3 Antiform axial trace

N

SCALE 1:4800

OCCIDENTAL MINERALS CORPORATION OXY

SILVER SPRING PROJECT
YAVAPAI CO., AZ

GEOLOGY MAP

Map By	DALE G. ARMSTRONG	Date 81-82
Drft. By	D.G.A.	Date 82
Revised		

PLATE 1

Cottonwood

Phelps Dodge Corp. Patented Claims

Verde Expl Claims

T.16 N.
R.3 E.
R2E

silver plate mine

copper chief mines

P.D. Pat. Claims

OXY MIN

(Verde Exploration Unpatented Claims)

T.14 1/2 N
R3E
R2 1/2E
T.14 N

Scale: 1:24,000

OCCIDENTAL MINERALS CORPORATION OXY

SILVER SPRING LAND

Map By DGA	Date 7/81
Drft. By	Date
Revised	

PLATE 2

COPPER CHIEF MINE
5800'

A

A' 4875'

Looking N47°E

S2

S2 Axial Plane

M.S.

M.S. TARGET

5 5 34 8 34 4A 8 1 8 5 5 34-45 34 5

8 3 5 3 45 34 4A-5 3

1 — Granodiorite (intrusive)

3 — Andesitic tuffs

5-4A — Rhyodacitic flows

8 — Basaltic flows

34 — Andesitic epiclastics

45 — Felsic tuffs and epiclastics

M.S. — Massive sulfide

600'
400'
0' 400' 600'

Scale = 1:4800
r.e. = 0

OCCIDENTAL MINERALS CORPORATION

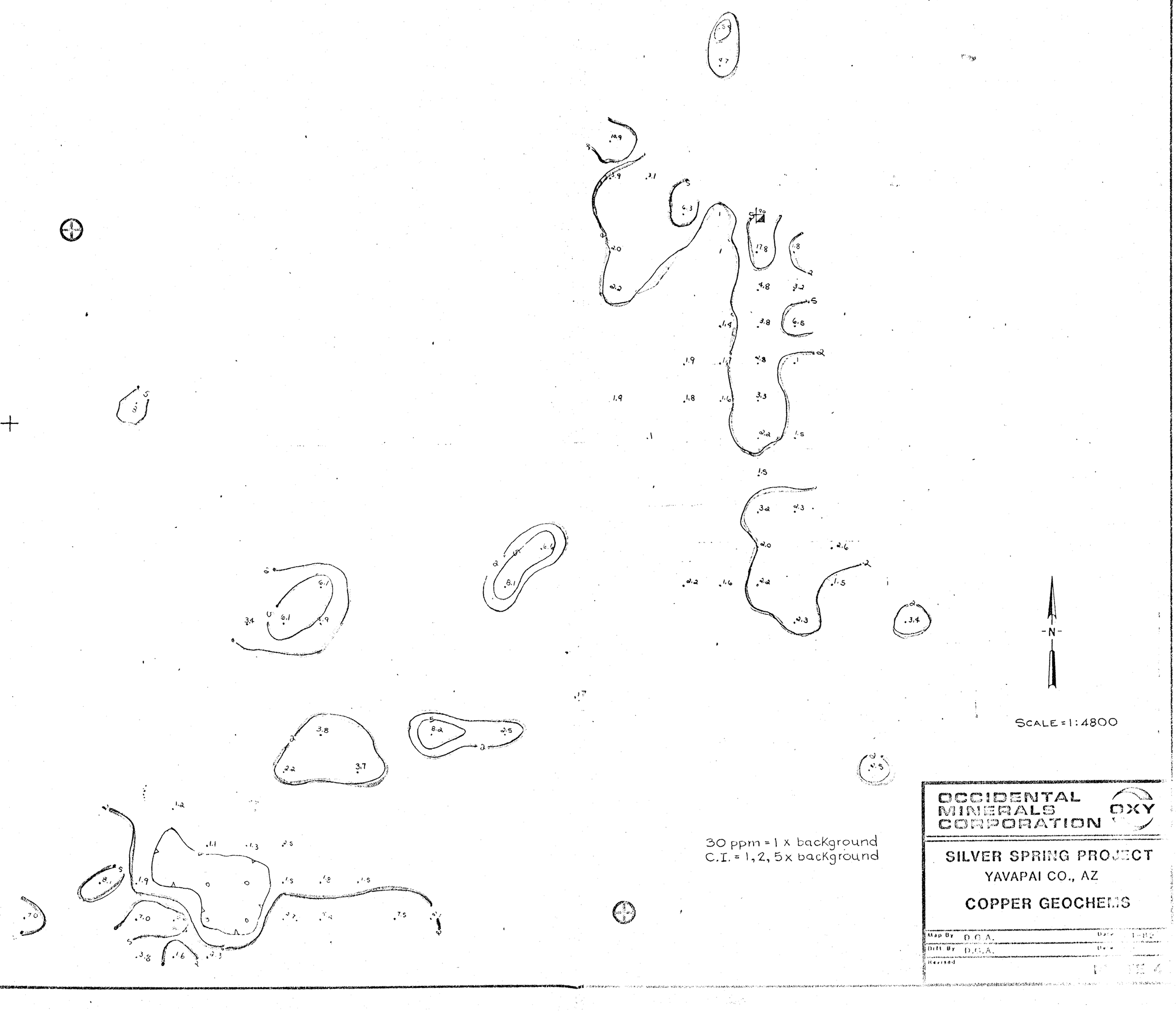
OXY

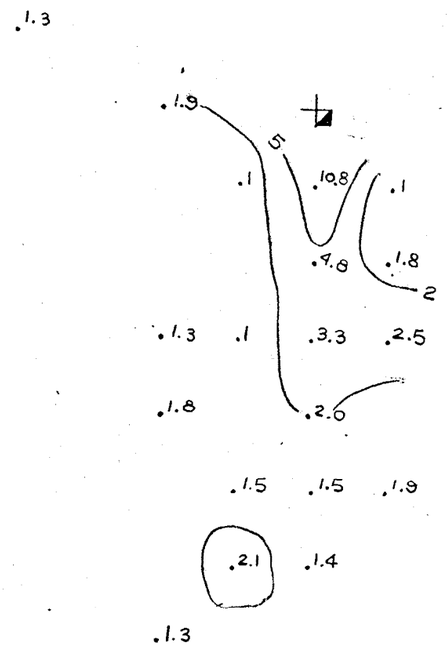
SILVER SPRING PROJECT
YAVAPAI CO., AZ

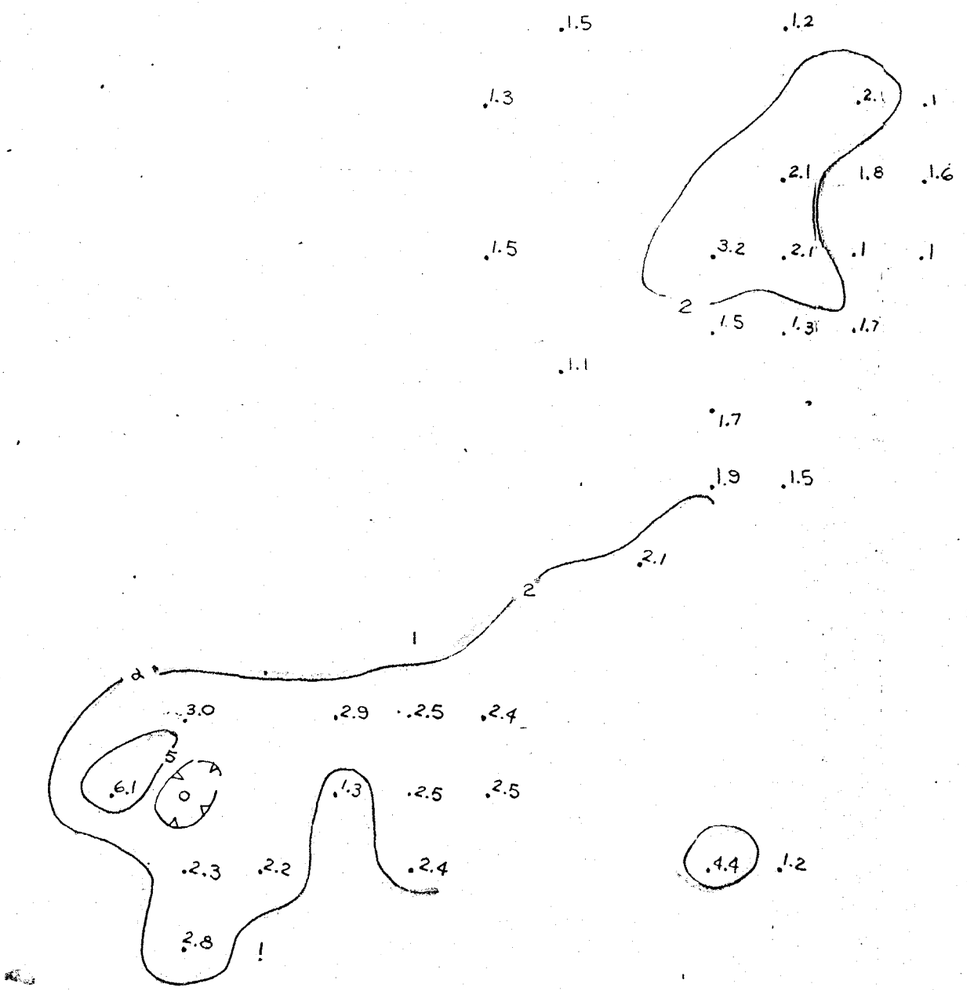
IDEALIZED CROSS SECTION

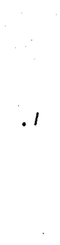
Map By	D.G.A.	Date	81-82
Drft. By	D.G.A.	Date	82
Revised			

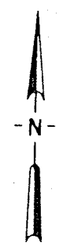
PLATE 3


N
SCALE = 1:4800
30 ppm = 1 x background
C.I. = 1, 2, 5x background
OCCIDENTAL MINERALS CORPORATION
OXY
SILVER SPRING PROJECT
YAVAPAI CO., AZ
COPPER GEOCHEMS
Map By D.G.A.
Drft By D.G.A.
Revised









SCALE 1:4800

165 PPm = 1 x background
C.I. = 2,5 x background

OCCIDENTAL MINERALS CORPORATION

OXY

SILVER SPRING PROJECT
YAVAPAI CO., AZ

ZINC GEOCHEMS

Map By D.G.A. Date 1-82
Drft By D.G.A. Date
Revised

FIG 5

ALTERATIONS

CHLORITE (Ch)
SERICITE (Ser)
PYRITE (Py)
LIMONITE (L)
MODERATE (+)
STRONG (++)

-N-

SCALE 1:4800

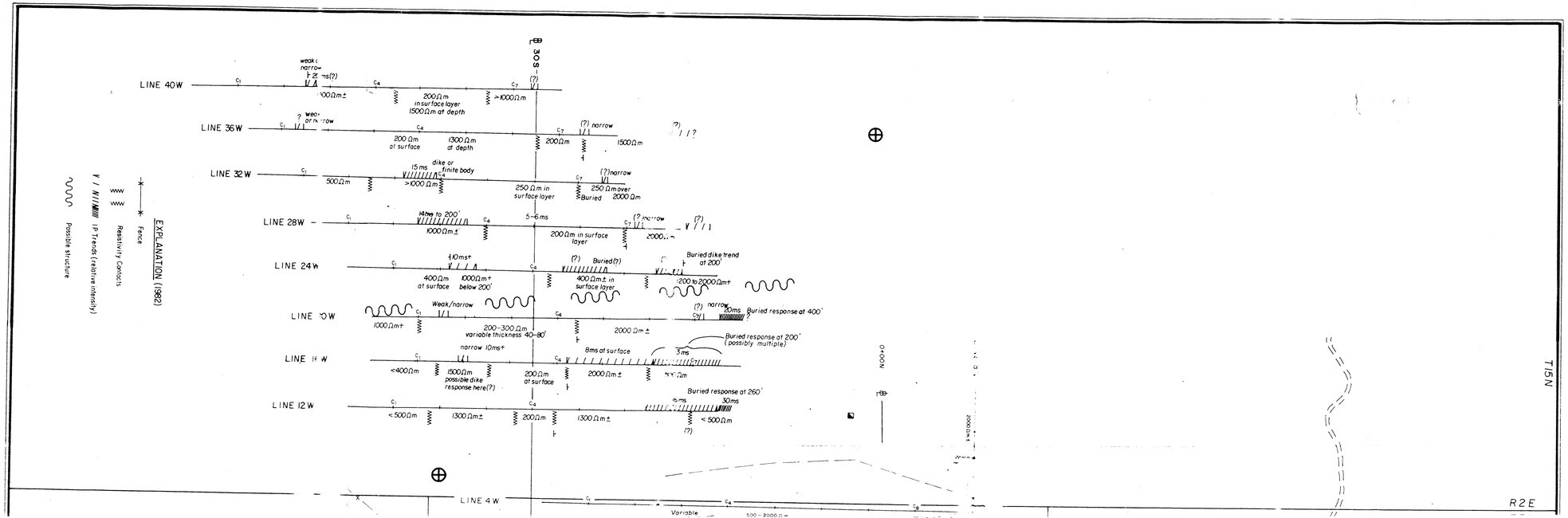
OCCIDENTAL MINERALS CORPORATION

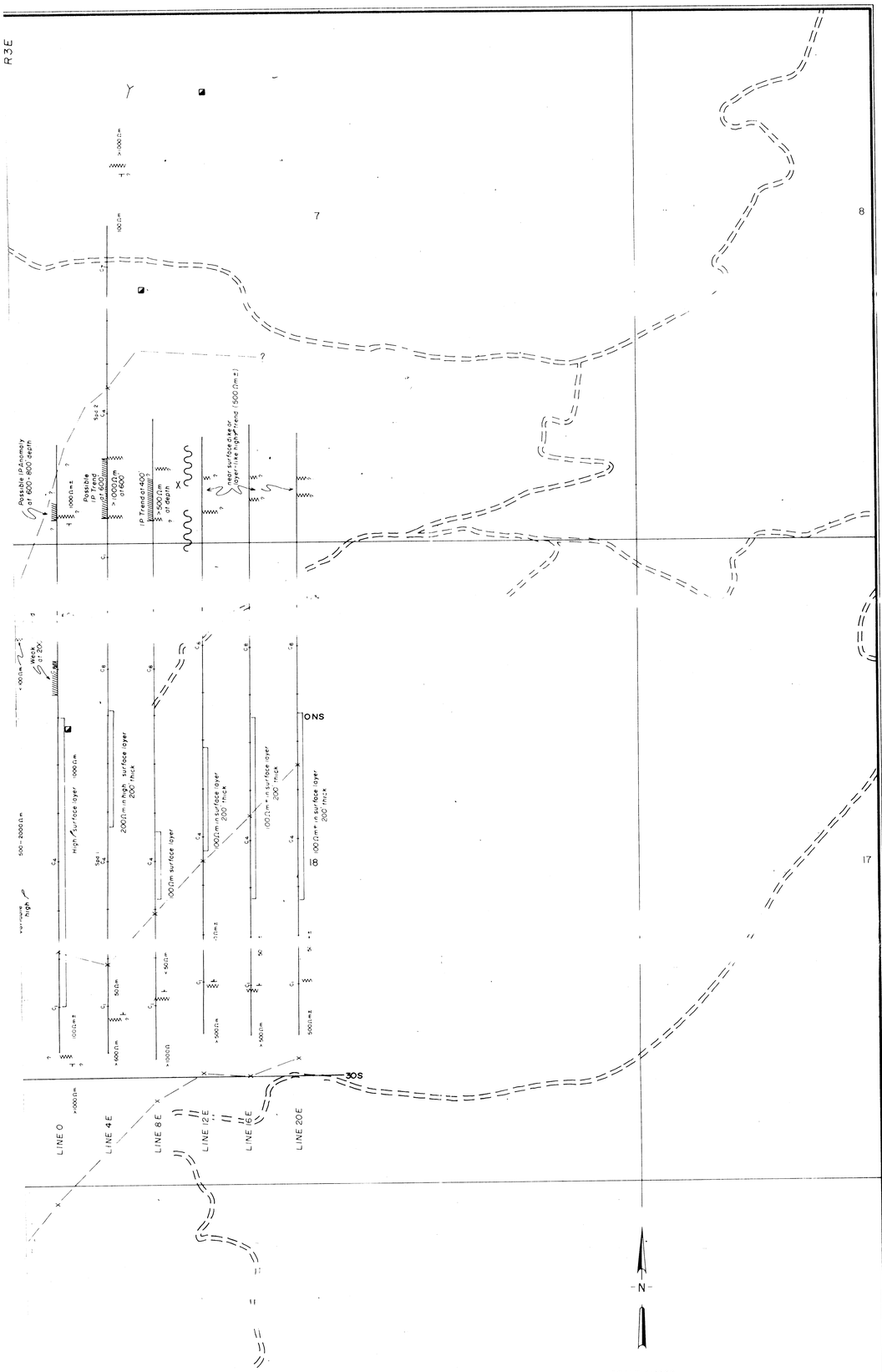
SILVER SPRING PROJECT
YAVAPI CO., AZ

ALTERATION OCCURRENCES

Map By DGA
Drft By DGA
Revised

PLATE 7


LINE 40W
LINE 36W
LINE 32W
LINE 28W
LINE 24W
LINE 20W
LINE 16W
LINE 12W
LINE 4W
3000N
NOOO
100Ωm±
200Ωm in surface layer 1500Ωm at depth
>1000Ωm
200Ωm at surface
1300Ωm at depth
200Ωm
1500Ωm
15ms
dike or finite body
>1000Ωm
500Ωm
250Ωm in surface layer
250Ωm over 2000Ωm
Buried
1000Ωm±
200Ωm in surface layer
2000Ωm
400Ωm at surface
1000Ωm+ below 200'
400Ωm± in surface layer
200 to 2000Ωm+
Buried dike trend at 200'
Buried response at 400'
1000Ωm+
200-300Ωm variable thickness 40-80'
2000Ωm±
Buried response at 200' (possibly multiple)
8ms at surface
3ms
<400Ωm
1500Ωm possible dike response here(?)
200Ωm at surface
2000Ωm±
Buried response at 260'
30ms
<500Ωm
1300Ωm±
200Ωm
1300Ωm±
<500Ωm
Variable
500-2000Ωm
EXPLANATION (1982)
Fence
Resistivity Contacts
IP Trends (relative intensity)
Possible structure
T15N
R2E



EXPLANATION (1981)

- Fence (partially built during survey)
- Resistivity Contacts
- IP Trends
- Possible structure

SCALE 1:4800

IP & RESISTIVITY SURVEY

PLAN MAP

SILVER SPRING PROJECT

YAVAPAI COUNTY, ARIZONA

for

OCCIDENTAL MINERALS CORP.

by

mining geophysical surveys INC.

PLATE 8