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P. O. Box 3605
903 University Boulevard
Tucson, Arizona 85722

October 19, 1970

Mr. Charles H. Suiter, President
Charleston Mines, Incorporated
5008 West Weldon Avenue
Phoenix, Arizona 85031

Blind Subject:
Tombstone District, Cochise
County, Arizona

Dear Mr. Suiter:

Thank you for your very nice letter, dated October 12th, which I have before me.

As you point out, it will take a certain amount of time to go over the data which you have submitted concerning the Charleston Mines property. However, I will do so at my earliest convenience and will contact you at that time.

Yours very truly,

John E. Kinnison
Regional Geologist

JEK/bl

b. c. c. Dr. T. F. O'Neil
File
Blue



AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DEPARTMENT
P. O. BOX 5795, TUCSON, ARIZONA 85703

J. H. COURTRIGHT
CHIEF GEOLOGIST
L. P. ENTWISTLE
ASSISTANT CHIEF GEOLOGIST
W. E. SAEGART
ASSISTANT CHIEF GEOLOGIST

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

February 28, 1969

J. E. K.

FEB 28 1969

Mr. E.D. Garnsey
9 Sherwood
Yonkers, N.Y. 10704

Dear Mr. Garnsey:

Your letter of February 4 to Mr. Bradford regarding the Tombstone District has been forwarded to this office for a reply.


As you will note from the attached summary, several large mining companies, including ASARCO, have conducted examinations and exploration of the district. Perhaps the most extensive program, carried out by Newmont during 1952 and 1953, involved sinking a shaft, cross cutting and underground drilling.

The principal production came from small but high grade enriched silver deposits at shallow depth in veins and in Cretaceous sedimentary beds. Exploration at depth encountered large volumes of water and only small occurrences of low grade primary silver mineralization.

Yours very truly,


J.H. Courtright

JHC:lzb
Encl.

cc: JJC Collins, w/encl
WESaegart, w/encl
JEKinnison, w/o encl 

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J. E. K.
FEB 25 1969

February 26, 1969

TO: J.H. Courtright

FROM: J.E. Kinnison

Tombstone District
Cochise County, Arizona
Status Report

The following is prepared at your request, in response to a letter of inquiry from Mr. E.D. Garnsey of Yonkers, New York.

HISTORY

The Tombstone district, first discovered in 1877, has produced in total to 1936, 37 million dollars derived principally from silver and to a lesser extent from gold. Half of the total production was made between 1879 and 1885, the yield being 5 million per year for 1881 and 1882. Ore occurs as small replacement bodies and as narrow fissure veins. Some of the near-surface ore was quite rich in silver due to enrichment. The general tenor of ore bodies mined at greater depth decreased through a range of ± 50 Oz. Ag/ton to an average of 11 Oz. Ag and 0.10 Oz. Au, for the period of 1908 to 1934.

Water now stands generally about the 450 feet level. Excessive pumping costs together with depletion of higher-grade reserves caused abandonment of all mining below the water level in 1911. Production continued in the upper levels up to the entrance of the U.S. into W.W.II.

The attached historical summary is copied from the Arizona Bureau of Mines Bulletin 143, 1938.

PRESENT STATUS

Over the years the many claims at one time held by numerous mining companies have been consolidated into a few major groups. During 1949 ASARCO held an option on a large area in the district, made a thorough examination and dropped the option due to an unfavorable exploration outlook. A few years later, during 1952-1953, Newmont had a field office in Tombstone and made an examination of the district. Since that time, both Bear Creek and Superior Oil have examined the district, and no doubt many other companies have also looked into exploration possibilities, on the fact of substantial past production from the district.

During the past two years the local newspapers have given considerable publicity to the district, several small firms have announced interest in the district, and recently a new discovery of a high-grade vein was reported.

John E. Kinnison

JEK:lzb
Ecnl.

Period	Price of silver	Production	Remarks
1877-80	\$1.15 - \$1.20	\$ 2,318,567	Discovery and early development. Mills built on San Pedro River.
1881-86	0.99 - 1.14	16,877,175	Active development and large production. Water encountered in mines in 1882, and mills built at Tombstone.
1887-96	0.63 - 1.05	4,564,650	Decreased production due to depletion of many of the large ore bodies above water level.
1897-1911	0.52 - 0.68	5,575,900	Consolidation of principal properties and attempted unwatering of district by a 1,000-foot pump shaft.
1912-14	0.553 - 0.615	379,917	Lessee operations.
1915-17	0.507 - 0.824	1,117,687	War period. Considerable production of mangiferous silver ore and concentrates.
1918-32	0.282 - 1.12	5,150,789	Mainly lessee operations. Production of silver during 1918-22 stimulated by Pittman Act.
1933-36	0.35 - 0.77	1,118,325	Production stimulated by increased price of gold and silver.

Dr. G. F. A. Kiersch
University of Arizona
Tucson, Arizona

Dear Sir:

In partial fulfillment of the requirements of geology 110, a geologic mapping course offered by the University of Arizona, I have examined some of the workings of the Tombstone district, Cochise County, Arizona, spending 10 days, from September 3 to September 13, 1952, on the ground, and I herewith submit my report thereon.

My report consists of maps, and related calculations, indexed to mine maps on file at the University of Arizona.

Respectively submitted,

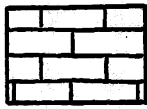
John E. Kinnison

John E. Kinnison
Tucson, Arizona
Jan. 15, 1953

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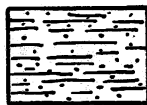
ROCKS



LIMESTONE



SHALE



"NOVACULITE"



DIORITE PORPHYRY

SYMBOLS



STRIKE & DIP
OF BEDS



FAULT



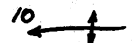
MINERALIZED VEINS
& NE FRACTURES



FRACTURE



VERTICAL FRACTURE



AXIS OF ANTICLINE,
SHOWING PLUNGE



AXIS OF SYNCLINE,
SHOWING PLUNGE



INDEFINITELY LOCATED
STRUCTURE



SHAFT



HEAD OF RAISE
OR WINZE



FOOT OF RAISE
OR WINZE



CAVED OR FILLED
AREA



INCLINED WORKINGS,
CHEVRONS POINT DOWN

STRATIGRAPHY MAPPED

CRETACEOUS

BISBEE GROUP

SHALE *Ksh*

10-FOOT LIMESTONE *K₁₀*

SHALE *Ksh*

BLUE LIMESTONE *K_b*

"NOVACULITE" *K_n*

PENNSYLVANIAN - PERMIAN

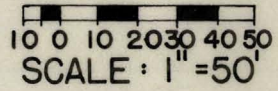
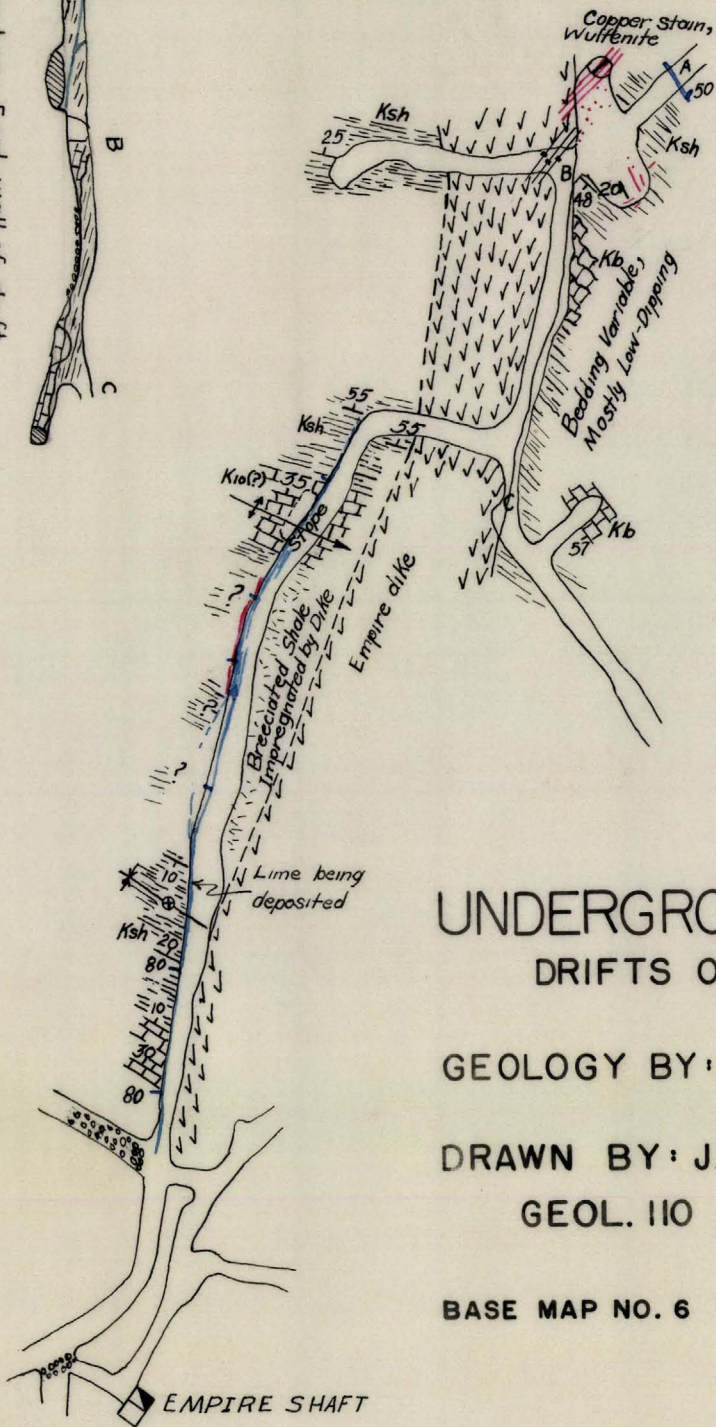
NAGO LIMESTONE *P_n*

EXPLANATION

J. E. KINNISON

JAN., 1953
GEOL. 110

Section: East wall of drift



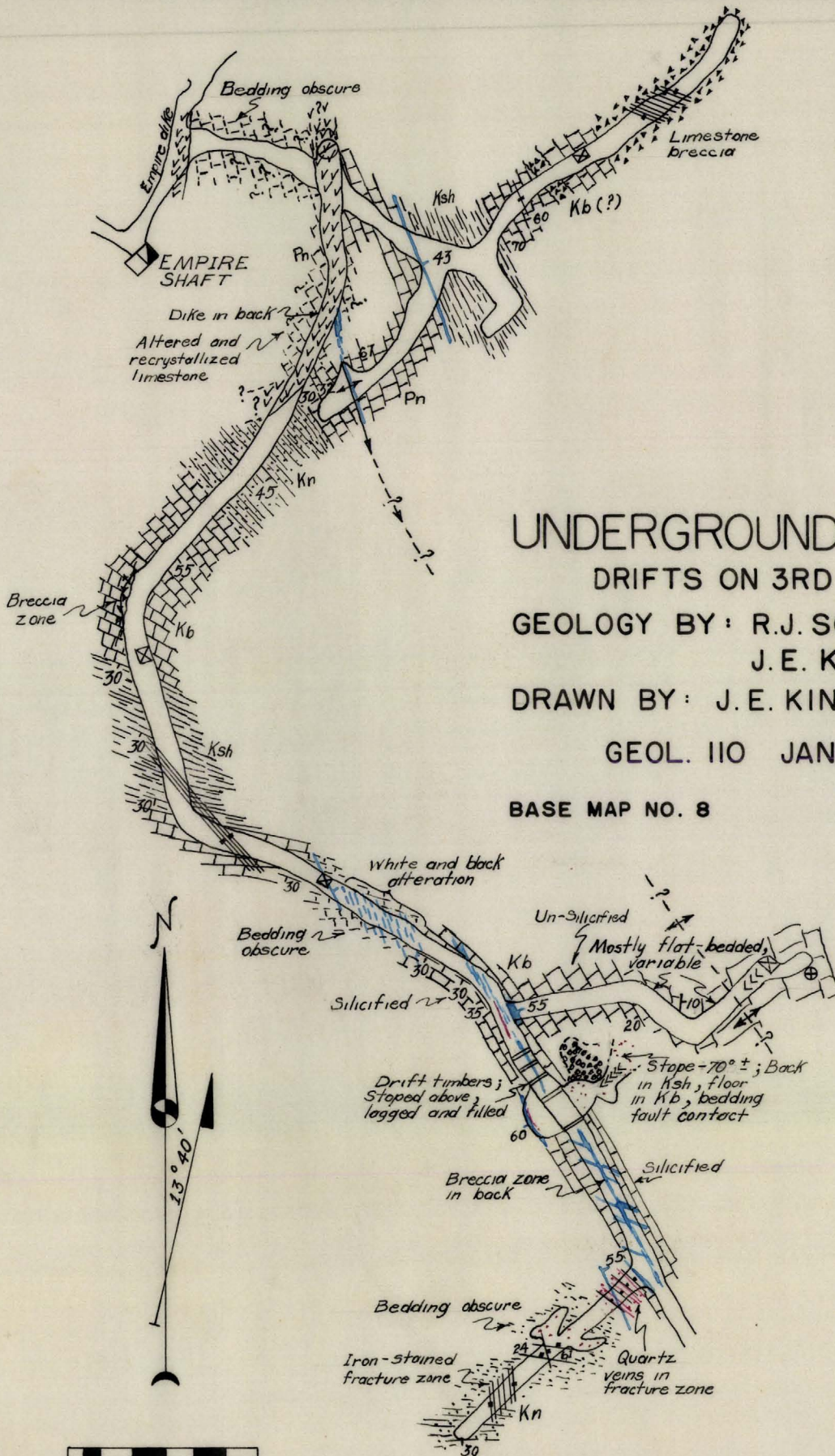
UNDERGROUND GEOLOGY DRIFTS ON 3RD LEVEL

GEOLOGY BY: R.J. SCHWARTZ
J. E. KINNISON

DRAWN BY: J.E. KINNISON

GEOLOG. 110 JAN., 1953

BASE MAP NO. 6



UNDERGROUND GEOLOGY

DRIFTS ON 3RD LEVEL

GEOLOGY BY: R.J. SCHWARTZ

J.E. KINNISON

DRAWN BY: J.E. KINNISON

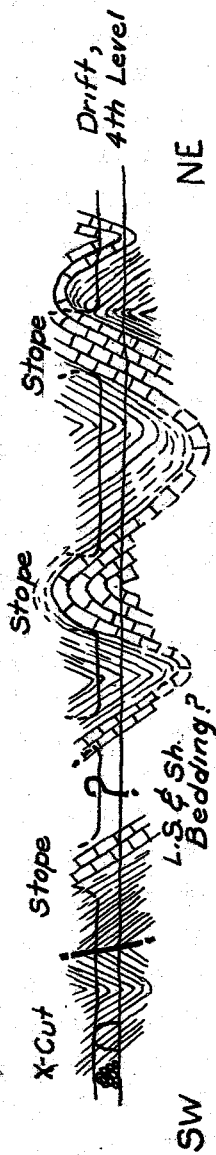
GEOLOGICAL JAN., 1953

BASE MAP NO. 8



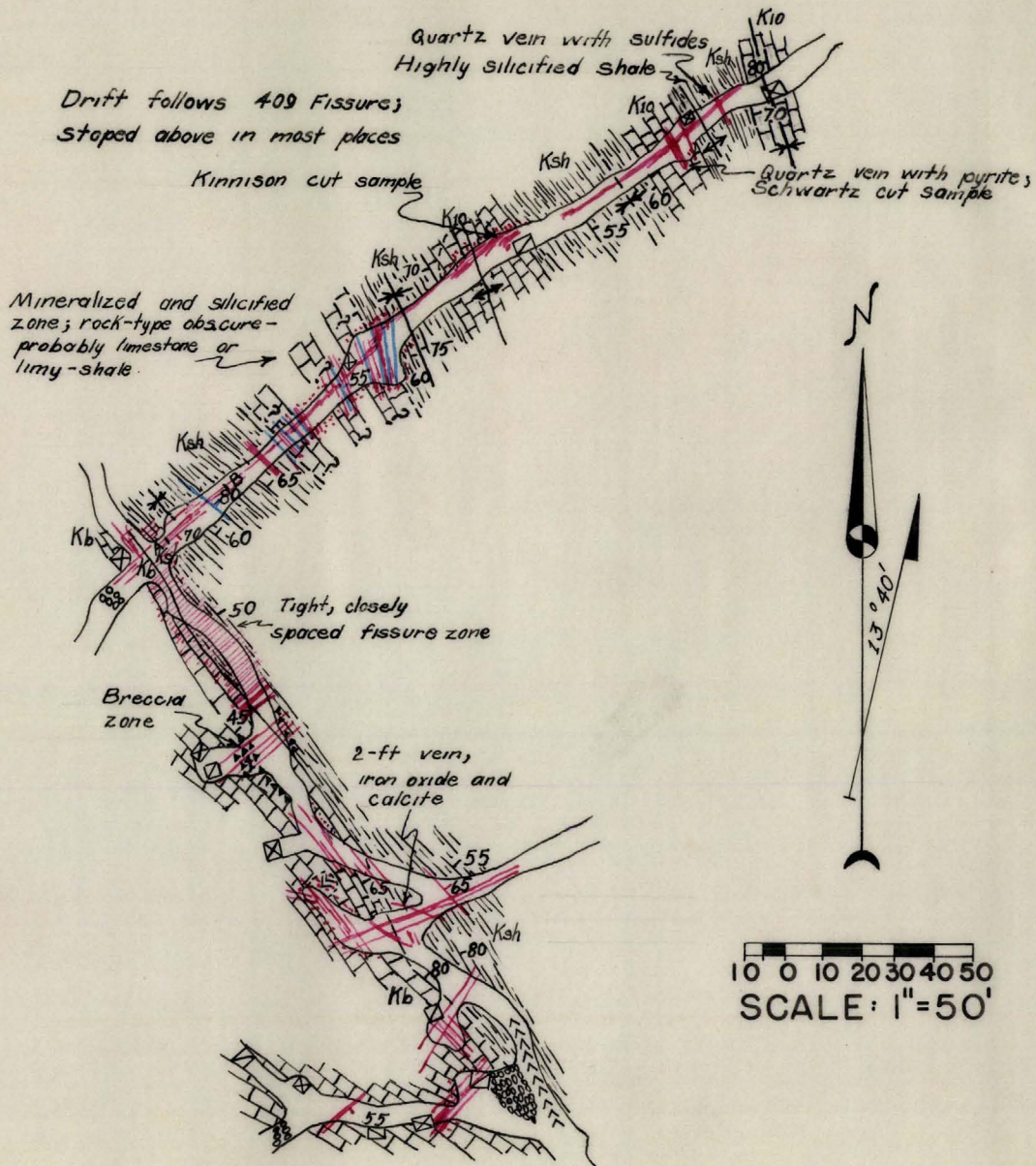
J. E. Krumm
Feb-1954

SCALE: 1" = 50'



GENERALIZED LONGITUDINAL SECTION ; 409 FISSURE

TOMBSTONE



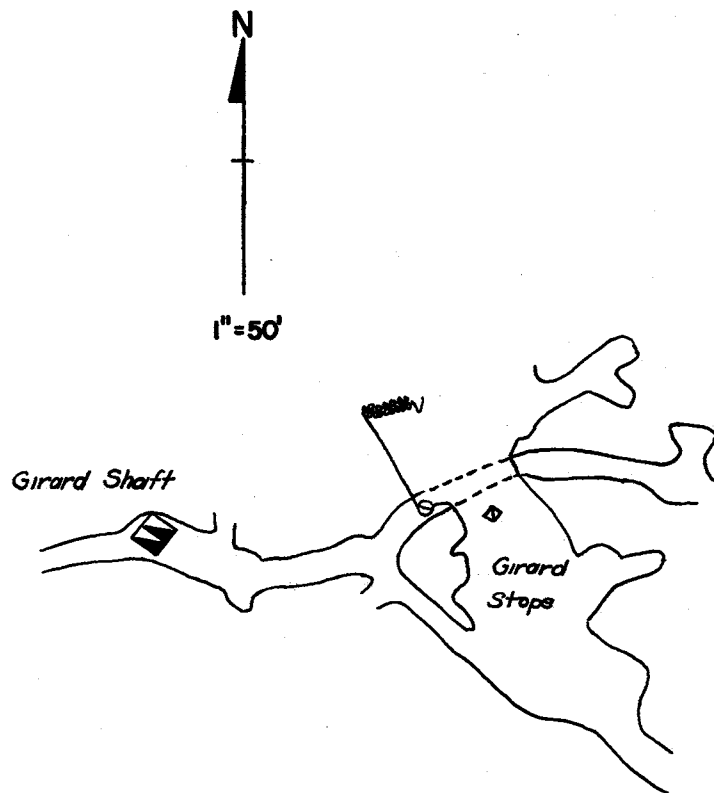
UNDERGROUND GEOLOGY DRIFTS ON 4TH LEVEL

GEOLOGY BY: J.E. KINNISON

DRAWN BY: J.E. KINNISON

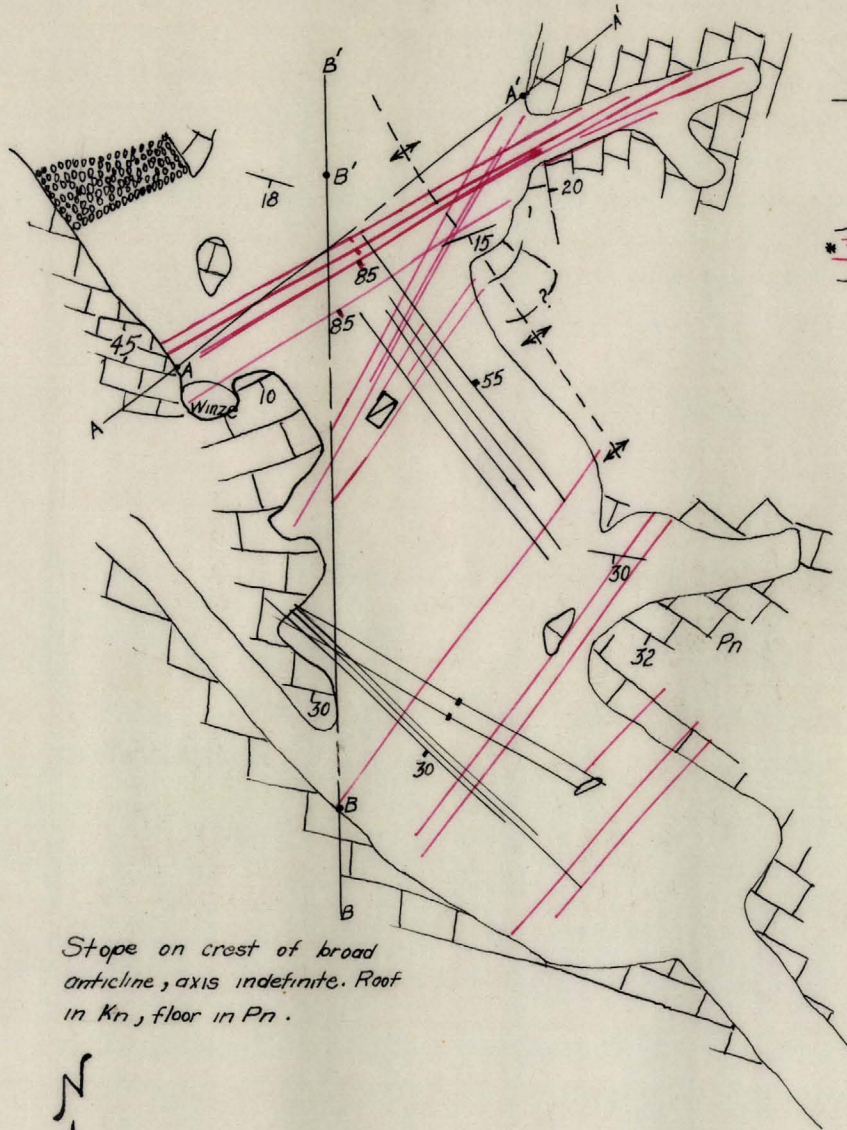
GEOLOGICAL IIO JAN., 1953

BASE MAP NO. 13

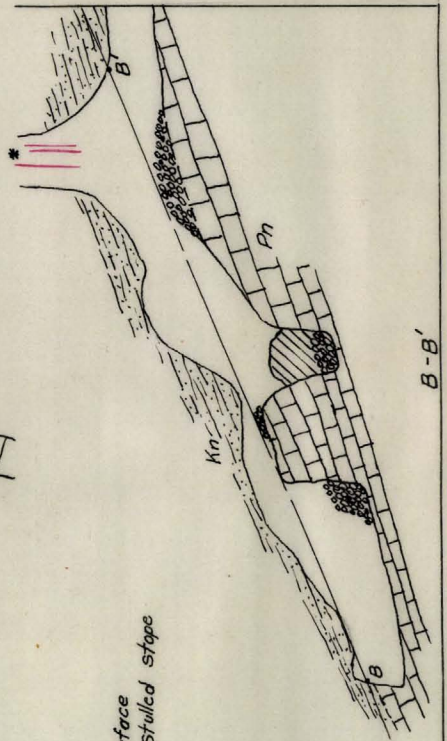


INDEX MAP
GIRARD STOPE

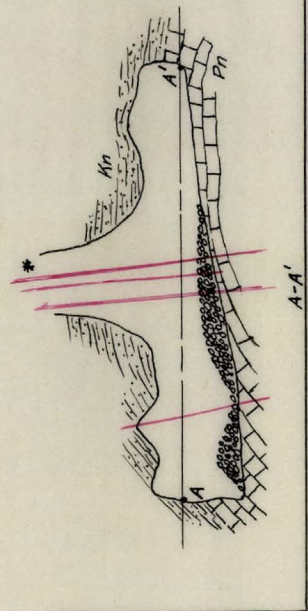
BASE MAP NO. 3
LOCATED BETWEEN 3 & 4 LEVELS



Stope on crest of broad anticline, axis indefinite. Roof in Kn, floor in Pn.



** Stopped to surface along fissure; Stalled stope ± 5 ft wide.*



Sections



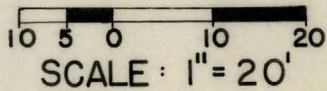
UNDERGROUND GEOLOGY GIRARD STOPE

GEOLOGY BY: R.J. SCHWARTZ
J. E. KINNISON

DRAWN BY: J. E. KINNISON

GEOL. 110 JAN., 1953

INDEX MAP, PP. 5



ORE CALCULATIONS:

GIRARD STOPE

Assumptions:

Total tonnage of rock mined contains 80 per cent ore
and 20 per cent waste.

Value of ore is \$32.50 per ton.

Tonnage factor ore: 10; tonnage factor waste: 12.5.

Area of plan view 3358 sq. ft.

Area of pillars - 28

Net area plan 3330 sq. ft.

Area of section A-A' 360 sq. ft.

Length A-A' 45 ft.

Area of section B-B' 540

Length B-B' 71

Total 900 sq. ft.

Total 116 ft.

Mean height of stope: $900/116 = 7.76$ ft.

Volume of stope: $3330 \times 7.76 = 25840.8$ cu. ft.

Tonnage factor of rock mined:

$$0.8 \times 10 = 8$$

$$0.2 \times 12.5 = 2.5$$

$$\text{Total } \underline{10.5}$$

Tonnage of rock mined:

$$25840.8/10.5 = 2461.03 \text{ tons}$$

Tonnage ore:

$$2461.03 \times 0.8 = 1968.824 \text{ tons}$$

Tonnage waste:

$$2461.03 \times 0.2 = 492.206 \text{ tons}$$

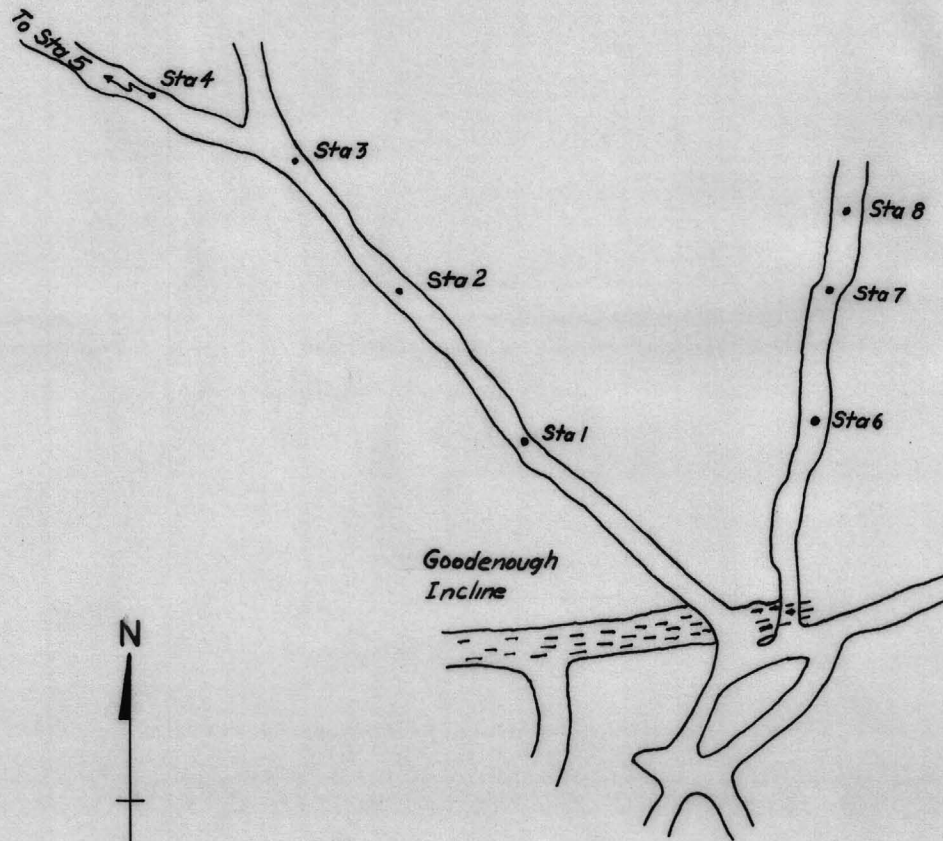
Value of ore mined:

$$1968.824 \times 32.50 = \$63987.$$

Note

Areas by planimeter.

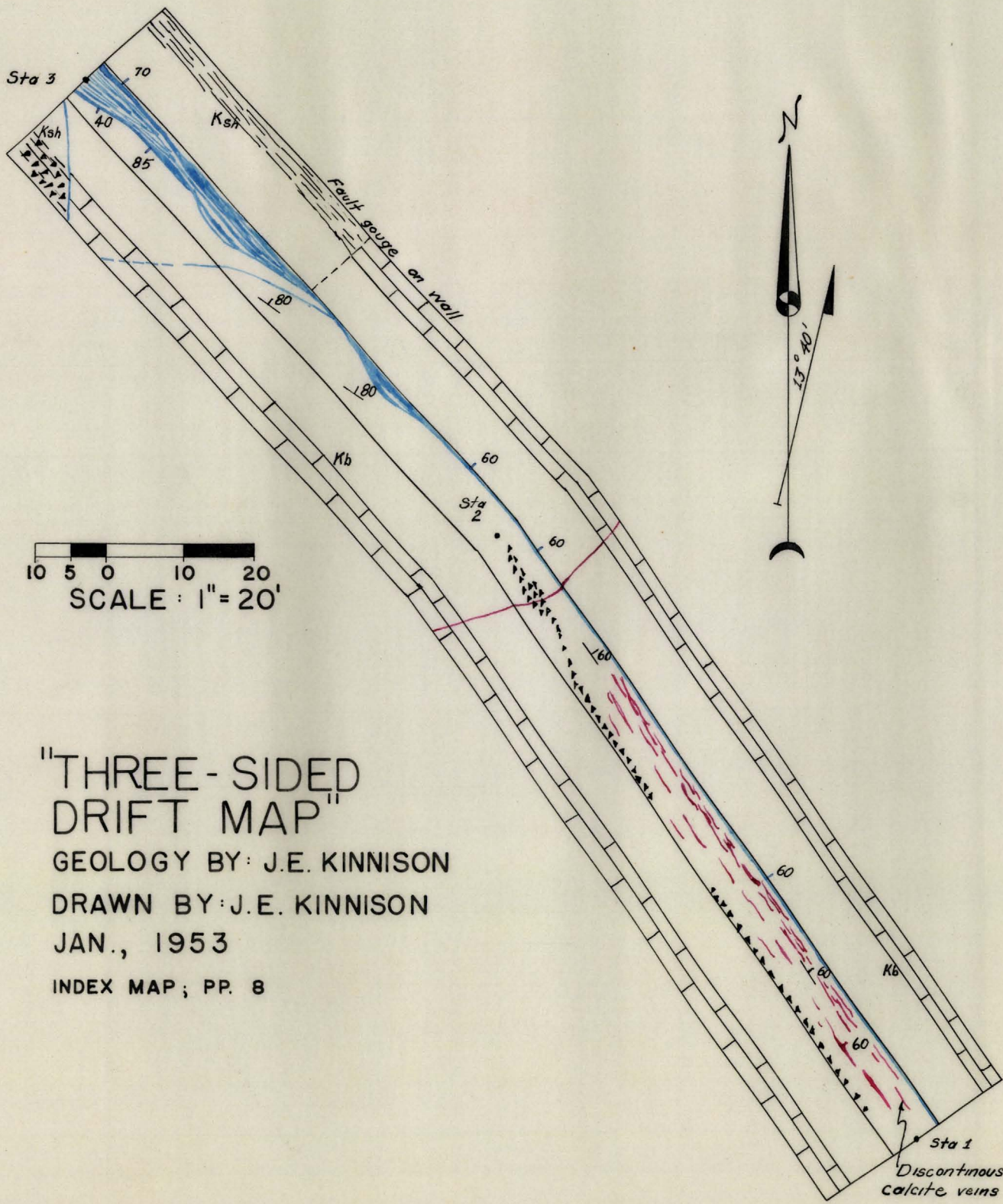
Vertical stope to surface along prominent fissure
zone not considered in calculations.



INDEX MAP

"THREE-SIDED DRIFT MAP"

BASE MAP NO. 1
3 LEVEL



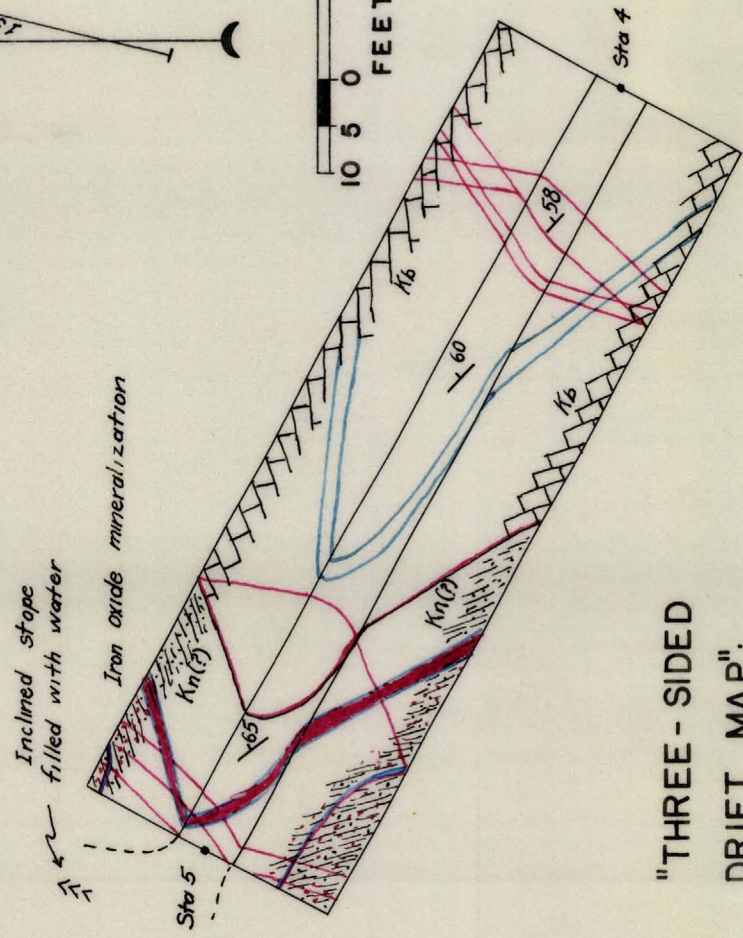
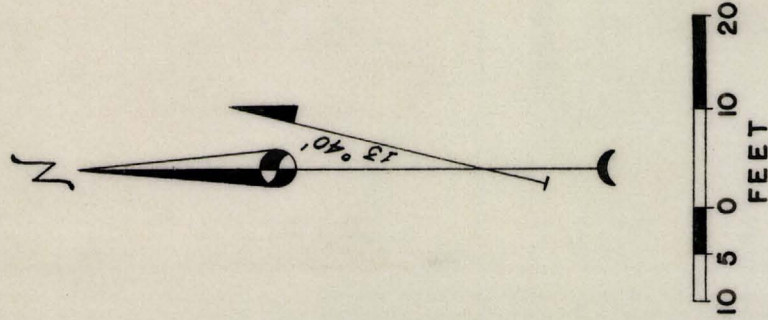
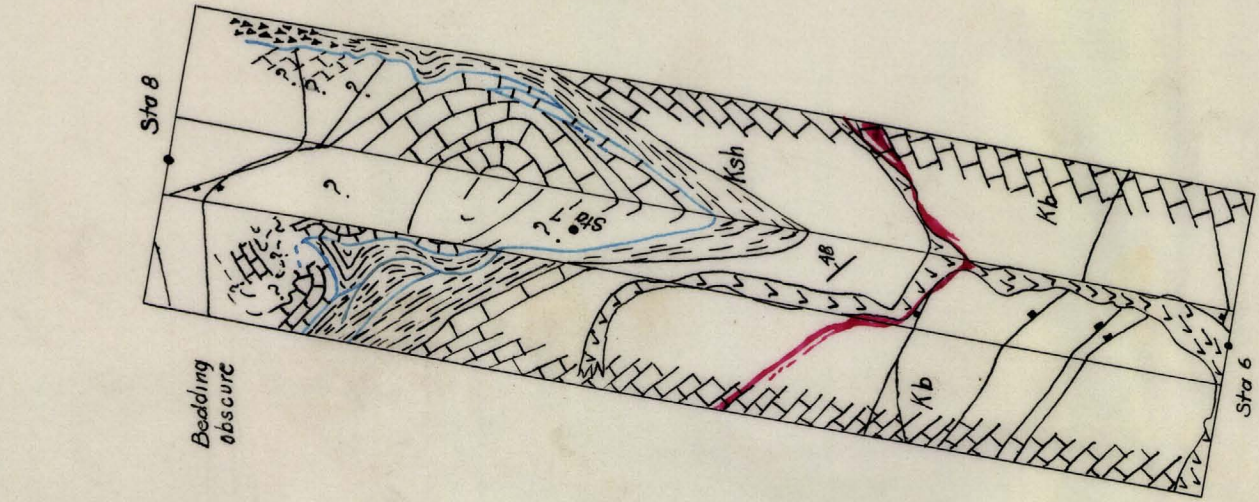
"THREE-SIDED
DRIFT MAP"

GEOLOGY BY: J.E. KINNISON

DRAWN BY: J.E. KINNISON

JAN., 1953

INDEX MAP; PP. 8



"THREE - SIDED
DRIFT MAP";
CONTINUED