

## **"THE BEST KEPT SECRET IN GREENSTONE"**

### **Presentation to the Residents of Greenstone,**

I would like to start off by thanking the Geraldton Economic Development Corporation for the opportunity to tell you about the property holdings of Hardrock Extension Inc. ("Hardrock Extension")

The property holdings of Hardrock Extension are located in the Geraldton Ontario Mining Camp. The camp produced three million ounces of gold between 1934 and 1968.

**Figure 1: - Location Map - Ontario**

**Figure 2: - Geological Location Map OGS #2199**

### **WAIT A MINUTE YOU SAY!      STOP RIGHT THERE!**

"Three million ounces! – Why would anyone be interested in a little gold camp like Geraldton when they could focus their attention on major mining camps like the Kirkland Lake, Red Lake or Timmins areas which had historical production rates of 50 to 70 million ounces?"

The answer is very simple: - The Kirkland Lake and Timmins Mining Camps have been producing Gold since 1910 and 1913 respectively.

The first mine in the Geraldton area did not begin producing until 1934.

By 1940, (**only six years later**) surface exploration for gold had come to a virtual standstill, due to labour shortages caused by the war, rising costs and a fixed gold price of \$35 per ounce.

The Geraldton area is under-explored therefore the potential for the discovery of world class ore bodies is very high.

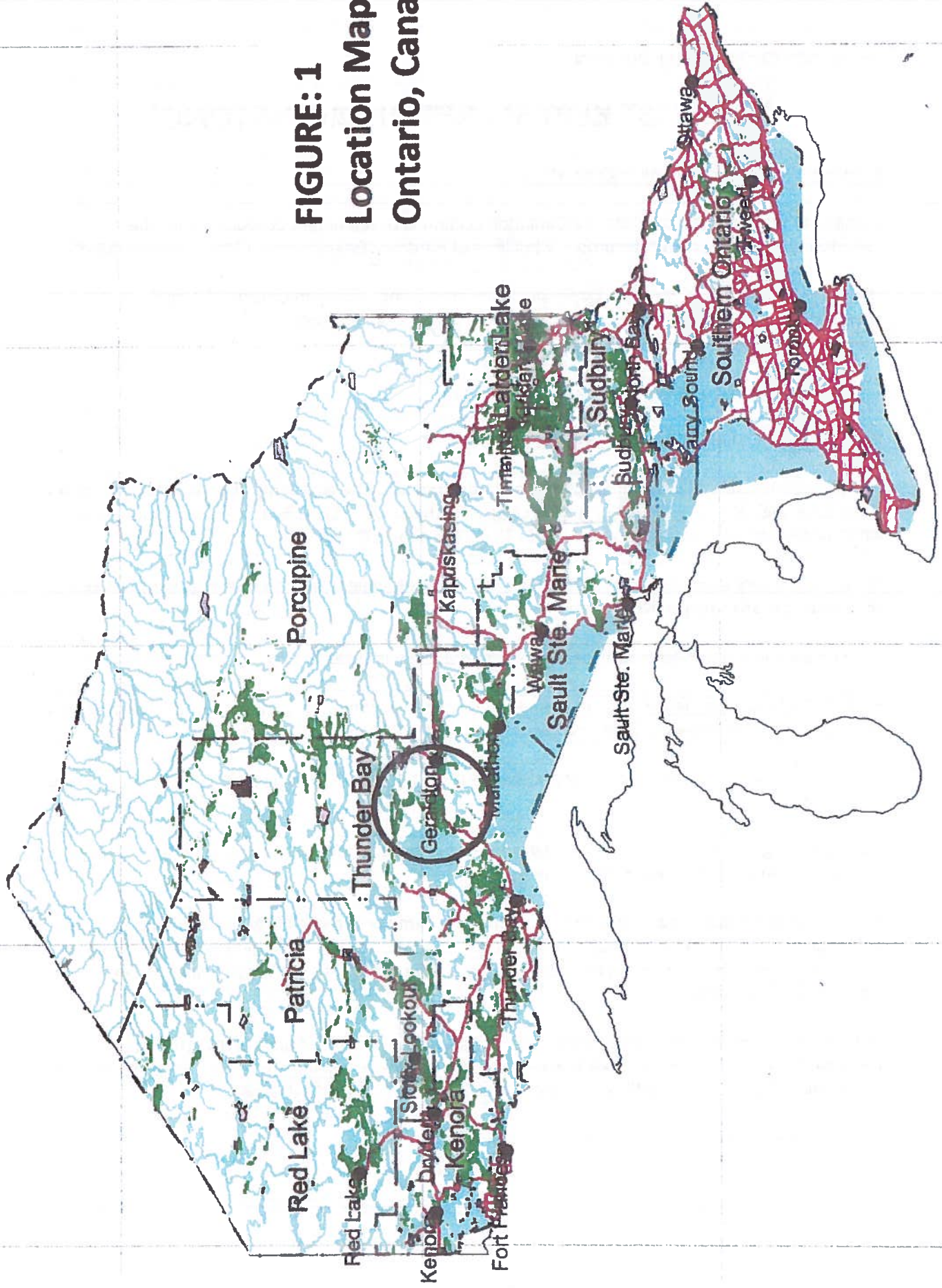
The last mining operation shut down in 1968 after producing 2.1 million ounces of gold over a thirty year period. The camp lay dormant from 1968 until 1980.

A handful of companies have explored in the Geraldton Camp between 1980 and present, however, almost all of them have limited their programs to so called "advanced exploration" ie: searching for leftovers and extensions of known ore zones in, over, under, parallel to and down plunge of the historical mine workings.

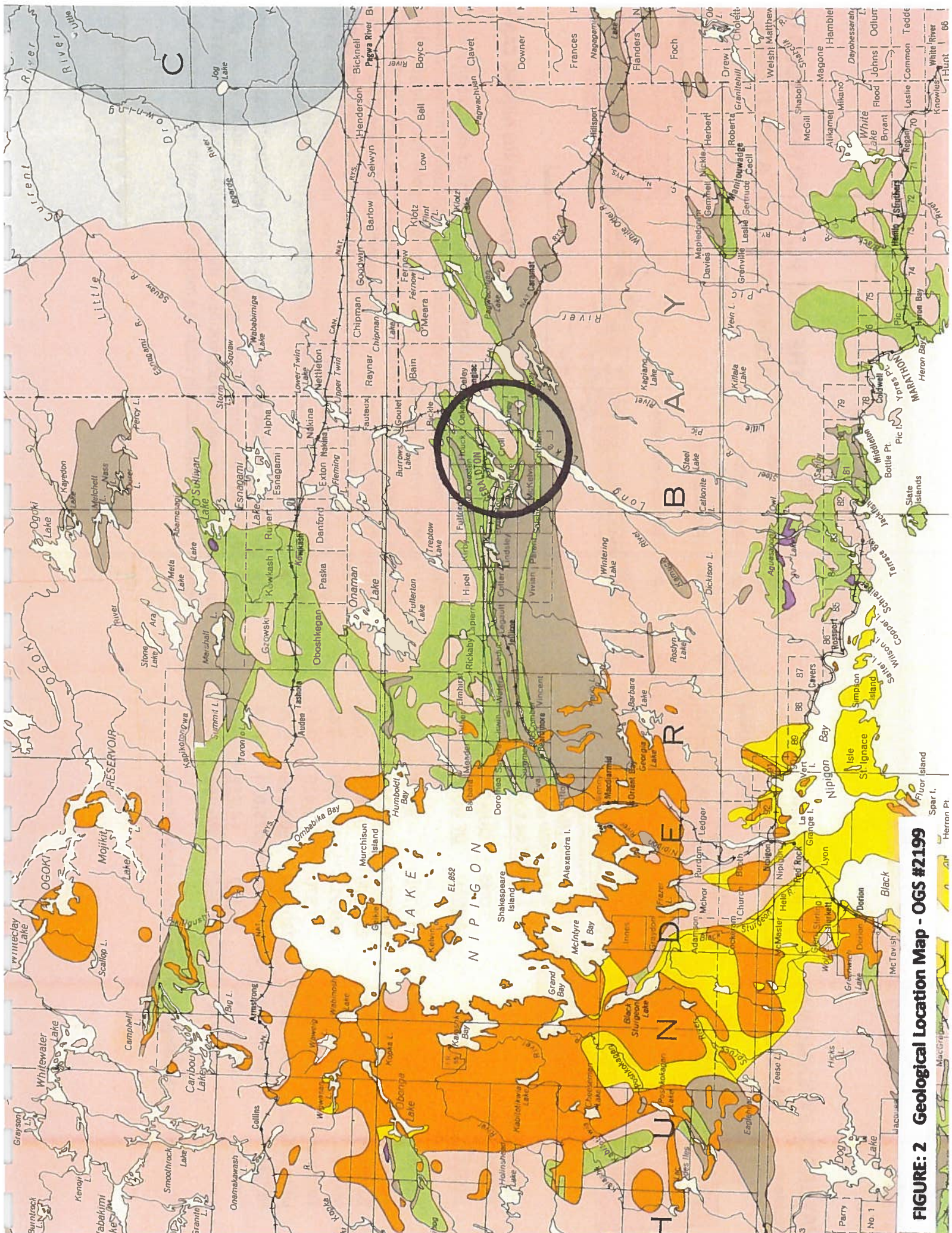
Hardrock Extension Inc. ("our company") holds 15 miles of claims immediately along strike of the historical 2.1 million ounce Hardrock/MacLeod Cockshutt/Mosher mining operation ("HMCM") as well as 2.4 miles of claims along strike of the 600,000 ounce Little Longlac Gold Mine.

**Figure 3: - Holdings Map – Geraldton Mining Camp**

**FIGURE: 1**  
**Location Map**  
**Ontario, Canada**







**FIGURE: 2 Geological Location Map - OGS #2199**



# HARDROCK EXTENSION INC.

President:

[michaelmalouf@rogers.com](mailto:michaelmalouf@rogers.com)

(807) 854-0201

## LEGEND

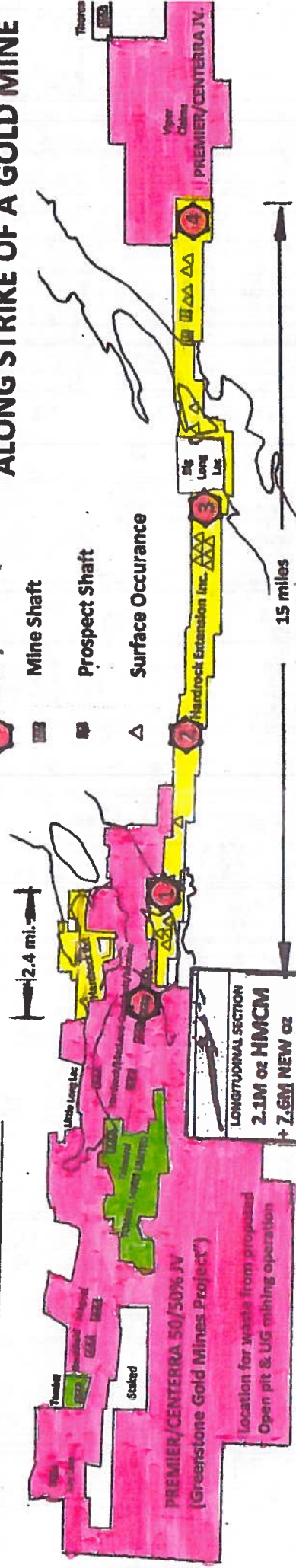
Major Structure

Mine Shaft

Prospect Shaft

Surface Occurrence

## THE BEST PLACE TO FIND GOLD IS ALONG STRIKE OF A GOLD MINE



## HISTORICAL

### PRODUCERS

from E to W

## OUNCES

### OF GOLD

PER TON

PRODUCERS	PERIOD	TONS MINED	OUNCES OF GOLD	OUNCES OF GOLD PER TON
Key Lake	1939-1940	14,722	5,675	0.39
Tombill	1938-1942	190,622	69,120	0.36
Bankfield	1937-1942	231,009	66,417	0.29
Magnet	1938-1951	359,912	152,089	0.42
Talmoral	1942-1948	9,570	1,415	0.15
Little Long Lac	1934-1953	1,780,516	605,449	0.34
<b>HMCM *</b>	<b>1938-1968</b>	<b>14,507,261</b>	<b>2,075,074</b>	<b>0.14</b>
Theresa	1935-1938	26,120	4,717	0.18
<b>TOTAL</b>		<b>17,119,956</b>	<b>2,979,956</b>	<b>0.17</b>

## POSITIONED FOR SUCCESS IN THE GERALDTON ONTARIO MINING CAMP

**HARDROCK EXTENSION INC. ("HARDROCK")** holds 15 mi. of mining claims along strike of the historic Hardrock/MacLeod Cockshutt/Mosher mining operation (the "HMCM") which produced 2.1 million ounces of gold from a large, folded westerly plunging geological structure between 1932 and 1968. The HMCM is held by Premier Gold Mines Limited ("Premier") and Centerra Gold Inc. in a recently formed 50/50% JV to confirm and develop 7.6 million new ounces which have been drill indicated and inferred over, under and parallel to the HMCM. See: Premier news releases dated Jul 8<sup>th</sup>, 2014 and Feb 5<sup>th</sup>, 2015.

Using the historic HMCM as our exploration model, **HARDROCK** has discovered four (4) major structures along strike which are bounded by 20 gold occurrences. These major structures have the potential to produce **60M PLU!** ounces of gold. **HARDROCK** is open to a merger with a major mining company.

FIGURE 3: Holdings Map – Geraldton Mining Camp

Hardrock Extension has surveyed most of its property along strike of the HMCM with ground magnetometer and electromagnetic surveys and, using the historical 2.1 million ounce HMCM as our exploration model, we have identified four major targets. There are more than 20 historical (1932-1940) surface gold occurrences on the Hardrock Extension properties. We have drilled 116 holes totalling 67,295 feet and have made several very encouraging diamond drill discoveries.

These four major structures are ready to be seriously explored. Target #1 is under the shallow waters of Kenogamisis Lake. Targets #2, #3 & #4 are accessible by bush roads and/or trails due to recent logging operations.

#### **THE MAJOR STRUCTURES ON OUR PROPERTY WERE MISSED BY THE HISTORICAL OPERATORS**

These major folded geological structures were missed by the early explorers because the Greenstone Belt along strike to the east of the HMCM was never blanketed with magnetometer and electromagnetic surveys which is the only possible way (other than by stripping or blind drilling) to identify folded structures and shear zones in areas which are covered by overburden.

The government released detailed maps and reports which described the structural geology of the Geraldton gold deposits in 1952 and 1967 and airborne geophysical surveys of the entire Beardmore-Geraldton Camp were performed the 1970's and 1980's but all of this information came too late to stimulate exploration due to low gold prices.

All surface exploration had stopped by 1940. All but one of the mines had closed by 1953. The HMCM operated until 1968 but it was essentially on social assistance as it was receiving a \$15 per ounce government subsidy to keep the operation afloat. With rising costs of labour and equipment following the end of WWII and a fixed gold price of \$35 per ounce there was no money or enthusiasm for further exploration for gold.

If you take the time to examine the technical data contained within this presentation, you will have no difficulty visualizing the potential for sixty million plus ounces on the Hardrock Extension property. (More on this extraordinary claim later.)

Please take the time to examine our Exploration Model (**Figures: 4a, 4b & 4c**) which shows a Surface plan, Longitudinal Projection and Cross Sections of the historical 2.1 million ounce HMCM. You really need to visualize the HMCM in the third dimension to appreciate the significance of the major folded structures we have identified on the Hardrock Extension property.

## **THE HMCM AS "OUR EXPLORATION MODEL"**

**We have used the geological structure which concentrated the gold at the 2.1 million ounce HMCM as our "exploration model." The following Surface Plan, Longitudinal Projection and Cross Sections are reductions of ODM Maps P.435, P.436 and P.437 released by C.F.Ferguson in 1967.**

### **The Surface Plan of the HMCM (Plan View) – Figure 4a**

Pay attention to the fact that the head-frames of the historical Hardrock #1 and #2 shafts and the MacLeod-Cockshutt #1 and #2 shafts are located within a very large, elliptical shaped, folded geological structure which is bounded by the "North" and "South" iron formations which are shown in the colour purple on the surface plan. Note: The 2,400 foot diameter of the fold as measured between the two iron formations. You are about to learn that this large folded structure is responsible for the concentration of the 2.1 million ounces of gold at the HMCM. Now focus your attention to the fact that the north and south iron formations on the west end of the surface plan are straight (ie: not folded). A great deal of drilling and trenching was performed on the west end of the surface plan but the bedding in this area is too tightly compressed, the gold values on and near surface were too narrow and erratic to be of any economic consequence. This is because the major folded structure responsible for concentrating the gold is actually 3,200 feet below Mosher Lake on the west end of the surface plan.

### **The Longitudinal Projection of the HMCM - (Looking North) - Figure 4a**

The longitudinal projection looks north at the underground workings of the HMCM. The ore bearing horizon comes to surface in the center of the large folded structure (See surface plan above) and plunges to the west to a depth of 3,200 feet on the west end of the longitudinal. Note the en-echelon (one overlying another) character and the remarkable continuity of the ore zones. This folded gold bearing horizon will undoubtedly persist down plunge to the west into the adjacent property which is owned by Tombill Mines Limited. The HMCM operation processed 14.5 million tons containing 2.1 million ounces of gold over a 30 year period. Approximately 30% of the gold came from sulphide replacement of iron formation in the "North Zone" while 70% of the gold came from quartz porphyry and/or lean iron formation in the "F Zone".

### **The Cross-Sections of the HMCM (Looking West) - Figure 4a - A PICTURE IS WORTH 1,000 WORDS!**

Have a good look at the six cross- sections (Looking West) through the underground workings of the HMCM. I'm sure you will agree, the relationship of the ore zones to folding is undeniable. The reason the HMCM was such a large deposit relative to the other operations in the camp is because of the size of the folded structure which concentrated the gold. In other words, NO LARGE FOLDED STRUCTURE – NO TWO MILLION OUNCES. This major structure was explored, developed and/or mined down plunge over a strike length of three miles.



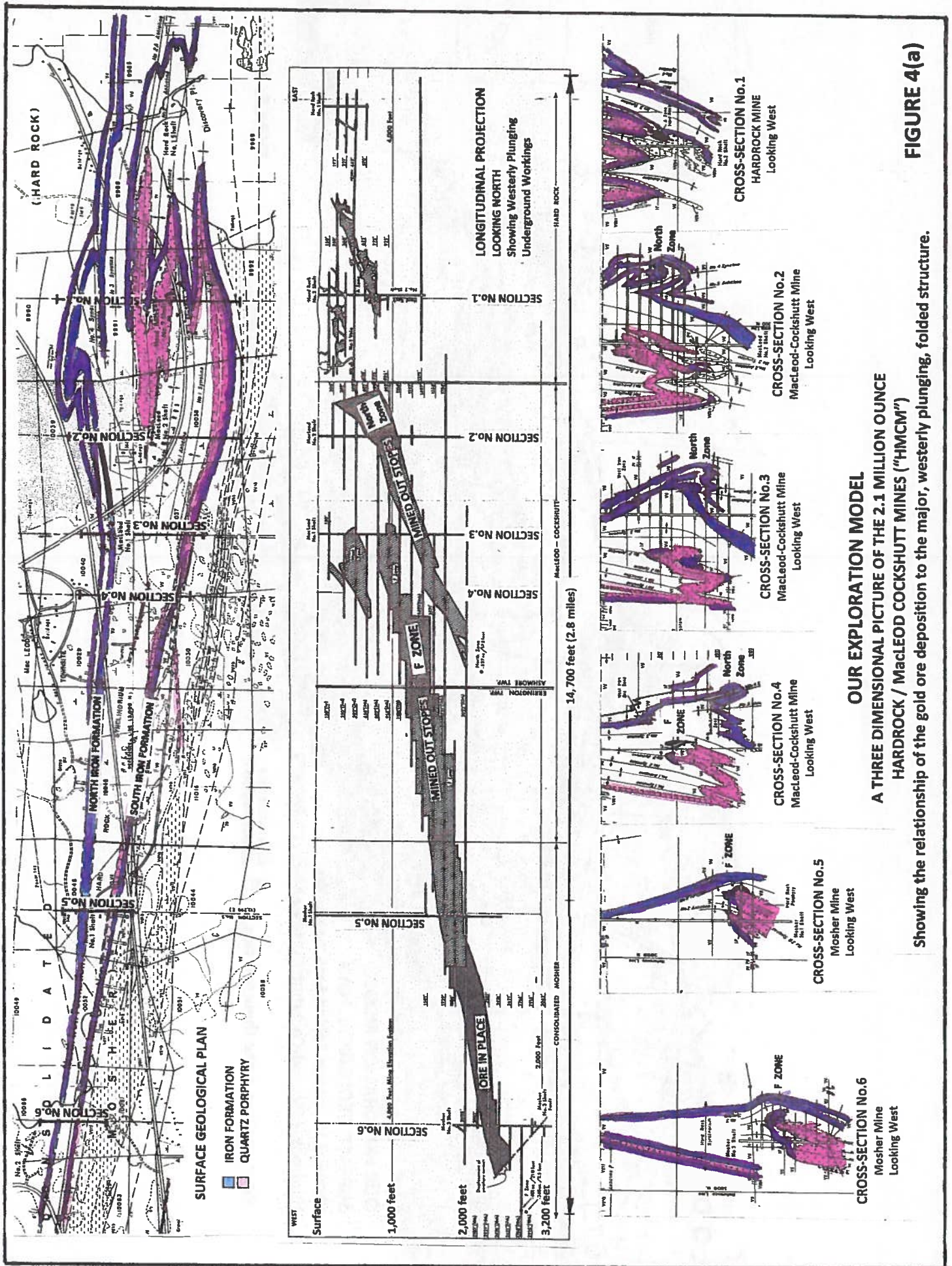


FIGURE 4(a)



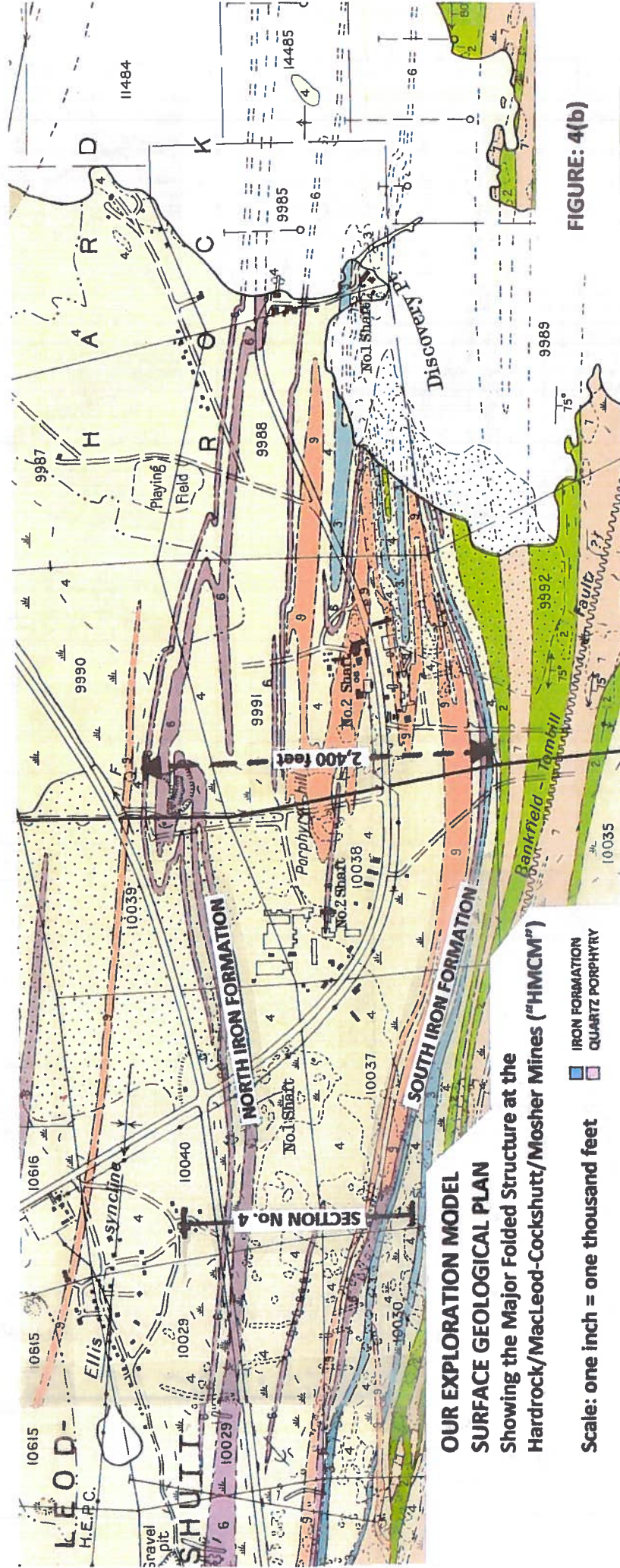
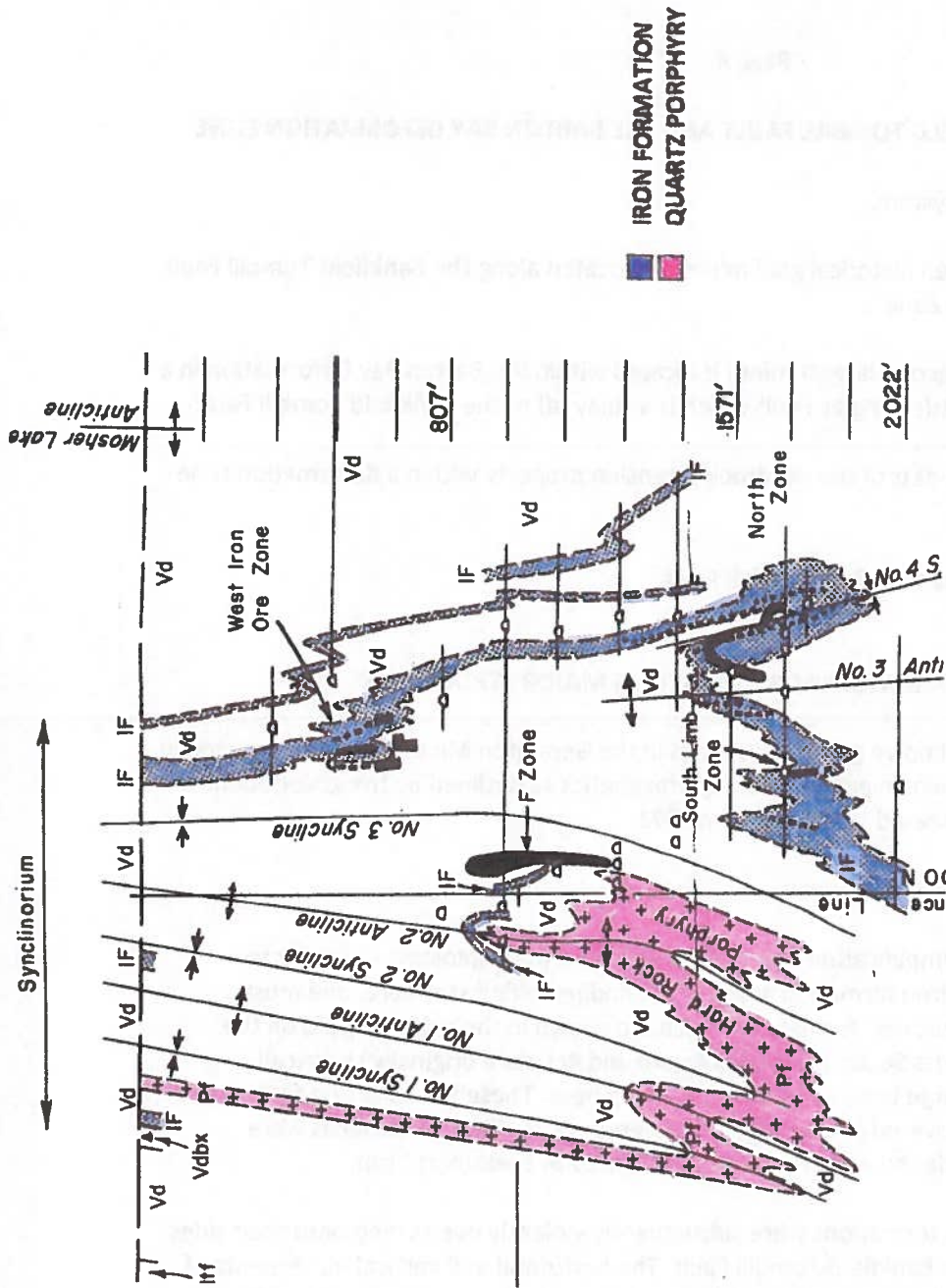


FIGURE: 4(b)





## CROSS-SECTION No.4

### MacLeod-Cockshutt Mine

Looking West



FIGURE 4(c)

## **THE IMPORTANCE OF THE BANKFIELD TOMBILL FAULT AND THE BARTON BAY DEFORMATION ZONE**

Every gold camp has a major fault system.

In the Geraldton area eight of the ten historical gold mines are located along the Bankfield-Tombill Fault within the Barton Bay Deformation Zone.

The Little Longlac Gold Mine (the second largest mine) is located within the Barton Bay Deformation in a major folded structure along the Little Longlac Fault which is a splay off of the Bankfield Tombill Fault.

The Theresa Mine is situated north-east of the Hardrock Extension property within a deformation zone in the McBean Lake Area.

**Figure 5: - Map Showing the Bankfield-Tombill Fault**

## **THE IMPORTANCE OF THE IRON FORMATION FOR IDENTIFYING MAJOR STRUCTURES**

All of the gold mines and all of the known gold occurrences in the Geraldton Mining Camp are located in deformation (deformed) zones within an envelope of high magnetics as outlined by the government aeromagnetic survey which was released to the public in 1971.

**See Figure 6: - Airborne Magnetic Survey**

Please forgive the following over-simplification of grade school elementary geology: - In order to understand the importance of the iron formation as a tool for finding folded structure, one must appreciate the fact that the magnetic iron formations which are shown in the colour purple on the Surface Geological Plan and the Cross Sections (**Figures 4a, 4b and 4c**) were originally chemically precipitated (deposited) out of a large body of water as flat lying beds. These flat lying iron formations were subsequently intruded and covered over by flows of igneous rocks. The rock surfaces were subsequently broken down by glaciation and erosion and deformed by metamorphism.

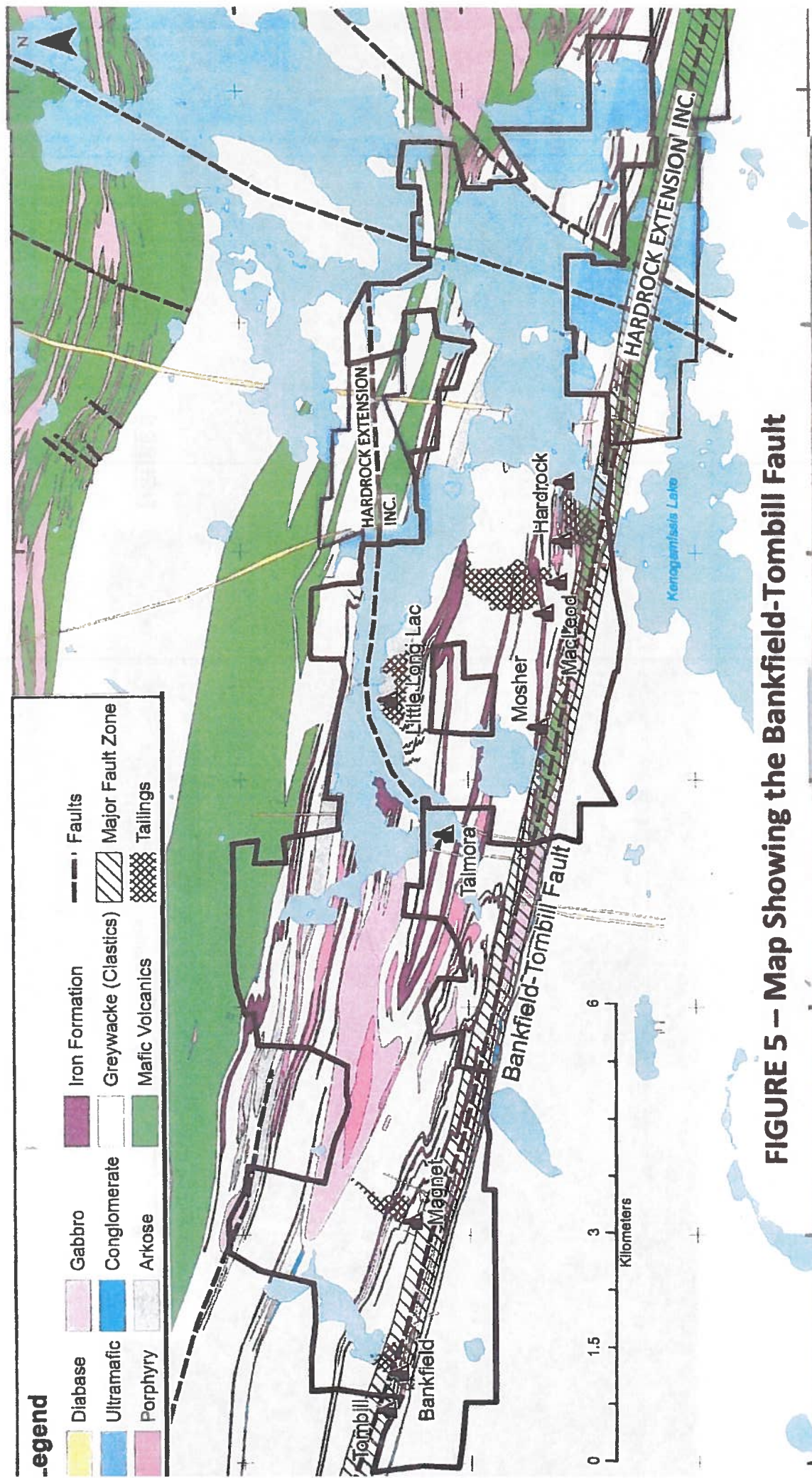
The above described flat lying rock formations were subsequently violently overturned onto their sides by the opposing movements of the Bankfield-Tombill Fault. The horizontal and vertical movements of the fault were responsible for the shearing and drag folding. As a result, the rocks in the Geraldton Camp are observed as having a nearly vertical dip and a pronounced westerly plunge.

As stated above, the net effect is the flat lying geological formations (which include the magnetic iron), have been turned on to their sides. When you look at the purple iron formations on the Surface Plans (**Figure 4a and 4b**), you need to appreciate that you are actually looking down at the "sides" of flat lying sedimentary beds.

**Figure 7: - Elementary Geology**

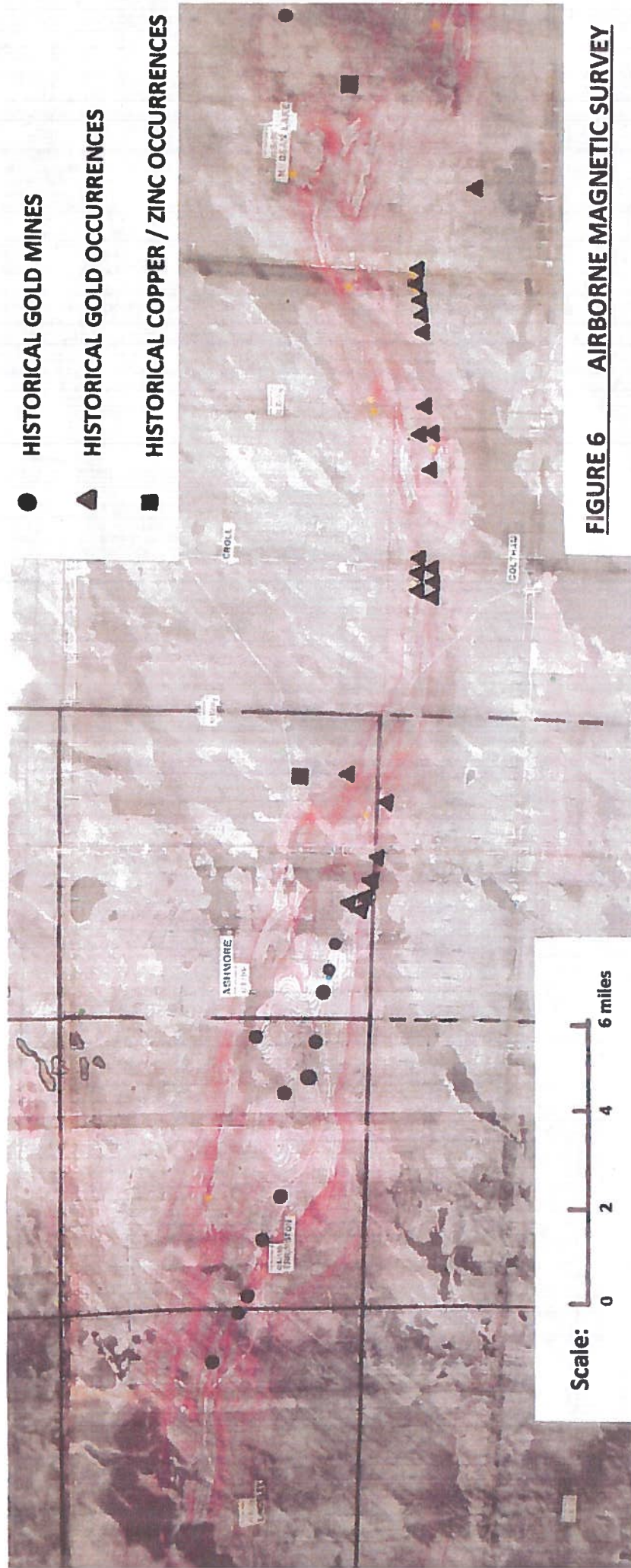
**Figure 8: - Using Magnetics to Identify Major Folded Structures**



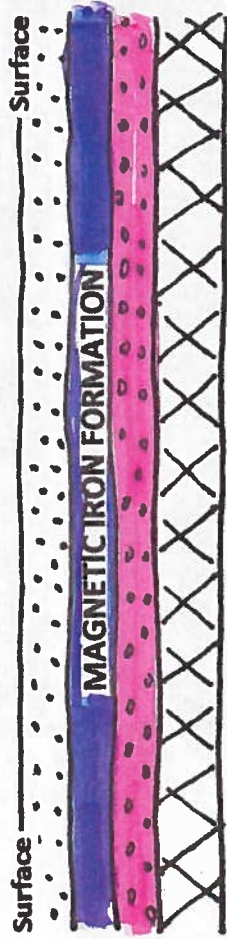


**FIGURE 5 – Map Showing the Bankfield-Tombill Fault**

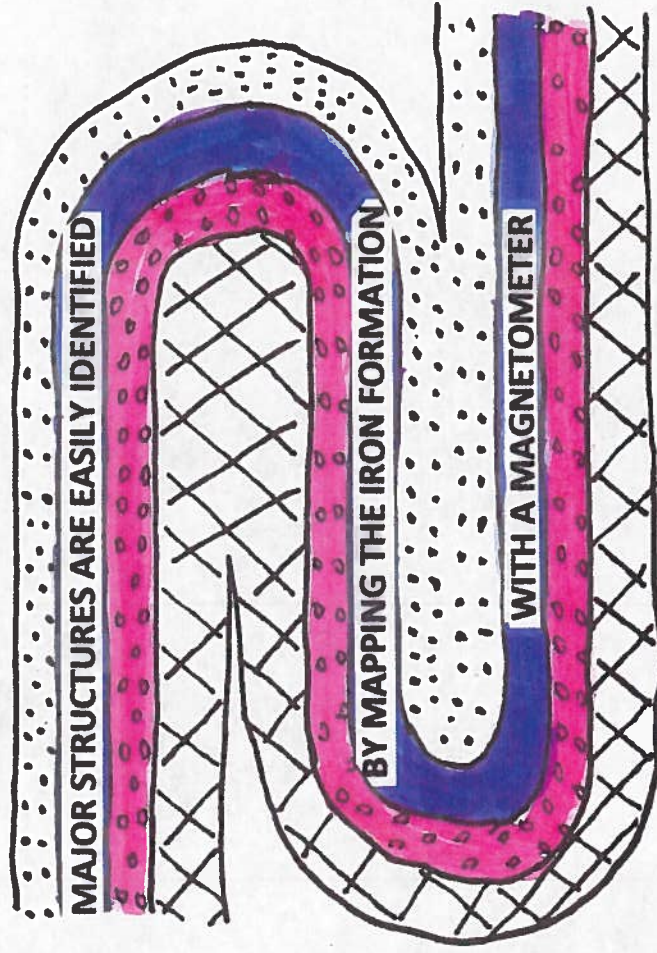








LONGITUDINAL SECTION SHOWING FLAT  
LYING ROCK FORMATIONS "LOOKING NORTH"



PLAN VIEW "LOOKING DOWN") AT THE SAME  
ROCK FORMATIONS AFTER BEING TURNED ON  
TO THEIR SIDES AND FOLDED BY FAULTING

FIGURE 7 Elementary Geology



Vertically standing, banded iron formation taken from surface at the "North Ore Zone", HMC. The rock surface is polished by glaciation.



**FIGURE 8 USING MAGNETICS TO IDENTIFY MAJOR STRUCTURES**



Ninety five percent of the rock in the Geraldton Mining Camp is covered by overburden. We don't have x-ray vision however we can easily identify the locations of major (and minor) folded structures and shear zones by mapping the overturned magnetic iron formation beds using a magnetometer. If our magnetic survey traces out a major fold in the iron formation, we know the adjacent rock types (above and below the iron formations) will be folded as well. Dr. Ferguson's Plans and Sections (**Figure 4a, 4b and 4c**) clearly demonstrate the relationship of the gold deposition to the major folded structure.

The conclusion therefore is the best place to look for another motherlode like the HMCM would be in the next major folded structure which is along geological strike to the east of the HMCM and close to the Bankfield-Tombill Fault within the Barton Bay Deformation Zone.

We have followed (mapped) the same two iron formations (the "North" and the "South" Iron formation) which trace out the folded structure at the historical HMCM mining operation through our Hardrock Extension property to the east and as luck would have it, we have identified three major folded structures (Targets #1, 2 & 3). Target #4, on the east end of our property has been identified from government airborne magnetometer and electromagnetic surveys and recent government geological mapping. All four targets are large enough to contain ore-bodies of considerable size.

**Figure 9:** - Compilation - HMCM and Target #1

**Figure 10:** - Compilation - HMCM, Target #1 and Target #2

**Figure 11:** - Compilation - Target #2 and Target #3

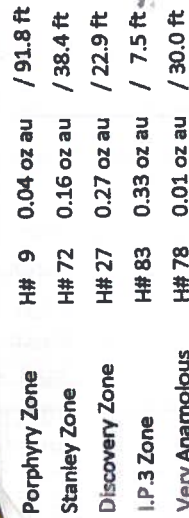
**Figure 12:** - Compilation - Target # 4

So there you have it. We have discovered three of the major structures along strike of the historical production by conducting basic magnetic surveys. This is hard to believe when you consider the surface expression of our western-most target is only two miles along strike of the 2.1 million ounce HMCM. These new structures are all the more compelling given the fact that they are bounded by several surface gold occurrences and diamond drill discoveries. In other words, there is just too much smoke to be ignored. We recommend a program of advanced geophysics (including I.P.) followed by diamond drilling (and stripping where practical) to explore these major structures where they express themselves on or close to surface.


Have a good look at our HMCM exploration model (**Figure 4a, 4b and 4c**) and compare it to the geophysical signatures of the major structures (**Figures 9, 10, 11 and 12**) on the Hardrock Extension property. Have a look at our geological compilation map (**Figure 9**) and note the locations of our surface gold occurrences and diamond drill discoveries in the vicinity of Target #1. Note the location of the Bankfield-Tombill Fault. (**Figure 5**).

Draw a straight line, if you will, through the historical Key Lake, Tombill, Bankfield, Magnet, Talmora, Mosher, MacLeod-Cockshutt and Hardrock Mines. Extend your line to the east and you will discover it passes right through the center of targets 1, 2 and 3 on our Hardrock Extension property. (**Figure 3**)





**FIGURE 9**    **Compilation**  
**HMCM and Target #1**



**HMC**

**HMC MINES**

**CENTERRA/PREMIER J.V.**

**LONGITUDINAL SECTION (Looking North)**



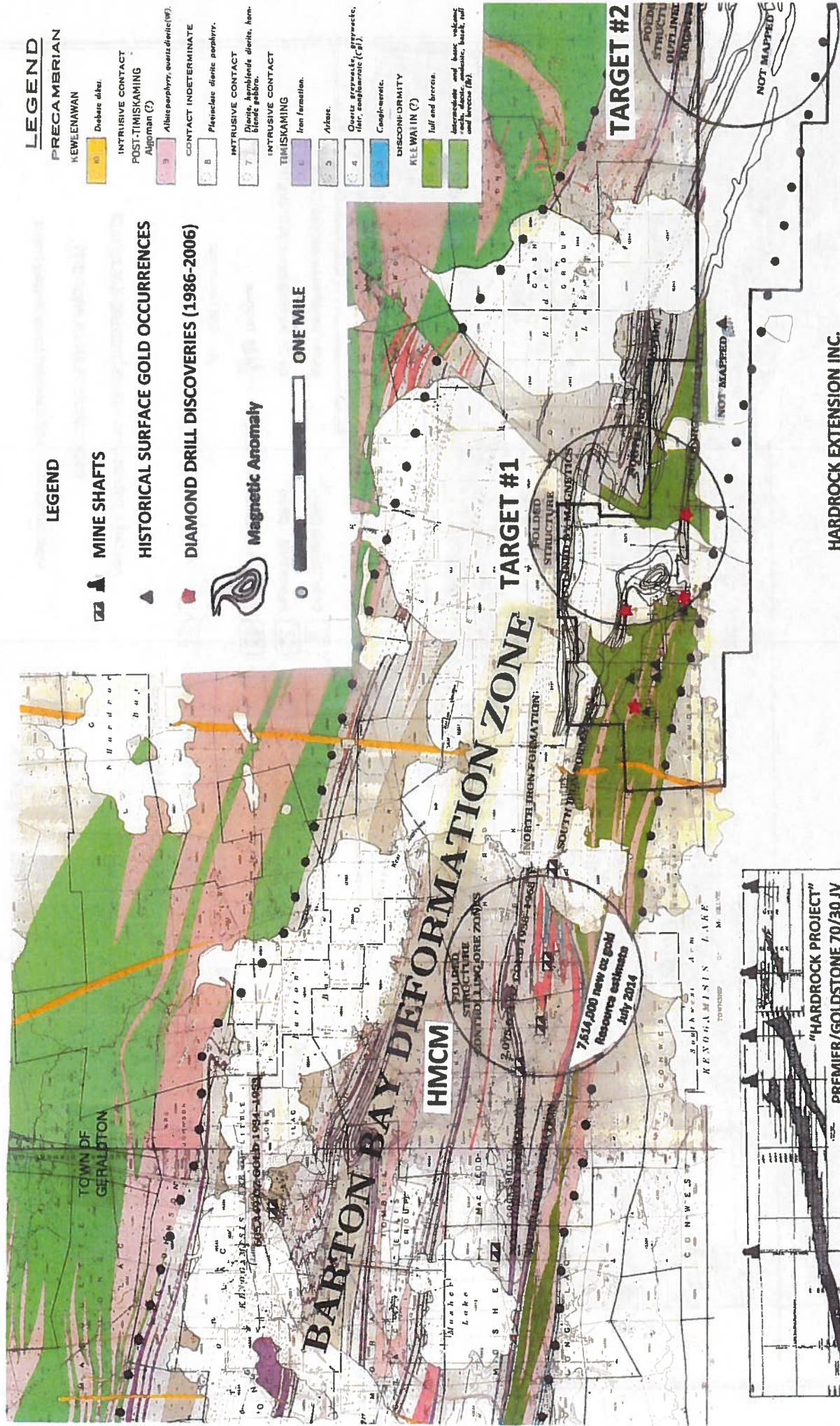


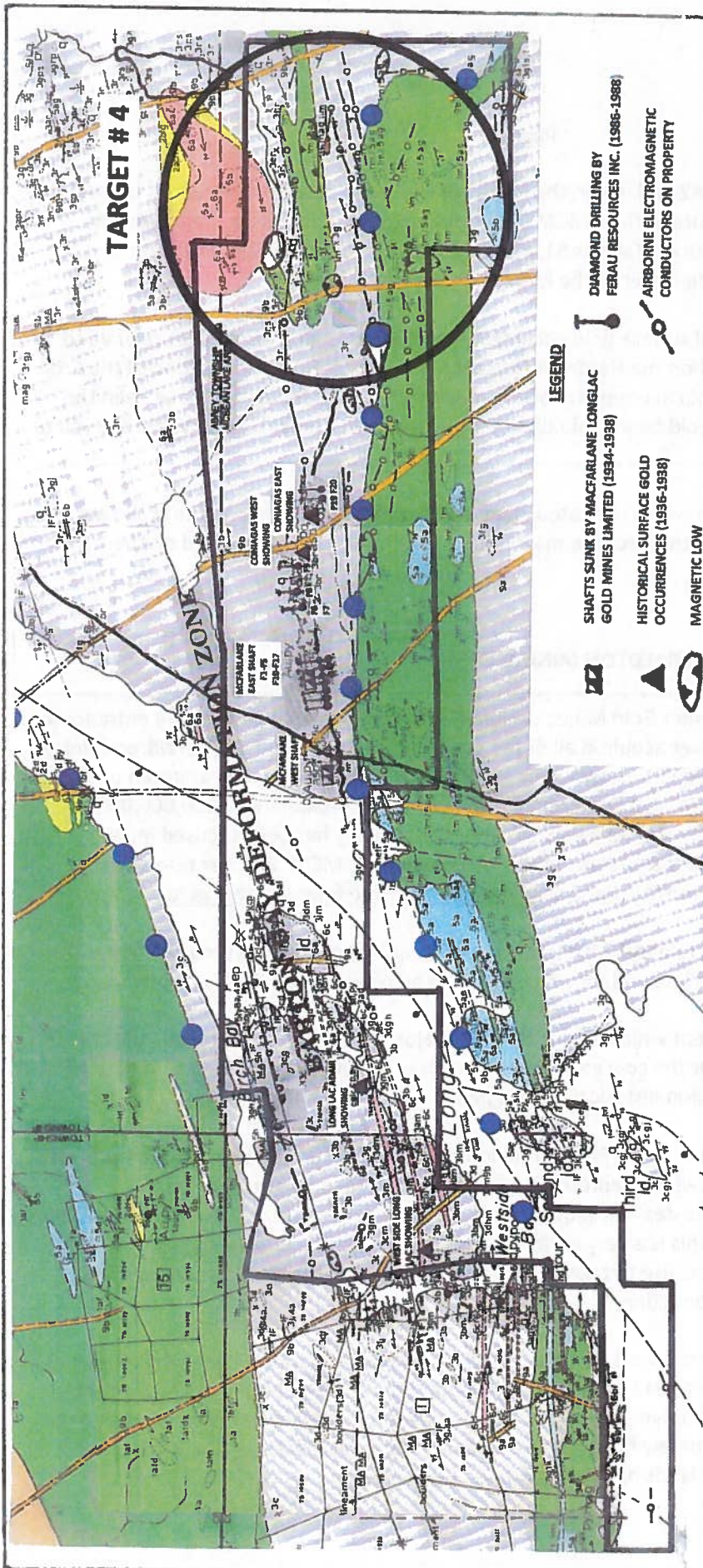
FIGURE 10 Compilation - HMCM, Target #1 and Target #2

"HARDROCK EXTENSION PROJECT"









# LEGEND

- SHAFTS SUNK BY MACFARLANE LONGLAC GOLD MINES LIMITED (1994-1998)
- DIAMOND DRILLING BY FERAU RESOURCES INC. (1986-1988)
- HISTORICAL SURFACE GOLD OCCURRENCES (1986-1988)
- AIRBORNE ELECTROMAGNETIC CONDUCTORS ON PROPERTY
- MAGNETIC LOW

HARDROCK EXTENSION INC.

"FERAU PROJECT"

## FIGURE 12 Compilation - Target #4

Geological Plan of Property

Modified Map 22539 - 1991 Geological Survey Mapping Project



- PRECAMBRIAN
  - MIDDLE TO LATE PROTEROZOIC
    - 6 Mafic Intrusive Rocks
  - LATE ARCHEAN
    - 7 Intrusive Rocks of Alkaline Affinity (Dikes)
    - 8 Felsic and Intermediate Plutonic Rocks
    - 9 Intermediate to Felsic Hypabyssal Rocks
- INTRUSIVE CONTACT
  - 5 Mafic to Ultramafic Intrusive Rocks
  - 4 Chemical Metasediments
  - 3 Epilastic Metasediments
  - 2 Intermediate to Felsic Metavolcanics
  - 1 Mafic to Intermediate Metavolcanics

Note the diameters of targets #1, #2 and #3 on the Hardrock Extension property compared to the 2,400 foot diameter of the folded structure at the HMCM (measured across the fold from the south iron formation to the north iron formation). Targets #1, #2 and #3 are 1.5, 1.2 and 2.0 times larger respectively, than the 2,400 foot diameter of the folded structure at the HMCM.

Note the locations of the historical surface gold occurrences and selected drill discoveries relative to major structures #1, #2, #3 and #4 on the Hardrock Extension properties. Note the location of the Croll Lake Stock, (Figure 15) along the north boundary of our property, which is thought to have been the heat source which mobilized the gold bearing fluids along the Bankfield-Tombill Fault. We invite you to make your own conclusions.

Target #4 is a gold bearing horizon which is located along the axis of a major Z fold in the McBean Lake Area. This structure can be seen in the airborne magnetic survey shown on Figure 6 and on the geological compilation Figure 12.

#### **RECENT DEVELOPMENTS IN THE GERALDTON MINING CAMP**

Approximately ten years ago, Premier Gold Mines Limited ("Premier") made an impressive entrance into the Geraldton Mining Camp. Premier acquired all of the past producing mines in the Geraldton Mining Camp with the exception of the properties owned by Tombill Mines Limited. (shown as green on the property holdings map Figure 3) We calculate Premier has invested approximately \$300,000,000 on acquisition and exploration over the last ten years. Most of their drilling has been focused in, over, under, down plunge and parallel to the underground workings of the HMCM. Premier refers to the historical HMCM mining property as their Hardrock Project. They have found a lot of gold.

On Jul 8<sup>th</sup>, 2014, (google the news release) Premier reported a mineral resource estimate of 7.6 million new ounces of gold (indicated and inferred) of which 59% is in an open pit and 41% is underground.

This is an incredible accomplishment which means that the major folded structure on their HMCM property is actually responsible for the concentration of a total of 9.7 million ounces of gold. (ie: the 7.6M new ounces plus the 2.1 million historical ounces mined between 1938 and 1968)

On Feb 5<sup>th</sup>, 2015 (google the news release) Premier announced it had entered into a joint venture with Centerra Gold Inc. ("Centerra") in which Centerra can earn a 50% interest by spending up to \$300,000,000 on the property. The deal subsequently closed and Centerra has made payments totalling \$96,000,000 in cash to Premier. This is a very exciting development. Centerra is the largest open pit gold miner in Asia and has the expertise to take the joint venture (officially named Greenstone Gold Mines) through to commercial production.

The Premier/Centerra joint venture is working on a feasibility study which anticipates the rerouting of a stretch of the Trans Canada Highway #11, moving the OPP Station, the Geraldton Interpretive Center, a highway service centre, the Ontario Hydro Installation, a portion of the Geraldton Golf Course and the purchase and removal of approximately fifty homes in the Hardrock and MacLeod Townsites. Almost all of the homes and affected vacant lands have already been purchased.



## **CONSIDER THE ENORMOUS POTENTIAL OF THE HARDROCK EXTENSION PROPERTIES**

If you have grasped the significance of the major structures on our property, you will quickly realize that **Hardrock Extension has the potential to produce 60,000,000 ounces!**

Let us make some assumptions based on Premier's release of July 8<sup>th</sup>, 2014 in which they report a new mineral resource of 7.6 million ounces in, over, under, beside and down plunge of the HMCM. Add to this, the historical production of 2.1 million ounces and you can make a reasonable statement that the large folded structure at the Premier/Centerra JV is responsible for the concentration of 9.7 million ounces of gold.

Now using the HMCM as your exploration model you might quickly assume that four similar sized structures with similar gold content on the Hardrock Extension property would have the collective potential to contain four times as much gold or 38.8 million ounces. (ie:  $4 \times 9.7\text{M oz} = 38.8\text{M oz}$ )

There is however much more to the equation when you factor in the potential strike lengths of the four, westerly plunging, structures on the Hardrock Extension property. Firstly, the "down plunge" strike length of the underground workings at the historic HMCM mining operation is 3.0 miles long. If you total the potential down plunge strike lengths of the four major structures from surface through to the west boundary of the Hardrock Extension property, you arrive at a combined strike length of 18.3 miles (to a maximum depth of one mile) which is 6.1 times longer than the strike length at the HMCM. )

We want to show you that just as the gold was concentrated by the major structure at the HMCM mining operation, there is good reason to believe that similar concentrations of gold could be found within the four major structures on the Hardrock Extension property.

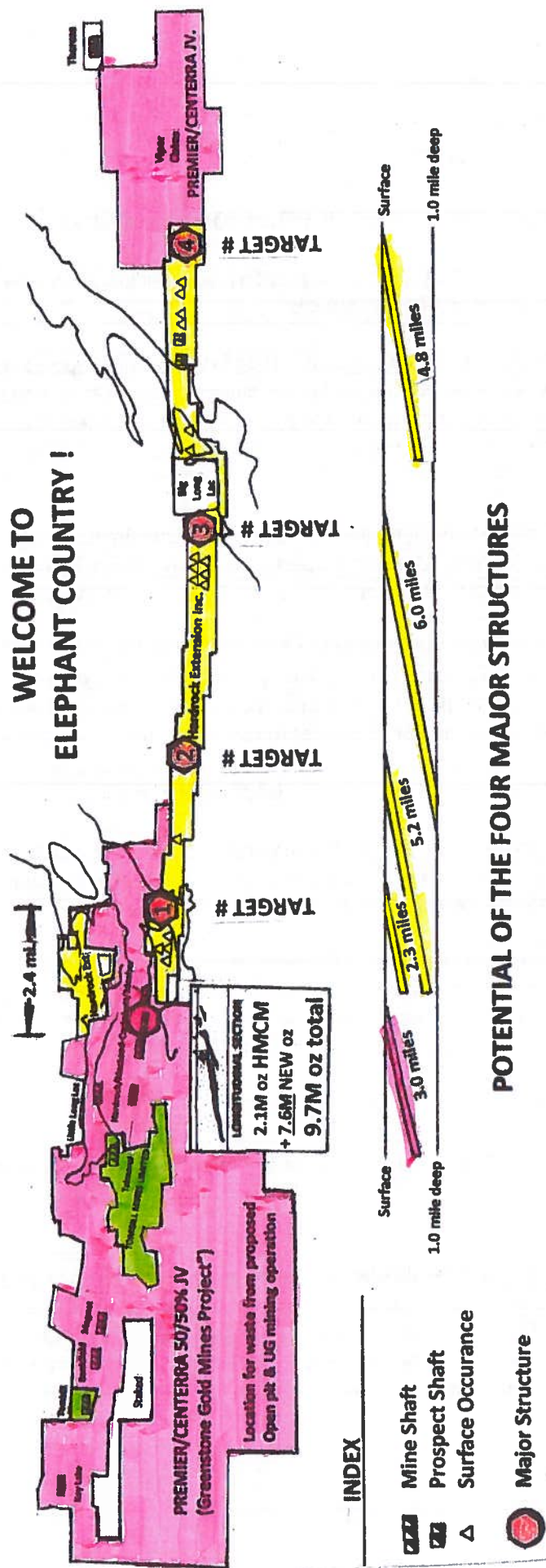
By extrapolation: - If the large folded structure on the Premier / Centerra joint venture is responsible for the concentration of 9.7 million ounces over a strike length of 3.0 miles then 18.3 miles of identical gold bearing structures on the Hardrock Extension property would have the potential to yield **59.2 million ounces to a depth of one mile**. (18.3 miles divided by 3.0 miles times 9.7 million ounces)

**Figure 13: - Map showing the potential for 59.2 million ounces**

It is worth noting that **59.2 million ounces** would have a gross value of **\$71.0 BILLION US** (based on a gold price of \$1,200 per ounce) which is 1.4 times the predicted \$50 billion dollar gross value of the chromite in the Ring of Fire. (Sudbury Star Nov 17, 2013)

**It is also worth noting that most of the infrastructure required to support major mining operations in Greenstone is already in place:** - The Towns of Geraldton and Longlac Ontario are serviced by the Trans Canada Highway, the CN railway, the Trans Canada Pipeline (natural gas), Ontario Hydro, a hospital, two clinics and an airport. The Towns are located within the Municipality of Greenstone which services a population of 5,500 residents. Furthermore, the First Nations and the Metis are pro development.

FIGURE 13: POTENTIAL



**POTENTIALLY 1.2 TIMES THE GROSS VALUE OF THE CHROMITE IN THE RING OF FIRE!**



### **A TRIBUTE TO ODM GEOLOGISTS H.C.HORWOOD, E.G.PYE AND C.F.FERGUSON**

We owe a tremendous debt of gratitude to ODM geologists H.C. Horwood and E.G. Pye who co-authored the Geological reports of Ashmore and Errington Townships in 1951 and to S.A.Ferguson who published the Surface Geology (ODM Map #435), Subsurface Plans and Longitudinal Projection (ODM Map #436) and Cross-sections (ODM Map #437) of the 2.1 million ounce HMCM mining operation in 1967.

These dedicated individuals left us with virtual treasure maps showing us the relationship of the gold deposition to the major structure at the HMCM mining operation. Hardrock Extension has mapped the same two iron formations which trace out the gold bearing structure at the HMCM mines eastward, along strike through the long axis of its property. As a result we have identified four major targets which stand out as prominently as the nose on your face. We believe these new structures will be responsible for turning the Geraldton-Longlac Area into the next world class mining camp.

No one understood the structural geology of the Geraldton Mining Camp in 1935.

#### **Figure 14(a): - Structural Geology of the HMCM Properties - 1935 Vs 1955**

The Hardrock Mine was discovered by prospector Hardrock Bill Smith who observed gold bearing quartz veins while paddling his canoe along the shoreline of Kenogamisis Lake. The Little Longlac, Bankfield and Magnet Mines were also discovered by shoreline prospectors. The old timers simply put their noses to the ground and followed the veins. Many of the early developers however were soon disappointed because 60% of the mines proved to be small, narrow, high grade operations which lasted less than 5 years. In hindsight the prospectors who discovered the 2.1 million ounce HMCM mines and the 600,000 ounce Little Longlac Mine were just plain lucky that the veins they were chasing were located in the east end of the camp rather than in the west end of the camp.

The above observation was made by Dr. A. J. Macdonald in the 1988 OGS Open File Report 165, in a bell curve which shows an exponential decrease in the gold content of deposits from east to west implying a source to the east.

#### **Figure 14(b): - Bell Curve Implying a Source to the East**

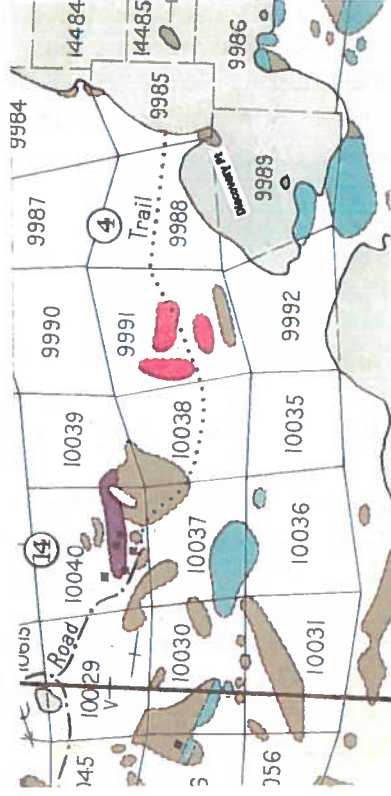
#### **Figure 15: - Geological Map of the Geraldton-Long Lake Area**

Today we understand the HMCM orebody was concentrated by a major, westerly plunging, folded structure and if we pay attention to the obvious we know exactly where (within target areas measuring from one half to one square mile) to expect the next elephants to come to surface.

I have enclosed Plan and Longitudinal views taken from The Premier July 2014 Hardrock Mineral Presentation so that you may appreciate the size and location of the proposed open pit at the HMCM. The Premier / Centerra joint venture anticipate mining most of remaining folded structure at the HMCM as an open pit measuring 3,100 feet by 5,300 feet.

## “THE BEST KEPT SECRET IN GREENSTONE”

# STRUCTURAL GEOLOGY OF THE HARDROCK & MACLEOD COCKSHUTT PROPERTIES



## What was known about structure in 1935



## What was known about structure in 1955 but never used as a model for exploration

## Why ???

**Because by 1940 surface exploration for gold had come to a standstill due to rising costs and a low gold price of \$35/oz.**

**FIGURE 14(a) STRUCTURAL GEOLOGY of the HCM 1935 Vs 1955**



Relationship between contained gold in various mines in the Geraldton Camp and distance from the eastern margin of Ashmore Township and the Croll Lake felsic intrusion (modified from Pye, 1951).

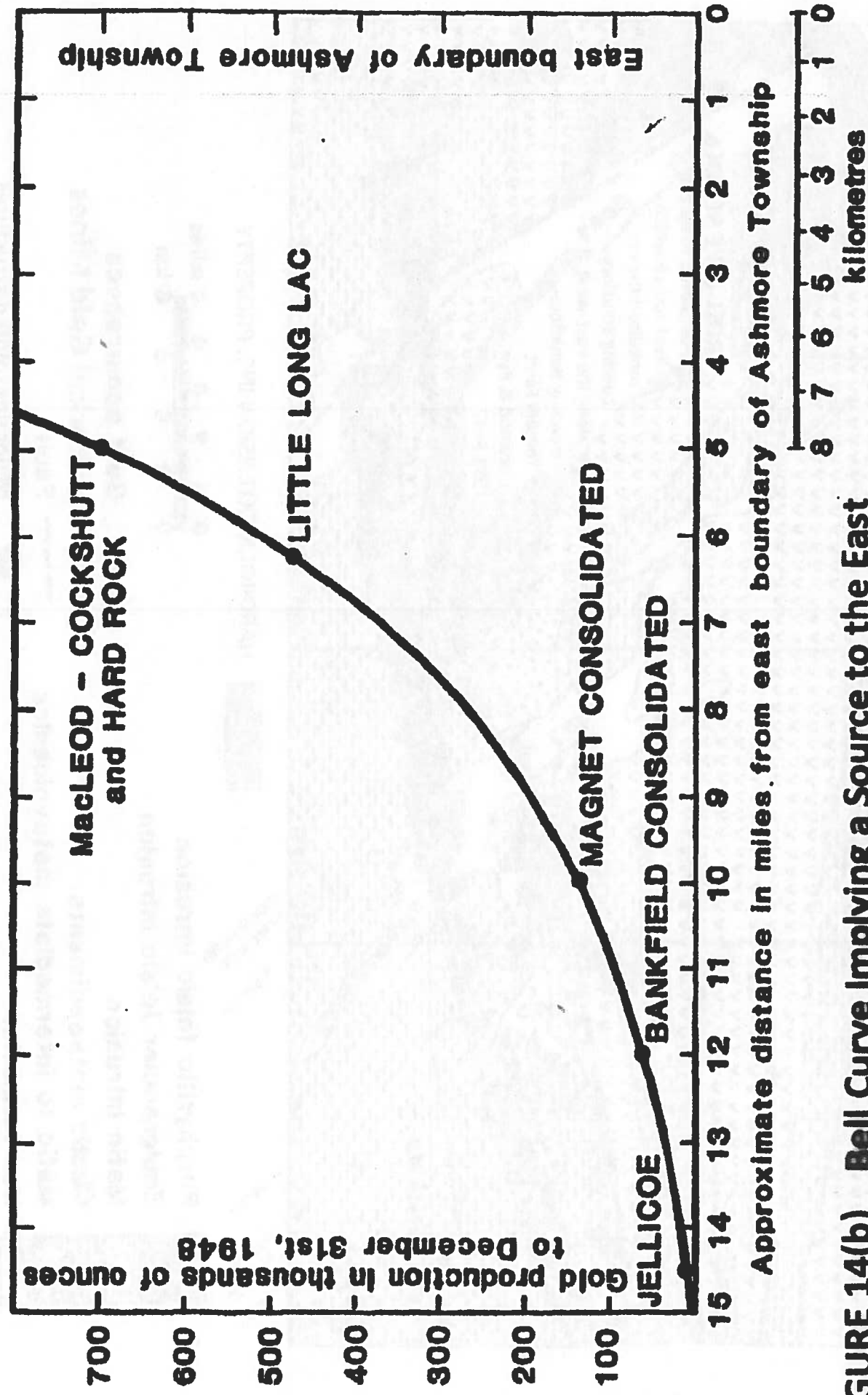


FIGURE 14(b) Bell Curve Implying a Source to the East

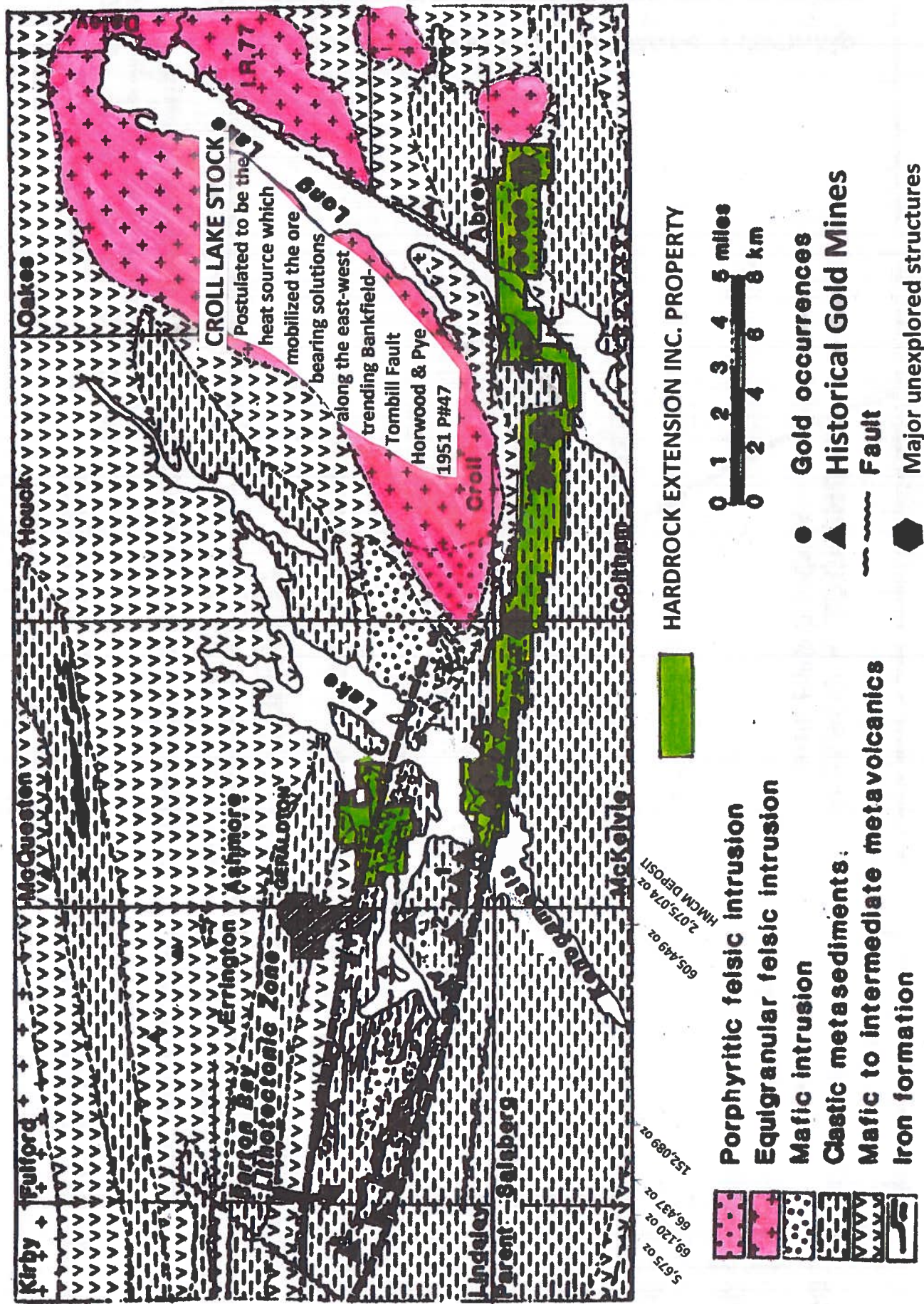


FIGURE 15: Geological Map of the Geraldton-Long Lake area (modified from Pye, 1951, and Horwood and Pye, 1951).



**Figure 16: - Premier/Centerra JV – Resource Estimate**

**Figure 17: - Premier/Centerra JV - 2014 PEA Pit Shell**

**Figure 18: - Folded Structure (from Figure 4b) Superimposed over the Pit Shell**

**Figure 19: - Mining the Whole Haystack / Folded Structure!**

## **IN CONCLUSION**

We hope this presentation has demonstrated the tremendous potential of the Geraldton Mining Camp. We hope you will take the time to review the Premier news releases dated June 8<sup>th</sup>, 2014 and February 5<sup>th</sup>, 2015. (The July 2014 Hardrock Mineral Resource Presentation is also available on the Centerra Gold website under advanced exploration – Greenstone Gold Mines – Technical Report on the Trans Canada Property.)

Hardrock Extension is seeking to partner with major mining companies that are committed to exploring the enormous potential of our properties.

If any of you would like to be kept abreast of our progress, feel free to put your contact information in our guest book.

I would like to thank all of you for participating in this Mining Update Event.

Sincerely,

Mike Malouf  
Hardrock Extension Inc.  
Tel: (807)854-0201  
Email: michaelmalouf@rogers.com

Oblique Long-Section View

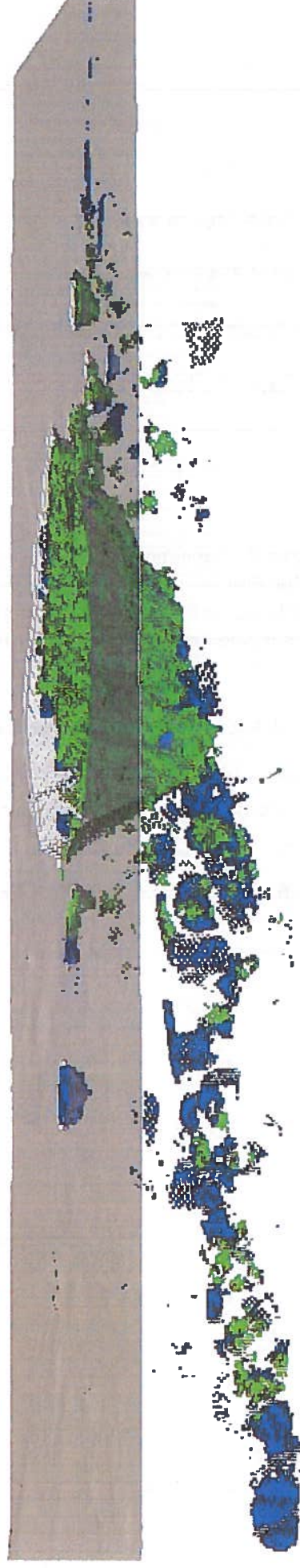
In-Pit Above 0.50 g/t Au

Open Pit Indicated : 83.868 Mt @ 1.47 g/t Au, 3.973 Moz

Open Pit Inferred : 10.225 Mt @ 1.53 g/t Au, 0.501 Moz



500m



Underground Above 3.00 g/t Au

Indicated : 5.169 Mt @ 5.40 g/t Au, 0.898 Moz

Inferred : 12.922 Mt @ 5.40 g/t Au, 2.243 Moz

\* See Note 1

**FIGURE 16:**

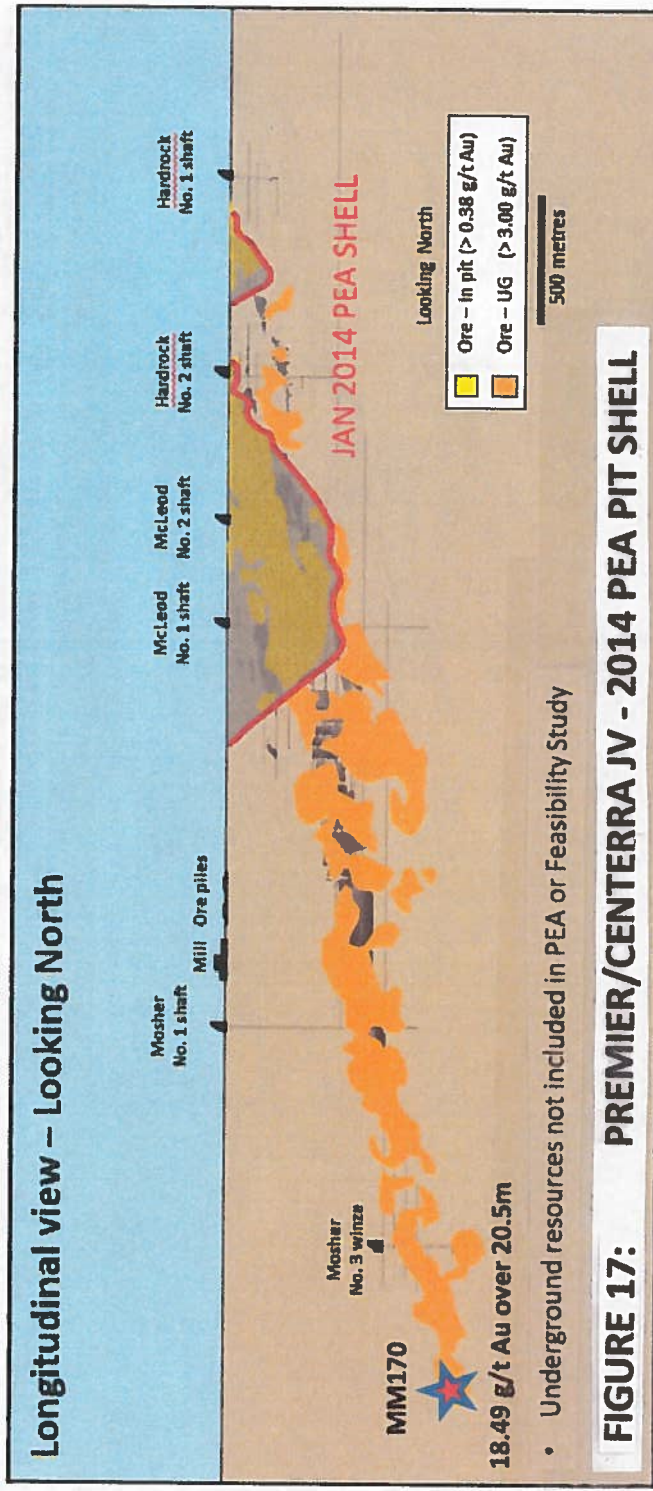
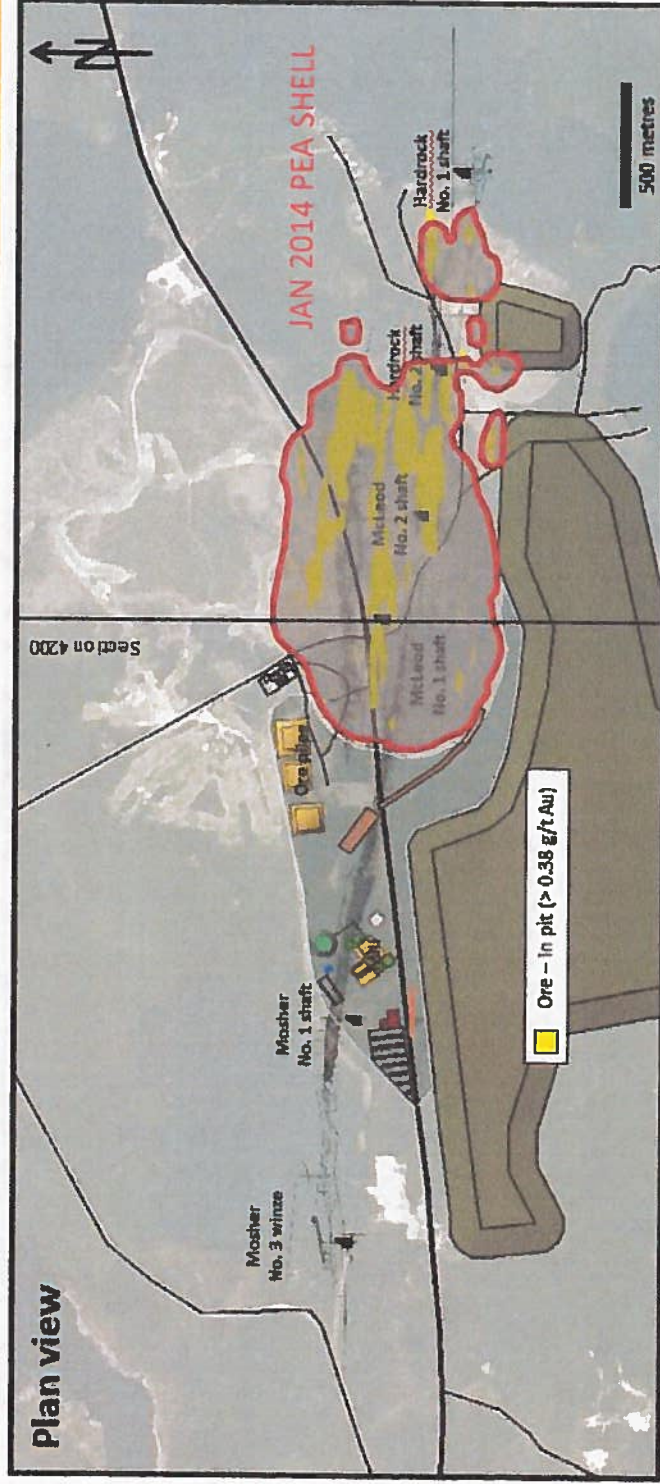
**PREMIER/CENTERRA JV  
RESOURCE ESTIMATE**

**Total Resources**

Indicated : 89.037 Mt @ 1.70 g/t Au, 4.870 Moz

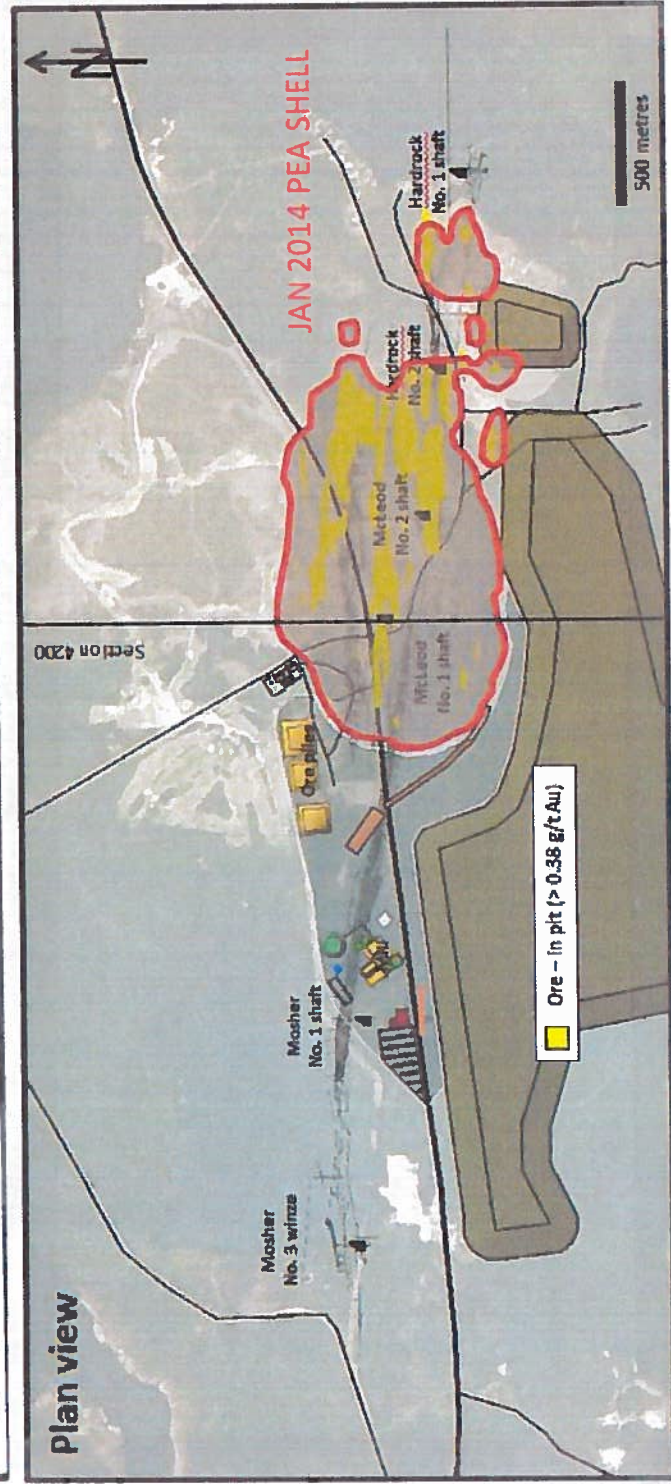
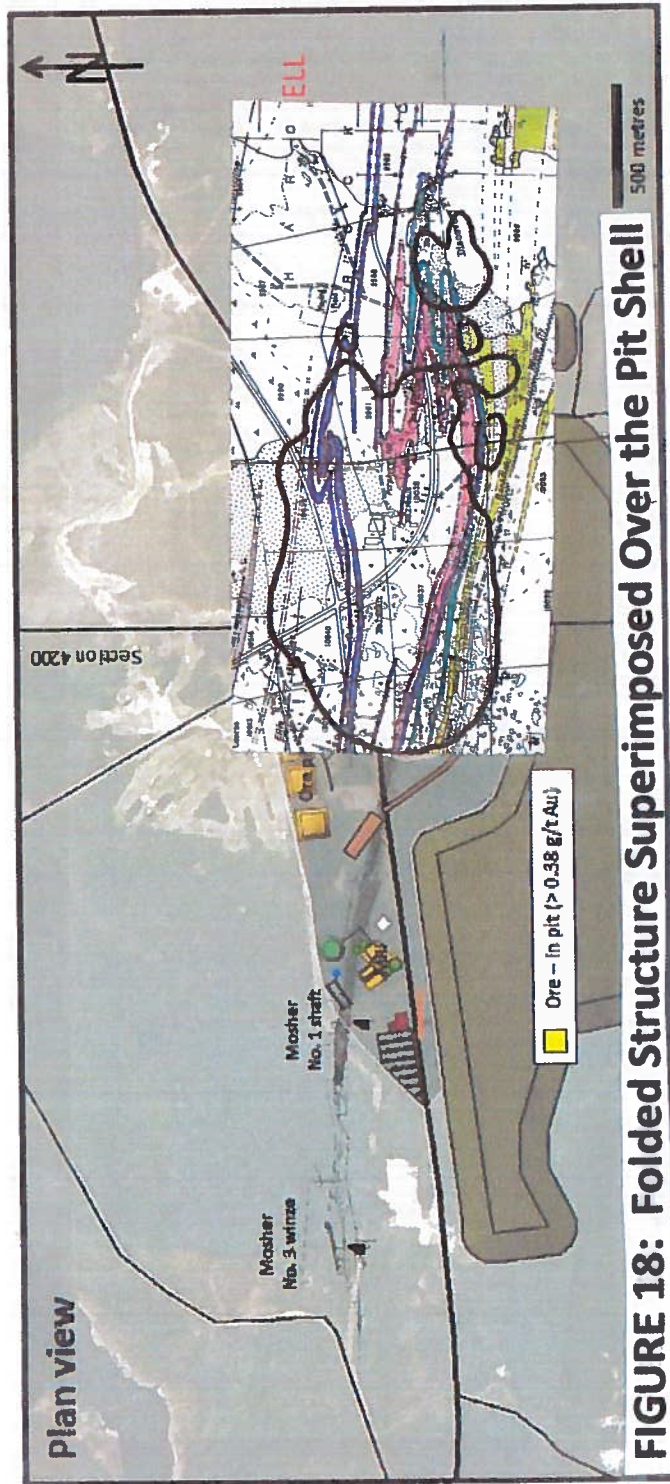
Inferred : 23.147 Mt @ 3.69 g/t Au, 2.744 Moz





**FIGURE 17: PREMIER/CENTERRA JV - 2014 PEA PIT SHELL**







It has been said that looking for gold is like trying to find a needle in a haystack.

There's enough gold here  
to mine the whole haystack!

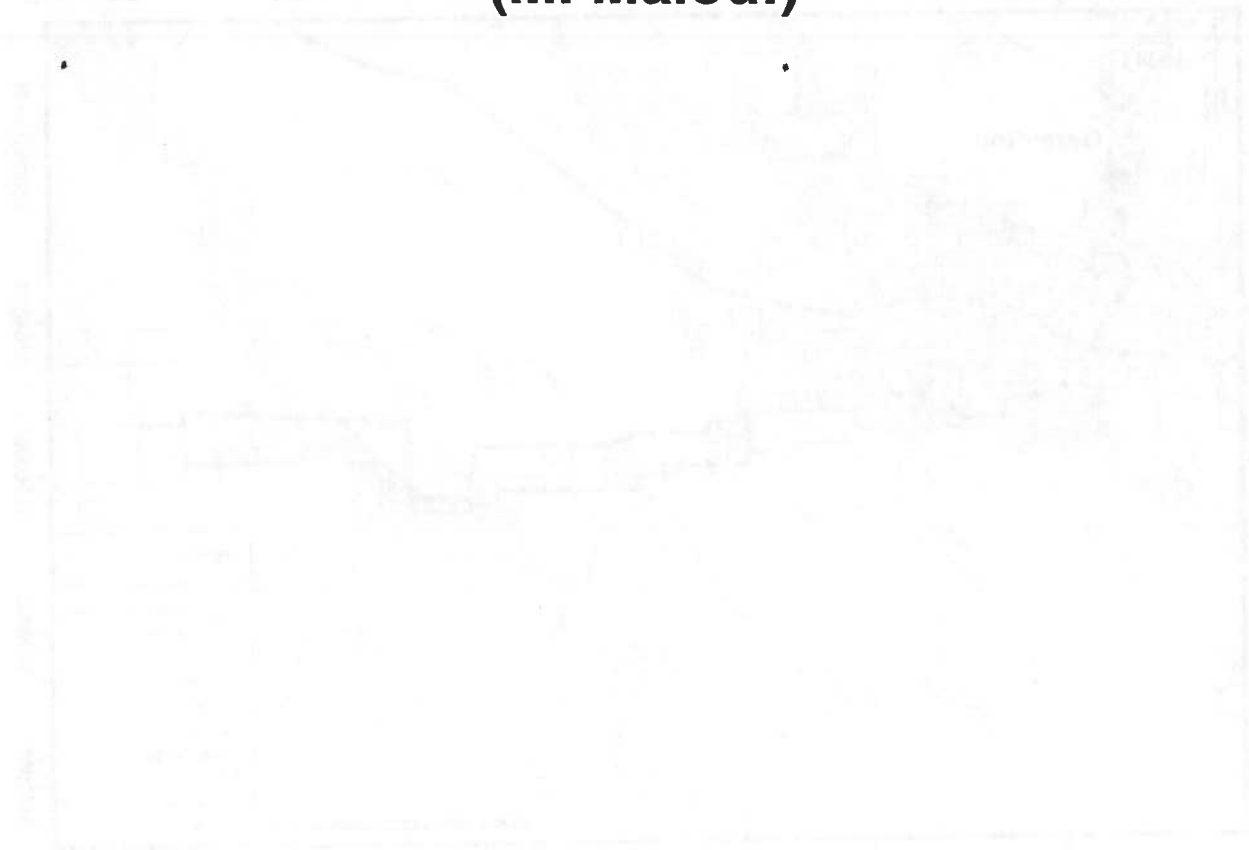


Figure 19: MINING THE FOLD STRUCTURE

# **Hardrock Extension** **Property**

## **Geraldton Gold Camp**

**(M. Malouf)**

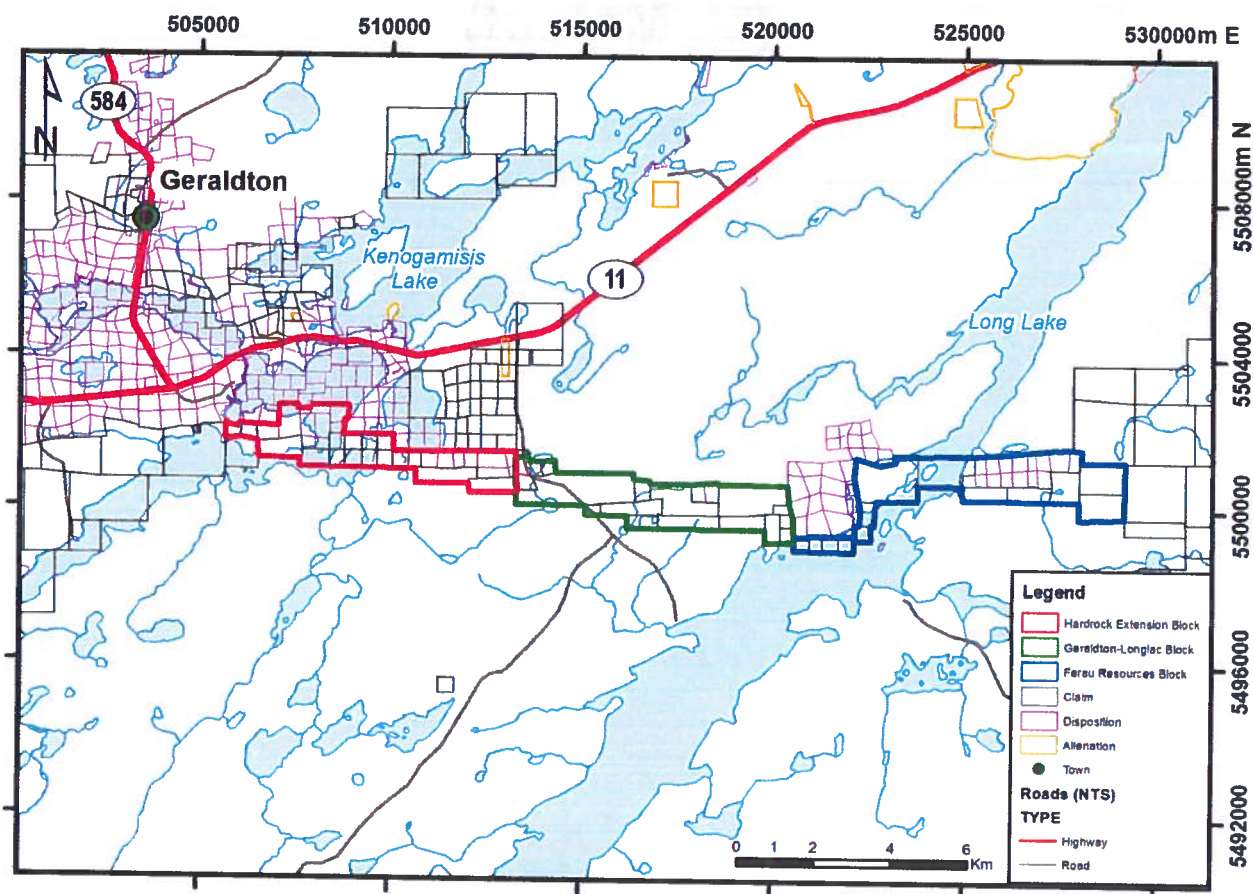


**Ontario Geological Survey ROA 2015**



## Hardrock Extension Property

The Hardrock Extension property straddles the boundary between Ashmore and McKelvie townships in the west and occupies portions of Coltham Township and the McBean Lake area in the east. It consists of one contiguous group of claims, comprising 3 properties (the Hardrock Extension, Geraldton-Longlac and Ferau Resources projects), trending east for 24 km from the southern end of Kenogamisis Lake southeast of Geraldton, to an area approximately 4 km east of Long Lake (Figure 10). Access to numerous occurrences along this property is via secondary bush roads, ATV trails and by water (boat access from Kenogamisis Lake and Long Lake) south from of Highway 11 between Geraldton and Longlac. Much of the current property was acquired by staking from 1981 to 1984 by M. Malouf of Geraldton and the Quaternary Mining and Exploration Company Limited. The property has been actively explored by the owner since 1982 and several groups of claims have been brought to lease. Exploration, including work over numerous historic gold occurrences, consisted of various ground magnetometer and electromagnetic surveys, stripping, sampling, geological mapping and diamond drilling. In total, 20 171 m in 116 holes have been drilled across the entire property by the current owner since 1986 (M. Malouf, Quaternary Mining and Exploration Company Limited, personal communication, January 2016). The western portion of the Hardrock Extension property is contiguous with Greenstone Gold Mines GP Inc.'s Hardrock project claims. The southern portion of the main iron formation and lithotectonic zone associated with known gold mineralization (including past production) on the Hardrock property strikes



**Figure 10.** Map showing the location of the Hardrock Extension property, including the Hardrock Extension, Geraldton-Longlac and Ferau Resources claim blocks (UTM co-ordinates in Zone 16).

east onto the Hardrock Extension claims and was the original premise for acquiring the ground. The eastern extension of this iron formation in Ashmore Township was mapped by Horwood and Pye (1955) of the Ontario Department of Mines in 1950 and was further confirmed by subsequent ground and airborne magnetic surveys. Greenstone Gold Mines is presently conducting an Environmental Assessment and Feasibility study on the Hardrock property, which hosts a NI 43-101-compliant resource estimate (Indicated and Inferred) of 7.61 million ounces of gold (Brousseau et al. 2015).

The discovery of gold by W.W. Smith in 1931 on Discovery Point in Kenogamisis Lake, approximately 500 m north of the Hardrock Extension claims, led to a major staking rush and the eventual production of 3 million ounces of gold from 1934 to 1968 in the Little Long Lac (Geraldton) camp. Exploration work, including magnetometer and electromagnetic surveys, diamond drilling and trenching, was conducted on what would become the westernmost claims of the Hardrock Extension property (designated the Hardrock Extension block), between 1932 and 1946. Ashmore Gold Mines Limited, a subsidiary of Hard Rock Gold Mines Limited, completed 11 shallow diamond-drill holes in the centre of Hardrock Peninsula (in Kenogamisis Lake, south of Discovery Point) and identified several pyrite- and arsenopyrite-mineralized quartz stringer zones in sheared and silicified diorite and tuffaceous sediments. Selected drill-core intersections returned up to 0.62 g/t Au over 24 m, including 4.35 g/t Au over 1.2 m (Hubacheck 1994). The area south of Eldee Lake, in the eastern portion of the Hardrock Extension block, was explored by the Killoran-Labine group during this early period. A prominent rusty-weathered, carbonate-altered shear zone, averaging 4.6 m wide, was uncovered and intermittently trenched along an easterly strike for approximately 244 m. Roughly 60 m north of this sheared horizon, a second shear zone was discovered containing large folded irregular masses of quartz and coarse arsenopyrite. Associated gold values were noted, but no actual values were reported (Hubacheck 1994). In this same area south of Eldee Lake, Draco Mines Limited, a subsidiary of Conwest Exploration Company, conducted a magnetometer and electromagnetic survey and completed 3 diamond-drill holes, for a total of 649 m, in 1946. No assay values were reported (Resident Geologist's Office Files, Thunder Bay North District, Thunder Bay). In 1950, the Ontario Department of Mines conducted a mapping program covering Ashmore Township (Horwood and Pye 1955). Since many of the past-producing mines were operating in the Geraldton camp at this time, H.C. Horwood and E.G. Pye had unprecedented access to both surface and underground bedrock exposures. This resulted in a very accurate and detailed geological map that helped guide future exploration in this area. The claims were subsequently dropped and, in 1981, M. Malouf and the Quaternary Mining and Exploration Co. Limited acquired a large group of 23 claims covering much of Hardrock Peninsula south of Discovery Point and east to the southern end of Eldee Lake. Work by the company, since that time, on the Hardrock Extension block included ground magnetometer and very low frequency electromagnetic (VLF-EM) surveys, extensive stripping and channel sampling, and the completion of 74 diamond-drill holes, totalling 15 603 m (Hubacheck 1994). Much of this work focussed on the Hardrock Peninsula and has resulted in the discovery of 6 main zones. A summary of assay results from some of the better diamond-drill core intersections (Hubacheck 1994) are provided as follows:

Zone (Occurrence)	Hole ID	Interval (m)	Au (g/t)
Porphyry	HH-09	28.0	1.24
Stanley	HH-72	11.7	4.98
Discovery	HH-27	7.0	8.40
Discovery	HH-10	5.4	23.64

The western group of claims on the Hardrock Extension property, which currently (as of January 2016) consists of 16 staked claims (24 units) and 19 leased claims (mining rights only), was designated the Hardrock Extension block (Hardrock Extension Inc.). Two additional companies (Geraldton-Longlac Gold Inc. and Ferau Resources Inc.) were formed by M. Malouf in 1983 to manage claims staked along an easterly trend through Coltham Township and the McBean Lake area. As of January 2016, the Geraldton-Longlac block (middle claim group) consisted of 12 staked claims (51 units) and 7 leased



claims, and the Ferau Resources block (eastern claim group, which includes claims both east and west of Long Lake), comprises 13 staked claims (47 units) and 15 leased claims. All 3 claim blocks are contiguous and, to the west, adjoin the Hardrock property of Greenstone Gold Mines.

In addition to occurrences on the Hardrock Extension block visited by staff of the Thunder Bay North Resident Geologist office during the 2015 field season (discussed later in this section), numerous historical and recently discovered gold occurrences have been documented on the Geraldton–Longlac and Ferau Resources claim blocks. Most of the current and past exploration work completed on the Geraldton–Longlac block was focussed in the north-central portion of Coltham Township. The Burroughs Syndicate originally investigated this area from 1934 to 1939 via surface prospecting, digging a series of small pits and trenches, a magnetic survey and shallow X-ray drilling. Six gold occurrences, with channel sample assays up to 1.53 ounces gold per ton, were located on the property during this period (Mason and White 1986). No further follow-up work was done until the claims were re-staked by M. Malouf and the Quaternary Mining and Exploration Company Limited in 1983. Exploration work on the Geraldton–Longlac block was conducted by the company from 1986 to 1988 and included a ground magnetic and electromagnetic survey. The survey identified 2 east-striking iron formation zones and several strong coincident electromagnetic conductors across the property. Extensive overburden stripping and trenching were undertaken followed by a diamond-drilling program. Trenching was completed in 2 main areas, designated the “West and East trenches”. Channel sample results from the West trench returned up to 7.46 g/t Au over 1.95 m. Three holes, centred on the Burroughs Syndicate showing, were completed for a total of 362 m. Assay results included up to 2.18 g/t Au over 1.2 m in the West trench area (Hubacheck 1994). A detailed description of the historic work and geology is provided by Kresz and Zayachivsky (1991), as part of their report on OGS mapping of the northern Long Lake area in 1987. Sulphide mineralization (pyrite) and gold (up 41.67 g/t Au in grab samples collected by the OGS staff) are associated with quartz- and quartz-carbonate veining and magnetite banded iron formation (Kresz and Zayachivsky 1991). The metasedimentary host rock, including chloritic siltstone and wacke, pebbly sandstone and conglomerate, has been intensely sheared and altered in places to hornblende and sericite schist. Also noted were quartz-tourmaline veins, feldspar porphyry dikes and units of coarse-grained gabbro and pyroxenite, intercalated with banded iron formations and conglomerates. In discussions with the property owner, and in a 1983 consultant’s report by C.W. Archibald (Mason and White 1986), it has been suggested that the intense shearing noted along the southern trenched exposures at the Burroughs Syndicate showing represents the eastern extension of the Bankfield–Tombill fault zone (Pye 1952). The occurrences in this area are part of a metasedimentary and mafic metavolcanic sequence of rocks that wrap around the southern flank of the Croll Lake biotite to hornblende granodiorite stock. It is worth noting that both Horwood and Pye (1955) and Macdonald (1983) postulated that hydrothermal venting from the Croll Lake stock is one possible source for the gold mineralization found in the Geraldton camp.

The Ferau Resources claim block was originally staked to cover the easternmost extension of the main iron formation structure associated with the gold mineralization at Geraldton. Both the regional airborne magnetic survey flown by the Ontario Department of Mines and Geological Survey of Canada (ODM–GSC 1963) and the ground magnetic surveys, completed by M. Malouf, show that the track of the southern iron formation structure underlies all 3 claim blocks. The Ferau Resources claims cover 6 historic gold occurrences that were documented by Fairbairn (1938) of the Ontario Department of Mines during his mapping of the northern Long Lake area in 1937. These sites, as well as those explored by the current owner M. Malouf, were visited and sampled by Kresz and Zayachivsky (1991) during the remapping of this area in 1987. They include the West-Side Long Lac and Long Lac Adair occurrences, west of Long Lake, and the 4 MacFarlane and Coniagas West and East occurrences, east of Long Lake. The most actively explored showing on the Ferau Resources block was the MacFarlane East occurrence, approximately 700 m east of Long Lake. Between 1936 and 1938, MacFarlane Long Lac Gold Mines Limited completed 4572 m of diamond drilling and sank a 44.8 m shaft with 24.4 m of drifting (Kresz and Zayachivsky 1991). Two grab samples of sulphide-mineralized (pyrite, pyrrhotite, chalcopyrite and

arsenopyrite) metasedimentary rocks collected from this occurrence during the mapping project returned values of 700 ppb and 5280 ppb Au, respectively (Kresz and Zayachivsky 1991). The geology of this occurrence and of the nearby Coniagas West occurrence (approximately 800 m to the east), is described as predominantly garnetiferous hornblende schists with lesser quartzofeldspathic sedimentary rocks hosting narrow, silicified, east-trending shears and asymmetric Z-folds. These shears host irregular quartz veins containing gold associated with pyrrhotite and arsenopyrite. Sampling of trenches on the Coniagas West occurrence, by Eldorado Nuclear Limited in 1982, returned assay results up to 3.30 g/t Au over 3 m (Kresz and Zayachivsky 1991). Ferau Resources Inc. conducted extensive stripping and trenching and completed diamond drilling at both the MacFarlane East and Coniagas West occurrences from 1987 to 1988. Diamond drilling consisted of 20 holes, totalling 1978 m. Assay highlights of selected intersections include 5.29 g/t Au over 4.9 m and 8.71 g/t Au over 1.9 m from the MacFarlane East shaft area (Hubacheck 1994).

The Hardrock Extension property lies along the northern portion, and within the eastern part of the Southern Metasedimentary sub-belt (SMB) (Devaney and Williams 1989), which marks the southern boundary of the eastern Marmion domain of the Wabigoon Subprovince. The SMB, which is part of the Beardmore–Geraldton greenstone belt, is host to 11 past-producing gold mines and over 95% of the 4.1 million ounces of gold produced from this greenstone belt (Mason and McConnell 1983). The SMB (*circa* 2691 to 2701 Ma) averages 3 km in width at the western end of the greenstone belt to 10 km in width in the Lindsey, Errington and Ashmore townships area to the east. It consists of a thick sequence of clastic metasedimentary rocks. Pye (1952) subdivided the SMB in the Geraldton area into 2 distinct groups: the southern Group B, consisting of a monotonous sequence of wackes; and the northern Group A, which contains arkose, wacke, siltstone, conglomerate and significant amounts of interbedded oxide-facies banded iron formation. It is in this area, along the northern portion of the SMB in Errington and Ashmore townships, within a major zone of deformation, where much of the gold mineralization is located, including 9 past-producing gold mines. This highly deformed and lithologically and structurally complex, east-southeast-trending, lenticular zone ranges from 2 to 4 km in width, is roughly 24 km long and has been termed the Barton Bay lithotectonic zone (BBLZ; Williams and Stott 1991; Smyk, Fralick and Hart 2005). The shallow, westerly plunges (approximately 30°) observed within this zone is pervasive along most of the Beardmore–Geraldton greenstone belt. The BBLZ is bounded on the south by the Bankfield–Tombill fault zone (Pye 1952), and by the Portage and related shear zones in the north. The BBLZ is characterized by prominent Z-folded iron formation, intense shearing and an anomalously higher percentage of mafic intrusive rocks (most notably as lenticular intrusions) and porphyritic felsic dikes, which may have had an influence on localizing mineralization (Lavigne 1983).

The western portion of the Hardrock Extension block lies within the eastern extent of the BBLZ. The zone is identified by intense shearing and a series of gold occurrences located immediately north of the eastern trace of the BBLZ on Hardrock Peninsula. This area has been explored in several stages, as previously mentioned, with magnetic and electromagnetic surveys, stripping, trenching, channel sampling and diamond drilling by the owner M. Malouf from 1982 to the present (January 2016). The zone of gold mineralization on the Hardrock Peninsula has been traced for 975 m along an easterly strike by a series of trenches and consists of 6 occurrences known as the Porphyry zone, Stanley zone, V.G. zone, Bingo vein, Point vein and the Discovery zone (Hubacheck 1994). This zone has been the main focus of exploration activity on the Hardrock Extension property and was visited by staff of the Thunder Bay North Resident Geologist office in the fall of 2015.

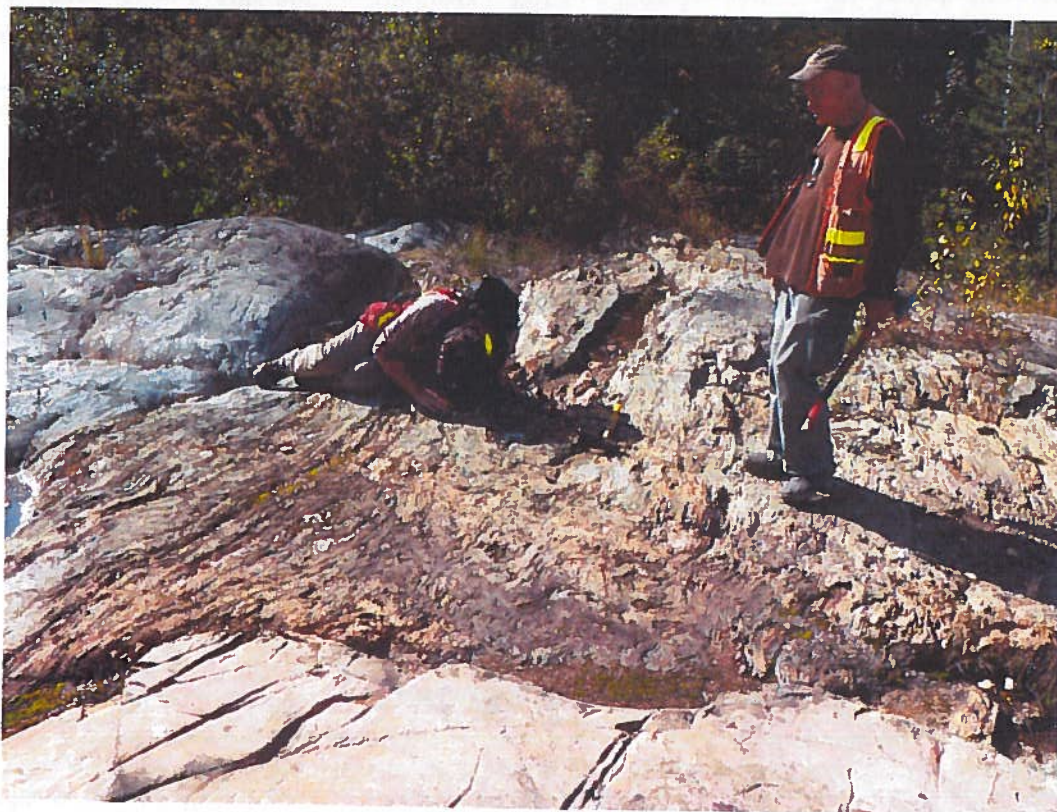
The Hardrock Peninsula is accessed by a secondary gravel road and ATV trail, from a point on Greenstone Gold Mines Hardrock property south of the Hard Rock Mine shaft #2. Assay results of grab samples



collected from 3 of the main occurrences by Resident Geologist staff in 2015 are provided as follows (Resident Geologist's Office files, Thunder Bay North District, Thunder Bay):

Sample No.	Gold (g/t Au)	Zone	Location (UTM Zone 16)
15-WHE-1	3.62	Porphyry zone	507297E 5501993N
15-WHE-2	3.10	V.G. zone	507489E 5501844N
15-WHE-3	0.32	Point vein	507993E 5501645N
15-WHE-6	5.08	Porphyry zone	507273E 5501959N

Detailed mapping by Horwood and Pye (1955) indicated that the Porphyry zone, as well as the other zones visited on the Hardrock Peninsula, lie within a roughly 700 m wide finger-shaped unit of metavolcanic tuffs and breccias with alternating sill-like lenses of hornblende diorite. This unit is surrounded by rocks of the Southern Metasedimentary sub-belt. Samples were collected by Resident Geologist staff from stripped bedrock exposures on the Porphyry zone displaying rusty quartz veins, *en échelon* boudinaged quartz stringers (averaging 2 to 10 cm wide) and brecciated stockwork quartz veining hosted in moderate to intensely sheared, chlorite-altered tuff (Photo 1). Mineralization averages from 2 to 5% (and ranges as high as 10 to 15%) and consists mostly of fine-grained, euhedral arsenopyrite and lesser amounts of pyrite. Highly deformed quartz masses from 1 to 2 m wide, exhibiting a crack-seal texture and containing fine laths of tourmaline, as well as patches and seams of rusty carbonate alteration and occasional apple-green fuchsite, were also observed. A grab and channel sampling program, conducted by the property owner, returned assay values up to 2.80 g/t Au over 4.6 m (Hubacheck 1994). Observations of the area and samples collected at both the V.G. zone and Point vein occurrences by Resident Geologist staff, indicate a similar geological setting. Sheared and carbonate-altered tuffs host quartz vein stringers

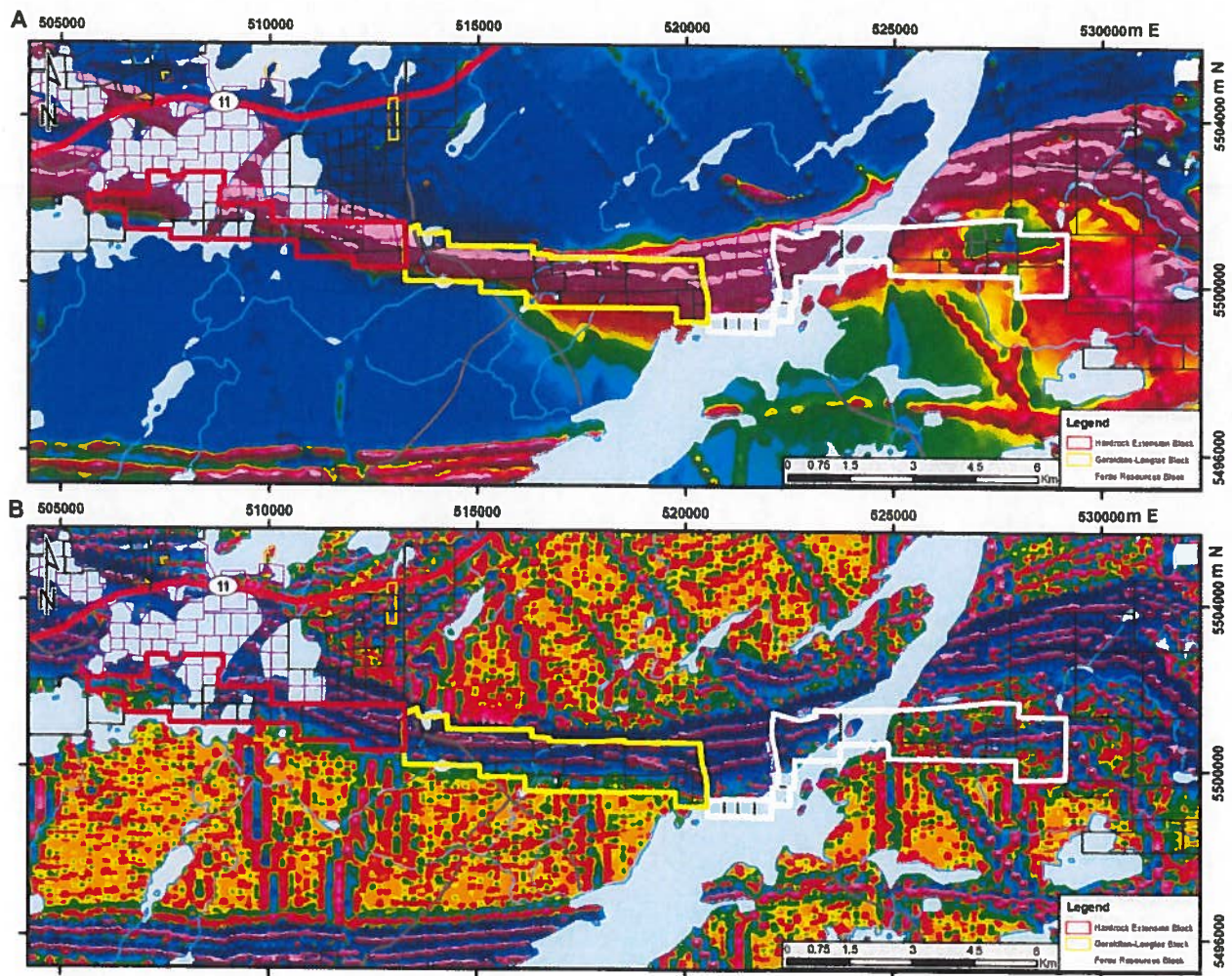


**Photo 1.** Staff of the Thunder Bay North Resident Geologist's office examining a highly deformed and sheared, carbonate-altered, quartz-veined exposure of mafic metavolcanic rocks on the Hardrock Extension property (Porphyry zone) with the owner, M. Malouf. Contacts between a feldspar porphyry dike (foreground) and relatively undeformed mafic tuffs (background) can also be observed.



containing arsenopyrite and pyrite. Detailed channel sampling of the V.G. zone, by the property owner, along a strike length of 104 m returned assay results up to 5.29 g/t Au over 6.1 m (Hubacheck 1994). The Point vein zone measures from 1.8 to 2.4 m wide and can be traced for over 90 m to the shore of Kenogamisis Lake at the eastern end of Hardrock Peninsula. This zone appears to be more highly silicified than the zones discussed above. A series of grab samples collected by the owner returned values ranging from nil to 1.56 g/t Au (Hubacheck 1994). The overall trend of the rocks ranged from 275° to 285°.

The potential for locating additional gold mineralization along the Barton Bay lithotectonic zone, both on the Hardrock Peninsula and to the east on the Geraldton–Longlac claim block, is high. A modern versatile time-domain electromagnetic (VTEM) survey, followed by detailed prospecting and sampling of anomalies along the almost 1000 m of strike length, is warranted. Attention should be focussed on those areas between known gold occurrences that display intense shearing. The close association between gold and sulphide mineralization (primarily arsenopyrite and, to a lesser degree, pyrite) is well known in the Geraldton camp. Of even greater significance, and previously mentioned as the main reason for the location of the Hardrock Extension property, is the eastern extension of the southern iron formation from the core of the Geraldton camp (Figure 11). Flexures or suggested Z-folded structures in the magnetic



**Figure 11.** Geophysical maps showing A) the total field magnetic response and B) the first vertical derivative for the Hardrock Extension property. The Hardrock Extension, Geraldton–Longlac and Ferau Resources claim blocks are indicated by red, yellow and white lines, respectively. Property geophysical imagery from Sims (2009); regional geophysical imagery from Ontario Geological Survey (2003a, 2003b, 2003c, 2003d); UTM co-ordinates in Zone 16.



trace of this iron formation should be explored in detail. These structures, as seen on the Hardrock property of Greenstone Gold Mines, may represent areas of high permeability and potential sites for hydrothermal alteration and gold mineralization. Several of these structures have been recognized in the geophysical data: the most prominent structure lies northeast of the Hardrock Peninsula in Kenogamisis Lake. Archibald (1983) and Hubacheck (1994) both agreed that the magnetic contours in this area define a large-amplitude Z-fold in the main iron formation units that pass through the Mosher, MacLeod-Cockshutt and Hardrock mine properties to the west. To date, the total gold endowment tied to these properties sits at 10.61 million ounces, which includes 3 million ounces of past production and the 7.61 million ounces resource of Greenstone Gold Mines (Brousseau et al. 2015). This area and the projection of the iron formation structure to the west should be explored by a winter diamond drilling program from Kenogamisis Lake.