CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
520-770-3500
http://www.azgs.az.gov
inquiries@azgs.az.gov

1 ton = 12. cuft = 2000.lbs

1 cuft = 166 pound

1 cuft = 1728 cu In = 166 pound

1 cu In = .0961 lbs or 1.538 oz.

~~Tally~~ gold: =

1 cuft H_2O = 62.5#s

rock is 2.65 times heavier

Au is 19.3 times heavier

Au is 7.29 times heavier than rock

1 oz rock = .667 cu in

1 oz Au = .08 cu in = .46 inches^3

TONNAGE and GRADE

CALCULATIONS

of the

LARGE MINE DUMPS

at the

OCTAVE MINE

Weaver Mining District

Yavapai County, Arizona

by

Richard E. Mieritz
Mining Consultant
Phoenix, Arizona

April 2, 1981

TABLE of CONTENTS

INCLUDED EXHIBITS

Set of three photographs.
Assay Sheets, set of two.
LOCATION MAP, MAP N°. 1
CLAIM MAP, MAP N°. 2
SURFACE MAP - OCTAVE MINE DUMPS, MAP N°. 3
SECTIONS - LONG DUMP, MAP N°. 4.

INTRODUCTION:

By verbal request and written authorization of September 25, 1980, Mr. Larry Belanger, President of Major Resources, Inc., St. Petersburg, Florida, the writer was asked to evaluate two relatively large mine dumps located on the Grey Devell patented mining claim of the Octave Mine, Weaver Mining District, Yavapai County, Arizona.

This report is based on the writer's personal visits to the area of concern in October and November, 1980 and again in March, 1981, on his general geologic knowledge of the district, his taking and preparation of samples of dump material and his surveying (transit and stadia) of the dumps. Assaying of all samples was completed by the Iron King Assay Office, Walter Statler, Arizona registered Assayer, Humboldt, Arizona.

THE PROPERTY:

The Octave Mine property as owned by Major Resources, Inc.and described by Mr. Belanger at this time consists of six patented lode mining claims, known as follows:

Patented Claims			
Dun Billy	M.S. 1248	Golden Rod	M.S. 1310
Grey Devell	M.S. 1248	Uncle Sam	M.S. 1310
Antelope	M.S. 1248	New Era	M.S. 1423

These claims are located in Sections 5 and 6 of T. 9 N., R. 4 W., G. & S. R. B. & M., Weaver Mining District, Yavapai County, Arizona. (See LOCATION MAP and CLAIM MAP Nos. 1 and 2)

HISTORY:

These claims were patented on July 23, 1897, December 3, 1899 and January 1, 1901 with a total of 101.41 acres.

At the time of Patent, the claims were credited with 9 shafts and levels, 3 open cuts, 3 tunnels, a one ton stamp mill and one rock cement water tank. The shafts are up to 300 feet deep and their development had only produced small dumps. After year 1897, considerable development on the Grey Devell claim took place in two decline shafts to produce the large dumps which are now in evidence. (See SURFACE MAP-OCTAVE MINE DUMPS, MAP No. 3). One dump is termed the "Long" dump and the other the "Conical" dump, both so named for obvious reasons.

MINE DUMP CHARACTER:

Mine dumps are the "unwanted" material from underground or surface development of potential mineralized zones. A dump will consist of absolute waste (barren of mineralization) and/or slightly mineralized material (low grade at the time--marginal or sub-marginal material.

Economics--metal prices--determine what is or is not ore. Because of current high metal prices, what was "low grade" or "waste" years ago, may now be "ore"--which, when treated, milled or smelted, can turn a profit over and above capital investment costs, operating costs and interest on the money.

Dumps, in contrast to "tailings"-the reject material of a milling operation--are more treacherous to sample, to handle and to mill and extract the metal values. Dumps are the crude material of an excavation, either surface or from underground work. This material is seldom sampled prior to or during removal from the working area--the single thought being to get rid of it (out of the way) as quickly and as cheaply as possible.

Most frequently the dump will consist of fine, clay like, sandy particles to large fragments up to 18 to 24 inches in size. Immediately, it is obvious that a representative sample must include the large pieces as well as the smaller size material. This would be possible only if a large (volume) bulk sample were taken, the total bulk crushed, mixed and split to a normal sample size of 3 to 8 pounds. There are many ways this can be completed but ALL are slow and expensive dollar-wise.

Dumps "grow" by pushing or dumping the unwanted material "over" the crest (edge), permitting the material to roll or slide down the embankment (angle of repose) which usually assumes an angle of from 30 to 50 degrees, but in the case of the Octave dumps, this angle is very frequently 35^{o}--measured from the "crest" (banks edge) to the "toe" (where dump material meets the surface). It can thus be visualized that the dump "grows" by "layering" at angles of approximately 35° to the horizontal.

A representative, true, ideal sample should be taken across the "layers"-at right angles. Tanking such a sample is possible but most frequently rather impractical, time-wise and cost-wise.

The undesirable but present physical characteristics which composite a "dump" are all deleterious elements which will not permit good representative sampling proceedures. The end result is that sampling is completed by the proceedure best suited to the conditions present and the amount of financing available. Sampling results are only indicative, not positive, when applied to a "whole".

OCTAVE DUMPS:

The writer surveyed the two important dumps (Long and Conical) on the Grey Devell claim by transit and stadia on October 24 and 25, 1980. The survey is necessary to prepare a reasonable accurate plan and cross-sections of the dumps to determine volumes of the two dumps. (See SURFACE MAP-OCTAVE MINE DUMPS and SECTIONS - OCTAVE MINE DUMPS, MAP Nos. 3 and 4).

In the opinion of the writer, the most suited means of sampling the "Long dump" is to drill vertical holes from its near level surface through the layered dump material to bedrock if possible. Two rows of vertical holes were drilled on the "Long" dump--six holes in a row near the drest (edge) of the dump and three holes near and paralleling the "toe" --junction of the dump material and the original ground surface on the level portion of the dump. (See SURFACE MAP No. 3).

The first row of holes were drilled to 23 foot depths and the second row of holes to a 13 foot depth.

The writer mentioned previously the "layering" characteristic of the dump at a repose angle of approximately 35°. it can thus be seen that the vertical holes would "cross-cut" the layers and thereby obtaining samples which would represent many "layers" and not thus one layer.

The position and slope of the Conical dump indicates that this material was separately and independently "stacked" or "piled". Because of the above, it is also indicated that the Conical dump material was so "piled" because it contained mineralization--"sorted" from the waste material.

Sampling of the Conical dump is more complicated because of its shape and lack of acceptance to drilling equipment. In lieu of sampling by drilling--backhoe trenches were dug into the slopes or bank of the dump (See MAP No. 3) and samples taken on near vertical pit walls of the trenches. These samples traversed the "layers" as near to a vertical angle to the layering as possible. Again, cross-cutting the layers, similar to a drill hole.

DRILLING and DRILL SAMPLES:

Mine dumps are unconsolidated material consisting of small rock pieces to large fragments up to 24 inches in size. Mine dump drill holes must be "cased to prevent "caving" of the loose material and in turn prevent "salting" or "dilution" of the sample taken.

The drill used at the Octave Long dump employed a down-the-hole air hammer (percussion type) with a special drill bit known as the ODEX Bit. It is an eccentric bit which drills a pilot hole followed by the eccentric portion to enlarge the hole ahead of the casing to permit the casing to closely follow the bit as the hole is advanced. (See included diagrams). In this way the sample is protected and the hole walls kept in place.

Drill hole samples (dust) were taken at five foot intervals. The sample, as received, - up to 70 to 80 pounds, dependent on recovery--was split several times using a Jones type splitter, to a size of about 5 to 6 pounds. This sample was then assayed and the gold-silver values reported as ounces per ton.

DUMP VOLUME CALCULATIONS:

Long Dump

As a result of the dump survey, crossections were prepared (Map No. 4) which shows the drill holes, sample depths, sample results, outline of the dump at that point or line and the assumed outline of the original surface. The outline of the dump on each section is that of a triangle.

Using a planimeter, the area of the dump outline was measured to determine the square footage.

Having the area of each section, the "average end" method of volume calculation was used, viz, the areas of two successive sections were summed and divided by 2 for the "average" area. This figure was multiplied by by the distance between the sections of concern to obtain the volume in cubic feet. To calculate the tonnage this block represents, the cubic footage was divided by 15 and 18 (cubic feet) to obtain two tonnage figures. Solid rock normally occupies 12 cubic feet to a ton. When rock is broken--dependent on size distribution--it expands in volume, thus, the use of the two factors. No volume test was made, but the use of the two factors will provide a minimum-maximum tonnage that could be expected.

The following tabulation indicates the data for each of the Sections:

Section	Distance Between Sections	Section Area, Sq.Inches	Scale Factor	Section Area, Sq. Feet	Average Area, Sq. Feet	Block Volume Cu. Feet
4 + 38		1.52 X	400 =	608		
	40 X				608 =	24,320
3 + 98		1.52 X	400 =	608		
	87 X				854 =	74,298
3 + 11		2.75 X	400 =	1100		
	54 X				1232 =	66,528
2 + 57		3.41 X	400 =	1364		
	72 X				2148 =	154,656
1 + 85		7.33 X	400 =	2932		
	63 X				2534 =	159,642
1 + 22		5.34 X	400 =	2136		
	72 X				2438 =	175,536
0 + 50		6.85 X	400 =	2740		
	20 X				2740 =	54,800
0 + 30		6.85 X	400 =	2740		
TOTAL VOLUME, Cubic Feet						709,780

At 18 cubic feet to the ton, there could be 39,432 calculated TONS.
At 15 cubic feet to the ton, there could be 47,319 calculated TONS.

Conical Dump

The top and base areas of the Conical dump were planimetered. The elevations of the survey points of the top and base were averaged indeendently and the difference in elevation was considered as the average height of the "CONE".

The cone volume was calculated by using the following formula:

$$\text{VOLUME} = \frac{h\ (Area_b + Area_t + \sqrt{Area_b \times Area_t}}{3}$$

Where "h" = height in feet = 46.5 feet

$Area_b$ = Area of base = 30,692 square feet
$Area_t$ = Area of top = 2,264 square feet

It thus follows:

$$\text{Volume} = \frac{46.5\ (30,692 + 2,264 + \sqrt{30,692 + 2,264}}{3}$$

$$= 15.5\ (32,956 + 8,336$$
$$= 640,026 \text{ cubic feet}$$

At 18 cubic feet to the ton, there could be 35,557 calculated TONS.
At 15 cubic feet to the ton, there could be 42,668 calculated TONS.

GRADE OF DUMPS:

Long Dump:

The limited number of holes drilled on the Long dump were designed to crosscut and sample the "layering" created by the formation of the dump. The first top three feet of each hole constituted one sample. Thereafter, five foot long samples were taken. The assay results of these samples are shown on the various Sections. As can be noted, these samples show a variance in metal content. This is not unusual. If the holes were drilled five feet away from the selected sites, a different set of metal content results would have been obtained. Thus, whatever sampling is done is primarily indicative in scope--not a positive term of the metal content.

The 38 samples taken from the drill holes were weight averaged, viz, length of sample times the value, the products summed and divided by the summation of the lengths to obtain an average for each hole. These averages are shown on the included Assay Sheets and on Map No. 4--Sections--Long Dump. Using the same method of averaging using ALL sample results and footages, it was determined that the average gold content was 0.0296 ounces per ton and the silver was 0.0718 ounces per ton.

Conical Dump:

This Dump was "moved" on March 15 and 16 by persons unknown to the writer except by hearsay. Prior to this act, the writer sampled the nine Pits shown on Map No. 3.-SURFACE MAP. The writer intended to sample the flat top portion of this dump, BUT, after the dump had been moved, this was not possible.

Nine samples were taken of various lengths. Again, the results of these samples were weight averaged, viz, footage times the contents, the products summed and divided by the sum of the footages. The end result being an average gold content of 0.0731 ounces per ton and the average silver content was 0.0815 ounces per ton. (See Map No. 3,-SURFACE MAP)

SUMMARY:

The tonnage and grade calculation exercise indicate the following results: (on next page.)

Long Dump: 39 to 47,000 tons--which could average 0.0296 oz/ton gold and 0.0718 oz/ton silver.

Conical Dump: 35 to 42,000 tons--which could average 0.0731 oz/ton gold and 0.0815 oz/ton silver.

The range in tonnage is due to the cubic foot factor (15 or 18) used for the same measured-calculated volumes. Moreover, an unknown factor is the underlying "original" ground surface on which the "Long Dump" rests. If that original surface is something other than what is indicated, the calculated tonnages as reported herein could be reduced or increased.

Dollar-wise, using $500.00 for the market price of gold, each ton of the Long Dump could have a value of $14.80 for the gold and about $0.85 for the silver when using a $12.00 market value, or a total of $15.65 per ton for the material in place, --untreated.

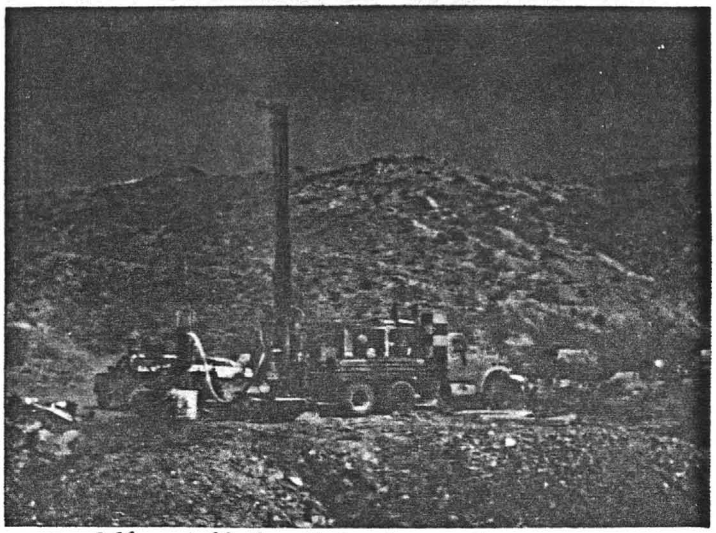
A dollar-wise value for the Conical Dump would be $36.55 per ton for gold and $0.97 per ton for silver for a total of $37.52 per ton for the material in place--untreated.

The above figures are based on the assumption that the indicated grades would exist for each and every ton calculated.

Respectfully submitted,

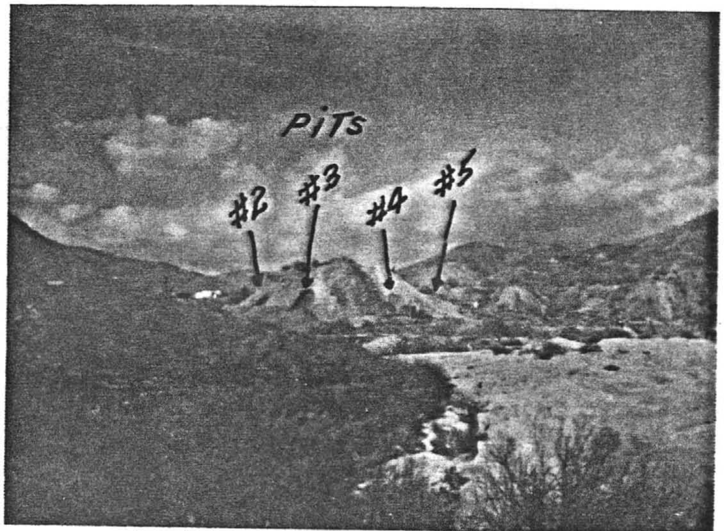
R. E. Mieritz
Mining Consultant
Phoenix, Arizona.

April 2, 1981



Drill on Hole #1, Long Dump. March 9, 1981, 2:30 PM. Looking Easterly.

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 1981
ARIZONA, U.S.A.



March 11, 1981 W. & S.W. side of Conical Dump Showing Backhoe Pits 2, 3, 4 & 5

March 11, 1981 - S E side of Conical Dump Showing Backhoe Pits 5, 6, 7, 8 & 9. 12:00 Noon.

IRON KING ASSAY OFFICE
ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER CERTIFICATE NO. 2978 WALTER G. STATLER Date Signed 3/26/81 ARIZONA, U.S.A.

ASSAY MADE FOR

Richard E. Mieritz
2940 N. Casa Tomas
Phoenix, Az. 85016

March 25, 1981

SAMPLE DESCRIPTION Hole		Depth		Au.	Ag.		Au Average	Ag Average
# 2540	L.D. 1	3'	3-13-1	.016	0.16			
2541		8'	-2	Tr.	0.04			
2542		13'	-3	Nil	Nil		.0021	.0710
2543		15.5'	-4	Nil	Tr.			
2544		18'	-5	Tr.	0.34			
2545		23'	-6	Tr.	0.02			
2546	L.D. 2	3'	-7	.030	Nil			
2547		8'	-8	Tr.	Nil			
2548		13'	-9	Nil	Nil		.0048	.00
2549		18'	-10	.004	Nil			
2550		23'	-11	Tr.	Nil			
2551	L.D. 3	3'	-12	.154	0.01			
2552		8'	-13	.098	0.02		.0790	.0072
2553		13'	-14	.094	Nil			
2554		18-23'	-15	Tr.	Nil			
2555	L.D. 4	3'	-16	.020	0.02			
2556		8'	-17	.070	Nil		.0306	.0141
2557		13'	-18	.022	0.02			
2558		19'-23'	-19	Tr.	0.02			
2559	L.D. 5	3'	-20	.028	0.07			
2560		8'	-21	.050	Nil		.0526	.0743
2561		13'	-22	.030	0.01			
2562		18'	-23	.038	0.04			

CHARGES $434.75

2563 on next sheet.

ASSAYER

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER CERTIFICATE NO. 2978 WALTER G. STATLER Date Signed 3/26/81 ARIZONA, U.S.A.

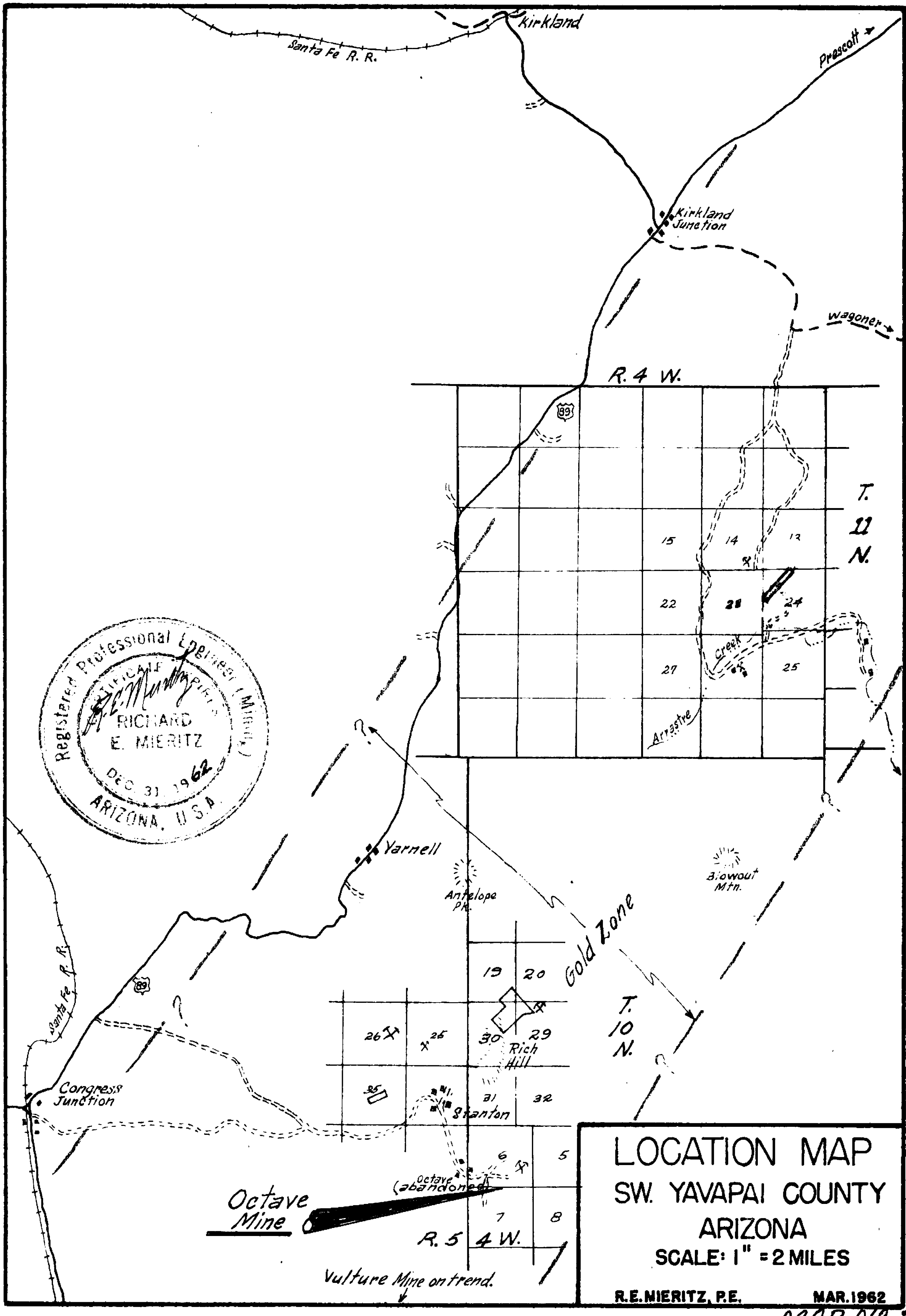
ASSAY MADE FOR: Richard E. Mieritz

March 25, 1981

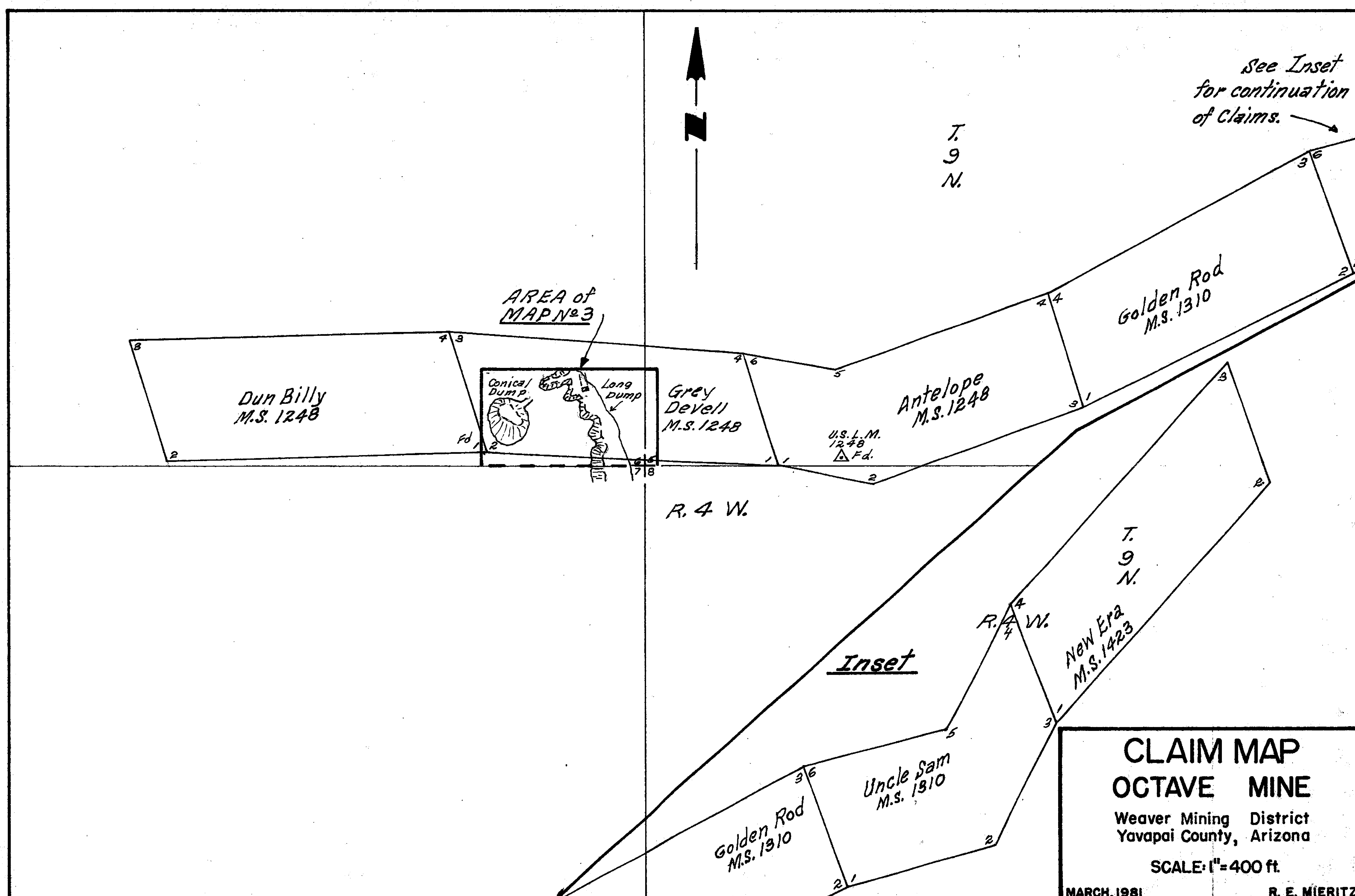
SAMPLE DESCRIPTION Hole	Depth		Au.	Ag.	Au Average	Ag Average
# 2563 L.D.5	23'	3-13-24	.107	0.25		
2564	3'	-25	.034	0.08		
2565	8'	-26	.003	0.13	.0186	.0604
2566 L.D.6	13'	-27	.031	0.10		
2567	18'	-28	.031	Tr.		
2568	23'	-29	Tr.	Tr.		
2569	3'	-30	Tr.	Tr.		
2570 L.D.7	8'	-31	.114	0.42	.0438	.1808
2571	13'	-32	Tr.	0.05		
2572	3'	-33	.057	0.33		
2573 L.D.8	8'	-34	.039	0.20	.0339	.2107
2574	13'	-35	.015	0.15		
2575	3'	-36	.012	0.11		
2576 L.D.9	8'	-37	.018	0.12	.0128	.1331
2577	13'	-38	.008	0.16		
2913 Pit #1	9'	-39	.022	Nil		
2914 Pit #2	7'	-40	.011	Nil		
2915 Pit #3	8'	-41	.086	0.12		
2916 Pit #4	6'	-42	.014	Nil		
2917 Pit #5	10'	-43	.279	0.30		
2918 Pit #6	10'	-44	.051	0.09		
2919 Pit #7	6½	-45	.025	0.10		
2920 Pit #8	8'	-46	.043	Nil		
2921 Pit #9	8'	-47	.056	0.05		

CHARGES

ASSAYER


Kirkland
Santa Fe R. R.
Prescott
Kirkland Junction
Wagoner
R. 4 W.
89
T. 11 N.
15
14
13
22
23
24
27
25
Creek
Arrastre
Registered Professional Engineer (Mining)
RICHARD E. MIERITZ
DEC. 31, 1962
ARIZONA, U.S.A.
Yarnell
Antelope Pk.
Blowout Mtn.
Gold Zone
Santa Fe R. R.
89
19
20
26
25
30
29
Rich Hill
T. 10 N.
35
31
32
Stanton
Congress Junction
6
5
Octave (abandoned)
Octave Mine
7
8
R. 5 4 W.
Vulture Mine on trend.
LOCATION MAP
SW. YAVAPAI COUNTY
ARIZONA
SCALE: 1" = 2 MILES
R.E. MIERITZ, P.E.
MAR. 1962

MAP No 1



CLAIM MAP
OCTAVE MINE
Weaver Mining District
Yavapai County, Arizona

SCALE: 1" = 400 ft.

MARCH, 1981 R. E. MIERITZ

MAP No 2

Doc 1 Pg. 15

Doc 1 Pg. 16

Mr. Larry W. Belanger, Pres.
Major Resources, Inc.
8401 36th Ave. No.
St Petersburg, Florida, 33710

Re: Octave Mine Dumps
Yavapai Co., Ariz.

Dear Mr. Belanger:

I delayed writing until now, hoping your attorney would contact me yesterday to advise he would be moving forward and in what direction to permit me free-no hassel entry to the Octave Mine dumps without the presence of a Sheriff's Deputy at the property. Unfortunately your attorney did not contact me, consequently, it is difficult for me to schedule any plans in advance.

I did travel to the property as I indicated in my phone call to you this past Thursday morning. On Wednesday, I arrived at Houston Mining operation and met Mr. Schroeder about 10:30 AM. I saw the patented corner and a similar one on top of the hill to the east. I also had a view of the dumps under consideration from the base of the dumps. The outline of the dumps is very irregular, both vertically and horizontally not only at the base but also at the top. A realistic tonnage estimate will require considerable surveying. My estimate of this phase is about four days for the field and office work to prepare a map which can be utilized for tonnage estimate and location of the samples taken

It is difficult to estimate, but I would venture that about 100 samples would have to be taken on the slopes of the dumps and on the surface as well as in the trenches or holes if they can be completed. The cost of assaying would approximate $1,000.-. Sampling and supervision of drill holes or trench excavation would probably require five to six days. A report preparation would require about two days Office time. Thus, we are talking about 12 days of my time, plus the assaying cost, plus drilling or trenching costs, plus any out-of-pocket expenses such as motel, meals, map prints, etc. The total cost would be between $5,500.- and $6,000.-.

If you have any questions as to the above, please write or telephone me. As you know, I am not always here, having to spend most of my time in Nevada.

I can not venture to the property again until I have a document in hand which Mr. Carlson will recognize as giving me authority and permission to enter the property of my free will at any time.

Sincerely yours,

R. E. Mieritz

October 19, 1980

Mr. Larry W. Belanger, Pres.
Major Resources, Inc.
8401 36th Ave. No.
St Petersburg, Fla., 33710

Dear Mr. Belanger:

You were not marked for a copy of the attached letter from Mr. Ireland kàthough it could have been a blind copy. None-the-less, I have made a few copies of theletter, one of which is being forwarded to you, attached to this letter.

Incidentially, Mr. Richard Merritt: is or was the County Engineer
for
for Yavapai County several years ago. It is hoped that Mr. Carlson will not notice the difference.

I will make a trip up there this coming Friday or Saturday to start work on the job. It is hoped that there is not another delay because of the wrong name.

I have called Mr. Ireland but he was not there. I left a message for him to make the correction of the name and send me a new letter on
Monday
Monday. Hopefully this will be done.

Sincerely yours,

R. E. Mieritz,
Mining Consultant

427-3347

Octave Dumps

VXJ977

10-1- To Octave Trip ~~[illegible]~~, 6 hrs
10-24 " " Survey 1 day
10-25 - Survey 1 day
~~10-28~~ 10-27 Survey Noto - Map. 1 day
11-28 Octave Trip 1 day,
3-2 - Office - Map - 3 hrs
3-3 Office Report 6 hrs
3-4 To Wickenburg - Prof - Jarrell -
3-5 - Wick - [illegible] - collect call - Mosher - Back hoe.

Can - Am

~~9-26 - Reports - 1 day~~
~~10-23 - 1/2 day~~
~~10-28 - Globe 1/2 day [illegible]~~
~~10-29 Globe 1 day~~
10-30 [illegible] Cod [illegible]. 1 day.

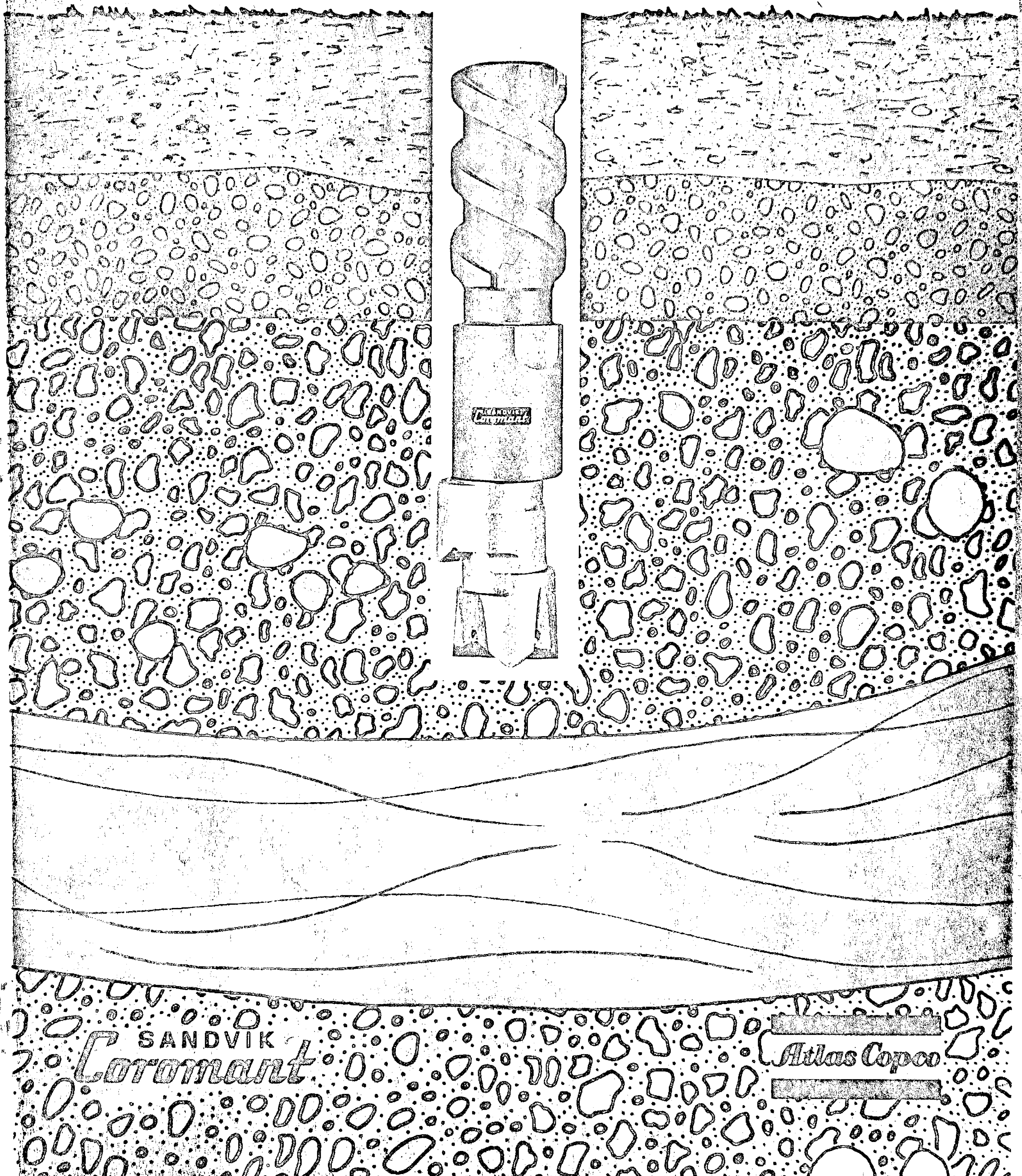
Migel - Golden Hillside

11-2 - Trip to Prop. 1 day

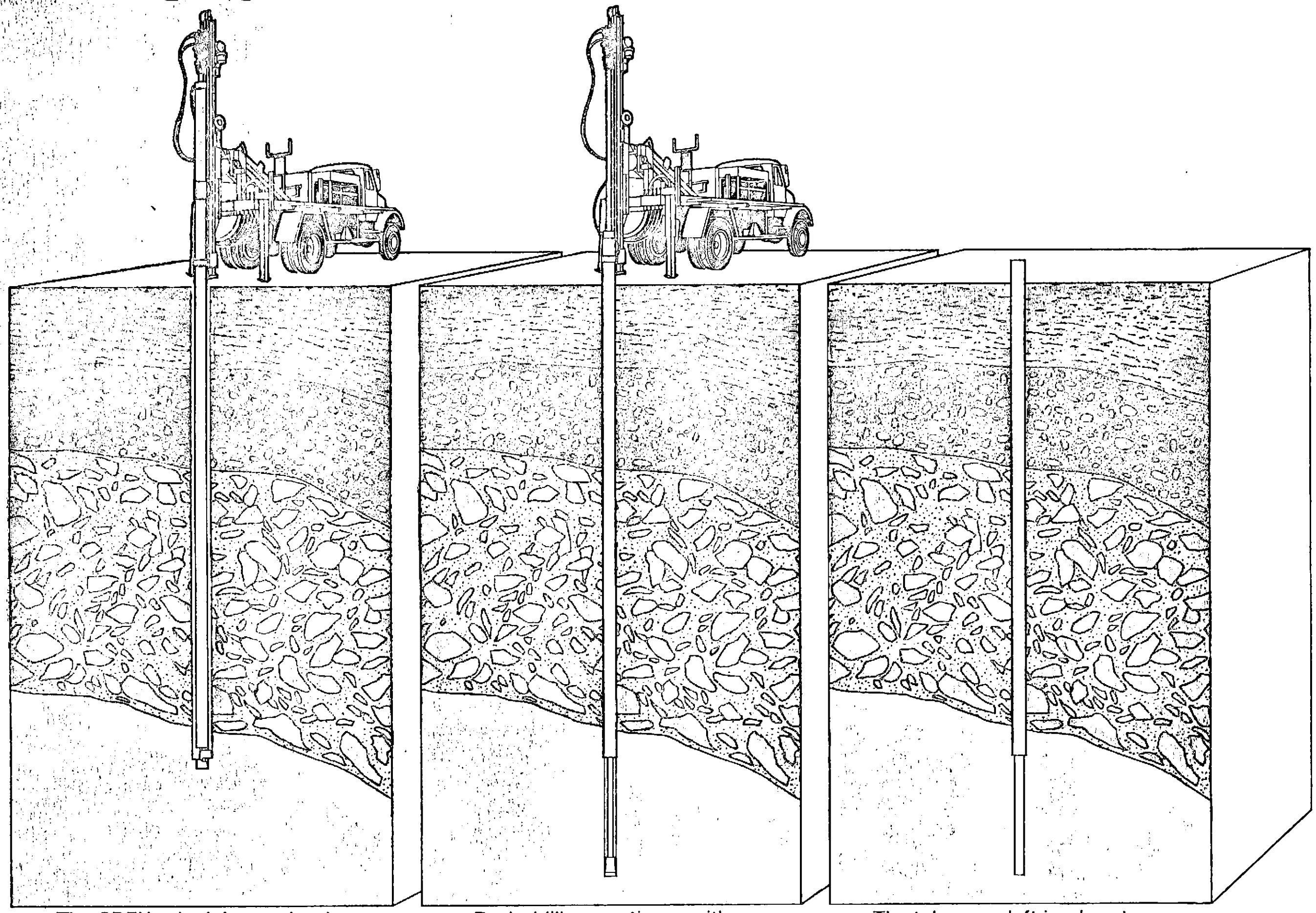
$22.00 per L.F.
$2.10 per loaded mile
$60.00 per hole set up time

ODEX

The method that makes it technically
and economically feasible to drill deep holes through overburden.
Developed by Atlas Copco and Sandvik



95% OF THE EARTH'S LAND SURFACE IS COVERED BY OVERBURDEN



The ODEX principle: overburden drilling to solid rock. The casing tubes follow without rotation.

Rock drilling continues with conventional equipment.

The tubes are left in place to stabilize the hole walls.

Drilling through overburden is often necessary, despite the fact that it is perhaps the most difficult type of drilling there is.

One of the problems is that you have to pass through several different types of formation in drilling a single hole. Another problem is that the hole walls are often instable. In certain cases this makes drilling by ordinary methods impossible.

In ODEX you have the method and equipment to tackle deep, lined holes under the most difficult conditions. Now it is possible to complete overburden drilling operations which were previously accompanied by great problems – where expensive methods such as diamond drilling, driving down tubes combined with blasting or stripping the overburden down to bedrock were the only alternatives.

ODEX is designed for difficult overburden drilling

ODEX is a new method for overburden drilling which has been developed by Atlas Copco and Sandvik in collaboration. The method is based on a drill bit with an eccentric reamer, which drills a hole larger than the outer diameter of the casing tubes.

You can drill deeper

In drilling with casing tubes which rotate, the friction between the tubes and the hole walls sets a limit to the depth which you can reach. Normally about 25 m (80 ft) is the maximum depth with a 127 mm (5") drill bit.

ODEX can drill lined holes as deep as is required, 50, 75, 100 m (165, 245, 330 ft) or more depending on local conditions.

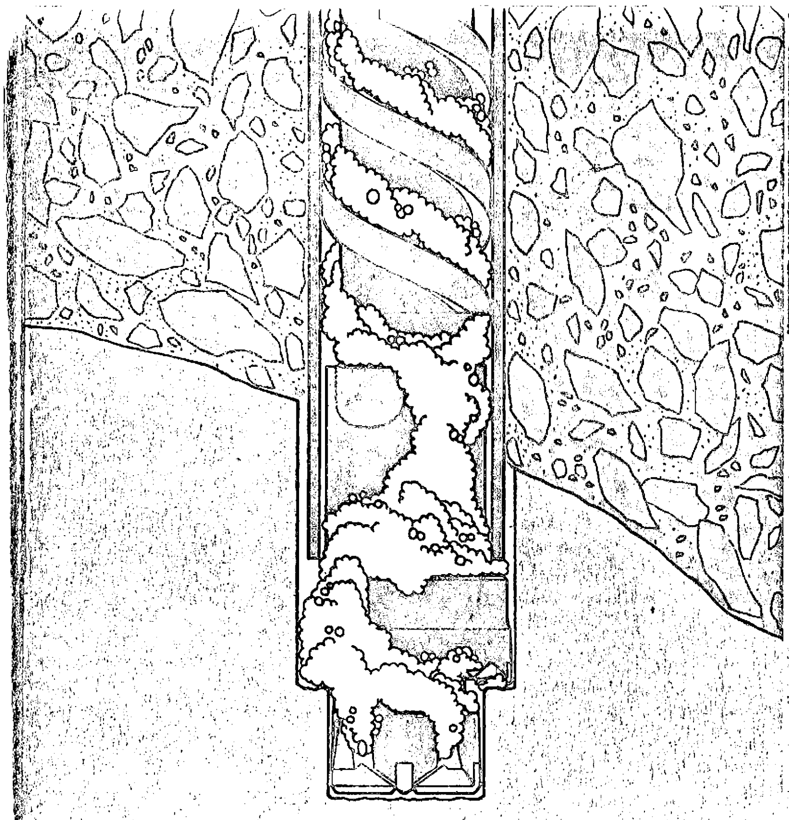
Cheaper casing tubes can be used

When the casing tubes are to be left in place, non-machined steel tubes can be used, welded together. The only requirement for the casing tubes is that they are of the correct size and of a grade suitable for welding. The dimensions of the drilling equipment are matched to international tube standards in order to facilitate acquisition.

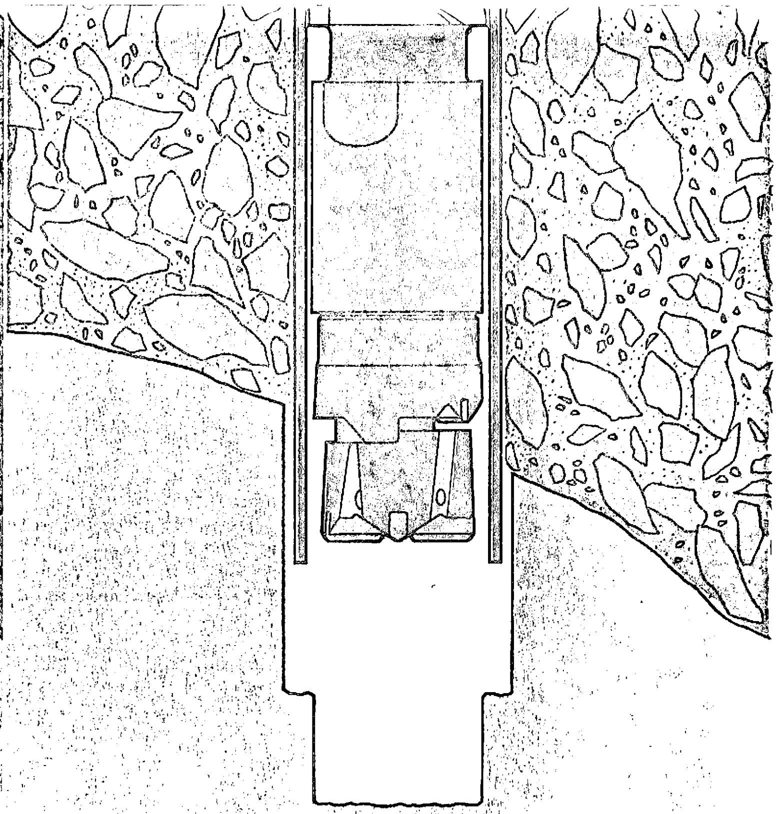
Some typical applications for the ODEX method

Drilling holes in civil engineering operations, for example
- anchoring
- grouting
- pipe and cable-laying through highway and railway embankments
- drilling blast holes without soil removal
- water wells

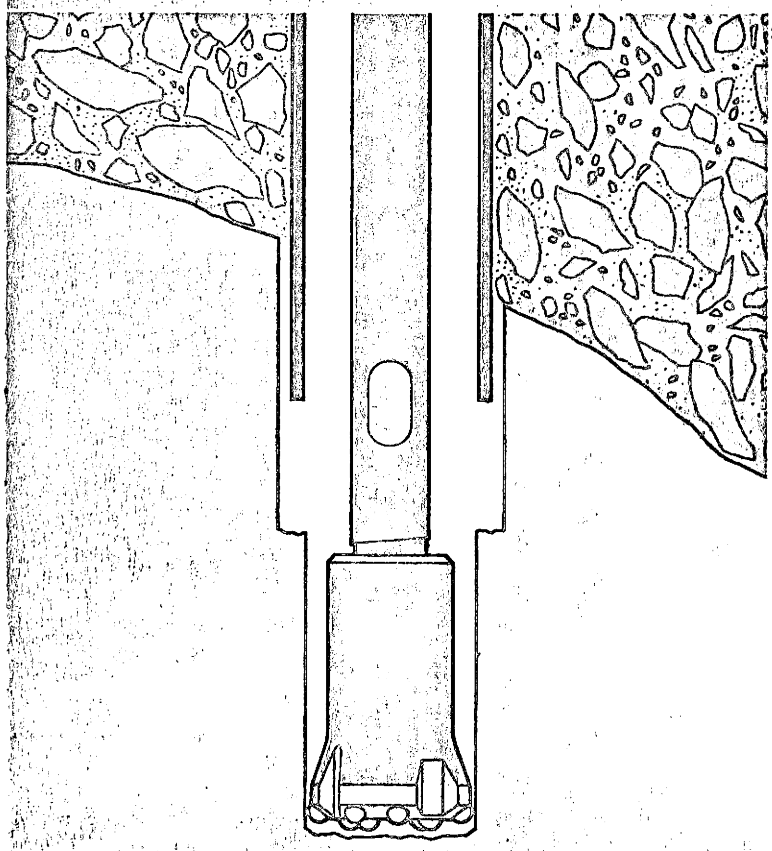
Prospecting, for example
- holes which will be continued with diamond drilling
- cuttings sampling
- soil sampling
- investigation of the thickness of the overburden
- investigation of the ground water table



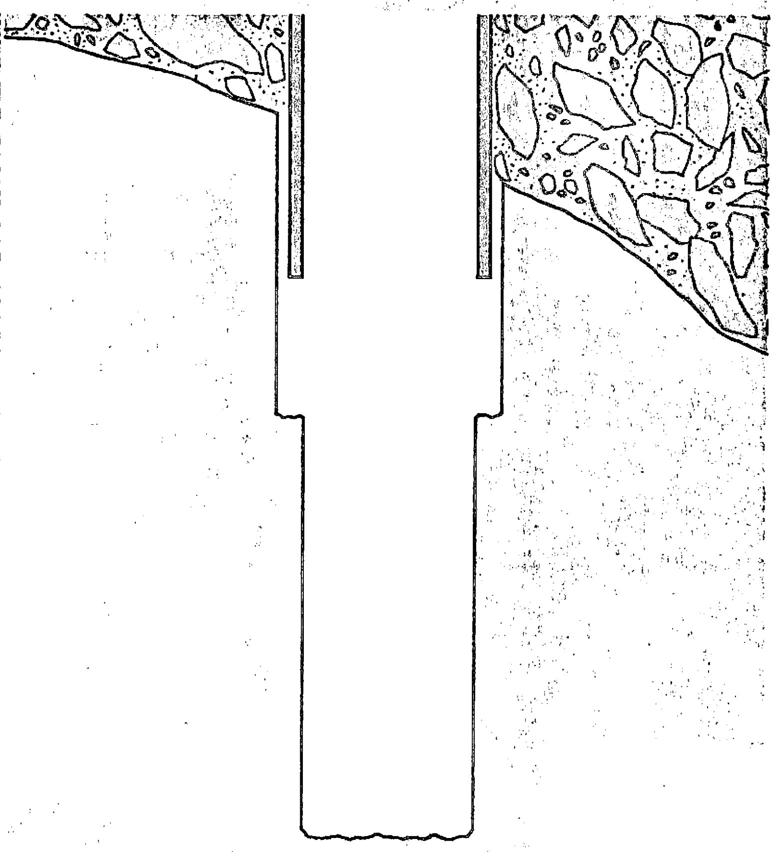
1. ODEX equipment at work. The pilot bit drills at the bottom of the hole. When rotation begins, the reamer swings out automatically and reams up the hole so that the casing tubes can slide down. The cuttings are transported upwards by means of foam flushing inside the casing tubes.



2. When drilling is completed, the drill bit is rotated in the other direction, so that the reamer is felled in. With the reamer in this position the drilling equipment can easily be withdrawn through the casing tubes.

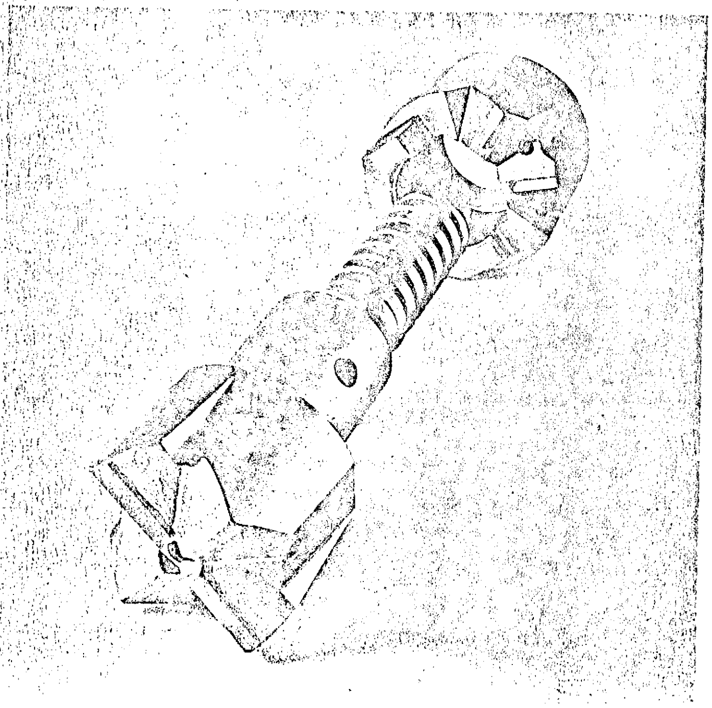


3. If the ODEX hole has been drilled into solid rock, drilling can continue there with standard equipment through the casing tubes.

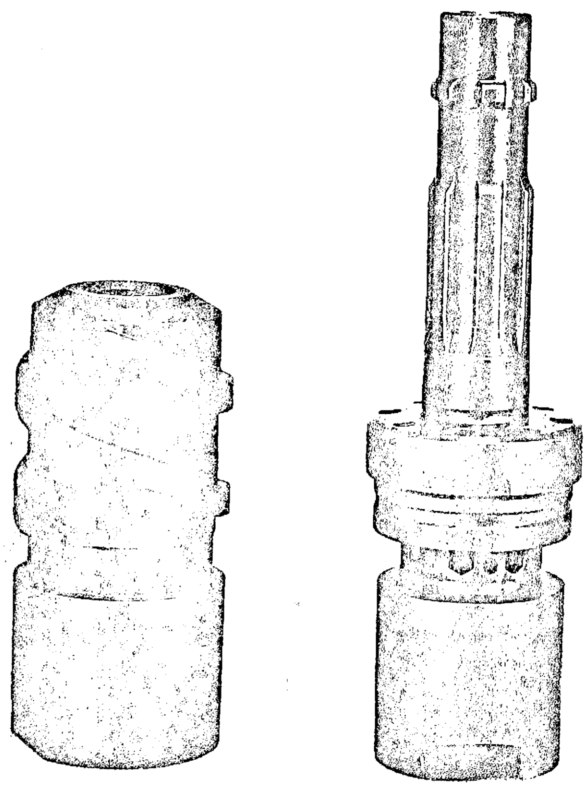


4. The casing tubes are left in place in the hole to stabilize the walls.

INGENIOUS ODEX



Pilot bit with eccentric reamer for ODEX 76.



Guides for eccentric bits, the one on the left for ODEX 127 with top hammer, that on the right for ODEX 115 with down-the-hole drill.

The ODEX bit is truly ingenious.

This simple but reliable design has the answer to most overburden drilling problems.

With ODEX drilling you can, for example, put down water wells where they will give the most water, not just where they are easiest to drill.

ODEX equipment can drill in anything. From the most non-consolidated soil stratum to homogeneous rock. Stones and boulders are easily passed.

Rugged, reliable design

The ODEX bit consists of three parts: pilot bit, reamer and guide.

The pilot bit is machined in a single piece and carries four cemented carbide cutting inserts.

The reamer has two cemented carbide inserts. The eccentrically placed hole permits the reamer to be felled out or in depending on the direction in which the equipment is rotated. Stop lugs hold the reamer in the correct position.

The flushing channels in the column between the reamer and pilot bit assure that the flushing agent keeps this area clean and that felling out and in occur smoothly. This and the rugged design eliminate the risk of the reamer getting stuck in the felled out position.

Guide to screen cuttings

Flushing and cuttings removal are critical points in overburden drilling. The cuttings must be finely ground for the flushing agent to be able to lift them to the surface.

For this reason the guide on ODEX bits is designed to screen the cuttings in the column in the casing tube. Only the smallest cuttings particles are allowed to pass. The remainder is forced back to be recrushed or is pressed out into the hole walls.

Effective ODEX drilling requires effective flushing

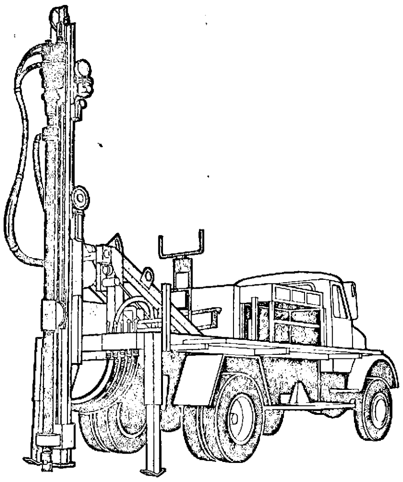
That's why we recommend foam flushing, which has proven the most effective means to remove cuttings.

The foam disintegrates the cuttings and lifts them. It lubricates and seals the hole walls. It makes it possible to drill deeper than with just air or water flushing and it reduces the risk of getting stuck. It also reduces wear on the equipment.

The casing tubes slide more easily down into the hole. The flushing effect is not lost when the drilling equipment passes through cavities or fissured rock.

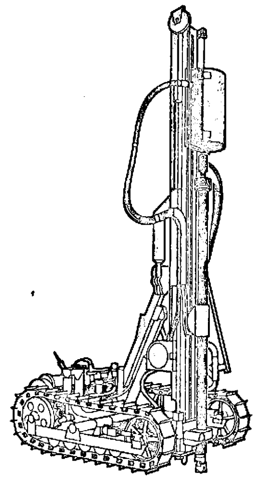
Foam makes the supply of flushing water last longer too. Consumption is only 3–5 l/min (0,7–1.1 Imp.gal/min), as compared to the normal ca 30 l/min (6.6 Imp.gal/min). This is an advantage you'll appreciate when the water has to be transported from a great distance.

CAN BE USED ON ATLAS COPCO STANDARD RIGS



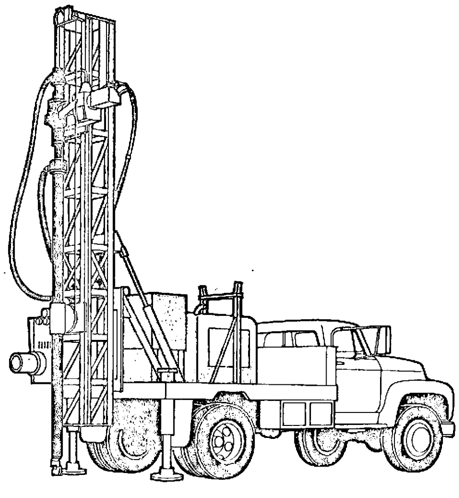
Aquadrill 461

Water well drilling rig equipped with down-the-hole drill COP 4 and rotation unit BBR 6-01. A simple, easily serviced rig suitable for the ODEX method. Easy to mount on a lorry or similar vehicle.



ROC 601-00

Versatile cross-country bench drilling unit with rock drill BBE 57-01. BBE 57-01 has separate rotation with high torque. For especially demanding drilling there is a rock drill with double rotation motor, BBE 53.



Mobile Drill B80

Lorry mounted drill rig with hydraulic rotation and feeding. Suitable for both Auger drilling and ODEX drilling.

A simple conversion makes ROC 601 a dual purpose rig

Atlas Copco ROC 601-00 crawler drills which are not already equipped for ODEX drilling can easily be completed. Handling the casing tubes and the foam flushing require a certain amount of complementary equipment. The set includes:

1. Winch with wire rope, controls and attachment device
2. Pulley
3. Yoke
4. Specially constructed drill steel support
5. Foam generator with transfer pump

The difference between rock drilling and ODEX drilling lies in tube handling and foam flushing

The yoke makes it easier to handle the casing tubes. During drilling it serves, with the drill steel support, as a guide for the casing tubes. The yoke is also used as an aid in taking up the tubes. The winch is used for manoeuvring the yoke along the feed beam. The wire rope between the yoke and the winch runs over the pulley.

Foam flushing requires a container (e.g. an oil drum) for the water and a one litre measure for adding the foaming concentrate. The mixture ratio is 0.5–4 parts Atlas Copco DFA 51 concentrate to 100 parts water.

The Atlas Copco foaming concentrate is a biologically degradable non-pollutant and is not dangerous to work with.

Tubes left in the hole are welded together

If the casing tubes are to be left in the hole when drilling is completed, it is suitable to weld them together. Then inexpensive non-machined steel tubes can be employed. The casing tubes are cut in lengths which match those of the extension rods.

For jointing we recommend equipment consisting of a bevelling machine, brackets and welding gear with suitable electrodes.

Tubes which are screwed together so that they can be withdrawn afterwards must be of relatively good quality so that the threads will last and the tubes themselves will stand up to the stresses of being driven up.

AVAILABLE FOR BOTH TOP HAMMER AND DOWN-THE-HOLE DRILLS

TOP HAMMER PRINCIPLE

The ODEX equipment for top hammers works in the traditional way with impact and rotation transmitted by means of extension rods.

To get the casing tubes to follow in the hole a portion of the impact energy is transferred from the rock drill by way of the shank adapter to a driving cap above the casing tube. The tube is then driven down without being rotated.

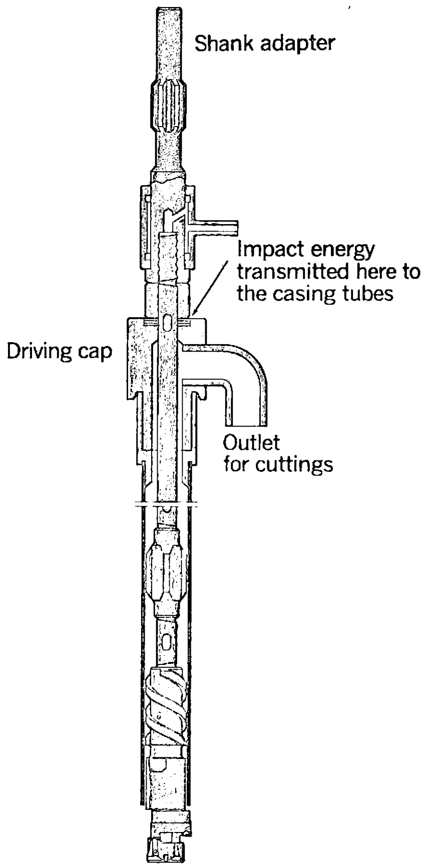
Connected to the driving cap is a rubber hose to lead off the foam and cuttings which come up out of the tubes.

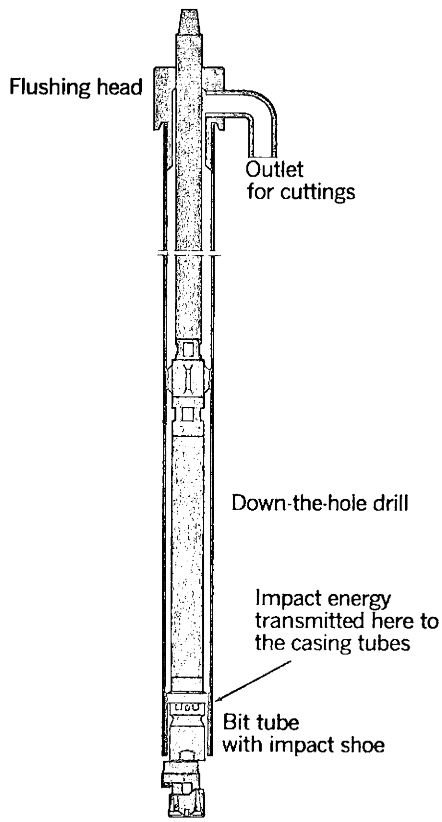
DOWN-THE-HOLE PRINCIPLE

No impact energy is lost in the drill tubes which only transmit rotation to the drill bit.

Since the hammer works at the bottom of the hole, the impact energy to the casing tubes must be transferred there too. A special bit tube is employed in down-the-hole drilling with the ODEX method. The bit tube has a driving shoe where the guide of the ODEX bit engages.

The driving cap of the top hammer version is here replaced by a flushing discharge head which leads off foam and cuttings.





ODEX 76 for top hammers

This equipment drills a 96 mm (3 25/32") hole with rotation to the left leaving room for casing tubes with an external diameter of 84 mm (3 5/16") and a goods thickness of 3.5 mm (9/64"). Drilling can then continue in rock with button bits or bits with conventional inserts with a maximum diameter of 76 mm (3").

To facilitate the withdrawal of the casing tubes there is a special tube-lifting device.

For grouting work there is a combined tube lifter/grouting device which lifts the tubes at an even rate as grouting progresses.

ODEX 127 for top hammers

The equipment drills a 162 mm (6 3/8") hole with rotation to the left leaving room for casing tubes with a maximum external diameter of 142 mm (5 9/16"). The goods thickness should be 5–6 mm (13/64 – 15/64") to avoid deformations. Drilling can continue in rock with button bits or bits with conventional cutting inserts with a maximum diameter of 127 mm (5").

ODEX 115 for Atlas Copco down-the-hole drill COP 4

The equipment drills a 152 mm (6") hole with rotation to the right making room for casing tubes with a maximum external diameter of 142 mm (5 9/16") and a goods thickness of 5–6 mm (13/64 – 15/64"). Drilling can then continue in rock with a standard drill bit with a maximum diameter of 115 mm (4 1/2").

ODEX 165 for Atlas Copco down-the-hole drill COP 6

The equipment drills a 212 mm (8 1/2") hole with rotation to the right making room for casing tubes with a maximum external diameter of 196 mm (7 11/16") and a goods thickness of 5–7 mm (13/64–1/4"). Drilling can then continue in rock with a standard drill bit with a maximum diameter of 165 mm (6 1/2").

DATA

	ODEX 76	ODEX 115	ODEX 127	ODEX 165
ODEX bit				
Pilot bit, diameter, mm (in)	70 (2 3/4)	110 (4 5/16)	110 (4 5/16)	152 (6)
Reamer, diameter, mm (in)	96 (3 25/32)	152 (6)	162 (6 3/8)	212 (8 1/2)
Standard bit for continuing drilling in rock, max. diameter, mm (in)	76 (3)	115 (4 1/2)	127 (5)	165 (6 1/2)
Extension rods				
R 38, 1 1/2" rope thread,				
L = 3050 mm (10')	•		•	
L = 2435 mm (8')	•		•	
L = 1220 mm (4')	•			
Drill tubes				
API 2 3/8" REG				
Outer dia = 76 mm (3")				
L = 3000 mm (9' 10")		•		
L = 1500 mm (4' 11")		•		
API 3 1/2" REG				
Outer diam = 114 mm (4 1/2 ")				
L = 1525 mm (5')				•
L = 3050 mm (10')				•
L¹ = 6250 mm (20 1/2')				•¹
Casing tubes				
Threaded				
Inner dia = 77 mm (3 1/32")				
Outer dia = 84 mm (3 5/16")				
L = 3050 mm (10')	•			
L = 2435 mm (8')	•			
L = 1220 mm (4')	•			
Non-machined steel tubes with good weldability				
Inner dia = 128–130 mm (5-5 1/8")				
Outer dia = 138–142 mm (5 3/8–5 1/2")				
L = 3050 mm (10')			•	
L = 2435 mm (8')			•	
L = 1500 (4' 11")		•		
L = 3000 mm (9' 10")		•		
Innerdia = 180–183 mm (7 5/64"–7 1/8")				
Outer dia = 192–196 mm (7 1/2"–7 11/16")				
L = 1525 mm (5')				•
L = 3050 mm (10')				•
L¹ = 6250 mm (20 1/2')				•¹
Atlas Copco standard rigs				
ROC 601-00 with chain feed type				
BMM 36K 258 (8' equipment)	Convers.set		Convers.set	
BMM 36K 268 (10' equipment)	Convers.set		Convers.set	
Aquadrill 571	Option		Standard	
Aquadrill 461		Standard		
Mobile Drill B40L		Option		
Mobile Drill B80		Convers.set		standard
Rotamec 1300		Convers.set		standard
Foam flushing				
Foam concentrate DFA 51 and possibly foam stabilizer C mixed with water. Foam liquid consumption 3–5 l/min (0.7–1.1 Imp. gal/min) of which 0.5-4% DFA 51.	•	•	•	•

	Weights kg	Weights lb
Extension rods		
L = 3050 mm (10')	24.1	53.1
L = 2435 mm (8')	19.2	42.3
L = 1220 mm (4')	9.6	21.1
Drill tubes for down-the-hole drill COP 4		
API 2 3/8" REG		
L = 3000 mm (9' 10")	23.0	50.7
L = 1500 mm (4' 11")	14.0	30.8
Drill tubes for down-the hole drill COP 6		
API 3 1/2" REG		
L = 1525 (5')	32	70.5
L = 3050 (10')	62	137.5
L¹ = 6250 (20 1/2')	199.5	440.0
Casing tubes (84/77, 3 1/32/ 3 5/16") threaded		
L = 3050 mm (10')	21.3	46.9
L = 2435 mm (8')	17.0	37.4
L = 1220 mm (4')	8.5	18.7
Non-machined steel tubes		
Inner dia = 128,5 mm (5 1/16")		
Outer dia = 139.7 mm (5 1/2")		
L = 3050 mm (10")	66.4	124.2
L = 2435 mm (8")	45.0	99.1
L = 1500 (4' 11")	27.8	61.1
L = 3000 mm (9' 10")	55.5	122.2
Innerdia = 182.5 (7 3/16")		
Outer dia = 193.7 (7 5/8")		
L = 1525 mm (5')	38.1	34.0
L = 3050 mm (10')	76.3	168.2
L¹ = 6250 mm (20 1/2')	156.3	344.6

¹) For Rotamec 1300 only

ODEX/dimension	Drill rig	Rock drill	Rotation unit	Feed	Suitable compressor
ODEX 76	ROC 601-00	BBE 57-01	–	BMM 36K 258	PR 600, PR 700
	ROC 601-00	BBE 57-01	-	BMM 36K 268	PR 600, PR 700
	Aquadrill 571	BBE 57-01	-	BMM 36K 255	PR 600, PR 700
ODEX 115	Aquadrill 461	COP 4	BBR 6-01	BMM 36K 855	PRH 700
	Mobile Drill B40L	COP 4	Hydraulic	–	PRH 425
	Mobile Drill B 80	COP 4	Hydraulic	–	PRH 425
ODEX 127	ROC 601-00	BBE 57-01 alt. BBE 53	–	BMM 36K 258	PR 600, PR 700
	ROC 601-00	BBE 57-01 alt. BBE 53	–	BMM 36K 268	PR 600, PR 700
	Aquadrill 571	BBE 57-01 alt. BBE 53	–	BMM 36K 255	PR 600, PR 700
ODEX 165	Mobile Drill B80	COP 6	Hydraulic	–	PRH 700
	Rotamec 1300	COP 6	Hydraulic	-	PRH 700 (inducled in the rig)

	BBE 57-01			BBE 53			COP 4			COP 6		
Air consumption during drilling at a working pressure* of	l/s	m³/min	cfm	l/s	m³/min	cfm	l/s	m³/min	cfm	l/s	m³/min	cfm
6 bar 87 psig	270	16	564	300	18	634	60	3.6	127	112	6.7	237
10,5 bar 150 psig				–	–		110	6.6	235	212	12.7	448
18 bar 260 psig				–	–	–	195	11.7	412	350	21.0	742
Weight (whithout shank adapter or bit)	kg	lb		kg	lb		kg	lb		kg	lb	
	170	375		250	550		36	79		86	190	

* Overpressure 1 bar = 100 kPa = 1.02 kg/cm² = 14.5 psig

FITS INTO THE COMPLETE ATLAS COPCO PROGRAMME FOR SOIL AND ROCK DRILLING

ODEX 76 on crawler drill ROC 601-00 with feed
BMM 36K 268. Rock drill BBE 57-01. Compressor Atlas Copco PR 700.

ODEX completes Atlas Copco's assortment of equipment for rock and soil drilling, which also includes prospecting and diamond core drilling equipment, both light and heavy rock drills, mechanized drill rigs, compressors, and Sandvik Coromant drill steel equipment.

Atlas Copco supplies more than equipment. We also supply advice. Our project department will be happy to share its experience with you.

REUTER EQUIPMENT
COMPANY
1802 W. Jackson
Phoenix, Arizona 85007
(602) 252-7231

SANDVIK

**SANDVIK COROMANT – A QUALITY PRODUCT FROM SANDVIK
SALES AND SERVICE AROUND THE WORLD
THROUGH ATLAS COPCO**

Atlas Copco

E 11035a
The manufacturer reserves the right to make modifications without prior notice

JAKFVERT & JOSEPHSON/DAHLBERG & CO, STOCKHOLM 1976-06/PRINTED IN SWEDEN

IRON KING ASSAY OFFICE
BOX 247
HUMBOLDT, ARIZONA 86329

STATEMENT

Richard E. Mievitz
2940 N. Casa Tomas
Phoenix, Az. 85016

PLEASE RETURN THIS STUB WITH YOUR REMITTANCE. YOUR CANCELLED CHECK IS YOUR RECEIPT. $

DATE	DESCRIPTION	CHARGES	CREDITS	BALANCE
3-26-81	47 Assays/Au & Ag @ $9.25	$434.75		
				$434.75

PAY LAST AMOUNT IN BALANCE COLUMN ▲

REDIFORM 8K874

Ck# 81-156
4-2-81

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER CERTIFICATE NO. 2978 WALTER G. STATLER Date Signed 3/26/81 ARIZONA, U.S.A.

ASSAY MADE FOR
Richard E. Mieritz
2940 N. Casa Tomas
Phoenix, Az. 85016

March 25, 1981

SAMPLE DESCRIPTION		Au.	Ag.			
# 2540	3-13-1	.016	0.16			
2541	-2	Tr.	0.04			
2542	-3	Nil	Nil			
2543	-4	Nil	Tr.			
2544	-5	Tr.	0.34			
2545	-6	Tr.	0.02			
2546	-7	.030	Nil			
2547	-8	Tr.	Nil			
2548	-9	Nil	Nil			
2549	-10	.004	Nil			
2550	-11	Tr.	Nil			
2551	-12	.154	0.01			
2552	-13	.098	0.02			
2553	-14	.094	Nil			
2554	-15	Tr.	Nil			
2555	-16	.020	0.02			
2556	-17	.070	Nil			
2557	-18	.022	0.02			
2558	-19	Tr.	0.02			
2559	-20	.028	0.07			
2560	-21	.050	Nil			
2561	-22	.630	0.01			
2562	-23	.038	0.04			

CHARGES $434.75

ASSAYER

IRON KING ASSAY OFFICE
ASSAY CERTIFICATE

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REGISTERED ASSAYER CERTIFICATE NO. 2978 WALTER G. STATLER Date Signed 3/26/81 ARIZONA, U.S.A.

ASSAY MADE FOR: Richard E. Mieritz

March 25, 1981

SAMPLE DESCRIPTION		Au.	Ag.			
# 2563	3-13-24	.107	0.25			
2564	-25	.034	0.08			
2565	-26	.003	0.13			
2566	-27	.031	0.10			
2567	-28	.031	Tr.			
2568	-29	Tr.	Tr.			
2569	-30	Tr.	Tr.			
2570	-31	.114	0.42			
2571	-32	Tr.	0.05			
2572	-33	.057	0.33			
2573	-34	.039	0.20			
2574	-35	.015	0.15			
2575	-36	.012	0.11			
2576	-37	.018	0.12			
2577	-38	.008	0.16			
2913	-39	.022	Nil			
2914	-40	.011	Nil			
2915	-41	.086	0.12			
2916	-42	.014	Nil			
2917	-43	.279	0.30			
2918	-44	.051	0.09			
2919	-45	.025	0.10			
2920	-46	.043	Nil			
2921	-47	.056	0.05			

CHARGES ____________ ASSAYER ____________ mm =/// mm

Dump

9'	X	.022	.198	Nil	—
7'	X	.011	.077	Nil	—
8'		.086	.688	0.12	.96
6	X	.014	.084	Nil	—
10	X	.279	2.790	0.30	3.00
10	X	.051	0.510	0.09	0.90
6.5	X	.025	0.162	0.10	0.65
8	X	.043	.344	Nil	—
8	X	.056	.448	0.05	0.40
72.5			5.301		5.91
			0.0731		0.0815

3700
40,000
1,480,000.00

600.—
368.66
231.34

624.65
231.34
601831

Drill Holes.

WD1-	3 X .016 =	.048	3X 0.16	.48
	5 X Tr =	—	5X 0.04	.20
	5 X Nil =	—	5 X Nil	—
	2.5 X Nil	—	2.5 X Tr	—
	2.5 X Tr	—	2.5 X 0.34	.85
	5.0 X Tr	—	5.0 X 0.02	.10
	23	.048	23	1.63
		0.0021		0.071
WD2	3 X .03	.09	X Nil	
	5 X Tr	—	Nil	
	5 X Nil	—	Nil	
	5 X .004	.020	Nil	
	5 X Tr	—	Nil	
	23	.110		
		0.0048		-.0
WD3	3 X .154	.462	X 0.01	.03
	5 X .098	.490	0.02	.10
	5 X .094	.470	Nil	—
	5 X Tr	—	Nil.	—
	18	1.422		.13
		0.079		0.0072
WD4	3 X .020	.06	0.02	.06
	5 X .070	.35	Nil	—
	5 X .022	.11	0.02	.10
	4 X Tr	—	0.02	.08
	17	.520		.24
		0.0306		0.0141
WD5	3 X .028	.084	0.07	.21
	5 X .050	.250	Nil	—
	5 X .030	.150	0.01	.05
	5 X .038	.190	0.04	.20
	5 X .107	.535	0.25	1.25
	23	1.209		1.71
		0.0526		0.0743

L.D.6 -	3 X .034	.102	X 0.08	.24
	5 X .003	.015	0.13	.65
	5 X .031	.155	0.10	.50
Rock?	5 X .031	.155	Tr	—
Rock	5 X . Tr	—	Tr	—
	23	.427		1.39
		0.01856 ~~0.0142~~		0.0604
LD7 -	3X Tr	—	Tr	—
	5X .114	.570	0.42	2.10
	5X Tr	—	0.05	.25
	13	.570		2.35
		0.0438		0.1808
LD8	3X .057	.171	0.33	0.99
	5X .039	.195	0.20	1.00
	5X .015	.075	0.15	0.75
	13	.441		2.74
		0.0339		0.2107
LD9	3X .012	.036	0.11	0.33
Rock	5 .018	.090	0.12	0.60
Rock	5 .008	.040	0.16	0.80
	13	.166		1.73
		0.0128		0.1331

166 = 4.913   166 = 11.92

0.0296   0.0718

Oct. 1 -	To Octave		6 hrs.	
Oct 24 -	" " Survey	1 day		
Oct 25 -	" " "	1 day.		
Oct 27 -	Office Survey Notes	1 day		
Nov 28 -	" Trip	1 day.		
Mar. 2 -	Office - Maps.		3 hrs	
Mar 3 -	Office Report		6 hrs.	
Mar 4	Wickenburg Prescott - Wick	1 day		
Mar 5	Wickenburg Phx		4 hrs.	
Mar 6	Office Report		5 hrs	
March 8	Phx, Wickenburg			
Mar 9 -	Wick - Oct Wick Oct Wick.	1 day		St. drill at 1:00 PM
Mar 10 -	Wick - Oct - Wick. 1	1 day		Drilling - Backhoe
Mar 11 -	" " "	1 day		Drill Samples.
Mar 12 -	Wick - Prescott Phx		4 hrs	Samples - Assayer
Mar 13 -	Office Maps.		3 hrs.	
Mar 14	" Maps - Volumes		5 hrs.	
Mar 16	Office - Claims Map - Report		4 hrs.	
Mar 17	Office - Typing Report. (Maps)		2 hrs.	
Apr 1 -	Office Calculations & finish Typing Report	1 day.		
Apr 2 -	Off - Report preparation		4 hrs	
		9 days.	46 hrs	
		5 days	6 hrs	
		14 days	6 hrs.	

CHURN DRILL SHIFT REPORT

PROPERTY Octave

HOLE NO LD 1

DATE March 9 1980

DRILL NO

SHIFT

BIT TYPE

DRILLER

CASING LOWERED - SIZE - FROM - TO

HELPER

FEET

WATER - DEPTH ENCOUNTERED FEET

FEET

BIT USED FEET

FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP 5 1/2

REPAIRING ENGINE OR RIG

DRILLING AND BAILING 1130 5 hrs.

CEMENTING HOLE FROM TO

SETTING CASING

FISHING

REMOVING CASING

REAMING HOLE FROM TO

EQUIPMENT REPAIR

CLEANING HOLE FROM TO

OTHER DELAYS

SAMPLES

DEPTH FROM	DEPTH TO	COLOR OF SLUDGE	CONDITION OF HOLE CAVING, ETC.	HARDNESS OF ROCK V.H. VERY HARD H. HARD M. MEDIUM S. SOFT V.S. VERY SOFT	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS (NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	3								
3	8								
8	13	Big							Ted
13	15.5								
15.5	18.0								
3-10-81									
18.0	22.0								finished 9:00 AM.

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT FEET

SAMPLES LEFT IN TUBS

DEPTH OF HOLE AT END OF SHIFT FEET

SAMPLES CANNED

SAMPLER

CHURN DRILL SHIFT REPORT

PROPERTY Octave

HOLE No LD-2 — DATE 3-10 1981

DRILL No ____ — SHIFT ____

BIT TYPE ____ — DRILLER ____

CASING LOWERED - SIZE - FROM - TO ____ — HELPER ____

____ FEET — WATER - DEPTH ENCOUNTERED ____ FEET

____ FEET

BIT USED ____ FEET

____ FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP 2 1/2 hrs. 9-11:30 — REPAIRING ENGINE OR RIG ____

DRILLING AND BAILING 1-1/2 hrs. — CEMENTING HOLE ____ FROM ____ TO ____

SETTING CASING ____ — FISHING ____

REMOVING Rods CASING ____ — REAMING HOLE ____ FROM ____ TO ____

EQUIPMENT REPAIR ____ — CLEANING HOLE ____ FROM ____ TO ____

OTHER DELAYS Grinding bit-

SAMPLES

DEPTH FROM	DEPTH TO	COLOR OF SLUDGE	CONDITION OF HOLE CAVING, ETC.	HARDNESS OF ROCK V.H. VERY HARD H. HARD M. MEDIUM S. SOFT V.S. VERY SOFT	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS (NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	3								Std 11:30 AM
3	8								Frank to Ap. Jct -
8	13								Hard bits - [illegible] -
13	18								(2 gallons [illegible])
18	23								Finished 12:55 PM
									Moved - 1:35 PM

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT ____ FEET — SAMPLES LEFT IN TUBS ____

DEPTH OF HOLE AT END OF SHIFT ____ FEET — SAMPLES CANNED ____

SAMPLER ____

CHURN DRILL SHIFT REPORT

PROPERTY Octave

HOLE No LP 3

DATE 3-10 1981

DRILL No

SHIFT

BIT TYPE

DRILLER

CASING LOWERED - SIZE - FROM - TO

HELPER

FEET

WATER - DEPTH ENCOUNTERED FEET

FEET

BIT USED FEET

FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP 12:55 3/4 hrs.

REPAIRING ENGINE OR RIG

DRILLING AND BAILING 1:40

CEMENTING HOLE FROM TO

SETTING CASING

FISHING

REMOVING CASING

REAMING HOLE FROM TO

EQUIPMENT REPAIR

CLEANING HOLE FROM TO

OTHER DELAYS

SAMPLES

DEPTH FROM	DEPTH TO	COLOR OF SLUDGE	CONDITION OF HOLE CAVING, ETC.	HARDNESS OF ROCK V.H. VERY HARD H. HARD M. MEDIUM S. SOFT V.S. VERY SOFT	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS (NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	3								Start 1240 PM
3	8								
8	13								
13	19	Crevice No Sample.							
19	23								Finished 4:30

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT FEET

SAMPLES LEFT IN TUBS

DEPTH OF HOLE AT END OF SHIFT FEET

SAMPLES CANNED

SAMPLER

CHURN DRILL SHIFT REPORT

PROPERTY Octave

HOLE NO AD-4

DATE 3-10 1981

DRILL NO

SHIFT

BIT TYPE

DRILLER

CASING LOWERED - SIZE - FROM - TO

HELPER

FEET

WATER - DEPTH ENCOUNTERED FEET

FEET

BIT USED FEET

FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP 1 hr

REPAIRING ENGINE OR RIG

DRILLING AND BAILING 5:30 PM

CEMENTING HOLE FROM TO

SETTING CASING

FISHING

REMOVING CASING

REAMING HOLE FROM TO

EQUIPMENT REPAIR

CLEANING HOLE FROM TO

OTHER DELAYS

SAMPLES

DEPTH FROM	DEPTH TO	COLOR OF SLUDGE	CONDITION OF HOLE CAVING, ETC.	HARDNESS OF ROCK V.H. VERY HARD H. HARD M. MEDIUM S. SOFT V.S. VERY SOFT	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS (NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	3								Start 5:30 PM
3	8								
8	13								
13	19	Cavity - No Sample							
19	23								Finished - 8:30 AM

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT FEET

SAMPLES LEFT IN TUBS

DEPTH OF HOLE AT END OF SHIFT FEET

SAMPLES CANNED

SAMPLER

CHURN DRILL SHIFT REPORT

PROPERTY Octave

HOLE NO LD-5

DATE March 11 1981

DRILL NO ______

SHIFT ______

BIT TYPE ______

DRILLER ______

CASING LOWERED - SIZE - FROM - TO

HELPER ______

______ FEET

WATER - DEPTH ENCOUNTERED ______ FEET

______ FEET

BIT USED ______ FEET

______ FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP ______

REPAIRING ENGINE OR RIG ______

DRILLING AND BAILING ______

CEMENTING HOLE ______ FROM ______ TO ______

SETTING CASING ______

FISHING ______

REMOVING CASING ______

REAMING HOLE ______ FROM ______ TO ______

EQUIPMENT REPAIR ______

CLEANING HOLE ______ FROM ______ TO ______

OTHER DELAYS ______

SAMPLES

DEPTH FROM	DEPTH TO	COLOR OF SLUDGE	CONDITION OF HOLE CAVING, ETC.	HARDNESS OF ROCK V.H. VERY HARD H. HARD M. MEDIUM S. SOFT V.S. VERY SOFT	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS (NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	3								Start 8:30 AM
3	8								
8	13								
13	18	} small samples.							
18	23	}							Stop 9:30 AM.

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT ______ FEET

SAMPLES LEFT IN TUBS ______

DEPTH OF HOLE AT END OF SHIFT ______ FEET

SAMPLES CANNED ______

SAMPLER ______

CHURN DRILL SHIFT REPORT

PROPERTY Octave

HOLE No WD-6

DATE March 11 1981

DRILL No

SHIFT

BIT TYPE

DRILLER

CASING LOWERED - SIZE - FROM - TO

HELPER

_____ FEET

WATER - DEPTH ENCOUNTERED _____ FEET

_____ FEET

BIT USED _____ FEET

_____ FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP

REPAIRING ENGINE OR RIG

DRILLING AND BAILING

CEMENTING HOLE _____ FROM _____ TO _____

SETTING CASING

FISHING

REMOVING CASING

REAMING HOLE _____ FROM _____ TO _____

EQUIPMENT REPAIR

CLEANING HOLE _____ FROM _____ TO _____

OTHER DELAYS

SAMPLES

DEPTH FROM	DEPTH TO	COLOR OF SLUDGE	CONDITION OF HOLE CAVING, ETC.	HARDNESS OF ROCK V.H. VERY HARD H. HARD M. MEDIUM S. SOFT V.S. VERY SOFT	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS (NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	3								Start 10.
3	8								
8	13								
13	18	Rock	Large Sample						
18	23	Rock	"		"				

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT _____ FEET

SAMPLES LEFT IN TUBS

DEPTH OF HOLE AT END OF SHIFT _____ FEET

SAMPLES CANNED

SAMPLER

CHURN DRILL SHIFT REPORT

PROPERTY *Octave*

HOLE NO *HD-7*

DATE *March 11* 19*81*

DRILL NO

SHIFT

BIT TYPE

DRILLER

CASING LOWERED - SIZE - FROM - TO

HELPER

FEET

WATER - DEPTH ENCOUNTERED FEET

FEET

BIT USED FEET

FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP

REPAIRING ENGINE OR RIG

DRILLING AND BAILING

CEMENTING HOLE FROM TO

SETTING CASING

FISHING

REMOVING CASING

REAMING HOLE FROM TO

EQUIPMENT REPAIR

CLEANING HOLE FROM TO

OTHER DELAYS

SAMPLES

DEPTH		COLOR OF SLUDGE	CONDITION OF HOLE	HARDNESS OF ROCK	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS
FROM	TO		CAVING, ETC.	V.H. VERY HARD; H. HARD; M. MEDIUM; S. SOFT; V.S. VERY SOFT					(NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	*3*								
3	*8*								
8	*13*								

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT FEET

SAMPLES LEFT IN TUBS

DEPTH OF HOLE AT END OF SHIFT FEET

SAMPLES CANNED

SAMPLER

CHURN DRILL SHIFT REPORT

PROPERTY *Altura*

HOLE NO *AZ-8*

DATE *March 11* 19*81*

DRILL NO

SHIFT

BIT TYPE

DRILLER

CASING LOWERED - SIZE - FROM - TO

HELPER

FEET

WATER - DEPTH ENCOUNTERED FEET

FEET

BIT USED FEET

FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP

REPAIRING ENGINE OR RIG

DRILLING AND BAILING

CEMENTING HOLE FROM TO

SETTING CASING

FISHING

REMOVING CASING

REAMING HOLE FROM TO

EQUIPMENT REPAIR

CLEANING HOLE FROM TO

OTHER DELAYS

SAMPLES

DEPTH		COLOR OF SLUDGE	CONDITION OF HOLE	HARDNESS OF ROCK	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS
FROM	TO		CAVING, ETC.	V.H. VERY HARD H. HARD M. MEDIUM S. SOFT V.S. VERY SOFT					(NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	*3*								
3	*8*								
8	*15*								

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT FEET

SAMPLES LEFT IN TUBS

DEPTH OF HOLE AT END OF SHIFT FEET

SAMPLES CANNED

SAMPLER

CHURN DRILL SHIFT REPORT

PROPERTY Calvare

HOLE No LR-9

DATE March 11 1981

DRILL No

SHIFT

BIT TYPE

DRILLER

CASING LOWERED - SIZE - FROM - TO

HELPER

FEET

WATER - DEPTH ENCOUNTERED FEET

FEET

BIT USED FEET

FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP

REPAIRING ENGINE OR RIG

DRILLING AND BAILING

CEMENTING HOLE FROM TO

SETTING CASING

FISHING

REMOVING CASING

REAMING HOLE FROM TO

EQUIPMENT REPAIR

CLEANING HOLE FROM TO

OTHER DELAYS

SAMPLES

DEPTH FROM	DEPTH TO	COLOR OF SLUDGE	CONDITION OF HOLE CAVING, ETC.	HARDNESS OF ROCK V.H. VERY HARD H. HARD M. MEDIUM S. SOFT V.S. VERY SOFT	IS SAMPLE RELIABLE, ETC.	SIZE TO WHICH SAMPLE WAS CUT (NUMBER OF SPLITS)	NUMBER OF BAILERS	DRY WEIGHT OF SPLIT SAMPLE	REMARKS (NOTE THICKNESS OF EXTREMELY SOFT AREAS. SPECIFY DRY WEIGHT OF AQUA-GEL ADDED.)
0	3								
3	8	Rock							
8	13	Rock							

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT FEET

SAMPLES LEFT IN TUBS

DEPTH OF HOLE AT END OF SHIFT FEET

SAMPLES CANNED

SAMPLER

Base Elevations	Top Elevations
3037.5	3070.3
3015.0	3071.9
3003.2	3071.2
3009.0	3070.6
3022.6	3072.5
3044.8	3069.1
3038.9	
21171.0	18425.6

3024.4 — 3070.9

46.5

Areas

Base	Top.
76.73 □"	5.66 □"
× 400	× 400
30,692 □'	2,264

32,956

~~16,478~~ ~~sq ft~~

~~× 46.5~~

~~766,227.~~ cuft

~~18~~

@ 15 cuft = 42,668 (calc.)

$V = \frac{h}{3} (A + A_1 + \sqrt{A \times A_1})$

$V = \frac{46.5}{3} \times (30,692 + 2,264 + \sqrt{69,486,688})$

$V = \frac{46.5}{3} \times (32,956 + 8,336)$

= ~~[illegible]~~

15.5 × (41,292)

V = 640,026 cuft

$\frac{640,026}{18}$ = 35,557 tons (calc.)

Section | Sq. Inches | Sq. Ft | Avg Area | Volume cu ft

40 | 24,320

3+98 — 1.52 × 400 = 608.00

67 | 854 = 74298

3+11 — 2.75 × 400 = 1100.00

54 | 1232 = 66528

2+57 — 3.41 × 400 = 1364.00

72 | 2148 = 154656

1+85 — 7.33 × 400 = 2,932.00

63 | 2534 = 159642

1+22 — 5.34 × 400 = 2,136.00

72 | 2438 = 175536

0+50 — 6.85 × 400 = 2,740.00

20

54800

709,780 | ~~660,460~~ | 39,432 ~~[illegible]~~ Tons. (calc.)

18 cu ft.

@ 15 cu ft | 47,319 ~~[illegible]~~ (calc.)

Say 43000 ~~[illegible]~~ Tons