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Item 73

# THE GETCHELL PROJECT

FMG, INC.

## INTRODUCTION

FirstMiss Gold Inc. was incorporated in August 1987 by First Mississippi Corporation for purposes of financing, developing and operating a gold mining project on the Getchell property and conducting exploration for gold. The Getchell property was transferred to FirstMiss Gold by First Mississippi in exchange for shares of FirstMiss Gold, which represent all of the shares outstanding prior to a recent stock offering. FMG, Inc. is a Nevada Corporation based in Reno and is the operating corporation for Getchell Mine.

First Mississippi Corporation is a diversified resource company with emerging interests in technology development and application. Established operations include: fertilizer production and marketing; production and marketing of industrial chemicals; exploration, development and production of oil and natural gas and the mining and marketing of coal. First Mississippi Corporation's new focus includes: production and marketing of specialty chemicals, minerals exploration and production, commercial development of thermal plasma technology and research in biotechnology.

FMG began operations in 1979 as FRM Minerals with an exploration and acquisition program which would lead to the development and production of precious metals and industrial minerals. The company obtained the Getchell property in 1983. Since that time FMG has developed 8,703,000 tons of gold reserves

amenable to open pit mining at a market price of \$325 per ounce. The deposit, with an average grade of .155 ounces of gold per ton and .075 oz/ton cutoff, is contained on 1,000 acres of a 32,000 acre property. The final feasibility study indicates an open pit gold mine and processing facility for nonleachable, refractory ore designed to produce an average of 150,000 ounces per year at a cost of \$225 per ounce over the life of the project. The capital cost to build the 3,000 ton per day mining and milling project is \$79,100,000.

Two hundred and fifty people will be employed at the mine and our annual payroll will be \$7,300,000. The net proceeds tax for the project is \$9.4 million (1987 dollars) and Nevada State Sales Tax on the capital investment is \$2.3 million.

FirstMiss Gold is currently continuing with exploration on the property as a follow-up to previous programs which developed new reserves for the major project, defined new reserves for the heap leach, and uncovered significant mineralization in new areas not previously evaluated.

FMG has been producing gold at Getchell since 1985 with a thousand ton per day heap leach facility that has recently been expanded to 2,000 tons per day. Heap leach production was 19,499 oz. in the year to June 1988 and is expected to continue at around 15,000 oz. per year for a few more years at least at a cash cost of around \$230/oz.

## FINANCIAL STRUCTURE

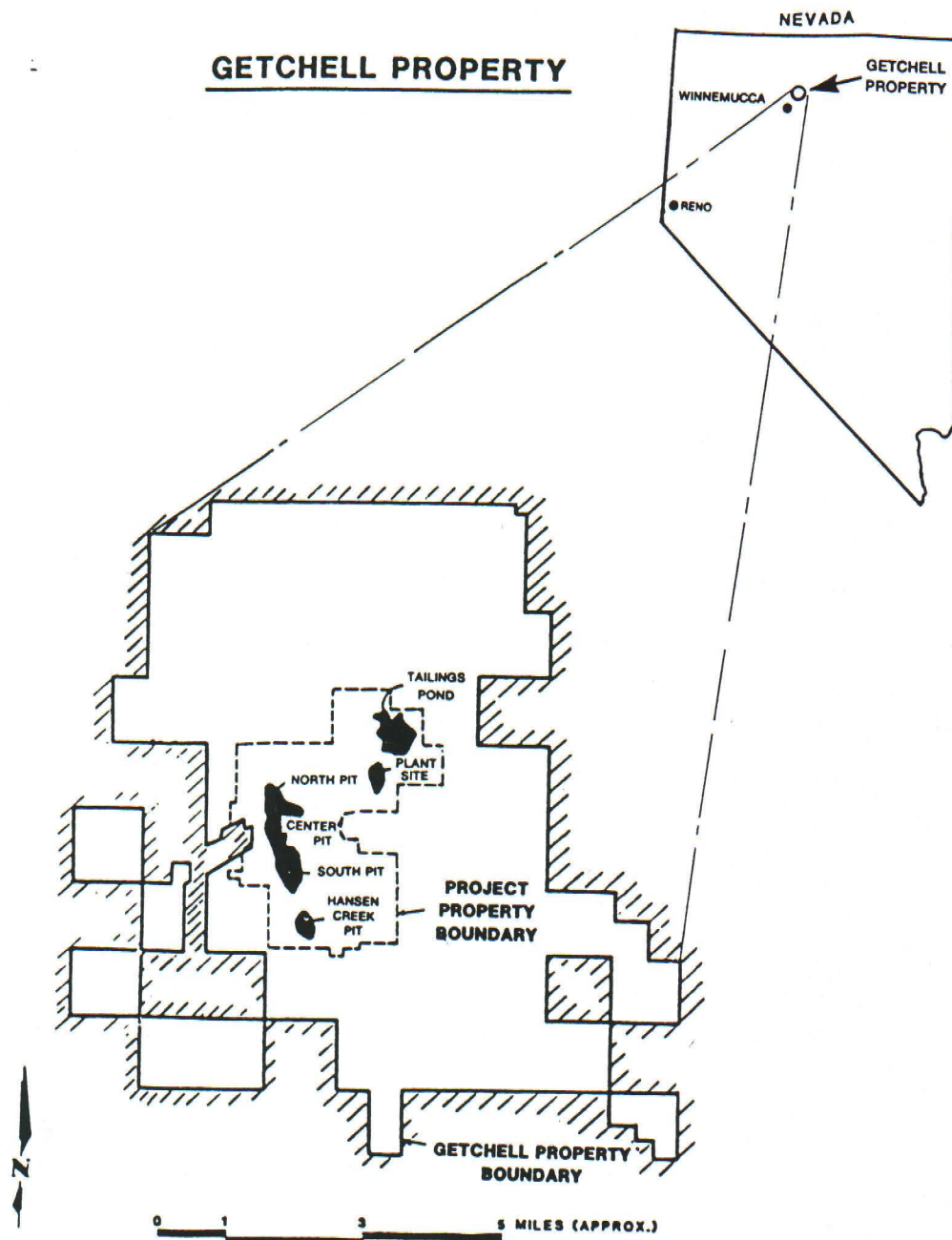
The Getchell project financing arrangements provide for a pool of funds of \$97.5m to cover expected construction costs, initial working capital and a contingency allowance. Of this amount, approximately \$71.2m will be supplied from a limited recourse gold loan, \$3.275m from an associated letter of credit, and the remainder from the proceeds of the recent \$23.2m share offering by FirstMiss Gold. Wright Engineers estimated in the feasibility study that there was an 80% probability that the capital cost of the Getchell Project, including initial working capital requirements, would not exceed approximately \$79.1m and a 95% probability that these costs would not exceed \$83.0m (exclusive of financing costs and without adjustment for inflation).



### LOCATION AND HISTORY

The Getchell Mine is located about 42 miles by road northeast of Winnemucca, Nevada, in the Potosi Mining District. The initial mining in the district, which was established in 1883, was for copper, lead, and silver in skarn-related deposits. In 1916, tungsten was discovered in the skarns and mined sporadically until 1955. Only limited mining of any type occurred in the district until 1934, when gold was discovered by Ed Knight and Emmett Chase. They sold the mine within a year to Nobel Getchell and his partner, George Wingfield. The mine was named after Nobel Getchell and became the largest gold producer in Nevada after five years of production, a position it held until 1954, when it was superseded by production of by-product gold from the Ruth Mine at Ely. Getchell was mined for oxide gold ore by underground and open pit methods from 1936 until 1945 when known oxide ores were mined out. From 1945 until 1967 several attempts were made to mine and roast sulfide ores for gold with varying degrees of success. During this time about two million tons of sulfide ore were mined. From 1967 until 1983 the property changed hands several times and exploration was carried out for gold and tungsten. Total production from Getchell prior to 1983 was approximately one million ounces of gold. FMG purchased the property from Conoco in 1983 for approximately \$5 million. Since the acquisition of the Getchell Property in 1983, FMG had expended approximately \$7.4m as of March 31, 1988, for exploration of the property of which approximately \$5.7m was related to the mine.

# GETCHELL PROPERTY



## ORE RESERVES AND MINING

Ore reserves were determined by standard reserve evaluation methods including 1,200 drill holes, 224 of which were drilled by FMG. Proven and probably reserves are 1.27 million ounces of gold at an average grade of .155 ounces per ton, which will be sufficient for a mine life of about 8-1/2 years. Reserves were confirmed by Wright Engineers. Stated reserves exclude possible geological ore and potential reserves for underground mining.

Project reserves are all located in the area of the old mine. Pre-production mining and pit development were begun in March, 1988. Ore has been stockpiled for mill testing and initial production.

FMG personnel will plan the mine and control ore quality. A major independent contractor has been selected to do the mining in order to minimize capital and operating costs. All mining will be by conventional open-pit techniques.



## REGIONAL GEOLOGY

The Osgood Mountain Range formed as the result of a Basin and Range uplift along a Cretaceous granodiorite stock which had been intruded into folded, Paleozoic sediments of the Preble, Comus and Valmy Formations. Resulting metamorphism along the intrusive contact formed rock assemblages ranging from tungsten skarns to marbles and hornfels to phyllites.

The eastern boundary of the Osgood Range is characterized by the Getchell fault system. This structure has placed younger Ordovician rocks of the Comus and Valmy Formations on the east in contact with the older Cambrian sediments of the Preble Formation and Cretaceous granodiorite on the west of the fault system.

Detectable amounts of gold can be traced all along the Getchell fault system but economic concentrations occur where thin-bedded limestones, limey siltstones and shales of the Preble and Comus Formations have been cut and structurally prepared by this faulting.



### GEOLOGIC SETTING

The Getchell gold system trends roughly N10-15W on the east flank of the Northern Osgood Range. Ore grade gold is found along this system for a strike length of approximately three miles on FMG property. All of the past production and our present mineable reserves are located in the area of the four existing pits -- the North, Center, South, and Hansen Creek Pits.

The Getchell gold deposit lies in a structurally prepared fault zone controlled by N10-15W Basin and Range faults dipping 40-75 degrees east. This faulting postdates east-west crossing structures and predates or is contemporary with northeast and northwest-trending structures and joint swarms. These crossing structures are a major control of ore deposition.

The fault zone runs along the east flank of the Cretaceous granodiorite Osgood stock, which intruded older, thrust-faulted, Paleozoic sedimentary rocks of the Preble, Comus, and Valmy Formations. Contact metamorphism along the intrusive formed tungsten-bearing, garnet-diopside skarns as well as more distal wollastonite skarns and marble. The Osgood Stock and associated skarns are found in both the footwall and hanging wall of the Getchell fault system. Dikes associated with the stock are also found in both walls of the system.

In the South Pit a series of gold-bearing, hanging wall structures approach the main Getchell structure from the southeast. As they approach the main structure, they mineralize the intra-structural country rock and combine with the main

structure forming high-grade, near vertical shoots within the system. New gold reserves were discovered by FirstMiss geologists under the old Getchell dumps in these hanging wall veins. The ore in these structures tends to be higher grade than the rest of the deposit and partially oxidized. This shallow oxide ore probably represents the type of ore that was originally mined during the early years of production at Getchell.

The main Getchell structure pinches upward at the north end of the Center Pit and is thin and inconsistent between the Center and North Pits, flaring slightly to form a small, near-surface pod of high-grade ore called the Old North Pit.

In the North Pit, the strike of the sediments which has generally followed the Getchell trend, swings to the west and the mineralization tends to warp slightly to follow the favorable beds of the Preble Formation. Almost half of the historic production from the Getchell was from the North Pit. The ore averaged .321 ounces per ton gold and was mined along the main Getchell structure in an ore zone varying from 40 to 100 feet thick.

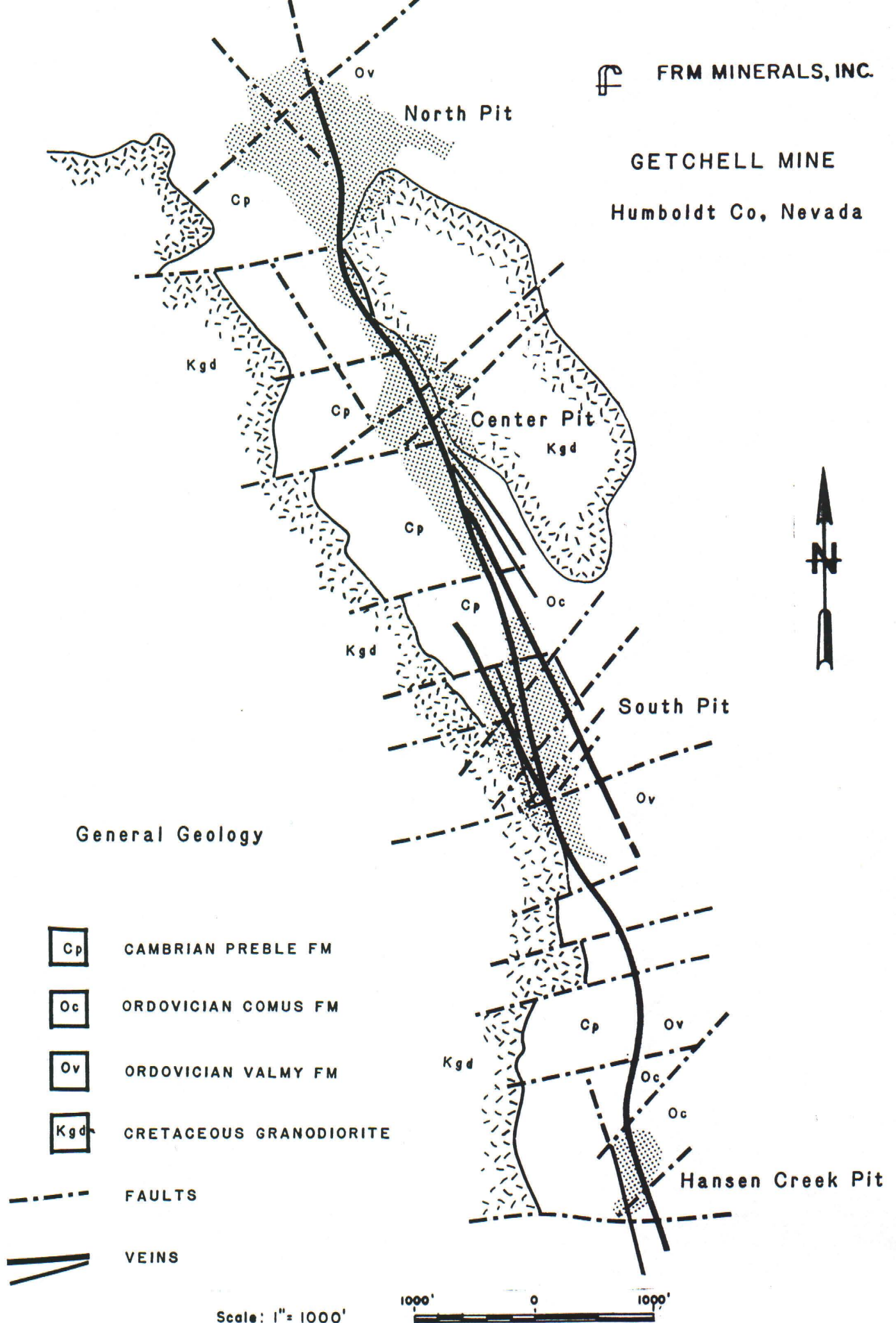




FRM MINERALS, INC.

# GETCHELL MINE

Humboldt Co., Nevada



## GOLD MINERALIZATION

The gold at Getchell was deposited in carbonaceous shale and limestone host rocks by several stages of relatively shallow, middle to late Tertiary hydrothermal activity. The bulk of the deposit contains refractory ore, the gold being associated with several stages of pyrite and therefore not amenable to heap leaching.

The host rocks, which are another major ore control in the Getchell deposit, were originally carbonaceous shales, thin-bedded limestones, and siltstones subjected to deformation and metamorphism ranging from epizonal (sericite-stable) to mesozonal (biotite-stable) prior to mineralization. Deposition of diffuse gold-bearing pyrite began during an early stage of hydrothermal activity accompanied by brecciation, silica flooding, silicification and clay alteration of sericite, feldspar and biotite. Later hydrothermal events remobilized and coarsened the diffuse gold and introduced additional gold, arsenic, and mercury, forming the present deposit. The arsenic formed the colorful arsenic sulfides, realgar and orpiment, for which Getchell is famous. The gold associated with early stages of disseminated pyrite is in the 0.1 - 1.0 micron size range while later stages of mineralization contain gold in the 1.0-10 micron range, also in pyrite. This gold is microscopic and invisible to the naked eye.

Some of the minerals contained in the Getchell ore are listed below:



# ORE MINERALS OF THE GETCHELL MINE, HUMBOLDT COUNTY, NEVADA

Acanthite	$\text{Ag}_2\text{S}$	Haidingerite	$\text{CaHAsO}_4 \cdot \text{H}_2\text{O}$
Arsenic	As	Ilsemanite	$\text{Mo}_3\text{O}_8 \cdot n\text{H}_2\text{O} (?)$
Arsenolite	$\text{As}_2\text{O}_3$	Jalpaite	$\text{Ag}_3\text{CuS}_2$
Arsenopyrite	$\text{FeAsS}$	Jamesonite	$\text{Pb}_4\text{FeSb}_6\text{S}_{14}$
Barite	$\text{BaSO}_4$	Laffittite	$\text{AgHgAsS}_3$
Bismuthinite	$\text{Bi}_2\text{S}_3$	Magnetite	$\text{Fe}^{+2}\text{Fe}_2^{+3}\text{O}_4$
Calcite	$\text{CaCO}_3$	Marcasite	$\text{FeS}_2$
Cassiterite	$\text{SnO}_2$	Molybdenite	$\text{MoS}_2$
Chabazite	$\text{CaAl}_2\text{Si}_4\text{O}_{12} \cdot 6\text{H}_2\text{O}$	Orpiment	$\text{As}_2\text{S}_3$
Chalcocite	$\text{Cu}_2\text{S}$	Pararealgar	AsS
Chalcopyrite	$\text{CuFeS}_2$	Pharmacolite	$\text{CaHAsO}_4 \cdot 2\text{H}_2\text{O}$
Cinnabar	$\text{HgS}$	Picropharmacolite	$\text{H}_2\text{Ca}_4\text{Mg}(\text{AsO}_4)_4 \cdot 11\text{H}_2\text{O}$
Coloradoite	$\text{HgTe}$	Polhemusite	$(\text{Zn}, \text{Hg})\text{S}$
Covellite	$\text{CuS}$	Pyrite	$\text{FeS}_2$
Diopside	$\text{CaMgSi}_2\text{O}_6$	Quartz	$\text{SiO}_2$
Ferrimolybdate	$\text{Fe}_2^{+3}(\text{MoO}_4)_3 \cdot 8\text{H}_2\text{O} (?)$	Realgar	AsS
Fluorite	$\text{CaF}_2$	Scheelite	$\text{CaWO}_4$
Galena	$\text{PbS}$	Silver	Ag
Galkhaite	$(\text{Cs}, \text{Tl})(\text{Hg}, \text{Cu}, \text{Zn})_4(\text{As}, \text{Sb})_4\text{S}_{12}$		
Getchellite	$\text{AsSbS}_3$	Sphalerite	$\text{ZnS}$
Gold	Au	Stibnite	$\text{Sb}_2\text{S}_3$
Graphite	C	Teallite	$\text{PbSnS}_2$
Grossularite	$\text{Ca}_3\text{Al}_2(\text{SiO}_4)_3$	Weillite	$\text{CaHAsO}_4$
Guerinite	$\text{Ca}_5\text{H}_2(\text{AsO}_4)_4 \cdot 9\text{H}_2\text{O}$	Wollastonite	$\text{CaSiO}_3$
Gypsum	$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$		

## CARBON CONTENT OF GETCHELL ORE

Petrographic analysis of the carbon at Getchell has shown:

- 1 - That originally syngenetic organic carbon occurred in Paleozoic sediments.
- 2 - Metamorphism has mildly silicified or recrystallized cryptocrystalline sediments confining the carbon to dustings along bedding planes.
- 3 - Carbon was also found migrating out of the bedding planes into cleavage faces and into the interstices between grain boundaries. This is typically found in the highly silicified rocks at Getchell.
- 4 - After at least one stage of brecciation and further hydrothermal activity, carbon was mobilized out of crystal interstices, subsequently, more carbon is found in veinlets and fractures and as colloidal carbon in microvugs.

Carbonaceous matter is found throughout the ore body in a succession of ever heavier hydrocarbons ranging from light organic hydrocarbon to graphite. The carbon stage seems to depend on the original organic content and the subsequent metamorphic and hydrothermal events. No direct line has been found between the amount or grade of gold-bearing sulfide in the ore and the presence or absence of carbon in any particular form. Neither do we find evidence of significant amounts of carbon being derived from a non-local source.

### STRUCTURAL CONTROL

There are three major structural trends which are directly related to the control of gold mineralization at Getchell:

East-West

N15W

N40E

The east-west cross-faults pre-date the main Getchell structure. It is theorized that they may represent block faults developed as a result of rock readjustment to the intrusion of the Osgood granodiorite stock. The relative movement of these east-west faults appears to locally enhance or inhibit mineralization by either introducing or removing favorable host rocks along the path of the Getchell fault.

This relationship can be seen at the north end of the North Pit, where a major east-west cross-faulting introduces an unfavorable rock type into the path of the main Getchell fault system and consequently acts as a barrier to ore-forming solutions.

The N15W Main Getchell fault trend is probably a structural fabric which originally influenced the intrusion of the Cretaceous granodiorite stock. This zone of weakness was subsequently reactivated as Basin and Range faulting along the eastern margin of the Osgood stock and is responsible for the intense, overall structural preparation of the sediments prior to gold mineralization.

The N40E faults and joint swarms are penecontemporaneous or later than the main Getchell trend. These N40E faults/joint swarms are influential in the development of high-grade ore shoots where they intersect the main Getchell structure.



### NORTH PIT

In the North Pit, the footwall is Preble Fm. and the hanging wall is a continuation of the granodiorite found in the north part of the Center Pit and the Valmy Formation. The contact of the granodiorite swings to the northeast giving way to the silicified sediments and volcanics of the Valmy. As the granodiorite contact moves to the east, structural preparation caused by the Getchell fault zone widens in the wedge of sediments caught between the main fault and the granodiorite, greatly enhancing later mineralization.

In the footwall, the strike of the sediments which has generally followed the Getchell trend, swings to the west and the mineralization tends to warp to follow the favorable beds of the Preble Formation. At the north end of the pit a northeast- to east-west-trending cross-fault cuts across the Getchell fault. Near-surface mineralization stops abruptly at this fault. This is believed to be a function of two different rock types faulted in the path of the Getchell structure, unfavorable upper Preble phyllites near surface against favorable Preble shales and limestones at depth.

Almost half of the historic production from the Getchell was from the North Pit. The ore averaged .321 ounce per ton gold and was mined along the main Getchell structure in an ore zone varying from 40 to 100 feet thick.

### CENTER PIT

The Center Pit is located on a continuation of the main structure from the South Pit. The footwall is the Preble Fm. (skarns, shales, and limestones). The hanging wall in the south is Comus Formation, made up of siltstones, shales and thin-bedded limestones, underlain by granodiorite. The hanging wall in the north is granodiorite. The main structure is thin in the south and thickens toward the north part of the pit where most of the previous mining occurred.

The hanging wall structures continue north from the South Pit and are found on the southeast flank of the Center Pit. These structures are highly mineralized in the wedge of sediments bounded by the main Getchell fault to the west and the granodiorite beneath and to the north. The ore in these hanging wall structures tends to be higher grade than the rest of the deposit and is fairly well oxidized. The oxide assemblage is an immature one, that is, the gold has not started to migrate or coarsen. The major sulfide phases (pyrite and realgar-orpiment) have combined to produce goethite, arsenian iron oxides and arseniosiderite, all of which replace pyrite in situ. The gold is in the pyrite pseudomorphs. This shallow oxide ore probably represents the type of ore that was originally mined during the early years of Getchell production.

The main structure pinches upward at the north side of the Center Pit and splits into two thin and inconsistent strands

between the Center and North Pits, flaring slightly at the location of the small "Old North Pit" to form a small near-surface pod of high-grade ore. This thinning and splitting of the ore body is believed to be caused by early, east-west cross-faults emplacing unfavorable host rocks in the path of the later Getchell fault.



### SOUTH PIT

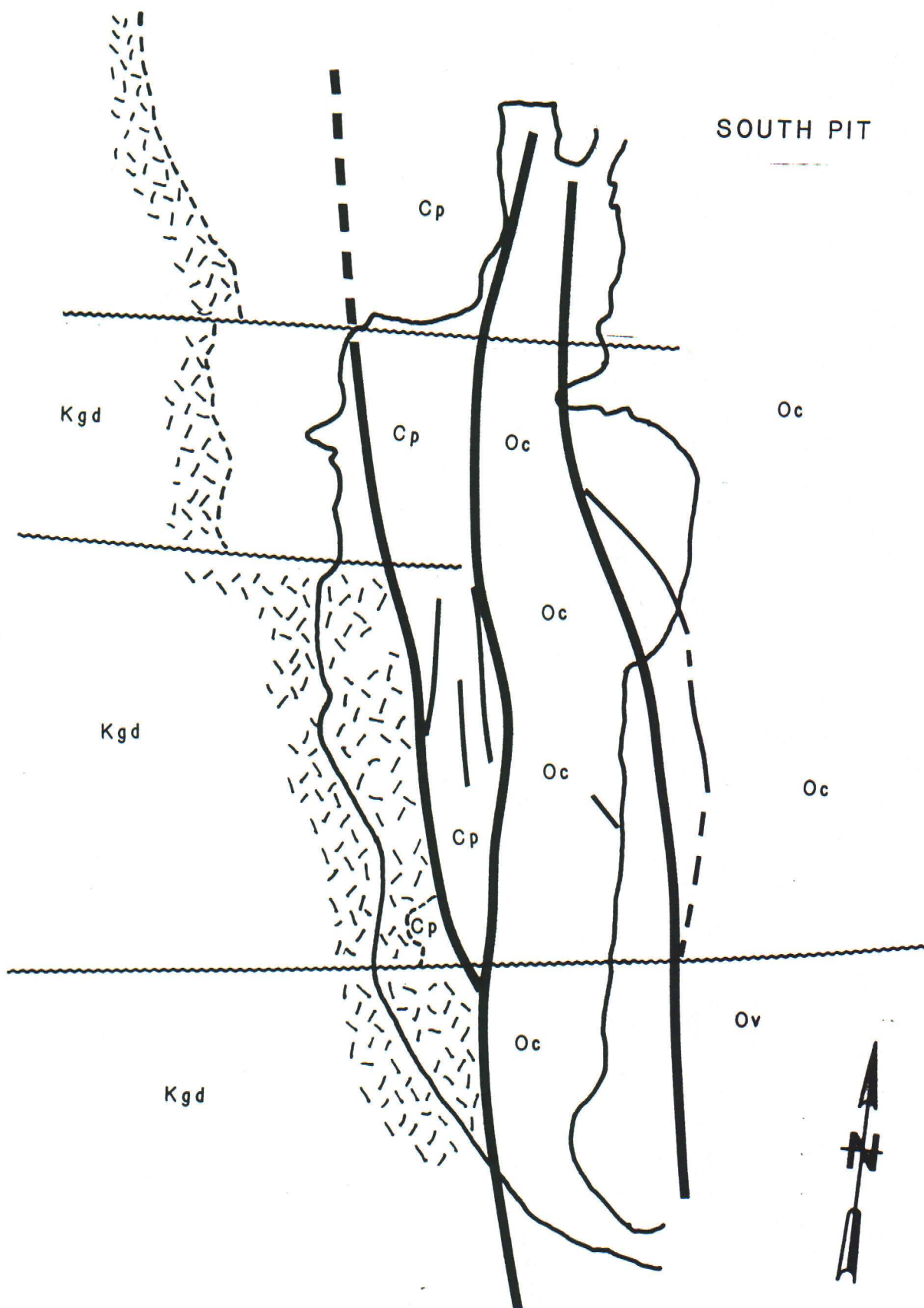
In the South Pit, a series of gold-bearing, hanging wall structures, steeply dipping to the east, approach the main Getchell structure at an oblique angle from the southeast. As they approach the main structure, they mineralize the intra-structural country rock and argillically alter the Comus siltstones and limestones of the main vein hanging wall. They appear to run tangent to the main structure rather than crossing over into the footwall. These hanging wall structures, which tend to be higher grade, combine with the main structure, forming high-grade, near vertical shoots within the system. The dip of the main Getchell system steepens locally where the steep hanging wall structures converge with the main fault.

In the footwall, to the west of the main structure, there are as many as three splinter veins, the strongest of which has been called the "West Vein". The West Vein is well mineralized but thin, and strikes more westerly than does the main structure. This strike takes it further west, away from the main Getchell structure north of the South Pit.

The footwall of the south part of the pit is granodiorite and selvages of silicified Preble skarn. Exposed in the bottom of the pit is an altered block of granodiorite rimmed by its skarn assemblage which has been faulted downward along one of the footwall structures. Jasperoids, which are common to the Getchell deposit, can be seen exposed on the main Getchell structure at the north end of the pit.



SOUTH PIT



Scale : 1" = 200'



### HANSEN CREEK PIT

The Hansen Creek deposit is located approximately one mile south of the South Pit. The pit is situated along a major north to N15W trending fault system.

The rock types present include carbonaceous shale-hornfels, siltstones and limestone-skarn of the Preble Formation. The units are tightly folded, which is visible in the skarns in the hanging wall of the fault zone at the north end of the pit. The principal host rock for mineralization is the carbonaceous shale-hornfels found in and adjacent to fault gouge zones.

Mineralization in the upper levels of the pit is broadly disseminated in favorable host rocks cut by the major fault zone (N - N15W) and enhanced and offset by N35 - 45E - trending fault/joint swarms. In the lower levels of the deposit, mineralization becomes tightly confined along the footwall and hanging wall faults with shoots developing along structural intersections. The pit was mined to its present configuration by FMG in 1986 to provide material for its heap leach operation.

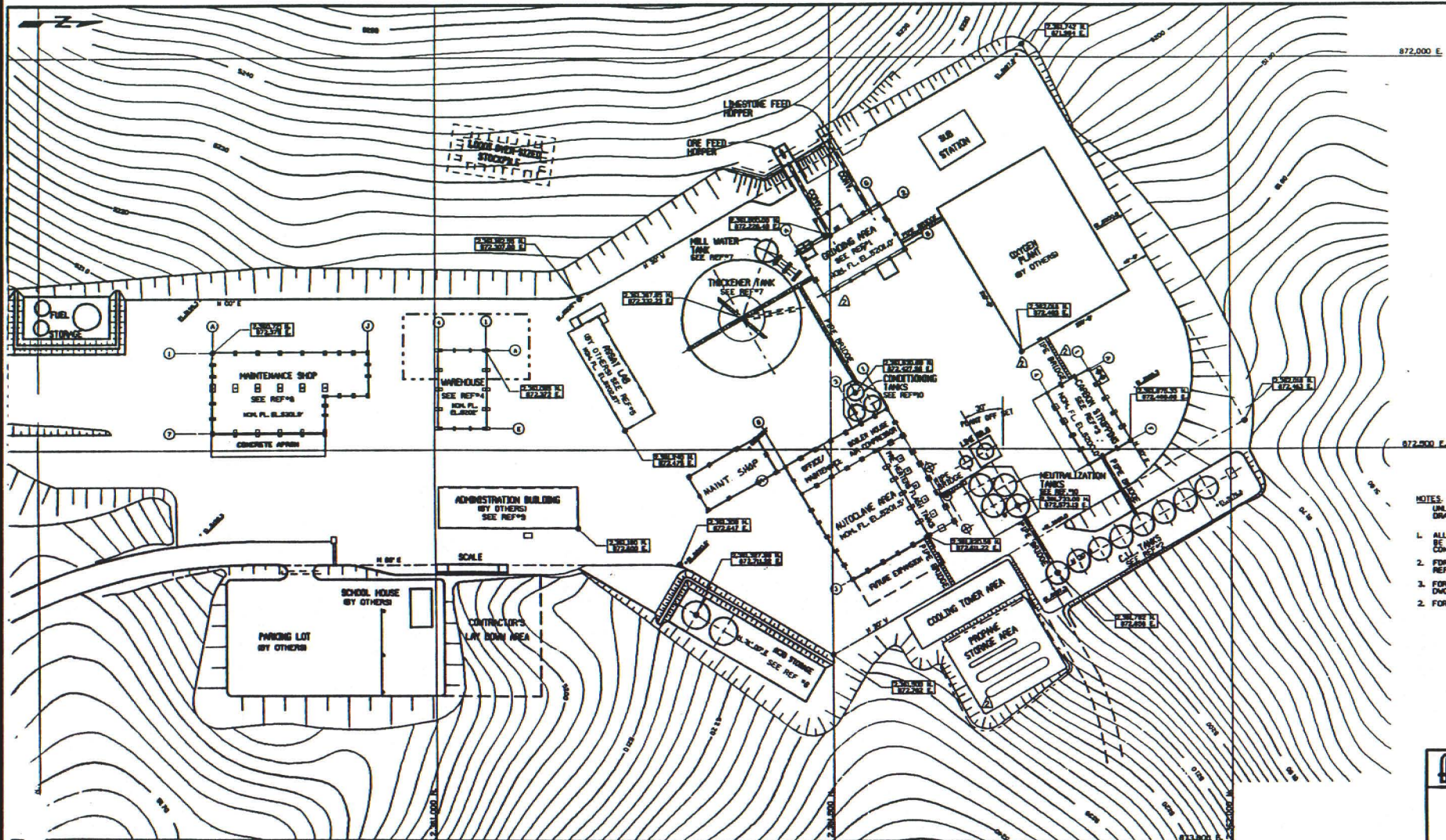
## MINING AND MILLING

The conventional open-pit mining methods that will be used to extract ore consists of five basic steps: drilling, blasting, classification of material, loading and hauling. Ore control in the open pits will be carried by sampling the blast hole cuttings. One sample will be taken from each 20 foot hole. Each intercept will be assayed for gold, cyanide-soluble gold, carbonate, iron and arsenic, so that the ore taken from the pits can be sorted by composition and grade and later blended to give a consistent product to the mill. FMG has started the removal of overburden and the mining of ore for stockpiles commences in 1988. The overall stripping ratio is expected to be approximately nine to one. Pitwall slopes will vary, but are expected to be in the 30 to 45 degree range.

We anticipate the production of approximately 174,000 ounces of gold per year for the first three and one-half years of the operation and production of approximately 122,000 ounces of gold per year for the remaining five years of the anticipated life of the current ore reserves.

FMG is constructing a 3,000 ton per day mill, a flow chart of which is on the next page. Tests by numerous engineers, chemists and metallurgists have demonstrated that satisfactory gold recoveries can be obtained from Getchell ore if it is oxidized in a high temperature - high pressure autoclave prior to treatment by conventional carbon-in-leach processes.





- NOTES:  
UNLESS NOTED OTHERWISE ON THIS  
DRAWING THE FOLLOWING SHALL APPLY:
1. ALL MATERIALS AND WORKMANSHIP SHALL  
BE IN ACCORDANCE WITH THE APPLICABLE  
CONTRACT SPECIFICATIONS.
  2. FOR GENERAL CONCRETE NOTES SEE  
REFERENCE No. 31.
  3. FOR FINAL SITE GRADING PLAN SEE  
DWG. E1573-121-3501.
  2. FOR ROCK CONTOURS SEE DWG. E1573-121-4206.

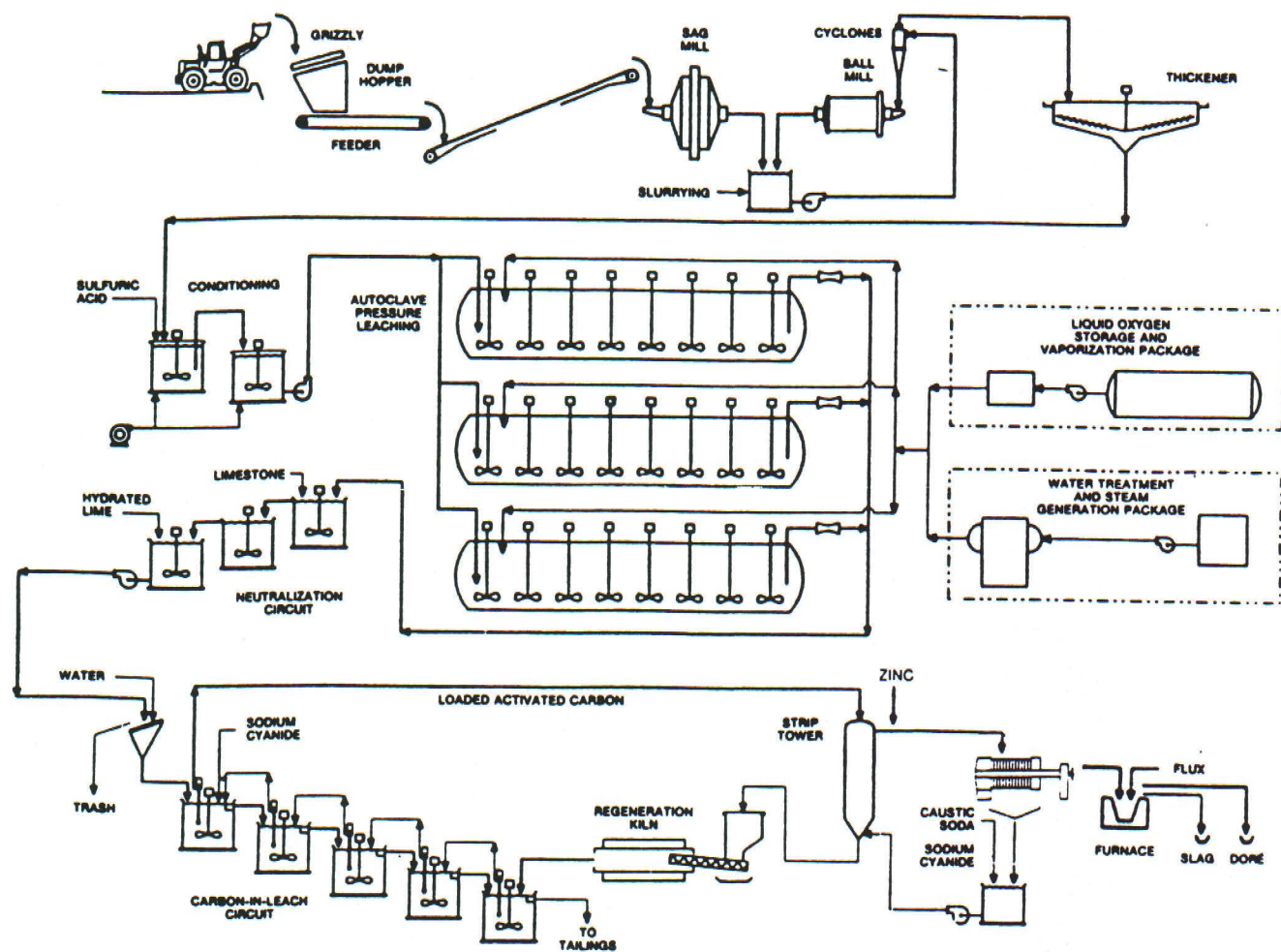
**FRM MINERALS, INC.**  
GETCHELL GOLD MINE PROJECT  
VANCOUVER, CANADA

PLANT SITE  
GENERAL PLAN

**WRIGHT ENGINEERS LIMITED**  
VANCOUVER, CANADA  
DWG. NO. E1573-121-3501-2

NO.	REVISION	DATE	BY	CHKD.	DESCRIPTION OF REVISION	NO.	REVISION	DATE	BY	CHKD.	DESCRIPTION OF REVISION	NO.	REVISION	DATE	BY	CHKD.	DESCRIPTION OF REVISION
1	CONSTRUCTION	1992	12	12	12	1	CONSTRUCTION	1992	12	12	12	1	CONSTRUCTION	1992	12	12	12
2	CONSTRUCTION	1992	12	12	12	2	CONSTRUCTION	1992	12	12	12	2	CONSTRUCTION	1992	12	12	12
3	CONSTRUCTION	1992	12	12	12	3	CONSTRUCTION	1992	12	12	12	3	CONSTRUCTION	1992	12	12	12
4	CONSTRUCTION	1992	12	12	12	4	CONSTRUCTION	1992	12	12	12	4	CONSTRUCTION	1992	12	12	12
5	CONSTRUCTION	1992	12	12	12	5	CONSTRUCTION	1992	12	12	12	5	CONSTRUCTION	1992	12	12	12
6	CONSTRUCTION	1992	12	12	12	6	CONSTRUCTION	1992	12	12	12	6	CONSTRUCTION	1992	12	12	12
7	CONSTRUCTION	1992	12	12	12	7	CONSTRUCTION	1992	12	12	12	7	CONSTRUCTION	1992	12	12	12
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9	CONSTRUCTION	1992	12	12	12	9	CONSTRUCTION	1992	12	12	12	9	CONSTRUCTION	1992	12	12	12
10	CONSTRUCTION	1992	12	12	12	10	CONSTRUCTION	1992	12	12	12	10	CONSTRUCTION	1992	12	12	12

## FLOW CHART OF GETCHELL PROJECT MILL





Ore will be treated in four steps before it is leached. First the ore must be ground to a fine particle size in a semi-autogenous (:SAG") mill. The output of the SAG mill will be slurried with water and then poured to a cyclone where it will be sized. Coarser material will be ground further in a ball mill and fine material will proceed directly to a thickener. In the thickener, a flocculant will be added to the slurry to assist settling. The thickened slurry will be sent to a conditioner. The ore will be conditioned with sulfuric acid to remove carbonates which will enhance the efficiency of the pressure oxidation process.

The conditioned slurry will be fed into one of three identical pressure oxidation lines, where its temperature will be raised to approximately 300 degrees Fahrenheit. The heated slurry will pass into the autoclaves, where it will be subjected to approximately 400 pounds per square inch of pressure and to a temperature of 410 degrees Fahrenheit. High purity oxygen will be injected into each stage to oxidize the sulfides and steam may be injected into the autoclaves to raise the slurry temperature if necessary. The oxidized slurry temperature and pressure will be reduced, through several stages as it leaves the autoclaves and lime is added to increase the pH.

The neutralized slurry will then be ready for the carbon-in-leach process to leach the contained gold. Gold will be adsorbed on activated carbon in slurry tanks. Carbon is screened from the slurry and the slurry will be pumped to a fully lined tailing



pond. Carbon loaded with gold will be washed with nitric acid. Then the gold will be removed from the carbon using a hot caustic and cyanide solution under pressure and recovered from the solution by precipitation using zinc dust. The precipitate is recovered by filtering and then retorted to remove mercury. The zinc-gold precipitate will then be mixed with borax, niter and silica and 2,500 degrees Fahrenheit in an induction furnace to produce dore' bullion.

## HEAP LEACHING

FirstMiss Gold has been heap leaching oxide ore remaining on waste dumps from past mining operations since 1985 to help finance exploration and engineering work on the main Getchell project. During 1987, the company also mined approximately 182,000 tons of in-place oxide ore.

FMG will continue to operate its heap leach operation in addition to the main sulfide mill. Reserves for the heap leach can come from several sources. These include previously mined dumps, low grade oxide encountered while mining our sulfide ore zones and newly discovered oxide on the property. A flow sheet for the heap leach is shown on the following page.

Leachable ore is hauled from its source and stacked in lined pads. The stacked heaps are sprayed with a weak cyanide solution using standard irrigation sprinklers. Sprayed solutions pass through the heaps, dissolving the gold as they pass. The solution containing the dissolved gold is collected in lined ditches and ponds.

Pumps move the solution with low concentrations of gold through tanks containing activated carbon. The carbon adsorbs the gold from the solution and the solution is returned to the system to be recycled. When loaded to capacity with gold, a tank of carbon is isolated from the system and a hot solution of caustic and alcohol is passed through the carbon to put the gold back into a very concentrated solution. The solution is passed through an electrolytic cell which electroplates the gold from





solution to steel wool. The steel wool with the gold is put into a smelting furnace and the zinc-gold precipitates and dore' bullion is produced.



INCORPORATED UNDER THE LAWS OF THE

STATE OF NEVADA,  
NOVEMBER 5,  
1936

NUMBER  
20922

SHARES  
—100—

CAPITAL STOCK \$1,500,000.00  
1,500,000 SHARES  
PAR VALUE \$1.00 FULLY PAID  
AND NON-ASSESSABLE

# GETCHELL MINE, INC.

REGISTERED AT RENO, NEVADA  
MAR 10 1951

NEVADA HOLDING COMPANY

REGISTRAR

*This Certifies that*

FILOR BULLARD & SMYTH

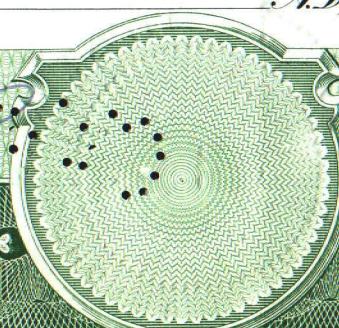
—ONE HUNDRED—

GETCHELL MINE, INC.

*owner of the Capital Stock of the Company by the holder hereof in person or by Attorney upon surrender of this Certificate properly endorsed.*

*In Witness Whereof, the said Company has caused this Certificate to be signed by its duly authorized officers and to be sealed with the Seal of the Company*  
this MAR 16 1951 day of AD, 19

*[Signature]*  
SECRETARY



*[Signature]*  
PRESIDENT

OCT 8 1951  
TRANSFERRED  
ORIGINAL

PAR VALUE \$1.00



For Value Received I hereby sell, assign and transfer unto

50 Shares Leon F. Zwiener, 150 1/2 E. Main Street,

PLEASE TYPEWRITE NAME AND ADDRESS

Fredricksburg, Texas

50 Shares M. B. Arnett Company, Frost Bank Bldg., San Antonio,

Texas

*Shares*  
of the Capital Stock represented by the within Certificate  
and do hereby irrevocably constitute and appoint

*Attorney*  
to transfer the said stock on the Books of the within named  
Company, with full power of substitution in the premises.

Dated MAR 27 1951

In Presence of:

John Michael Long

NOTICE: THE SIGNATURE TO THIS ASSIGNMENT MUST CORRESPOND WITH THE NAME AS WRITTEN UPON THE FACE OF THE CERTIFICATE IN EVERY PARTICULAR WITHOUT ALTERATION OR ENLARGEMENT OR ANY CHANGE WHATSOEVER.

N. Y.-EED. TAX DUE PAID  
THRU STK. CLN. CPM

MAR 27 1951

*John Bullard & Son*  
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