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December 16, 1958

Mr. J. T. Jackson
Director, Arican Mines, Ltd.
1119 Burrard Building
1030 West Georgia Street
Vancouver, B. C.
CANADA

Dear Mr. Jackson:

I am posting today by airmail under separate cover three copies of my report on the Bowyer mine.

I appreciate the opportunity for undertaking this examination and only regret that the report is not encouraging.

Enclosed you will find my statement in duplicate.

Cordially yours

E. N. Pennebaker

ENP:mc

# VIRGO HOLDINGS LTD.

1119 - 1030 WEST GEORGIA STREET
VANCOUVER 1, B.C.

MUtual 3-8355


January 6, 1959

Dr. C. P. Jenney
362 Lakeshore Highway
Oakville, Ontario

Dear Phil:

Before going any further please tell Janet that I am sorry that I fed the dog the roast and also thank her for the Christmas card. The rocks to which I refered were in connection with Lapidary work that Ruth and I are doing as a hobby and of course we are expecting particularlly amethyst, rubys and diamonds in the rough. So far we are concentrating mostly on Fraser River jade and moss agate.

It was very good of you to put me in touch with Pennebaker and I might say that his report was one which could be produced with a certain amount of pride because he is certainly a good workman. At least my part of the merchandise was as advertised and for this I thank you very sincerely.

Very best personal regards.

Yours very sincerely,

Jim

J. T. Jackson

JTJ:bmf

Penny - This just turned up in my unfiled files! Undoubtedly you have similar problems! Not. you should have it in your files for future reference. Jim

Sure glad you were paid in full!

Phil

C. PHILIP JENNEY
CONSULTING GEOLOGIST
372 LAKESHORE HY. WEST
OAKVILLE, ONTARIO
VICTOR 4-9413

Jan 29/59

Dear Kenny—

Glad to hear you knocked off $500 from Jackson — before you started. I'm afraid he'll be very slow with the balance.

Incidentally he wrote me a very fine letter telling me what a good job you'd done & how pleased he was. Unfortunately I tossed it in the waste-basket or lost it. I meant to send it on to you.

Hope Katie isn't too broken-up about her Mother — if Mother's not going to recover.

Janet & I are looking forward to a rallying around the flag with you & Katie in S.F. Don't fail to show.

Regards

Phil

# VIRGO HOLDINGS LTD.

1119 - 1030 WEST GEORGIA STREET
VANCOUVER 1, B.C.
MUtual 3-8355


March 3, 1959

E.N. Pennebaker
Consulting Geologist
P.O. Box 817
Scottsdale, Arizona

Dear Pennebaker:

When I was writing you the other day, I was in somewhat of a hurry and forgot to give you the latest developments of the property in Arizona. This property is turned out to be particularly interesting and somewhat productive.

The interest and productivity centered around the fact that sometime after your report, which is completely confidential to me and Mr. Charles, McCann and Cohen appeared to take divergent views of different matters at their respective stopes and cross-cuts. Each turned up separately in Vancouver and fought the battle of the telephone. Thereafter and serruptitiously decided that the one, alone, ought to hasten to the Arizona property on an individual frolic. Unfortunately the aircraft left Vancouver in the cold cruel dawn at 5:00 o'clock A.M. and when Cohen turned around to see what passengers he could impress his vis-a-vis turned out to be McCann. Utter silence persisted right through to California and each departed in a westerly direction but both arrived at the same air-craft for Blythe. Again each started out in several different directions, but that night there were two cars on the way to the mine, one containing McCann and the other containing Cohen. They met at the property, and resumed negotiations before the Local Magistrate the following morning. The closest details I have heard indicate that McCann was swollowing heart pills with recklessabandon and Cohen adjourned to get a fresh supply of garlic. The firm result therefore stands that the property is definitely not been high-graded.

My former junior partner James R. MacBrien was out here and was making inquires about a chap by the name of James A. McRae of Midland Savings Building, Denver, Colorado who operates Trade Winds Exploration, financing Timor Oil, on Timor Island near Java. I understand his geologist is George Downs of Denver. It is a matter of interest to MacBrien as to whether McRae and Downs combination are good, bad and indifferent and it would be a pleasure for me to be able to pass on to him any information you have in confidence.

Yours very sincerely,

J.T. Jackson
Director

JTJ:bmf

March 21, 1959

Mr. T. J. Jackson
1119 Burrard Building
1030 West Georgia Street
Vancouver 1, B. C.
CANADA

Dear Mr. Jackson:

Thank you for your interesting letter of March 3. Evidently Cohen and McCann kept things popping around the Bowyer mine. Sounds like a good scenario for a TV movie. Anyway, the action of the Old West is being kept alive!

I have delayed answering your letter in the hope that I might learn something about Messrs. McRae and Downs. Mr. McRae is listed in the Rocky Mountain Directory, and Mr. Downs is listed as a member of the American Association of Petroleum Geologists. Unfortunately I have found out nothing else about them, but I am making further inquiry, through a friend in Denver.

I had a most enjoyable visit with Phil Jonney in San Francisco about a month ago.

Cordially yours

E. N. Pennebaker

ENP:mc

# BOWYER MINE

## YUMA COUNTY, ARIZONA

December 15, 1958

E. N. PENNEBAKER
CONSULTING GEOLOGIST
SCOTTSDALE, ARIZONA

E. N. PENNEBAKER
CONSULTING GEOLOGIST
P. O. BOX 817
SCOTTSDALE, ARIZONA

December 15, 1958

Arican Mines, Ltd.
1119 Burrard Building
1030 West Georgia Street
Vancouver 5, B. C.

Gentlemen:

I herewith submit three copies of my report on the Bowyer mine, Yuma County, Arizona.

Attention is directed to the sections entitled "Comments" and "Conclusions" for a summary of my findings.

Yours very truly

E. N. Pennebaker

E. N. PENNEBAKER

ENP:mc
encls.

# GEOLOGIC ANALYSIS

of the

# BOWYER MINE

YUMA COUNTY, ARIZONA

For

ARICAN MINES, LTD.

By

E. N. PENNEBAKER

December 15, 1958

TABLE OF CONTENTS

# GEOLOGIC ANALYSIS

of the

# BOWYER MINE, YUMA COUNTY, ARIZONA

For

# ARICAN MINES, LTD.

## INTRODUCTION

On December 3, 4 and 5, 1958, the writer made a brief examination of the Bowyer mine, sometimes known as the Dome Basin mine. This property is situate on the west side of the north end of the Dome Rock Mountains in northern Yuma County, Arizona, and it occupies a part of Section 28, Township 5 North, Range 20 West of the Gila and Salt River meridian. The area is generally known as the Plomosa Mining district.

The property lies in a bee-line about 8½ miles northwest of Quartzite, Arizona, and about 17 miles northeast of Blythe, California. It is connected to Quartzite by a rough and sandy gravel road that is about 14 miles long.

The nearest shipping points to Arizona smelters are at Parker and Bouse, Arizona, on the Atchison, Topeka and Santa Fe Railroad. These are reached by truck hauls of about 30 miles from the mine.

The collar of the main shaft and the remains of the old mill are near the base of a steep mountain that faces west,

toward the Colorado River and the California State Line, some 10 miles distant. The elevation at the mill is about 875 feet above sea level.

The Bowyer mine is less than a mile east of the eastern boundary of the Colorado River Indian reservation. Outside of the reservation, mining claims can be located on open ground of the Public Domain, and they are held by fulfilling the annual requirements for assessment work until they are issued letters patent.

The writer is advised that the Bowyer property consists of 7 unpatented lode mining claims. No property maps were shown him, and the relative positions of the claims are not known. Presumably the parcel of ground is about 140 acres in extent.

## HISTORY

The Bowyer mine is an old property, but only fragments of its history are known to the writer. Some of this is based on heresay, a part of which is contradictory.

Records of the Arizona Corporation Commission reveal that the Bowyer Gold and Copper Company was incorporated on July 15, 1909, and that its charter expired through statuatory limitation on July 15, 1934 (after 25 years). The company's capitalization was 1,000,000 shares with par value of $5.00 per share. Annual reports were filed with the Commission for 1912 to 1924, inclusive, but these contain little pertinent information.

The Mines Handbook for 1926 (Vol. XVII) reports that "In August, 1925, the Arizona Corporation Commission investigated

this company on complaint of stockholders", but the writer could find no record of this investigation in the Commission's available micro-film records.

A mill of 50 tons capacity was constructed in the early nineteen-twenties, but this was apparently dismantled many years ago. Judging by the size of the tailings dump, scarcely more than 500 tons of material were treated.

Apparently all activity at the mine ceased in about 1925, but it is believed that work was resumed by the Bowyers in the early nineteen-fifties, and presumably at this time the 19-degree incline was driven off the main shaft and a small shoot of ore was found. It is rumored that a shipment of rich ore was then made that yielded a handsome net smelter return.

At present the property contains no machinery nor equipment.

In 1922 the officers of the old company were listed in "The Mines Handbook" (Vol. XV) as follows:

Jos. Bowyer, President-treasurer
H. C. Wohler, Vice-President
C. M. Robins, Secretary
With J. D. Bowyer and O. T. Hodge as Directors.

Other items of past history will be mentioned in discussions that follow:

## GENERAL GEOLOGY

Bedrock in the area of interest consists of Precambrian layered rocks of siliceous composition, limestone beds of doubtful age and a granitic intrusive that is probably much younger and possibly of Mesozoic or Tertiary age. The general attitude of the rock layers is about N70°W with a gentle dip toward the north.

Part of the limestone conforms to this general attitude, but some sections display bedding that is intricately crenulated and folded in a most complex fashion. Furthermore some of the limestone has undergone contact metamorphism with the development of marble and skarn (or tactite). This consists of irregular bodies made up of garnet intergrown with magnetite, silica, epidote and calcite. There are also extensive zones that are replaced by a dense, chalcedonic silica, or "chert", and these zones of silicified limestone are easily confused with other siliceous Precambrian rocks of an originally different kind.

A quick examination of the main inclined shaft shows that the limestone was in part thin-bedded and impure and interlayered with shaly and/or sandy beds, and these have been converted into a variety of schists and lime-silicate metamorphic rocks.

The siliceous Precambrian rocks consist of schists, hornfels, and possibly fine-grained quartzites. The original nature of some of these rocks could not be determined from a brief examination, but some may be metamorphased lavas and tuffs. In general these rocks rest upon the limestone zone and dip to the north, but because of local complex folding and erratic contact metamorphism they are readily confused with the silicified limestone.

The younger granite crops out about 500 feet south of the main shaft collar. It is a medium-grained rock containing quartz, feldspar, and subordinate dark mica. Where it is exposed it is grey in color and fresh in appearance. It has not undergone hydrothermal alteration and small-scale veining of the porphyry copper type, although in places it shows a veined structure carrying epidote.

## MINERALIZATION

Mineralization is displayed on the surface by limited, discontinuous zones of fracturing that cut through limestone and skarn and contain iron oxide and green copper staining.

These sporadic occurrences fall erratically along a zone that strikes about N70°W for a distance of about 1,000 feet, but on the east the zone kinks to about S40°E. Although the trend is about the same as the general trend of the rock layers, mineralization appears to be controlled by steep fracturing that crosses bedding, and only locally does it go down-dip on gently-inclined bedding.

There are three groups of mineral showings scattered along the aforementioned zone. The one on the southeast is about 150 feet long. It consists of steep fractures striking about N40°W, along or near which mineralization occurs over widths ranging from a few inches to about 36 inches. This consists of white quartz and epidote veinlets with minor showings of green oxidized copper minerals. These showings have been followed by (1) an 8-foot hole inclined down toward the north, (2) a 30-foot incline down to the north, and (3) a shallow cut. In the 30-foot incline there is 36 inches of scattered quartz lenses and minor oxidized copper at the portal which goes down along the limestone bedding to where it dies out down-dip at the face on a weak N35°W steep fracture. Evidence of copper mineralization is generallyweak, and the old-timers did not follow it far. These showings did not warrant sampling. There is an abundance of silicified rock nearby, which is dense, chalcedonic and cherty and is probably

silicified limestone. Other nearby limestone is intricately folded.

A second section of the mineralized zone appears north of the main gulch and is exposed for about 200 feet. On the east it is represented by a quartz vein 1 to 8 inches wide that cuts through and is younger than a body of magnetite exposed in the gulch bottom. Farther up the hill toward the west mineralization occurs in a steep crushed zone about 12 inches wide in which there are a few thin streaks containing oxidized copper minerals associated with epidote. About 100 feet farther up the hill and toward the northwest is an inclined shaft about 25 feet deep in which some quartz lenses (6 to 24 inches long, and smaller) are associated with scattered copper silicates. Again the showings are weak and did not warrant sampling.

The third section of the northwesterly-trending mineralized zone is at its westerly end, and here is where most of past and present activity has been centered. Between the second and third sections there is a stretch of about 400 feet in which the zone is not evident.

The third section consists of one element striking about N57°W through the collar of the main shaft for a strike length of about 100 feet, and 50 feet farther along on the northwest a short incline has also been put down on it (where drilling water is now stored). This is a rather strong showing of substantial width consisting of a gossan with abundant iron oxide and subordinate green copper.

Diverging from the above described trend near the main shaft is an irregular zone of fracturing (and minor folding ?)

with a strike of about S20E, which carries weak but noticeable mineralization.

Sinking of inclined workings near the fracture intersection described above eventually led to the discovery of a small shoot of sulfide ore at shallow depth (about 40-50 feet below the overlying surface). Much of this lens of ore did not crop out but was covered by a roof of marble or skarn laced through by veinlets of white quartz.

On the surface there are heavy zones of skarn and magnetite nearby to the east.

Scabs of ore left on the walls of the stope show it to consist of fine-grained garnet with associated fine-grained magnetite and epidote. This material is cut by glassy and white quartz that carries the copper-iron sulfide, chalcopyrite. Some of the chalcopyrite is intergrown with pyrite, and locally the latter is moderately abundant. In some specimens chalcopyrite fills in around magnetite crystals and is definitely later in age; chalcopyrite is also later than the glassy quartz.

Chalcopyrite is replaced (and enriched) by secondary chalcocite, and this mineral contributes importantly to the copper content of the small ore shoot found at shallow depth.

In the oxidized zone at and near the surface the copper silicate, chrysocolla, is the principal green-colored mineral, and this is associated with subordinate malachite. Some copper pitch also occurs as a direct oxidation product of the chalcopyrite.

Iridescent stains on chalcopyrite resemble bornite but are extremely thin. The writer did not identify bornite as a

constituent of importance.

In summary, the following features of mineralization at the Bowyer mine are worthy of note:

(1) Ore occurs in and near silicified and garnetized limestone ("skarn" or "tactite"), but some, if not all, of it is later than the formation of the skarn and is related in trend to fractures.

(2) The major localizer of ore appears to be steep pre-mineral fractures or fracture intersections, whereas flat bedding is a subordinate control that may give flat tops and bottoms to the ore shoots.

(3) Copper is associated with veinlets and lenses of white quartz.

(4) The favorable fracturing may be related to zones of extreme minor folding in the limestone.

## THE MINE WORKINGS

Although there are a number of pits and short inclines on the property, the principal working consists of a deep inclined shaft with various drives and raises leading off from its upper part.

The shaft bears about N40°E and is inclined downward at an inclination of 30 degrees from the horizontal. It is untimbered but is in remarkably good condition.

Although it has been stated that this shaft is 1,400 or 1,500 feet deep (on the incline), the writer in company with Mr. Harvey Cohen measured its depth and found it to be 625 feet. At this point a horizontal drift runs from the bottom of the

shaft into the hanging wall toward the north. Near the junction of the shaft and the drift, the drift is filled with muck to within about 18 inches of the back. Looking through this aperture, Mr. Cohen and the writer believed the drift to continue for about 100 feet and there to stop.

However, in 1924 the Bowyer Gold and Copper Company reported to the Arizona Corporation Commission that the mine contained 2,300 feet of workings. If this be true, then the drift leading from the bottom of the shaft may be longer than we suspected.

There are two main levels leading off the (30°) inclined shaft. One of these takes off at 77 feet down the incline and consists of a drift 90 feet long running toward the northwest. It followed weak fracturing but found no mineralization.

The second level takes off at 182 feet down the incline, near where a very small showing of iron oxide and a very minor amount of green copper is exposed. The workings here consist of (1) a 90-foot drift to the northwest from which (2) a cross-cut leads off for 90 feet to the southwest, and (3) a curious "run-around" drift that curls around the shaft and almost breaks through into the drift first mentioned. No mineralization was found. From near this point in the shaft a raise (4) was driven into the hanging wall at an upward inclination of about 34 degrees. We were unable to enter this raise because of lack of entrance ladder, but it was roughly estimated to be several hundred feet long.

The above is apparently the "200-foot level". "The Mines Handbook" for 1924 (Vol. XVI) quotes a company report alleging

that an ore body 100 feet long was found on this level. The writer found no evidence of such mineralization.

A third set of workings leads off from near the collar of the 30-degree inclined shaft, and it is believed that this work was done in the early nineteen-fifties. It includes an incline sloping down at about 19 degrees, and this explores a shallower section than the main shaft. It goes down on the slope about 100 feet from the collar to where a scab of sulfide remains, and a stope drift was run about 50 feet to the southeast and another drift was driven about 50 feet to the northwest.

The drift to the southeast developed a small ore body with rich patches. Judging by the size of the opening this ore shoot was roughly 30 feet long by 5 to 20 feet wide, and it probably averaged about 15 feet high. Thus its tonnage was 1,000 or less, unless the shoot extended back into the drift toward the northeast, which it may have done. Therefore a tonnage of 1,500 to 2,000 seems to be the maximum found.

There is a raise and a drift going up to the northeast for 50 feet or so which we were unable to enter, but it appeared doubtful if any ore came from here. It is also quite doubtful if any ore came from the raise leading up from 182 level.

There is also a short raise and a short drift leaving the incline at about 65 feet down, but only a small tonnage, if any, could have come from here.

Therefore the maximum tonnage of ore extracted as judged by mine openings leading from the main shaft, could hardly have exceeded 2,000 or 3,000 tons at the most generous estimate.

In summary the Bowyer mine workings reveal shallow mineralization, but they failed to find any additional ore at depth. The deeper work was apparently conducted on the theory that ore followed bedding, which in general dips northerly at a flat angle, but the hanging wall raises and drifts toward the north apparently found nothing of value.

## PAST PRODUCTION

We have no reliable information regarding past production and shipments, other than from the size of the mine openings just discussed.

Nevertheless there are about 500 tons of tailings at the former millsite and a dump near the shaft containing possibly 1,500 tons or less of sulfide-bearing material. This about balances the tonnage roughly estimated from the mine openings, but, as previously noted, there are also rumors of an alleged shipment a few years ago of rich ore to an Arizona smelter that returned high values and a substantial amount of money.

This shipment was thought to have been to the Hayden smelter of American Smelting and Refining Company, but this company has kindly checked its records at the writer's request and reports no shipment was ever received by them from the Bowyer mine. However, they have advised that Roy T. Bowyer and R. S. Kinsey submitted a sample in March, 1954, and the smelter agreed to take a trial car, freight charges prepaid, but no shipment was ever received from Bowyer and Kinsey.

It is possible that a shipment was sent to the Magma Copper Company smelter at Superior, Arizona, because freight

rates to Superior were probably a little lower than to Hayden, but the writer has no information on this possibility.

Nevertheless, judging by the size of the stoped area and the size of the dump, there is little liklihood that a substantial tonnage left the property, although a small shipment of rich hand-sorted ore could have been made.

## SAMPLING AND ORE VALUE

There is little to be gained from sampling the walls of the old stope. It does display small patches of rich sulfides plastered on barren garnet rock, but the copper content changes radically over very short distances. Consequently an individual rich sample would have little significance because it could not be related to a specific, substantial tonnage. These patches, then, are the small leavings remaining from the activities of the earlier mining.

Therefore, in order to try to obtain a representative value for the ore shoot extracted, the writer has sampled the so-called "ore dump" believed to contain no more than 1,500 tons (and possibly much less). This part of the dump is on the east, and it shows chunks that contain sulfides and other chunks that are stained green by oxidized copper minerals. The western part of the dump, on the contrary, contains barren material from the shaft, and this material was not included in the sample.

One sample amounting to 20 pounds in weight was taken from the smaller pieces on the ore dump. This sample was assayed at the laboratory of International Smelting & Refining Company with the following results:

Copper..... 0.99%

Gold..... 0.005 oz. per ton

Silver..... 0.10 " " "

Tungsten..... Trace

(See attached assay certificate, Sample No. 1.)

Another sample weighing 10 pounds was taken of chips from the larger-sized material in the same dump. The following results were obtained:

Copper..... 0.98%

Gold..... 0.005 oz. per ton

Silver..... 0.08 " " "

Tungsten.... Trace

(See attached assay certificate, Sample No. 3.)

A third sample weighing 10 pounds was taken from loose material left on the floor of the stope, this material, probably amounting to 50 or 100 tons, contained the following:

Copper..... 1.07%

Gold..... 0.005 oz. per ton

Silver..... Trace

Tungsten.... Trace

(See attached assay certificate, Sample No. 2.)

The above samples seem surprisingly low in tenor, because chalcopyrite and green copper can be seen in some of the rock fragments making up the material sampled. Nevertheless, the writer exercised care in taking these samples to make them

representative, and the consistent copper value in all three implies that this was achieved. It is rumored that other samples taken from this dump have returned high values in copper. This could only be from rich specimens picked out from the general run of material.

International Smelter has kindly calculated the return from material of the grade of Sample No. 1, and this amounts to a deficit of $3.09 per ton (before freight, mining, and other charges).

American Smelting and Refining Company has furnished the assay return of the sample submitted by Bowyer and Kinsey in March, 1954. This is:

Copper..... 4.20%

Gold..... 0.01 oz. per ton

Silver..... 1.67 " " "

(See attached copy of letter).

International Smelting has calculated the smelter return from ore of this grade at present smelting rates to be $13.64 per ton. From this we must deduct:

| | |
|---|---|
| Trucking to railroad at Parker.... | $ 3.50 |
| Rail freight, Parker to Miami..... | 8.00 |
| Cost of Mining..... | ? |
| Cost of Development..... | ? |
| Return of capital..... | ? |

Consequently it is readily apparent that substantial tonnages of far richer ore would be needed to yield a profit under the conditions pertaining at the Bowyer mine.

## PRESENT ACTIVITY

During the past several weeks certain activities at the mine have been resumed on behalf of Arican Mines, Ltd. This consists of constructing a small office and storage building and the attempt to drill shallow vertical holes from the surface by a portable "Pack Sack" diamond drill.

The sites for the holes have been selected on the theory of a southeasterly extension of the known ore shoot. Although underground the stope appears to pinch in this direction, nevertheless the theory is sound. However, a logical start would be to blast the scabs of ore remaining in the stope to see if any of them continue outward.

The site of Hole No. 1 on the surface is about 40 feet beyond and southeast of the stope face. The hole cut skarn for 6 feet and became stuck. The core displays no copper minerals.

The drill was then moved a foot or two to one side and an attempt was made to drill another hole. This was advanced to a depth of 30 feet, where it also was stuck. Again barren skarn was cut.

Hole No. 3 is located about 75 feet southeasterly and beyond the stope face. Difficulty was encountered in its drilling, but on December 5 it had reached a depth of 23 feet in barren skarn.

Although the depth of the objective in this area is only 45 or 50 feet, this type of drill appears to be unsuitable for the drilling conditions imposed by the garnet-magnetite-silica rock.

## COMMENTS

Mineralization at the Bowyer mine is typical of the "contact metasomatic" or "pyrometasomatic" type. Although there are some notable exceptions, ore deposits of this kind are generally of comparitively small size and are very irregular in outline. They are commonly associated with "skarn" or "tactite" (Garnet-silica-magnetite-epidote rock).

In driving to the Bowyer mine through Bowyer Gap, a major zone of limestone and skarn can be observed for several miles as the mine is approached. This displays few diggings and little or no evidence of copper until the Bowyer mine is reached. Consequently there is no major surface display of hydrothermal alteration nor copper mineralization in this area.

Although the mine is already explored to considerable depth, the very small shoot near the surface was the only ore found. This deeper work was apparently done on the theory that ore would follow a "favorable" limestone bed dipping toward the north, but the deeper workings reveal no clue of such a bed. However, because of folding in parts of the limestone, it would require detailed study to determine whether the ore-bearing beds in the little stope were actually cut by the deeper workings.

The ore is spatially related to the skarn, and further exploration should be preceeded by detailed geologic mapping to outline the occurrences of this associate. Nevertheless, the problem is not simple, because copper mineralization is also associated with certain sets of fractures, intensely folded limestone zones, and quartz veins. It would appear that these features would occur together only in a limited number of locations,

and the generally weak surface showings observed in the area seem to indicate this.

The better grade of copper ore on the dump has been substantially enriched by secondary chalcocite. Consequently if a rich shipment were made in the past, its tenor was largely due to the secondary enrichment of a shallow ore by supergene processes related to weathering. Although the depth of weathering probably varies considerably from place to place in the Bowyer area, deep prospecting, if successful, is more likely to find unenriched, lower-grade copper mineralization.

The better places to prospect are in and near the skarn, where it is cut by copper-bearing fissures of northwesterly trend. Such exploration would require detailed geologic mapping and surface diamond drilling with equipment adequate to do the job.

This is essentially "blind prospecting", and in its planning any help from geophysics would be welcome; however, there are exposed bodies of magnetite on the property that contain no copper, and, therefore, a magnetic survey might be misleading.

Copper ore at the Bowyer mine is rumored to contain substantial values in gold, and the lack of gold in samples taken by the writer, and also in the sample submitted to the A. S. & R. smelter, is puzzling. It is possible that some gold may occur in the leached gossan near the main shaft, where it might have been concentrated during the oxidation of this material.

It should be pointed out that any samples taken underground or by diamond drill in this kind of a deposit must be received with caution. Even where substantial values are returned by assay, the results mean very little until they are

related by other good samples and measurements to a substantial tonnage.

Search for and development of ore bodies of this type will be very expensive per ton of ore found, and any profits that might be won from a quick initial discovery are likely to be dissipated in the further search for other ore shoots.

## CONCLUSIONS

Considering the various features discussed in foregoing sections of this report, it is the writer's conclusion that the chances of finding commercially profitable ore bodies on the Bowyer property are quite limited, and the expenditure of moneys for this search is most hazardous.

It is possible that a few small bodies of good tenor may be found, but it is judged that any profit would be lost on capital expenditures and the expensive search for other deposits. Furthermore the chances of finding a really big ore body appear to be very remote.

Any additional prospecting, other than the completion of the small drilling program now under way, should be guided by detailed geologic study, which would probably cost around $5,000. However, because of the limited possibilities of the ground, the writer does not believe such an expenditure is warranted.

The writer has recently learned that the Bowyer mine has already been examined by certain large Arizona mining companies that are keenly anxious to develop new sources of ore. The writer is personally acquainted with one of the companies that turned it down because of limited possibilities for developing

a profitable tonnage.

In concluding it must be pointed out that the main shaft is in barren rock to the deepest point of observation at 625 feet on the incline (except for a modest amount of gossan at its collar); that only the drifts on the stope level started in ore and that other drifts and cross-cuts are in barren rock; that there is only 50 or 100 tons of low-grade material on the stope floor and that the floors of other workings, including the main shaft, do not contain any broken ore; that, although limited spots in the mined ore shoot may have been of high-grade, the general average, on the basis of recent sampling of the dump, is low in tenor; and that there is no indication in the workings presently available for observation that the deposit is extensive.

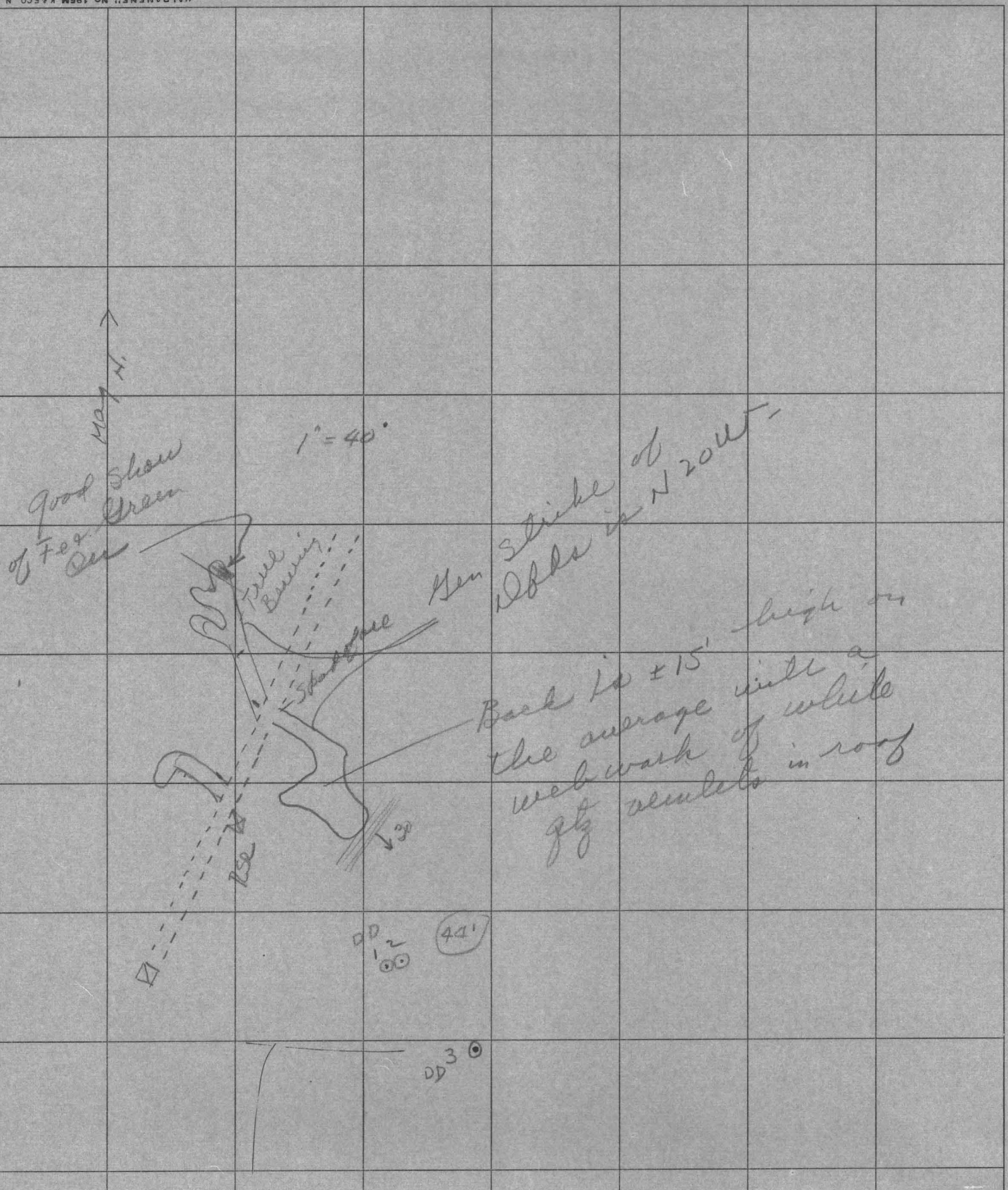
Therefore it is recommended that no more money be spent on the Bowyer property.

E. N. Pennebaker

E. N. PENNEBAKER

Scottsdale, Arizona
December 15, 1958

58



FORM 12 5M 7-56 M-7050 K. P. S.

# INTERNATIONAL SMELTING & REFINING COMPANY

MIAMI PLANT

## ASSAY CERTIFICATE

Name E. N. Pennebaker Box 817 Scottsdale, Arizona
MINE

Class..... Lot..... Date December 11, 19 58

| Smelter Lot | Per Ton of 2000 Lbs. Oz. Silver | Per Ton of 2000 Lbs. Oz. Gold | Per Cent Copper | Per Cent Insoluble | Per Cent $SiO_2$ | Per Cent $Al_2O_3$ | Per Cent Fe | Per Cent CaO | Per Cent S | Per Cent W03 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 1 | 0.10 | 0.005 | 0.99 | | 30.5 | 2.5 | 20.8 | 24.4 | 0.8 | Trace |
| No. 2 | Trace | 0.005 | 1.07 | | | | | | | " |
| No. 3 | 0.08 | 0.005 | 0.98 | | | | | | | " |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

C. F. Smith

Chief Chemist

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN ORE PURCHASING DEPARTMENT
810 VALLEY NATIONAL BUILDING
TUCSON, ARIZONA

REED F. WELCH
MANAGER

December 10, 1958

Mr. E. N. Pennebaker
P.O. Box 817
Scottsdale, Arizona

Dear Mr. Pennebaker:

I have investigated the possibility of shipments having been made in recent years to our Hayden Plant from the Bowyer property near Quartzsite, which we talked about the other evening.

My file contains correspondence in 1954 with Mr. R. J. Kinsey and Roy T. Bowyer. At that time Mr. Bowyer indicated a desire to ship copper ore to Hayden and advises me he was installing equipment to concentrate the ore. A handsample he submitted to Hayden in March 1954 assays:

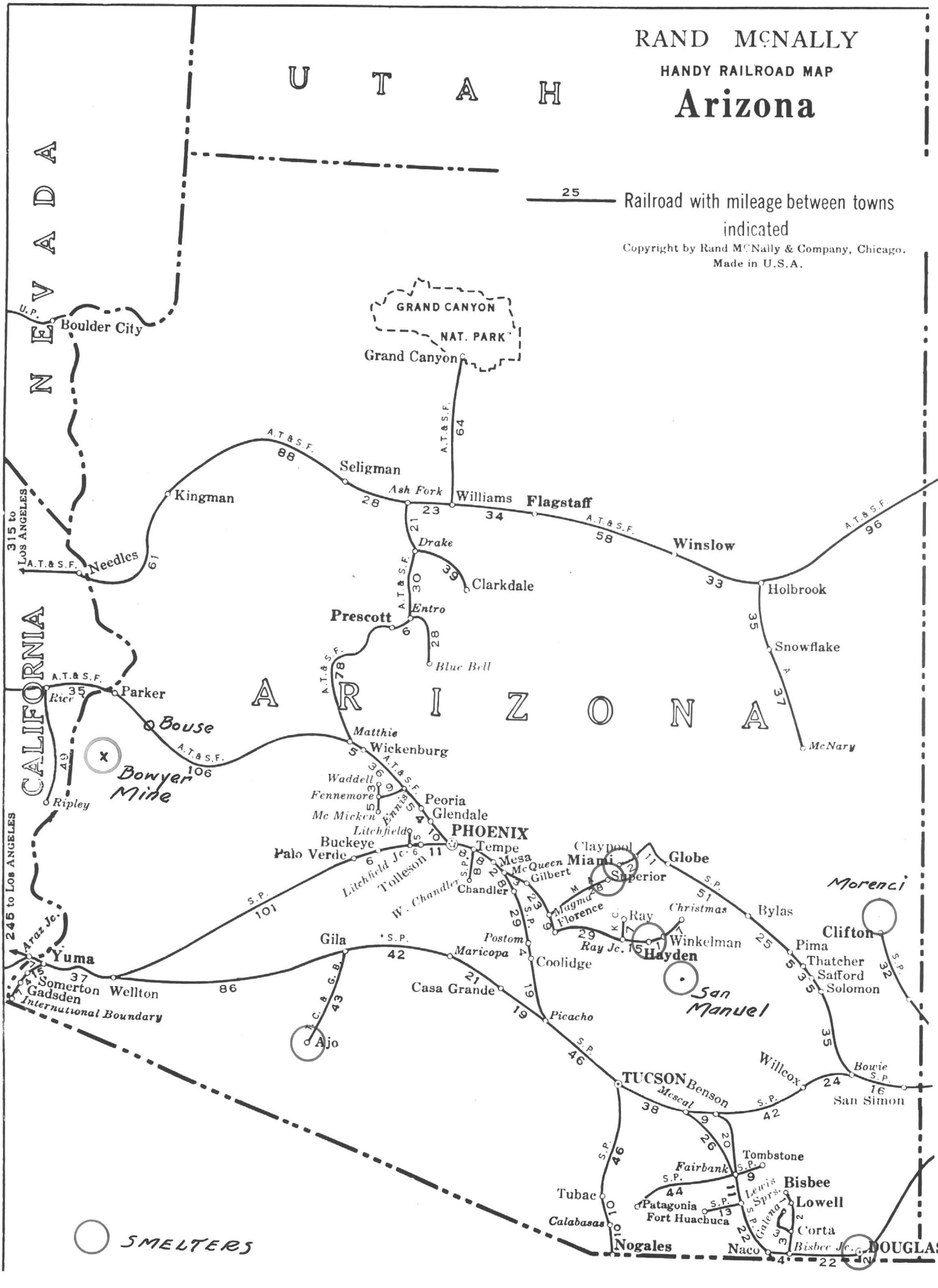
| Au | Ag | Pb | Cu | SiO2 | Fe | CaO | S | Al2O3 |
|---|---|---|---|---|---|---|---|---|
| .01 oz | 1.67 oz- | | 4.2 | 20.6 | 24.9 | 19.0 | 6.0 | 5.2 |

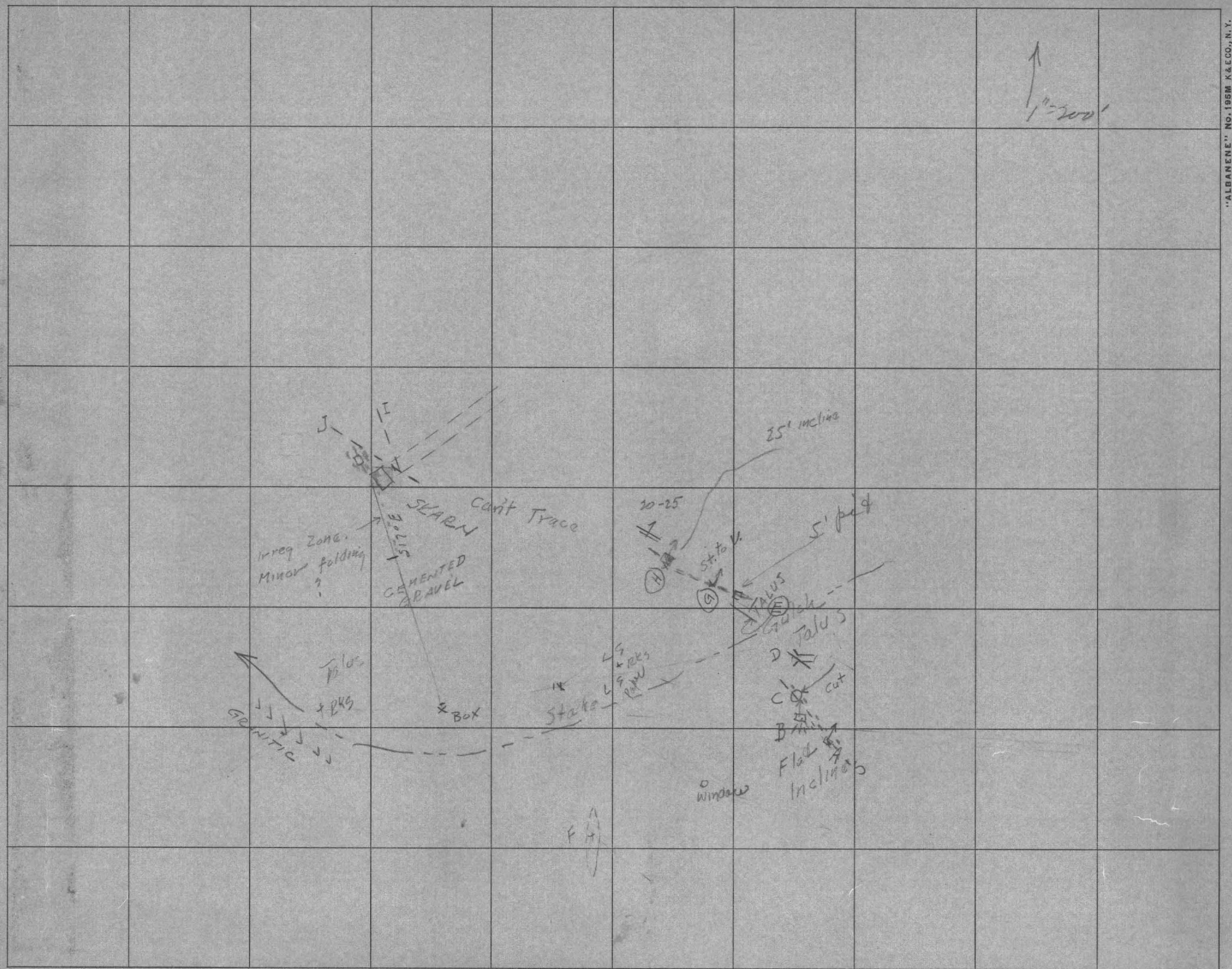
In letter dated March 16, 1954, addressed to Mr. Kinsey in Phoenix I agreed to take a trial car, freight charges prepaid. However, the purchase schedule was cancelled in March 1955, no shipment having been received at Hayden.

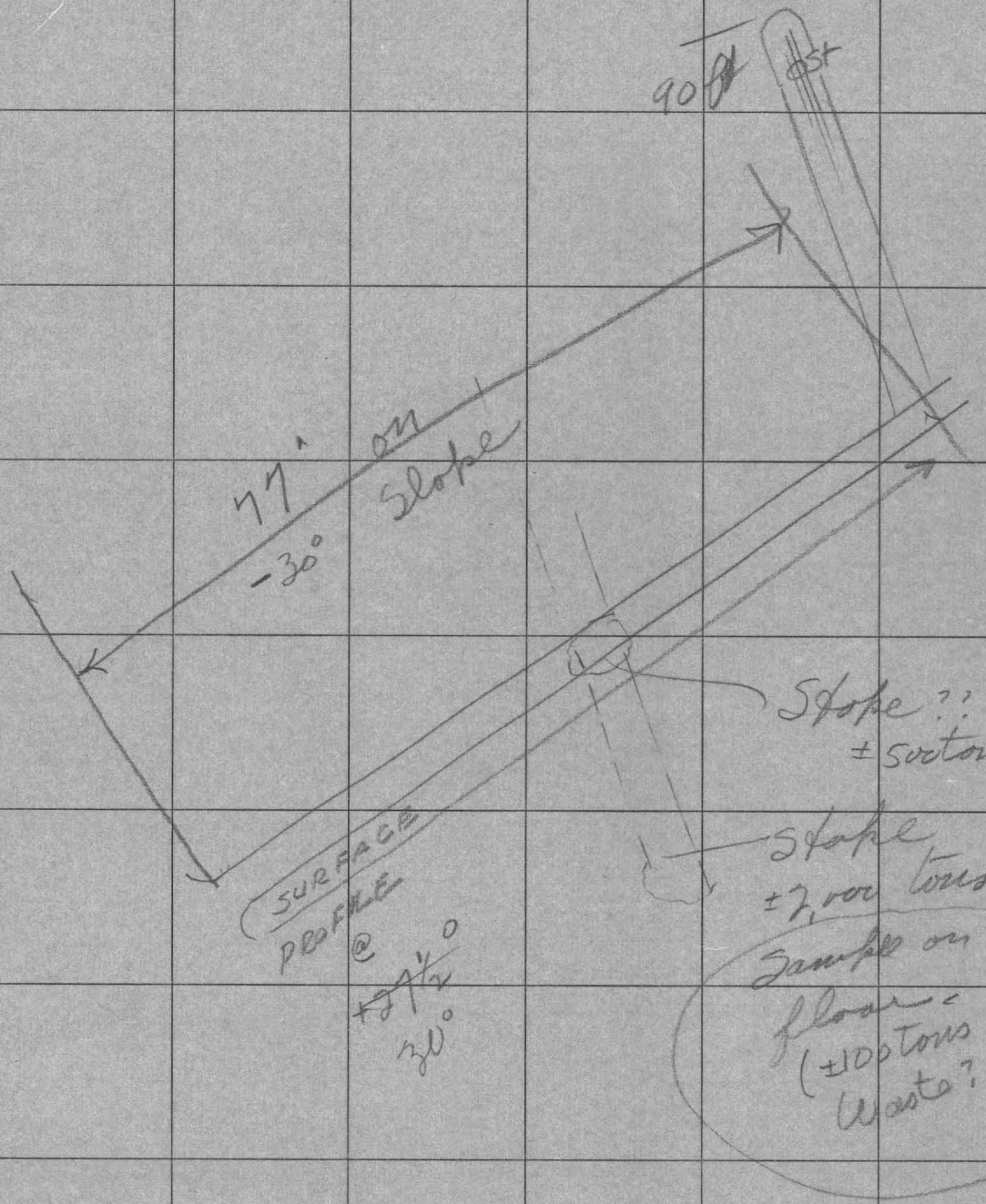
Yours very truly,

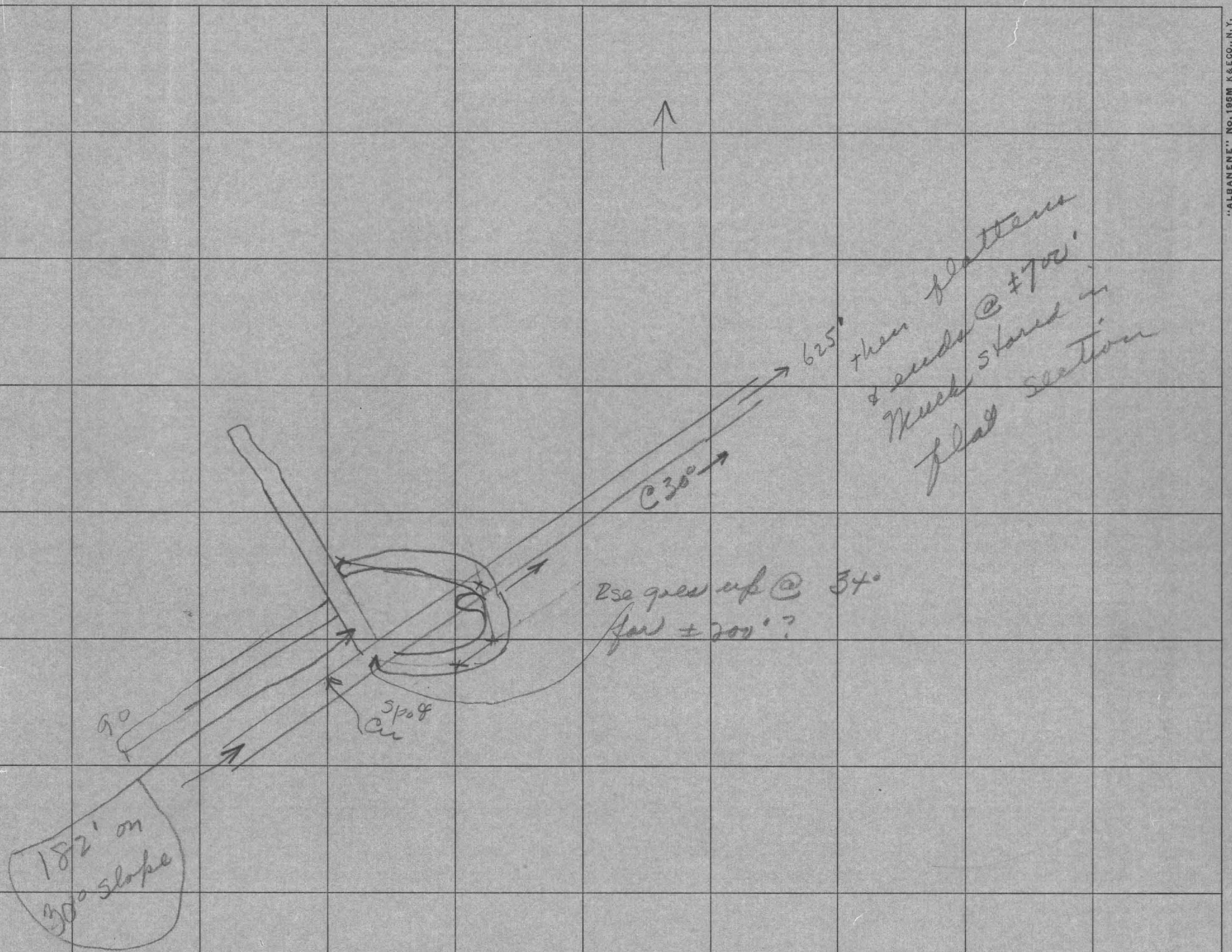
REED F. WELCH

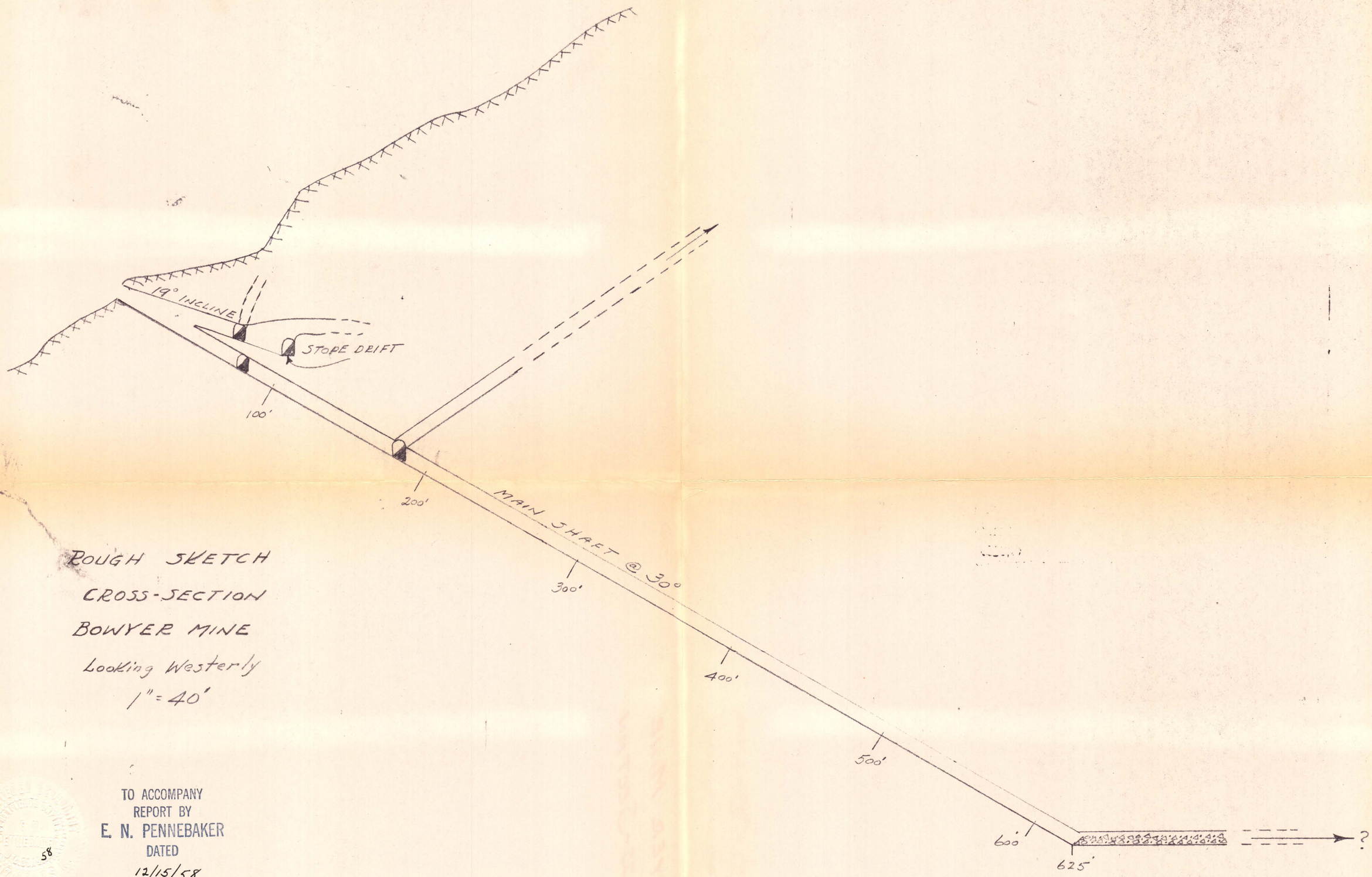
to San Bernardino
PARKER
King
W. & O.
Pride
Black Tank
Ogden
Osborne Well
BLACK PEAK
Osborne Wash
CACTUS PLAIN
RIVER
COLORADO
Denny
CALIFORNIA
ARIZONA
State 72
AT&SFRR
Linskey
Bouse Wash
10 Mile Well
Little Butte Wood
Bouse
RIVER
LA POSA PLAIN
INDIAN RESERVATION
Iron
Four Peaks
6 Mile Well
AT&SF RR
State 72
Moon Mtn.
Valenzuela
Mudersbach
Lead
Ibex Peak
Mammoth
Tyson Wash
Bowyer Mine
Dome Basin
Darling
Boyer Gap
Well
State 95
PLOMOSA MTS.
Haystack Peak
BEAR HILL
Haystack
PALO VERDE WEIR
Seventy
La Paz Mtn.
Goodman Tank
(La Paz)
Colrio
Bear
Oldman Mtn.
Quartzsite
U.S. 60-70
Plomosa Pass
Shamrock
Guadalupe
DOME ROCK
Goodman
Gonzales
(Olive City)
Granite Mtn.
Sugarloaf Peak
Sawtooth Mtn.
La Cholla Mtn.
La Paz Arroyo
Tank
Plomosa
Desert Queen
Dripping Spring
to Blythe
Ehrenberg
Beamer Well
New Water Spring
BLACK MESA
Cunningham Mtn.
Copper Bottom
Tule Spr.


RAND McNALLY
HANDY RAILROAD MAP
Arizona
25 Railroad with mileage between towns indicated
Copyright by Rand McNally & Company, Chicago.
Made in U.S.A.
UTAH
NEVADA
CALIFORNIA
ARIZONA
GRAND CANYON NAT. PARK
Grand Canyon
Boulder City
U.P.
Needles
A.T.&S.F.
315 to Los Angeles
Kingman
Seligman
Ash Fork
Williams
Flagstaff
Winslow
Holbrook
Snowflake
McNary
Drake
Clarkdale
Prescott
Entro
Blue Bell
Parker
Rice
Bouse
Bowyer Mine
Ripley
Matthie
Wickenburg
Waddell
Fennemore
Mc Micken
Ennis
Peoria
Glendale
Litchfield
PHOENIX
Tempe
Mesa
McQueen
Gilbert
Chandler
W. Chandler
Buckeye
Palo Verde
Litchfield Jc.
Tolleson
Claypool
Miami
Superior
Globe
Magma
Florence
Ray
Ray Jc.
Christmas
Winkelman
Hayden
Bylas
Morenci
Clifton
Pima
Thatcher
Safford
Solomon
San Manuel
Postom
Maricopa
Coolidge
Casa Grande
Picacho
Gila
Yuma
Araz Jc.
Somerton
Gadsden
Wellton
International Boundary
246 to Los Angeles
Ajo
TUCSON
Benson
Mescal
Willcox
Bowie
San Simon
Tombstone
Fairbank
Bisbee
Lowell
Corta
Lewis Spgs.
Patagonia
Fort Huachuca
Tubac
Calabasas
Nogales
Naco
Bisbee Jc.
DOUGLAS
SMELTERS







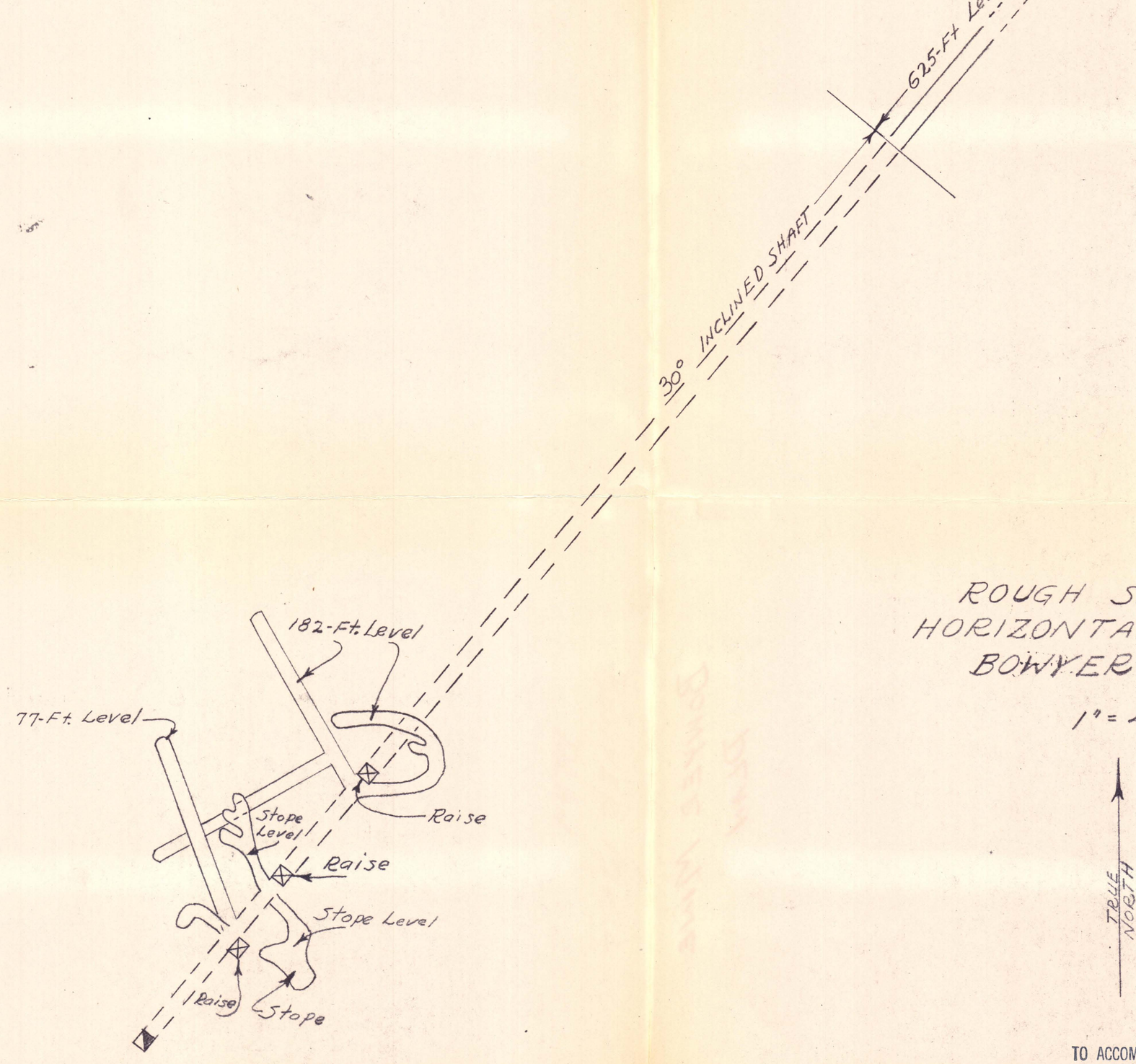



ROUGH SKETCH
CROSS-SECTION
BOWYER MINE
Looking Westerly
1" = 40'

TO ACCOMPANY
REPORT BY
E. N. PENNEBAKER
DATED
12/15/58

Bowser Mine
Cross-Section

END



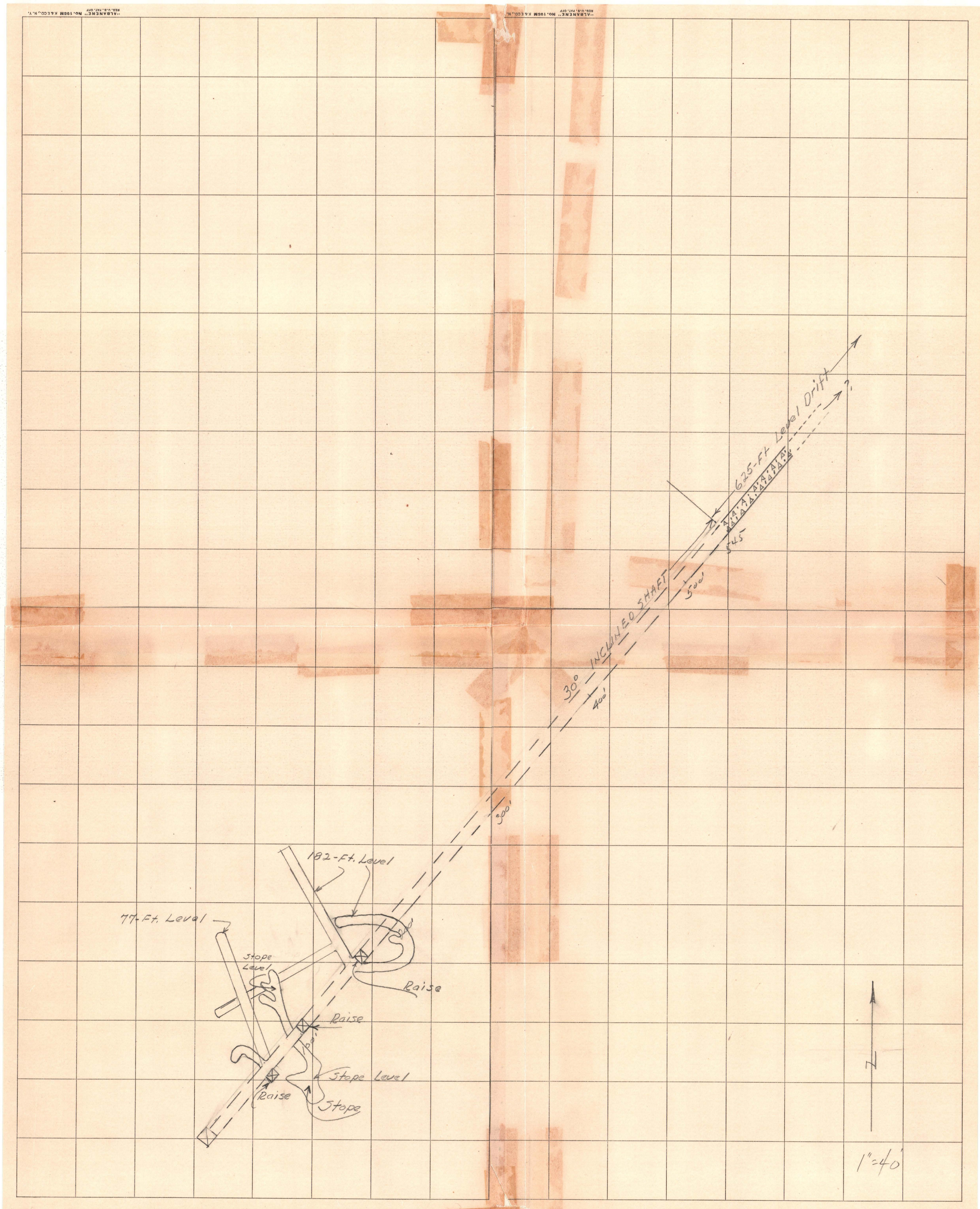

# ROUGH SKETCH
# HORIZONTAL PROJECTION
# BOWYER MINE

1" = 40'

TRUE NORTH

TO ACCOMPANY
REPORT BY
E. N. PENNEBAKER
DATED
12/15/58

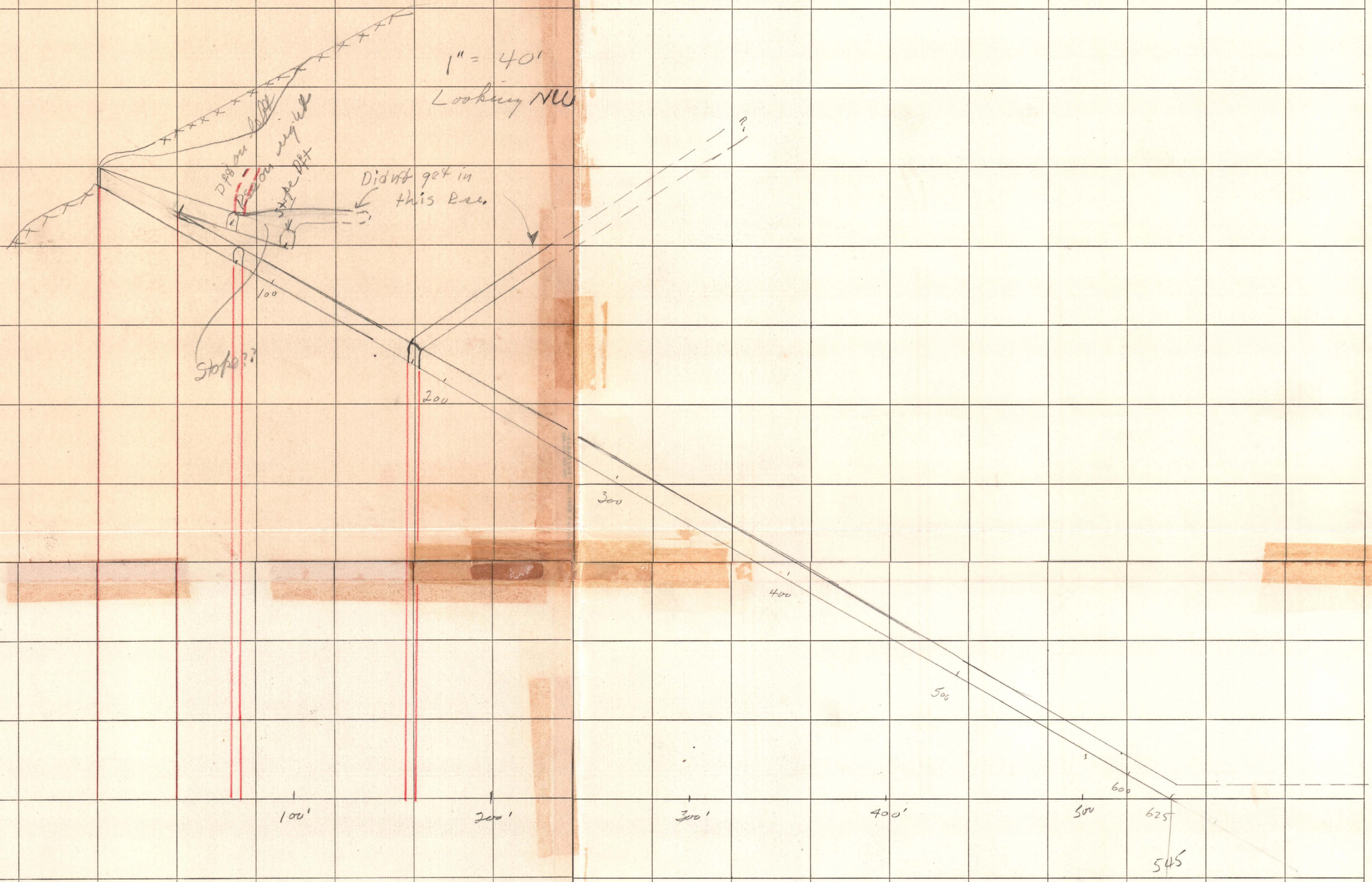
BOWYER MINE
PLAN



Bearing of Sightline ≠N 40E

1" = 40'

Looking NW



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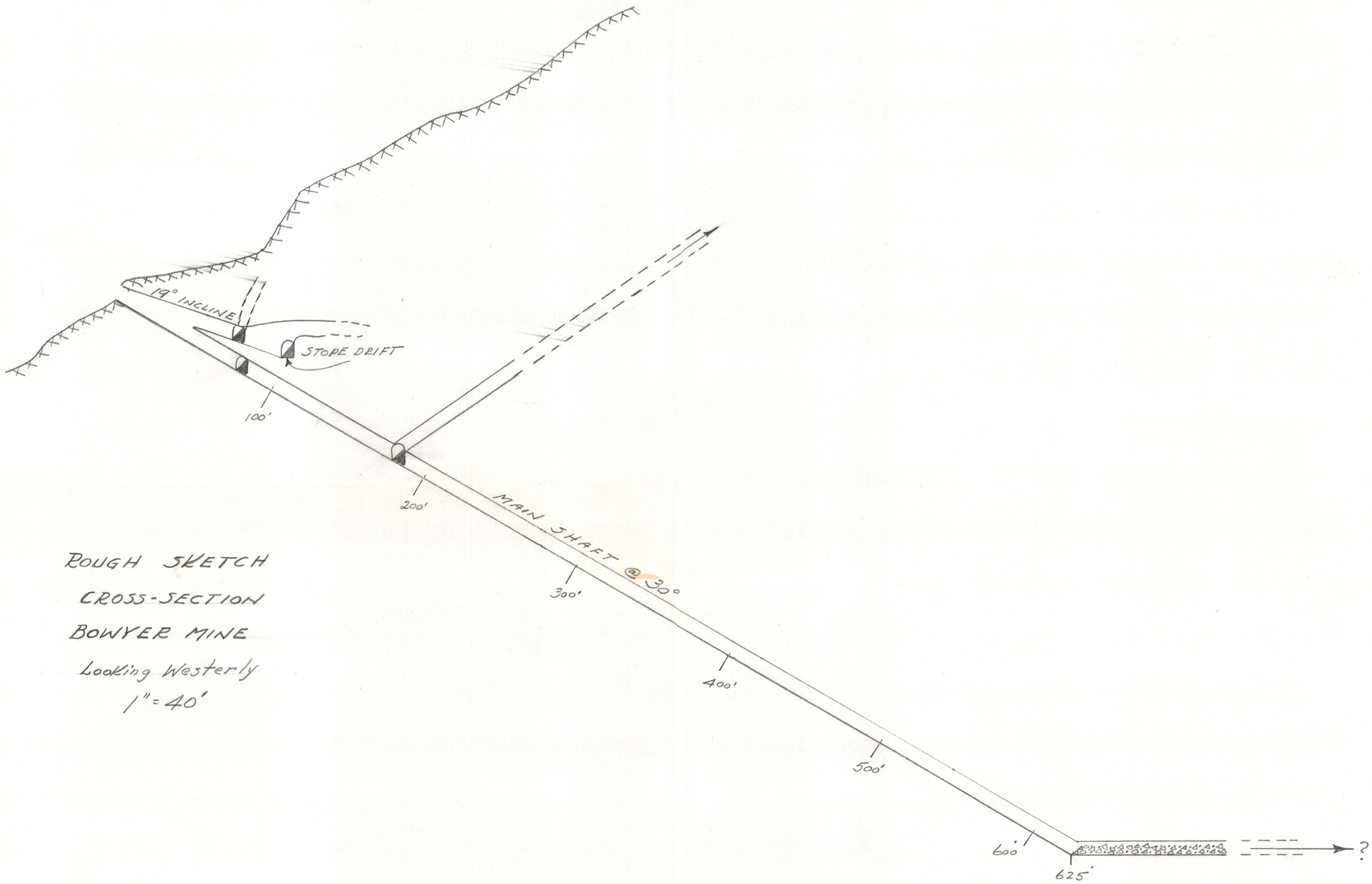



ROUGH SKETCH
CROSS-SECTION
BOWYER MINE
Looking Westerly
1" = 40'

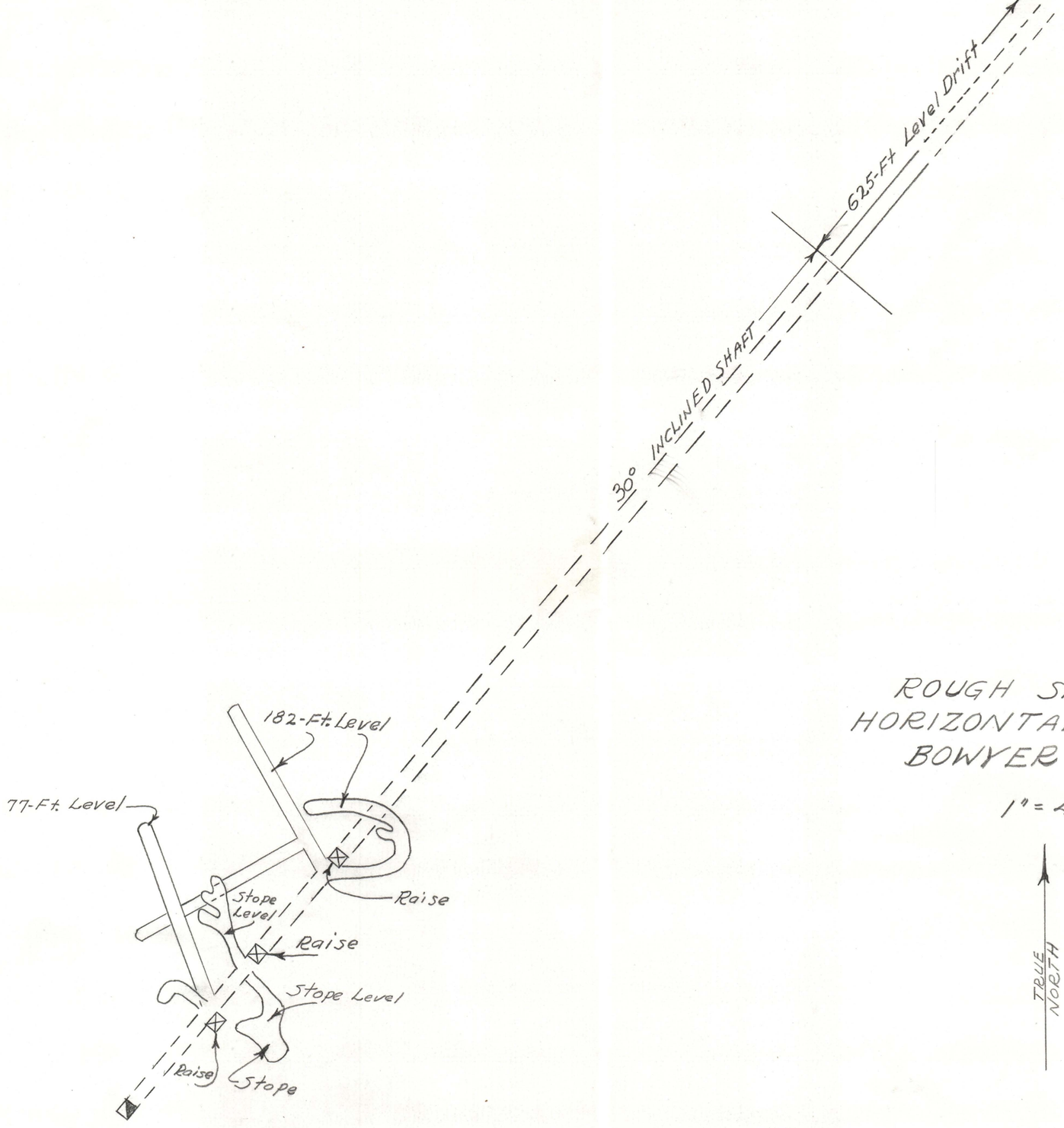
E. N. PENNEBAKER

TRIM TO HERE

TRIM TO HERE

TRIM TO HERE

TRIM TO HERE




# ROUGH SKETCH
# HORIZONTAL PROJECTION
# BOWYER MINE

1" = 40'

TRUE NORTH

E. N. PENNEBAKER