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## **ASX AND MEDIA RELEASE**

### **INDEPENDENT TECHNICAL REPORT**

#### **GOLD, COPPER AND BASE METAL EXPLORATION ASSETS, KINGDOM OF SAUDI ARABIA**

As foreshadowed in the Company's quarterly report released on ASX on 31 October, attached is the independent technical report delivered today to the Company.

Yours faithfully,

A handwritten signature in black ink, appearing to read "David Turvey", is written over a horizontal line.

**David Turvey**  
Executive Director

#### **Further information**

David Turvey (Executive Director) on 08 8418 8568 or 0416 119 583

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## Independent Technical Report - Saudi Arabia Projects

Prepared by Coffey Mining Pty Ltd on behalf of:  
**Lawson Gold Limited**

MINEWPER00928AA  
1 November 2012

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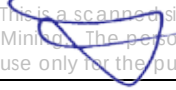
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## Document Review and Sign Off

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Peer Review  
John Hearne

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## Independent Technical Report

1 November 2012

The Directors  
Lawson Gold Limited

Dear Sirs

Coffey Mining Pty Ltd ("Coffey Mining") has been commissioned by Lawson Gold Limited ("Lawson") to provide an Independent Technical Report on mineral properties prospective for gold and base metals in the Kingdom of Saudi Arabia ("KSA"). The ITR has been prepared on information available up to and including 16<sup>th</sup> July 2012. Coffey Mining was also engaged by Grant Thornton Australia ("Grant Thornton") to produce an independent technical valuation of these projects and this valuation will be subject to a separate disclosure.

The Project tenements comprise 14 Exploration Licenses and two Mining License Applications covering 2,149km<sup>2</sup>. The legal status of the assets in which Lawson intends acquiring an interest, the various agreements covering those interests, and the exploration, mining and minerals processing legislation applicable in KSA have not been independently verified by Coffey. The present status of tenements, agreements and legislation described in this report is based on information provided by the Project vendors, Mawarid Energy and Mining Company ("MEMC"), formerly Petro Hunt Middle East Limited ("PHME"), and the report has been prepared on the assumption that exploration and potential development of the projects will prove to be lawfully allowable.

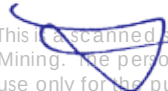
Coffey Mining has based its review of the Projects on information provided by MEMC, along with technical reports prepared by government agencies, independent consultants, and other relevant published and unpublished data. Site visits were undertaken to the eight higher priority Projects by Coffey Mining between September 10<sup>th</sup> and 23<sup>rd</sup>, 2011. Coffey Mining has endeavoured, by making all reasonable enquiries, to confirm the authenticity and completeness of the technical data upon which the Independent Technical Review is based.

Coffey Mining is an exploration, mining and resource consulting firm, which has been providing services and advice to the international mineral industry and financial institutions for over 50 years. The primary authors of this report are Mr Paul Mazzoni and Dr Marian Skwarnecki. Mr Mazzoni is a professional geologist with over 35 years experience in the exploration, development and mining of base and precious metal properties and industrial mineral properties internationally. Mr Mazzoni is the Chief Geologist at Coffey Mining, is a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM), has Chartered Professional (CP) accreditation and is a Member of the Society of Economic Geologists (MSEG). Dr Skwarnecki is a professional geologist and geochemist with 22 years experience in exploration and evaluation of mineral properties in Australia and overseas. He is a Senior Consulting Geologist with Coffey and is a Member of the Australian Institute of Geoscientists (AIG).

Each of the authors has the appropriate relevant qualifications, experience, competence and independence to be considered an "Expert" or "Specialist" under the definitions provided in the Valmin Code and as "Competent Persons" under the definition provided in the JORC Code. Neither Coffey Mining, nor the authors of this report have, or have had previously, any material interest in Lawson or the mineral properties or companies in which Lawson has, or is earning, an interest. Our relationship with Lawson is solely one of professional association between client and independent consultant. This report is prepared in return for professional fees based upon agreed commercial rates and the payment of these fees is in no way contingent on the results of this report.

This report has been prepared in accordance with the Code and Guidelines for Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Reports ("The Valmin Code"), and the rules and guidelines issued by such bodies as the ASIC and Australian Securities Exchange (ASX), which pertain to Independent Expert Reports. The report is also consistent with the 'Australasian Code for Reporting of Mineral Resources and Ore Reserves' as prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Mineral Council of Australia (JORC).

For and on behalf of Coffey Mining Pty Ltd

  
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Chief Geologist

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## EXECUTIVE SUMMARY

### Introduction

Lawson Gold Limited ("Lawson") commissioned Coffey Mining Pty Ltd (Coffey) to prepare an Independent Technical Report (ITR) for various gold and base metal exploration projects in the Kingdom of Saudi Arabia (KSA). The Project tenements comprise 14 Exploration Licenses (ELs) and two Mining License Applications (MLA) covering 2,149km<sup>2</sup> (Figure 1). The Licenses are held by Mawarid Energy and Mining Company ("MEMC") and the Mining License Applications (MLA) have been made to retain 50km<sup>2</sup> each of the expired Kitnah and Arin ELs. The legal status of the MEMC licenses, the various agreements covering those interests, and the exploration, mining and minerals processing legislation applicable in KSA have not been independently verified by Coffey. These are the subject of a separate legal due diligence by Lawson. The present status of tenements, agreements and legislation described in this report is based on information provided by MEMC and by Lawson's Saudi legal advisors.

The primary authors of this report are Mr Paul Mazzoni and Dr Marian Skwarnecki. Each of the authors has the appropriate relevant qualifications, experience, competence and independence to be considered an "Expert" or "Specialist" under the definitions provided in the Valmin Code, and as "Competent Persons" under the definition provided in the JORC Code. The Independent Technical Review has been prepared on information provided by MEMC and available up to and including 16 July 2012. Site visits were undertaken to eight licenses by Mr Paul Mazzoni and Dr Marian Skwarnecki between 8 and 23 September 2011. The following eight licenses were visited; Arin, Kitnah, Tathlith, Ajer, Turabah-Aqiq, Garith, Miyah and Qubbah. Forty three rock samples from 10 prospects were submitted for independent assay.

### Country Background

The Kingdom of Saudi Arabia (KSA) is a monarchy governed by King Abdullah bin Abdul-Aziz Al Saud in conjunction with the Consultative Council acting as an advisory body. KSA is an Islamic state with its judicial system based on Islamic i.e. Shari'ah law. It is the largest state in the Middle East and covers an area of 2,149,690km<sup>2</sup> bordered by Jordan, Syria, Iraq and Kuwait to the north, Qatar and United Arab Emirates to the east and Yemen and Oman to the south. Riyadh is the capital city and its major ports are: Jeddah Islamic Port on the Red Sea and King Abdul Aziz Port on the Arabian Gulf. Approximately 95% of the country is arid or semi-arid and only 0.5% is arable. Oil exports in the 1970s and '80s provided enormous revenue turning the underdeveloped country into a modern state. The country remains a leading producer of oil and natural gas and holds more than 20% of the worlds proven oil reserves. KSA has a modern transportation network of roads, railroads, air, marine and public transport.

### The Minerals Industry

The KSA economy is strongly linked to hydrocarbon production, which accounts for about 61% of the nominal gross domestic product. In 2009, the value of Saudi Arabia's total exports was about US \$192 billion and dominated by both crude and refined hydrocarbons. Phosphate, bauxite and industrial minerals including feldspar currently dominate the non hydrocarbon sector of the minerals industry. The Government maintains ownership in most of the large companies that operate in the mineral sector, which included Saudi Basic Industries Corp (SABIC) and Ma'aden. Subsidiaries of SABIC include the Al-Jubail Fertilizer Co., the National Chemical Fertilizer Co., the Saudi Arabian Fertilizer Co., the Saudi Iron and Steel Co. (Hadeed), and several petrochemical companies.

Mining and mineral exploration are governed by the Deputy Ministry for Mineral Resources (DMMR) a constituent of the Ministry of Petroleum and Mineral Resources, based in Jeddah. The DMMR is the sole agency handling the application and administration of the Mineral Resources Mining Investment Code, 2004 which promotes diversification and development of the non hydrocarbon sector. A Mineral Investment Services Centre is being established at the DMMR to facilitate access to information and concession documents for potential investors. The Mining Investment Code allows foreign ownership, repatriation of profits and a favourable tax regime.

There is currently no significant base metal production in KSA but new projects being developed by foreign companies are expected to come on stream over the next 12 months. These include Jabal Sayid and Al Massane, both VMS style polymetallic deposits with gold credits and should maintain precious metal production. Ma'aden and its subsidiaries are currently the sole gold producers in KSA with a modest annual production of 176,000oz Au and 305,000oz Ag in 2009. Ma'aden also produced 5,000t of Zn and 2,000t of Cu in concentrates from the Al Almar polymetallic gold mine. Ma'aden gold production appears to be declining.

### **Geology and Metallogeny of KSA**

The terranes exposed in western Saudi Arabia, in which the MEMC Projects occur, are part of the Arabian-Nubian Shield (ANS) which is mainly composed of volcanic, sedimentary and intrusive rocks of Neoproterozoic age (1000-542Ma). The shield formed by the accretion of several tectonostratigraphic terranes during successive tectonic events between 780-640Ma, caused by the convergence of East and West Gondwana along sutures (large scale boundary faults) between the terranes. This was followed by intrusion of plutons, strike-slip faulting, development of pull-apart basins, local uplift of gneiss domes, and the unconformable deposition of layered rocks on the newly-accreted terranes. More recently, rifting associated with the opening of the Red Sea has resulted in younger basin development along the Red Sea margins and extensive Cainozoic basaltic volcanism (the Harrats). The rifting split the ANS into two halves. The western half of the shield occurs in Sudan, Ethiopia, Somalia, Eritrea and Egypt, while the eastern half occurs in Saudi Arabia and Yemen. For the purposes of considering mineral endowment, it can be regarded as one entity. Gold and base metal mineralisation is ubiquitous through the ANS although only a few deposits of significance are currently being mined. These are primarily gold deposits or copper-zinc deposits often with associated important precious metal content.

The ANS is host to several significant mesothermal gold deposits which are either intrusive related or shear zone hosted. The Sukari gold deposit in Egypt is the most significant gold deposit in the ANS with current resource of more than 12 million ounces. The Lega Dembi deposit in Ethiopia is a typical mesothermal shear zone hosted gold deposits with a total endowment of about 3.3 million ounces. The Koka deposit in Eritrea is of a similar style with about 1.1Moz. Examples of mesothermal shear and intrusive related gold deposits in Saudi Arabia include the Sukhaybarat Deposit with original resources of 8.5Mt @ 2.5g/t Au. Several epithermal deposits are known from the ANS including Mahd adh Dhahab with 2Mt @ 24g/t Au and 87g/t Ag and Al Amar with 3.5Mt @ 10.5g/t (1.07Moz).

Volcanogenic massive sulphide (VMS) deposits containing varying amounts of copper, zinc, gold and silver are the principal base metal deposits in the ANS. More than 60 occurrences are known from KSA, the largest of which is Jabal Sayid with total Resources of 37.5Mt @ 2.2% Cu (with approximately 0.3g/t Au, 21g/t Ag and 0.5% Zn). Other significant base metal deposits known are at Al Massane (currently under development) and Kutam.



### Arin EL

The Arin EL contains the Kutam Cu-Zn-Ag-Au Deposit and the Farah Garan Cu-Zn-Ag Prospect hosted by Neoproterozoic volcanics and volcanoclastics of the Malahah Belt. More extensive copper mineralisation at Kutam has generally been described as VMS style and has been the subject of significant exploration activity including diamond drilling and preliminary metallurgical testwork. The prospect was discovered by the USGS (United States Geological Survey) in 1974 and drilled by the USGS and Noranda exploration in 1976-77. The drilling defined a steeply-dipping zone of disseminated and stringer style Cu-Zn mineralisation. PHME acquired the deposit as part of the Malaha-Najran Exploration License in July 1997. The investigations by PHME culminated in a new resource estimate and preliminary pit optimisation studies completed in 2010 by MineMap Consulting Pty Ltd (MineMap). Total Indicated and Inferred Resources for the Kutam Deposit were estimated at 16.43Mt @ 1.03% Cu, 0.51% Zn and 0.10g/t Au (Table A).

Metallurgical testwork conducted in 1978 suggested it would be possible to obtain a copper concentrate assaying 25% Cu with a recovery of 95% but additional testwork is required to confirm the viability of producing saleable copper and zinc concentrates. A first pass economic analysis of the Jabal Dhaylan prospect was completed by MineMap using a Lerch Grossman Algorithm. Two high level pit optimisations were undertaken, one at a 1% Cu equivalent cutoff grade using the total Resource and one at a 1% Cu equivalent cutoff grade, using a model constrained to Indicated Resource only.

| <b>Table A</b><br><b>MineMap 2010 Kutam Mineral Resource Estimate</b> |                   |                     |                     |                       |
|-----------------------------------------------------------------------|-------------------|---------------------|---------------------|-----------------------|
| <b>Category</b>                                                       | <b>Tons</b>       | <b>Cu Grade (%)</b> | <b>Zn Grade (%)</b> | <b>Au Grade (ppm)</b> |
| Indicated                                                             | 6,173,000         | 1.25                | 0.76                | 0.08                  |
| Inferred                                                              | 10,261,000        | 0.89                | 0.36                | 0.11                  |
| <b>Total</b>                                                          | <b>16,434,000</b> | <b>1.03</b>         | <b>0.51</b>         | <b>0.10</b>           |

Coffey considers that there are a number of data deficiencies which impact on the confidence in the Kutam resource estimate but that these could at least be classified as "Inferred Resources". Coffey reviewed the pit optimisations completed along with the cost assumptions used and concluded that there are some indications that the Kutam Deposit may host a potentially economic source of Cu. The economic potential of the currently defined resources appears to be marginal however there is excellent potential for increasing the resources at depth through additional exploration drilling.

The deposit is open down plunge at good Cu-Zn grades over mineable widths and additional drilling is required to establish the potential for underground mining to supplement open pit ore. Further more detailed project studies are required to more accurately assess the potential project economics. These should be underpinned by an updated resource estimate incorporating the additional drilling.

At Farah Garan, sulphide mineralisation is directly associated with cherty dolomite in four exhalative units. The highest grades are found in the "South" unit, as banded and disseminated pyrite, sphalerite, chalcopyrite, tetrahedrite-tennantite and galena. Only thin intervals of significant mineralisation have so far been intersected and the prospect appears to have limited potential.

### Ajer EL

The Ajer Exploration License contains the Jabal Dhaylan zinc-lead deposits. The deposits are hosted by the Miocene Maqna Group carbonates, claystones and sandstones. The significant mineralisation is broadly concordant with coarser grained carbonate facies although in detail is often discordant. It shows many similarities to Mississippi-type (MVT) deposits. The deposits are dominated by "oxide" mineralisation which mostly consists of black manganese oxides containing about 30% Zn together with hemimorphite and hydrozincite with bulk grades commonly exceeding 15% Zn. Primary sulphide mineralisation consisting of sphalerite and galena has been intersected in some of the deeper drilling although the grades encountered to date are quite low.

Seven prospects were identified by PHME: JJM3m, JJM4m, JJM4m South, JJM5m, Badu Camp, New Gossan, and RRC. The JJM3m (Calamine Hill), JJM4m and New Gossan (East and West) Deposits have been the focus of most drilling. Mineral Resources for Jabal Dhaylan were estimated at a 1% Zn cutoff by MineMap in 2010 from drilling data provided by PHME. These estimates have not been independently validated by Coffey. The total Mineral Resources were estimated at 4.076Mt @ 5.29% Zn and 1.07% Pb. Over half of the total is in the JJM-3m Deposit (Table B).

| <b>Table B</b><br><b>Jabal Dhaylan MineMap 2010 Resource Estimate</b> |                  |             |                      |             |                      |
|-----------------------------------------------------------------------|------------------|-------------|----------------------|-------------|----------------------|
| <b>Deposit</b>                                                        | <b>Tons</b>      | <b>Zn %</b> | <b>Zn Metal tons</b> | <b>Pb %</b> | <b>Pb Metal tons</b> |
| New Gossan -East                                                      | 1,085,583        | 5.43        | 58,947               | <b>0.9</b>  | 9,770                |
| New Gossan -West                                                      | 460,791          | 5.73        | 26,403               | 0.76        | 3,502                |
| JJM-3m                                                                | 2,382,373        | 5.10        | 121,501              | 1.26        | 30,017               |
| JJM-4m                                                                | 146,982          | 6.09        | 8,951                | 0.29        | 426                  |
| <b>Total</b>                                                          | <b>4,075,729</b> | <b>5.29</b> | <b>215,802</b>       | <b>1.07</b> | <b>43,715</b>        |

Coffey considers that there are a number of data deficiencies which impact on the confidence in the resource estimate but that these could at least be classified as "Inferred Resources".

A first pass pit optimisation study and economic analysis of Jabal Dhaylan was completed by MineMap in 2010 using a Lerch Grossman Algorithm. Two high level optimisations were undertaken, one at a 1% Zn equivalent cutoff grade and one at a 10% Zn equivalent cutoff grade.

A metallurgical testwork program and Scoping Study was conducted by Mintek in South Africa in 2000 and a more extensive test program completed in 2008. No physical concentration (upgrading) of the ore was demonstrated and any process route must be capable of treating raw ore. Two process routes were examined; an acid leach hydrometallurgical and a pyrometallurgical process. Both were shown to be viable although the hydrometallurgical process suffered from high acid consumption in some of the carbonate rich units unless a pre roast (calcining) was employed and the pyrometallurgical process requires feed grades around 15% Zn. From the Mintek Scoping Study, the pyrometallurgical processing route (DC Arc Furnace) proposed to treat 105,100t/year of 15% Zn ore to produce ~15,000kg of high grade PWG (Prime Western Grade) zinc ingot for direct sale.

Coffey has reviewed the testwork and pit optimisation studies and concludes that there are some indications that the Jabal Dhaylan Prospect may host a potentially economic source of Zn (and Pb). Coffey's review suggests marginal economics for the Project at the level of accuracy of the input data. Additional work is warranted to more clearly define inputs to financial modelling. The main focus should be on growing the resource base in order to offset capital costs. Addition of sulphide resources to the oxide resources will provide additional processing options and could have a significant positive benefit on Project economics.

At Jabal Dhaylan, the extensive younger cover conceals most of the host stratigraphy and provides significant exploration potential for additional shallow oxide resources. There is also exploration potential for deeper sulphide mineralisation which would not only add to the total resource base but would also provide significant metallurgical benefits.

## Kitnah EL

The Kitnah EL contains the Al Majma and Kitnah gold prospects hosted by predominantly felsic volcanic and metasedimentary rocks of the Halabah Group. The prospects define a semi continuous zone of gold mineralisation extending over a 2km strike extending to the northern EL boundary associated with the major NNE trending Asharah Fault Zone or a splay off this fault.

Mineralisation outcrops as thin gossan bands, boudinaged quartz veins, deformed and undeformed quartz vein breccias and gossanous quartz breccia veins. These vary from tens of centimetres up to several metres wide. There is significant local structural complexity characterised by polyphase deformation during veining and brecciation. Gossanous zones at surface show anomalous base metal and gold values with up to 7000ppm Cu, 2450ppm Zn, 38ppm Au and 19ppm Ag. Ancient workings are locally developed on these zones, most notably at Al Majma South. Primary sulphides associated with quartz carbonate veining and thin foliation concordant sulphide bands comprise mainly pyrite, with lesser chalcopyrite, arsenopyrite, sphalerite, tetrahedrite and minor pyrrhotite. Several well exposed narrow gossanous quartz breccia veins west of the main mineralised zone at Kitnah have also been mapped and sampled by PHME. These returned maximum rock chip values up to 35.25g/t Au but are very well exposed and appear to have limited tonnage potential.

The Majma-Kitnah zone has been drilled out by PHME with 59 west dipping diamond drillholes at approximately 50m spacing along strike. Forty six holes recorded intercepts with >0.5g/t Au suggesting extensive low level gold mineralisation over the whole 2km strike but only a few holes show intersections of potential economic interest. The drilling results suggest higher grade mineralisation is so far confined to three discrete zones at Al Majma (MA12, MA46), Al Majma South (MA23B, MA02 and MA08) and Kitnah Main Zone (MA29 and MA48). The most significant intersection was in hole MA-12 which recorded 16.47m @ 11.04g/t Au associated with strong quartz carbonate pyrite tetrahedrite veining with minor arsenopyrite and chalcopyrite.

Results suggest that higher grade shoots may have limited (<50m) strike but Coffey believes that the controls on the higher grades have yet to be understood and the drilling pattern completed to date has not necessarily defined their true potential. The mineralised zone is open along strike to the north (outside the current EL) and to the east under Wadi Kitnah where it is covered by recent wadi sediments. Extensive As anomalism defined by the wadi sediment geochemical survey suggest the total mineralised system may have over 9km of additional strike to the south of the known prospects. These all provide a valid exploration opportunity to define more significant gold mineralisation within the project.

Since most of the project area consists of outcrop and residual soil, systematic surface geochemical sampling (including wadi sediments, soils and composite rockchips) should provide a quick and effective tool to screen these areas and focus in on significant mineralisation. Collection of detailed airborne magnetic data is warranted to facilitate structural interpretation particularly in areas of younger cover. Detailed structural mapping and additional close space drilling are required to resolve shoot geometries and economic potential associated with the current high grade intersections.

## Tathlith EL

Tathlith is the largest of the MEMC exploration licenses and is made up of five separate blocks covering an area of 678.3km<sup>2</sup> in the Nabitah Mobile Belt flanking the Nabitah Fault Zone (NFZ). The EL contains the Lugatah Prospect, numerous other gold prospects including Bir Cananah, West Thafin, Al Hasbat and Ailah-Avala along with numerous ancient mines. The gold prospects are mainly associated with the NFZ, within a zone termed the “Jabal Ishmas-Wadi Tathlith Gold Belt” by the USGS. Gold mineralisation is associated with quartz carbonate veins hosted by a variety of greenschist facies rocks including metavolcanics, metasediments and both mafic and felsic intrusives.

The Lugatah Prospect is the most significant gold occurrence currently known in the EL and is associated with a major N-S line of ancient workings. In 2003, the Saudi Geological Survey (SGS) completed 24 generally shallow diamond drillholes to investigate the mineralisation down to 70m over about 500m of strike. Sampling revealed multiple zones of gold mineralisation in wide sheared and altered zones. Nine boreholes returned individual intersections between 2.6m and 6.0m width with Au grades between 5 and 51g/t Au. Another 14 boreholes returned average grades between 0.2 and 4g/t over widths of up to 54m. Surface composite rock chip sampling and re assaying of SGS core by PHME generally confirmed the mineralisation although some nugget effect was evident. The mineralisation is open at depth and along strike to the north and south. The north end in particular has some of the best drill intersections including 6m @ 7.38g/t Au from 142m in drillhole CO-14 on the last close spaced drill traverse. The mineralisation passes under transported cover to the north of here and has not been tested. There is significant potential to define an open pitable gold resource at Luggatah with additional systematic drilling.

The Al Hasbat Prospect consists of a 520m-long group of ancient mine workings, quartz dumps and quartz vein outcrops. It was mapped and sampled by the UGSS in the early 1970s. An initial six drillhole RC drilling program by PHME in 2005 returned generally narrow intersections (1m) with up to 33.97g/t Au and no further work was done. No systematic surface geochemistry, airborne magnetic data collection and interpretation or structural mapping was done.

At the Hobuyet Prospect drilling designed to test ancient workings returned narrow (1m ) intersections up to 2.4g/t au and at Wadi Thafin up to 5.4g/t Au over 1m. Similar narrow zones of low to moderate grades were encountered in RC drilling at the Ailah-Avalah Prospect with values up to 7.19g/t Au over 1m. At Bir Cananah in the northwest Thafin area, PHME RC drilling of ancient workings on a 150m long quartz vein returned up to 4m @13.9g/t Au (TFN-02) and 3m @29.14g/t Au (TFN-01). RC drilling at West Thafin on a 100m long quartz vein returned intersections up to 3m @17.38g/t Au.

Numerous gold occurrences throughout the EL suggest a generally fertile belt capable of hosting economic mineralisation under the right local conditions. Geophysical and geochemical base data need to be compiled (or acquired) then reviewed with a view to generating targets for follow up. Particular emphasis is required on structural interpretation and assessment of target areas concealed by younger cover.

## **Turabah-Aqiq EL**

The EL is made up seven separate areas covering an aggregate area of 254.63km<sup>2</sup>. The EL is underlain by Proterozoic rocks which are part of the Bidah Belt of the Asir Terrane. These consist of greenschist facies sheared volcanic, sedimentary and plutonic rocks that have been tightly to isoclinally folded about N-S trending axes and are cut by numerous N-S trending brittle-ductile shear zones. There are four gold prospects which have been drilled by PHME; Aqiq-Ghamid, P777, Mulhal and Shignah as well as many other smaller gold prospects many of which were drilled in the past by Ma'aden. The most significant prospects are Mulhal and the Aqiq-Ghamid Ancient Mine.

Mulhal was initially explored as a VMS copper prospect focussed on several ancient workings. Host rocks have been described as andesitic to dacitic volcanics, volcanoclastics and sediments. These are generally extensively sheared and altered and isoclinally folded with flat to steep plunging N-S trending fold hinges,. Sheared gossanous zones comprise; quartz, limonite-goethite, secondary Cu minerals and minor barite. These occur both concordant with foliation and bedding or as discordant zones in shears and faults. They are generally recessively weathering and usually accompanied by extensive hematite staining possibly derived from primary chlorite alteration. Three sub parallel gossanous alteration zones are described over about 1.5km of strike.

PHME RC drilling and trenching in the southernmost area returned very significant gold-silver intersections over a potential strike length of 300m which have not been closed off by drilling either down dip or along strike. It includes high grade RC drill intersections such as the 7m @ 20.2g/t Au and 147.3g/t Ag in hole MUL-23 which require immediate drill follow up. Diamond drilling in the northern prospect area zones returned only narrow gold anomalous zones but it is far from clear how the drilling was planned and how effective it has been.

At Aqiq-Ghamid, extensive ancient workings followed generally narrow steep dipping dilational quartz veins at various orientations hosted by tonalite and quartz porphyry. Generally narrow weakly gold anomalous sericite-pyrite alteration selvages surround the veins. The USGS drilled 12 diamond drillholes and PHME drilled six diamond holes and 21 RC drillholes. Individual veins are thin, sparsely distributed in the outcrop areas and nowhere appear frequent enough to present a bulk tonnage low grade mining opportunity. Areas of subcrop and thin cover were partially tested by PHME with both trenching and with small grids of "post hole" drilling however no compilation of these data was seen. The area lends itself to systematic surface geochemical exploration and shallow regolith drilling. It is recommended that this be completed first to assess the potential for a bulk tonnage low grade deposit.

## **Qubbah EL**

The EL contains the Qubbah gold prospect hosted by an intrusive grading from coarse diorite to quartz-gabbro, intruding hornfelsed metasediments. A number of small trenches and pits, typically no wider than a metre, have been dug by ancient miners into NE trending shear zones with sparse quartz veining or quartz stockwork veins cutting the intrusive. Rock chip sampling returned assays values of 0.01-9.47g/t Au. PHME completed 5 RC holes (for 696m) in 2007 with the most significant intersections being 3m @ 6.81g/t Au from 44m in hole QUB-1 and 1m @ 20.7g/t Au in QUB-4.

### Miyah EL

This EL contains a large number of gold prospects hosted by low-grade metavolcanic and metavolcaniclastic rocks of the 725Ma Zaam Group. The host rocks and mineralisation are well exposed with only restricted areas of alluvial or scree cover. The gold occurrences are associated with ancient workings, usually with widths up to several metres and strike lengths of 75-200m. Drilling was completed over ten of these prospects by PHME.

The Tefel Prospect contains a 300m x 80m zone of multiple foliation parallel quartz veins hosted by quartz sericite schist. Individual veins range up to 10m width and up to 100m length. PHME rock samples included a maximum value of 44.35ppm Au and an overall average value of 1.39ppm Au. Eight RC holes were drilled and returned a number of intersections of several metres at 1-2g/t Au with a maximum of 10g/t over 1m in TEF-03.

The Umm Al Qurayyat Prospect contains ancient workings consisting of shallow declines down the dip and along the footwall of sheeted quartz veins in the hangingwall of a thrust and are spatially associated with an inner zone of red-weathering pyrite-sericite alteration and an outer zone of orange-weathering carbonate-chlorite alteration. Rock chip sampling returned multiple >1ppm Au assays with a maximum value of over 27ppm Au. PHME planned a 20 hole RC drilling program to test this area.

PHME completed 19 RC drillholes into ancient workings at the Abu Nafilah Prospect. Best results included 7m @ 6.82g/t Au from 33m in drillhole NAF-02 and 6m @ 8.1g/t from 86m in NAF-16.

Given the extensive outcrop and generally small size of the mineralised veins, the potential for a significant sized gold deposit in this EL appears limited. However the widespread nature of the gold mineralisation suggests a systematic surface geochemical sampling program, structural interpretation and review of exiting data should be completed to assess the potential for more significant mineralisation.

### Garith EL

The EL comprises three separate blocks (GAR-1 to GAR-3) covering 363.66km<sup>2</sup> and mostly underlain by rocks of the Asir Composite Terrane. These are greenschist to amphibolite facies Neoproterozoic volcanics and metasediments bounded to the west and south by Tertiary to Quaternary lava flows. Proterozoic intrusive rocks comprise diorite, tonalite, granodiorite, syenogranite, olivine gabbro and anorthosite. The EL also includes extensive areas of Tertiary to Recent sediment cover. There are 26 known metallic mineral occurrences including quartz vein hosted Cu-Au in meta-volcanic rocks or diorite, magnetite lenses, W bearing quartz veins, fault related Ba-Mn veins and base metal sulphides hosted by Cainozoic algal reef limestones.

The GAR-1 license block contains the Al Shoabah prospects comprising quartz veining with carbonate and very local sericite alteration over an area of 6km by 1.7km. The prospects are interpreted as lying along strike from Ma'aden's Ar Rjum Au deposit 30km to the north. Geochemical posthole drilling returned few anomalous results and few holes from the 43 hole RC follow up drilling returned values of note. The best intersections were 1m @ 4.881g/t Au (SHU-09) and 2m @ 1.592g/t Au (SHU-31).

The P778 Prospect (GAR-2) comprises two veins clusters within the Najd Fault Zone consisting of several N-S trending quartz veins with limonite, hematite, Mn oxides and malachite staining. Vein widths range from <1m to >3m and 10 of the 151 composite rock chip samples returning >1g/t Au. Much of the drilled mineralisation at Garith appears to be narrow and low-grade. Further exploration should concentrate on data acquisition, compilation and new target generation.

### Other Projects

The remaining eight exploration licenses were generally assigned lower priority by MEMC. Accordingly only summary information was reviewed by Coffey. It is recommended that a more comprehensive data review is completed. All eight licenses contain ancient workings which have been rock chip sampled and in some cases drilled by MEMC. At **Madha**, **Mutahil**, **Nabagha** and **Harb**, generally low gold levels (1-2g/t Au) were reported from rockchips and drilling. The remaining four licenses generally contain some interesting results and should be reviewed first.

One drillhole into an 80m long quartz vein at **Khadra** returned 6m @ 43.78g/t Au from 20m. Three prospects were identified at **Matran** with drill results including 7m @ 4.02g/t Au at the Al Ula Prospect. The **Silaila** license contains four gold prospects including the P196 ancient mine area where veining and alteration occur over 1.5km of strike. Of the 361 rock samples collected, 122 returned >1g/t Au and 15 contained >10g/t Au. At the Hawawit prospect, 10% of the rockchip samples (48) returned >1g/t Au. The **Buwaydah** EL contains two prospects including Al Buwaydah where 144 rockchip samples from an 8m wide, limited strike length vein averaged 3.01g/t Au and the maximum value was 311g/t Au.

### Major Conclusions and Recommendations

The MEMC portfolio of tenements in the KSA represents a unique opportunity to acquire a significant ground holding in the ANS with a significant number of base metal and gold prospects. While some of the known prospects have been explored for over thirty years, the intermittent exploration effort, changing commodity focus, lack of systematic exploration and lack of application of appropriate modern exploration technology has resulted in only partially effectiveness of this historical exploration. Historical exploration has also very much focused on outcrop areas and follow up of known occurrences.

In more recent times, pressures imposed by license maturity and statutory expenditure commitments have provided an increasing complication with managing these assets and have sometimes resulted in the application of a less than optimum exploration strategy. The time constraints imposed by license maturity will require careful management and will result in the need to convert some of the key areas to Mining Leases to retain them. It becomes important in 2013 for some key licenses such as Ajer. The total life of tenement statutory expenditure commitment for the current MEMC licenses is US\$15.23M. Of this, about \$2.3M has already been spent on exploration. The remaining expenditure commitment for all the tenements is US\$12.925M by September 2013. This is a significant commitment which requires careful management and it is not clear if waivers are possible.

Coffey Mining considers that there are three key prospects which provide immediate opportunities for exploration success; Mulhal, Kutam and Lugatah. A fourth prospect, Jabal Dhaylan offers significant exploration potential for additional resources under cover but drill target definition has yet to be undertaken. A fifth prospect, Kitnah-Majma, has returned a few significant gold intersections but requires additional detailed work including some high priority close spaced drilling follow up to determine its potential.

Both the Mulhal and Lugatah Prospects offer high priority “walk up” drill targets with excellent opportunity to define significant additional resources. At Mulhal, significant high grade gold mineralisation in trenching and RC drilling extends over at least 300m of strike and to 50m depth. It has not been closed off along strike or at depth. It includes high grade RC drill intersections such as the 7m @ 20.2g/t Au and 147.3g/t Ag in hole MUL-23 which require immediate follow up. At Lugatah, a significant gold system comprising one or more dominant flat dipping quartz reefs and substantial footwall zones of steep dipping stringer veins has been defined over 500m of strike. To date only shallow drill testing has been completed and the system is open to the north of the best drill intersections. Intersections requiring follow up include 6m at 26.1g/t Au from 21.5m in hole CO-07 underlain by 3m @ 14.3g/t Au from 73.5m in hole CO-16. The gently dipping nature of the mineralisation offers an opportunity for open pit mining with a low strip ratio.

Coffey Mining considers that the Jabal Dhaylan and Kutam Deposits are both potential opportunities to develop small mining and processing operations however on current indications both appear to have marginal economics. In both cases project economics would be improved by increasing the resource base. Additional resource drilling requires implementation of a rigorous QAQC regime and resource estimation should follow current best practise to ensure JORC compliant Mineral Resources are established with a high degree of confidence.

For the remaining extensive ground holdings, a prospect review and prioritisation is required. There is a need to systematically review all the historical exploration data and plan acquisition of key exploration base data such as surface geochemistry to filter well exposed areas and areas of residual soils. Detailed airborne magnetic survey data and regolith drill geochemistry should be used to assess areas of concealment and generate targets for follow-up. Well exposed areas with only sporadically mineralised narrow veins or small gossanous zones with no significant untested EM anomalies offer little obvious potential.

An experienced Exploration Manager and several exploration geologists need to be committed full time for at least the first 12 months in order to adequately resource the initial work.

# 1 INTRODUCTION

## 1.1 Terms of Reference

Lawson Gold Limited ("Lawson") has commissioned Coffey Mining Pty Ltd (Coffey) to prepare an Independent Technical Report (ITR) on various gold, and base metal exploration projects in the KSA. Coffey Mining was also engaged by Grant Thornton Australia ("Grant Thornton") to produce an independent technical valuation of these projects and this valuation will be subject to a separate disclosure. The Project tenements comprise 14 Exploration Licenses (ELs) and two Mining License Applications (MLA) covering 2,149km<sup>2</sup> (Figure 1.1\_1 and Figure 1.1\_2). The ELs are held by Mawarid Energy and Mining Company (MEMC). A full tenement schedule is given in Appendix A. The most advanced projects are the Kutam Cu-Zn-Au Project and the Jabal Dhaylan Zn-Pb Project, both of which have been subject to significant drilling and Mineral Resource estimates completed. Other major projects with significant past exploration include the Magma-Kitnah Au project, the Lugatah Au Project, the Aqiq-Ghamid Au Project and the Abu Nafilah Au Project.

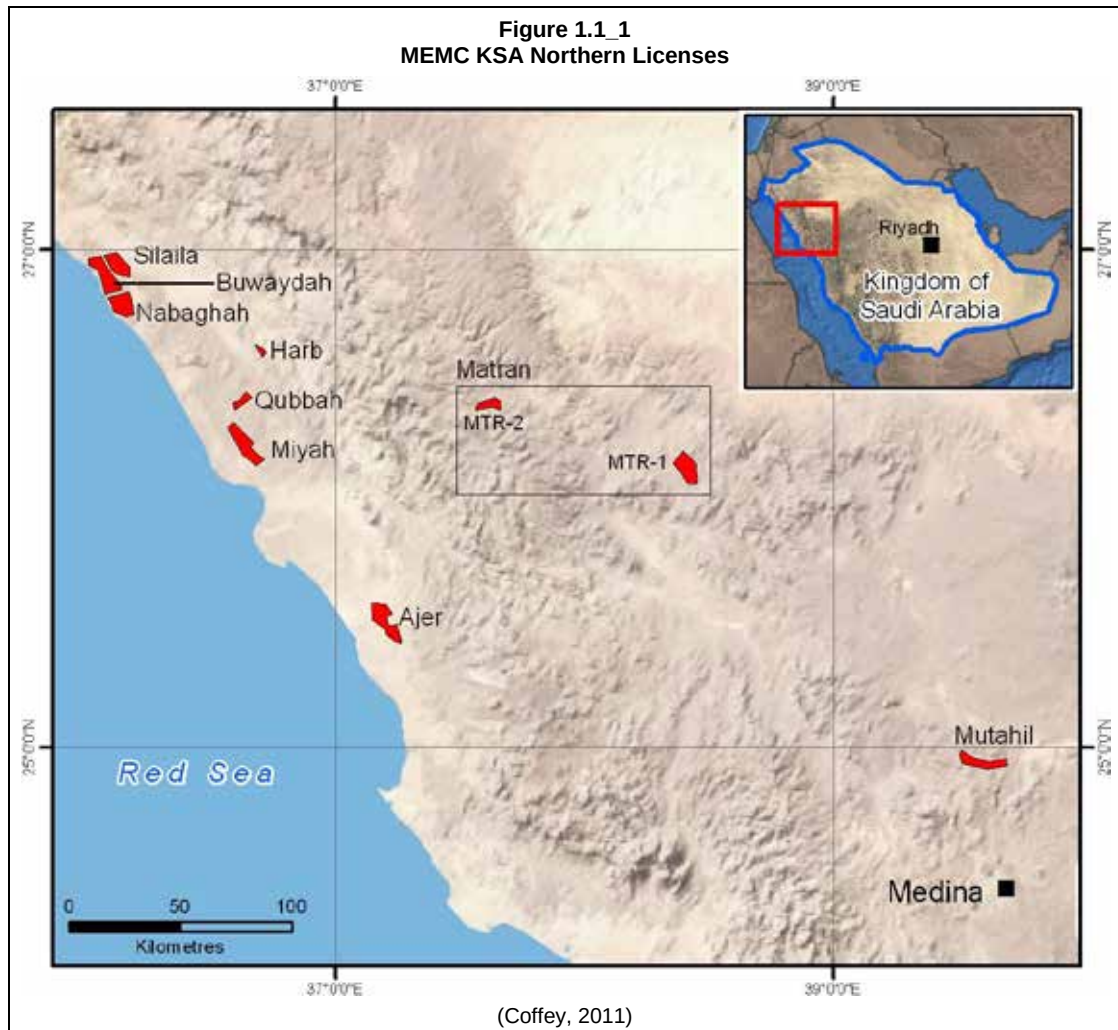
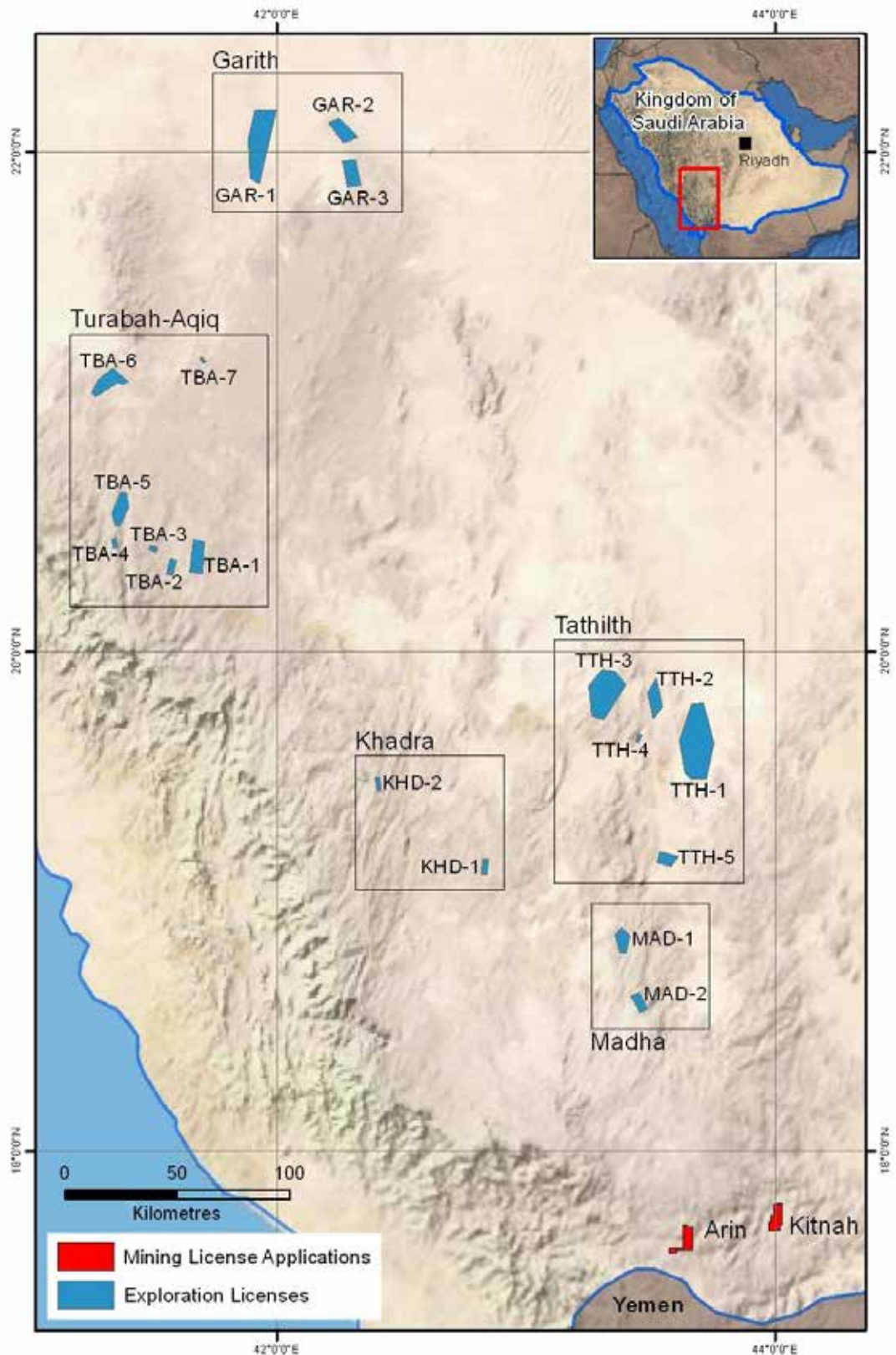


Figure 1.1 2  
MEMC KSA Southern Licenses



(Coffey, 2011)

The legal status of the MEMC assets, the various agreements covering those interests, and the exploration, mining and minerals processing legislation applicable in KSA have not been independently verified by Coffey. The present status of tenements, agreements and legislation described in this report is based on information provided by MEMC, and the report has been prepared on the assumption that exploration and potential development of the projects will prove to be lawfully allowable. Coffey is not qualified to comment on the nature of the transactions or arrangements between Lawson, and other third parties.

The Independent Technical Report has been prepared on information available up to and including 16 July 2012. The conclusions expressed in this report are therefore only valid up to this date and may change with time in response to variations in economic, market, legal or political factors, in addition to on-going developments with respect to the planned exploration and development activities. All monetary figures included in this report are expressed in United States dollars (US\$) unless otherwise stated.

## **1.2 Qualifications, Experience and Independence**

Coffey is an exploration, mining and resource consulting firm, which has been providing services and advice to the international mineral industry and financial institutions for over 50 years.

The primary authors of this report are Mr Paul Mazzoni and Dr Marian Skwarnecki. Mr Mazzoni is a professional geologist with 35 years experience in the exploration, development and mining of base and precious metal properties and industrial mineral properties internationally. Mr Mazzoni is the Chief Geologist at Coffey Mining, is a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM), has Chartered Professional (CP) accreditation and is a Member of the Society of Economic Geologists (MSEG). Dr Skwarnecki is a professional geologist and geochemist with 22 years experience in exploration and evaluation of mineral properties in Australia and overseas. He is a Senior Consulting Geologist with Coffey and is a Registered Professional Geoscientist (AIG).

Each of the authors has the appropriate relevant qualifications, experience, competence and independence to be considered an "Expert" or "Specialist" under the definitions provided in the Valmin Code, and as "Competent Persons" under the definition provided in the JORC Code.

Neither Coffey, nor the authors of this report have, or have had previously, any material interest in Lawson or the mineral properties in which Lawson has an interest. Our relationship with Lawson is solely one of professional association between client and independent consultant. This report is prepared in return for professional fees based upon agreed commercial rates and the payment of these fees is in no way contingent on the results of this report.

Coffey is not in a position to make direct comment on any interest the directors and promoters of Lawson may have in the company or its assets, nor is Coffey qualified to comment on or confirm this aspect.

### 1.3 Principal Sources of Information

The principal sources of information used to compile this report comprise technical records, along with technical reports and data variously compiled by MEMC and its consultants, and government agencies, along with discussions with MEMC technical and corporate management. A listing of the principal sources of information is included in Section 13 of this report. In addition, site visits were undertaken to the project areas by Mr Paul Mazzoni and Dr Marian Skwarnecki between 8 and 23 September 2011.

During the site visits, 43 validation rock samples were collected from surface mineralisation at 10 separate prospects. All samples were analysed for Au, Ag and a multi element suite of base metals and pathfinder elements at UltraTrace Laboratories in Perth, Western Australia. Site visit waypoint data are appended to this report as are all analytical results from the Coffey samples (Appendices C and D respectively). Coffey also reviewed diamond drill core from four prospects to verify mineralisation documented. The core review however was compromised by the poor state of preservation of the core and limited access to the core.

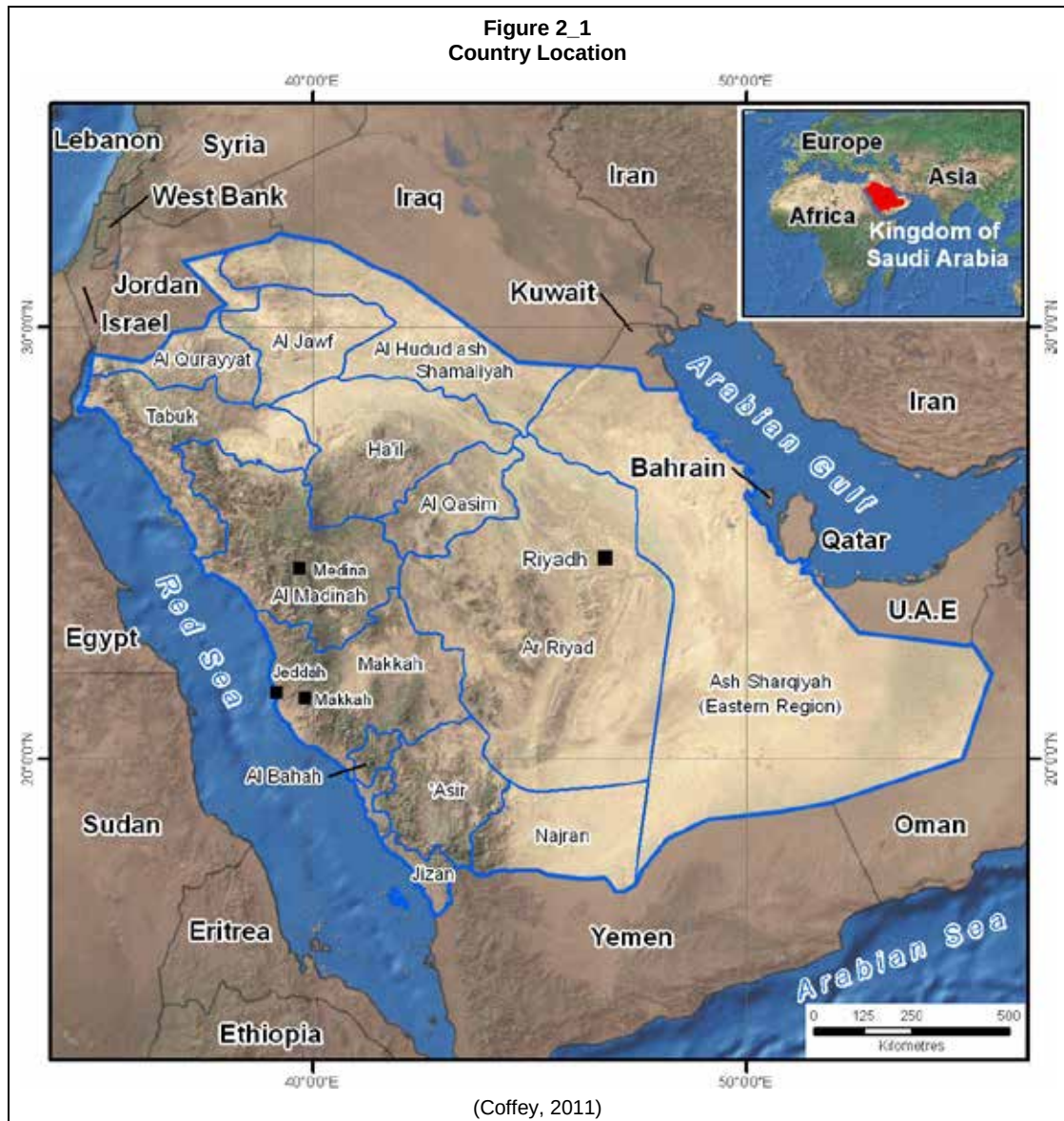
All reasonable enquiries have been made to confirm the authenticity and completeness of the technical data upon which this report is based. The quantum of historical data is such that a detailed review is beyond the scope of this report and Coffey has relied to a certain extent on summary data provided by MEMC. Not all data were present in the databases provided and some of the historical data appears to have been lost.

### 1.4 Reliance on Other Experts

The information in this report that relates to Mineral Resources is extracted from a report prepared and signed by Mr Geoff Markey and Mr Seldon Mart as co-authors. Mr Seldon Mart is a member of the Australian Institute of Geoscientists and is the chief geologist employed by MineMap Consulting. Mr Mart has appropriate relevant qualifications, experience, competence and independence to be considered a "Competent Person" under the definition provided in the JORC Code and has sufficient experience which is relevant to the type of mineralisation and type of deposit under consideration and to the activity undertaken to qualify as Competent Person under the definition provided in the JORC Code. Mr Mart has consented to be named as Competent Person for the Mineral Resource estimation and to the inclusion in this report of the matters that relate to the Mineral Resources and MineMap estimations in the form and context in which they appear.

## 2 COUNTRY BACKGROUND

The Kingdom of Saudi Arabia (KSA) is a monarchy governed by King Abdullah bin Abdul-Aziz Al Saud in conjunction with the Consultative Council acting as an advisory body. Saudi Arabia, located on the peninsula between Africa and Eurasia known as the Middle East (Figure 2\_1) was founded on 23 September 1932 by the union of the kingdoms of Hejaz and Nejd. Saudi Arabia is an Islamic state with its judicial system based on Islamic (Shari'ah) law. The following description is based largely on information from the online Britannica Encyclopaedia ([www.britannica.com](http://www.britannica.com)).



## 2.1 Geography

Saudi Arabia is the largest state in the Middle East and covers an area of 2,149,690km<sup>2</sup>. It is bordered by Jordan, Syria, Iraq and Kuwait to the north, Qatar and United Arab Emirates to the east and Yemen and Oman to the south. Saudi Arabia is open to the Red Sea to the west and the Arabian Gulf (Persian Gulf) to the east. Riyadh is the capital city and its major ports are: Jeddah Islamic Port on the Red Sea and King Abdul Aziz Port on the Arabian Gulf. Saudi Arabia is divided into 14 provinces each with a provincial capital.

Approximately 95% of Saudi Arabia is arid or semi-arid and approximately 0.5% is arable. The KSA has no natural water-courses but the landscape is still very varied with forest, grasslands, tropical coastline, rugged mountain ranges, humid oasis and vast sand dune deserts. The Eastern Province has the largest oasis and most extensive date palm groves in the world and Ar Riyadh Province is home to the largest herd of dairy cattle in the world.

### 2.1.1 Topography

The Arabian Peninsula is dominated by a plateau that rises abruptly from the Red Sea, forming an imposing escarpment running parallel to it and dips gently towards the Arabian Gulf. In the north of Saudi Arabia, the western highlands are 1,500m above sea level, decreasing to 1,200m near Medina and increasing significantly toward the southeast to 3,000m above sea level. The coastal plain is almost nonexistent on the north coast of the Red Sea, except for occasional wadi deltas and widens slightly in the south. This is in contrast to the Arabian Gulf coast where the drainage is more dendritic and much more extensive. The Tuwayq Mountains in the east are part of a series of low ridges, 1,200km long, curving eastwards north-south. They form a prominent ridge with steep slopes on the western side and gentle slopes on the east rising from the plateau 850m above sea level and up to 1,100m southwest of Riyadh.

Much of the interior of Saudi Arabia is covered by sand. The world's largest desert, Rub al-Khali (the "Empty Quarter") dominates the southern portion of the country and covers more than 647,500km<sup>2</sup> from near the border with Yemen, northeast to the Arabian Gulf.

### 2.1.2 Climate

Saudi Arabia has three climatic zones; desert almost everywhere; steppe along the western highlands and; a small area of humid and mild temperatures with long summers, in the Asir highlands north of Yemen.

Winters from December to February are generally mild, in the low to mid 20°Cs and overnight temperatures can approach freezing at higher elevations. Central Saudi Arabia, around Riyadh experiences extreme temperatures of hot and cold. During summer, the day time temperature throughout most of the country exceeds 38°C in the shade and can be as high as 55°C in the desert. In March and April, some precipitation, normally torrential, falls.

### 2.1.3 Population, Ethnicity, Languages and Religion

The population of Saudi Arabia in July 2011 was estimated at 26.13 million people with the capital Riyadh home to 4.7 million. A significant proportion of the population, one-fifth to one quarter are foreign guest workers brought in for menial and some technical of tasks. Of the Saudi natives, 90% are Arab and 10% are Afro-Asian. Nomadic Bedouin are virtually nonexistent today, with over 80% of people livening in cities and almost all the rest living in government supported agricultural enterprises. The official language is Arabic and there are three main dialect groups across the country. The monetary unit is the Saudi Riyal (SR).

Saudi Arabia is the birthplace of Islam and home to two of Islam's holiest shrines in Makkah and Medina. Most Saudis follow the majority Sunni branch of Islam and the second major branch, the Shi'ites make up a small proportion, found mostly in the eastern part of the country. It is illegal to practice or worship any non-Muslim religion in Saudi Arabia. Every year during the Islamic month of Dhu al-Hijjah, Muslims from around the world complete the Haji, the traditional Muslim pilgrimage to Makkah. The Haji is one of the five pillars of Islam and is required to be undertaken by every adult Muslim at least once in their lives providing their health and finances permit. It represents one of the largest human migrations with over 2 million participants. Only Muslims are permitted to enter Makkah and Medina.

### 2.1.4 History of KSA

Abdul Aziz Ibn Saud began a 30 year campaign to unify most of the Arabian Peninsula by conquering the oasis of Riyadh in 1902 and then Jeddah in 1926. He later proclaimed himself King, creating the Arabian Kingdom of Al Saud (Saudi Arabia) in 1932. Oil was discovered in 1936 and production began after 1941 but development was hampered by WWII. It wasn't until 1944 that full production commenced. The KSA could not supply the workforce numbers required for oil production and the Saudi monarchy formed a joint venture with a number of American oil companies called Arabian American Oil Company (Aramco) now Saudi Aramco. In 1980 Saudi Arabia assumed complete control of its oil production.

In 1991 the United States Armed Forces were invited by the Saudi monarchy to protect it from assault and liberate neighbouring Kuwait from Iraqi forces. The presence of the US troops on Saudi soil close to the holy places of Makkah and Medina angered purists and led to increased internal and external insurgencies.

In 2005 Abdullah Bin Abdul Aziz Al Saud became King after the death of King Fahd and introduced a program of moderate reform. The King was particularly concerned with the countries reliance on oil revenue and for the first time used force by security services against some extremists. Broad government changes were enacted in 2009, affecting the judiciary, armed forces and various ministries including the appointment of the first female deputy minister, in charge of overseeing girl's education. It was announced in 2011 that women will be allowed to vote in municipal elections and run for office in the 2015 elections.

## 2.2 Economy and Infrastructure

Oil exports in the 1970s and '80s provided Saudi Arabia with enormous revenue turning the underdeveloped country into a modern state. The country remains a leading producer of oil and natural gas and holds more than 20% of the world's proven oil reserves.

Saudi Arabia has a modern transportation network of roads, railroads, air, marine and public transport. There are three international airports: King Khalid International in Riyadh, King Fahd International in Dhahran and the King Abdulaziz International Airport in Jeddah and 24 regional and local airports. The national airline, Saudi Arabian Airlines (SAA) began in 1945.

## 2.3 Minerals Industry

### 2.3.1 Introduction

The Kingdom of Saudi Arabia (KSA), ranks first in the world in terms of its declared crude oil reserves with about 20% of the world's total proved crude oil reserves. KSA was a leading producer of petroleum, including condensate, crude oil, and natural gas liquids and ranks 9<sup>th</sup> in the world in terms of petroleum refining capacity, 26<sup>th</sup> in terms of steel production and also produces a variety of industrial minerals and metals. All mineral deposits are the exclusive property of the state. The Supreme Council for Petroleum and Mineral Affairs defines and approves national hydrocarbon policies and strategies. The Ministry of Petroleum and Mineral Resources implements general policy related to minerals, natural gas, and oil. The Deputy Ministry for Mineral Resources administers activity in the mining sector and promotes the mineral industry.

Mining is regulated by Royal Decree No. M/47 (the Mineral Investment Law) of 20 Sha'ban 1425 (4 October 2004).

With its crude oil resources and increased production capacity, Saudi Arabia is well placed to meet international demand for petroleum. Significant infrastructure development, which includes the expansion of the national highway and railroad network, will likely maintain the short-term demand for construction minerals and products, such as cement, glass, sand, steel, and stone and facilitate new project development. KSA's continued encouragement of private investment in mineral projects is expected to be attractive to international investors. A number of important steps were taken in the 1990s to create a comprehensive institutional and regulatory framework to support mining in the Kingdom. The Saudi Arabian Department of Mining and Mineral Resources (DMMR) were reorganized in 1994 and the Saudi Arabian Geological Survey (SGS) was established in 1999. The incorporation of the Ma'aden Mining Company in 1997 created the basis for systematic exploration and extraction. Ma'aden became a publicly listed company in 2008, although it remains over 60% government owned.

### 2.3.2 Economic Significance of the Minerals Industry

Saudi Arabia's economy is strongly linked to hydrocarbon production, which accounts for about 61% of the nominal gross domestic product. In 2009, the volume of crude oil exported by Saudi Arabian Oil Co. (Saudi Aramco), was 2.06 billion barrels, and exports of refined petroleum products increased by 13% to 149 million barrels. Mineral products (primarily crude oil) account for 90% of total Saudi Arabian exports. In 2009, the value of Saudi Arabia's total exports was about US \$192 billion.

The Government maintains ownership in most of the large companies that operate in the mineral sector, which included Saudi Basic Industries Corp (SABIC) and Ma'aden. Subsidiaries of SABIC included Al-Jubail Fertilizer Co., National Chemical Fertilizer Co., Saudi Arabian Fertilizer Co., Saudi Iron and Steel Co. (Hadeed), and several petrochemical companies.

Exploration for and production of crude oil in Saudi Arabia is restricted to Saudi Aramco, which forms joint ventures with international firms to explore for natural gas and to refine petroleum. The Ministry of Petroleum and Mineral Resources supervises its affiliate companies in the mineral and petroleum sectors; these included Aramco Gulf Operation Ltd., Ma'aden, and Saudi Aramco. The Ministry also supervises the Saudi Geological Survey.

About 56% of Saudi Arabia's crude oil exports are shipped to Asia and about 14% shipped to the United States. Countries of Asia also bought about 51% of Saudi Arabia's exports of refined petroleum products and about 38% of its exports of natural gas liquids.

### 2.3.3 Industrial Minerals and Bulk Commodities

The non hydrocarbon mineral production in KSA is currently dominated by industrial minerals including 200ktpa of low grade bauxite and 600ktpa low grade iron ore for use in the cement industry, 550ktpa feldspar for the ceramics industry and about 30ktpa barites. KSA also produces 3.2Mtpa of sulphur as a by-product from oil refining.

Saudi Arabia's phosphate resources are currently estimated at 3.1bn tons, of which 1.6bn is deemed minable. Ma'aden holds 70% equity in the Al-Jalamid phosphate project and continued the development of the Al-Jalamid phosphate mine and the Ras Az Zawr fertilizer complex. Ma'aden Phosphate Co., which was the operating company, planned initial production of diammonium phosphate fertilizer in late 2010.

In December 2009, Alcoa Inc. of the United States acquired 40% equity interest in Ma'aden's ongoing aluminium project. The joint venture expected to use imported bauxite to begin production at the alumina refinery at Ras al Zawr in 2013. Initial production from the aluminium smelter at Ras al Zawr also was expected in 2013. Development and initial production from the Az Zabirah metallurgical-grade bauxite mine was scheduled for 2014 as was the startup of a rolling mill at Ras al Zawr. Production from the Az Zabirah bauxite and kaolin mining operation of Ma'aden produces low-grade bauxite which is used by the cement industry.

London Mining Plc of the United Kingdom completed a bankable feasibility study for the 5Mtpa iron ore pelletizing plant for the Wadi Sawawin project. Saudi London Iron Ltd., which is a joint venture of London Mining and National Mining Company of Saudi Arabia, will operate the project, which also includes a proposed iron ore mine 52km inland from the seaside pelletizing plant.

Olayan Descon Industrial Company Ltd of Saudi Arabia was contracted by Ma'aden to develop a 140ktpa capacity magnesite mine at Zarghat (Al-Gazalah deposit) and to build a processing plant at Medina. The plant would produce caustic calcined magnesia and dead-burned magnesia. First Energy Bank B.S.C. of Bahrain and Project Management and Development Company of Saudi Arabia formed the Saudi Polysilicon joint venture, which is to develop a polysilicon plant at Al Jubail Industrial City 2. The proposed 7,500tpa capacity plant is expected to begin production in 2013.

#### 2.3.4 Base Metals and Gold

Ma'aden and its subsidiaries is currently the sole gold producer in the Kingdom with a modest annual production of 176,000oz Au and 305,000oz Ag recorded in 2009 and 147,000oz Au produced from five mines in 2011. Ma'aden's gold and base metals business is carried out through Ma'aden Gold and Base Metals Company (MGBM), a wholly owned subsidiary of Ma'aden. MGBM operates five gold mines in Saudi Arabia which have produced over 4 million ounces of gold since 1988 (<http://www.maaden.com.sa/en/business/gold>). MGBM is developing a new gold province in the Central Arabian Gold Region (CAGR) and also carries out an extensive precious and base metals exploration development programme in Saudi Arabia.

Current (August 2011) reported Measured, Indicated and Inferred Mineral Resources at existing mining operations comprise 76.8Mt @ 1.31g/t Au. An additional 320.2Mt @ 1.28g/t Au of Measured, Indicated and Inferred Resources are associated with nine evaluation projects (Ma'aden, 2012).

There is currently no significant base metal production in KSA. In 2011 Ma'aden produced 4,300t of Zn in concentrates from the Al Almar polymetallic gold mine. Bariq Mining Ltd., which was a joint venture of Citadel Resources Group of Australia and Consolidated Mining Company Investments Ltd. of Saudi Arabia, completed a feasibility study of the Jabal Sayid copper and gold project in 2009. The study envisaged a 3Mtpa underground mine based on Reserves of 24.4Mt @ 2.3% Cu, 0.3g/t Au and 10g/t Ag. Citadel also explored the Bari gold, the Lahuf gold, the Jabal Baydan zinc, the Jabal Matober gold, the Jabal Shayban copper, and the Wadi Shugea copper-gold-zinc deposits in 2009. In 2010 Citadel was taken over by Equinox Minerals Limited which is proceeding with development of the Jabal Sayid Mine.

Al Masane Al Kobra Mining Company (AMAK), which was a venture of local investors and the Arabian American Development Co. of the United States, continued work on the 700,000tpa copper, zinc and precious metals Al Masane Mine in Saudi Arabia. The surface facilities were completed in 2010 and pre-production underground mine development commenced.

## 2.4 Mining Law

The Deputy Ministry for Mineral Resources (DMMR) is a constituent of the Ministry of Petroleum and Mineral Resources, based in Jeddah, Saudi Arabia. The DMMR is the sole agency handling the application and administration of the Kingdom of Saudi Arabia Ministry of Petroleum and Mineral Resources Deputy Ministry for Mineral Resources Mining Investment Code, 2004. A Mineral Investment Services Centre is being established at the DMMR to facilitate access to information and concession documents for potential investors.

Licenses granted rights under the Mining Investment Code are:

- § A Reconnaissance license.
- § An Exploration license.
- § A Material collection license.
- § An Exploitation license, which includes:
  - ú A Mining license.
  - ú A Raw materials quarry license.
  - ú A Small mine license.
  - ú A Building materials quarry license.

A natural or corporate person may obtain more than one license. A summary of the application fees, number of years of tenure, possible extensions and processing schedule for each license type is shown in Table 2.5\_1.

Generally a Reconnaissance license is obtained first so that the holder can determine if they wish to obtain exclusive rights over an area by applying for an Exploration License. Reconnaissance Licenses are issued for a period of 2 years and may be renewed or extended for a single additional 2 year period. The license allows investigation using geophysical, geochemical including collecting samples and remote sensing techniques of minerals specified in the application. All minerals not excluded by the Mining Investment Code can be explored for (Chapter One, Article 3). It is possible for more than one reconnaissance licence to exist over the same area. Annual Progress reports summarising reconnaissance results are required and a Final report on expiration. Chapter 3, Section 1, Articles 32 and 33 of the Mining Investment Code detail the rights and obligations of the Reconnaissance Licence holder.

**Table 2.5\_1**  
**License Information**

| Licence Type        |                           | Application Fee (SR) | Max. Area (km <sup>2</sup> ) | No. Years | Extension / Renewal (yrs) | Issuance, Renewal / Extension Fee (SR) | Processing Schedule* |
|---------------------|---------------------------|----------------------|------------------------------|-----------|---------------------------|----------------------------------------|----------------------|
| Reconnaissance      |                           | 5,000                |                              | 2         | 2                         | 5,000                                  | 15 days              |
| Exploration         |                           | 5,000                | 100                          | 5         | 5                         | 5,000                                  | 30 days              |
| Exploitation:       | Mining                    | 5,000                | 50                           | 30        | 30                        | 10,000                                 | 60 days              |
|                     | Raw Material Quarry       | 5,000                | 50                           | 30        | 30                        | 10,000                                 | 60 days              |
|                     | Small Mine                | 5,000                | 1                            | 20        | 20                        | 10,000                                 | 60 days              |
|                     | Building Materials Quarry | 1,000                | .25                          | 5         | 5                         | 5,000                                  | 30 days              |
| Material Collection |                           | 1,000                |                              | 2         | 2                         | 5,000                                  | 30 days              |

\* Ministry processing schedule of applications from the date of completion of all requirements

An Exploration License is issued for a maximum area of 100km<sup>2</sup>, for a period not exceeding 5 years and may be renewed or extended for a period or periods not exceeding 5 years in total. Exploration licenses allow for detailed exploration by any practical exploration method that precedes commercial production of nominated minerals. Minimum expenditure requirements have to be met each year, set out as:

- § SR 750 in the 1<sup>st</sup> and 2<sup>nd</sup> years;
- § SR 3,000 in the 3<sup>rd</sup> and 4<sup>th</sup>;
- § SR 4,500 in the 5<sup>th</sup> and 6<sup>th</sup>;
- § SR 5,600 in the 7<sup>th</sup> and 8<sup>th</sup>; and
- § SR 7,500 in the 9<sup>th</sup> and 10<sup>th</sup> years.

Within the period of the license an Exploitation License (Mining License) may be obtained if all obligations are fulfilled and there is a proven discovery of an exploitable mineral or minerals. Annual Progress reports summarising exploration results are required and a Final report on expiration. Chapter 3, Section 2, Articles 35 and 36 of the Mining Code detail the rights and obligations of the Exploration Licence holder.

An Exploitation License is granted for extraction of ores or minerals. If any mineral deposits are discovered that are not covered by the license then the owner can apply to the Ministry to mine those also. No mining can commence without having first submitted a feasibility study. Extensions and renewals are permitted provided all of the license requirements have been met and adhered to. Chapter four of the Mining Investment Code details the provisions for Exploitation Licenses, which include:

- § Mining License or Raw Material Quarry license: issued for a maximum of 30 years over a contiguous area not exceeding 50km<sup>2</sup>. The license is limited to mineral or rock types specified in the Regulation as raw materials.
- § Small Mine License: issued for no longer than 20 years over a contiguous area not exceeding 1km<sup>2</sup>.
- § Building Materials Quarry license: issued for no longer than 5 years over a contiguous area not exceeding 250m<sup>2</sup>. The license is limited to mineral or rock types specified in the Regulation as building materials.

A Material Collection License, limited to the collection of material suitable for specimens, decorative work or similar is issued for a maximum of 2 years. No trading of materials obtained is permitted and they must be extracted without the use of power tools or equipment. The license may be renewed or extended for similar periods.

There is no surface rental for exploration, and the rental rate for mining is limited by the Mining Code to a maximum of SR10,000 (US\$2,666) per square kilometre per year. Profits and capital may be repatriated without any restriction. The Mining Code permits all documents holders to use water resources within their concession area, subject to any existing arrangements that may have been made for the supply of towns or villages, and all equipment required for the implementation of a concession is exempt from import and export duties.

### 3 REGIONAL GEOLOGY

#### 3.1 Geology of the Arabian Shield

The Arabian shield exposed in western Saudi Arabia, comprising the eastern part of the Arabian-Nubian Shield (ANS), is mainly composed of volcanic, sedimentary and intrusive rocks of Neoproterozoic age (1000-542Ma). The shield formed by the accretion of several tectonostratigraphic terranes during successive tectonic events which occurred between 780-640Ma, caused by the convergence of East and West Gondwana along sutures (boundary faults) between the terranes. This was followed by intrusion of plutons, strike-slip faulting, development of pull-apart basins, local uplift of gneiss domes, and unconformable deposition of layered rocks on the newly-amalgamated terranes (Sangster & Abdulhay, 2005).

Eight tectonostratigraphic terranes (Figure 3.1\_1) have been recognised (Table 3.1\_1). Terranes in the western portion of the Arabian shield (Midyan, Hijaz, Jiddah and Asir) are interpreted to have formed in a juvenile (ensimatic) oceanic environment, whereas those in the east (Afif, Ha'il, Ad Dawadimi and Ar Rayn) originated from mixed oceanic and evolved continental sources.

Episodes of strike-slip faulting and development of pull-apart basins followed amalgamation of the Arabian shield. More than thirty basins, ranging in age from <670Ma to ~580Ma, have been recognised and are filled by a variety of volcanic and sedimentary lithologies. Two of the largest (Murdama and Bani Ghayy) contain marine sediments. Post-amalgamation felsic plutonic rocks are relatively undeformed and formed by melting of older crustal rocks. Northwest-trending shear zones probably formed during the <640Ma Najd orogeny. Two of the largest, Ar Rika and Halaban-Zarghat, segment the Afif terrane. The former contains highly metamorphosed para- and orthogneisses and slivers of serpentinite. The latter is a complex strike-slip fault system.

The Red Sea coastal plain is bounded on the east by the Hijaz range, the western margin of which is defined by an escarpment uplifted to more than 3000m. The coastal plain reaches an altitude of about 200m and is generally about 5-10km wide, but ranges up to 40km. Sedimentary cover along the coastal plain (excluding Pliocene-Quaternary alluvium), is controlled by tectonics related to the opening of the Red Sea, and ranges in age from Cretaceous to late Miocene and comprises three assemblages:

- § Cretaceous-Eocene;
- § Oligocene; and
- § Miocene.

**Figure 3.1 1**  
**Geological Map of the Terranes of the Arabian Shield**

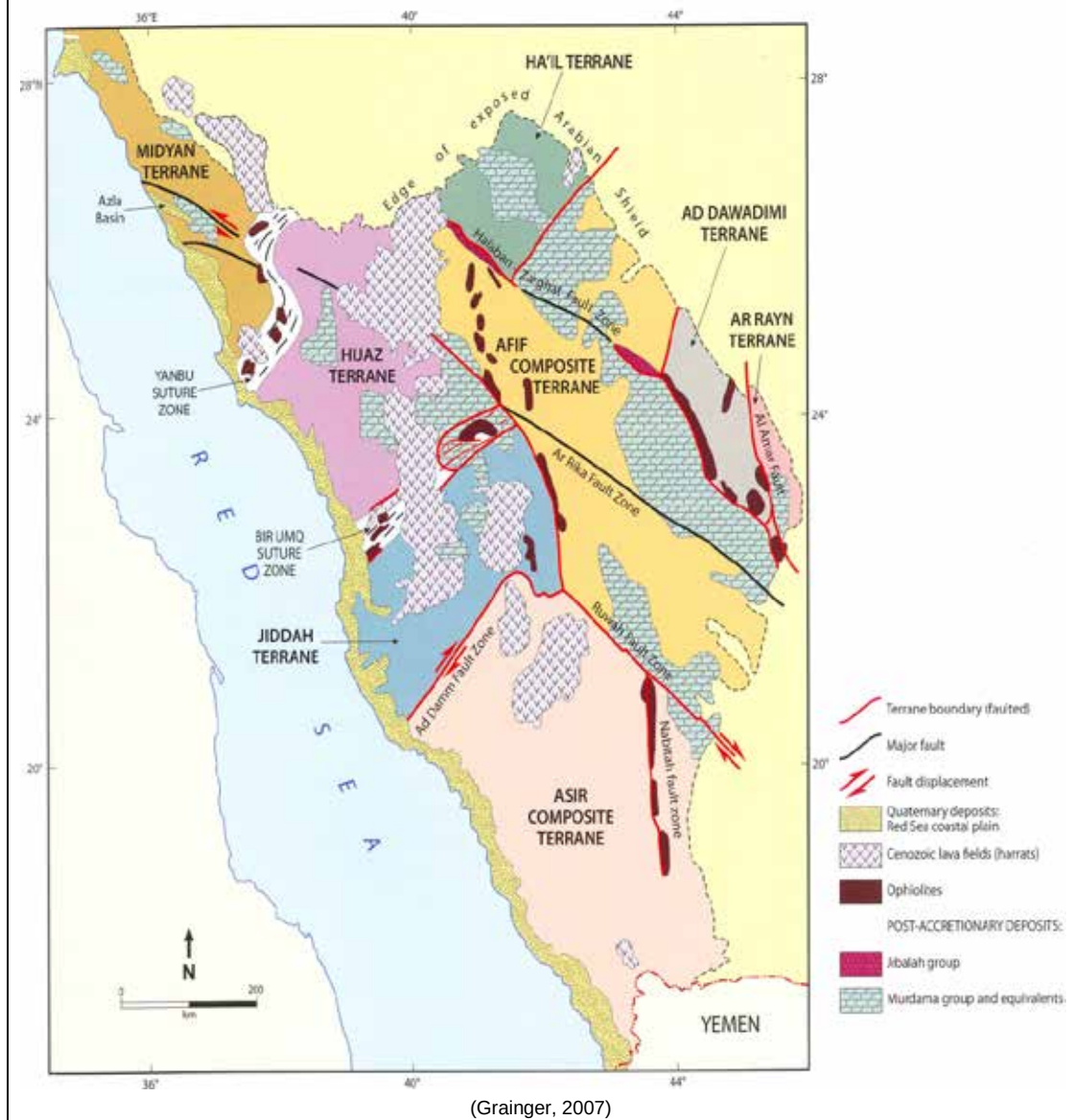


**Table 3.1\_1**  
**Geological Characteristics of the Terranes of the Arabian Shield**

| Terrane     | Components                                                                                                                                                                | Lithologies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Geochronology and Structures                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Midyan      | Two deformed units (Zaam group; Bayda and Hegal groups)                                                                                                                   | Zaam group: volcanosedimentary and chemical sedimentary rocks (?800-720Ma).<br>Bayda and Hegal groups: island arc assemblage (low-K basaltic, andesitic and intercalated rhyolitic volcanic and volcanoclastic rocks and epiclastic sedimentary rocks).                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Dated intrusions are >710Ma.<br>Separated from the Hijaz terrane to the south by the Yanbu suture (?>696Ma) which contain ophiolites (780-740Ma).                                                                                                                                                                                                                                                             |
| Hijaz       | Two volcanic arcs (Birak and Al Ays) and two overlying volcanosedimentary groups (Hadiyah, Furayh)                                                                        | Birak group: abundant low-K to tholeiitic pillow basalts, tuffs and volcanoclastic rocks; ophiolites of the Bi'r Umq suture.<br>Al Ays: ranges from a forearc succession in the west to an eastern volcanic arc of low- and high-K volcanic mafic rocks, rhyolite and welded tuff.<br>Hadiyah and Furayh groups: a 6-km thick sequence of conglomerate, marble, rhyolite tuff, andesite and basalt intruded by diorites, tonalites and granodiorites.                                                                                                                                                                                                                                                      | Granitic pluton from the layered sequences yielded a minimum age of 720Ma for the layered sequence.<br>The Bi'r Umq suture along the southern margin of the terrane dated at 780-760Ma.                                                                                                                                                                                                                       |
| Jiddah      | Supracrustal rocks of the Samran and Mahd groups unconformably overlain by the Ghamr group                                                                                | Samran and Mahd groups: volcanic, volcanoclastic and sedimentary rocks.<br>Ghamr group: basalt, andesite, dacite, rhyolite, epiclastic sandstone and polymictic conglomerate.<br>Ophiolite complexes suggestive of a mixed mid-ocean ridge and island arc environments.                                                                                                                                                                                                                                                                                                                                                                                                                                    | Samran and Mahd groups (810-780Ma).<br>Ghamr group (<760Ma).<br>Ophiolite complexes (838-828Ma).<br>Southern boundary is the undated Ad Damm fault zone.                                                                                                                                                                                                                                                      |
| Asir        | Western and eastern successions; sediment-filled, elongate post-tectonic basins                                                                                           | Western succession: island-arc volcanic rocks and associated intrusions.<br>Eastern succession: volcanic rocks and a belt of orthogneiss of variable composition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Eastern succession (850-790Ma).<br>Western succession (785-680Ma).<br>Post-tectonic basins (<664Ma to <638Ma).<br>Terrane is characterised by shear zones whose histories and tectonic significance poorly understood; joins Afif terrane to the NE along the Ruwah fault zone.                                                                                                                               |
| Afif        | Composite in age and provenance; four subterrane: Khida (Archaean to Palaeoproterozoic continental microplate) and Siham, Nuqrah and Suwaj (Neoproterozoic volcanic arcs) | Khida: polydeformed, high-grade metamorphosed volcanic rocks, schist and gneiss; extensive intrusions of Neoproterozoic granite.<br>Siham: upper greenschist volcanic and sedimentary rocks unconformable on the Khida and probably representing a continental-margin volcanic arc; arc-related mafic and intermediate intrusions.<br>Nuqrah: island-arc volcanic and sedimentary rocks intruded by mafic and intermediate intrusions; remnant ophiolites (mafic-ultramafic intrusions) as roof pendants and lenses along the Hulayfah-Ad Dafinah-Ruwah suture.<br>Suwaj: strongly deformed felsic intrusions with lesser basalt and dacite, and with large amounts of diorite to granodiorite intrusions. | Most of Siham group deposited at 750-740Ma; arc-related intrusions 750-705Ma.<br>Nuqrah group deposited at 839-821Ma; ophiolites dated at 823Ma and 847Ma.<br>Suwaj: intrusions at 745-667Ma.<br>Afif terrane converged with, and truncated, terranes to the west along the Hulayfah-Ad Dafinah-Ruwah suture at about 680Ma; in contact with other terranes to the east along the Halaban-Zarghat fault zone. |
| Ad Dawadimi | Homogeneous crustal unit                                                                                                                                                  | Sandstones and siltstones of the Abt formation; mafic-ultramafic rocks (interpreted to be ophiolites) in linear belts along the margins and within the terrane; depositional environment of the Abt formation uncertain.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Ophiolites emplaced at about 680Ma; unnamed suture along contact with Afif terrane to the west.                                                                                                                                                                                                                                                                                                               |
| Ar Rayn     | Bimodal Al Amar group and three suites of mafic to intermediate plutonic rocks                                                                                            | Al Amar group: tholeiitic to calcalkalic andesite and rhyolite volcanic and volcanoclastic rocks; probably formed in a mature island arc.<br>Three distinct suites of mafic to intermediate plutonic rocks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Al Amar group probably deposited prior to 690Ma; plutons emplaced at 689-616Ma.<br>The 670-640Ma Al Amar fault zone separates this terrane for the Ad Dawadimi terrane to the west.                                                                                                                                                                                                                           |
| Ha'il       | Volcanosedimentary sequence intruded by mafic-intermediate plutons                                                                                                        | Strongly deformed volcanic and sedimentary rocks intruded by mafic to intermediate plutonic rocks considered to be coeval with the supracrustal rocks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Granodiorites dated at 740Ma.                                                                                                                                                                                                                                                                                                                                                                                 |

Up to the beginning of the Cretaceous, sedimentary deposits consisted dominantly of sandstone, interpreted to be an accumulation of terrigenous material deposited under very stable conditions, probably under a semi-arid climate. In the upper part of the succession, a gradual change in sedimentation occurs, with deposition of carbonates and microplankton sediments, marking a marine transgression as the Gulf of Suez opened. The top of the Cretaceous sequence is truncated by Oligocene detrital sediments indicating a general uplift and emergence of the region. Fragments of Eocene marine sediments indicate that marine conditions extended until at least that period, although that material was largely removed by the Oligocene. The Oligocene deposition, accompanied by periodic normal faulting and extrusion of basalts, was mainly deltaic, fluvial and lacustrine. The main period of subsidence and marine transgression took place at the end of the Oligocene. During the middle Miocene, coral reefs developed along horsts parallel to the coast. Landward, the sediments grade into detrital sand, whereas seawards, Globigerina marl is developed. A shallowing of the sea resulted in an upward transition from marl to lagoonal facies to evaporite.

Seafloor spreading, accompanied by graben-faulting during the early to middle Pliocene resulted in a trough 1000m deep and up to 40km wide along the axis of the Red Sea. Sedimentation in the trough was dominantly pelagic carbonate and aeolian detritus swept into the trough. By the late Pleistocene, a number of deeps, floored by tholeiitic basalts and partially filled by brine pools, had developed along the axial trough. Locally (e.g., Atlantis II Deep), the brine pools contain up to 30m of metal-rich mud.

### 3.2 Regional Metallogeny

The Arabian-Nubian Shield (ANS) is a Mesoproterozoic block covering about 1.6 million square kilometres. The shield has been split into two halves by rifting associated with the opening of the Red Sea at around 25My BP. The western half of the shield occurs in Sudan, Ethiopia, Somalia, Eritrea and Egypt, while the eastern half occurs in Saudi Arabia and Yemen. For the purposes of considering mineral endowment, it can be regarded as one entity. Gold and base metal mineralisation is ubiquitous through the ANS although only a few deposits of significance are currently being mined. These are primarily gold deposits or copper-zinc deposits often with associated important precious metal content.

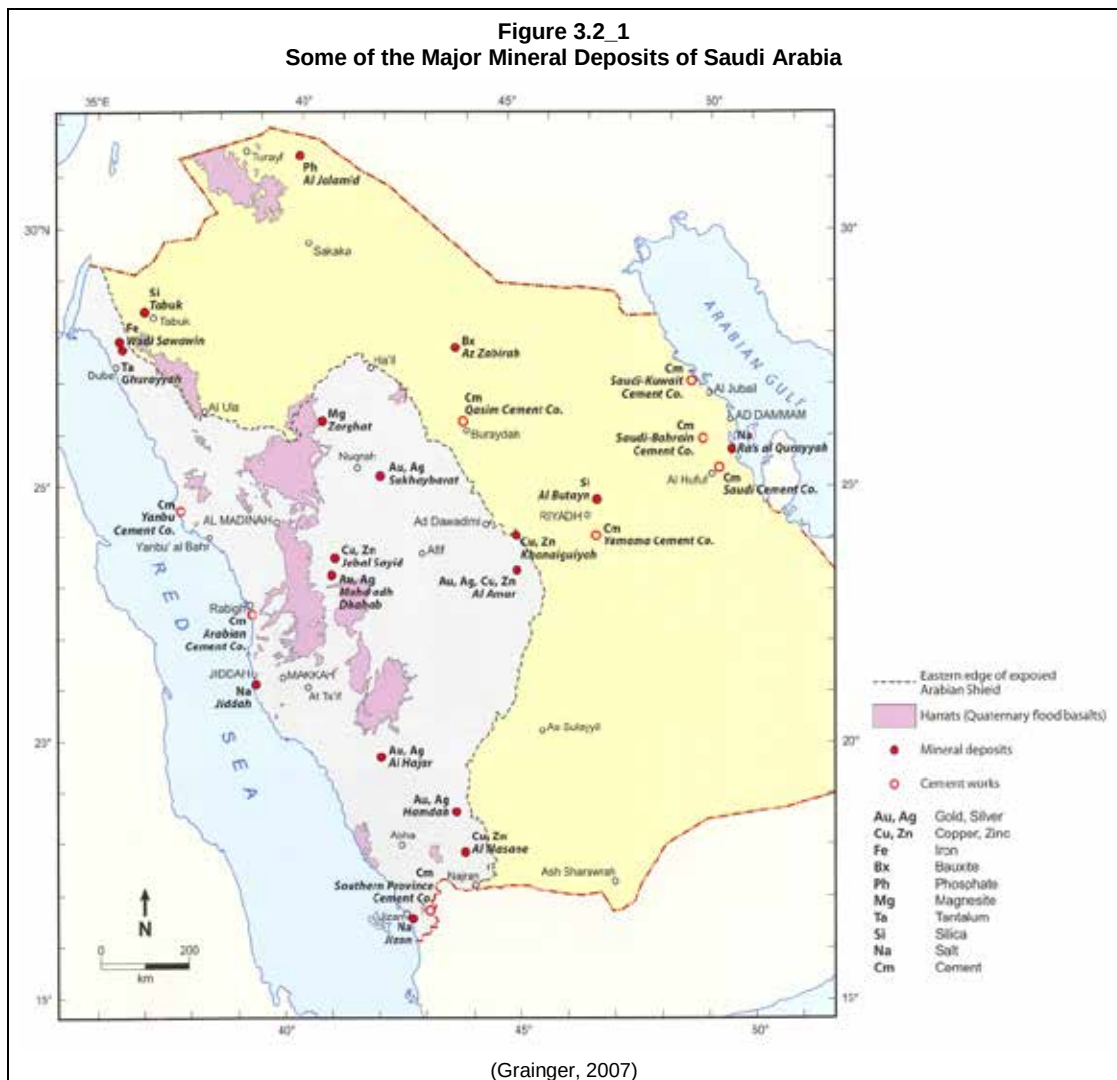
The ANS is host to several significant mesothermal gold deposits which are either intrusive related or shear zone hosted. The Sukari gold deposit in Egypt, held by Centamin Ltd, is the most significant gold deposit in the ANS with current resource of more than 12 million ounces (9.01Moz in Measured and Indicated categories and 3.3Moz classified as Inferred). Gold mineralisation at Sukari is hosted almost entirely within a fault bound granodiorite body, locally called the Sukari Porphyry, which intrudes a sequence of sheared Late Precambrian metavolcanic and metasedimentary rocks.

The Lega Dembi deposit in Ethiopia appears to be the most significant of the typical mesothermal shear zone hosted gold deposits with past production (including alluvial workings) of about 55 tonnes and reserves to 200m depth of 60 tonnes. This gives a total endowment of about 3.3 million ounces. The Koka deposit in Eritrea is of a similar style with about 1.1Moz. Examples of mesothermal shear and intrusive related gold deposits in Saudi Arabia include the currently operating open pit mine at Sukhaybarat with original resources of 8.5Mt @ 2.5g/t Au. This mine is currently producing about 50,000 ounces per year.

In addition to these mesothermal gold deposits, several epithermal deposits are known from the Saudi Arabian part of the ANS. The most significant deposit is the Mahd adh Dhahab deposit with 2Mt @ 24g/t Au and 87g/t Ag (1.4Moz Au and 17.8Moz of Ag). This mine is currently producing about 100,000 ounces of gold per annum. Another notable epithermal deposits in Saudi Arabia is the Al Amar deposit with 3.5Mt @ 10.5g/t for 1.07Moz. This is currently being brought into production and is expected to produce about 50,000oz per annum.

Volcanogenic massive sulphide deposits containing varying amounts of copper, zinc, gold and silver are the principal base metal deposits in the ANS. More than 60 occurrences are known from the Saudi portion of the shield (Figure 3.2\_1). They are generally not particularly high grade but the oxidised portions of the deposits commonly show supergene enrichment of gold and silver to ore grades in a gossanous zone overlying a higher grade supergene sulphide zone.

**Figure 3.2\_1**  
**Some of the Major Mineral Deposits of Saudi Arabia**



In terms of bulk commodities, very large Palaeocene to Eocene aged phosphate deposits (up to 400Mt) are known to occur over an extensive belt in northern Saudi Arabia. A notable 100Mt bauxite deposit known as at Az Zabirah is located in the north. There are no existing iron ore operations and no current mining for iron ore. Podiform chromite deposits associated with ophiolites in suture zones are common throughout the ANS. None of these are of great significance but in at least one deposit in Ethiopia (Yubdo Mine), associated laterites are mined for secondary platinum mineralisation. Some chromite is also described from layered mafic-ultramafic intrusives.

## 4 ARIN LICENSE

### 4.1 Project Background

The Arin Exploration License contains the Kutam Cu-Zn-Ag-Au deposit and the Farah Garan Cu-Zn-Ag Prospect and is located in the southern part of Saudi Arabia (Figure 1.1\_2) within the provinces of Asir and Najran, about 10kmSE of Dhahran Al Janub. The general topography in the project area is shown in Figure 4.1\_1.

**Figure 4.1\_1**  
**Kutam Topography**

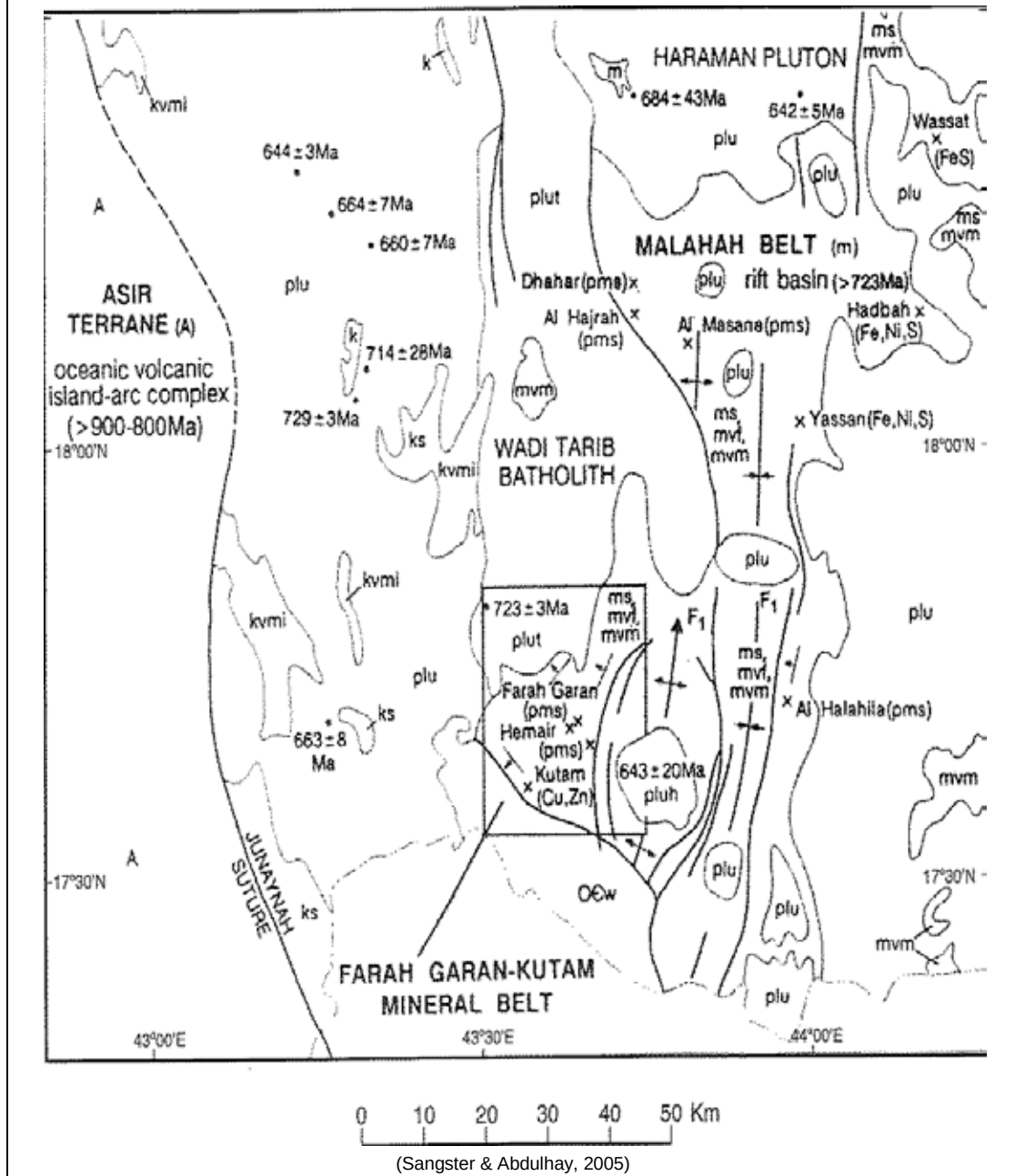


View NNE from waypoint 178 along line of ancient workings (Coffey, 2011)

These prospects occur in the Farah Garan-Kutam (FGK) belt in the southwestern corner of the Malahah belt (Figure 4.1\_2), which is part of the Halabah group of rocks (Asir terrane), interpreted to be a possible back-arc rift assemblage metamorphosed to greenschist facies (Sangster & Abdulhay, 2005).

The Malahah belt is composed primarily of deformed and metamorphosed volcanic and sedimentary rocks and trends north-south. Rocks within the belt show a general east to west progression from mainly mafic volcanic rocks to bimodal basalt-rhyolite sequences and are interpreted to be 780-740Ma old.

Figure 4.1\_2  
Schematic Geological Map of the Farah Garan-Kutam Mineral Belt



Halaban Group rocks are divided into Khadra (k), Malahan (m) and Tathlith sub-groups

s – sedimentary rocks  
i – intermediate rocks  
me – mélange

v – volcanic rocks  
f – felsic rocks  
plu – plutonic rocks (undifferentiated)

m – mafic rocks  
sp – serpentinite  
pms – polymetallic sulphides

Regionally, there are four types of mineral deposits in the Malahah belt:

- § Iron sulphide deposits;
- § Ni-bearing iron sulphide deposits;
- § Volcanogenic Cu-Zn massive sulphides; and
- § Sulphide-poor quartz veins.

Iron sulphide deposits, ranging in size to over 100 million tonnes, occur at Wadi Wassat in the easternmost part of the belt. These deposits are low-temperature massive sulphide deposits that formed in restricted oceanic basins. Further to the west, in the Wadi Qatan area, the Hadbah, Harth, Suwaydan and other prospects are large pyrite-pyrrhotite deposits hosted by mafic volcanic rocks and epiclastic sedimentary units. The sulphides at the Hadbah Prospect are nickel-bearing but the nickel is of unknown origin.

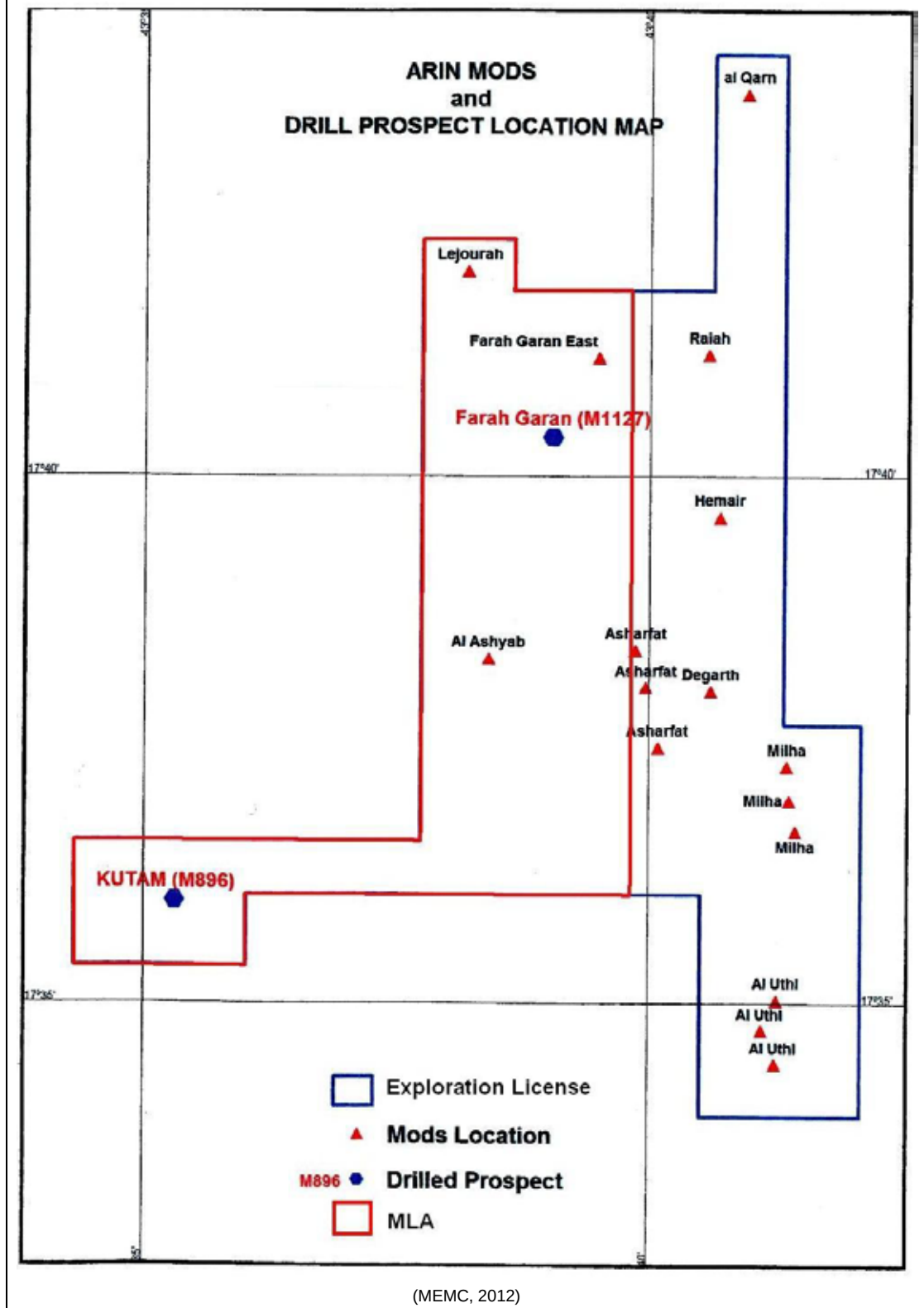
Volcanogenic Cu-Zn massive sulphide mineralisation occurs in the bimodal volcanic belts in the western part of the belt. These prospects include Al Masane, Dhahar, Talaa, Al Halahila, Farah Garan and Kutam. The Kutam prospect is located in the southwestern part of the Arin exploration license area and consists of a large group of ancient mine workings with extensive piles of smelter slag. The prospect was discovered by the USGS in 1974 and drilled by the USGS and Noranda exploration in 1976-77. The drilling defined a steeply-dipping zone of disseminated and stringer-style Cu-Zn mineralisation.

## 4.2 Mineral Tenure

The Arin Exploration License and the Kitnah EL were retained portions of the larger Malaha-Najran Exploration License which had been previously held by PHME since 23 July 1997. The Arin license was due for expiry on 8 April 2012 and 50km<sup>2</sup> of the EL area is being retained through application for an Exploitation (Mining) License. The outline of the Arin Mining License Application (MLA) is shown in Figure 4.2\_1 and details of the tenement schedule are given in Appendix A.

Coffey has not independently validated the licensing details and the present status of tenements, agreements and legislation described in this report is based on information provided by MEMC.

Figure 4.2\_1  
Arin Mining License Application



### 4.3 Project Geology and Mineralisation

#### 4.3.1 Geology

##### Stratigraphy

A generalised stratigraphic diagram in the FGK belt is shown in Figure 4.3.1\_1 and the generalised distribution of lithologies is shown in Figure 4.3.1\_2. The succession comprises three major assemblages:

- § A lower sequence of felsic metavolcanic rocks with minor interbedded of sedimentary rocks overlain by mafic volcanic and volcanoclastic rocks;
- § A middle, complex sequence of grey phyllite overlain by a series of interdigitating felsic and mafic volcanic rocks, chlorite phyllite (possibly mafic meta-tuff), sericitic phyllite (possibly felsic meta-tuff), and siliceous exhalative units; and
- § An upper sequence of mafic volcanic rocks that grades southwards into sedimentary rocks and greywacke; the uppermost unit is a grey phyllite, possibly representing carbonaceous mud.

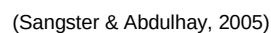
Volcanic rocks of the FGK belt comprise a distinctly bimodal assemblage of tholeiitic basalt and Na-rich rhyolite. Plutonic rocks surround and intrude the FGK belt and range from tonalite (~730Ma) through granodiorite and biotite monzogranite (~640Ma) to dacite quartz porphyry (~630Ma).

##### Structure

Four periods of regional and two periods of local deformation have affected the rocks of the FGK belt. These are:

- § Initial NW-SE compression ( $D_1$ ) producing isoclinal NE-trending folds with gentle plunge and steep axial planes;
- § NE-SW compression ( $D_2$ ) producing right-vergent folds with steeply plunging axial planes;
- § Intrusion of the ~640Ma Hadadah pluton ( $D_3$ ) east of Kutam producing a broad domal foliation;
- § Shearing ( $D_4$ ) cutting the dacitic quartz porphyry at Kutam;
- § Narrow, inward-dipping zones of foliation ( $D_5$  and  $D_6$ ) surrounding two local intrusions; and
- § Two sets of late, but pre-Palaeozoic, dip-slip faults.

**Figure 4.3.1\_1**



dms - dolomitic mica schist (and chert)

gp – grey phyllite

sp – sericite phyllite

slt – siltite

fvf – feldspar-phyric volcanic rocks

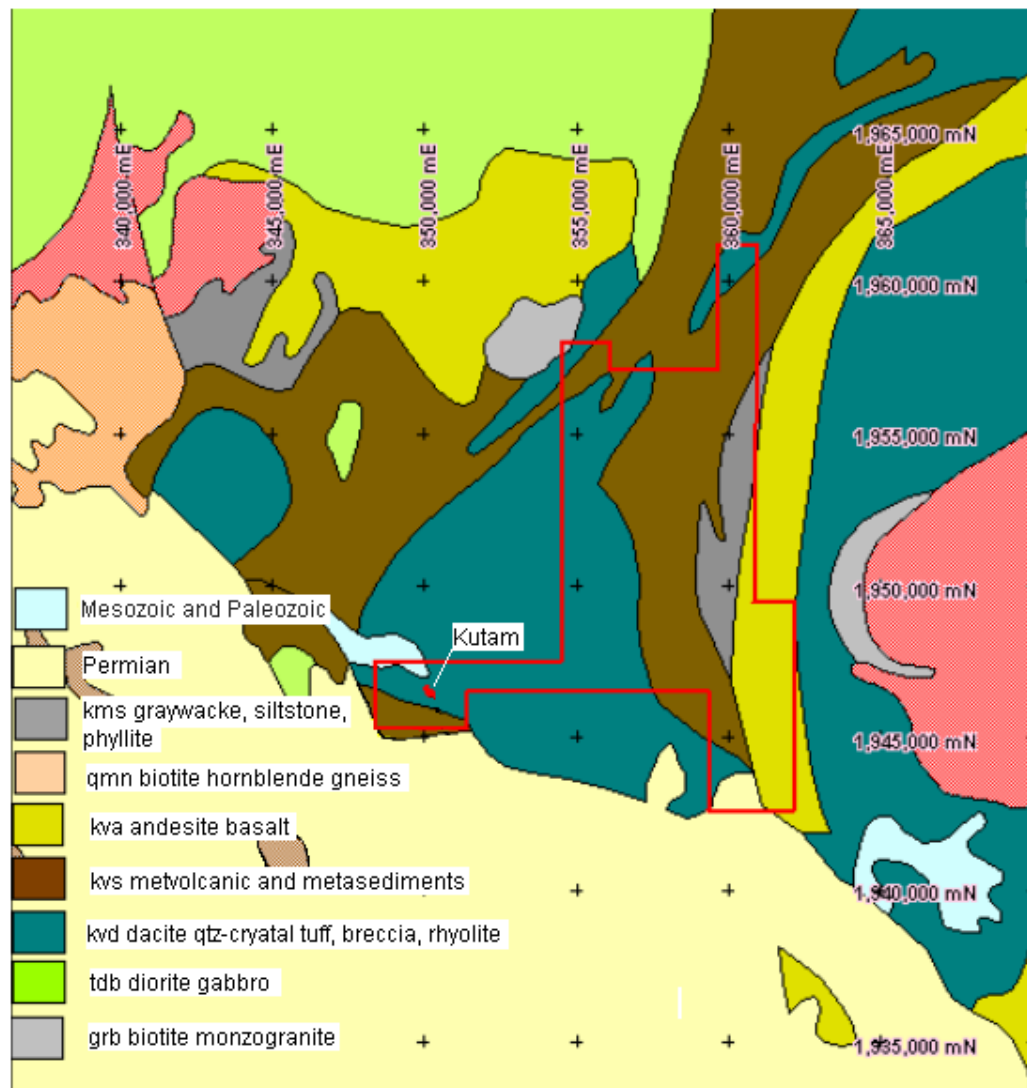
fvq – quartz-phyric felsic volcanic rocks

gw – greywacke

csp – chlorite-ser

msd – sedimentary dolomite

Figure 4.3.1\_2  
Project Geology



(PHME, 2011)

### Kutam

Sheared mafic to intermediate volcanic rocks are the major supracrustal units. The mafic volcanic rocks are complexly intercalated with quartz porphyry, such that both types have been mapped as a composite unit. The porphyry ranges from undeformed to strongly foliated and has been described by some authors as extrusive and others as intrusive. North-trending mafic dykes cut foliation in the volcanic rocks and are the youngest intrusions in the area. All rocks (extrusive and intrusive) have been metamorphosed to amphibolite facies.

Steeply W-dipping layering ( $S_1$ ) in the volcanic rocks has been overprinted by a pervasive NW-trending, W-dipping foliation. Two steeply SW-dipping foliation planes have been recognised in the mineralised area: one striking about N60°W, the other N45°W. Late NW-trending faults also occur.

### Farah Garan

A north trending, steeply W-dipping sequence of mafic and felsic volcanic rocks contains a varied sequence of sedimentary rocks. The mafic group includes W-facing pillow basalts, mafic agglomerates and mafic lapilli tuff. The felsic rocks (dacite to rhyolite) have been metamorphosed to quartz-eye sericite phyllite. They are relatively siliceous in the east and may there represent felsic domes or flows. A carbonatised phyllite unit separates the western and eastern quartz-eye sericitic phyllites and locally contains disseminated barite and pyrite. An interpreted exhalative unit comprises intercalated cherty dolomite, talc, chlorite, chert and sulphides. Cherty dolomite, in particular, is associated with layered sulphides.

Regional folding about N-trending sub-horizontal axes ( $F_1$ ) has produced a steeply W-dipping bedding plane foliation and, in less micaceous rocks, a parallel cleavage. A later SSE-trending folding event ( $F_2$ ) with steep southerly plunges has produced an S-plunging lineation. The final structural event is represented by a series of NW to E-W faults occupied by aplite and mafic dykes.

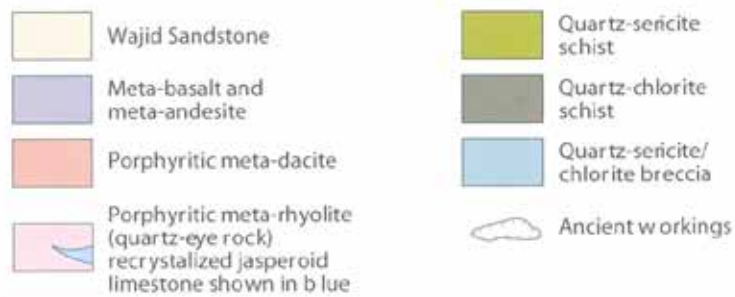
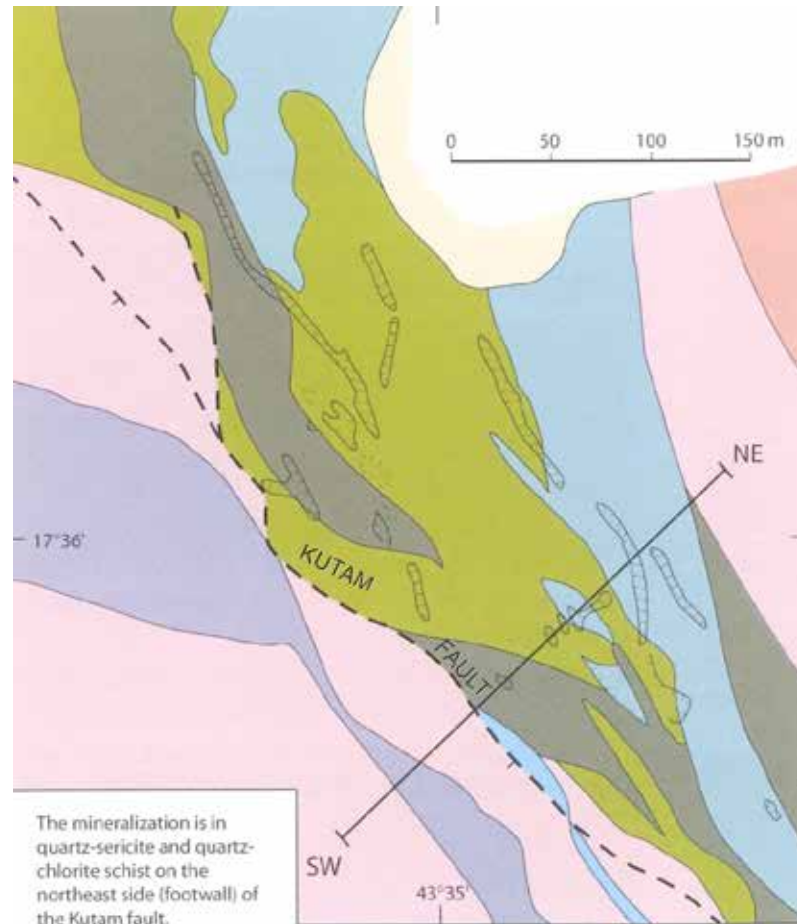
## **4.3.2 Mineralisation**

### Kutam

Rocks around the ancient workings have been extensively sheared and recrystallised and pervasively altered. The dominant host rocks (Figure 4.3.2\_1) to mineralisation are quartz-phyric rhyolite porphyry, quartz-sericite schist and chlorite schist (commonly garnetiferous). Mineralised bodies have been described as locally discordant but generally stratiform and stratabound disseminations and stringers of sulphides. Cross-sections (Figure 4.3.2\_2) suggest that the mineralisation occurs as thin, sheet-like conformable bodies and the lack of a massive sulphide body. Chalcopyrite and sphalerite are the main sulphides; minor amounts of pyrite, tetrahedrite and galena have been recorded. Sulphide bodies and host rocks are surrounded by and included in a body of dacitic quartz porphyry. In outcrop and ancient workings, gossanous veins and vein breccias often contain abundant quartz (Figure 4.3.2\_3).

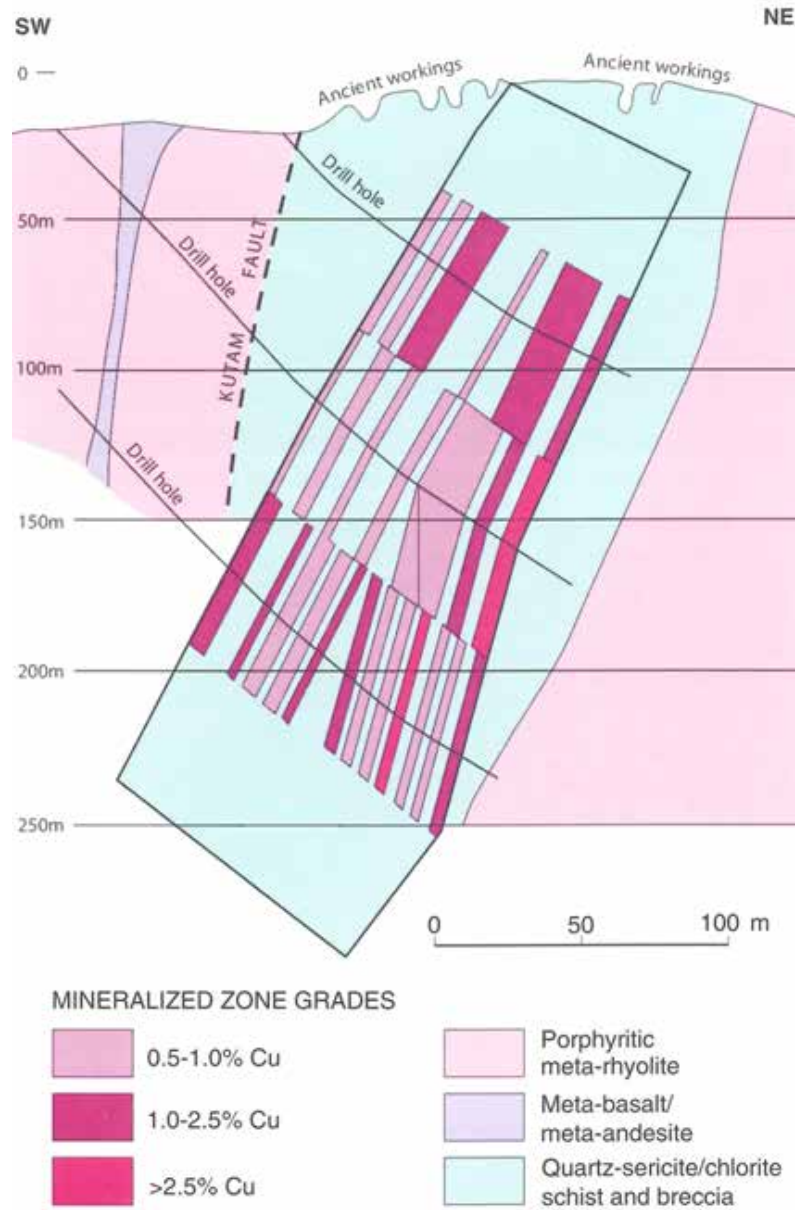
Studies of metal ratios (Legg, 1983) suggest that low Zn:Cu ratios occur on the footwall (NE) side, whereas high Zn:Cu ratios are found on the hangingwall (SW) side. Since the stratigraphy is considered to be W-facing, metal zoning suggests a general increase in Zn:Cu ratios toward the stratigraphic top of the deposit. High Zn concentrations extend beyond high Cu concentrations along strike to the NW.

Figure 4.3.2\_1  
Geological Map of Kutam Prospect



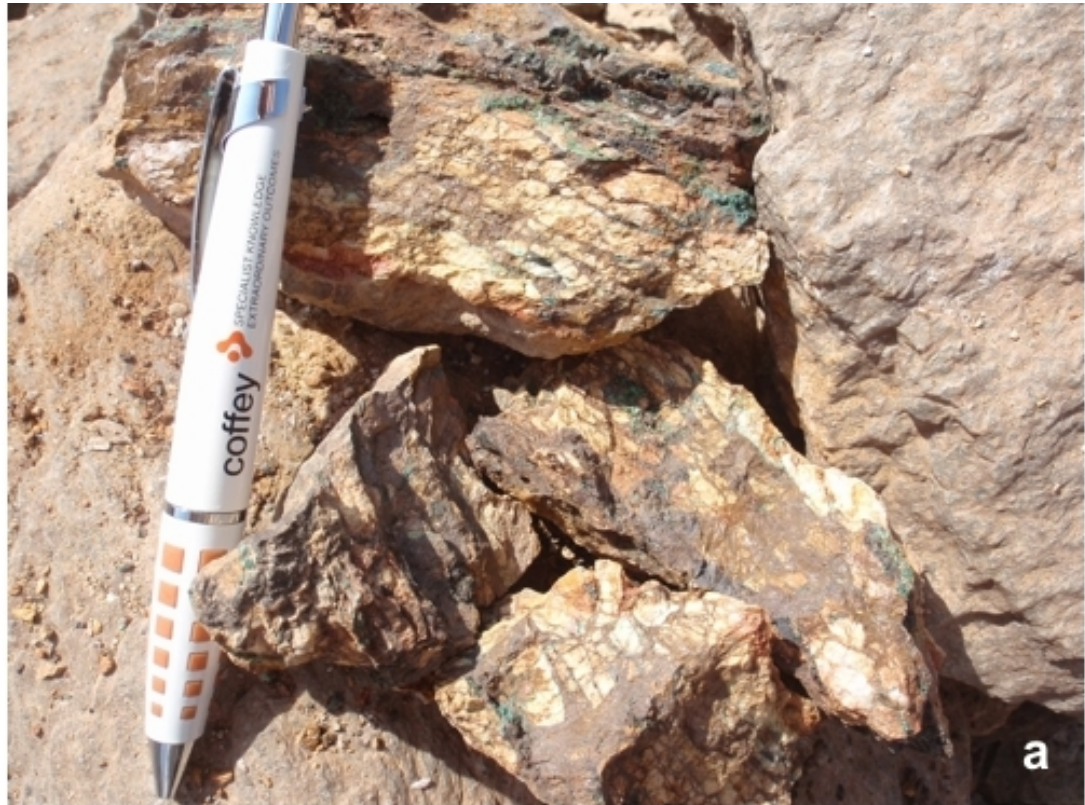
(Sangster and Abdul Hay, 2005)

Figure 4.3.2\_2  
Kutam – Geological Cross-Section



(Sangster and Abdul Hay, 2005)

**Figure 4.3.2\_3**  
**Kutam Mineralisation**



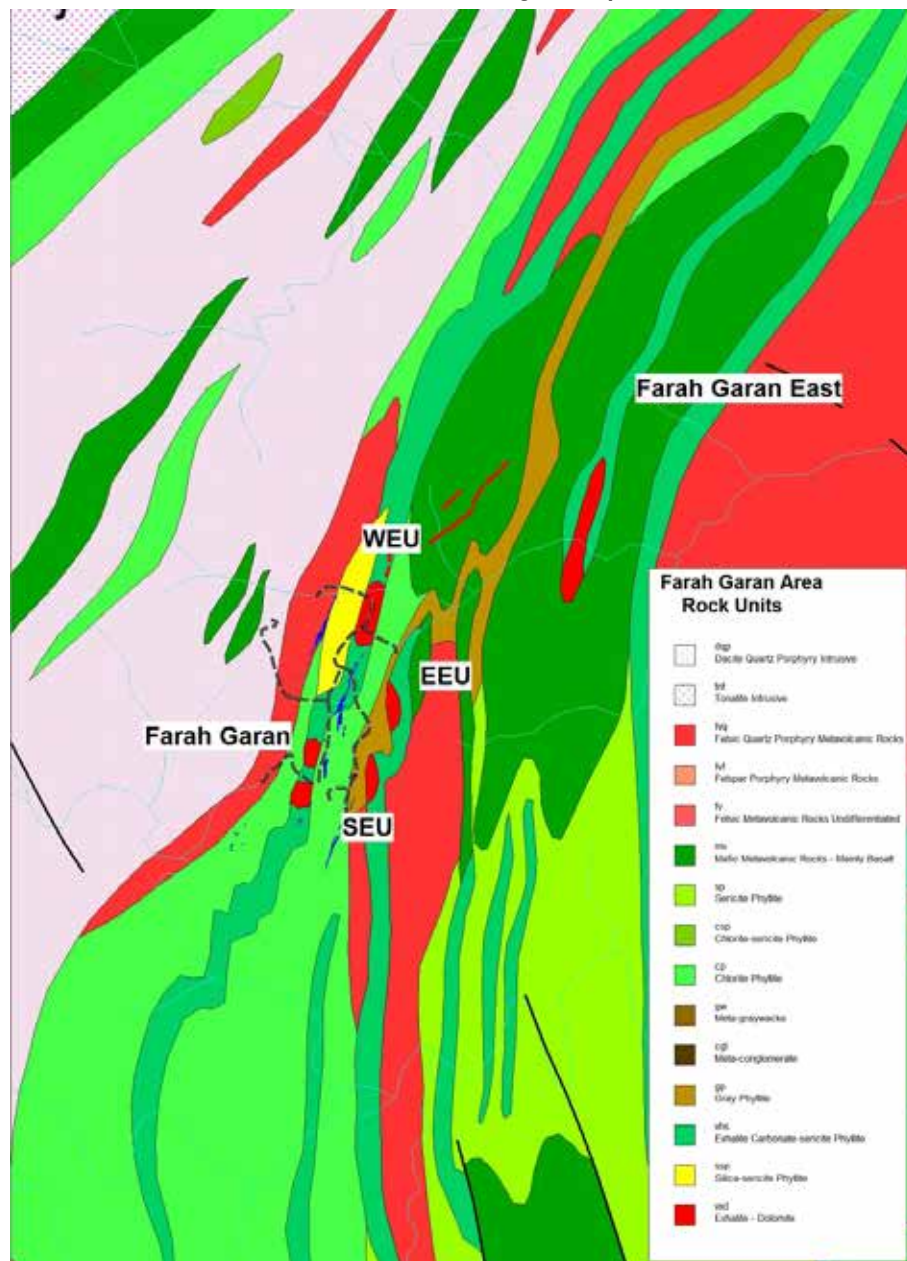
- a) Gossanous silica-limonite-malachite vein breccia in pale oxidised quartz-kaolin-sericite schists (waypoint 180).  
 b) Coarse grained blebby and stringer chalcopyrite and sphalerite (brown) in strongly chlorite altered volcaniclastic from diamond drillhole KU-02, 347m.

(Coffey, 2011)

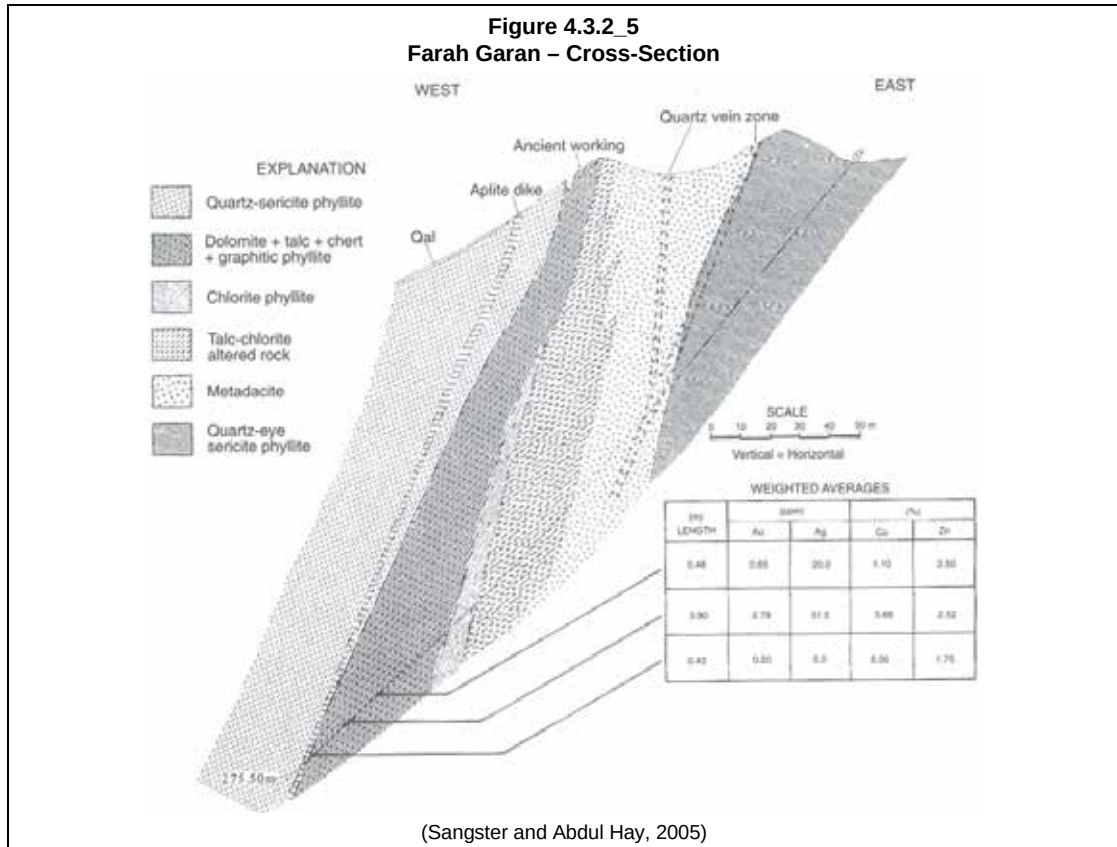
### Farah Garan

Sulphide mineralisation is directly associated with cherty dolomite in four exhalative units (Figure 4.3.2\_4): East (EEU), South (SEU), West (WEU) and the more recently discovered Southeastern Exhalite (SE Ex). Of these, the highest grades are found in South unit, where drilling has intersected banded and disseminated pyrite, sphalerite, chalcopyrite, tetrahedrite-tennantite and galena in a zone 31m thick within cherty dolomite (Figure 4.3.2\_5). Minor amounts of arsenopyrite, boulangerite and various tellurides have also been recorded. However, only thin (<4m) intervals of significant sulphide mineralisation have so far been intersected.

**Figure 4.3.2\_4**  
**Farah Garan - Geological Map**



From PHME



### 4.3.3 Deposit Model

As with several other base metal deposits in Saudi Arabia, definitive evidence regarding deposit-type is contradictory.

Smith et al. (1977) regarded Kutam to be epigenetic and localised by three intersecting fractures, mainly on the basis of petrographic evidence. Legg (1983) regarded the mineralisation to be a VMS-style deposit based somewhat erroneously on the similarity of metal ratios to those of Kuroko deposits.

Evaluation of the relative merits of these contrasting genetic hypotheses should consider the following:

- § The presence of gahnite (zinc spinel) and almandine in the ore is strong evidence that mineralisation was in place prior to mineralisation;
- § Vital descriptive information, such as the nature and style of mineralisation and of the relative abundance of sulphide phases is lacking;
- § No unequivocal evidence of facing of the stratigraphy in the immediate Kutam area is available;
- § There seems to be considerable variance in the interpretation of the nature of the original rock types; e.g., whether rocks were originally intrusive or extrusive, or whether they were exhalative or sedimentary; and
- § Sulphur isotopic compositions suggest a volcanogenic origin for the sulphur.

Similar problems also exist at Farah Garan where, although the general consensus seems to be that the mineralisation is exhalative-related VMS-style, there is no agreement as to whether the deposit is vent-proximal or vent-distal, i.e., the existence or otherwise of a stringer zone. In addition, because of a lack of drilling and unweathered outcrop, there is uncertainty in the nature of the host lithologies and their geochemical affinities. If Farah Garan is a VMS deposit, then a definite chronological horizon exists within the volcanic stratigraphy for further exploration in the immediate area.

## **4.4 Exploration History**

### **4.4.1 Geochemical Sampling**

A number of wadi sediment geochemical surveys have been conducted in and around the license by Riofinex (1978-1984) and the USGS (1987). These surveys consisted of regional wadi sediment sampling programmes and detailed or follow-up wadi sediment sampling at specific anomalies or target areas (Table 4.4.1\_1).

During the reconnaissance phase of Riofinex's SE Asir Project (1978-1981), 6,477 wadi sediment samples were collected from area of some 1700km<sup>2</sup>. The ultimate sample density was 3-4 samples per km<sup>2</sup>. Samples collected from 2-3 sites, which comprised natural drop out sites in the wadis. The samples were sieved to -40 mesh in the field. A total of 200 grams of -40 mesh material was collected. Field duplicates collected for about 5% of samples.

The samples were prepared at the Riofinex laboratory in Jeddah by sieving to two size fractions: -40+80 mesh and -80 mesh. The samples were analysed for Cu, Pb, Zn, Ni, Co, Mn, and Fe by atomic absorption spectrometry following a hot perchloric acid digestion.

Anomalies were followed up systematically. The first step was to re-analyse the anomalous sample to confirm the value. If the value was reproduced, then the site was re-visited and re-sampled. This was followed by detailed wadi sediment sampling, geological mapping at 1:10,000 scale and traverse rock sampling in the immediate area of the anomaly. Follow-up work was not done at known prospects, or those being worked on by other companies, such as the USGS. In all, about 20 anomalies were followed up in detail.

In 1983, Riofinex undertook a major program to re-evaluate the mineral potential of the SE Asir Project area. This new work included collection of about 300 new heavy mineral concentrate (HMC) samples, and an extensive program of re-analysis of the pulps of wadi sediment samples collected during 1978-81. Initially, some 300 pulps from both size fractions were analysed for As, Sb, Bi, Mo, Ba, Sn and W by XRF, and Ag by AAS, at Comlabs in Australia. Remnants of these pulps were also analysed for Au by neutron activation analysis (NAA) at Bondar-Clegg in Ottawa, Canada. The remainder of the >6,000 pulps was analysed for As and possibly for Au by AAS at the Riofinex Lab in Jeddah in 1983-84. Samples containing >40ppm As were analysed for Au by NAA at Bondar-Clegg in Canada. In 1983, 240 "raw wadi-sediment samples" from the 1978-81 programs were also analysed for Sn, W and Mo by XRF at Comlabs.

**Table 4.4.1\_1**  
**Summary of Wadi Sediment Geochemical Surveys**

| Year    | Type | No. of Samples     | Size Fractions Analysed | Sample Density                    | Laboratory       | Elements Analysed             | Analytical Method                        | Reference                                  |
|---------|------|--------------------|-------------------------|-----------------------------------|------------------|-------------------------------|------------------------------------------|--------------------------------------------|
| 1978-81 | WS   | 6477               | -0.60+0.18mm, -0.18mm   | 3.5-4 samples per km <sup>2</sup> | Riofinex, Jeddah | Cu, Pb, Zn, Ni, Co, Mn, Fe    | AAS                                      | Parker (1982)                              |
| 1982-83 | HMC  | 299                | -1.0mm                  | 1 per 3km <sup>2</sup>            |                  | Sn, W                         | Assay? (not clear if analyses were done) | Sanderson (1984)                           |
| 1982-83 | WS   | 303 (from 1 above) | -0.60+0.18mm, -0.18mm   | NA                                | Bondar-Clegg     | Au                            | NAA                                      | Riofinex, (unpubl.); also Sanderson (1984) |
| 1982-83 | WS   | 303 (from 1 above) | -0.60+0.18mm, -0.18mm   | NA                                | Comlabs          | As, Sb, Bi, Mo, Ba, Sn, W, Ag | XRF                                      | as above.                                  |
| 1982-83 | WS   | 240 (from 1 above) | Bulk                    | NA                                | Comlabs          | Sn, W, Mo                     | XRF                                      | as above.                                  |
| 1982-83 | WS   | 6477?              | -0.60+0.18mm, -0.18mm   | NA                                | Riofinex, Jeddah | As                            | AAS                                      | as above.                                  |
| 1983    | WS   | 600-700?           | -0.60+0.18mm, -0.18mm   | NA                                | Bondar-Clegg     | Au                            | NAA                                      | as above.                                  |
| 1987    | WS   | 136                | -0.60+0.18mm, -0.18mm   | >4 per 1km <sup>2</sup>           | Riofinex, Jeddah | Au, Ag, As                    | AAS                                      | Saleh (1985)                               |
| 1987    | WS   | 450                | -0.18mm                 | 1 per 1.5km <sup>2</sup>          | Skyline Labs     | Ag, As, Cu, Pb, Zn, Au        | AAS, Graphite furnace AAS                | Samater et al. (1989)                      |
|         | HMC  | 450                | -2.0mm non-magnetic     | 1 per 1.5km <sup>2</sup>          | Skyline Labs     | Ag, As, Cu, Pb, Zn, Au        | AAS, Graphite furnace AAS                | as above.                                  |

AAS = atomic absorption spectrometry  
 XRF = X-ray fluorescence spectroscopy  
 NAA = neutron activation analysis

ES = semi-quantitative emission spectroscopy  
 HMC = heavy mineral concentrate  
 WS = wadi sediment

Sanderson (1984) also collected 299 HMC samples from areas underlain by granitic rocks. These samples were processed and examined for scheelite under ultraviolet light. According to Sanderson (1984, p. 25), it was planned to analyse these samples for Sn and W. It is not known if these analyses were ever completed.

A brief field program to follow up a number of gold anomalies identified in the Farah Garan area was conducted by Saleh (1985). This project involved a limited amount of follow-up wadi sediment and rock sampling; however, the samples may not have been analysed due to budget cuts at the Riofinex Mission.

In December 1987, the USGS carried out a helicopter-supported wadi sediment geochemical survey over the Farah Garan-Kutam belt (Samater, et al., 1989) that covers the western third of the MEMC License. The geochemical survey was part of a larger USGS effort in southern Saudi Arabia focusing on gold mineralisation.

The USGS survey based on orientation work carried out by the USGS in the Central Shield area and used a somewhat different methodology than that used in the Riofinex surveys. Samples were collected at 450 sites covering an area of 580km<sup>2</sup>, for a density of one sample per 1.5km<sup>2</sup>. At each site, a bulk sediment sample weighing about 5kg was collected from a single shallow pit at each site and sieved to –10 mesh in the field. The sample was then split into two portions. One portion was sieved to –80 mesh (–180µ). The second portion was hand-panned to produce a heavy mineral concentrate, from which magnetic material was removed using a hand magnet. Both samples, the –80 mesh wadi sediment and the non-magnetic concentrate, were analysed at Skyline Labs in Denver, Colorado, USA for Cu, Pb, Zn, Ag and As by AAS and for Au by Graphite Furnace AAS. The results were compiled statistically and 43 anomalous areas were identified, 14 of which were coincident sediment-panned concentrate anomalies. Fifteen of the anomalies, all from panned concentrates, were followed up by Kellogg et.al. (1989).

#### **4.4.2 Kutam**

The Kutam prospect is located in the southwestern part of the Arin exploration license area and consists of a large group of ancient mine workings with extensive dumps of smelter slag. The prospect was discovered by the USGS in 1974 and drilled by USGS and Noranda exploration in 1976-77. The drilling defined a steeply-dipping zone of disseminated and stringer style Cu-Zn mineralisation.

##### Geophysics

The USGS conducted an extensive geophysical program at Kutam which included radiometrics, self-potential (SP), Turam, induced polarisation (IP), magnetics, downhole resistivity and SP (Blank et al., 1979). GeoTerrex Limited also flew nine test lines of an airborne INPUT survey over the prospect. Noranda completed a limited amount of additional geophysical work (Bent & MacInnis, 1977) WGM reviewed the geophysical data in detail and concluded that much of it was of little value due to shallow depth penetration and poor data quality. The IP data, although applicable to a depth of only 80m, did show an anomaly over the mineralised zone. This suggests that IP or CSAMT could be a useful tool for future exploration. This was confirmed by induced polarisation modelling. The INPUT survey showed a four-channel anomaly over the Kutam deposit plus five other weak anomalies nearby.

WGM digitized the USGS ground magnetic and Self-Potential data to aid in the interpretation of the data. The magnetic data showed a pronounced trend of generally higher remnant magnetism in the northern part of the surveyed area. This could be a regional affect caused by the mafic volcanic rocks which underlie the area to the north of the prospect. A second-order trend surface was removed from the data ("detrending") in order to more accurately view the local magnetic variations. The magnetic data shows a zone of moderate to low magnetism which corresponds to the mineralised zone. The mafic volcanic rocks to the southwest show a complex zone of magnetic highs. A strong, localised magnetic high is present to the northeast of the mineralised zone. This high is evident even when the data is upward-continued to 60m above ground level. This anomaly may be caused by an intrusive body.

In the SP data, the mineralised zone also shows as a zone of low resistivity. The low resistivity zone terminates abruptly at the southeast end of the mineralised zone. It is possible that a fault is present in this area, as a strong NE-SW feature is also visible in the magnetic data.

The TEM survey was completed in June 2001. A moderate to strong TEM anomaly was located directly over the ancient mine workings and surface projection of the mineralised zone. The TEM anomaly indicated that the mineralisation continued to a depth of at least 300m below surface. The TEM survey also explored along strike to the northwest and southeast but failed to delineate any anomalies.

A drillhole (KU-02) was drilled to 485m in late 2002 to test the TEM anomaly and to determine whether the style, grade and width of the mineralisation changed with depth. It intersected a sequence of metamorphosed volcanic rocks and possibly intrusive rocks and heavily disseminated to semi-massive sulphides consisting of chalcopyrite and lesser sphalerite with traces of pyrite from 342.00 to 347.20m. Stringers and veins of chalcopyrite and sometimes sphalerite continued from 347m to 402m, but were most common between 357-396m, averaging 0.95% Cu over 24.9m. Significant downhole intersections from KU-2 are shown in Table 4.4.2\_1 and these correlate well with mineralisation intersected in holes NK-6 and NK-14 (Table 4.4.2\_1).

#### Drilling

Eight diamond drillholes (KA-1 to KA-8; Table 4.4.2\_1) for about 2000m were drilled by the USGS in 1974-1975. Five holes intersected economically interesting grade and thickness. Mineralisation was considered to be epigenetic and to be located at the junction of fractures in highly sheared quartz porphyry. Noranda drilled 15 holes (NK-1 to NK-15) for 3500m in 1976-1977 and considered the deposit to be volcanogenic in origin and genetically related to a porphyritic meta-rhyolite which forms the footwall to mineralisation. PHME drilled two diamond drillholes (KU-01 and KU-02) in 2002.

In early February 2008, PHME drilled 25 RC holes along the mineralised zone at an average of 55m depth to test the continuity of near-surface mineralisation along strike and demonstrated continuous mineralisation. Most of the better intersections are within the main area of ancient workings, specifically holes KU-05, KU-07, KU-10, KU-11, KU-17, KU18 and KU-19 (Table 4.4.2\_2), mainly within a zone of silica-sericite phyllite. The majority of the intersections of >0.5% Cu are in strongly silicified, moderately sericitised rocks with visible fine-grained sulphides (pyrite, chalcopyrite and sphalerite) and secondary green Cu mineral(s).

**Table 4.4.2 1**  
**Kutam – Significant Intersections from Diamond Drilling >2.5% Cu**

| Hole ID | From (m) | To (m) | Length (m) | Cu % | Zn %  | Au g/t | Ag g/t |
|---------|----------|--------|------------|------|-------|--------|--------|
| KA-1    | 117.85   | 118.75 | 0.90       | 2.80 | 4.20  | 0.14   | 16.00  |
|         | 125.40   | 144.85 | 19.45      | 2.53 | 0.87  | 0.09   | 5.82   |
|         | 157.45   | 171.10 | 13.65      | 2.55 | 0.24  | 1.12   | 1.43   |
| KA-2    | 67.60    | 69.00  | 1.40       | 3.50 | 15.61 | 0.66   | 53.18  |
|         | 81.50    | 84.70  | 3.20       | 3.08 | 2.88  | 0.39   | 56.19  |
|         | 122.40   | 138.50 | 16.10      | 2.58 | 0.21  | 0.21   | 6.72   |
|         | 155.70   | 162.00 | 6.30       | 2.56 | 0.04  | 0.18   | 5.30   |
|         | 174.80   | 175.90 | 1.10       | 2.80 | 0.05  | 0.10   | 4.80   |
| KA-5    | 192.50   | 196.00 | 3.50       | 2.58 | 0.89  | 0.10   | 7.88   |
|         | 199.00   | 205.40 | 6.40       | 2.65 | 0.73  | 0.06   | 6.90   |
|         | 215.75   | 216.75 | 1.00       | 3.65 | 0.54  | 0.08   | 9.40   |
|         | 218.75   | 219.75 | 1.00       | 3.42 | 1.12  | 0.03   | 5.50   |
|         | 226.75   | 227.75 | 1.00       | 2.60 | 2.35  | 0.06   | 4.35   |
|         | 251.00   | 252.00 | 1.00       | 4.30 | 0.09  | 0.36   | 8.80   |
|         | 259.00   | 264.00 | 5.00       | 2.76 | 0.21  | 0.16   | 4.77   |
| NK-1    | 128.35   | 130.49 | 2.14       | 2.70 | 8.86  | 0.30   | 23.65  |
|         | 150.40   | 151.95 | 1.55       | 2.87 | 0.44  | 1.83   | 32.72  |
|         | 180.70   | 182.71 | 2.01       | 2.90 | 1.99  | 0.55   | 5.42   |
|         | 189.63   | 190.64 | 1.01       | 3.18 | 0.45  | 0.10   | 5.20   |
|         | 198.78   | 199.79 | 1.01       | 3.50 | 0.05  | 0.06   | 5.60   |
|         | 209.60   | 213.38 | 3.78       | 2.84 | 0.04  | 0.08   | 8.63   |
| NK-2    | 73.29    | 80.00  | 6.71       | 2.62 | 1.32  | 0.28   | 12.90  |
|         | 112.01   | 113.05 | 1.04       | 2.77 | 0.84  | 0.07   | 5.00   |
|         | 152.59   | 158.54 | 5.95       | 2.53 | 0.03  | 0.33   | 3.48   |
| NK-3    | 72.56    | 80.18  | 7.62       | 2.58 | 1.66  | 0.16   | 11.47  |
|         | 111.34   | 114.82 | 3.48       | 2.91 | 0.24  | 0.36   | 8.56   |
|         | 129.12   | 130.79 | 1.67       | 3.10 | 0.09  | 0.18   | 10.68  |
| NK-4    | 57.62    | 60.06  | 2.44       | 3.08 | 1.02  | 0.06   | 5.25   |
|         | 66.62    | 70.15  | 3.53       | 2.69 | 0.64  | 0.22   | 7.22   |
| NK-5    | 185.12   | 186.74 | 1.62       | 2.94 | 3.03  | 0.06   | 8.30   |
|         | 198.17   | 210.09 | 11.92      | 2.55 | 0.75  | 0.11   | 4.04   |
|         | 212.32   | 213.41 | 1.09       | 2.67 | 0.31  | 0.14   | 5.20   |
|         | 217.65   | 220.09 | 2.44       | 2.59 | 0.28  | 0.05   | 3.20   |
|         | 222.56   | 230.24 | 7.68       | 2.73 | 0.33  | 0.08   | 4.71   |
| NK-6    | 169.36   | 172.10 | 2.74       | 2.85 | 5.62  | 0.26   | 17.10  |
|         | 199.09   | 200.61 | 1.52       | 2.53 | 1.02  | 0.06   | 3.30   |
|         | 214.42   | 216.46 | 2.04       | 2.90 | 0.36  | 0.05   | 3.80   |
| NK-7    | 123.17   | 125.00 | 1.83       | 2.84 | 5.01  | 0.17   | 10.00  |
|         | 190.24   | 190.85 | 0.61       | 2.82 | 0.24  | 0.05   | 1.40   |
|         | 191.62   | 192.83 | 1.21       | 2.86 | 0.45  | 0.05   | 1.40   |
|         | 200.49   | 205.73 | 5.24       | 2.78 | 0.42  | 0.05   | 1.40   |
| NK-8    | 185.30   | 187.44 | 2.14       | 2.83 | 5.54  | 0.05   | 8.40   |
|         | 200.49   | 201.22 | 0.73       | 4.29 | 11.50 | 0.11   | 11.60  |
|         | 202.74   | 203.66 | 0.92       | 4.31 | 1.83  | 0.11   | 11.60  |
|         | 257.16   | 262.50 | 5.40       | 2.68 | 0.43  | 0.16   | 2.00   |
|         | 279.27   | 282.01 | 2.74       | 2.70 | 0.13  | 0.35   | 2.80   |
| NK-9    | 125.18   | 129.21 | 4.03       | 2.54 | 0.78  | 0.11   | 7.80   |
|         | 131.22   | 133.23 | 2.01       | 2.65 | 1.95  | 0.11   | 7.80   |
|         | 168.66   | 174.36 | 5.70       | 2.89 | 0.10  | 0.06   | 4.32   |
|         | 184.42   | 187.44 | 3.02       | 2.71 | 0.04  | 0.28   | 3.30   |
|         | 190.46   | 194.60 | 4.14       | 2.83 | 0.04  | 0.05   | 3.68   |
| NK-10   | 127.44   | 129.66 | 2.22       | 2.57 | 1.89  | 4.90   | 160.00 |
|         | 167.47   | 168.48 | 1.01       | 2.74 | 0.06  | 0.06   | 2.90   |
| NK-11   | 164.30   | 168.29 | 3.99       | 2.64 | 1.28  | 0.05   | 4.73   |
| NK-12   | 116.46   | 117.47 | 1.01       | 2.57 | 0.10  | 0.19   | 3.50   |
| NK-13   | 244.88   | 253.14 | 8.26       | 2.67 | 2.13  | 0.14   | 13.17  |
|         | 257.16   | 260.40 | 3.24       | 3.07 | 1.36  | 0.50   | 8.90   |
|         | 275.46   | 280.33 | 4.87       | 2.68 | 0.16  | 0.10   | 3.42   |
|         | 285.37   | 286.37 | 1.00       | 3.04 | 1.13  | 0.07   | 2.30   |
|         | 288.38   | 290.40 | 2.02       | 3.33 | 0.32  | 0.05   | 4.40   |
| NK-14   | 256.13   | 257.32 | 1.19       | 3.04 | 8.16  | 0.15   | 14.10  |
|         | 266.31   | 267.32 | 1.01       | 2.92 | 2.49  | 0.05   | 4.30   |
|         | 270.33   | 286.43 | 16.10      | 2.50 | 0.70  | 0.07   | 6.37   |
| KU-02   | 335.11   | 335.45 | 0.34       | 3.70 | 11.57 | 2.80   | 44.00  |
|         | 342.00   | 347.20 | 5.20       | 3.83 | 7.30  | 0.50   | 48.30  |

| <b>Table 4.4.2 2</b><br><b>Kutam – Significant Intersections from RC Drilling at 0.5% Cutoff</b><br><b>Kutam Cu-Zn Prospect – RC Drillholes KU-03 to KU-27</b><br><b>Mineralised Intercepts (0.5% Cu Cutoff Grade)</b> |          |        |            |        |                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|------------|--------|---------------------------------------------|
| Drill hole                                                                                                                                                                                                             | From (m) | To (m) | Length (m) | Cu (%) | Remarks                                     |
| KU-04                                                                                                                                                                                                                  | 13       | 14     | 1          | 0.55   |                                             |
|                                                                                                                                                                                                                        | 17       | 18     | 1          | 0.84   |                                             |
| KU-05                                                                                                                                                                                                                  | 7        | 13     | 6          | 0.61   |                                             |
|                                                                                                                                                                                                                        | 25       | 44     | 17         | 3.28   | including 5.0m of 5.321% Cu from 36 to 41m  |
|                                                                                                                                                                                                                        | 48       | 56     | 8          | 1.40   | including 2.0m of 2.92% Cu from 50 to 52m   |
| KU-06                                                                                                                                                                                                                  | 4        | 7      | 3          | 0.50   |                                             |
|                                                                                                                                                                                                                        | 11       | 15     | 4          | 0.56   | including 1.0m of 1.081% Cu from 11 to 12m  |
| KU-07                                                                                                                                                                                                                  | 0        | 5      | 5          | 0.72   |                                             |
|                                                                                                                                                                                                                        | 25       | 26     | 1          | 0.51   |                                             |
|                                                                                                                                                                                                                        | 36       | 43     | 7          | 0.76   |                                             |
|                                                                                                                                                                                                                        | 56       | 58     | 2          | 0.88   |                                             |
| KU-08                                                                                                                                                                                                                  | 25       | 26     | 1          | 0.57   |                                             |
| KU-09                                                                                                                                                                                                                  | 0        | 3      | 3          | 0.69   |                                             |
|                                                                                                                                                                                                                        | 7        | 8      | 1          | 0.52   |                                             |
|                                                                                                                                                                                                                        | 13       | 14     | 1          | 0.50   |                                             |
|                                                                                                                                                                                                                        | 22       | 23     | 1          | 0.54   |                                             |
|                                                                                                                                                                                                                        | 55       | 58     | 3          | 0.55   |                                             |
| KU-10                                                                                                                                                                                                                  | 4        | 13     | 7          | 0.58   |                                             |
|                                                                                                                                                                                                                        | 33       | 38     | 5          | 0.89   | including 1.0m of 1.500% Cu from 36 to 37m  |
|                                                                                                                                                                                                                        | 43       | 45     | 2          | 1.94   | including 1.0m of 3.017% Cu from 44 to 45m  |
|                                                                                                                                                                                                                        | 49       | 60     | 11         | 0.92   | including 4.0m of 2.051% Cu from 52 to 56m  |
| KU-11                                                                                                                                                                                                                  | 3        | 4      | 1          | 1.28   |                                             |
|                                                                                                                                                                                                                        | 18       | 19     | 1          | 0.91   |                                             |
|                                                                                                                                                                                                                        | 25       | 35     | 10         | 0.57   |                                             |
|                                                                                                                                                                                                                        | 41       | 50     | 9          | 1.26   | including 3.0m of 2.661% Cu from 41 to 44m  |
|                                                                                                                                                                                                                        |          |        |            |        | including 1.0m of 3.288% Cu from 8 to 9m    |
| KU-12                                                                                                                                                                                                                  | 8        | 11     | 3          | 2.08   |                                             |
|                                                                                                                                                                                                                        | 21       | 23     | 2          | 0.78   |                                             |
|                                                                                                                                                                                                                        | 36       | 37     | 1          | 0.52   |                                             |
|                                                                                                                                                                                                                        | 41       | 43     | 2          | 6.48   | including 1.0m of 11.042% Cu from 41 to 42m |
|                                                                                                                                                                                                                        | 49       | 53     | 4          | 0.74   | including 1.0m of 1.409% Cu from 52 to 53m  |
|                                                                                                                                                                                                                        | 59       | 60     | 1          | 0.60   |                                             |
| KU-13                                                                                                                                                                                                                  | 11       | 12     | 1          | 0.55   |                                             |
|                                                                                                                                                                                                                        | 48       | 49     | 1          | 0.53   |                                             |
| KU-14                                                                                                                                                                                                                  | 15       | 17     | 2          | 0.84   |                                             |
|                                                                                                                                                                                                                        | 28       | 29     | 1          | 2.62   |                                             |
|                                                                                                                                                                                                                        | 33       | 37     | 4          | 0.65   |                                             |
|                                                                                                                                                                                                                        | 41       | 42     | 1          | 0.83   |                                             |
|                                                                                                                                                                                                                        | 47       | 48     | 1          | 1.02   |                                             |
| KU-15                                                                                                                                                                                                                  | 25       | 26     | 1          | 0.99   |                                             |
|                                                                                                                                                                                                                        | 30       | 31     | 1          | 0.93   |                                             |
|                                                                                                                                                                                                                        | 34       | 37     | 3          | 0.53   |                                             |
| KU-16                                                                                                                                                                                                                  | 7        | 8      | 1          | 0.81   |                                             |
|                                                                                                                                                                                                                        | 11       | 12     | 1          | 0.68   |                                             |
|                                                                                                                                                                                                                        | 40       | 42     | 2          | 1.11   |                                             |
| KU-17                                                                                                                                                                                                                  | 1        | 3      | 3          | 0.55   |                                             |
|                                                                                                                                                                                                                        | 12       | 15     | 3          | 1.84   | including 1.0m of 2.394% Cu from 13 to 14m  |
|                                                                                                                                                                                                                        | 22       | 49     | 27         | 0.74   | including 3.0m of 2.202% Cu from 46 to 49m  |
|                                                                                                                                                                                                                        | 55       | 60     | 5          | 0.84   | including 1.0m of 1.881% Cu from 57 to 58m  |
| KU-18                                                                                                                                                                                                                  | 0        | 9      | 9          | 0.57   | including 1.0m of 1.540% Cu from 8 to 9m    |
|                                                                                                                                                                                                                        | 24       | 36     | 12         | 0.52   |                                             |
|                                                                                                                                                                                                                        | 46       | 60     | 14         | 0.64   | including 1.0m of 1.731% Cu from 49 to 50m  |
| KU-19                                                                                                                                                                                                                  | 4        | 13     | 6          | 0.96   | including 1.0m of 1.961% Cu from 4 to 5m    |
|                                                                                                                                                                                                                        | 16       | 17     | 1          | 1.00   |                                             |
|                                                                                                                                                                                                                        | 24       | 27     | 2          | 1.08   |                                             |
|                                                                                                                                                                                                                        | 30       | 32     | 2          | 0.72   |                                             |
|                                                                                                                                                                                                                        | 39       | 40     | 1          | 0.60   |                                             |
| KU-20                                                                                                                                                                                                                  | 33       | 41     | 8          | 0.59   | including 1.0m of 1.111% Cu from 33 to 34m  |
|                                                                                                                                                                                                                        | 53       | 54     | 1          | 0.50   |                                             |
| KU-23                                                                                                                                                                                                                  | 33       | 34     | 1          | 0.60   |                                             |
|                                                                                                                                                                                                                        | 50       | 51     | 1          | 1.28   |                                             |
| KU-24                                                                                                                                                                                                                  | 13       | 14     | 1          | 0.63   |                                             |
|                                                                                                                                                                                                                        | 31       | 33     | 2          | 1.07   |                                             |
|                                                                                                                                                                                                                        | 46       | 47     | 1          | 0.76   |                                             |
| KU-27                                                                                                                                                                                                                  | 32       | 33     | 1          | 0.50   |                                             |
|                                                                                                                                                                                                                        | 53       | 54     | 1          | 0.67   |                                             |

#### 4.4.3 Farah Garan

Ancient mine workings at Farah Garan were noted by R.E. Anderson in 1974 during reconnaissance mapping of the Mayza quadrangle (Anderson, 1979). The USGS conducted detailed geologic mapping and rock sampling in 1975 and 1976 and drilled three core holes in 1978-1979 (Smith, 1979; Smith & Mawad, 1982). One of the holes intersected potentially economic mineralisation, and further work was recommended but not carried out. In 1977, Noranda geologists examined the prospect while carrying out their drilling program at Kutam but did no detailed work (Bent, 1977).

From 1978 to 1985, Riofinex conducted their Southeast Asir Project, which included wadi sediment sampling and prospect examinations in the Farah Garan area but no work on the prospect itself (Parker, 1982; Sanderson, 1984; Saleh, 1985).

From 1987 to 1988, the USGS conducted a second project at Farah Garan which included detailed geologic mapping, ground electromagnetic surveys, and the drilling of seven additional holes (Doebrich, 1989). Concurrently, they carried out a program of regional geological mapping, geochemical sampling and prospect evaluations throughout the Farah Garan - Kutam belt (Bookstrom, et al., 1989a, 1989b; Kellogg et al., 1989; Samater et al., 1989).

In January 1986, Mr Greg Fernette visited the prospect along with Messers W.H. White, J.L. Doebrich and R.M. Samater of the USGS. The visit was part of a trip to plan the subsequent USGS gold program in the Malahah terrane. During the visit, gossans, exhalative rocks and ancient mine workings were examined and compared with those at Al Masane.

##### Geophysics

The USGS conducted reconnaissance self-potential and Turam surveys at Farah Garan in 1976. During the 1987 program, a reconnaissance Crone Electromagnetic (CEM) survey was carried out which provided data that are more useful. In the CEM survey, a frequency of 5010 Hz and a coil separation of 150 meters were used, based on the results of the test lines. The survey had a maximum depth penetration of 75m.

The survey outlined two sub-parallel anomalous zones, which generally follow the exhalative units. Two specific anomalies within the larger anomalous zones were associated with portions of the West and South Exhalative Units where mineralisation was intercepted in drillholes.

PHME completed a TEM survey over the three exhalite units in 2008. A baseline and 14 cross-lines were surveyed over a strike-length of 1400m (Figure 4.4.3\_1), with stations at 100m spacing along the baseline and 20m on cross-lines; 342 stations were surveyed.

##### Drilling

Ten core holes were drilled at Farah Garan by the USGS. Three holes totalling 809m were drilled in 1978-79 (Smith & Mawad, 1982). Doebrich (1989) drilled an additional seven core holes totalling 1202m in 1988, bringing the total drilling at Farah Garan to 2011 meters in ten holes. The drilling focused on testing the three exhalative units. Six holes were drilled on the West Exhalative Unit, two on the East Unit and two on the South Unit. Results of the drilling are summarised in Table 4.4.3\_1.

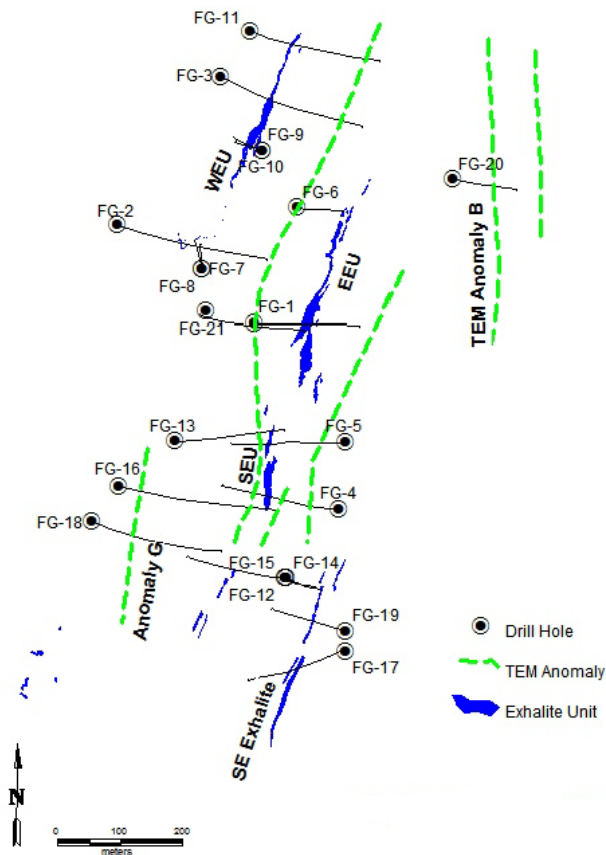
**Table 4.4.3\_1**  
**Farah Garan – Significant Diamond Drillhole Intercepts**

| Hole  | From (m) | To (m) | Width (m) | Cu (%) | Pb (%) | Zn (%) | Au (g/t) | Ag (g/t) | Drilled By | Zone  |
|-------|----------|--------|-----------|--------|--------|--------|----------|----------|------------|-------|
| FG-1  | 111      | 112    | 1         | 0.11   |        | 1      | 0.12     | 6.7      | USGS       |       |
| FG-1  | 123.92   | 124.74 | 0.82      | 0.82   |        | 3.1    | -        | 22       | USGS       |       |
| FG-1  | 134.7    | 135.4  | 0.7       | 0.7    |        | 3      | -        | 6.9      | USGS       |       |
| FG-2  | 123      | 123.5  | 0.5       | 0.3    |        | 2      | 0.17     | 12       | USGS       | WEU   |
| FG-2  | 131      | 132    | 1         | 0.26   |        | 2.15   | 0.41     | 6.5      | USGS       | WEU   |
| FG-3  | 80.5     | 89     | 8.5       | 0.29   |        | 3.18   | 8.67     | 18.5     | USGS       | WEU   |
| FG-4  | 196.7    | 204.35 | 7.65      | 1.11   |        | 1.32   | 0.22     | 6        | USGS       |       |
| FG-4  | 231.62   | 232.1  | 0.48      | 1.1    |        | 2.5    | 0.65     | 20       | USGS       |       |
| FG-4  | 245.15   | 249.05 | 3.9       | 0.68   |        | 2.52   | 2.78     | 151.5    | USGS       |       |
| FG-4  | 262.87   | 263.3  | 0.43      | 5      |        | 1.75   | 0.5      | 35       | USGS       |       |
| FG-5  | 139.26   | 142.75 | 3.49      | 0.57   |        | 1.33   | 2.08     | 30.7     | USGS       |       |
| FG-5  | 158      | 164.6  | 6.6       | 1.12   |        | 2.73   | 2.67     | 40       | USGS       |       |
| FG-5  | 189      | 194.25 | 5.25      | 1.21   |        | 3.68   | 14.6     | 99       | USGS       |       |
| FG-6  | 80.25    | 82.3   | 2.05      | 1.42   |        | 4.92   | 0.51     | 28.7     | USGS       | EEU   |
| FG-7  | 52.98    | 54.46  | 1.48      | 0.4    |        | 5.2    | 0.36     | 6.5      | USGS       | WEU   |
| FG-9  | 17.85    | 21.45  | 3.6       | 0.48   |        | 3.3    | 2.26     | 46       | USGS       | WEU   |
| FG-9  | 52.3     | 55.75  | 3.45      | 0.37   |        | 1.69   | 3.02     | 7.3      | USGS       | WEU   |
| FG-11 | 77.88    | 78.5   | 0.62      | 1.45   | 0.33   | 2.18   | 6.106    | 32.8     | PHME       | WEU   |
| FG-11 | 267.25   | 269.15 | 0.82      | 0.21   | 0.07   | 0.58   | 0.244    | 5.2      | PHME       | SEU   |
| FG-12 | 56.63    | 56.9   | 0.27      | 0.53   | 0.03   | 2.85   | 0.248    | 9.5      | PHME       | SEE   |
| FG-12 | 61.05    | 63.07  | 2.02      | 0.44   | 0.05   | 1.78   | 0.25     | 8.19     | PHME       | SEE   |
| FG-13 | 147.05   | 148.68 | 1.63      | 1.42   | 0.03   | 2.82   | 0.588    | 37.2     | PHME       | SEU   |
| FG-13 | 161.66   | 161.95 | 0.29      | 2.59   | 2.27   | 13.35  | 5.127    | 240.5    | PHME       | SEU   |
| FG-13 | 167.95   | 169.9  | 1.95      | 4.08   | 0.38   | 8.61   | 1.524    | 72.9     | PHME       | SEU   |
| FG-14 | 267.25   | 269.15 | 0.82      | 0.23   | 0      | 0.21   | 0.138    | 4.2      | PHME       | SEE-W |
| FG-14 | 93.8     | 100    | 6.2       | 0.56   | 0.04   | 1.3    | 0.293    | 8.2      | PHME       | SEE   |
| FG-15 | 167.95   | 0      | -167.95   | 0.22   | 0.01   | 0.47   | 0.16     | 3.6      | PHME       | SEU   |

Based on geology and the TEM results, PHME selected five targets for drilling. These targets were located at different stratigraphic levels in the exhalite-volcanic-sedimentary package. Eleven holes (for 2634m) of core drilling were completed. The results of the drilling are summarised in Table 4.4.3\_1. The drill targets were:

- § West Exhalative Unit (WEU) - the stratigraphically the highest exhalite zone. USGS drillhole FG-3 intersected of zone of high gold in disseminated sulphide mineralisation in dolomite. Subsequent USGS drilling indicated that the dolomite pinched out to the south and down dip. The horizon gave no TEM response. Geologic interpretation of the exhalite suggested it might plunge to the north. One hole was drilled to test this target. It intersected a very thin bed of massive sulphides with 6g/t Au over 0.65m. The drilling indicated that both the exhalite and the mineralisation do not continue to the north.
- § TEM Anomaly B – at the north margin of the rhyolite dome which is flanked by graphitic metasedimentary rocks interbedded with tuffs and tuffaceous sediments. These rocks gave a strong TEM response. The sedimentary basin indicated by the graphitic sediments could be a favourable location for the deposition of sulphides - so one hole was budgeted to test this area (Figure 4.4.3\_1). However, no mineralisation was intersected.

**Figure 4.4.3 1**  
**Farah Garan – TEM Anomalies and Location of Diamond Drillholes**



(from PHME, 2011)

- § South Exhalative Unit (SEU) - the highest priority drill target. The SEU comprises a long and locally thick zone of exhalative dolomite, talc and gossan with numerous ancient mine workings. The USGS drilled three holes on the SEU, one of which intersected 5.25m of high-grade sulphide mineralisation in mixed graphitic phyllite, phyllite and exhalite. This zone can be traced to the south for more than 100 meters in outcrops of malachite-stained dolomite and gossan. Five holes were drilled to test this zone; one along strike to the north, two to test down-dip of the USGS holes, and two along strike to the south. The holes drilled along strike to the north and south did not intersect any mineralisation. The two holes drilled down-dip intersected thin and locally high-grade beds of massive sulphides interbedded with phyllite and exhalite. The drilling indicated that the mineralisation continues down dip, but is a thin sheet-like body with no significant tonnage.
- § TEM Anomaly G - a broad TEM high over the area adjacent to and west of the SEU. This TEM anomaly could be interpreted as a number of thin highly conductive bodies or as a single larger body beneath the surface. A sulphide body located en échelon and down-dip of the SEU was consistent with the geology as interpreted from the USGS drillholes. This target was tested by three holes, all of which were also sited to test the SEU. The drillholes intercepted a number of thin graphitic horizons that corresponded with the interpreted locations of thin conductors. No sulphide mineralisation was intersected west of the SEU.

- § SE Exhalite (SE Ex) - an exhalative horizon, consisting of a relatively continuous dolomite unit, found southeast of the SEU. Surface sampling of the dolomite showed anomalous to high base and precious metals concentrations. Four holes were drilled to test this zone. All four holes intercepted several meters of low- to moderate-grade sulphide mineralisation with dolomite and talc. One of the four holes was drilled to test further down dip, but Cu-Zn grades were found to decrease with depth.

#### 4.4.4 Other Prospects

Initial geological field work was carried out at the Farah Garan East, Al Qarn, Al Asharafat, Milha and Al Uthl prospects (Figure 4.2\_1). Activities included surface rock chip sampling, preliminary geological mapping, locating ancient workings by GPS and data compilation. Overall, 138 surface samples were collected from shear zones, quartz veins and breccias.

### 4.5 Sampling and Assaying Procedures

The USGS and Noranda used approximately 1.0m sample lengths for their drill core samples, except where there was visually high-grade mineralisation. In such cases, sample lengths were reduced to as little as 0.25m. As such high-grade stringers are common; the overall pattern of sample lengths is irregular.

Noranda split the drill core on site and shipped the half-core for sample preparation and assay to the G. Watson Gray Laboratory in the U.K. All samples were assayed for Cu and Zn. Assays for Ag and Au were made on the first four holes, but this practice was discontinued because of the generally low level of values obtained. In the subsequent holes, samples were composited prior to assay.

PHME sampled every meter in its RC drillholes. Samples were split into two; one half was sent to Al Amri Laboratory in Jeddah, the other stored. Samples were analysed for Cu and Zn using PRP3 code of preparation and by complete acid digestion and fire assay (ARAA).

### 4.6 Mineral Resources

#### 4.6.1 Summary

Mineral Resources for the Kutam Deposit have been estimated by MineMap Consulting Pty Ltd (Markey 2010a). These estimates have not been independently validated by Coffey and are presented here as reported by MineMap Consulting Pty Ltd (MineMap). No digital block models were provided and the following comments are based on a review of the documentation accompanying the estimate. The resource was calculated using MineMap Mine Planning Software, Normal Kriging as the estimation technique and approximately 1% Cu-Equivalent wireframes to constrain the mineralisation. The resource was subdivided into Indicated and Inferred categories with the division primarily based on confidence levels in the distribution and continuity of mineralisation between drillholes. Results are summarised in Table 4.6.1\_1.

| Table 4.6.1_1<br>MineMap 2010 Kutam Mineral Resource Estimate |                   |             |             |              |
|---------------------------------------------------------------|-------------------|-------------|-------------|--------------|
| Category                                                      | Tons              | Cu Grade %  | Zn Grade %  | Au Grade ppm |
| Indicated                                                     | 6,173,000         | 1.25        | 0.76        | 0.08         |
| Inferred                                                      | 10,261,000        | 0.89        | 0.36        | 0.11         |
| <b>Total</b>                                                  | <b>16,434,000</b> | <b>1.03</b> | <b>0.51</b> | <b>0.10</b>  |

#### 4.6.2 Data Collection Methodology

A total of 58 holes for 8,247.3m have been drilled into the deposit in three stages. Noranda and the USGS drilled 23 diamond drillholes for 5,424m of core during the 1970s. The deepest drillhole was 345 meters. PHME subsequently drilled 33 RC drillholes totalling 2,227m and 2 diamond drillholes (598m). The deposit has effectively been drilled on 80m line spacings with holes at 20m to 60m intervals along the lines and inclined to the northeast to intersect the steeply SW dipping mineralisation. Drilling at the south end of the deposit is a little more haphazard and the deposit appears to have not been closed off to the south.

The USGS, Noranda and PHME only sampled zones of core where mineralisation was visible; the core was half split and submitted for analysis. The PHME RC holes were sampled at 1m intervals, riffle split and approximately  $\frac{1}{4}$  of the 1m interval being submitted for analysis, all the RC samples were sent for analysis.

Noranda core samples (n=1011) were analysed by Watson Grey Laboratory in the UK for Cu, and Zn with only the first four holes assayed for Ag and Au (method unknown); the USGS core samples (n=1060) were analysed by the USGS-DGMR Laboratory in Jeddah; the PHME core samples (n=49) were assayed by Al Amri Laboratory Jeddah (Au by fire assay and Cu, Zn and Ag by INAA). The PHME RC drill samples (n=2198) were assayed by Al Amri Laboratory Jeddah for base metals only. There is some confusion in the MineMap report about the analytical method employed for base metals. In one section, the report suggests all USGS and PHME base metal assays were by INAA (Instrumental Neutron Activation Analysis) however elsewhere the report refers to base metal analysis by Atomic Absorption Spectrometry (AAS). PHME documentation confirms AAS as the analytical method for base metals and 30gm Fire Assay with an AAS finish for Au.

No QAQC data are available for the USGS and Noranda drilling. In 1978, Riofinex as part of their study of the deposit, resampled (quarter core) and assayed 20 intervals from the Noranda drillholes. They also re-assayed pulps from these same intervals. The pulp re assays and the pulp versus quarter core comparisons were quite poor. Riofinex concluded that given the erratic nature of the mineralisation it was not possible to differentiate between natural close range variability and sampling or analytical bias.

Density data were collected by Noranda on an unspecified number of core samples based on Cu grade. Values ranged from 2.9t/m<sup>3</sup> (2.5% Cu) to 2.75t/m<sup>3</sup> (1% Cu). Based on this historical information, MineMap applied a constant density of 2.7t/m<sup>3</sup> to mineralisation within the 1% Cu<sub>eq</sub> wireframe. A density of 1.9 was used for "waste material" lying outside the 1% wireframe.

Abnia Survey of Jeddah was contracted by PHME (January 2008) to undertake a topographic survey of the Kutam Deposit and to survey collars of PHME drillholes completed prior to Jan-2008. Resurveying of the bulk of Noranda and USGS drillhole collars was also completed. There was good agreement in eastings and northings with the original data however there was approximately 10m difference between USGS and Noranda elevations which remains unresolved. All diamond drillholes were surveyed downhole utilising a Tropari instrument.

PHME, Noranda and the USGS geologically logged all of their drillholes. MineMap reported that PHME only partially standardised logging codes, and given the relative complexity of the local geology and the large numbers of RC meters drilled by PHME further work was required to creating a standardised geological legend.

Results from the earlier drilling were copied from paper reports into an Access database which also contained the more recent PHME data. The PHME database was provided to MineMap for use in the resource modelling. No data validation was completed by MineMap.

#### 4.6.3 Resource Modelling

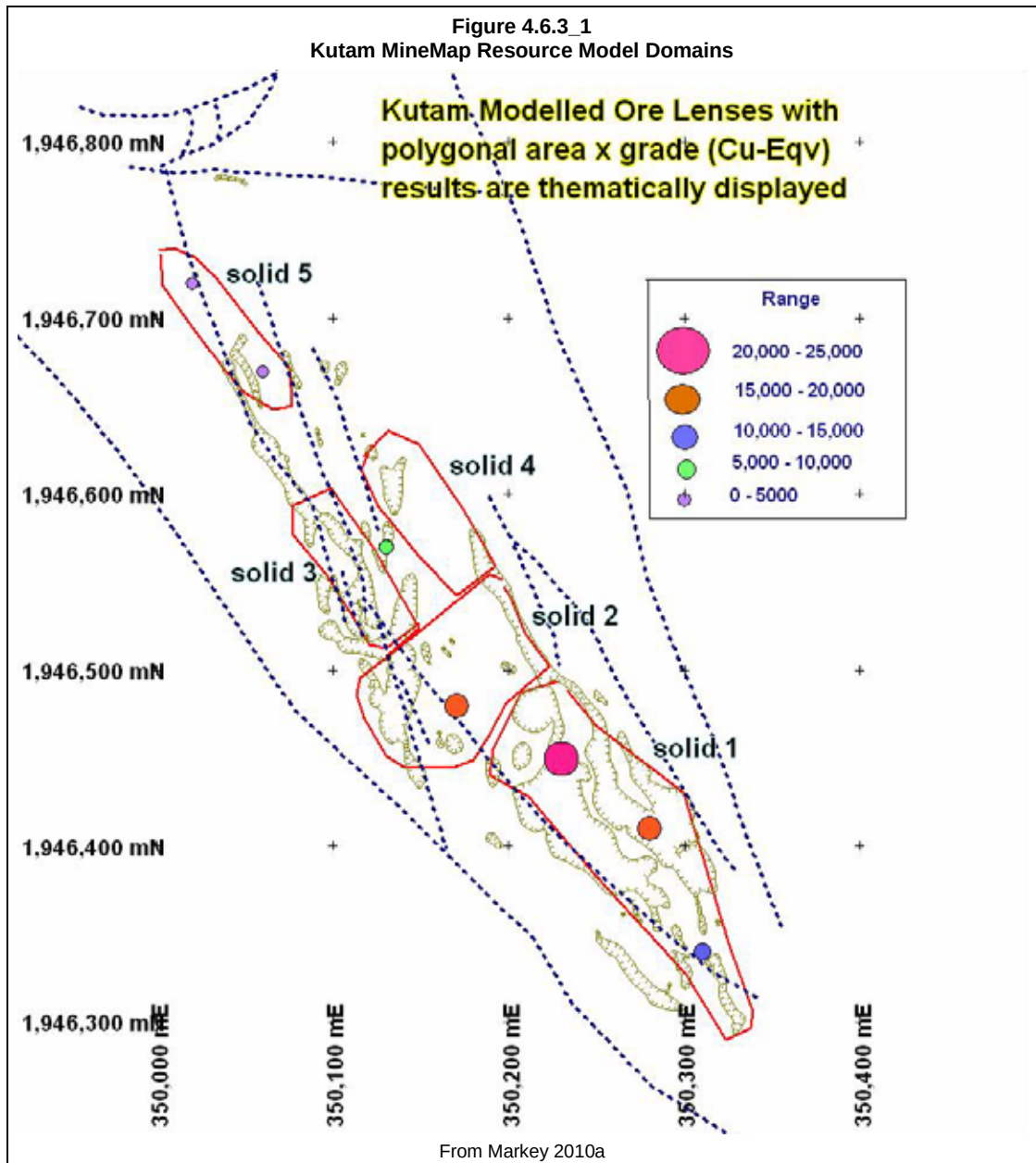
A wireframe of the mineralisation was created using a 1.0% Cu equivalent outline of the Au, Zn, Ag and Cu mineralisation. The metal prices used for the Cu equivalence calculation were Cu \$2.10/lb, Zn \$0.68/lb, Au \$700/oz and Ag \$13/oz. Five separate solids (wireframes) were constructed based on interpreted discontinuity of mineralisation.

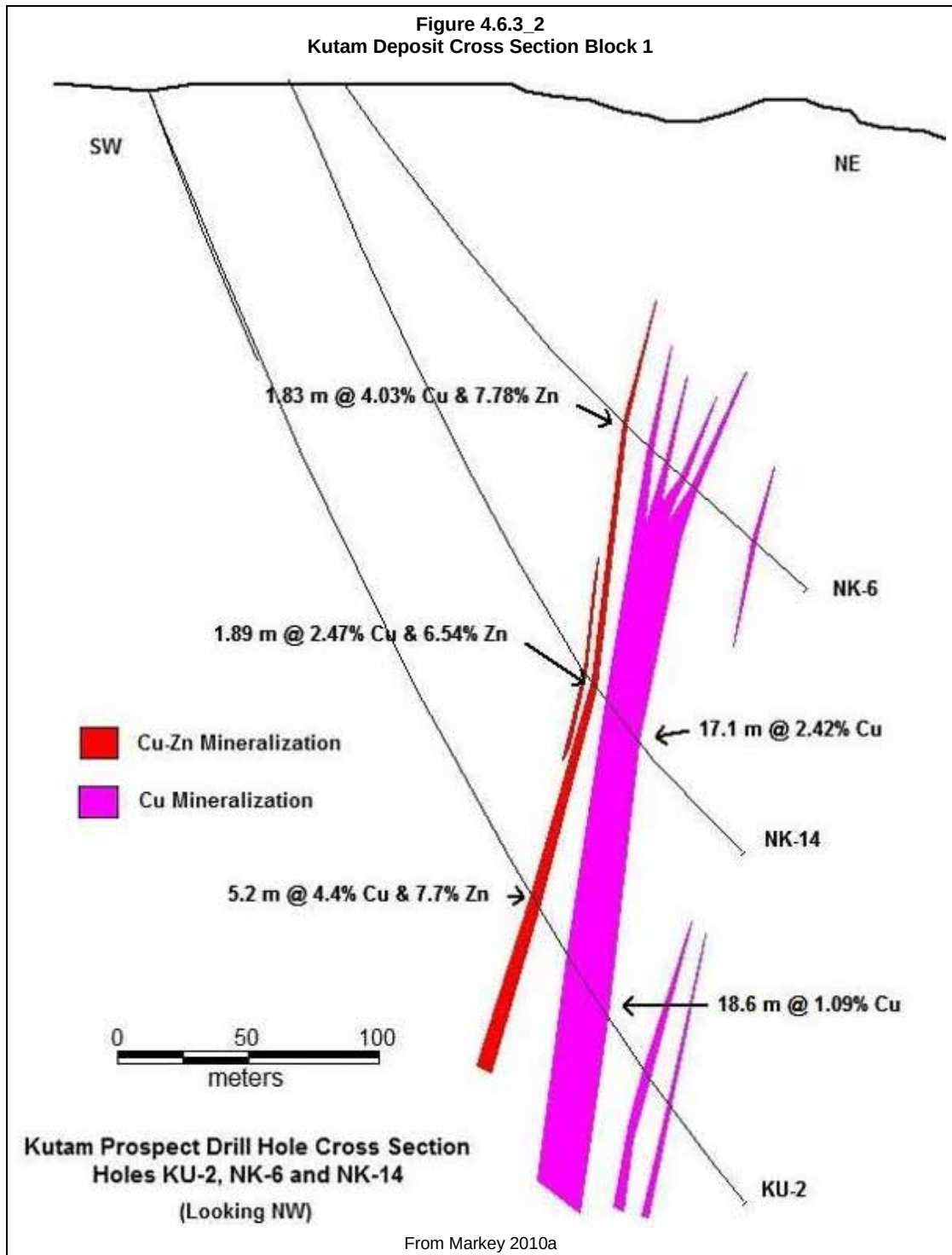
The surface projection of the five main solids is illustrated in Figure 4.6.3\_1 together with outlines of the ancient workings, faults and a visualisation of the Cu metal content per polygon calculated by multiplying polygon area (m<sup>2</sup>) by (calculated) polygonal Cu grade.

The block model was created using Minemap Mine Planning Software with cell sizes of 10m (Y) x 5m (X) x 5m (Z). Minemap Mine Planning Software was used to create the histograms and variograms. Normal kriging was used to compute cells using search ellipse parameters defined from a fitted variogram model.

The resource was classified as Inferred and Indicated material based on the drillhole spacing and levels of confidence in predicting the continuity of mineralisation between drillholes. Solid 1 is at the south end of the deposit and contains a relatively broad and coherent zone of mineralisation with common internal zones of waste and poorly mineralised material. A core zone of more consistent of mineralisation was interpreted in Solid 1 and classified as Indicated. Mineralisation continuity, metal zonation and evidence for increasing metal content at depth are illustrated in a cross section through diamond drillhole KU2 (Figure 4.6.3\_2).

Solids 2-5, contain less coherent zones of mineralisation and all material in Solids 2-5 was classified as Inferred.





#### 4.7 Mining Investigations

Both the Jabal Dhaylan and Kutam Deposits have had pit optimisations undertaken on them by MineMap to indicate the presence or otherwise of a potential economic ore source. The use of "Reserve" to define this work as noted by MineMap is not in accordance with the JORC code, rather the work has produced a potential in-pit inventory based on assumed cost and recovery inputs and using the total Resource.

A first pass economic analysis of the Jabal Dhaylan prospect was completed by MineMap using a Lerch Grossman optimisation algorithm. Two high level optimisations were undertaken, one at a 1% Cu equivalent cutoff grade using the total Resource and one at a 1% Cu equivalent cutoff grade, using a model constrained to Indicated Resource only. The 1% Cu equivalent cutoff grade represents a reasonable assumption for a cutoff grade for any open pit operation at this early stage of review.

A range of cost scenarios were used for the optimisation. The processing and smelting costs, whilst being stated as being 'broadly' in line with those seen in the Australian mining sector, look to be for high throughput operations only and potentially optimistic for the potential production scale of this prospect. No capital costs have been estimated for this prospect.

At a 1% Cu equivalence cutoff grade, there are some indications that the Kutam Prospect may host a potentially economic source of Cu. However, based on the optimisation undertaken to date and correcting for the addition of capital costs, the potential economic inventory of the prospect may be quite marginal.

#### **4.8 Metallurgical Testwork**

A preliminary program of mineralogical and metallurgical testwork was completed by Riofinex. (1978). Testwork comprised an examination of the mineralogy, mineral liberation characteristics and amenability of the ore to processing via conventional floatation. Test samples were derived from four selected diamond drill core intersections. The original Riofinex testwork was not available for review by Coffey but several summary descriptions of the work were.

Results of the analysis concluded that the release size of chalcopyrite and sphalerite varied with the head grade but a relatively coarse grind should give adequate liberation of both minerals from gangue although not necessarily from each other. An initial optimum grinding size of 80% passing 150 mesh was indicated.

Results of floatation testwork estimated that it would be possible to obtain a copper concentrate assaying 25% Cu with a recovery of 95%. Zinc recovery was described as more problematic, and testwork suggested that a zinc concentrate assaying 50% Zn with a recovery of 75% could be possible. No data were provided on likely Zn or precious metal content of the 25% Cu concentrate.

Metallurgical testwork must be regarded as very preliminary and additional testwork is required to confirm the viability of producing saleable copper and zinc concentrates.

#### **4.9 Coffey Mining Conclusions and Recommendations**

The pit optimisation studies at Kutam suggest marginal economics at the level of accuracy of the input data. Additional work is required more clearly understand potential financial outcomes from project development. A high priority is additional extensional drilling to increase the available resources.

Coffey considers that there are a number of data deficiencies which impact on the confidence in the Kutam resource estimate. These include; inconsistent topographic survey data, incomplete QAQC data, different generations of analytical data derived from different laboratories and different analytical methods with no analytical validation, incomplete sampling (visible mineralisation only), incomplete assay suite in database, density model based on minimal data, and insufficient geological control on wireframing.

Notwithstanding these comments, it is apparent that there is a significant body of mineralisation present with Mineral Resources which in Coffey's view might be appropriately classified as "Inferred". The deposit appears to be open at depth and particularly so to the south where there is some evidence of increasing Cu and Zn grades with depth at least in the hangingwall mineralised zone. Infill drilling of the southern part of the deposit is warranted to increase the confidence in the continuity of mineralisation in this part of the deposit and to extend the mineralisation down dip / down plunge to the south and add to the resources.

The additional drilling together with geological logging and assaying, re-logging of historical holes and re-assaying all available historical drill sample pulps should form the basis of an updated resource estimate. The new data collection should include the introduction of an appropriate QAQC program. Structural mapping at surface together with structural logging of oriented drill core should be incorporated into a geological model for the deposit and the geological model should be utilised in resource estimation.

Additional metallurgical testwork is required to confidently characterise potential saleable concentrates and the results of this as well as current metal prices should be considered when formulating cutoff grades and metal equivalence formulae. Greater rigour should be applied to derive potential capital and operating costs for mining and processing as well as product revenues. These should be underpinned by a new resource model and form the basis of future pit optimisation or other economic studies.

The remaining Arin EL contains a number of other mineral occurrences including the Farah Garan Prospect which have in the past been subject to varying degrees of follow up. An ultradetailed airborne magnetic survey should be completed over the EL and should be recompiled together with the existing regional geological, geochemical and geophysical data to provide exploration targets for new or follow up geochemical sampling and/or reconnaissance geochemical drilling. This work should include a detailed review of the Farah Garan Prospect drilling to determine what additional work is required over this prospect.

## 5 AJER EXPLORATION LICENSE

### 5.1 Introduction

The Ajer Exploration License is located in the northern part of the kingdom of Saudi Arabia and is located within Tabuk province, about 550km NW of Jeddah. Typical Project topography is shown in Figure 5.1\_1. Access to the area is via the Jeddah-Tabuk coastal sealed road. The license contains the Jabal Dhaylan Pb-Zn deposits.

**Figure 5.1\_1**  
**General Topographic View of Project**



View looking north to JJM-3M (Calamine Hill) from Waypoint 366  
(Coffey, 2011)

### 5.2 Mineral Tenure

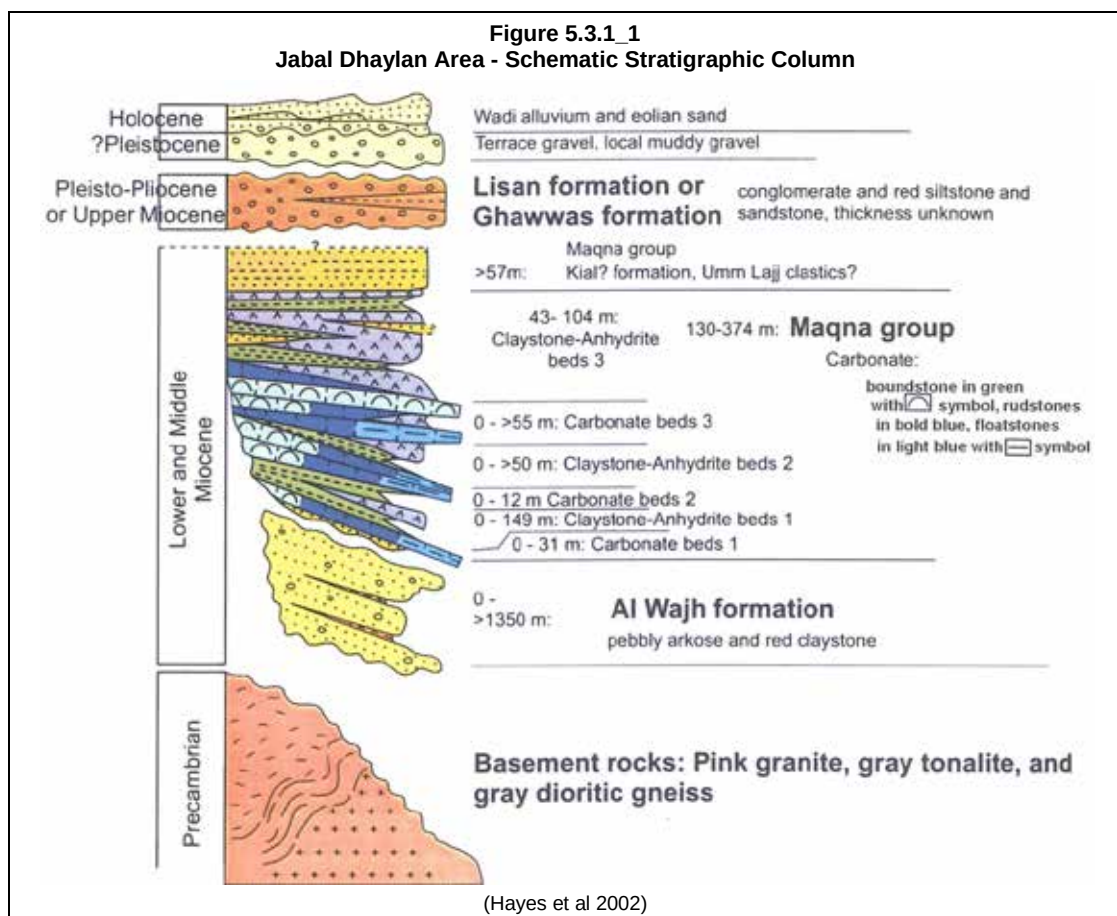
The location of the Ajer license is shown in Figure 1.1\_1 and details of the tenement schedule are given in Appendix A.

Coffey Mining has not independently validated the licensing details and the present status of tenements, agreements and legislation described in this report is based on information provided by PHME.

### 5.3 Project Geology and Mineralisation

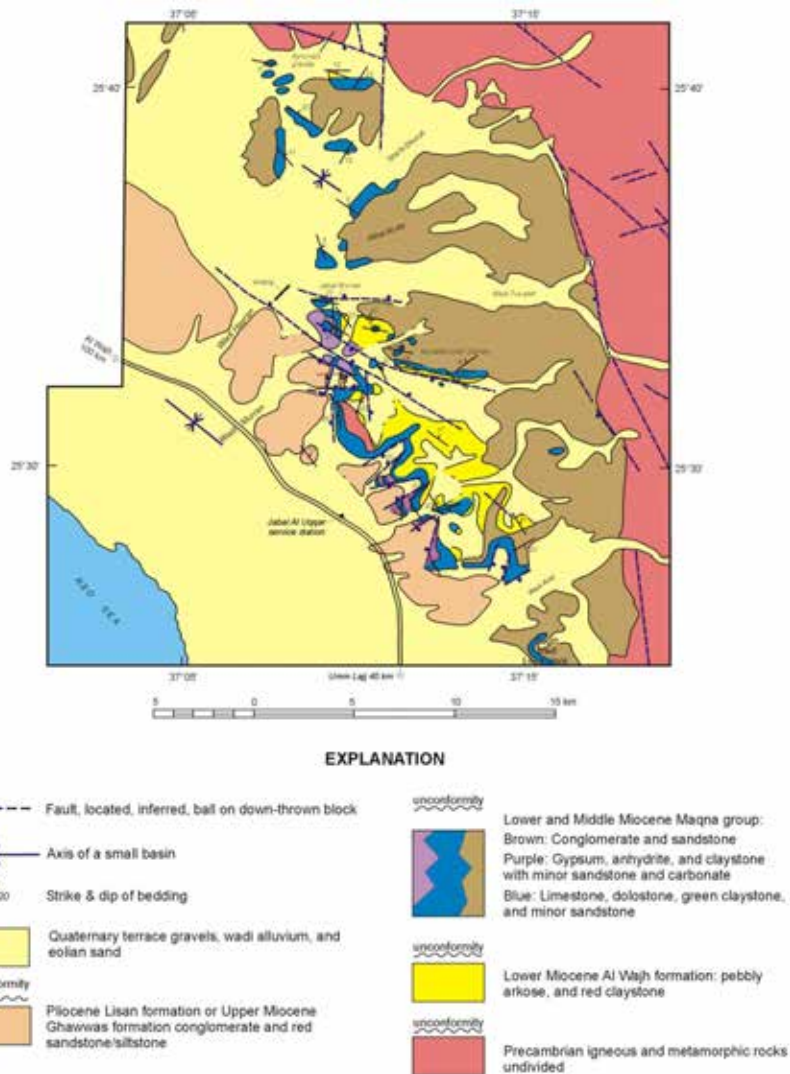
#### 5.3.1 Geology

The stratigraphic succession commences with the Lower Miocene non-marine arkose and claystone of the Al Wajh formation (Figure 5.3.1\_1), which rests unconformably on a Proterozoic basement of granite or tonalite. Unconformably overlying the Al Wajh is the Lower and Middle Miocene Maqna group, comprising shallow-water carbonate, anhydrite, claystone, marine sand and siltstone, and non-marine carbonate-cemented conglomerate. The Late Miocene Ghawwas (or Lisan) formation, consisting of conglomerate containing sedimentary rock clasts in a sandstone or siltstone matrix, unconformably overlies the Maqna rocks. Near Calamine Hill, the Ghawwas conglomerates contain clasts of Maqna carbonates containing Pb-Zn sulphides (Hayes et al., 2002).



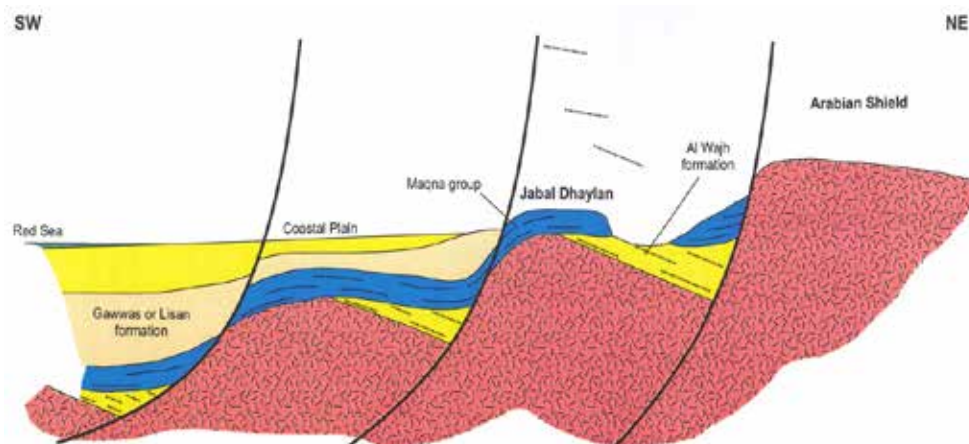
Structurally, the area is dominated by west-side-down normal listric faults associated with the opening of the Red Sea rift (Hayes et al., 2002; Figure 5.3.1\_3). The structurally upthrown fault blocks are now represented by a range of hills (Figure 5.3.1\_4). As a result of rotational movement on the faults, the pre-faulting Al Wajh formation dips E to NE at about 20°-25°. The overlying Maqna formation was drag-folded against the faults, resulting in NW- or SW-plunging anticline-syncline pairs (Figure 5.3.1\_2), indicating significant post-Al Wajh and pre-Maqna faulting, but with some syn-Maqna faulting.

**Figure 5.3.1 2**  
**Jabal Dhaylan – Geological Map**



(Hayes et al 2002)

**Figure 5.3.1 3**  
**Sketch of Structural Relations at Jabal Dhaylan**



(Hayes et al 2002)

**Figure 5.3.1\_4**  
**The Jabal Dhaylan Hills, viewed from the West – Upthrown Fault Blocks**



(Coffey, 2011)

### 5.3.2 Mineralisation

The Jabal Dhaylan deposit consists of two main occurrences:

§ Calamine Hill; and

§ Cryptomelane Hill.

Mineralisation occurs in three, separate, pene-conformable beds in the Maqna Carbonate i.e. beds 1, 2 and 3A and these consist of both sulphide and non-sulphide types. Non-sulphide mineralisation is found in the weathered zone and was produced by weathering of primary sulphide mineralisation in a carbonate environment.

Much of the weathered ore consist of disseminated and dendriform black Mn oxides, notably cryptomelane  $[K(Mn, Zn)_8O_{16}]$ , which, according to Hayes et al. (2002), contains about 30% Zn, resulting in grades in the weathered zone of up to 15% Zn. The other main Zn-bearing phases, hemimorphite  $[Zn_4Si_2O_7(OH)_2 \cdot H_2O]$  and hydrozincite  $[Zn_5(CO_3)_2(OH)_6]$ , occur as crystalline masses or as cavity-filling encrustations (Figure 5.3.2\_1 and 5.3.2\_2). Lesser amounts of chalcophanite  $[(Zn, Fe, Mn)Mn_3O_7 \cdot 3H_2O]$ , hetaerolite  $(ZnMn_2O_4)$  and hollandite  $[(Ba,K)(Mn,Zn)_8O_{16}]$  also occur. Secondary Pb-bearing phases include hydrocerussite  $[Pb(CO_3)_2(OH)_2]$ , plattnerite  $(PbO_2)$  and pyromorphite  $[Pb_5(PO_4)_3Cl]$ .

Primary sulphide mineralisation occurs below the weathered zone and comprises sphalerite, galena, pyrite, marcasites and, locally, barite. Sphalerite occurs as colloform replacement of dolostone and in veinlets, whereas galena is present as disseminated cubes or as crystalline masses surrounding granite cobbles at the base of section. Pyrite and marcasite occur as framboids, as fill in foraminifera moulds, and as concretions in claystone and sandstone. Barite is post-sulphide and occurs as vein-centre infill or crystalline aggregates; on the basis of specific gravity measurements, the barite contains about 35%  $SrSO_4$ . Very coarse-grained crystalline calcite was the last phase to form and post-dates sulphides and barite, and so may not be genetically related to the Pb-Zn mineralisation.

Seven prospects which have been identified by PHME: JJM3m, JJM4m, JJM4m South, JJM5m, Badu Camp, New Gossan, and RRC (Figure 5.3.2\_3). These prospects have had varying amounts of exploration work. The JJM3m, JJM4m and New Gossan prospects, in particular, have been extensively drilled (RC and diamond); results to date indicate that JJM3m, New Gossan (East and West) and JJM4m may contain economic levels of non-sulphide Zn mineralisation. Geological summaries of the main prospects are given in Section 5.4.

**Figure 5.3.2 1**  
**Calamine Hill - Mineralisation in the Weathered Zone;**  
**Hemimorphite and Smithsonite Lining Cavities in Maqna Carbonate**

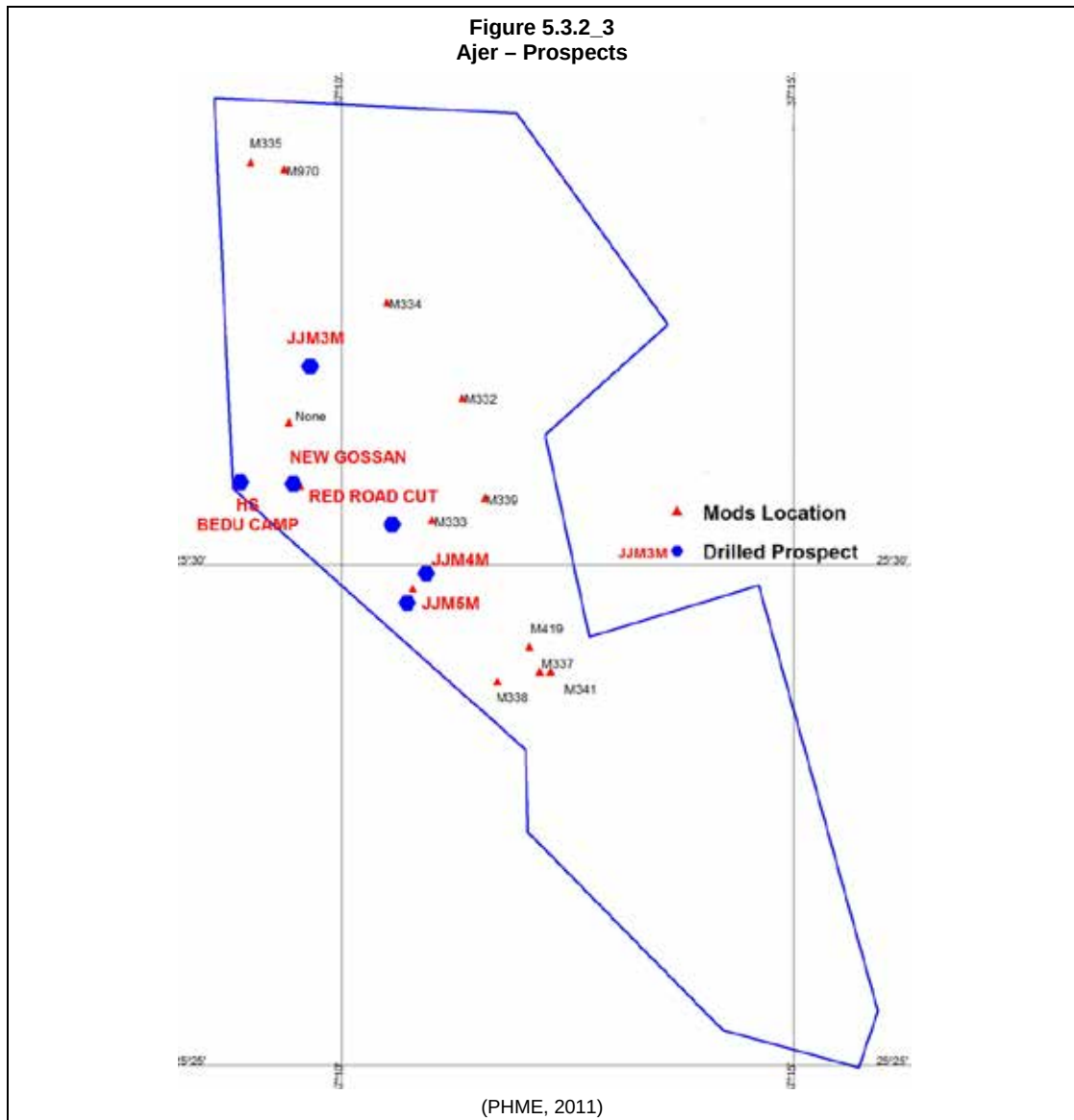


(Coffey, 2011)

**Figure 5.3.2\_2**  
**Jabal Dhaylan JJM-3m Mineralisation**



- a) Manganese stained mineralised vuggy calc-rudite overlying SW dipping anhydrite bearing mudstone (JJM-3m, waypoint 358)  
 b) Bladed hemimorphite crystals and stubby smithsonite crystals lining vughs in calc-rudite (JJM-3M, waypoint 357)  
 (Coffey, 2011)



## 5.4 Deposit Model

Hayes et al. (2002) proposed that Jabal Dhaylan mineralisation represented an example of a salt-related, carbonate-hosted deposit similar to those described in Tunisia and the Gulf Coast region of the USA, despite many similarities to Mississippi-type (MVT) deposits. The reasons were:

- § The host rock sequence is dominantly evaporite rather than carbonate;
- § Association with an early oceanic, syn-rifting setting, rather than a continent-continent collision;
- § The absence of coarsely crystalline “saddle” dolomite; and
- § The tectonically segmented Jabal Dhaylan area precludes the regionally extensive palaeohydrogeological flow paths of ore fluids regarded as diagnostic of MVT deposits.

Sangster & Abdulhay (2005) were more in favour of a MVT model, because they regarded the definition of MVT deposits, as used by Hayes et al. (2002), to be too restrictive and because of the lack of any known salt diapirs in the Jabal Dhaylan region.

## 5.5 Exploration History

In 1968, eleven outcropping occurrences of Zn-Pb-(Cu-Ag) minerals and barite were discovered along Jabal Dhaylan by the BRGM. Five occurrences were in Tertiary arkoses and small. Four occurrences in overlying carbonates are larger and richer, and have potential for economic mineralisation. At Calamine Hill, 21 diamond drillholes intersected a resource in the weathered zone. Work carried out by the USGS in 1996-2000 included selective geological re-mapping, additional outcrop sampling, extensive ground geophysical surveys, 13 diamond drillholes (for 2,252m), and supporting laboratory studies.

Exploration by PHME includes general prospecting, geological mapping, rock chip sampling, trenching, collection of metallurgical test samples, and RC, diamond and RAB (rotary air blast) "post hole" drilling. A total of 2,704 rock chip samples were collected by PHME and analysed for Zn and Pb; of these, 1,359 samples were for metallurgical testing. A total of 405 holes, including 160 post holes (on a 100m by 20m or 100m by 100m grid), 90 RC and 135 diamond holes were drilled by PHME and USGS for a total of 14,674.7m.

### New Gossan

The New Gossan prospect was identified in December 2004, during reconnaissance of the western flank of Jabal Dhaylan, south of the established mineralisation at Calamine and Cryptomelane Hills (JJM3m). Exposures of black, porous 'gossanous' material at the foot of the range, and fragments of similar material along with masses of Mn oxide on the slopes above, indicated a westerly-dipping mineralised horizon approximately 100m wide at the surface. Rock samples contained values of up to 16% Zn, indicating that the gossanous outcrops were manifestations of significant Zn mineralisation.

Between 2005 and 2007, a program of trenching, RC drilling, and limited diamond drilling has delineated a high-grade Zn resource in the discovery area (West Zone), and indicated a second mineralized body 250m to the east within the same rock units (East Zone). Ore controls have been not firmly established, but early assessments point to permeable horizons within marine claystones and limestones were the locus of high-grade sulphide mineralisation, followed by near-surface oxidation and supergene enrichment. Mineralisation in both the West and East Zones is located above up-thrown blocks of granitic basement, suggesting that the bounding faults were fluid conduits to the overlying carbonates. Drilling has outlined a zone of oxide mineralisation with a central core up to 25m thick, and many of the intercepts exceed 15% Zn.

JJM3m

This is the largest known Zn occurrence in the district and was the focus of exploration by BRGM. The prospect is underlain by NW-dipping carbonates and clastic rocks of the Magna Group and the Al Wajh Formation. The Magna Group hosts the Zn mineralisation, although some high Zn values have been found to extend into the Al Wajh sandstones at the Magna-Al Wajh contact. The Miocene sedimentary rocks unconformably overlie granite, which outcrops south of the prospect. The Miocene rocks are also cut by a number of normal faults.

The faults and the granite form the boundary of the prospective area at JJM3m. The granite does not host Zn mineralisation and faults to the north and west displace the Magna group downward beyond economic mining depth. The prospective area is a horst measuring 600m by 800m, bounded by faults to the north and west and by granite to the south.

JJM4m

This prospect comprises a narrow zone of high-grade non-sulphide mineralisation based on an extrapolation of the BRGM trench data and USGS drillhole JUQ-1. To test this target, PHME drilled 30 holes for 809.10m. Thirteen of these holes intersected mineralisation assaying >10% Zinc. Of these, eleven holes had intercepts assaying >15% Zn.

JJM5m

This prospect occurs along a ridge with high-grade outcropping mineralisation. Drilling, however, indicated that the mineralisation died out within 20m down-dip of outcrop. Results are being evaluated.

Red Road Cut (RRC)

This is a small prospect where low-grade mineralisation 4m thick was intersected by drilling and extended 21m down dip. Additional drilling is required to test the mineralisation at depth.

## 5.6 Mineral Resources

### 5.6.1 Summary

Mineral Resources for Jabal Dhaylan have been estimated by MineMap (Markey 2010b). These estimates have not been independently validated by Coffey Mining and are presented here as reported by MineMap. No digital block models were provided and the following comments are based on a review of the documentation accompanying the estimate and a review of the drilling data provided by PHME.

The resources were estimated using Minemap Mine Planning Software, 3D IDW (weighted inverse distance) for grade interpolation and “approximately” 1% Zn cutoff wireframes to constrain the mineralisation. MineMap considered the mineralisation continuity and drillhole spacing sufficient to classify the resources as Indicated. Four separate deposits were modelled, JJM3m, JJM4m, New Gossan East and New Gossan West. The total Mineral Resources were estimated at 4.076Mt @ 5.29% Zn and 1.07% Pb. Over half of the total is in the JJM3m Deposit. The individual contributions to the total are shown in Table 5.6.3\_1.

## 5.6.2 Data Collection

MineMap based their resource estimate on data provided by PHME. The data were not independently validated. The database comprises three generations of drilling and analytical data which correspond to the historical investigations completed by the USGS, BRGM and more recent drilling completed by PHME. The BRGM completed 21 diamond drillholes for 1,262m (60m average depth); the USGS completed 13 diamond drillholes for 2,253m (average depth of 173m) and PHME completed 80 diamond drillholes for 2719m (34m average depth). In addition to this, PHME completed 273 RC drillholes for 7694m (average depth 28m). Most of the RC drilling (90 holes + 7 diamond drillholes) was completed at New Gossan while most of the diamond drilling (74 holes + 10 RC holes) was completed at JJM3m. JJM4m was drilled with 37 diamond drillholes. Geochemical "post hole" drilling (160 RAB holes) was completed by PHME between New Gossan and JJM3m. No compilation of this geochemical drilling was sighted. The location of all drilling is shown in Figure 5.6.2\_1. Resource drilling was on relatively irregular grids varying from approximately 80m x 50m to 40m x 30m as exemplified by the JJM3m Deposit drilling (Figure 5.6.2\_2).

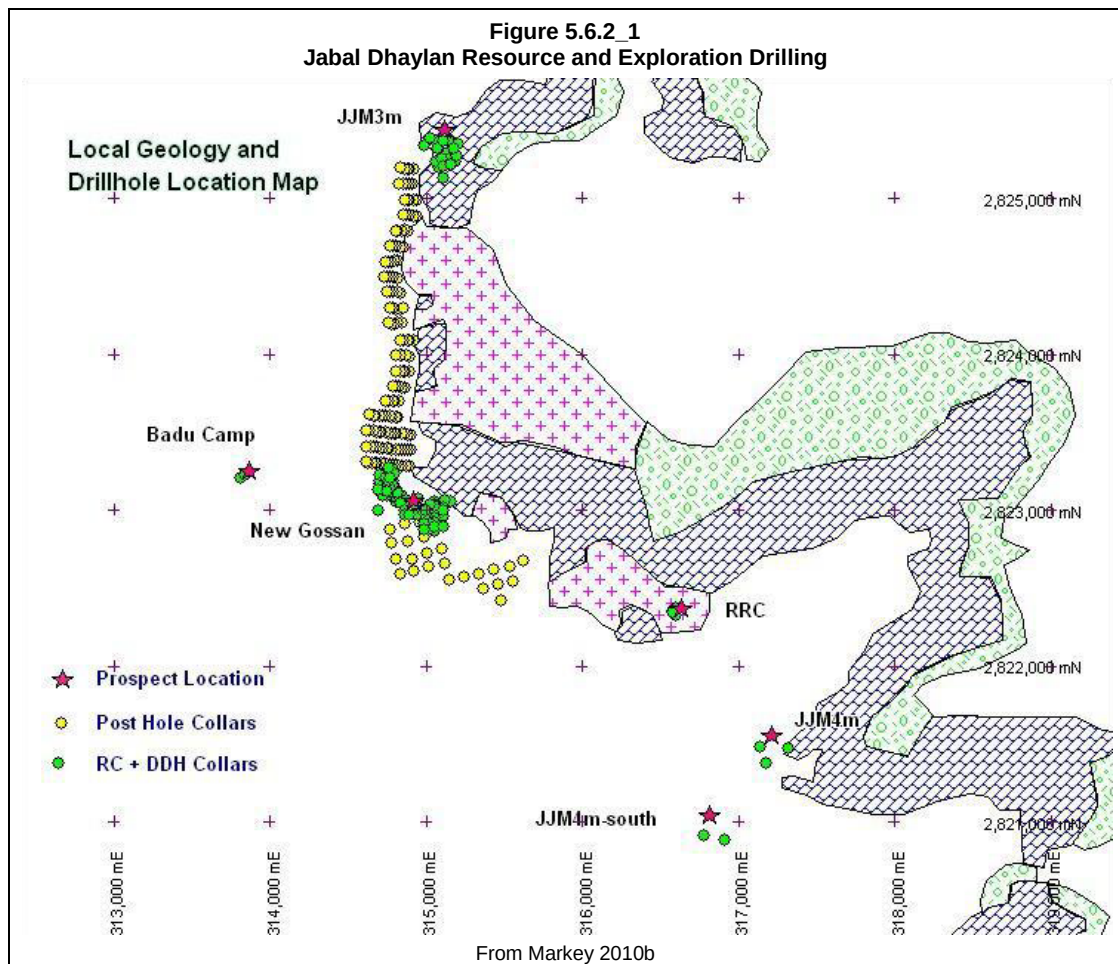
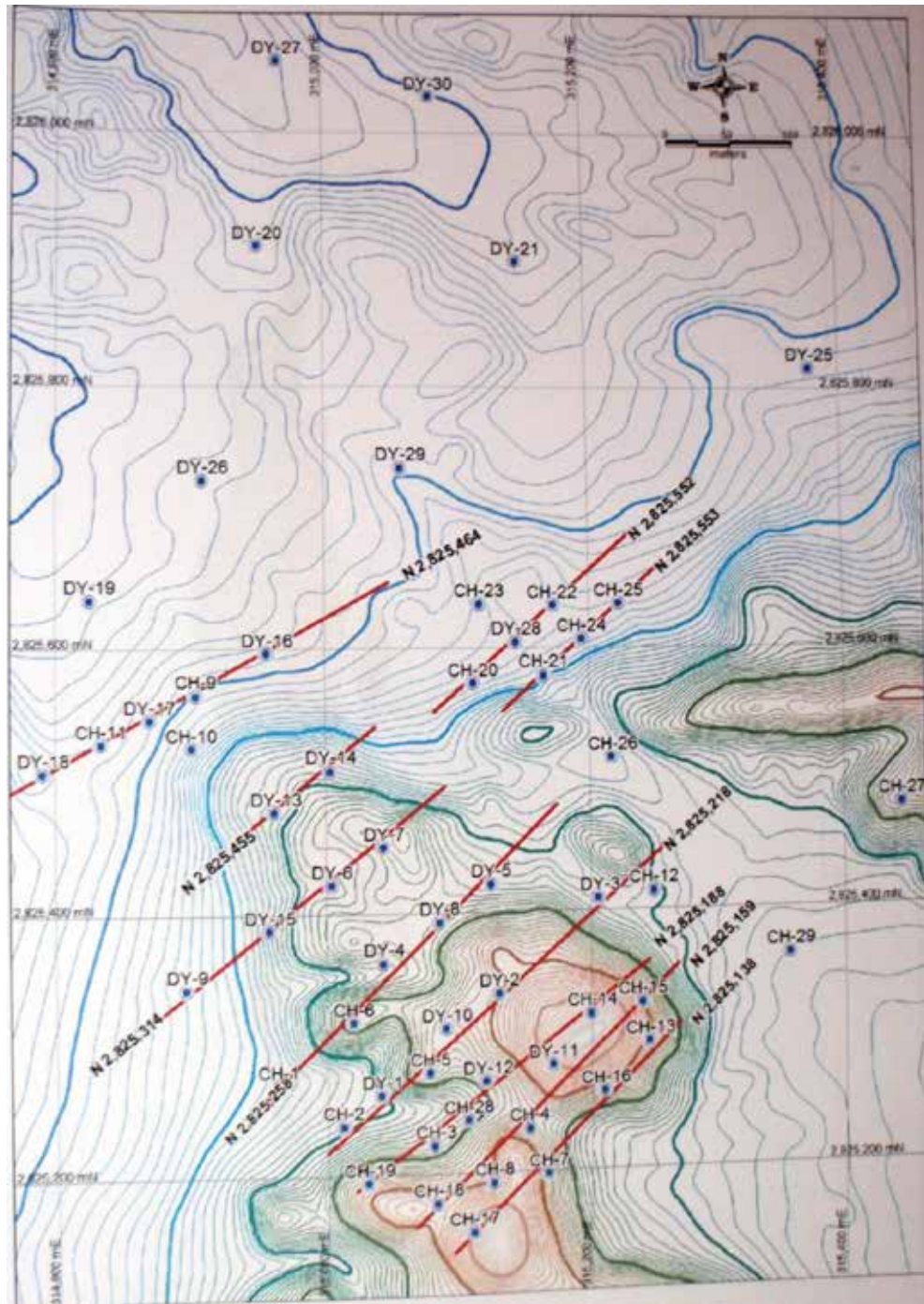


Figure 5.6.2 2  
Jabal Dhaylan JJM-3M Resource Drilling



From PHME

The variable sampling intervals averaged 1.62m and it appears that half core was sampled and submitted for assay. PHME, BRGM and the USGS geologically logged all of their drillholes however geological data were not used in the resource modelling as the logging codes require standardisation.

The MineMap report suggests all samples were assayed for Zn and Pb by INAA. The USGS and BRGM laboratories were not specified but the PHME analyses were undertaken by Al Amri Laboratories in Jeddah. MineMap comment PHME submitted “a number” of standards and also duplicate RC samples for analysis but no review of these data was available for comment.

All PHME drillhole collars were surveyed by Abnia Surveying from Jeddah. Abnia were also contracted to do a topographic survey of selected areas within the Jabal Dhaylan license and to also resurvey BRGM and USGS drill collars. There are no downhole surveying records for any drilling at Jabal Dhaylan but since the majority of the holes are relatively shallow and nearly all are vertical, the impact on estimation confidence is likely to be minimal.

Drill core samples were submitted for density determination by PHME and the samples were sourced from a number of different types of mineralisation at different depths. The values quoted show a large range (1.18 to 3.15). An average value of 1.9 was used for “ore” and “waste” in resource modelling. Given the obviously highly variable porosity and erratic distribution of vughs and cavities in the mineralisation, the large range of values recorded is not surprising.

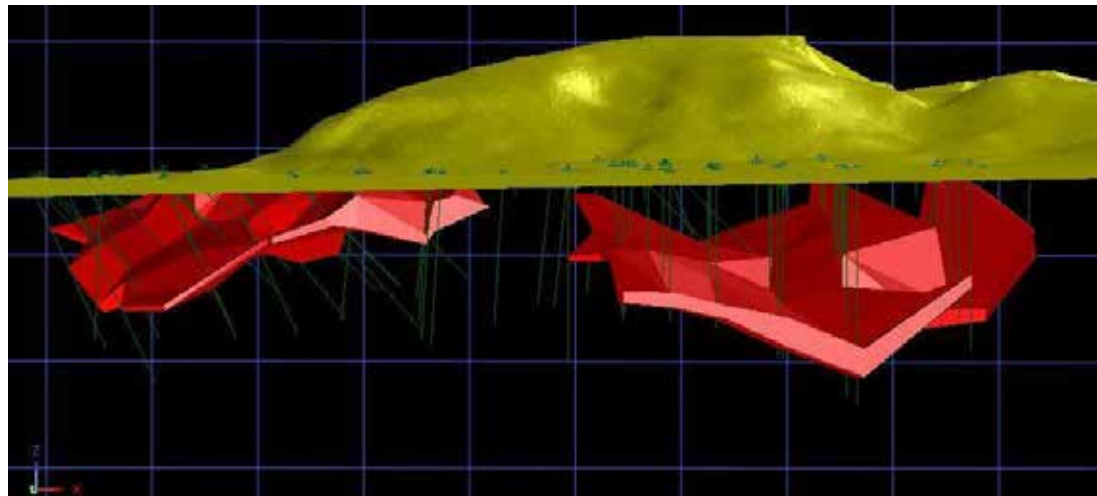
### 5.6.3 Resource Modelling

The resources were estimated using Minemap Mine Planning Software. An “approximately” 1% Zn cutoff was used to constrain the mineralisation in four wireframes/solids; New Gossan East, New Gossan West, JJM4m and JJM3m. Block models were constructed with blocks measuring 5m (X) by 5m (Y) by 4m (Z). Ellipsoidal 3D-IDW (Inverse Distance Weighting) was used for grade interpolation with the size and orientation of the ellipses differing slightly for each mineralised block. They varied from 50m (X radius)-70m(Y radius)-40m (Z radius) at New Gossan East to 50m (X) x 50m (Y) x 20m (Z) at JJM4m. The individual contributions to the total are shown in Table 5.6.3\_1. The 3D model for New Gossan is illustrated in Figure 5.6.3\_1.

| Table 5.6.3_1<br>Jabal Dhaylan MineMap 2010 Resource Estimate |                  |             |                |             |               |
|---------------------------------------------------------------|------------------|-------------|----------------|-------------|---------------|
| Deposit                                                       | Tons             | Zn %        | Zn Metal tons  | Pb %        | Pb Metal tons |
| New Gossan -East                                              | 1,085,583        | 5.43        | 58,947         | 0.9         | 9,770         |
| New Gossan -West                                              | 460,791          | 5.73        | 26,403         | 0.76        | 3,502         |
| JJM3m                                                         | 2,382,373        | 5.1         | 121,501        | 1.26        | 30,017        |
| JJM4m                                                         | 146,982          | 6.09        | 8,951          | 0.29        | 426           |
| <b>Total</b>                                                  | <b>4,075,729</b> | <b>5.29</b> | <b>215,802</b> | <b>1.07</b> | <b>43,715</b> |

Adapted from Markey 2010b

**Figure 5.6.3 1**  
**New Gossan Resource Model**



New Gossan West (left) and New Gossan East (right) mineralisation solids with drilling and topography shown (50m grid)  
From Markey 2010b

## 5.7 Mining Investigations

A first pass economic analysis of the Jabal Dhaylan prospect was completed by MineMap using the Lerch Grossman Algorithm. Two high level optimisations were undertaken, one at a 1% Zn equivalent cutoff grade and one at a 10% Zn equivalent cutoff grade.

From the Mintek scoping study, the pyrometallurgical processing route (DC Arc Furnace) assumes that 105,100t/year of mineralisation is treated, requiring a feed grade of 15% Zn and 2% Pb. The operating costs are stated as \$70/t of ore in 2000, which may escalate to as much as \$92.50/t in 2011. After taking into account the missing items and applying escalation, MineMap estimated the total capital for the prospect would likely range between \$30M to \$53M.

The 10% Zn equivalent cutoff grade is a better assumption for a cutoff grade for the open pit operations at this early stage of review and may provide a 15% Zn ore feed grade to the plant.

At a 10% Zn equivalence cutoff grade, there were some indications that the Jabal Dhaylan Prospect may host a potentially economic source of Zn (and Pb) ore. However, based on the optimisation undertaken to date and correcting for the increase in operating and capital costs, the potential economic inventory of the prospect may be quite small and marginal.

## 5.8 Metallurgical Testwork

### 5.8.1 Introduction

A large metallurgical testwork program was conducted by Mintek in South Africa in 2008 to assess the metallurgical characteristics and process and recovery options for the deposit. A previous high level study, designated as a scoping study, was conducted by Mintek in 2000 which proposed a pyrometallurgical process route consisting of calcining followed by direct reduction and recovery in a direct current arc furnace.

The base case design criteria was a process plant designed to treat approximately 100,000tpa of 15% Zn ore to produce ~15,000kg of high grade PWG (Prime Western Grade) zinc ingot for direct sale and a small amount of lead.

## 5.8.2 Testwork

### Sampling

Extensive drilling exploration of the Jabal Dhaylan deposit has taken place between 2000 and 2007. Geological and lithological characterisation identified three main mineral associations or domains that were investigated separately during the metallurgical testwork program.

The three main 'composites' produced from the drill core were then divided further into a number of blends according to their lithology. The sample selection and composition for metallurgical testing appears to be well documented and the process appears sound and hence the sample would appear to be representative for metallurgical purposes.

### Mineralogy

Extensive mineralogical work was carried out in order to assess the mineral abundance, deportment, grain size and associations, primarily of the zinc. The testwork appears comprehensive and consisted of both optical and analytical (XRF) investigations.

The mineralisation of each of the three main domains in the Dhaylan deposit is complex and dominated by secondary carbonate, oxides and silicate minerals. The zinc mineralisation is varied with the main constituents being smithsonite, hemimorphite, chalcophanite, hetaerolite, hydrozincite and Zn-chlorite. The zinc tends to be intergrown and poorly liberated in most samples.

Secondary lead mineralisation present includes cerussite, plattnerite and pyromorphite. A small amount of sulphide is present as sphalerite with minor galena.

In general the Zn-bearing minerals are poorly liberated and are generally intergrown. The liberation sizes ranged from 20µm to 75µm over the three domains.

### Comminution

Preliminary comminution testwork undertaken included Bond Crushing, Ball mill and abrasion indices.

The results indicate that all mineralisation types can be classified as soft to very soft. The average result for each index is given below in Table 5.8.2\_1.

| Table 5.8.2_1<br>Jabal Dhaylan – Comminution Testwork Results |       |        |
|---------------------------------------------------------------|-------|--------|
| Indices                                                       | Unit  | Avg    |
| Crushing Wi                                                   | kWh/t | 6.2    |
| Ball Mill Wi                                                  | kWh/t | 8.71   |
| Abrasion h                                                    |       | 0.0157 |

### Beneficiation

A sample of each of the three main composites was subjected to a series of physical upgrading or beneficiation tests in order to determine if a higher grade zinc 'concentrate' could be produced which could then be processed further.

The testwork included a number of separation methods including gravity by shaking table, heavy media separation and finally flotation.

None of the above testwork proved viable and no significant upgrading could be obtained and the testwork was discontinued.

### Hydrometallurgical

Two primary processing methods were investigated, those being a hydrometallurgical and pyrometallurgical processing route.

The hydrometallurgical flowsheet essentially consists of 'Whole of Ore' acid leaching to recover the zinc into a pregnant liquor followed by solvent extraction (SX) purification and finally electrowinning. A number of various options were tested involving the SX raffinate recycling and removal of impurities etc.

A whole ore blend of the three main composites was leached at 300µm, 150µm and 75µm in order to assess the acid consumption and Zn recovery. Further tests were also conducted on individual lithology types to gauge the effect on the GAC or 'Gangue Acid Consumption'.

The results indicate that approximately 90% Zn recovery could be achieved for all three mineralisation types. This could be increased to as high as 98.5% if re-leaching of the residue is employed. The pregnant liquor was relatively high in impurities however, such as Mn, Al and Mg which will require the purification with SX prior to electrowinning.

The significant issue with the leaching stage is the high acid consumption related to the oxide, carbonate rich mineralisation. Results indicate that acid consumption ranged from 200kg/t to as high as 600kg/t were encountered for certain lithologies. The average consumption for the "whole ore" blend was ~300kg/t.

The overall Zn recovery did not appear to depend significantly on the lithology ore grind size, although the GAC was slightly lower with increasing grind size.

### Pyrometallurgical

The second processing option investigated was a pyrometallurgical flowsheet whereby the ROM material is first calcined and undergoes direct reduction in a DC arc furnace. The Pb/Zn is fumed off and recovered in a condenser and cast directly into high grade metal ingots. This was the process route selected in the 2000 Mintek scoping study.

The process consists of crushing ROM material down to 25mm-30mm which is then fed into a rotary calciner. The gas-fired calciner operated at approximately 1000°C in order to oxidise the carbonates. The calcined material is then fed directly into a DC arc furnace along with a quantity of coking coal and silica and smelted at around 1450°C.

The lead and zinc are reduced to metal and 'fume off' due to their high vapour pressures. The gases then enter a splash condenser where they precipitate again as molten metal. The mixture is cooled whereby the zinc and lead are separated and cast as ingots.

The average Zn recovery for all smelting tests was 97%. Some lithologies performed slightly worse and required some adjustments to the amount of silica and other reagents in the recipe. A scale up factor was applied to the laboratory results which indicated that Zn recovery between 85% - 95% could be expected at commercial scale.

A simplified schematic of the pyrometallurgical process route is given below in Figure 5.8.2\_1.

## 5.9 Capital Costs

The capital cost of the pyrometallurgical processing route treating 100,000tpa of "whole ore" with a feed grade of 15% Zn was estimated as part of the Mintek 2000 study.

A breakdown of the capital areas is given below in Table 5.9\_1. (US\$)

The process plant capital was estimated by Mintek at US\$22,512,000. It is noted however that the above estimate does not include the following items:

- § Land purchases
- § Infrastructure
- § owners costs
- § project management

Escalation for the period 2000 to 2011 would increase the above figure by approximately 32%. This equates to US\$29,716,000. Also the level of study would suggest a confidence level of +/-50% should be applied although this is not stated in the report.

After taking into account the missing items and applying escalation the total capital for this project would likely range between \$30M - \$53M.

Figure 5.8.2\_1  
Schematic of the Pyrometallurgical Process Route

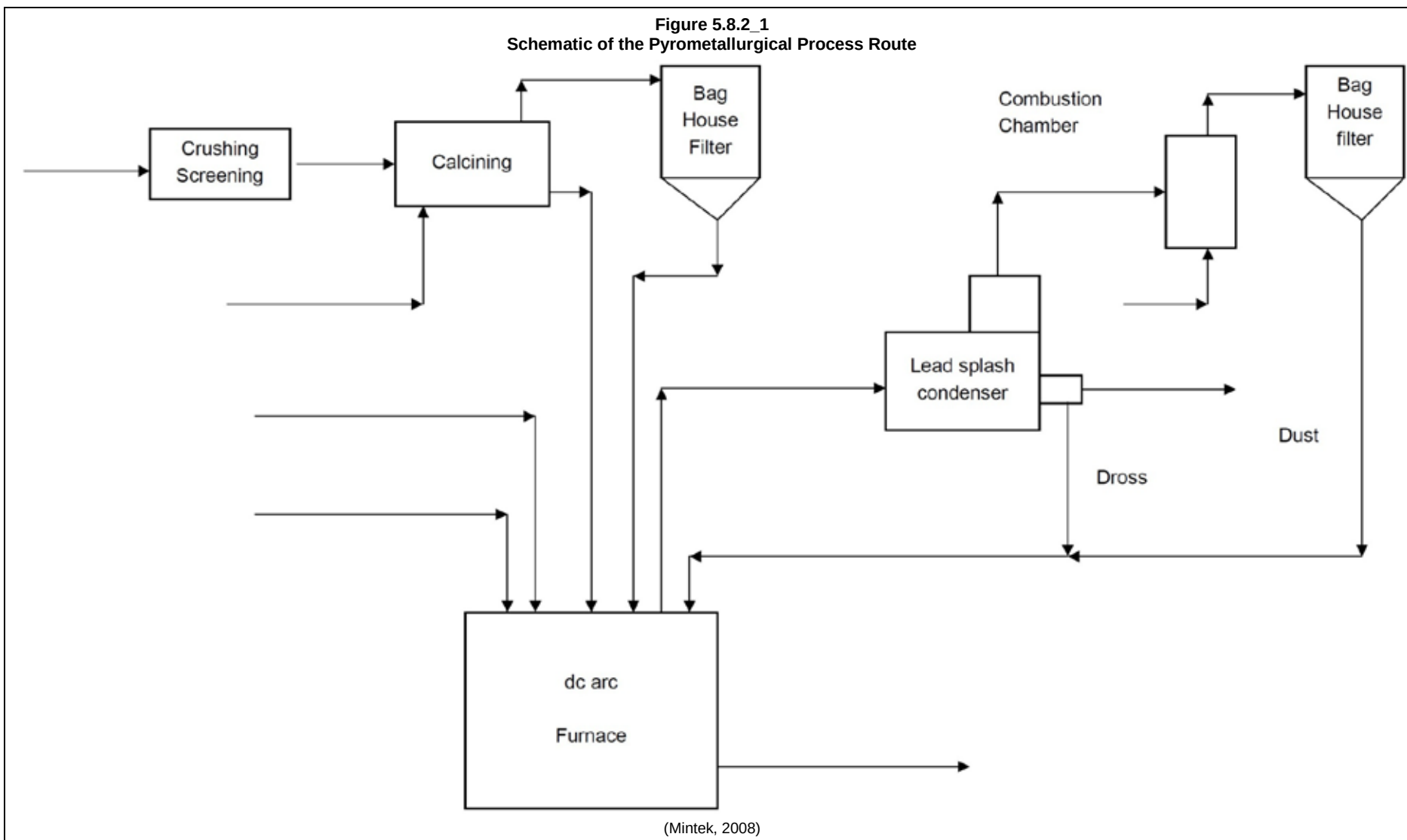


**Table 5.9\_1**  
**Jabal Dhaylan Processing – Capital Cost Breakdown (YR2000 estimate)**

| Area                     | 2000 Scoping Study<br>US\$000's |
|--------------------------|---------------------------------|
| Crusher and Handling     | 337                             |
| Calcining                | 1,755                           |
| Storage and Feed System  | 500                             |
| Smelting                 | 7,040                           |
| Condensing               | 1,000                           |
| Gas Handling             | 500                             |
| Dross Handling           | 750                             |
| Granulation              | 420                             |
| Utilities                | 500                             |
| Buildings/Infrastructure | 2,400                           |
| Indirects (15%)          | 2,280                           |
| Vehicles                 | 280                             |
| Site Works               | 760                             |
| Contingency (20%)        | 3,704                           |
| Royalties                | 285                             |
| <b>Total</b>             | <b>22,512</b>                   |

### 5.9.2 Operating Costs

The estimated operating costs breakdown for the zinc smelting processing option in the Mintek 2000 study is shown below in Table 5.9.2\_1.

**Table 5.9.2\_1**  
**Jabal Dhaylan Processing – Operating Cost Breakdown**

| Area           |                 | Unit  | 2000 Scoping Study |                  |
|----------------|-----------------|-------|--------------------|------------------|
|                |                 |       | US\$/t             | Annual           |
| Variable Costs | Crushing        | t     | 2.50               | 262,750          |
|                | Power (furnace) | MWh   | 16.0               | 759,688          |
|                | Power (plant)   | MWh   | 16.0               | 94,209           |
|                | Coke            | t     | 100                | 409,900          |
|                | Silica          | t     | 50                 | 367,850          |
|                | Reagents        |       | 5.0                | 368,005          |
|                | Electrodes      | T     | 3,500              | 332,363          |
|                | Gas             | Gj    | 2.5                | 1,158,500        |
|                | Consumables     |       | 5.0                | 368,005          |
| Fixed Costs    | Labour          |       |                    | 1,293,000        |
|                | Maintenance     | 4%    |                    | 1,014,000        |
|                | Insurance       | 0.75% |                    | 190,000          |
|                | Administration  | 15%   |                    | 391,000          |
| <b>Total</b>   |                 |       | <b>70.00</b>       | <b>7,009,270</b> |

The estimated confidence level has not been stated in the study however is assumed to be +/-50% which is typical of scoping or conceptual study level.

Escalation for the period 2000 to 2011 would increase the above figure by approximately 32%. This equates to \$9,252,000 annually or US\$92.50 per tonne of ore processed.

## 5.10 Coffey Mining Conclusions and Recommendations

Coffey considers that there are a number of data deficiencies which impact on the confidence in the Jabal Dhaylan resource estimate. The density data present a significant uncertainty for tonnage estimation and this issue is sufficiently important to suggest that the Resources would be best classified as "Inferred".

Other data issues impacting on resource classification include incomplete QAQC data, different generations of analytical data derived from different laboratories with no analytical validation, a very limited assay suite in the database and minimal geological control on the estimation process. Notwithstanding these issues, Coffey Mining considers that Jabal Dhaylan contains several significant albeit modest sized zinc-lead deposits which contain notable zones of >10% Zn and include many drill intersections with >20% Zn + Pb over significant widths.

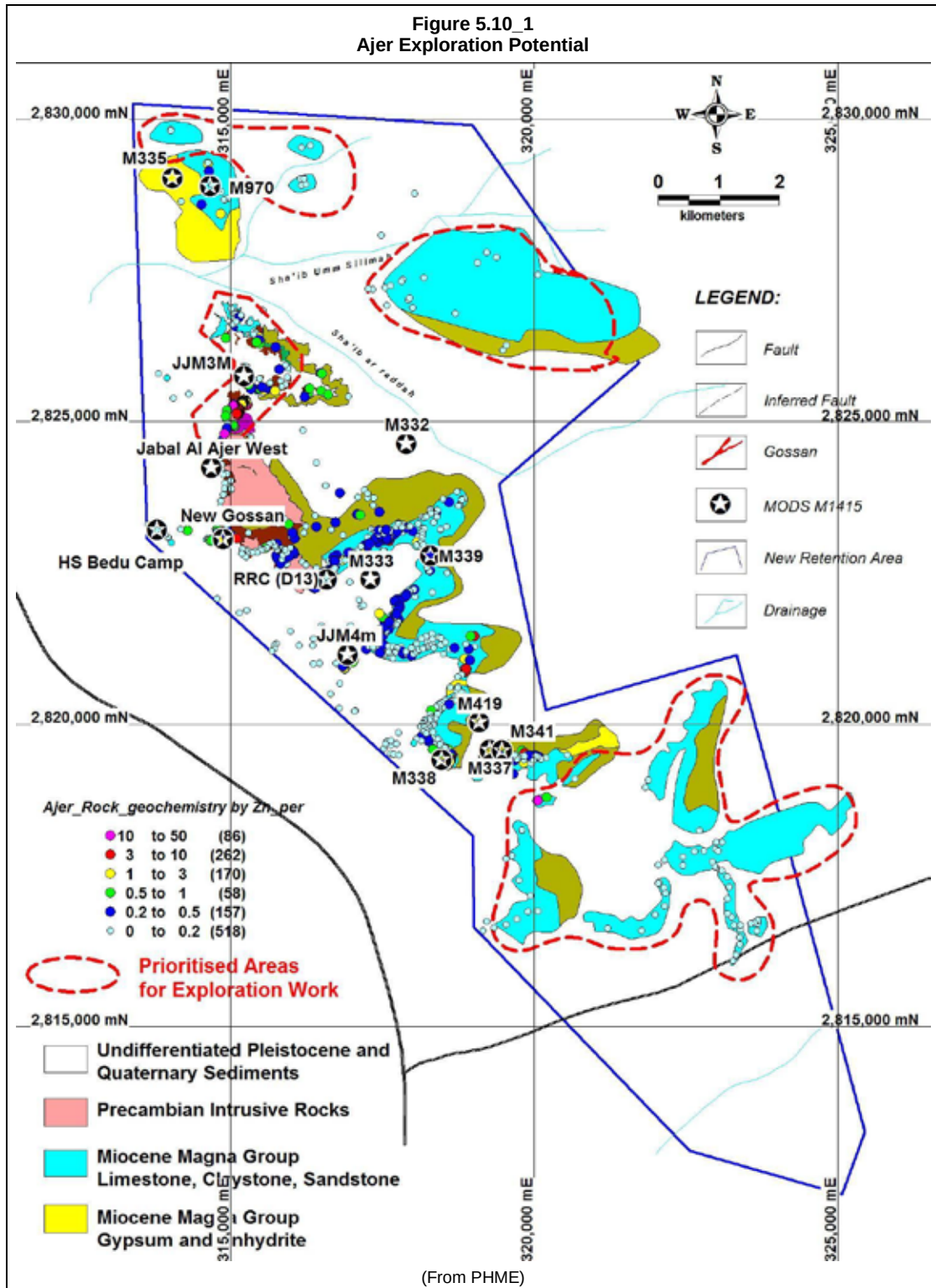
Additional drilling together with geological logging and assaying, re-logging of historical holes and re-assaying all available historical drill sample pulps should form the basis of updated resource estimates. The new data collection should include the introduction of an appropriate QAQC program. New drilling samples and selected drill sample pulps within the resource areas should be re-assayed for a multi element suite including both beneficial and deleterious elements (Ag, Cd and Ge).

Coffey's review of the pit optimisation studies at Jabal Dhaylan suggests marginal economics for the Project at the level of accuracy of the input data. Additional work is warranted to more clearly define inputs to financial modelling. Metallurgical testwork suggests at least one processing option may be viable with acceptable capital and operating costs but is dependent on a relatively high feed grades.

The main focus should be on growing the resource base in order to offset capital costs. Addition of sulphide resources to the oxide resources will provide additional processing options and could have a significant positive benefit on Project economics. Other processing options allowing lower feed grades and mixed oxide-sulphide feed should also be investigated.

There are numerous other Zn-Pb prospects within the project area which include JJM-5M, Red Road Cut and HS Bedu Camp. These suggest widespread mineralisation process and enhance the opportunity to define additional resources. Much of the project area and surrounding ground are concealed by younger transported cover and require systematic exploration (Figure 5.10\_1). Deeper diamond drilling suggests that the near surface oxide mineralisation which comprise the Mineral Resources is associated with primary sulphide mineralisation down dip. Primary sulphide grades encountered to date are generally quite low but the prospectivity for higher grade sulphide mineralisation is regarded as high.

Systematic compilation of all the existing geological, geochemical and geophysical data is required prior to formulating an exploration strategy forward. Geological and structural mapping needs to be completed in the outcrop areas as part of this process along with orientation geochemical and geophysical investigations to determine effective targeting and exploration tools for sulphide as well as oxide mineralisation in the covered areas.



## **6 KITNAH LICENSE**

### **6.1 Introduction**

The Kitnah Exploration License and the Arin EL were retained portions of the larger Malaha-Najran Exploration License which had been previously held by PHME since 23 July 1997. The Kitnah license was due for expiry on 8 April 2012 and 50km<sup>2</sup> of the EL area is being retained through application for an Exploitation (Mining) License. The area is about 80km by highway north of the city of Najran and contains the Al Majma and Kitnah gold prospects. Access to the area is excellent with a sealed road providing access to within 1km of the main prospects at the north end of the license.

### **6.2 Mineral Tenure**

The Kitnah EL covered an area of 99.05km<sup>2</sup> and was granted a "final" five year renewal in June 2007 with an expenditure commitment of ~US\$811K. Total Expenditure to June 2012 has been ~US\$738,137. The license was due for expiry on 8 April 2012 and 50km<sup>2</sup> of the EL area is being retained through application for an Exploitation License (Mining License Application) dated 28 March 2012). The licence details are listed in the tenement schedule shown in Appendix A and the boundaries along with the location of the main prospects are shown in Figures 1.1\_2 and 6.2\_1. Coffey has not independently validated the licensing details and the present status of tenements, agreements and legislation described in this report is based on information provided by MEMC.

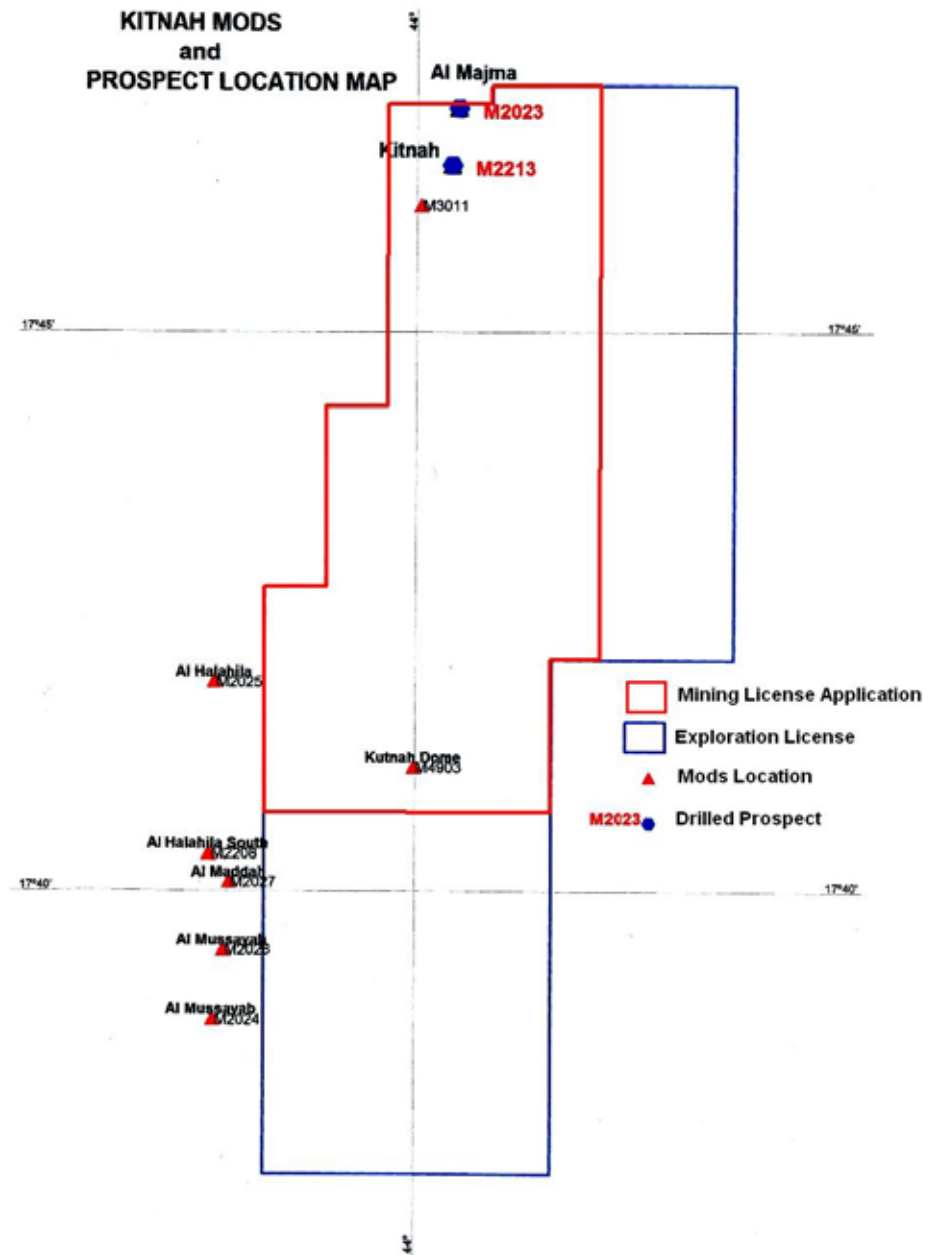
### **6.3 Geology and Mineralisation**

#### **6.3.1 Regional Geology**

The Kitnah EL is situated in the southern portion of the Malahah Belt (Figure 4.1\_2), which is part of the Halabah group of rocks (Asir Terrane). The predominantly felsic volcanic and sedimentary rocks which make up the Halabah Group are interpreted to be a possible back-arc rift assemblage metamorphosed to greenschist facies. The volcanoclastic and epiclastic sedimentary rocks associated with the volcanic-arc assemblage in the southern part of the Malahah Belt commonly are gray to black, pyritic, calcareous, and in part carbonaceous, with subordinate chert and thin, discontinuous marble beds. Grain size ranges from boulder conglomerate to slate; pebble-bearing, sand-sized clastic rocks are predominant. Facies changes commonly are rapid along and across strike in the coarser grained units.

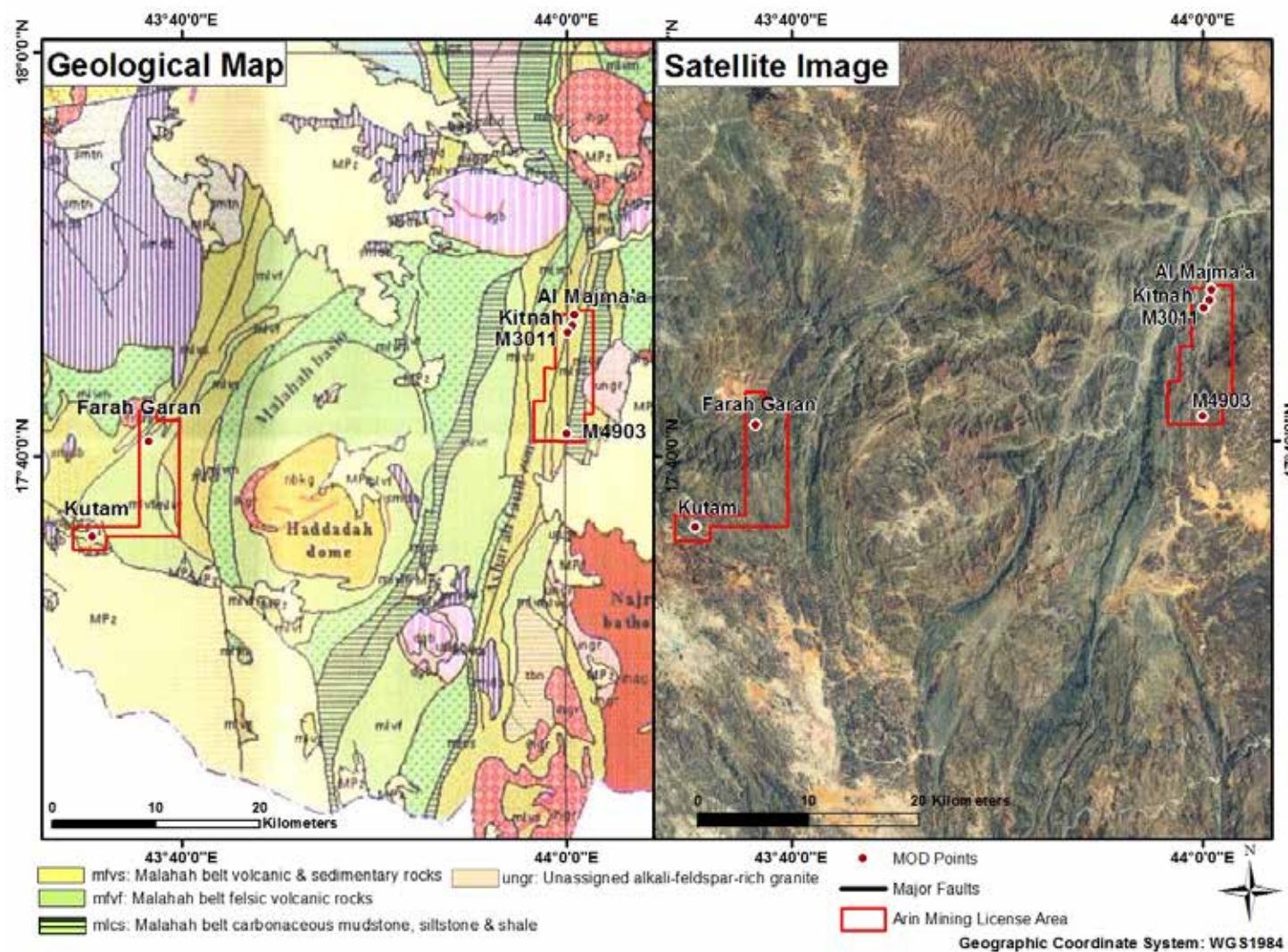
The Kitnah EL lies to the east of the Hadadah Pluton and is traversed by a major NNE trending structure, the Asharah Fault Zone (Figure 6.3\_1). The Asharah Fault Zone separates carbonaceous and pyritic phyllites and greywackes on the east and a gray-green volcanoclastic unit on the west. East of and gradational with the carbonaceous phyllites are undifferentiated metasedimentary rocks. On a regional scale, gold mineralisation at the two main prospects Kitnah and Al Majma is associated with the Asharah Fault Zone.

Figure 6.2\_1  
Kitnah Exploration License and Mining License Application



From PHME

Figure 6.3\_1  
Arin - Kitnah Regional Geology



From Wuth 2011 (updated 2012 with Arin and Kitnah MLAs)

### 6.3.2 Local Geology

The Al Majma – Kitnah prospects are located at the north end of the EL along a 2km segment of a prominent north trending scarp interpreted to be the local manifestation of the Asharah Fault Zone or a major splay off the Asharah Fault. The scarp separates rugged outcrops of N-S trending, near vertical dipping, predominantly metasedimentary rocks to the west from recent alluvial (wadi) sediments to the east. The metasediments comprise various phyllites and schists which vary from very fine-grained to medium-grained and contain varying proportions of quartz, sericite, chlorite and carbonate. Two main types are recognised, quartz-chlorite-sericite schist interpreted to be a metamorphosed mafic tuff and calcareous quartz-sericite schists interpreted to be metasedimentary rocks. Thin beds of massive carbonate from 1m to 8m thick and locally gossan beds from 0.2m to 0.3m thick are interlayered with the schist. The metasedimentary rocks were seen to be intruded by a small, medium-grained felsic dyke at Al Majma.

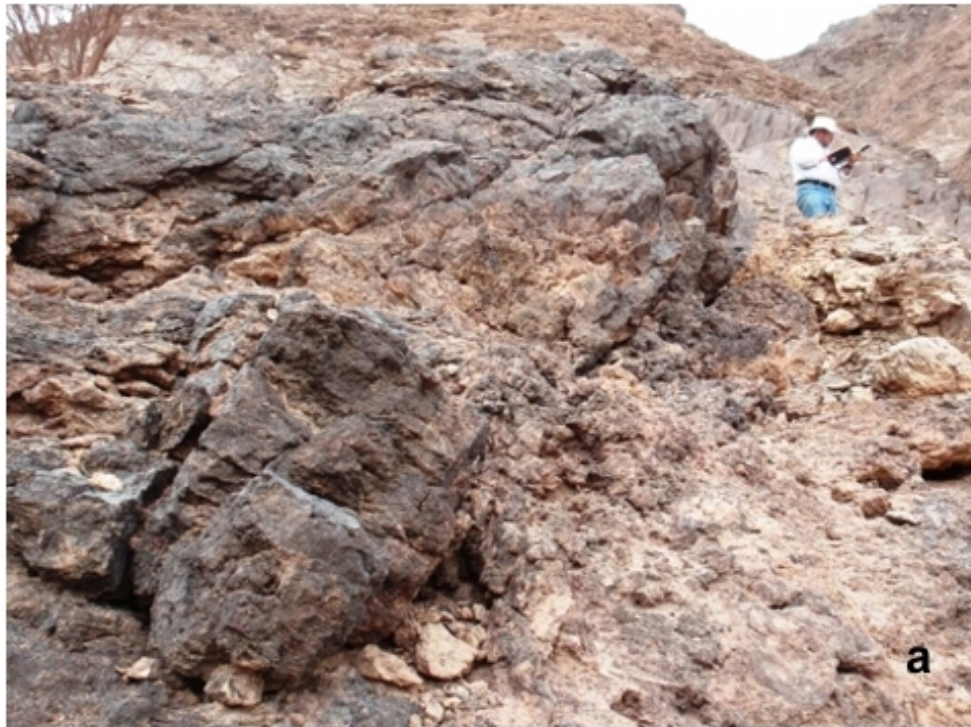
### 6.3.3 Mineralisation

Mineralisation in the Kitnah-Al Majma area outcrops in the form of thin gossan bands, boudinaged quartz veins, deformed quartz vein breccias and gossanous quartz breccia veins (Figure 6.3.3\_1). In outcrop, the mineralised zones vary from tens of centimetres to several metres wide. At the south end of the Al Majma Prospect, discrete gossan zones with small ancient workings are also present trending parallel to the regional foliation over about 130m of strike. These showed a coincident TEM anomaly extending N-S over about 800m. Initial drilling by PHME showed the TEM anomaly to be due to carbonaceous phyllite with massive sulphide bands (beds). In the same area, ancient workings are developed on a 2m wide gossanous vein zone cutting the regional foliation and enclosed by chrysocolla-stained schists. Gossanous zones at surface show anomalous base metal and gold values with up to 7000ppm Cu, 2450ppm Zn, 38g/t Au and 19ppm Ag in historical rock samples.

Petrological studies on drill core undertaken by the SGS in 2009 showed that the primary sulphides comprise mainly pyrite, chalcopyrite, arsenopyrite, sphalerite, with minor tetrahedrite and pyrrhotite. Copper, zinc, arsenic and silver can reach significant levels in the mineralised drill intersections although base metal data do not appear to be available for all samples (Table 6.3.3\_1). Microscopic gold was observed as inclusions in arsenopyrite, in association with sphalerite as well as dendritic grains disseminated within chalcopyrite and tetrahedrite and in the silicate gangue. The host rock mineralogy consists mainly of quartz and carbonate along with chlorite, sericite and plagioclase.

Mineralisation has been identified over a 2km N-S strike length and the whole strike length has been drilled out by PHME with west dipping angle diamond drillholes at approximately 50m spacing along strike (Figure 6.3.3\_2). A total of 59 diamond drillholes for 4849.9m were drilled (average depth 82m). Some areas have closer spaced (along strike) drilling following up earlier intersections and in a few cases drilled beneath previous intersections.

**Figure 6.3.3 1**  
**Majma - Kitnah Outcropping Mineralisation**

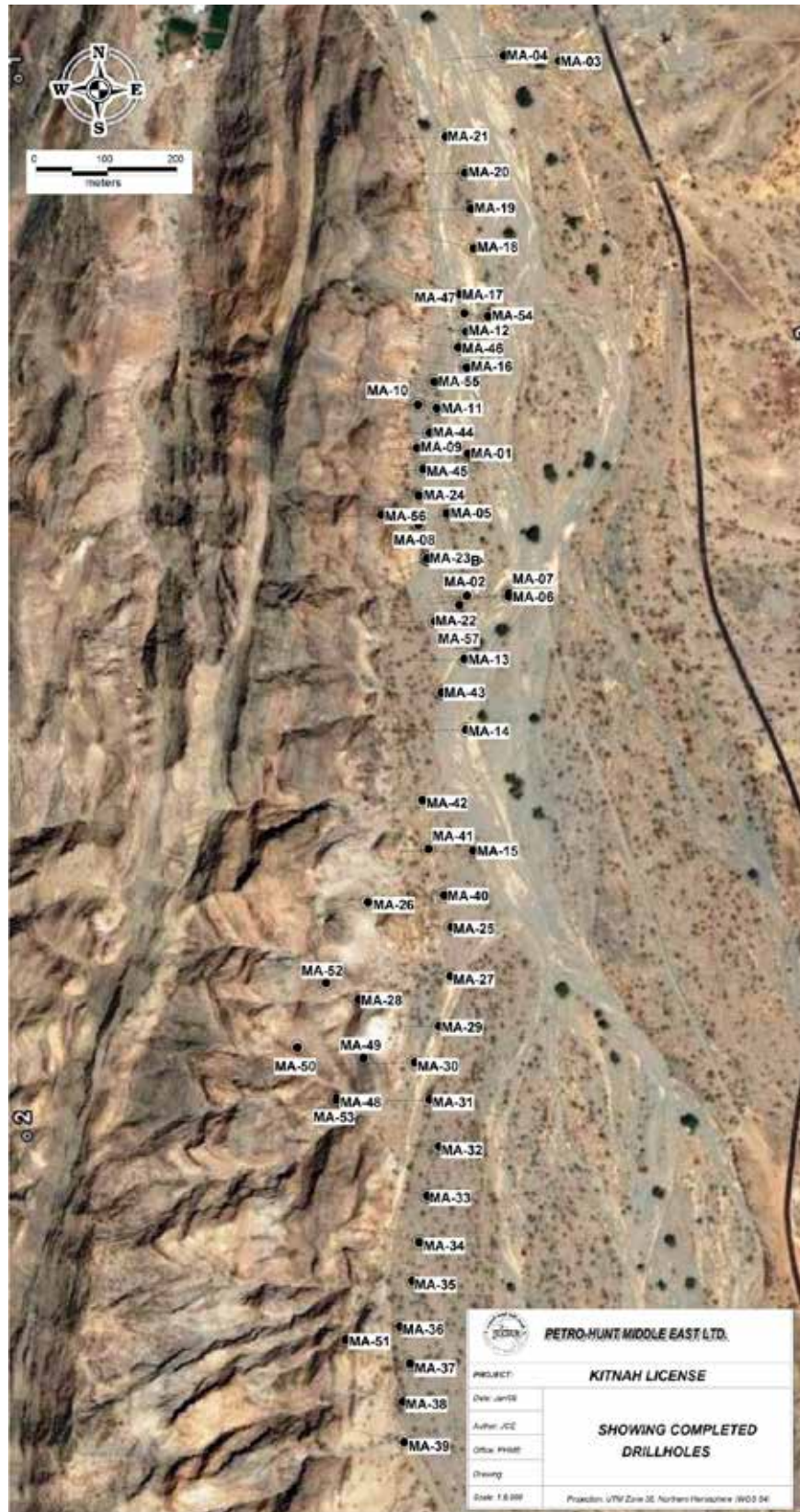


- a) Al Majma South steep SE dipping gossanous zone at waypoint 216  
b) Al Majma South irregular quartz carbonate vein stockwork at waypoint 222 (pen as scale)  
(Coffey, 2011)

**Table 6.3.3\_1**  
**Selected Al Majmah – Kitnah Drill Intersections**

| Hole ID       | From (m) | To (m) | Interval (m) | Au (g/t Au) | Cu (ppm) | Ag (ppm) | As (ppm) |
|---------------|----------|--------|--------------|-------------|----------|----------|----------|
| <b>MA-02</b>  | 112.42   | 114.85 | 2.43         | 15.988      | 2883.151 | 15.954   | 709.6548 |
| MA-04         | 74.95    | 79.30  | 4.35         | 1.404       | 1259.323 | 12.371   | 296.255  |
| MA-05         | 70.43    | 74.40  | 3.97         | 1.584       | 3415.353 | 20.856   | 319.390  |
| <b>MA-08</b>  | 24.00    | 50.00  | 26.00        | 2.622       |          |          |          |
| MA-09         | 46.00    | 48.00  | 2.00         | 1.616       |          |          |          |
| <b>MA-12</b>  | 34.53    | 51.00  | 16.47        | 11.041      |          |          |          |
| MA-17         | 130.75   | 131.56 | 0.81         | 8.094       | 10.264   | 0.926    | 498.035  |
|               | 145.00   | 148.00 | 3.00         | 1.487       | 24.093   | 0.935    | 12441.86 |
| MA-19         | 93.50    | 94.50  | 1.00         | 1.264       | 1008.411 | 6.506    | 1614.294 |
| <b>MA-23B</b> | 47.35    | 52.95  | 5.60         | 12.094      | 790.088  | 63.208   | 140.719  |
| MA-23         | 50.30    | 52.90  | 2.60         | 1.435       | 2191.464 | 23.652   | 238.688  |
| MA-24         | 46.50    | 52.47  | 5.97         | 1.539       | 1602.396 | 10.653   | 5941.168 |
| MA-25         | 85.40    | 86.40  | 1.00         | 4.699       | 462.005  | 3.982    | 291.752  |
| MA-27         | 77.40    | 80.20  | 2.80         | 3.036       | 932.939  | 11.877   |          |
|               | 86.45    | 88.45  | 2.00         | 1.497       | 526.120  | 3.685    |          |
| <b>MA-29</b>  | 78.40    | 83.35  | 4.95         | 9.041       | 798.091  | 5.818    | 426.611  |
|               | 85.35    | 86.35  | 1.00         | 1.214       | 219.345  | 3.363    |          |
| MA-30         | 44.50    | 53.05  | 8.55         | 2.258       | 747.759  | 24.282   |          |
| MA-32         | 74.05    | 76.88  | 2.83         | 2.256       | 135.317  | 1.084    | 237.372  |
|               | 108.65   | 109.65 | 1.00         | 1.769       | 283.144  | 1.643    | 80.734   |
| MA-33         | 62.60    | 75.30  | 12.70        | 1.769       | 415.985  | 7.266    | 796.063  |
| MA-34         | 103.80   | 107.80 | 4.00         | 1.328       | 91.927   | 0.504    | 5886.095 |
| MA-38         | 53.75    | 54.80  | 1.05         | 2.622       |          |          |          |
| MA-40         | 71.10    | 73.10  | 2.00         | 1.788       |          |          |          |
|               | 75.10    | 76.50  | 1.40         | 3.311       |          |          |          |
|               | 81.55    | 82.10  | 0.55         | 1.510       |          |          |          |
|               | 92.35    | 93.55  | 1.20         | 4.051       |          |          |          |
| MA-41         | 40.00    | 42.55  | 2.55         | 2.931       |          |          |          |
|               | 50.15    | 55.40  | 5.25         | 1.430       |          |          |          |
|               | 61.20    | 62.05  | 1.65         | 5.394       |          |          |          |
| MA-43         | 96.10    | 96.80  | 0.70         | 7.536       | 317      | 0.6      | 47       |
| MA-44         | 21.90    | 23.10  | 1.20         | 2.445       | 178      | 1.0      | 894      |
|               | 64.40    | 70.00  | 5.60         | 2.159       | 1416     | 14       | 429      |
| MA-46         | 28       | 31.0   | 3.0          | 1.892       | 8081     | 18.744   | 3786     |
|               | 94.55    | 96.67  | 2.12         | 11.285      | 8517     | 112      | 10718    |
| <b>MA-48</b>  | 3.90     | 6.65   | 2.75         | 3.023       | 621      | 3.392    | 1366     |
|               | 13.90    | 20.35  | 6.45         | 11.046      | 1078     | 23.753   | 1979     |
| <b>MA-53</b>  | 3.00     | 6.20   | 3.00         | 11.221      |          | 9.090    |          |
| MA-56         | 1.00     | 6.00   | 5.00         | 1.00        |          |          |          |
| MA-57         | 51.95    | 52.70  | 0.75         | 1.287       |          | 6.70     |          |

Figure 6.3.3 2  
Majma – Kitnah Drilling



(Wuth, 2011)

The drilling results as well as the Coffey investigation of the outcrops suggest short range discontinuity may be a feature of the higher grade mineralisation. A significant number of holes (46) recorded intercepts with  $>0.5\text{g/t Au}$  suggesting extensive low level gold mineralisation over the whole 2km strike. A smaller number of holes show intersections of potential economic significance. The more significant intersections are shown in Table 6.3.3\_1. Within the 2km mineralised zone, better results appear to be confined to three areas of restricted strike:

- § Al Majma Prospect in drillholes MA12 and MA46.
- § Al Majma Prospect South in drillholes MA 23B, MA02 and MA06.
- § Kitnah Main Zone in drillholes MA29 and MA48.

The most significant drill intersection was in MA-12 which recorded 16.47m @  $11.04\text{g/t Au}$  which included about 4.5m at  $>30\text{g/t Au}$  associated with strong quartz carbonate pyrite tetrahedrite veining with minor visible arsenopyrite and chalcopyrite between 37.35m and 41.9m (Figure 6.3.3\_3).

Observations on outcrops near these zones suggest significant local structural complexity characterised by polyphase deformation during veining and brecciation. Extensive folding and boudinaging of early veins is evident as are shallow plunges on lineations and folded veins and dips are common. More detailed structural mapping and some closer spaced drilling with collection of oriented drill core is required to resolve potential shoot geometries.

To the west of the main mineralised zone at Kitnah, several well exposed gossanous quartz breccia veins have also been mapped and sampled by PHME. Three narrow vein systems designated Vein 1 Vein 2 and Vein 3 were recorded with maximum values up to  $35.25\text{g/t Au}$  (Figure 6.3.3\_4).

Although PHME did complete some rock chip sampling in the outcrop areas (116 samples), no systematic surface geochemistry was seen.

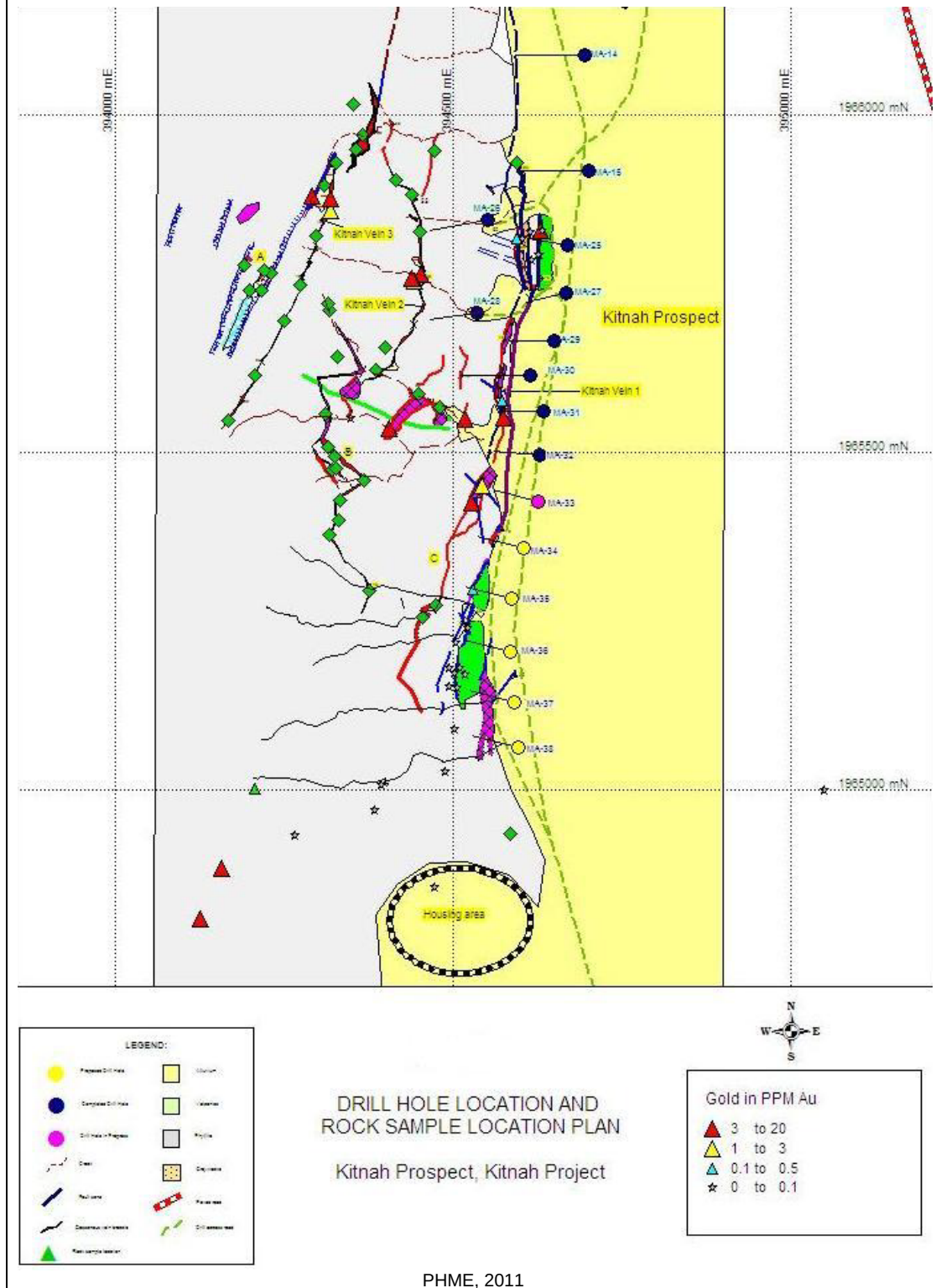
**Figure 6.3.3\_3**  
**Majma Prospect Diamond Core Hole MA-12**



- a) High grade partly oxidised banded and partly brecciated quartz –carbonate- sulphide vein with pyrite tetrahedrite minor chalcopyrite and arsenopyrite (37.35m -39.6m)
- b) High grade quartz-carbonate-pyrite-tetrahedrite vein breccia (39.6m -43.3m)
- c) Quartz- carbonate- pyrite veined, weakly silicified and mylonitised metasediments with prominent pyrite-tetrahedrite-quartz-carbonate vein at 95.3m

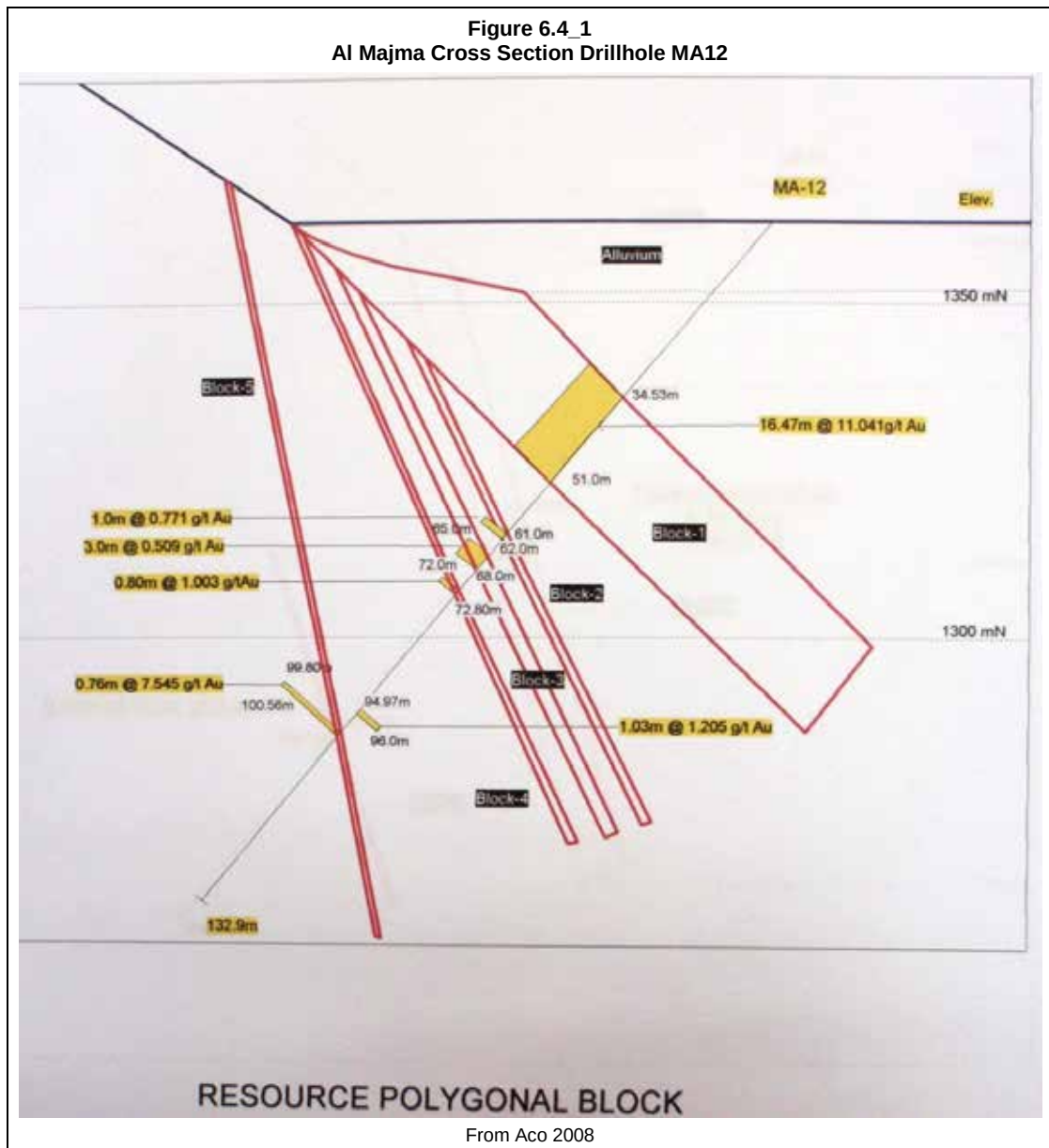
(Coffey, 2011)

**Figure 6.3.3 4**  
**Kitnah Prospect Drilling and Rock Chip Sampling Locations**



## 6.4 Mineral Resources

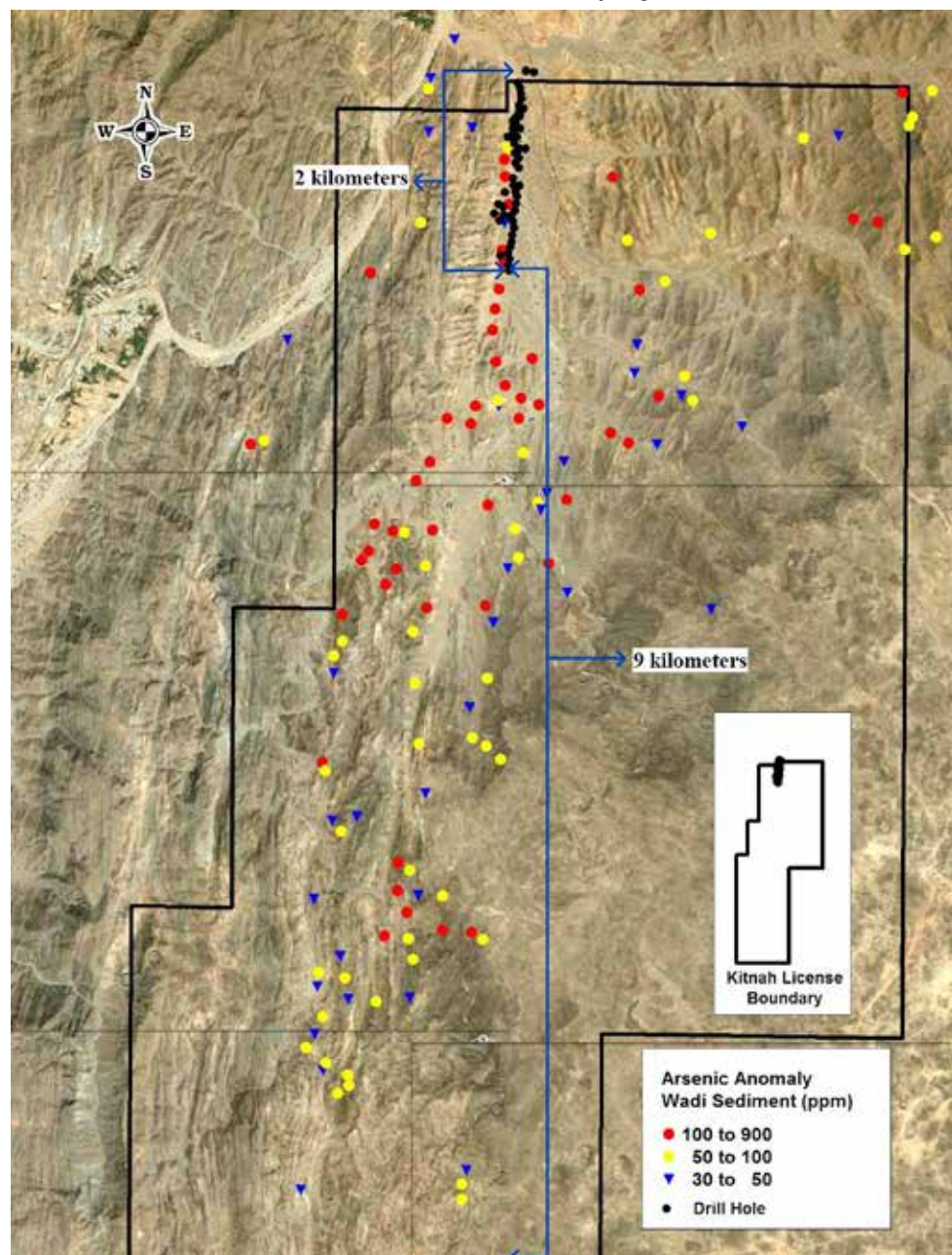
There are no formal Mineral Resources for the Kitnah Project however PHME has reported a polygonal estimates based on their drilling. A review of the resource estimation report (Aco, 2008) suggests a significant amount of extrapolation has been used to calculate polygonal areas and a restricted number of isolated higher grade intersections have a disproportionate impact on the overall grade (Figure 6.4\_1).



## 6.5 Other Prospects

Historical regional drainage sampling programs, completed by Riofinex between 1978 and 1981 and by the USGS between 1987 and 1988, was compiled by PHME as part of the initial Malaha-Najran license investigations. This included coverage of the Kitnah EL where the wadi sediment geochemistry has defined a regional As anomaly associated with the Asharah Fault Zone. Given the strong As association with the gold mineralisation at Kitnah and Al Majma, PHME believed the wadi sediment anomalism is indicative of potential gold mineralisation over an additional 9km of strike to the south of the Al Majma and Kitnah Prospects (Figure 6.5\_1).

**Figure 6.5\_1**  
**Kitnah Wadi Sediment Sampling**



From PHME

## 6.6 Coffey Mining Conclusions and Recommendations

### 6.6.1 Conclusions and Exploration Potential

Coffey considers that the results of exploration at Kitnah to date suggest a significant mineralised system exists with base metal and gold mineralisation associated with multiple complex structures over at least 2km of strike and in zones which in drilling may locally reach thicknesses of tens of metres but are more commonly in the order of tens of centimetres to several metres. Results suggest that higher grade shoots may have limited (<50m) strike but Coffey believes that the controls on the higher grades have yet to be understood and the drilling pattern completed to date has not necessarily defined their true potential. The mineralised zone is open along strike to the north and to the east under Wadi Kitnah where it is covered by recent wadi sediments. Extensive As anomalism defined by the wadi sediment geochemical survey suggest the total mineralised system may have over 9km of additional strike to the south of the known prospects. These all provide a valid exploration opportunity to define more significant gold mineralisation within the project.

The well exposed veins to the west of Kitnah may have less potential but could warrant follow up in the context of providing small satellite positions to supplement more significant mineralisation elsewhere. Although the project area has been explored for a considerable time, much of the exploration (up until 2004 at least) was focused on base metals and driven by VMS models. This has resulted in a less than systematic exploration effort for gold and certain basic data have yet to be acquired. Since most of the project area is outcrop and residual soil, surface geochemical sampling (including the existing wadi sampling) should provide a quick and effective tool to screen these areas.

### 6.6.2 Coffey Mining Recommendations

Coffey Mining recommends the following:

- § Completion of detailed airborne magnetic survey over the EL to aid with structural interpretation, particularly in the areas concealed by wadi sediments.
- § Complete detailed structural mapping over the Al Majma-Kitnah prospect area together with detailed surface geochemical sampling (systematic rock chip and or channel sampling of mineralised zones) and reinterpretation of the drilling data.
- § Complete a limited program of close spaced oriented diamond core drilling around the high grade intersections in MA12 and MA23B at Al Majma Prospect as well as around MA29 and MA48 at Kitnah Prospect.
- § Complete reconnaissance geochemical drilling of areas concealed by wadi sediments immediately east of Al Majma – Kitnah to search for potentially more significant mineralisation associated with splays off the Asharah Fault Zone.
- § Complete follow up of the wadi sediment As anomalism with infill wadi sediment sampling followed by grid soil sampling or reconnaissance geochemical drilling in concealed areas to quickly assess the prospectivity of the remaining license area. This should be a relative high priority given the 2012 EL expiry date.

- § If possible acquire additional license coverage to the north of Al Majma.
- § Some preliminary metallurgical testwork is warranted given the potential for refractory gold.

In addition to these recommendations, some consideration should be given to the completion of an orientation electrical geophysical survey (IP) over the strongest known gold mineralisation to investigate the utility of this method in defining bedrock drilling targets. The presence of sulphidic carbonaceous metasediments may detract from the utility of electrical geophysical methods but an orientation survey may still be warranted given the strong sulphide association.

## 7 TATHLITH EXPLORATION LICENSE

### 7.1 Introduction

The Tathlith Exploration License is located in the southern western part of the Kingdom of Saudi Arabia. The license comprises five prospective gold exploration target areas, namely the Ailah-Avala (TTH-1), Jabal Hoboyet and Wadi Thafin (TTH-2), Lugatah (TTH-3), West Thafin (TTH-4), and Al Hasbat (TTH-5), covering an area of 678.3km<sup>2</sup>, which is located entirely within Asir Province about 800km SE of Jeddah. Access to the area is via the Jeddah-Tathlith sealed road, followed by several kilometres of desert tracks (Figure 7.1\_1).

**Figure 7.1\_1**  
**General Topographic View of Project**



View looking S from waypoint 26a, ~30 degree west dipping main reef system to left of buildings (Coffey, 2011).

The Tathlith EL contains the Lugatah and Bir Cananah gold prospects, as well as several other mineralisation occurrences, including numerous ancient gold mines where gold mineralisation occurs in veins hosted by both layered and intrusive rocks.

### 7.2 Mineral Tenure

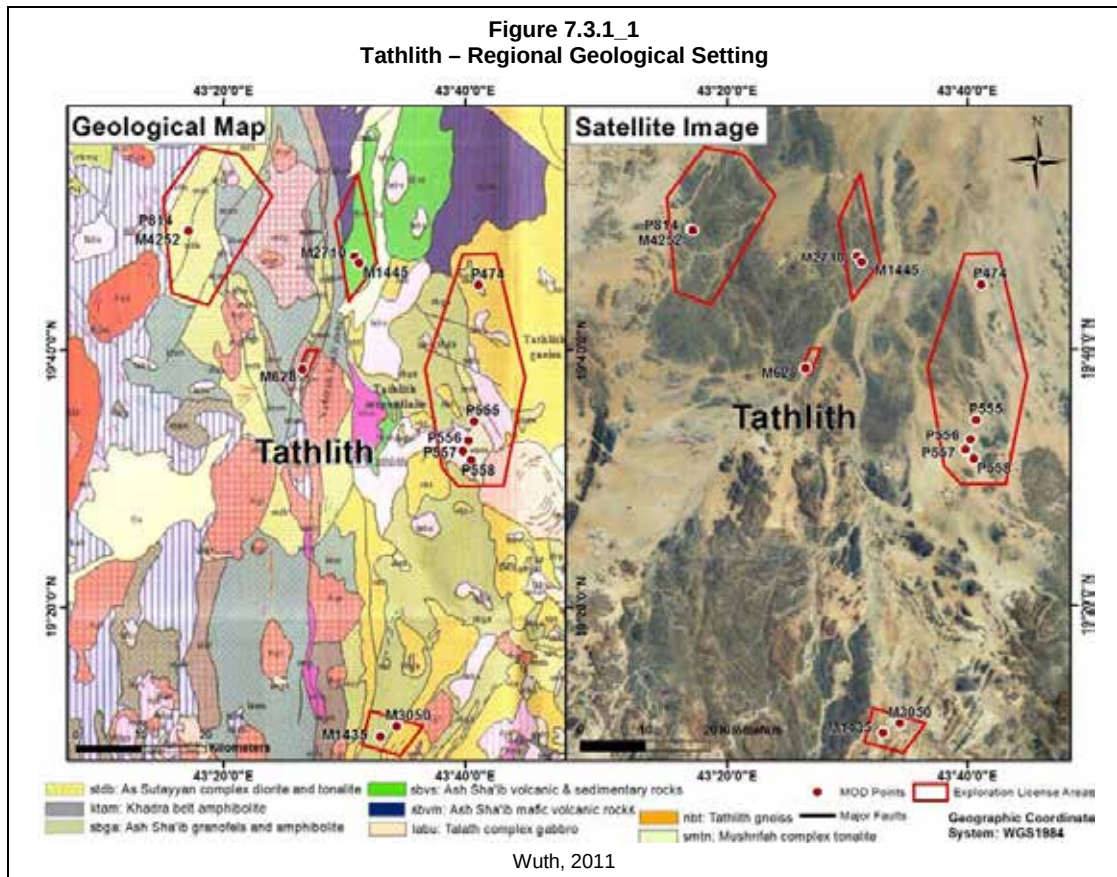
The location of the Tathlith license is shown in Figure 1.1\_2 and details of the tenement schedule are given in Appendix A.

Coffey has not independently validated the licensing details and the present status of tenements, agreements and legislation described in this report is based on information provided by MEMC.

### 7.3 Project Geology and Mineralisation

#### 7.3.1 Geology

The Tathlith exploration license area is located in the Asir terrane within the Nabitah mobile belt, which consists of a belt of highly deformed rocks flanking the Nabitah fault zone (NFZ) which is interpreted to be a suture zone. The Tathlith License is underlain by two groups of layered and intrusive rocks separated by the NFZ (Figure 7.3.1\_1).



The Tathlith area has many reported mineral occurrences including metamorphosed SEDEX Zn mineralisation in the Ash Shaib Belt and Cu-Ni-Co mineralisation near Jabal Ar Robut. An extensive but little explored unit of exhalative ferruginous chert and carbonate is reported in the western part of the area. There are also numerous ancient gold mines where Au mineralisation occurs in veins hosted by both layered and intrusive rocks. The gold prospects are mainly associated with the NFZ, within a zone termed the “Jabal Ishmas-Wadi Tathlith Gold Belt” by the USGS.

The NFZ is highly sheared, locally to mylonite, and protolithology throughout much of the zone cannot be distinguished. Enclosing rocks to the east are mainly metasedimentary rocks (phyllite) derived from clastic sediments and to the west metavolcanic rocks (greenschists) derived from intermediate volcanic rocks.

A quartz porphyry body in the shear zone is now thought to be metasomatised metasedimentary rocks near the contact with a granitic body. This elongated body of quartz porphyry has been interpreted as representing a tectonic slice caught between bodies of chlorite schist (mafic to intermediate metavolcanic rocks). A granitic intrusive body is present just to the west of the southern portion of the mineralised zone and as small lenses or dykes in the mineralised zone. Post-tectonic granodiorite plutons intrude rocks on both sides of the NFZ.

The TTH-3 Lugatah prospect sits along a shear splay off the NFZ. Mineralisation is associated with a series of quartz veins, stockworks, and breccias within a generally N-trending zone of shearing, brecciation, and hydrothermal alteration. The apparent lens-like configuration of the mineralised bodies may be a factor of continued ductile deformation following deposition of the Au and associated sulphides. The relationship of the quartz veins to the Au mineralisation is not clear. On surface, most of the ancient mines are along the selvages of larger quartz veins.

The geology of the area to the east of the NFZ is characterised by an intimate mixture of folded and deformed, layered metavolcanic and metasedimentary rocks, high-metamorphic-grade orthogneisses, and foliated and deformed intrusive rocks (diorite to granodiorite). This complex is cut by a series of syn- and post-tectonic pink K-feldspar granite dykes and plutons. The rocks are of uncertain age and tectono-stratigraphic association. The high-grade metamorphic rocks were derived from partial melting and metamorphism of the pre-existing layered metamorphic rocks and diorite to granodiorite intrusive rocks during a major tectonic event along the suture zone. The layered rocks consist of amphibolite, schist and metamorphosed mafic volcanic and volcano-sedimentary rocks. Pre-tectonic intrusive rocks consist of small monzogranite plutons.

Three important structural trends appear to have localised the Au-bearing quartz veins - N, NE, and NW. Located in the east of NFZ is the TTH-1 (Ailah-Avala) and TTH-5 (Al Hasbat) prospects. The TTH-1 (Ailah-Avala) area is underlain by granodiorite-diorite-quartz diorite and bounded by metavolcanic/metasedimentary rocks to the NW and SW, by granite-monzogranite to the west, with windows of gabbro and fine-grained mafic rock. The few rock outcrops in the area show mostly the regional chlorite-carbonate alteration with minor localised K-feldspar alteration, except for the granite-monzogranite which is mainly unaltered. At the Al Hasbat mine, the country rock is foliated and sheared granodiorite. The quartz veining is milky, commonly banded, vuggy and Fe oxide-stained and locally brecciated and healed. Quartz stringers in the wall rock are common in both hanging wall and footwall of the vein. Two generation of felsic dykes and one mafic are parallel and in the same structure as the vein.

To the west of the NFZ, the layered rocks are part of the Khadra Belt of the Asir terrane. The layered rocks consist of basalt, andesite and volcano-sedimentary rocks with lesser amounts of silicic volcanic rocks. All of the layered rocks are strongly deformed, with steep dips and northerly trends. Intrusive rocks west of the NFZ comprise a N-trending swarm of dolerite sills and small plutons of gabbro and quartz diorite.

The TTH-2 (Jabal Hobuyet and Wadi Thafin) and West Thafin (TTH-4) prospects are located in the west of the NFZ. The country rocks to Au mineralisation are greenschists, including some carbonaceous schist, with bounding of mafic. Quartz is locally highly brecciated and healed and contains wallrock and gossan fragments. Carbonate alteration is dominant, chloritisation is weak and minor fine-grained pyrite may occur. Diorite/granodiorite at depth is weakly chloritised with minor carbonate-pyrite alteration. At Jabal Hobuyet, geological mapping indicates that the area is underlain mainly by metasedimentary/ metavolcanic rocks that are commonly intruded by felsic dykes. Wallrock alteration is mainly carbonate with weak chlorite development and minor silicification.

In West Thafin, the vein system is hosted by sheared gabbro/diorite with mafic dykes. The ancient workings are small-scale and lack in size or depth extent. There are small patches of carbonate alteration but sericite is limited. Veins are partially laminated, but dominantly bucky and or sheared. The vein system appears to pinch out immediately along strike.

### 7.3.2 Mineralisation

The gold prospects are mainly associated with the NFZ and have been named the “Jabal Ishmas-Wadi Tathlith Gold Belt” by the USGS. Most of the Au-bearing quartz veins/lodes are hosted by the NFZ or parallel to semi-parallel to NFZ. They are generally N-trending and dip east at a high angle ( $>45^\circ$ ).

The ancient workings tend to occur in clusters. Gold-bearing quartz veins are hosted by a variety of different rocks types, including the granite-granitic gneiss-gabbro/diorite suite, metasedimentary rocks, granodiorite, and quartz porphyry. The assay grades for these occurrences range from below detection limit up to 325g/t Au. A large percentage of the gold occurrences have had only one or two samples from them assayed and are largely unmapped.

Mineralisation in the Tathlith License has been interpreted to be both syngenetic and epigenetic, and contains a number of Au occurrences with anomalous results located in a favourable tectonic setting. Gold mineralisation is mainly of the quartz lode-style. Accessory minerals that may be associated with the quartz veins are pyrite  $\pm$  arsenopyrite  $\pm$  galena  $\pm$  sphalerite  $\pm$  malachite  $\pm$  siderite  $\pm$  graphite. Pyrite  $\pm$  chlorite  $\pm$  kaolinite  $\pm$  muscovite/sericite  $\pm$  malachite  $\pm$  siderite are the main alteration minerals of the host-rocks adjacent to the quartz veins.

At exploration target M1435 (TTH-5; Al Hasbat), the veins dip  $45^\circ\text{E}$ , although locally the dips are steeper ( $60^\circ$ ). The footwall lithology is poorly exposed and consists of carbonate-altered mafic rock. The hangingwall unit is also composed of carbonate-altered mafic rock. In the hangingwall, however, two weakly altered granitic sills intrude parallel to the vein. The main Au-bearing quartz vein is up to 2m thick and composed of milky quartz which has been fractured, brecciated and resealed. Multiple generations of veins are visible. The quartz is moderately iron-stained.

At M628 in the Lugatah area (TTH-3), mineralisation is associated with a series of quartz veins, stockworks, and breccias within a 60-90m wide, N-trending zone of shearing, brecciation and alteration approximately 600m in length. The extent of deformation makes defining the protolithology difficult. A granitic intrusive body is present just to the west of the southern portion of the mineralised zone and as small lenses or dykes in the mineralised zone itself. Quartz occurs as veins, as much as 3m wide, stringers, and breccia-filling. The larger veins strike generally N to NW and dip 50-70°W (Figure 7.3.2\_1). Individual veins are brecciated, sheared, and folded. Where brecciated, veins are healed by a later quartz event. Sericite and carbonate are pervasive throughout the sheared zone including the quartz veins. Dark chlorite veinlets are locally abundant and appear to be a late event.

**Figure 7.3.2\_1**  
**Lugatah Mineralisation**



View south from waypoint 256 to ancient workings concentrated along footwall of flat W dipping quartz reef  
(Coffey, 2011)

Individual mineralised zones are lenticular bodies that strike generally 340°-350° and dip generally W, although some may be close to vertical. Drill results suggest that these lenses are relatively short (<50m in length) that may rake to the north. Existing data suggests that these individual lenses are en echelon to the NW moving from south to north. The deformation continued after deposition of the Au and associated sulphides. The relationship of the quartz veins to the Au mineralisation is not clear. On surface, most of the ancient mines are along the selvages of larger quartz veins. In the drill core, significant Au values are associated with only some quartz veins. There are broad zones with trace and significant Au values where quartz was not reported in the core logs. In the diamond drill core, there seems to be a stronger correlation between Au and the secondary white mica and secondary quartz, even in and adjacent to the quartz veins.

The P555/P556/P557/P558 prospects at TTH-1 (Ailah-Avala) are associated with scattered outcrops and ancient workings that have yielded anomalous Au assays. From RC drilling, the area is underlain by diorite/quartz diorite, monzodiorite and granodiorite, with intercalated metavolcanic rocks and mafic dykes. Common alteration minerals are chlorite and carbonate. Quartz appears as stringers/veinlets from 1-5m wide. Traces of pyrite locally occur in the wallrock. Assay results indicated that the drilled zones are mostly barren at depth, with few anomalous Au intersections; only four holes contain >1g/t Au at depth.

The P555 prospect consists of a 270m-long group of ancient workings with several exposures of quartz veining. The gold apparently occurred in a 1-2m thick quartz vein and in adjacent sheared and carbonate-altered rock. The vein and the ancient workings trend 085° and dip 85°-90°S. The vein is exposed at the east end of the prospect, where it is 0.9m thick. The vein is composed of fractured, brecciated and resealed milky quartz with locally heavy iron-oxide staining. The host rocks to quartz veins are greenschists with interbedded quartzite (Riofinex's metasedimentary unit). Carbonate alteration and quartz veining extend from the vein into the adjacent wallrock for as much as 1m. Quartz rubble and several small ancient workings on the hill to the south of the prospect suggest the presence of additional parallel shear zones and veins.

At M4252 (TTH-4; West Thafin Prospect), the vein trends north and has an approximate 150m strike length. There are a number of discontinuities along the vein and sub-parallel lenses/local stockwork zones. The vein system is hosted in sheared gabbro/diorite and a mafic dyke. Small-scale ancient workings lack any size or depth. There are small patches of carbonate alteration but limited sericite. Quartz veins are partially laminated but dominantly bucky and/or sheared; the vein system appears to pinch out abruptly along strike beyond zone of old workings.

At P814 (TTH-4), the zone of veining trends north and has an approximate 100m strike length; it dips approximately 60-70°W. The shear zone which hosts the quartz veining appears to be at least partially located about the contact between an irregular mafic dyke and gabbroic rocks.

The results of a petrological study by the SGS suggest the following paragenetic sequence:

- § Formation of the host rocks;
- § Brittle deformation of the host rocks;
- § Emplacement of quartz into open fractures;
- § Ductile deformation producing shear zones and foliation in all rock types, including the existing quartz veins;
- § Hydrothermal alteration, with the introduction of white mica, carbonate, and silica (?) more or less contemporaneous with the ductile deformation;

- § Introduction of Au along with minor amounts of pyrite, arsenopyrite, chalcopyrite, tetrahedrite, sphalerite, and galena, more or less contemporaneous with the development of the white mica and carbonate;
- § Formation of dark chlorite veinlets;
- § Brittle deformation along discrete fault planes; and
- § Weathering and oxidation of the sulphides and ferromagnesian minerals.

The ductile deformation event caused intense microbrecciation of the host rocks and cataclasis of former quartz and feldspar grains into angular fragments. Hydrothermal solutions then locally corroded the existing quartz and feldspar grains and deposited white mica and carbonate into and along the corroded microfractures. Some of the host rocks were converted to white mica (probably sericite), carbonate, chlorite, relict rounded quartz, and hydrothermal quartz. The smaller quartz veins were disaggregated and now remain as stringers of corroded quartz fragments; the larger veins were sheared and granulated and corroded along shear planes. White mica, sulphides, and some hydrothermal quartz were deposited in microfractures along the granulated and corroded shear planes.

Sulphides are a minor component, but they seem to be intimately associated with the presence of gold. The sulphides are fine-grained and occur as stringers, trains, and aggregates along microfractures and grain boundaries in association with white mica and late-stage quartz. Pyrite also occurs as fine sporadic disseminations. Some of the sulphide minerals show late brittle deformation.

Visible gold was noted in one drillhole during core logging. Most of the gold is fine-grained, <6-70 microns in size, as seen in thin section. Gold was noted in several physical sites including:

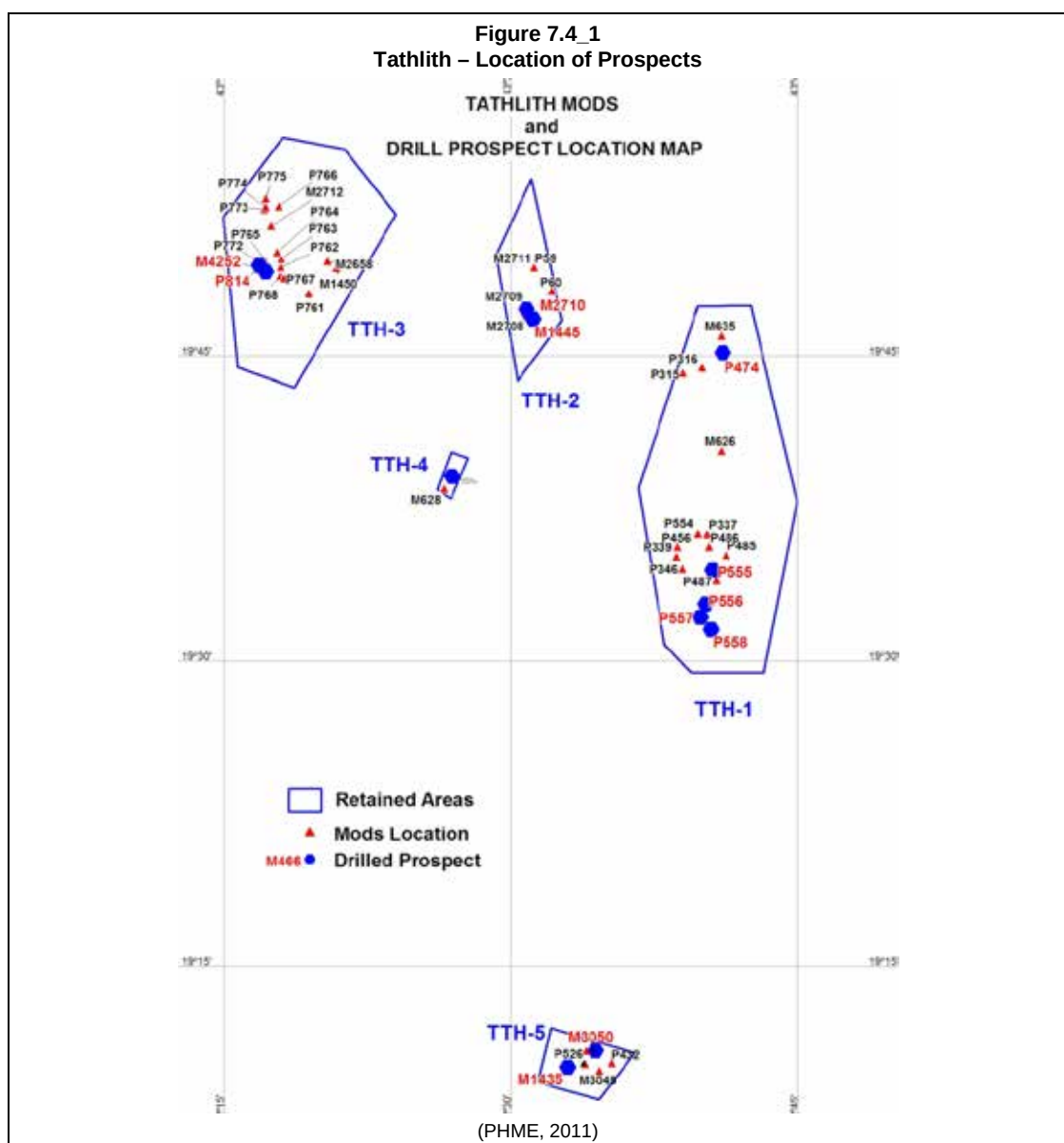
- § In microfracture fillings in pyrite with chalcopyrite and tetrahedrite;
- § Along grain boundaries between sulphides;
- § As tiny inclusions in pyrite;
- § As tiny grains in hydrothermal quartz;
- § As microfracture fillings in quartz;
- § In association with arsenopyrite; and
- § As secondary wire gold in Fe oxides.

The association of gold with quartz veins is still not clear. In some of the drill core, assay data indicate that there are gold anomalies where quartz veins are not present in the core, but the rock is highly sheared and altered to sericite, with or without carbonate and quartz. Petrologically, the gold is intimately tied to white mica and/or carbonate, hydrothermal quartz, and sulphides.

## 7.4 Prospects

The Lugatah Project (TTH-4 M628) was identified by PHME as a key target. A preliminary estimate by the SGS suggested a coherent body of mineralisation averaging 6g/t Au could be defined to 70m depth. The mineralisation is open at depth and along strike with a potential to increase resources. Typical results from drilling and trenching are shown in Tables 7.5.1\_1 and 7.5.1\_2.

The P555 prospect is located in the Avala Target area (TTH-1) in the central part of the Tathlith exploration license (Figure 7.4\_1). This prospect was chosen for early drilling because of its relatively simple geological setting and the potential for mineralisation in wallrocks and in parallel shears or veins.



The Al Hasbat gold prospect (M1435) is located in the southern part of the Tathlith Exploration license in the Hashim Target Area. The prospect consists of a 520m-long group of ancient mine workings, quartz dumps and quartz vein outcrops. It was mapped and sampled by the UGSS in the early 1970s. The USGS report an assay from a 1-2m channel sample across a vein of 11g/t Au. The quartz veins are hosted by a N-trending shear zone. The veins dip 45°E, although there is local evidence of a steeper dip of 60°. The shallow dip of the veins makes this an attractive open pit target. In addition, there is potential for additional mineralisation in the altered and veined wallrock of the hangingwall and footwall. The evidence for this is the fracturing, brecciation and veining visible in, and associated with, the granitic sills in the hangingwall of the vein.

## 7.5 Exploration History and Results

Exploration activities undertaken in the license include detailed geological mapping, surface rock sampling, geophysical surveying, drilling, drillhole logging and sampling, analysis of geochemical samples, and mineralogical studies of polished and thin sections.

### 7.5.1 M628 (TTH-4 Lugatah)

In 2003, the Saudi Geological Survey (SGS) undertook a drilling program of 24 holes (for 2,287.8m) to define the nature of the known Au mineralisation at Lugatah between surface and 30m below surface and between 30m and 70m below surface. The results suggested that the project had the potential for a low-grade, bulk mining operation.

Sampling revealed multiple zones of gold mineralisation in wide sheared and altered zones. Nine boreholes returned individual intersections between 2.6m and 6.0m with Au grades between 5g/t and 51g/t. Another 14 boreholes returned average grades between 0.2g/t and 4g/t over widths between 7m and 54m (0.5g/t Au over 54m).

The analytical results for the 2287.8m of diamond drilling by SGS indicate several anomalous gold zones within the broad sheared and altered area. There are approximately 31 intercepts of at least 2m that show 1g/t Au or greater. Widths of individual intercepts with >1g/t Au are mostly in the range of 2-10m. Longer intercepts, as much as 46 meters, can be defined, but these include high (>18g/t) gold values and large segments between the higher values with values of < 0.02g/t Au (Table 7.5.1\_1).

On acquiring the EL in 2007, PHME took a series of continuous composite rock chip outcrop samples along lines that cross the up-dip trace of some of the SGS drillholes. The results reported show a reasonable correlation, suggesting little surface enrichment/depletion and continuation of the mineralisation up-dip. 284 samples were collected on eight lines (Table 7.5.1\_2).

The results of the PHME continuous composite rock chip sampling are similar to those obtained in the SGS drilling program. The range of grades and widths of mineralisation are essentially the same as those seen in the drill core.

**Table 7.5.1\_1**  
**Tathlith – SGS Lugatah Drill Intercepts with >5g/t Au**

| Drillhole LUG- | From (m) | To (m) | Length (m) | Au (g/t) |
|----------------|----------|--------|------------|----------|
| CO-02          | 8.51     | 11.15  | 2.60       | 6.34     |
| CO-11          | 10.55    | 13.50  | 2.95       | 7.07     |
| CO 11          | 28.50    | 31.00  | 2.50       | 5.21     |
| CO-03          | 9.00     | 13.00  | 5.00       | 7.80     |
| CO-17          | 51.35    | 57.35  | 6.00       | 5.96     |
| CO-09          | 27.50    | 30.50  | 3.00       | 11.40    |
| CO-16          | 73.50    | 76.50  | 3.00       | 14.30    |
| CO-07          | 21.50    | 27.50  | 6.00       | 26.10    |
| CO-07          | 37.50    | 40.50  | 3.00       | 51.08    |
| CO-08          | 53.10    | 56.10  | 3.00       | 9.18     |
| CO-14          | 142.00   | 148.00 | 6.00       | 7.38     |

**Table 7.5.1\_2**  
**Tathlith – Summary of 2007 PHME Lugatah Outcrop Sampling**

| Line | Drillhole | Length (m) | Number of Samples | Range Au (g/t) | Average Au (g/t) |
|------|-----------|------------|-------------------|----------------|------------------|
| A    | CO-07     | 45.5       | 19                | 0.47 – 13.70   | 2.56             |
| B    | CO-06     | 64.0       | 44                | 0.12 – 23.28   | 2.69             |
| C    | CO-05     | 35.0       | 21                | 0.05 – 9.15    | 1.44             |
| D    | CO-17     | 29.0       | 29                | 0.04 – 2.90    | 0.22             |
| E    |           | 62.0       | 28                | 0.01 – 6.99    | 0.61             |
| F    |           | 18.0       | 18                | 0.01 – 28.8    | 3.28             |
| G    |           | 29         | 20                | 0.12 – 13.90   | 2.76             |
| H    |           | 38.5       | 28                | 0.01 – 2.66    | 0.26             |

### 7.5.2 TTH-5 (Al Hasbat Prospect)

In early 1970s, USGS conducted some work on this prospect and reported an assay from a 1m to 2m channel sample across a vein exposed in an ancient mine at M1435 as 11g/t Au.

In November 2005, PHME carried out an initial drilling program of 6 RC drillholes (for 660m). The drillholes were sited in pairs, with the first hole to test the vein 30m down dip and the second targeted at 100m down-dip (Table 7.5.2\_1).

In early 2006, the ancient Hashim workings and quartz veins were examined. It was decided that drilling was the best way to evaluate the prospects and that no further surface sampling was warranted.

**Table 7.5.2\_1**  
**Tathlith – Significant Drill Intersections, Al Hasbat Prospect**

| Hole ID | From (m) | To (m) | Interval (m) | Au (g/t) |
|---------|----------|--------|--------------|----------|
| M35-01  | 27       | 28     | 1            | 1.48     |
| M35-01  | 26       | 27     | 1            | 1        |
| M35-01  | 27       | 28     | 1            | 1.48     |
| M35-02  | 66       | 67     | 1            | 1.09     |
| M35-02  | 67       | 68     | 1            | 33.97    |
| M35-02  | 68       | 69     | 1            | 2.11     |
| M35-02  | 69       | 70     | 1            | 1.56     |
| M35-02  | 72       | 73     | 1            | 1.15     |
| M35-03  | 38       | 39     | 1            | 1.29     |
| M35-04  | 80       | 81     | 1            | 1.44     |
| M35-04  | 81       | 82     | 1            | 1.09     |
| M35-04  | 86       | 87     | 1            | 1.1      |
| M35-05  | 81       | 82     | 1            | 5.72     |
| M35-05  | 82       | 83     | 1            | 1.4      |
| M35-06  | 23       | 24     | 1            | 9.46     |
| M35-06  | 24       | 25     | 1            | 28.82    |
| M35-06  | 26       | 27     | 1            | 1.12     |

PHME also conducted several campaigns of field work in the Al Kashba (M3050) area of TTH-5, including reconnaissance prospecting (some mapping), rock chip sampling and also RC drilling. Four rock chip samples were collected with a maximum assay of 4.18g/t Au (average of 1.96g/t Au). Four RC holes (for 200m) were drilled to test the strike length of the deposit below outcropping quartz veining and ancient workings. The chip logging shows the area to be underlain by granodiorite and diorite. Alteration consisted of minor chlorite, carbonate and silica. Disseminated pyrite and chalcopyrite were noted locally. Only one significant intersection was returned: KAS-03, 14m to 15m, 1.06g/t Au. Due to disappointing results of the drilling program, no further work was carried out.

### 7.5.3 TTH-2 (Jabal Hobuyet and Wadi Thafin Prospect)

The ancient workings in the Hobuyet Prospect (M1445) area consist of a large trench and several clusters of pits. The general trend of the pits is N-S to 340°. The main trench is 57m long by 7m wide. In the pit, two veins are exposed. The main vein trends 035°, is >1.5m wide, shallowly-dipping (38°SE), milky quartz with limonite, hematite and Mn oxides. The other vein is 1m wide consisting of similar material and trending 260°/80°NW.

PHME conducted several intensive campaigns of field work within the TTH-2 license which included reconnaissance prospecting (some mapping), rock chip sampling and RC drilling. Chip logging shows the area to be underlain mainly by metasedimentary/metavolcanic rocks intruded by felsic dykes. Alteration is predominantly carbonitisation, weak chloritisation and weak silicification. Minor Fe oxides after pyrite occur locally. Five RC holes (for 210m) were drilled. The program was designed to test along the strike length of the deposit below areas of outcropping quartz veining and ancient workings. Three of the five holes intersected quartz veining (HOB-2, 3 and 4). Significant assay results are shown in Table 7.5.3\_1.

**Table 7.5.3\_1**  
**Jabal Hobuyet – Significant RC Drilling Intersections**

| Hole ID | From (m) | To (m) | Interval (m) | Au (g/t) |
|---------|----------|--------|--------------|----------|
| HOB-02  | 27       | 28     | 1            | 1.303    |
| HOB-02  | 33       | 34     | 1            | 1.395    |
| HOB-03  | 23       | 24     | 1            | 1.073    |
| HOB-03  | 33       | 34     | 1            | 1.599    |
| HOB-04  | 17       | 18     | 1            | 1.494    |
| HOB-04  | 20       | 21     | 1            | 1.054    |
| HOB-04  | 46       | 47     | 1            | 1.773    |
| HOB-04  | 47       | 48     | 1            | 2.359    |
| HOB-04  | 49       | 50     | 1            | 2.015    |
| HOB-05  | 21       | 22     | 1            | 1.569    |
| HOB-05  | 22       | 23     | 1            | 1.290    |

In the Mahazol area (M2710) of Wadi Thafin prospect, ancient mine workings occur along a folded 1m to 3m wide quartz vein with declines on both the hanging- and footwall. The attitude of the vein varies in strike from 035° to 160° and a 20° to 55° dip E or S. The major workings are situated on what a fold nose that plunges SE. Quartz is locally highly brecciated and healed and contains wallrock and gossan fragments. A small pod of possible listwaenite occurs just to the SW of the vein.

Rock chip logging shows the area to be underlain mainly by metasedimentary rocks intruded by felsic dykes in drillhole MAH-01. This hole intersected a diorite/granodiorite body at 27m depth. Alteration is mainly carbonitisation, weak chloritisation, with minor fine-grained pyrite. Diorite/granodiorite at depth is weakly chloritised with minor carbonate and pyrite. Four RC holes (for 250m) were drilled at the prospect to test along the strike length of the deposit below areas of outcropping quartz veining and ancient workings. Significant drill intersections are listed in Table 7.5.3\_2.

**Table 7.5.3\_2**  
**Wadi Thafin – Significant Drill Intersections**

| Hole ID | From (m) | To (m) | Interval (m) | Au (g/t) |
|---------|----------|--------|--------------|----------|
| THE-02  | 36       | 37     | 1            | 5.395    |
| THE-02  | 38       | 39     | 1            | 2.590    |
| MAH-01  | 19       | 20     | 1            | 1.868    |
| MAH-01  | 20       | 21     | 1            | 1.244    |

#### 7.5.4 TTH-1 (Ailah-Avala Prospect)

The drilling program by PHME in this prospect area (TTH-1) was to test areas under pediment and wadi cover and to test known zones of alteration and mineralisation areas for lower-grade, bulk Au mineralisation.

In July of 2007, the post hole drilling commenced and 136 holes for 1,469m were completed on the P747, P547 and P548 grids. The P555, P556, P557 and P558 prospects in TTH-1 are situated in a generally flat, sand-covered area of about 7km<sup>2</sup>.

The drill targets were based mostly on assay values and ancient workings, since quartz vein outcrops are very few and scattered. It is the purpose of this drilling program to locate and evaluate the source of the quartz dumps, float and rubble in the area. Thirty-five RC drillholes were completed at the Ailah Prospect (for 1,931m). Drill-chip logging showed that the area is underlain by diorite/quartz diorite, monzodiorite and granodiorite, with intercalated metavolcanic rocks and mafic dykes. Common alteration minerals are chlorite and carbonate. Quartz appears as stringers/veinlets from 1m up to 5m wide. Disseminated pyrite is rarely present in the wallrock commonly. Only four holes show >1g/t Au intercepts at depth (Table 7.5.4\_1).

| Table 7.5.4_1<br>Ailah-Avala – Significant Drillhole Intersections |              |          |
|--------------------------------------------------------------------|--------------|----------|
| Hole ID                                                            | Interval (m) | Au (g/t) |
| AIL-14                                                             | 3-4          | 1.645    |
|                                                                    | 14-15        | 2.028    |
| AIL-33                                                             | 7-8          | 7.186    |
| AIL-34                                                             | 8-9          | 2.12     |
|                                                                    | 9-10         | 1.51     |
| AIL-35                                                             | 9-10         | 6.44     |

#### 7.5.5 TTH-4 (West Thafin Prospect)

In the Bir Cananah, Northwest Thafin area (M4252), PHME conducted reconnaissance prospecting (some mapping), rock chip sampling and RC drilling. Nine rock chip samples returned a maximum of 27.98g/t Au, with average of 13.63g/t Au. Four RC holes (for 210m) were drilled to test along the strike length of the deposit below areas of outcropping quartz veining and ancient workings. Significant drillhole intersections are listed in Table 7.5.5\_1.

| Table 7.5.5_1<br>Northwest Thafin – Significant Drillhole Intersections |          |        |              |          |
|-------------------------------------------------------------------------|----------|--------|--------------|----------|
| Hole ID                                                                 | From (m) | To (m) | Interval (m) | Au (g/t) |
| TFN-01                                                                  | 21       | 22     | 1            | 2.771    |
|                                                                         | 22       | 23     | 1            | 79.908   |
|                                                                         | 23       | 24     | 1            | 4.734    |
| TFN-02                                                                  | 18       | 19     | 1            | 9.070    |
|                                                                         | 19       | 20     | 1            | 9.174    |
|                                                                         | 20       | 21     | 1            | 23.671   |
|                                                                         | 21       | 22     | 1            | 13.665   |
|                                                                         | 23       | 24     | 1            | 2.046    |
| TFN-03                                                                  | 33       | 34     | 1            | 3.085    |
|                                                                         | 34       | 35     | 1            | 5.558    |
|                                                                         | 35       | 36     | 1            | 3.058    |
|                                                                         | 36       | 37     | 1            | 1.044    |
|                                                                         | 31       | 32     | 1            | 1.393    |

In the Bir Cananah (West Thafin area; P814), 12 rock chip samples returned a maximum of 28.28g/t Au, with average value of 13.79g/t Au. Three RC holes (for 190m) were drilled to test along the strike length of the deposit below areas of outcropping quartz veining and ancient workings. Significant drillhole intersections are shown in Table 7.5.5\_2.

| Table 7.5.5_2<br>West Thafin – Significant Drillhole Intersections |          |        |              |          |
|--------------------------------------------------------------------|----------|--------|--------------|----------|
| Hole ID                                                            | From (m) | To (m) | Interval (m) | Au (g/t) |
| TFN-06                                                             | 42       | 43     | 1            | 1.556    |
|                                                                    | 43       | 44     | 1            | 2.060    |
| TFN-07                                                             | 25       | 26     | 1            | 29.691   |
|                                                                    | 26       | 27     | 1            | 12.123   |
|                                                                    | 27       | 28     | 1            | 10.330   |

## 7.6 Coffey Mining Conclusions and Recommendations

Tathlith is the largest of the MEMC exploration licenses covering 678.3km<sup>2</sup> of ground prospective for gold and base metals. The EL contains Lugatah and numerous other gold prospects including Bir Cananah, West Thafin, Al Hasbat and Ailah-Avala. Numerous gold occurrences throughout the EL suggest a generally fertile belt capable of hosting economic mineralisation under the right local conditions. Geophysical and geochemical base data need to be compiled (or acquired) then reviewed with a view to generating targets for follow up. Particular emphasis is required on structural interpretation and assessment of target areas concealed by younger cover. Appropriate detailed airborne magnetic data should be acquired to facilitate structural interpretation. Systematic surface geochemical sampling in areas of residual soil and regolith geochemical drilling in shallowly concealed areas need to be completed along with structural mapping in outcrop areas.

The Lugatah Prospect contains significant gold mineralisation which has so far been outlined by relatively shallow drilling down to 70m depth and over about 500m of strike. There is significant potential to define an open pitable gold resource at Lugatah with additional systematic drilling. The mineralisation is open at depth and along strike to the north and south. The north end in particular has some of the best drill intersections including 6m @ 7.38g/t Au from 142m in hole CO-14 on the northernmost close spaced drill traverse. Other intersections requiring follow up include 6m at 26.1g/t Au from 21.5m in hole CO-07 underlain by 3m @ 14.3g/t Au from 73.5m in hole CO-16. The mineralisation passes under transported cover to the north of here and has not been tested. Additional drilling should be planned to include both RC drilling and oriented diamond core drilling.

The additional Lugatah drilling should incorporate appropriate sampling and analytical procedures and implementation of a QAQC regime such that a preliminary JORC compliant Mineral Resource estimate can be completed.

The existing prospect data from Bir Cananah, West Thafin Al Hasbat, Hobuyet Prospect need to be reviewed in the context of the systematic project wide data acquisition previously described so that follow up can be prioritised.

## 8 TURABAH-AQIQ EXPLORATION LICENSE

### 8.1 Introduction

The Turabah-Aqiq Exploration License is located in the western part of the Kingdom of Saudi Arabia. The license contains seven segment areas (TBA-1, TBA-2, TBA-3, TBA-4, TBA-5, TBA-6, TBA-7) covering an area of 254.63km<sup>2</sup> and is entirely located within Al Baha and Makkah Provinces. The Turabah-Aqiq license is situated just east of the Red Sea escarpment, about 450km from Jeddah. Topography in the license area has moderate relief with elevations ranging from 1050m to 1700m. Wadis in the area generally drain to the northeast. The Turabah-Aqiq EL contains the Aqiq-Ghamid and Mulhal gold prospects.

### 8.2 Mineral Tenure

The location of the Turabah-Aqiq license is shown in Figure 1.1\_2 and details of the tenement schedule are given in Appendix A. Coffey has not independently validated the licensing details and the present status of tenements, agreements and legislation described in this report is based on information provided by MEMC.

### 8.3 Project Geology and Mineralisation

#### 8.3.1 Geology

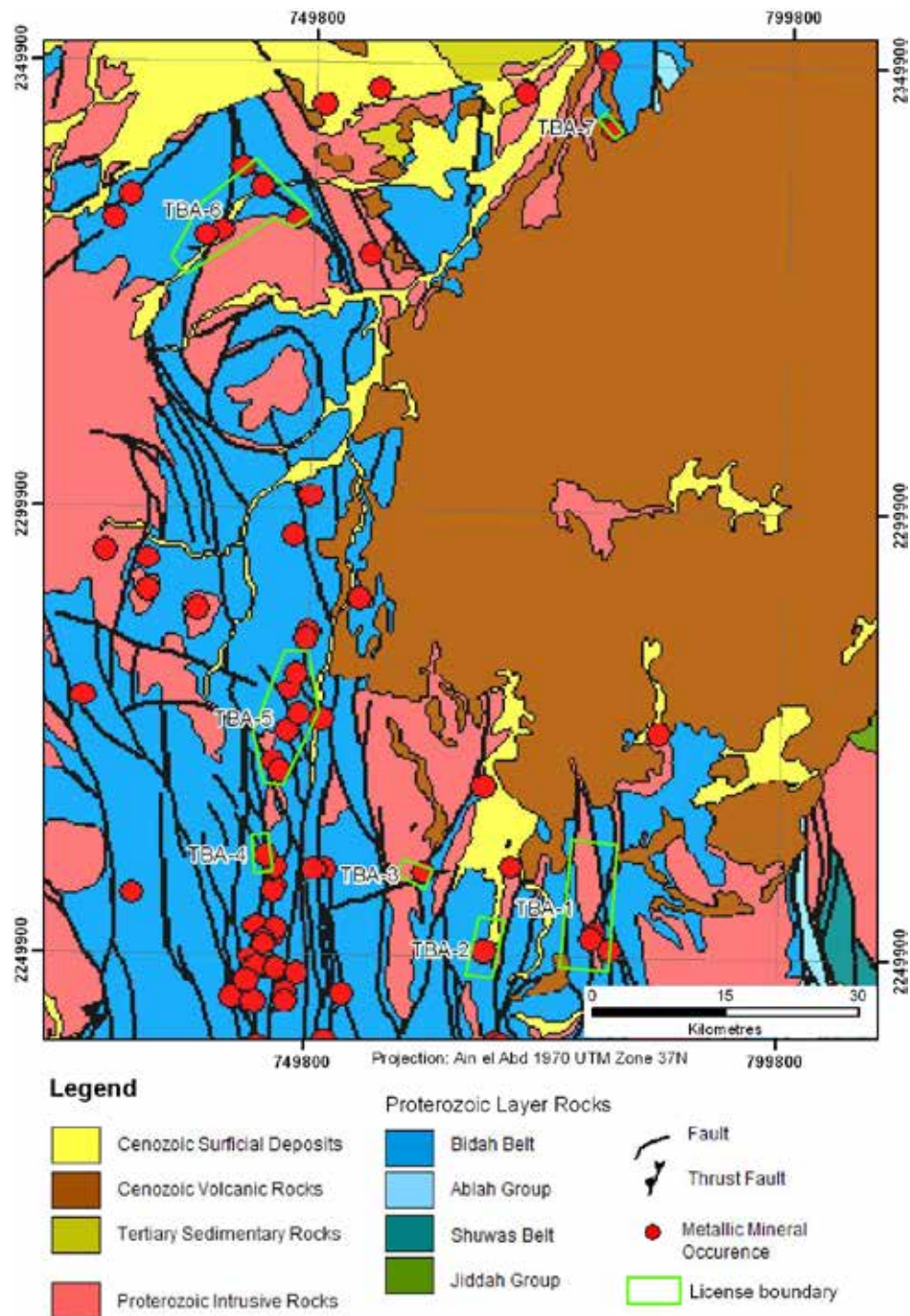
The Turabah-Aqiq Exploration License is underlain by rocks ranging from Proterozoic to Recent in age. The Proterozoic rocks are part of the Bidah belt of the Asir Terrane. The exposures of Precambrian rocks are bounded to the east by the Tertiary to Quaternary lava flows of Harrat al Buqum. Portions of the northern part of the exploration license are covered by Tertiary to Recent sediments and sedimentary rocks (Figure 8.3.1\_1).

The rocks of the Bidah belt have been subdivided into three major lithological groups. From east to west these are: Group 1 - mafic volcanic rocks; Group 2 - felsic volcanoclastic rocks; and Group 3 - epiclastic and felsic volcanoclastic rocks. Regionally, lithologic groups young to the west. Group 1 have been assigned to the Khumrah greenstone, whereas Groups 2 and 3 are assigned to the Hawiyah formation. Previous workers have variously termed these rocks the Baish (Group 1) and Baha (Groups 2 and 3), the Sharq, Bidah and Gharb and "Older Volcanic Rocks", "Metasedimentary Rocks", and "Younger Volcanic Rocks".

The Khumrah greenstone (Group 1) is interpreted to be the product of back-arc spreading and basaltic volcanism associated with the opening of a marginal sea, and is a bimodal suite composed of chemically immature low-K tholeiites and sodic dacite and rhyolite. The Hawiyah sedimentary rocks (Groups 2 and 3) are the result of contemporaneous erosion and deposition in the back-arc basin environment.

The Proterozoic rocks within the license area consist of sheared volcanic, sedimentary and plutonic rocks that have been tightly to isoclinally folded about N-trending axes and are cut by numerous N-trending brittle-ductile shear zones. Wadi Bidah, in the central part of the license area formed in, and parallel to, one of these north-trending sinistral shear zones.

Figure 8.3.1 1  
Turabah-Aqiq - Regional Geology and Mineral Occurrences



(PHME, 2011)

Regional metamorphism is greenschist facies. Intrusive rocks in the belt consist of granites, diorites, tonalites, and granodiorites. Tertiary volcanism produced the flood basalts of the Harrat al Buqum to the east of the license.

### 8.3.2 Regional Mineralisation

There were over 100 metallic mineral occurrences reported within the Turabah-Aqiq license area when PHME undertook its initial literature review in early 2005. The mineral deposits of the Bidah belt can be divided into four types:

- § exhalative sulphide deposits (e.g., Gehab, Shaib al Tair and Mulhal), exposed principally as gossans in proximal felsic volcanic facies;
- § distal volcanosedimentary deposits associated with disseminated to sub-massive sulphides (e.g., Rabathan);
- § deposits related to shear zones and quartz veins associated with other deposit types (e.g. Mamilah, Shigenah and Aqiq-Ghamid); and
- § gold-enriched gossans developed over exhalative sulphides (e.g., Shaib al Tair and Gehab).

### 8.3.3 Geology of Aqiq-Ghamid Mine

Three major rock units crop out in the area of the ancient mine. They are volcanic siltstone of the Jof Formation, mainly confined to the eastern part of the area, and tonalite, and its quartz porphyry border facies, emplaced in the west and south. Quartz veins and subordinate felsic dykes cut the plutonic rocks.

The volcanic siltstone of the Jof formation of the Baish group crops out in the eastern and southern parts of the area and is present as xenoliths in the tonalite. It is fine-grained and green, metamorphosed and altered. The alteration and/or metamorphic minerals are chlorite, epidote, carbonate, sericite, and pyrite; assemblages including chlorite, epidote, carbonate and pyrite are most common. The weathering intensity is variable. Very fine-grained micaceous and chloritic minerals are preserved, but local, white, powdery minerals may be related to weathering and decomposition of the mineral constituents.

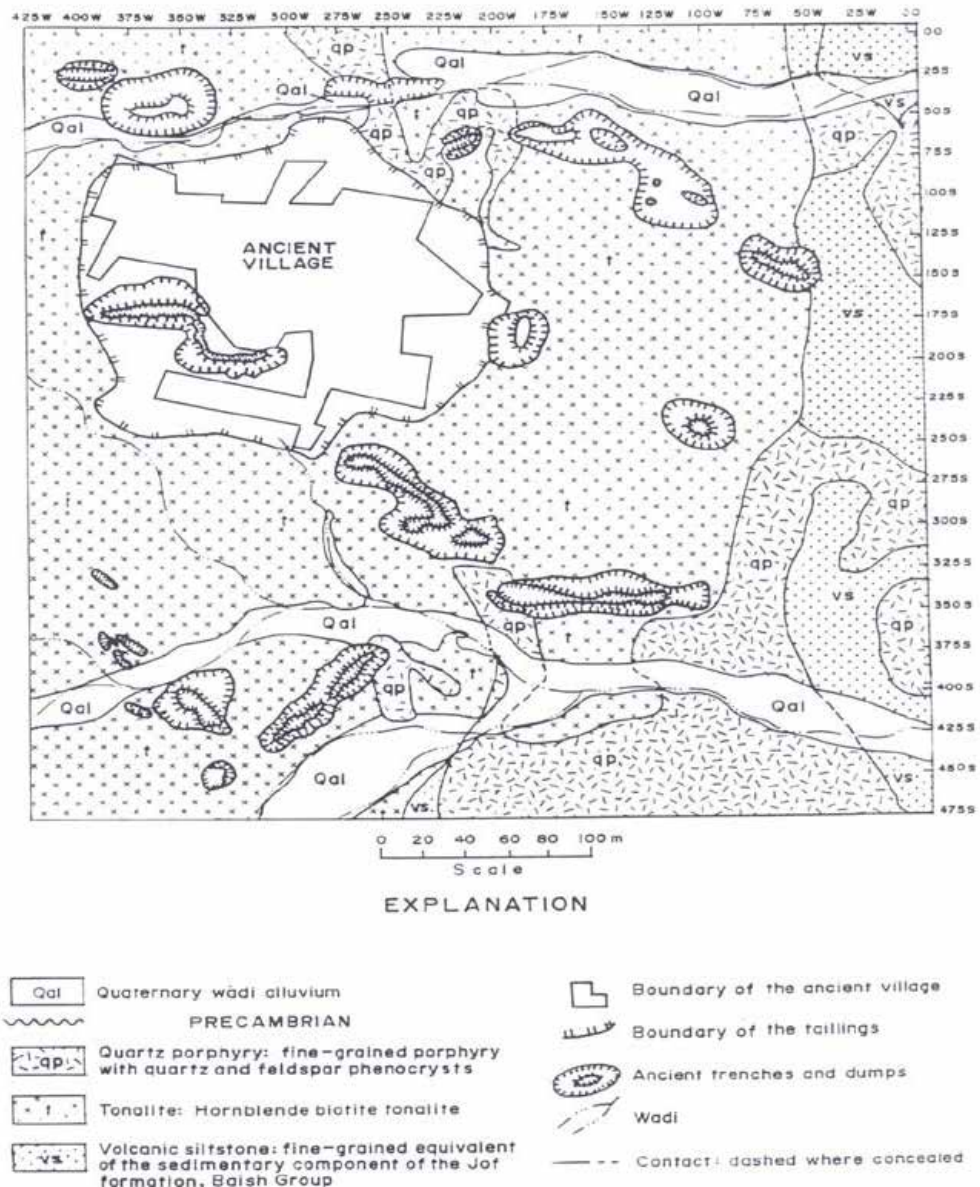
The plutonic rocks correspond to tonalite and quartz porphyry, which have intruded the volcanic siltstone. The quartz porphyry constitutes the border facies of the tonalite. Together they represent the older tonalite of Cater & Johnson (1987). The tonalite is mainly present in the central and western parts of the map area and abundant small dykes occur in the siltstone. The tonalite is grey, medium- to coarse-grained, and commonly altered and weathered. The extremely weathered parts are completely friable and broken.

The quartz porphyry is the border facies of the tonalite and has the same mineral constituents, the main difference being the texture. The contact between the quartz porphyry and the tonalite is irregular and may be either sharp or gradational, although the latter is the most common. Dykes of quartz porphyry in the siltstone are less abundant than tonalite dykes.

Surficial deposits consist of residual soil and eluvial material and wadi alluvium. Commonly, the larger fragments in the eluvium form a lag at the surface, whereas the finer debris is present at depth. The components are varied, but were mainly derived from the rocks cropping out at the prospect.

Slag from ancient smelting activities is also present on the surface. Wadi alluvium at Aqiq-Ghamid consists of silts, sand and gravel. This unconsolidated and semi-sorted material was deposited during recent pluvial periods.

**Figure 8.3.3 1**  
**Aqiq-Ghamid – Geological Map and Ancient Workings**



(Fotawi et al., 1994)

#### 8.3.4 Mineralisation, Aqiq-Ghamid Mine

Quartz veins are the dominant structural feature and trend NW, N-S, NE, and E-W. The NW-trending workings to the northeast of the ancient village appear to represent a series of en echelon E-W veins, based on observations in the current trenches, rather than NW-striking veins.

The veins probably formed as a result of movements on the Aqiq structural zones, the two strands of which pass 1km to the east and west of the prospect. However, the range of orientations of the veins, which are dilatational features, indicates that they did not form as the result of a single deformation event.

In the ancient mine workings, the foliation and the contact of the veins with the intrusive rocks are both N-trending and steeply dipping. Foliation in the tonalite is probably due to compression after its intrusion. Microscopically, a cataclastic texture is present along the grain boundaries, caused by crushing and fracturing due to severe mechanical stress during deformation. The tonalite and quartz porphyry are moderately well-jointed; joints in the tonalite trend N, whereas in the quartz porphyry they trend NW.

At the ancient mine, mineralisation consists of gold contained in quartz veins and, to a lesser extent, in the host-rock tonalite. The veins have been grouped into four types according to their characteristics and mineralogy (Fotawi et al., 1994):

- § Type I - discontinuous milky-quartz veins up to 1cm wide that pinch and swell along their length; their mean Au content is 0.1g/t.
- § Type II - milky to translucent quartz veins; the widths of the veins range from 3mm to 10cm; they are typically curvilinear and pinch and swell, and they also occur as pods and lenses; epidote is locally present, as is oxidised pyrite; they contain patches of hematite and Fe-Mn staining; their mean Au content is 0.02g/t.
- § Type III - milky to translucent to semi-transparent vein quartz characterised by abundant Fe-Mn oxides on fracture surfaces; the widths of the veins range from 0.7cm to >35cm; their mean Au content is 2.5g/t.
- § Type IV - the main Au-bearing quartz veins mined in ancient times; these veins strike NW, N-S, NE, and E-W (Figure 8.3.3\_1), are vertical, and are up to 90m long; their widths range from few centimetres to >1m (Figure 8.3.4\_1 and 8.3.4\_2); the vein quartz is patchily white to dark grey and is transparent to translucent; no sulphides present; the mean Au content of dump material collected from trenches and on the surface is 2.9ppm - possibly the minimum value of the Au-bearing quartz worked by the ancients.

### 8.3.5 Geology and Mineralisation, Mulhal

Lithological units range from basal andesitic to dacitic tuffs upwards to a rhyolitic tuff. Contacts between these units are generally inferred. Quartz veining cuts across the various lithologies. Most rocks have been hydrothermally altered and sheared, which are locally intense. Extensive hydrothermally altered shear zones extend approximately 1.8km north of the ancient mine (Figure 8.3.5\_1) and terminate, possibly as a result of faulting, at the southern end of the workings. Many contacts are gradational and layering is only locally present. Structurally, the rocks generally dip to the east. There is intense folding and tight folds on N-trending axes with amplitudes of only few metres, and attitudes of fold can change abruptly. Shearing is the most important structural feature in the area and large areas of mainly siliceous rocks have been deformed. Gossans exhibit relatively intense shearing (Figure 8.3.5\_2) and, locally, barite-bearing gossans grade laterally into sheared siliceous rocks. It is believed that the larger shears flatten and terminate toward the southern end of the mine area. The local geology is illustrated in Figure 8.3.5\_3.

**Figure 8.3.4 1**  
**Aqiq-Ghamid Mineralisation**



Waypoint 292 view east at outcropping narrow quartz vein with 1m wide weathered sericitic alteration zone in monzonite/granodiorite host.  
(Coffey, 2011)

**Figure 8.3.4 2**  
**Aqiq-Ghamid Ancient Workings**



Waypoint 295 view looking west in Aqiq-Ghamid ancient mine with steep S dipping quartz vein (30cm max width)  
(Coffey, 2011)

**Figure 8.3.5\_1**  
**Mulhal Topography and Mineralisation**



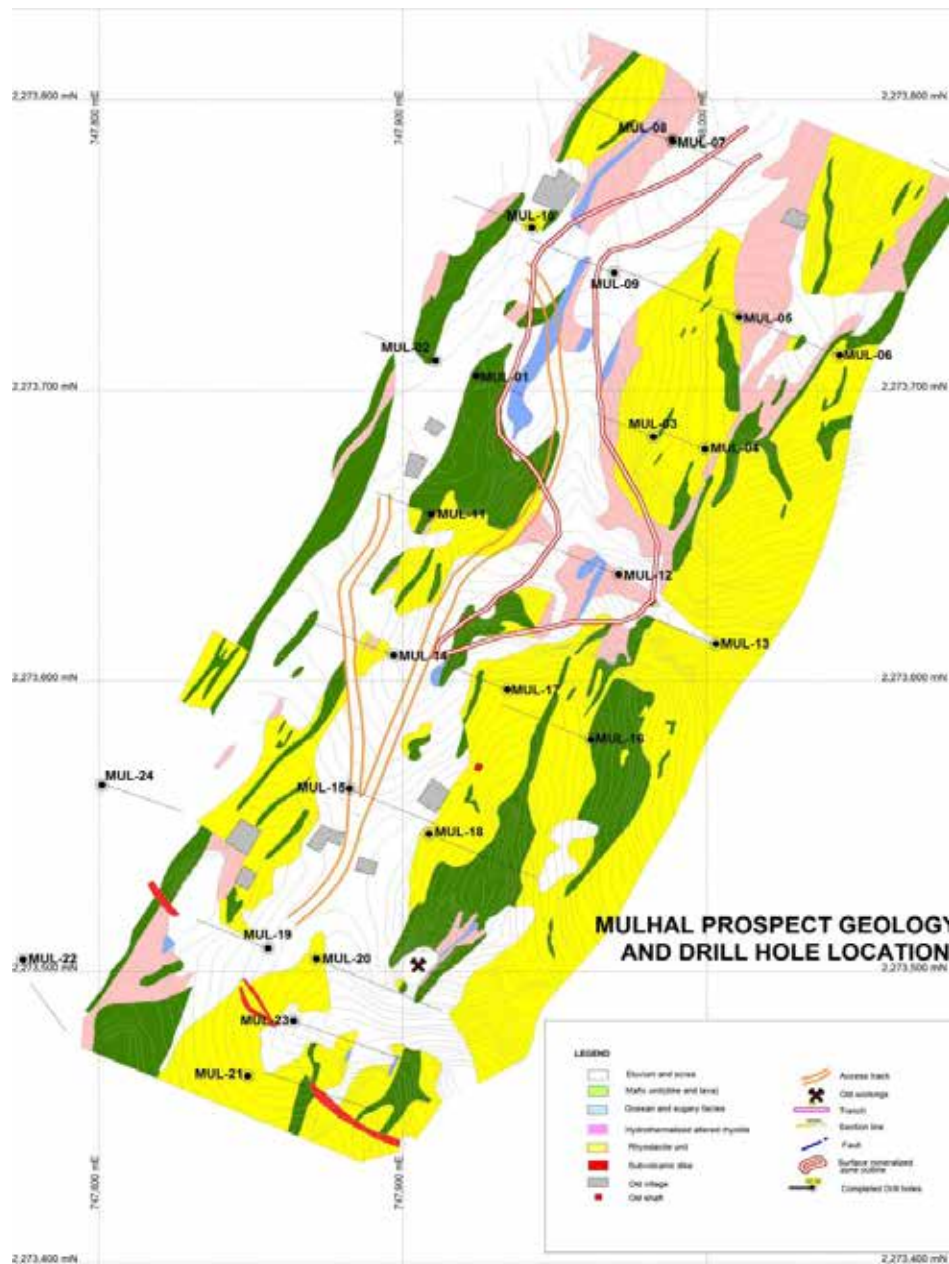
View N from waypoint 316. Trench T50 on left near vehicle, ancient workings on right in middle distance (Coffey, 2011).

**Figure 8.3.5\_2**  
**Mulhal Mineralisation**



Waypoint 312. Steep W dipping gossanous quartz veined shear zone exposed on N wall of Trench T-50 (Coffey, 2011)

Figure 8.3.5\_3  
Mulhal – Geology and Mineralisation



(PHME, 2011)

Mineralisation in the oxidised zone is in faults and shears. Two types of mineralisation have been recognised:

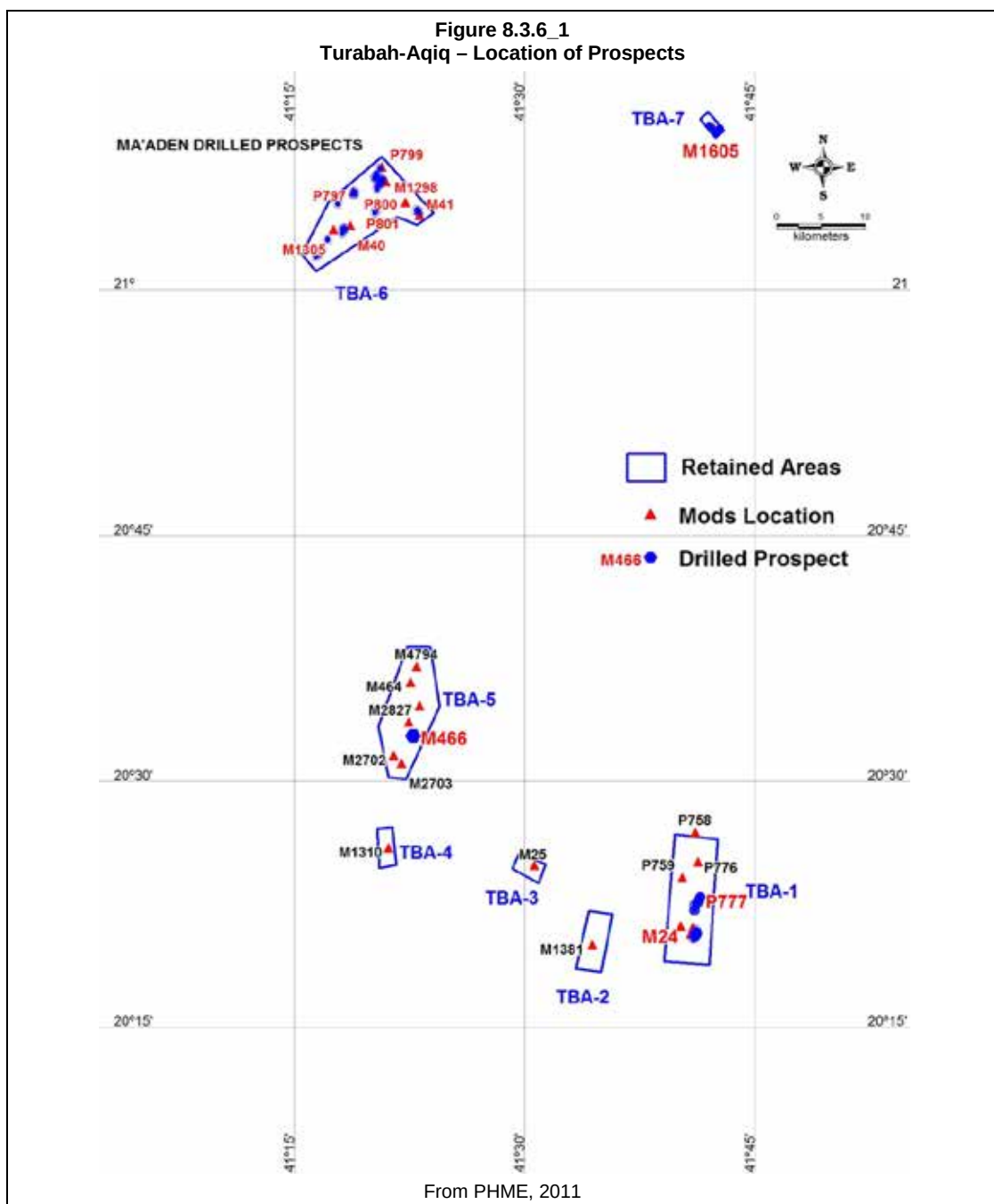
- § Stratiform deposits at the contacts between quartz crystal tuffs and basalts;
- § Discordant deposits in shears, faults and fractures.

Both types contain Au-Cu mineralisation.

### 8.3.6 Prospects

The license comprises seven gold exploration target areas with numerous ancient workings, many quartz veins and large alteration zones (Figure 8.3.6\_1). These areas have exploration potential for Au-bearing veins in greenstones and intrusive rocks, and polymetallic epithermal mineralisation. Generally, three types of gold occurrences occur:

- § Au-enriched gossans;
- § Au-bearing quartz veins; and
- § Au-bearing epithermal or massive sulphide systems.



## 8.4 Exploration History

### 8.4.1 Previous Exploration, Turabah-Aqiq License Area

The earliest recorded modern exploration in the area was by the Saudi Arabian Mining Syndicate (SAMS) who examined prospects near Baha and Turabah in the 1930s. This was followed by examinations and sampling of a number of ancient mine sites by DGMR in the 1960s.

From 1970 to about 1982 there was a large amount of exploration work in the area. The USGS Mission and the DGMR mapped most of the area at 1:100 000. An airborne INPUT survey was flown over the area by GeoTerrex under contract to DGMR. The USGS engaged in a large exploration program which included mapping, sampling, drilling and geophysical follow-up over a period of 10 years to the early 1980s. The Riofinex Geological Mission did a review of the prior exploration in the area and did exploration in the early 1980s. The BRGM explored gold prospects in the Turabah area in 1981-82.

In the late 1980s, the BRGM carried out an extensive exploration program in the district which included 1:100,000 geological mapping and detailed exploration at a number of prospects. The primary objective of this work was to locate gold-bearing gossans similar those found in the Shuwas Belt at Al Hajar.

Ma'aden held an exploration license over the area from 1996 to 2004. Ma'aden completed an airborne magnetic and electromagnetic survey, prospect examinations and drilled several prospects in the Mamilah area in the northern part of the Bidah belt.

### 8.4.2 Previous Exploration, Aqiq-Ghamid

In 1967, Smith and Kouther prepared a geological map of the ancient Aqiq-Ghamid mine at a scale of 1:2 500 and collected 26 dump samples and 11 channel samples. The average gold content of the channel samples was 4.8g/t (range: 0.7-13ppm) and for the dump samples was 5.0g/t (range 0.3-22g/t). They concluded that the assay values were moderately encouraging and recommended a limited drilling program to test veins approximately 50m below the surface, but no drilling took place.

In 1982, the USGS conducted a geologic exploration program to evaluate potential targets at the ancient Aqiq-Ghamid mine. The veins and dumps were sampled and mineralised rocks were mostly noted in two NW-trending zones of quartz veining, with possible high-grade mineralisation at their intersection with NE-trending veins. The average Au content of 35 dumps samples collected was 4.8g/t, similar to that obtained by Smith & Kouther (1967), with a range of 0.3-22.1g/t. Forty-one channel samples were also collected: one of them from altered quartz diorite wallrock, and the remainder from the quartz veins in the ancient workings. The average gold content of samples from the workings was 1.1g/t, with a range of 0.06-13g/t.

In 1990-1991, the Ministry of Petroleum and Mineral Resources (DMMR) carried out an evaluation of the Aqiq-Ghamid mine (supervised by BRGM). The work consisted of grid survey grid sampling, topographic mapping, geological mapping, geophysical surveying and trenching. Ground geophysical surveys were made during July and October 1990, including resistivity/IP, SP, electromagnetic (VLF and GENIE), and magnetic. The objectives were to map the subsurface extensions of the quartz veins in tonalite country rock at the prospect, in particular the northern and southern vein systems, and to locate any similar veins in the prospect area. The main geophysical approach was based on the resistivity contrast between the highly resistive quartz veins and the comparatively less resistive intrusive country rock.

The results obtained from all the different geophysical methods indicated that only resistivity was successful in detecting anomalies that could be related to quartz veining. Resistivity-high axes suggest that the vein systems in the northern and southern part of the prospect extend to depths of at least 100-200m, have a greater strike length at depth than at the surface, and consist of steeply-dipping veins or vertical en echelon veins.

#### 8.4.3 PHME Exploration, Aqiq-Ghamid

In 2007, a diamond drilling program was carried out to fully evaluate the gold potential of Aqiq-Ghamid; 27 drillholes were laid out over the known prospective zone. However, only six diamond holes were completed (for 439.1m). In August 2008, the remaining 21 holes were completed by RC drilling (for 1,722m). The six diamond holes intersected zones of >3-16g/t Au (Table 8.4.3\_1).

| Table 8.4.3_1<br>Aqiq-Ghamid – 2007 Diamond Drillhole Intersections |          |        |                                                                   |
|---------------------------------------------------------------------|----------|--------|-------------------------------------------------------------------|
| Hole No.                                                            | From (m) | To (m) | Interval                                                          |
| M24-01                                                              | 5.0      | 8.0    | 3m @ 0.233g/t Au                                                  |
|                                                                     | 62       | 63.50  | 1.50m @ 0.523g/t Au                                               |
| M24-02                                                              | 59       | 66     | 8m @ 0.615g/t Au, including 0.40m @ 7.282g/t Au from 63.30-63.70m |
|                                                                     | 68.70    | 74     | 5.30m @ 0.314g/t Au                                               |
| M24-04                                                              | 42.45    | 43.25  | 0.90m @ 3.159g/t Au                                               |
| M24-05                                                              | 51.65    | 60     | 8.35m @ 0.215g/t Au                                               |
| M24-06                                                              | 28.0     | 39.40  | 11.40m @ 0.705g/t Au, including 1m @ 4.005g/t Au from 32-33m      |
|                                                                     | 43.50    | 47.40  | 3.90m @ 0.266g/t Au                                               |
|                                                                     | 56       | 61.75  | 5.75m @ 0.396g/t Au                                               |
|                                                                     | 78.15    | 79.00  | 0.85m @ 16.899g/t Au                                              |

The RC drilling program evaluated the potential of the Au-bearing quartz veins and the tonalite-quartz porphyry zone where no surface quartz veins are visible. Anomalous Au in several trenches was shown to extend beyond 50-100m depth and that the anomalous zones were still open below the zone of oxidation.

A further 21 RC holes and 110 post holes were drilled to the north and south of the Aqiq-Ghamid prospect (Table 8.4.3\_2). Post holes were drilled to 10m vertical depth and sampled every 5m.

**Table 8.4.3\_2**  
**Aqiq-Ghamid –Selected RC Drillhole Intersections**

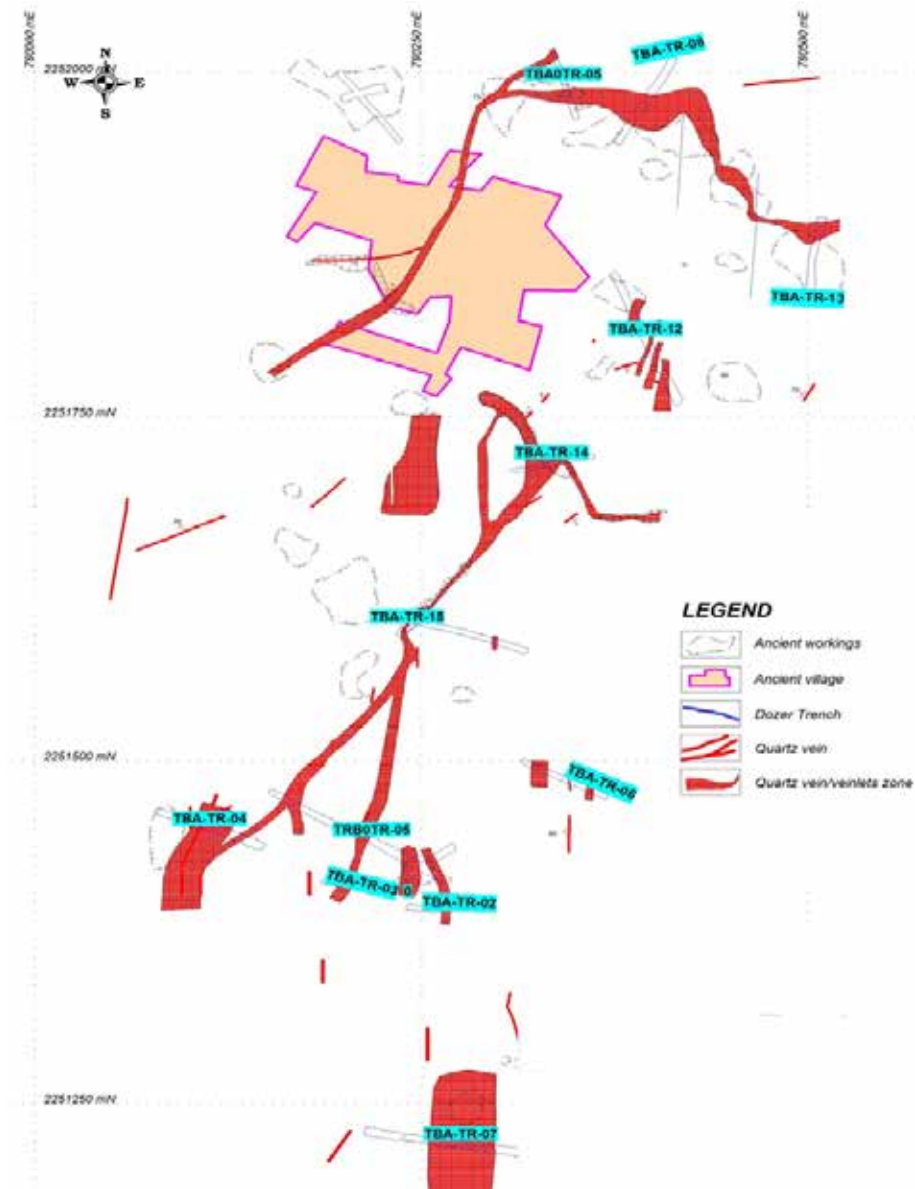
| Hole ID   | From (m) | To (m) | Width (m) | Grade (g/t Au) | Remarks                                                                                |
|-----------|----------|--------|-----------|----------------|----------------------------------------------------------------------------------------|
| M24-RC-01 | 45       | 46     | 1         | 1.181          |                                                                                        |
|           | 48       | 50     | 2         | 1.388          |                                                                                        |
| M24-RC-02 | 0        | 1      | 1         | 1.372          |                                                                                        |
| M24-RC-03 | 54       | 56     | 2         | 1.114          |                                                                                        |
|           | 56       | 60     | 4         | 9.769          | Vein                                                                                   |
| M24-RC-04 | 67       | 69     | 2         | 43.93          | Vein                                                                                   |
| M24-RC-05 | 62       | 63     | 1         | 4.026          | Vein                                                                                   |
| M24-RC-06 | 0        | 12     | 12        | 1.306          | Oxide zone                                                                             |
|           | 37       | 38     | 1         | 1.335          |                                                                                        |
| M24-RC-09 | 74       | 75     | 1         | 1.142          |                                                                                        |
| M24-RC-11 | 33       | 52     | 19        | 4.124          | Including 3m of 19.602g/t Au from 46-49m (vein)                                        |
| M24-RC-12 | 7        | 8      | 1         | 1.131          | Oxide zone                                                                             |
| M24-RC-13 | 7        | 13     | 6         | 1.131          | Oxide zone                                                                             |
|           | 19       | 27     | 8         | 1.127          |                                                                                        |
|           | 52       | 53     | 1         | 1.135          |                                                                                        |
| M24-RC-14 | 46       | 47     | 1         | 12.611         | Vein                                                                                   |
|           | 86       | 94     | 8         | 1.551          | Including 2m of 3.195g/t Au from 88-90m (vein)                                         |
| M24-RC-16 | 40       | 41     | 1         | 3.906          | Vein                                                                                   |
|           | 47       | 49     | 2         | 1.407          |                                                                                        |
| M24-RC-17 | 58       | 60     | 2         | 1.416          | Including 1m of 8.545g/t Au from 92-93m (vein)                                         |
|           | 75       | 78     | 3         | 1.304          |                                                                                        |
|           | 81       | 82     | 1         | 1.241          |                                                                                        |
|           | 90       | 93     | 3         | 3.363          |                                                                                        |
|           | 96       | 97     | 1         | 1.583          |                                                                                        |
| M24-RC-18 | 3        | 4      | 1         | 1.435          | Including 1m of 4.175g/t Au from 80-81m (vein)                                         |
|           | 79       | 82     | 3         | 2.726          |                                                                                        |
|           | 84       | 90     | 6         | 2.297          | Including 1m of 3.670g/t Au from 85-85m (Vein) ; 2m of 3.778g/t Au from 88-90m (Vein); |
|           | 94       | 99     | 5         | 1.6            | Including 2m of 3.060g/t Au from 94-96m (vein)                                         |
| M24-RC-19 | 61       | 62     | 1         | 2.149          |                                                                                        |
| M24-RC-21 | 56       | 57     | 1         | 9.143          | Vein                                                                                   |

Seventeen trenches were completed for 883m. The trenches were dug by a bulldozer and sampled at 1m intervals. Trench samples yielded anomalous and high values of gold (Figure 8.4.3\_1; Table 8.4.3\_3).

**Table 8.4.3\_3**  
**Aqiq-Ghamid – Significant Results from Channel Sampling of Trenches**

| Trench    | From (m) | To (m) | Length (m) | Grade (Au g/t) |
|-----------|----------|--------|------------|----------------|
| TBA-TR-01 | 100      | 110    | 10         | 0.623          |
| TBA-TR-14 | 13       | 36     | 23         | 1.783          |
| TBA-TR-16 | 5        | 19     | 14         | 1.840          |
|           | 0        | 13     | 13         | 4.330          |
| TBA-TR-18 | 18       | 21     | 3          | 0.922          |
|           | 45       | 53     | 8          | 0.424          |

Figure 8.4.3 1  
Aqiq-Ghamid - Location of Trenches



(PHME, 2011)

#### 8.4.4 PHME Exploration, Mulhal

This prospect was first drilled in 2005 with 20 RC drillholes. The results showed several significant intercepts (Table 8.4.4\_1). The best result was from drillhole MUL-20 recording a 15m interval of 6.902g/t Au. Surface rock sampling results were also promising with most of the samples responding with anomalous gold values, the highest of which was 18g/t Au. These assays are from three sub-parallel zones of alteration with strike length of over 1.5km.

Additional drilling comprised 10 holes, consisting of five RC and five diamond holes (for 652.25m). Overall results include significant intersections in holes MUL-19, MUL-20, MUL-21 and MUL-23 in the southern area, and narrow and low-grade intercepts (MUL-26, MUL-27, and MUL-29) in the northern area. Significant results were also returned from trench channel sampling. These included 33.3m @ 3.41g/t Au in trench T-250 (Table 8.4.4\_1).

| Table 8.4.4_1<br>Mulhal Significant Mineralisation |          |          |           |                |                                                                                                                      |
|----------------------------------------------------|----------|----------|-----------|----------------|----------------------------------------------------------------------------------------------------------------------|
| Hole ID                                            | From (m) | To (m)   | Width (m) | Grade (g/t Au) | Remarks                                                                                                              |
| MUL_03                                             | 13<br>26 | 21<br>28 | 8<br>2    | 2.977<br>0.763 | Including 6m of 3.789g/t Au from 15-21m.                                                                             |
| MUL_05                                             | 0<br>27  | 4<br>33  | 4<br>6    | 1.063<br>2.090 | Including 1m of 2.627g/t Au from 2-3m.<br>Including 3m of 3.419g/t Au from 27-30m.                                   |
| MUL_07                                             | 5        | 10       | 5         | 1.064          |                                                                                                                      |
| MUL_09                                             | 5        | 13       | 8         | 1.681          | Including 2m of 3.419g/t Au from 5-7m.                                                                               |
| MUL_10                                             | 17       | 20       | 3         | 0.727          | Including 1m of 1.999g/t Au from 17-18m.                                                                             |
| MUL_12                                             | 2        | 16       | 14        | 5.731          | Including 8m of 7.934g/t from 2-10m.                                                                                 |
| MUL_16                                             | 22<br>39 | 23<br>44 | 1<br>5    | 1.991<br>2.610 | Including 2m of 5.546g/t Au from 40-42m.                                                                             |
| MUL_19                                             | 20       | 23       | 3         | 13.749         | Including 1m of 39.531g/t Au from 20-21m.                                                                            |
| MUL_20                                             | 19<br>47 | 27<br>62 | 8<br>15   | 0.914<br>6.902 | Including 2m of 1.660g/t Au from 22-24m.<br>Including 11m of 8.833g/t Au from 48-59m.                                |
| MUL_21                                             | 39       | 47       | 8         | 12.112         |                                                                                                                      |
| MUL_23                                             | 16<br>27 | 22<br>46 | 6<br>19   | 7.007<br>9.214 | Including 2m of 33.270g/t Au, 131.565ppm Ag from 18-20m.<br>Including 8m of 18.862g/t Au, 136.930ppm Ag from 31-39m. |
| MUL_27                                             | 39.05    | 40.05    | 1         | 0.791          |                                                                                                                      |
| MUL_29                                             | 54.75    | 55.75    | 1         | 1.369          |                                                                                                                      |
| T-150                                              |          |          | 3.4       | 6.96           | Trench channel sampling ends in 5.92g/t Au mineralisation                                                            |
| T-200                                              |          |          | 30.2      | 2.42           | Trench channel sampling                                                                                              |
| T-250                                              |          |          | 33.3      | 3.41           | Trench channel sampling includes 10.2m @ 6.14g/t Au                                                                  |

#### 8.4.5 Other Prospects

Twelve other prospects from the seven areas of the license were evaluated mainly for their gold mineralisation potential. The work completed for each of the prospects is summarised in Table 8.4.5\_1.

| Table 8.4.5_1<br>PHME Exploration on Other Prospects at Aqiq-Ghamid |          |                                                                             |
|---------------------------------------------------------------------|----------|-----------------------------------------------------------------------------|
| Area                                                                | Prospect | Work Completed                                                              |
| TBA-1                                                               | P777     | Dozer trenching, mapping/sampling; RC and post hole drilling                |
| TBA-2                                                               | M1381    | Follow-up rock sampling                                                     |
| TBA-3                                                               | M25      | Follow-up work                                                              |
| TBA-4                                                               | M1310    | Follow-up rock sampling                                                     |
| TBA-5                                                               | M464     | RC drilling/rock sampling                                                   |
|                                                                     | M2703    | Semi-detailed mapping and follow-up rock sampling                           |
|                                                                     | M2702    | Semi-detailed mapping and follow-up rock sampling; access roads preparation |
|                                                                     | M465     | Semi-detailed mapping and follow-up rock sampling                           |
|                                                                     | M2827    | Limited rock sampling                                                       |
| TBA-6                                                               | M40      | Semi-detailed mapping and follow-up rock sampling (drilled by Ma'aden)      |
|                                                                     | P797     | Semi detailed mapping and follow-up rock sampling (drilled by Ma'aden)      |
| TBA-7                                                               | M1605    | RC drilling/trenching/rock sampling                                         |

## 8.5 Coffey Mining Conclusions and Recommendations

At Mulhal, significant high grade gold mineralisation in trenching and RC drilling extends over at least 300m of strike and to 50m depth in the southern part of the prospect. It has not been closed off along strike or at depth. It includes high grade RC drill intersections including 7m @ 20.2g/t Au and 147.3g/t Ag in hole MUL-23 which require immediate drill follow up. Data from several key trenches (T-50 and T100) could not be found for the Coffey review. One grab sample collected by Coffey from T-50 contained 9ppm Ag but only 38ppb Au. It was obvious from the site inspection that all the trenches exhibit significant alteration and shearing with associated quartz veining and they should be re sampled to validate earlier results. Detailed structural mapping and a systematic detailed soil geochemical survey should be completed prior to planning follow up drilling.

The remaining 1.5km strike prospect area to the north is characterised by generally excellent outcrop and residual soils. Structural mapping and systematic surface geochemical sampling should be completed prior to planning follow up. The existing prospect geophysical data need to be compiled and re interpreted.

At Aqiq-Ghamid Ancient Mine, individual veins are thin, sparsely distributed in the outcrop areas and nowhere appear frequent enough to present a bulk tonnage low grade mining opportunity. A polygonal estimate by PHME suggesting the area contains 4.6Mt of mineralisation at about 1g/t Au is not supported by Coffey. Areas of subcrop and thin cover were partially tested by PHME with both trenching and with small grids of "post hole" drilling however no compilation of these data was seen. The area lends itself to systematic surface geochemical exploration and shallow regolith drilling. It is recommended that this be completed first to assess the potential for a bulk tonnage low grade deposit.

## 9 QUBBAH EXPLORATION LICENSE

### 9.1 Introduction

The Qubbah Exploration License is located in the northern of part of the kingdom of Saudi Arabia (Figure 9.1\_1) within Tabuk province. The Qubbah EL contains the Qubbah gold prospects.

**Figure 9.1\_1**  
**Qubbah - General Topographic View showing Ancient Trenches and Pits (looking southeast)**



(Coffey, 2011)

### 9.2 Mineral Tenure

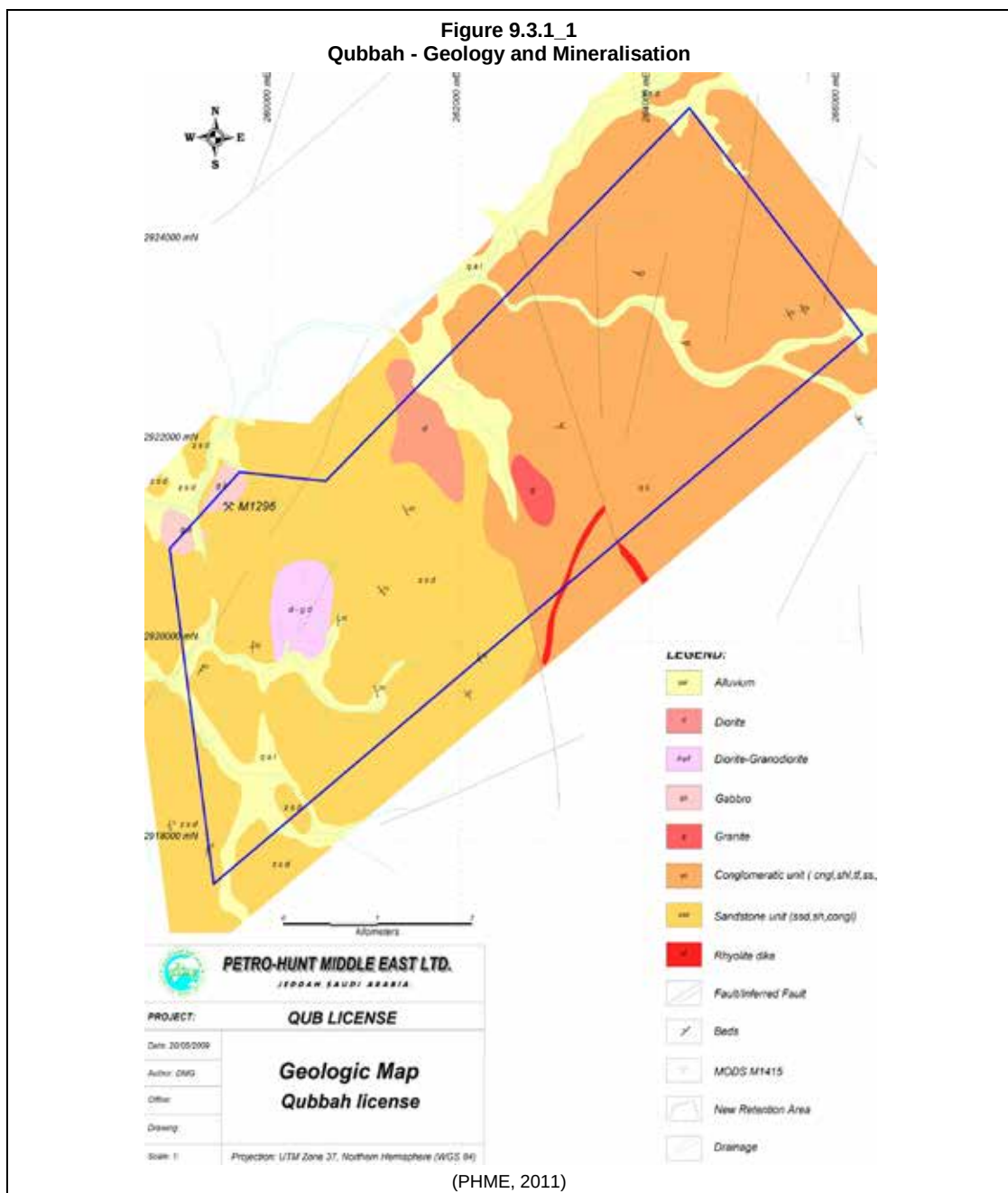
The location of the Qubbah license is shown in Figure 1.1\_1 and details of the tenement schedule are given in Appendix A.

Coffey has not independently validated the licensing details and the present status of tenements, agreements and legislation described in this report is based on information provided by MEMC.

### 9.3 Project Geology and Mineralisation

#### 9.3.1 Geology

The Qubbah area is underlain by a granodioritic stock, grading from coarse diorite to quartz-gabbro, intruding country rock composed of ferruginous metasedimentary rocks (Figure 9.3.1\_1). A thin and discontinuous aplite dike cuts the granodiorite stock and metasedimentary units. Sub-parallel to the aplite dike, NE-trending shears dipping southeast cut across the intrusive and metasedimentary rocks and appear to have provided pathways for the gold-bearing fluids. Intense quartz stockworks and brecciation characterise the contacts of the intrusions, particularly the granodiorite and quartz gabbro. A number of small trenches and pits, typically no wider than a metre, have been dug by ancient miners into the shear zones.



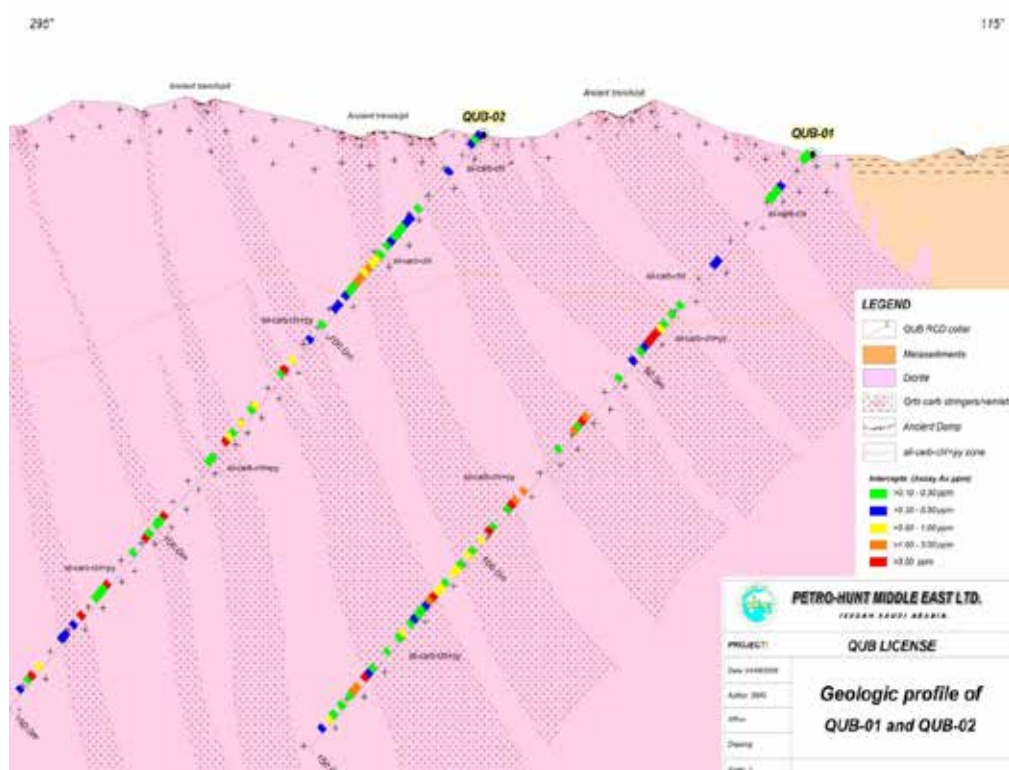
### 9.3.2 Mineralisation

At Al Qubbah prospect (MODS 1296) Au mineralisation is hosted by intrusive and metasedimentary rocks. Historical miners extracted ore material from narrow shear zones and stockworks in a diorite-granodiorite stock intruding metasedimentary rocks (Figure 9.3.2\_1 and Figure 9.3.2\_2). Intense quartz stockworks and zones of brecciation characterise the contacts of the intrusive rocks, particularly the granodiorite and quartz gabbro.

Geochemical results of rock chip sampling returned assays values of 0.01-9.471g/t Au. A few samples collected from the aplite dyke returned values up to 2.0g/t Au. Some quartz rubble occurs on some of the mine dumps suggesting the presence of quartz veining in the old workings. However, only rare occurrences of quartz veinlets are left exposed in the mining area.

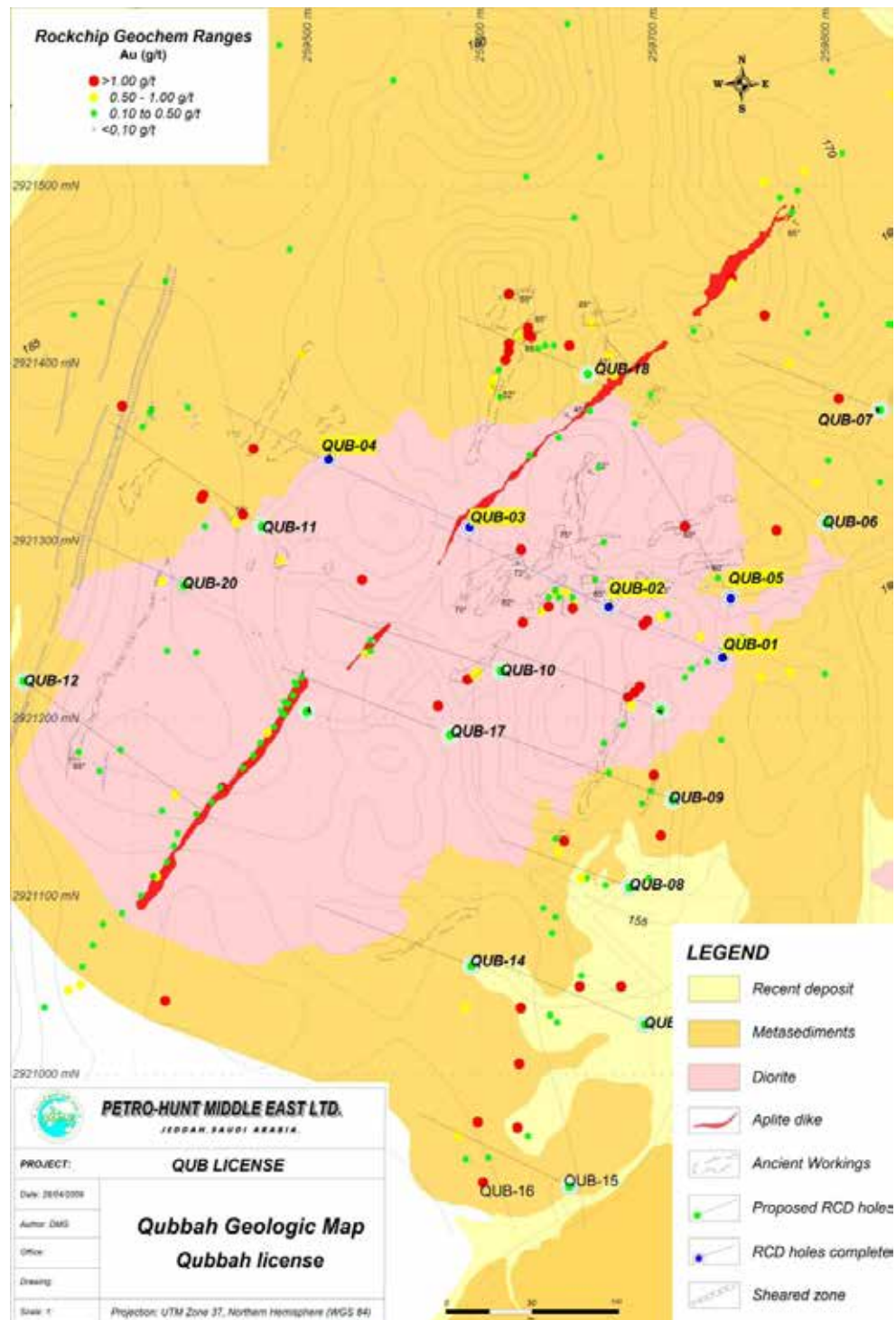
The granodiorite is commonly altered to chlorite-sericite+carbonate and contains stockwork quartz-calcite veinlets along contacts with the country rock. The metasedimentary rocks also exhibit moderate alteration, but this extends only for a few metres away from the contact. It is not clear whether this alteration is related to metasomatism associated with the intrusion of the granodiorite. Parallel NE-trending shear zones intersecting the intrusive and metasedimentary rocks contain the gold mineralisation (Figure 9.3.2\_3).

**Figure 9.3.2\_1**  
Qubbah – Geological Cross-Section through Drillholes QUB-01 and QUB-02  
showing Zones of Stockwork Veining



(PHME, 2011)

Figure 9.3.2 2  
Qubbah – Rock Chip Geochemistry in Relation to Location of Drillholes



(PHME, 2011)

**Figure 9.3.2\_3**  
**Qubbah Mineralisation**



Narrow east dipping quartz vein with hematite alteration selvage in diorite host at waypoint 387; sample of vein assayed 17.8g/t Au(Coffey, 2011)

#### 9.4 Exploration History

The Qubbah prospect (MODS 1296) has been investigated by several explorers including the BRGM, JGM, Riofinex and DGMR. The prospect was also drill tested by SAMS in the mid 1930s. No details of the drilling data are known except for a mention of fine disseminated pyrite in diorite intersected by one of the drillholes.

PHME conducted several campaigns of rock chip sampling within the Qubbah license; 258 samples have collected and analysed for gold. The average Au grade is 0.59g/t Au. Significant assays (>1g/t) are listed in Table 9.4\_1.

PHME also completed 5 RC holes (for 696m) within the Qubbah License in April and May 2007. This was part of an initially planned program of 18 holes; due to the drill rig being seconded to another project, the remaining 13 holes were not completed. The most significant results from the drilling are shown in Table 9.4\_2.

Table 9.4\_1  
Qubbah – Rock Chip Analyses >1g/t Au

| Sample ID | Sub Area | Location Description | UTM_E  | UTM_N   | Sample  |           | Interval (m) | Rock Type                              | Au (g/t) |
|-----------|----------|----------------------|--------|---------|---------|-----------|--------------|----------------------------------------|----------|
|           |          |                      |        |         | Source  | Type      |              |                                        |          |
| 28016     | Qubbah   | ancient excavation   | 259690 | 2921215 | Outcrop | Composite | 2x3          | 0.1-0.3m quartz vein                   | 1.322    |
| 28020     | Qubbah   | ancient excavation   | 259719 | 2921308 | Outcrop | Composite | 4x30         | fine veinlets                          | 2.423    |
| 28025     | Qubbah   | ancient excavation   | 259451 | 2921161 | Outcrop | Composite | 3x4x50       | felsic dyke                            | 2.029    |
| 28028     | Qubbah   | ancient excavation   | 259463 | 2921315 | Outcrop | Composite | 4x3x3        | altered sedimentary rock               | 1.380    |
| 28029     | Qubbah   | ancient excavation   | 259469 | 2921352 | Outcrop | Composite | 2.5x5x3      | altered sedimentary rock               | 1.087    |
| 28033     | Qubbah   | ancient excavation   | 259628 | 2921416 | Outcrop | Composite | 3x2          | sedimentary rock                       | 2.336    |
| 28035     | Qubbah   | ancient excavation   | 259625 | 2921254 | Outcrop | Composite | 10x2         | granodiorite                           | 1.287    |
| 28037     | Qubbah   | ancient excavation   | 259439 | 2921324 | Dump    | Grab      | 5x5          | quartz vein                            | 2.824    |
| 28038     | Qubbah   | ancient excavation   | 259440 | 2921326 | Dump    | Grab      | 10x5         | quartz vein                            | 1.266    |
| 28277     | Qubbah   | ancient trench       | 259695 | 2921253 | Outcrop | Composite | 0-5.0        | granodiorite                           | 2.624    |
| 28278     | Qubbah   | ancient trench       | 259697 | 2921255 | Outcrop | Composite | 5.0-10.0     | granodiorite                           | 3.139    |
| 28281     | Qubbah   | ancient trench       | 259686 | 2921212 | Outcrop | Composite | 0-5.0        | granodiorite                           | 1.788    |
| 28283     | Qubbah   | ancient dump         | 259693 | 2921218 | Dump    | Composite | 10.0x10.0    | quartz and granodiorite                | 1.486    |
| 28286     | Qubbah   | ancient excavation   | 259628 | 2921420 | Outcrop | Composite | 2.5          | greywacke                              | 2.561    |
| 28287     | Qubbah   | ancient excavation   | 259630 | 2921415 | Outcrop | Composite | 2            | greywacke                              | 1.763    |
| 28291     | Qubbah   | ancient excavation   | 259652 | 2921410 | Outcrop | Composite | 0-5.0        | greywacke                              | 1.307    |
| 28293     | Qubbah   | ancient excavation   | 259617 | 2921411 | Outcrop | Composite | 5.0-10.0     | greywacke                              | 1.803    |
| 28294     | Qubbah   | ancient excavation   | 259617 | 2921407 | Outcrop | Composite | 0-5.0        | greywacke                              | 1.311    |
| 28295     | Qubbah   | ancient excavation   | 259615 | 2921402 | Outcrop | Composite | 5.0-10.0     | greywacke                              | 1.060    |
| 28300     | Qubbah   | foot hill            | 259576 | 2921207 | Outcrop | Composite | 0-5.0        | granodiorite                           | 1.581    |
| 28370     | Qubbah   | below hill           | 259682 | 2921049 | Dump    | Composite | 5x5m         | sedimentary rock                       | 1.490    |
| 28371     | Qubbah   | below hill           | 259658 | 2921049 | Dump    | Composite | 5x15m        | sedimentary rock                       | 9.471    |
| 28373     | Qubbah   | below hill           | 259624 | 2921037 | Dump    | Composite | 10x10m       | sedimentary rock                       | 1.625    |
| 28375     | Qubbah   | below hill           | 259623 | 2921006 | Dump    | Composite | 5x10m        | sedimentary rock                       | 1.480    |
| 28376     | Qubbah   | below hill           | 259599 | 2920973 | Dump    | Composite | 5x5m         | sedimentary rock                       | 3.116    |
| 28379     | Qubbah   | below hill           | 259622 | 2920970 | Outcrop | Composite | 5x5m         | sedimentary rock with quartz fragments | 1.973    |
| 28381     | Qubbah   | below hill           | 259602 | 2920939 | Outcrop | Composite | 2x10m        | sedimentary rock with quartz fragments | 3.697    |
| 28387     | Qubbah   | below hill           | 259649 | 2921131 | Dump    | Composite | .10m         | quartz stringers                       | 3.673    |
| 28391     | Qubbah   | north of road        | 259705 | 2921134 | Dump    | Composite | 5x5m         | sedimentary rock with quartz fragments | 2.272    |
| 28401     | Qubbah   | ancient excavation   | 259593 | 2921222 | Outcrop | Composite | 0-5.0        | granodiorite                           | 1.011    |
| 28405     | Qubbah   | ancient excavation   | 259640 | 2921263 | Outcrop | Composite | 5.0-10.0     | granodiorite                           | 1.438    |
| 28409     | Qubbah   | hill side            | 259772 | 2921306 | Outcrop | Composite | 1            | granodiorite                           | 2.093    |
| 28410     | Qubbah   | hill side            | 259532 | 2921278 | Outcrop | Composite | 0.4          | structure with alteration              | 1.244    |
| 28412     | Qubbah   | ancient excavation   | 259808 | 2921380 | Outcrop | Composite | 4.2          | greywacke                              |          |
| 28413     | Qubbah   | hill top             | 259864 | 2921402 | Dump    | Composite | 3.0x5.0      | altered rock                           |          |
| 28445     | Qubbah   | ancient working      | 259654 | 2921262 | Outcrop | Composite | 3x3          | diorite(?)                             |          |
| 28462     | Qubbah   | base of hill         | 259418 | 2921041 | Dump    | Composite | 5x5m         | granodiorite; quartz fragments         |          |
| 28464     | Qubbah   | at hill              | 259765 | 2921427 | Dump    | Composite | 5x10m        | sedimentary rock with quartz fragments |          |
| 28476     | Qubbah   | at ridge             | 259866 | 2921446 | Dump    | Composite | 5x5m         | sedimentary rock                       |          |
| 28482     | Qubbah   | N of ancient village | 259701 | 2921168 | Dump    | Composite | 5x5m         | sedimentary rock with quartz fragments |          |
| 30507     | Qubbah   | ridge                | 259624 | 2921295 | Outcrop | Chip      | 0.8          | aplite dyke                            |          |
| 30509     | Qubbah   | ridge                | 259746 | 2921448 | Outcrop | Chip      | 0.3          | breccia                                |          |
| 30511     | Qubbah   | ridge                | 259617 | 2921439 | Outcrop | Chip      | 0.4          | sedimentary rock                       |          |

**Table 9.4\_2**  
**Qubbah – Significant RC Drilling Intersections**

| Hole ID | Depth (m) | Whole Drillhole Average Au g/t | Significant Intercepts |     |           |        |
|---------|-----------|--------------------------------|------------------------|-----|-----------|--------|
|         |           |                                | From                   | To  | Width (m) | Au g/t |
| QUB-1   | 150       | 0.5                            | 44                     | 47  | 3         | 6.81   |
| QUB-1   |           |                                | 67                     | 71  | 4         | 2.18   |
| QUB-1   |           |                                | 132                    | 136 | 4         | 1.77   |
| QUB-2   | 150       | 0.42                           | 33                     | 37  | 4         | 1.52   |
| QUB-2   |           |                                | 59                     | 60  | 1         | 8.51   |
| QUB-2   |           |                                | 95                     | 96  | 1         | 5.08   |
| QUB-3   | 150       | 0.5                            | 28                     | 30  | 2         | 7.72   |
| QUB-3   |           |                                | 76                     | 78  | 2         | 5.24   |
| QUB-3   |           |                                | 117                    | 121 | 4         | 4.37   |
| QUB-4   | 96        | 0.54                           | 32                     | 35  | 3         | 1.96   |
| QUB-4   |           |                                | 44                     | 45  | 1         | 20.7   |
| QUB-4   |           |                                | 66                     | 68  | 2         | 1.5    |
| QUB-5   | 150       | 0.16                           | 64                     | 65  | 1         | 2.0    |
| QUB-5   |           |                                | 138                    | 141 | 3         | 1.91   |

## 9.5 Coffey Mining Conclusions and Recommendations

The EL contains good exposure of the Qubbah gold prospect where a number of small trenches and pits, typically no wider than a metre, have been dug by ancient miners into NE trending shear zones with sparse quartz veining or quartz stockwork veins. Rock chip sampling and limited RC drilling by PHME returned low to modest gold grades only. The prospect area is almost 100% outcrop and mineralisation appears too narrow and sparsely distributed to offer any significant potential.

## 10 MIYAH EXPLORATION LICENSE

### 10.1 Introduction

The Miyah EL is located in the northern part of Saudi Arabia (Figure 1.1\_1) in Tabuk Province, about 690km NW of Jeddah and contains the Abu Nafilah and An Nahdaman gold prospects. The project topography and extent of outcrop is illustrated in Figure 10.1\_1.

**Figure 10.1\_1**  
**General Topographic View of Project**



(Coffey, 2011)

### 10.2 Mineral Tenure

The location of the Miyah license is shown in Figure 1.1\_1 and details of the tenement schedule are given in Appendix A.

Coffey has not independently validated the licensing details and the present status of tenements, agreements and legislation described in this report is based on information provided by MEMC.

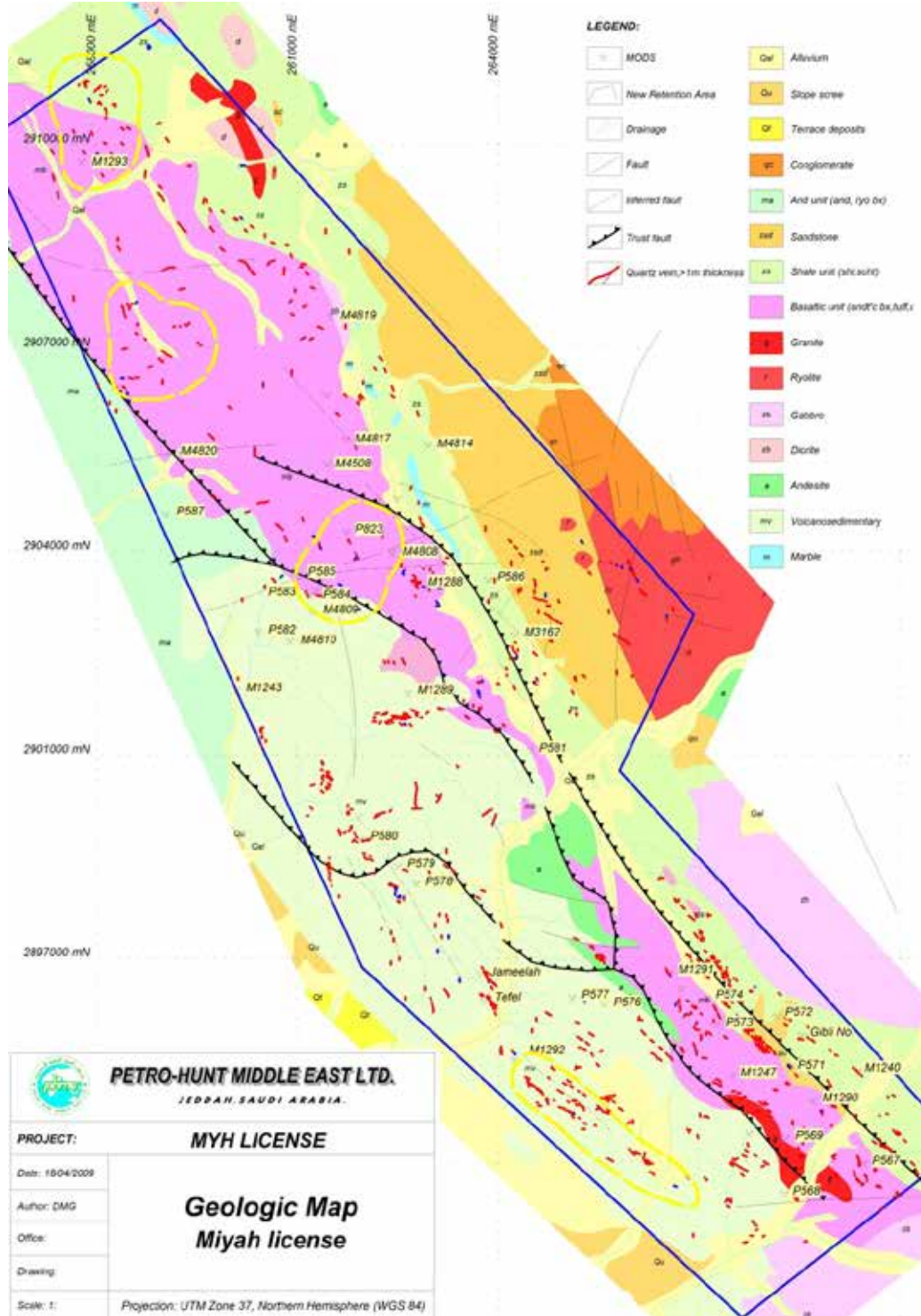
### 10.3 Project Geology and Mineralisation

#### 10.3.1 Geology

The Au-bearing veins of the Al Wajh district are mainly hosted by low-grade metavolcanic and metavolcaniclastic rocks of the Zaam group (>725Ma), which consists of the Miyah and Kibrah formations. In the north, the Miyah formation consists of mafic to felsic tuffs, andesite lavas, volcaniclastic sandstone and conglomerate, and a basal basalt unit (Figure 10.3.1\_1). In the south, the rocks consist of basalts and clastic units comprising volcanic conglomerate, coarse-grained sandstone, and sandstone-siltstone-graded units (LeAnderson et al., 1995).

Observed contacts are mainly strike-slip faults which, combined with overturned folds and a lack of marker horizons, makes stratigraphic relations uncertain. Neoproterozoic porphyry occurs in the southern part of the district, together with small gabbro and diorite intrusions.

**Figure 10.3.1 1**  
**Miyah Project Geology and Mineralisation**



The region has been affected by three deformation events ( $D_1$ - $D_3$ ) that have been interpreted as progressive phases of the main deformation event presumably related to the accretion between the Midyan and Hijaz terranes (700-660Ma). A fourth event ( $D_4$ ) probably correlates with the post-620Ma Najd-type sinistral shearing event. Each episode was associated with quartz veining and mineralisation (LeAnderson et al., 1995). The most pervasive fabric is a widespread, unevenly concentrated, spaced cleavage designated  $S_2$  that forms an axial planar cleavage to  $F_2$  folds.

### 10.3.2 Mineralisation

The license is host to large ancient workings such as those at Umm Al Qurayyat and Umm Huwayweetat, and many Au occurrences related to shear/vein and possibly intrusion-related mineralisation.

The exploration targets license include the Abu Nafilah, Ash Shuwaytah, Tefel, An Nahdyn, Abu Nuthayrah, Jameelah, Gibili, Gibili North, Kawr Al Gibli, Khawr Al Arjah, Khawr Al Arjah North, and Khawr Al Arjah South gold prospects (Figure 10.3.2\_1 and 10.3.2\_3).

#### Abu Nuthayrah (M1291)

The prospect is marked by a linear zone trending NW of generally shallow trenches extending over a strike length of approximately 150m. Mafic rocks occur on the eastern portion of the prospect, with the main shear running along the contact between mafic rocks (mainly basalts) and sedimentary rocks (phyllites) to the west of the main shear. The dominant mineralised shear trends sub-parallel to regional stratigraphy. All known diorites also occur to the west of the main shear.

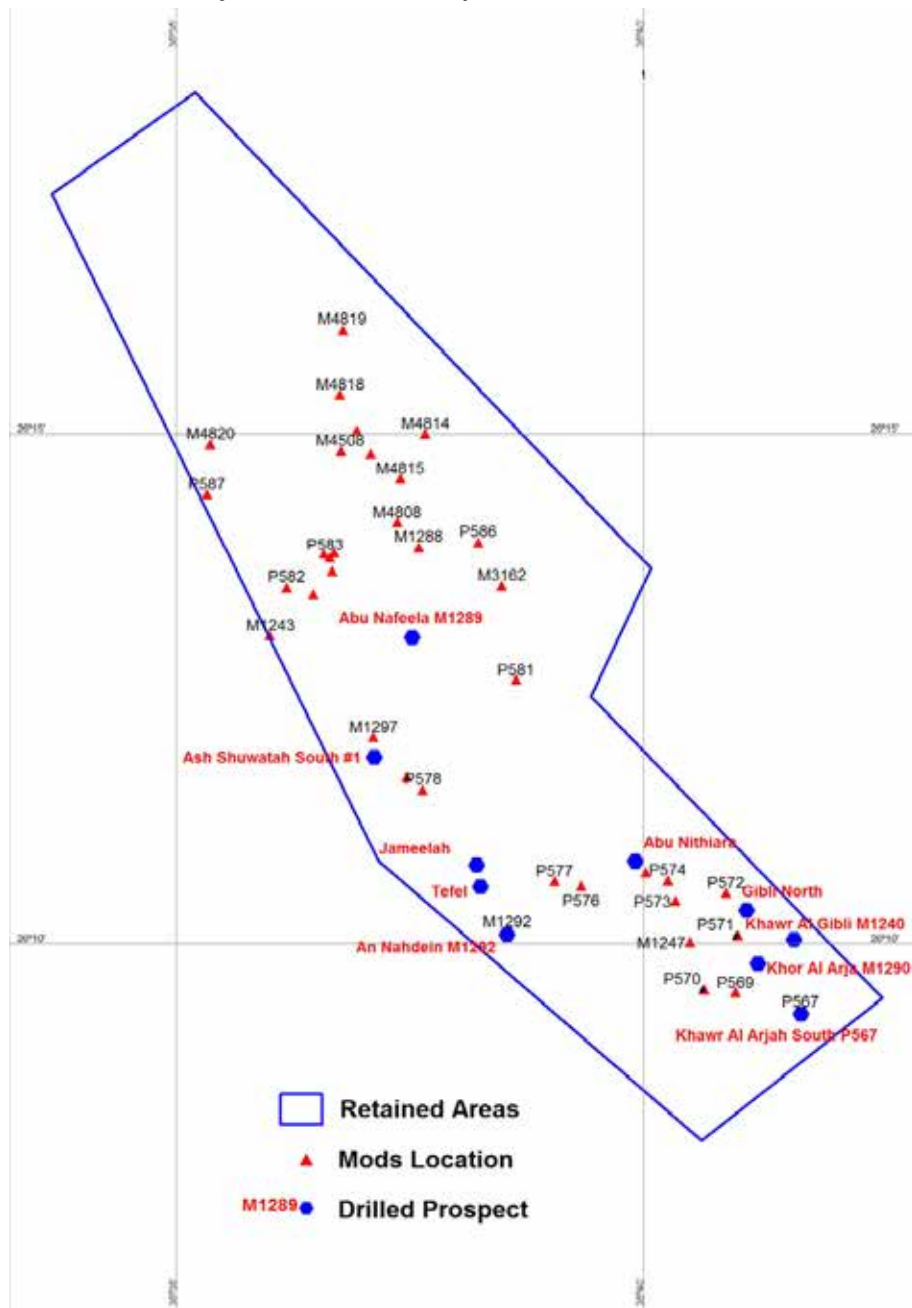
There appears to be at least two different stages of quartz veining, each has a similar NW strike but is distinguished by differences in vein texture and dip orientation. The interpreted earlier veining, probably related to thrusting, comprises broad discontinuous lenses of very coarse-grained bucky quartz, dips to the west and is weakly mineralised. Gold is primarily hosted by subvertical to 65°E-dipping (partially laminated) quartz veins parallel to the strike-slip shear. These veins are sinuous, irregular and exhibit pinch-and-swell along strike.

#### Khawr al Arjah North (M1290)

The prospect is located on the western margin of the Hamaliyah shear to the NW and along strike from the ancient mining centre of Khawr al Arjah. Lithologies include schists, phyllite and a metamorphosed felsic-intermediate intrusive unit which partially occupies the central portion of the prospect.

Ancient workings at the prospect consist of an irregular ~75m long shallow trench which has been excavated along a NW-trending zone of strongly clay-altered, sheared and sericitised rocks; foliation appears to dip steeply east. Sericite alteration pinches out to the immediate north of the prospect, but is still prominent south of the ancient workings. Quartz veining occurs as irregular and discontinuous lenses, generally restricted to the southern portion of the ancient workings.

**Figure 10.3.2\_1**  
**Miyah – Location of Prospects and Ancient Mines**



From PHME 2011

#### Khawr al Gibli North

The Khawr al Gibli North prospect is centred on the Hamaliyah shear, which trends parallel (NW) to stratigraphy and is hosted within phyllitic (locally grading to schistose) metasedimentary rocks. This prospect lies on the same structure which hosts mineralisation at Khawr al Gibli, 800m to the southeast.

The prospect contains an 80m WNW-trending zone of anatomising coarse-grained subvertical quartz veins with widths to >2m. A series of very shallow ancient workings strikes N-S from the margins of the zone of quartz veining. Only minor hydrothermal alteration was noted at the prospect.

#### Khawr al Gibli

The Khawr al Gibli prospect is centred on the Hamaliyah shear, which trends parallel (NW) to stratigraphy and is hosted within phyllitic (locally grading to schistose) metasedimentary rocks. The prospect is defined by a NW-trending zone of generally small-scale ancient workings over approximately 200m strike. In situ quartz veining was only observed in the northern portion of the prospect; sampling of this single narrow, irregular and discontinuous vein (strike length ~40m) returned only anomalous gold results.

Hydrothermal alteration, predominately sericite, is restricted to the southern end of the prospect and was only observed on waste dump material from ancient excavations. Sampling of this dump material returned values of up to 7.57g/t Au.

#### Khawr al Arjah South

The prospect comprises a 120m long, NNW-trending zone of ancient workings which generally consists of shallow trenches, but with two deeper <4m excavations in the northern and southern portions of the prospect. Sporadic shallow trenches extend a further >150m to the south, whereas to the north, the mineralised structure probably extends across Wadi Arah and links through to the Khawr al Arjah, 1.2km to the northwest.

Lithologies include schists, basalt, metasedimentary rocks (phyllite), and felsic to intermediate intrusive units. The geology is relatively complex as the area has undergone more than one episode of deformation and alteration. The dominant structural feature is a NNW-trending, steeply (60-90°) east-dipping shear zone. Hydrothermal alteration includes chlorite, sericite, and carbonate visible along vein selvages and zones of more intense shearing.

#### An Nahdayn

Ancient workings consist of two subvertical shafts 1-2m across and up to 5m deep, a stope about 20 x 5m in area and 5m deep and minor excavations on and around a discontinuous quartz vein (Figure 10.3.2\_4). The shafts were dug on the main vein and an isolated quartz boudin. A variety of lithologies occurs, including schists, basalt, metasedimentary rocks and felsic-intermediate intrusive rocks. Broad zones of orange-weathering carbonate and patchy shear-hosted sericitic alteration locally overprint these units.

The main vein system strikes approximately NE, an unusual trend in the district apart from a few exceptions, such as Abu Nafilah and partially at Ash Shuwatah. Most mineralised structures trend NW sub-parallel to the regional stratigraphy.

#### Jameelah

The Jameelah prospect is located along the slope of a relatively steep hill. The prospect is based around two prominent quartz veins trending NNW, sub-parallel to stratigraphy. There are also lesser zones of stockworks and smaller-scale quartz veining.

The upper-slope (western) and larger vein, which is approximately 350m long, pinches and swells along strike to 4m in width. It generally strikes 340° and dips subvertically west to vertically. The vein is generally concordant with the contact between a hangingwall metavolcanic (meta-andesite tuff) unit and footwall metasedimentary rocks (quartz-sericite schists) which contain some goethite replacing euhedral pyrite cubes.

The lower vein, which is hosted by metasedimentary rocks, trends sub-parallel to foliation/bedding and dips 40-55°E. From limited exposures, the area covered by quartz talus between the two larger veins hosts a (semi linear) complex of smaller veins and stockwork zones.

Quartz veins are generally milky white strongly fractured and contain variable amounts of Fe oxide staining. At least two stages of quartz veining can be observed in some exposures. The later-stage (smaller) veins commonly contain coarse-grained pyrite cubes, similar to those visible in the upper vein footwall metasedimentary rocks.

### Tefel

The Tefel prospect is characterised by at least 16 separate sub-parallel major quartz veins and lenses within a broad NW-trending zone 300m wide and 80m wide. The veins range in width to 10m, with strike lengths less than 100m. The veins are hosted in quartz-sericite schists and are generally concordant with local foliation and stratigraphy. Cross-cutting small-scale extensional veins have also been observed.

### Ash Shuwaytah

Shallow ancient workings at Ash Shuwaytah occur along a 250m-long NW-trending zone of discontinuous quartz veins and stockwork lodes hosted in thinly-bedded volcanoclastic sandstone and minor dykes of the Miyah formation. The veins dip to the NE at 40-50°. Individual quartz vein segments range up to 45m in length and pinch-and-swell in thickness from 10cm to 160cm; at other locations, the veining is discontinuous and/or boudinaged. Wall rocks have been intensely sheared and altered to clay, with hydrothermal alteration minerals including sericite and carbonate.

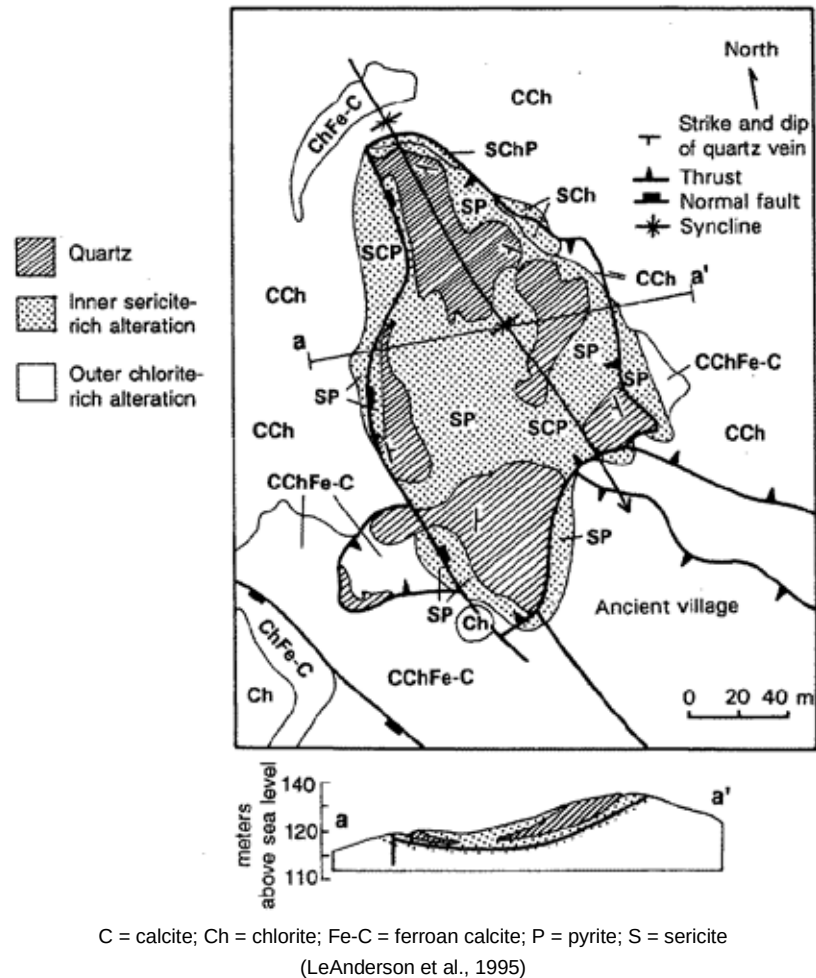
Rock chip and grab sampling at the prospect by the Japanese Geological Mission in the 1960s (150 samples) averaged 0.48g/t Au. Nine samples were subsequently collected by the USGS in 1992 and showed erratic gold results ranging up to 22g/t Au, with an average value of 3.26g/t Au.

### Umm Al Qurayyat (M1288)

Umm Al Qurayyat prospect is located in the central part of the main Al Wajh gold district around ancient mining excavations and is a historical archaeological site.

The host rock to the quartz vein mineralisation is massive and pillowed lava flows, ranging in composition from dacite to basaltic andesite, of the basalt unit of the Miyah formation. The workings consist of shallow declines down the dip and along the footwall of sheeted quartz veins (LeAnderson et al., 1995). The sheeted zones occur in the hangingwall of a thrust and are spatially associated with an inner zone of red-weathering pyrite-sericite alteration and an outer zone of orange-weathering carbonate-chlorite alteration (Figure 10.3.2\_2).

Figure 10.3.2 2  
Umm Al Qurayyat - Simplified Structural and Alteration Map showing Location of Quartz Veins



Chlorite- and ferroan calcite-altered rocks that host small scattered quartz, albite and ferroan calcite veins within the carbonate-chlorite alteration zone structurally underlie the thrust. A N-striking down-to-the-east normal fault forms part of the western boundary of the deposit. The principal veins of the deposit make up about five stacked, shallowly- to moderately-dipping, sub-parallel zones of sheeted quartz (stage II veins) folded into a SSE-plunging syncline separated by sparsely veined sericitic rock. Bodies of quartz range in size from small isolated pods about 30cm in diameter to sheeted zones up to 70m long, 50m wide and 10m to 15m thick, although a thickness of 1m to 3m is the most common. The veins pinch and swell, anastomose, form boudins, and commonly bifurcate towards their ends or grade laterally into stockworks. They commonly terminate abruptly. The depth extension of the sheeted veins is unknown, but the 8m depth limit of the old workings is their probable depth limit (LeAnderson et al., 1995). The relative chronology of veins is shown in Table 10.3\_1.

The general conclusion in the literature is that there is little potential for additional mineralisation, as the outcropping vein material is merely an erosional remnant. However, alteration has been noted along the thrust fault south of the ancient mines and there is the possibility of additional mineralisation at other locations along the thrust.

**Table 10.3\_1**  
**Umm Al Qurayyat - Relative Correlation of Veins**

| <b>Veins Hosted by Country Rocks</b>                  | <b>Veins Hosted by Stage II Quartz Veins</b>              |
|-------------------------------------------------------|-----------------------------------------------------------|
| Deformation episode D <sub>4</sub> (>620Ma)           | Stage VI – Euhedral quartz                                |
| Deformation episode late D <sub>3</sub>               | Stage V – White calcite-sericite-pyrite                   |
| Stage V – White calcite                               | Stage IV – Chlorite ± ferroan calcite                     |
| Stage IV – Chlorite + ferroan calcite                 | Stage IVB – Quartz ± sericite                             |
| Stage IVA – Albite                                    | Stage IVC – Sericite ± calcite                            |
| Stage III Ferroan calcite ± albite ± pyrite ± calcite | Stage III – Ferroan calcite ± sericite ± pyrite ± calcite |
| Stage IIIA – Quartz ± ferroan calcite ± calcite       |                                                           |
| Stage IIIB – Quartz ± sericite ± ferroan calcite      |                                                           |
| Deformation episode D <sub>3</sub> (~660Ma)           |                                                           |
| Stage II – Quartz ± gold                              |                                                           |
| Deformation episode ?D <sub>2</sub>                   |                                                           |
| Stage I - Albite                                      |                                                           |

(LeAnderson et al., 1995)

**Figure 10.3.2\_3**  
**Abu Nafilah – Carbonate + Silica Alteration Zone at Margin of Quartz Vein**



Abu Nafilah, waypoint ANF3 (Coffey, 2011)

Reconnaissance examination of the prospect by PHME showed that hydrothermal alteration was relatively widespread and extends to the south, east and north of the ancient mine area. Rock sampling and mapping of the area confirmed this. Rock chip sampling at Qurayyat prospect resulted in a number of significant gold assay values of >1.0g/t Au, with a maximum value of over 27.0g/t Au. The rock sample data also show anomalous As values over the entire sampled area of 0.4km<sup>2</sup>. The data suggest the possibility of a much larger mineralised system which is exposed intermittently beneath unaltered metavolcanic rocks.

**Figure 10.3.2\_4**  
**Ah Nahdayn – Mineralisation**



Ah Nahdayn, Waypoint AN7, old workings; Quartz veinlets in deformed and altered schist at junction of two vein Trends. Two sets of cleavages present, one dipping 80° to 050°, the other dipping 48° to 090° (Coffey, 2011)

## 10.4 Exploration History

The area was investigated by the Saudi Arabian Mining Syndicate (SAMS) in the 1930s carrying out sampling mapping and drilling (including 7 diamond drillholes at Umm Al Qurayyat).

The USGS mapped the Al Wajh Quadrangle at 1:500,000 scale (Brown et al., 1963). The USGS also carried out detailed stream sediment sampling of second to third order tributaries encompassing the license. Three sediment size fractions were collected at each sampling site: -80 mesh, -200 mesh and a heavy mineral concentrate.

In 1965, the Japanese Geological Mission produced a 1:50 000 geological map over part of the Al Wajh Quadrangle. From November 1972 to March 1973, BRGM conducted 1:100,000 geological mapping, accompanied by mineral exploration.

The DMMR and the USGS carried out detailed sampling and mapping in the late 1980s and early 1990s. Riofinex completed a study in 1981.

Between February 2005 and February 2007, PHME conducted several campaigns of field work including reconnaissance prospecting (with some mapping), rock chip sampling (2,838 samples), trenching at selected locations, and also 112 RC (for 6,534m) and four diamond drillholes (for 556.6m) at twelve prospects.

Abu Nathayrah

Exploration by PHME includes mapping, rock chip sampling, an RC drilling program (8 holes for 518m), and one diamond drillhole (for 128.35m). Better intersections are shown in Table 10.4\_1.

| Table 10.4_1<br>Abu Nathayrah – Significant Drilling Results |          |        |           |        |             |
|--------------------------------------------------------------|----------|--------|-----------|--------|-------------|
| DH ID                                                        | Depth    |        | Width (m) | Au g/t | Sample Type |
|                                                              | From (m) | To (m) |           |        |             |
| ABN-03                                                       | 18       | 19     | 1         | 2.61   | DH-RC       |
| ABN-03                                                       | 19       | 20     | 1         | 2.24   | DH-RC       |
| ABN-04                                                       | 14       | 15     | 1         | 1.26   | DH-RC       |
| ABN-04                                                       | 24       | 25     | 1         | 2.02   | DH-RC       |
| ABN-04                                                       | 25       | 26     | 1         | 12.45  | DH-RC       |
| ABN-04                                                       | 26       | 27     | 1         | 5.66   | DH-RC       |
| ABN-04                                                       | 28       | 29     | 1         | 1.03   | DH-RC       |
| ABN-04                                                       | 33       | 34     | 1         | 1.91   | DH-RC       |
| ABN-05                                                       | 19       | 20     | 1         | 1.06   | DH-RC       |
| ABN-05                                                       | 20       | 21     | 1         | 1.32   | DH-RC       |
| ABN-05                                                       | 25       | 26     | 1         | 5.78   | DH-RC       |
| ABN-05                                                       | 30       | 31     | 1         | 1.07   | DH-RC       |

The results confirmed the continuity of the mineralisation immediately below the central zone of ancient workings (Figure 10.4\_1). In addition, secondary zones of shearing and quartz veining were also seen in both hangingwall and footwall structures, although unlikely to provide an economic target. Overall, the drilling results reflect the surface geology, i.e., the lack of veining and hydrothermal alteration, suggesting that Abu Nuthayrah only potentially hosts a small-scale resource.

Khawr Al Arjah North

Exploration by PHME includes mapping, rock chip sampling and RC drilling (3 holes for 190m). Assay results from the drilling are shown in Figure 10.4\_2 and Table 10.4\_2, with only one significant intercept, despite relatively broad surface zones of clay and sericite alteration but only limited quartz veining (<5%). The prospect has effectively been downgraded as a potential host of economic mineralisation pending further evaluation.

Khawr Al Gibli North

Exploration by PHME included mapping, rock chip sampling and RC drilling (5 holes for 325m). The drillholes were designed to mineralisation below outcropping quartz veins and shallow ancient workings. No significant Au results were returned. No quartz veining was seen in the drilling, despite the broad zones of quartz veining visible on the surface. No further work is recommended at this prospect.

Figure 10.4\_1  
Abu Nathayrah – Plan View of Drillholes with Assays

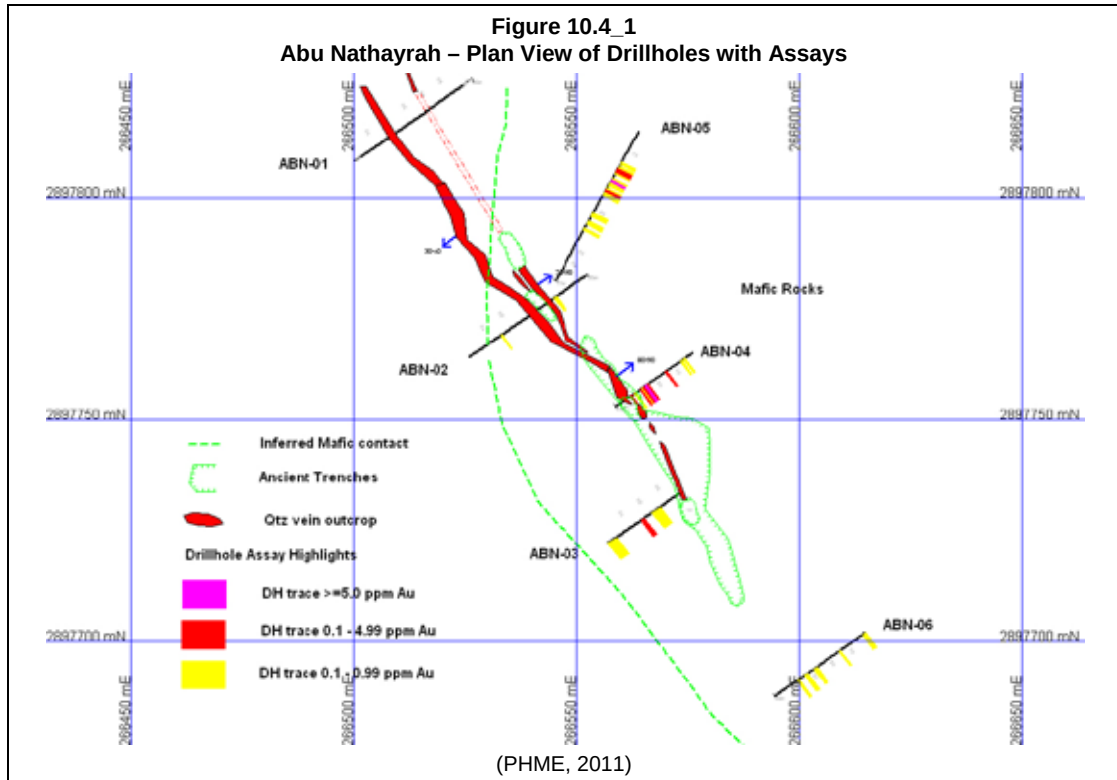


Figure 10.4\_2  
Khawr Al Arjah North – Plan View of Drillholes with Assays

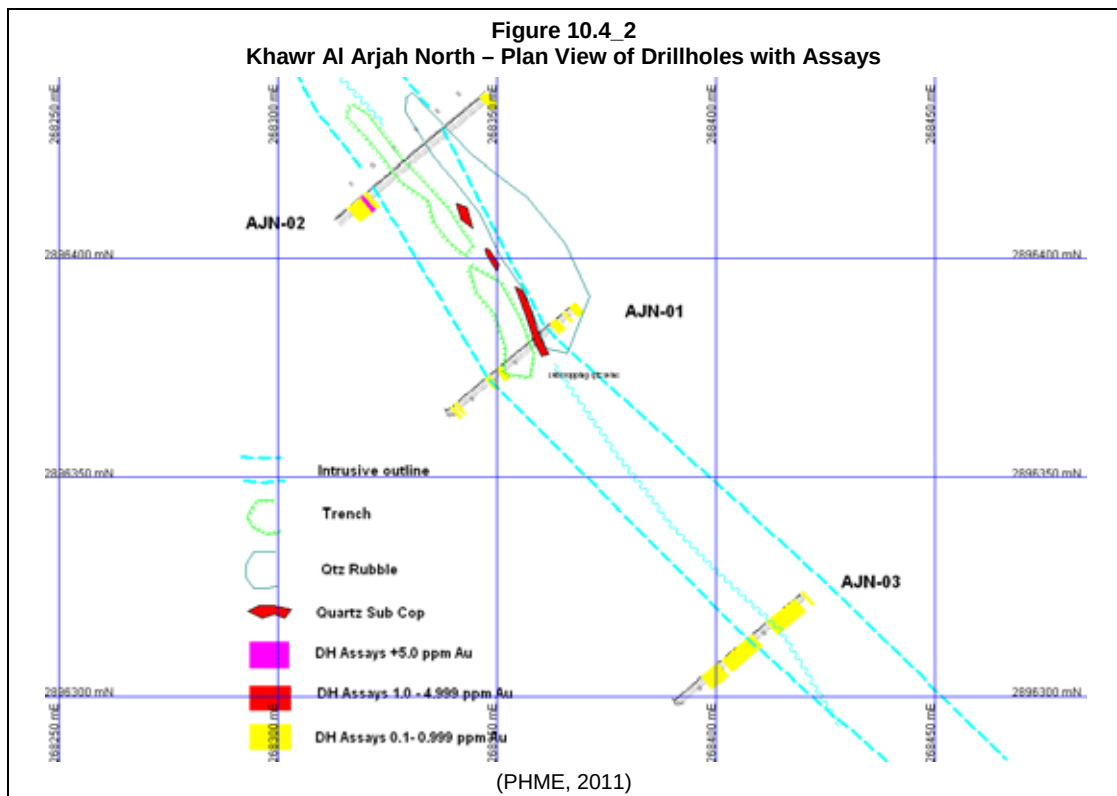


**Table 10.4. 2**  
**Khawr Al Arjah North - Significant Drilling Results**

| DH ID  | Depth                  |        | Width (m) | Au (g/t) | Sample Type            |
|--------|------------------------|--------|-----------|----------|------------------------|
|        | From (m)               | To (m) |           |          |                        |
| AJN-01 | No significant results |        |           | AJN-01   | No significant results |
| AJN-02 | 12                     | 13     | 1         | 6.801    | RC                     |
| AJN-03 | No significant results |        |           | AJN-03   | No significant results |

#### Khawr Al Gibli

Exploration by PHME includes one trench (270m), two lines of post-hole drilling and RC drilling (13 holes for 495m) the Hamaliyah shear between the Khawr al Arjah and Khawr al Gibli prospects. Assay results from the trenching and drilling show only a single result >1g/t Au from drillhole GBJPH-09: 1m @ 1.95g/t Au (24-25m).

#### Khawr Al Gibli South

Exploration by PHME includes mapping, rock chip sampling and RC drilling (6 holes for 371m). The drilling was designed to test below outcropping quartz veining and ancient trenching. No significant Au results were returned. No further work is recommended.

#### Khawr Al Arjah South

Exploration by PHME includes geological mapping, rock chip sampling and RC drilling (4 holes for 231m). The drilling was primarily designed to test below the ancient workings and for potential strike extensions to the south. The most significant hole (Table 10.4.3) as AJS-03, which returned 6m @ 2.87g/t Au (9m to 15m), which included 1m @ 5.18g/t Au (12m to 13m), and 2m @ 1.24g/t Au (31m to 33m).

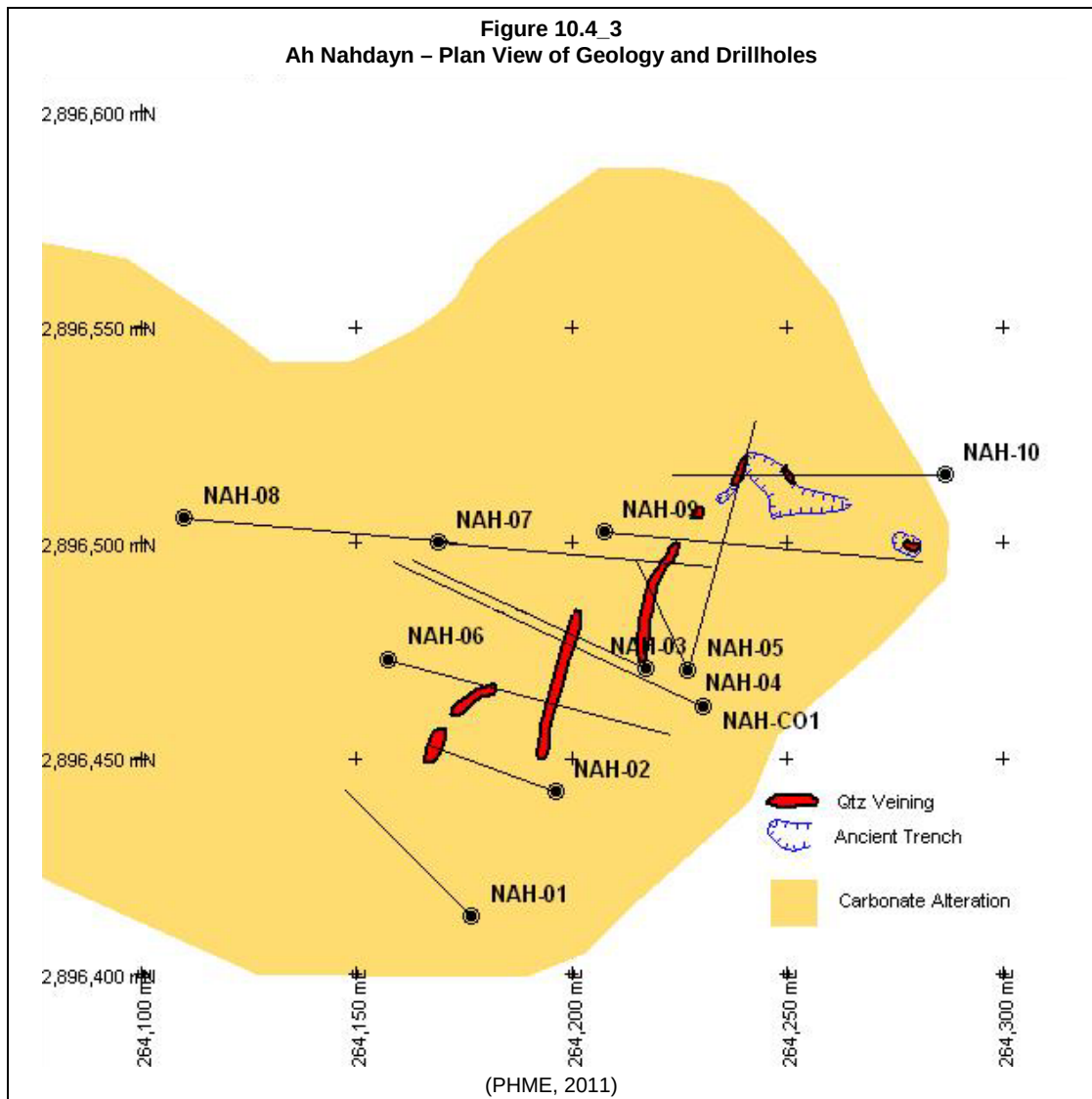
**Table 10.4. 3**  
**Khawr Al Arjah South - Significant Drilling Results**

| DH ID  | Depth    |        | Width (m) | Au (g/t) | Sample Type |
|--------|----------|--------|-----------|----------|-------------|
|        | From (m) | To (m) |           |          |             |
| AJS-02 | 1        | 2      | 1         | 1.121    | RC          |
| AJS-03 | 9        | 10     | 1         | 4.361    | RC          |
| AJS-03 | 10       | 11     | 1         | 4.184    | RC          |
| AJS-03 | 12       | 13     | 1         | 5.179    | RC          |
| AJS-03 | 13       | 14     | 1         | 1.041    | RC          |
| AJS-03 | 14       | 15     | 1         | 1.796    | RC          |
| AJS-03 | 31       | 32     | 1         | 1.106    | RC          |
| AJS-03 | 32       | 33     | 1         | 1.374    | RC          |
| AJS-03 | 42       | 43     | 1         | 2.988    | RC          |

Potentially economic grades (and widths) of mineralisation were not seen in the drilling. The prospect, however, exhibits some broad zones of alteration which contain anomalous Au and, although not a high priority, further drilling and evaluation of this prospect is recommended.

### Ah Nahdayn

PHME collected 11 rock chip and grab samples; results included a maximum value of 4.98g/t Au. Ten RC holes (for 786m) and one diamond drillhole (for 113.1m) were drilled (Figure 10.4\_3) to test along the exposed strike length of the main vein and below ancient workings.



Anomalous assay results from the drilling were returned from several holes (Table 10.4\_4), within broad zones of strong alteration (carbonate- sericite-quartz).

The veining is discontinuous but appears to be part of a larger S-folded and boudinaged vein system. As the main vein appears to pinch out along), there appears limited strike potential for this deposit. However, given the structural complexity of this area, the prominent level of hydrothermal alteration seen and encouraging assay results from both the drilling and surface sampling, additional drilling and mapping are recommended.

**Table 10.4\_4**  
**Ah Nahdayn – Significant Drilling Results**

| <b>DH ID</b> | <b>From<br/>(m)</b> | <b>To<br/>(m)</b> | <b>Width<br/>(m)</b> | <b>Au<br/>(g/t)</b> |
|--------------|---------------------|-------------------|----------------------|---------------------|
| NAH-02       | 10.0                | 11.0              | 1.0                  | 1.197               |
| NAH-02       | 20.0                | 21.0              | 1.0                  | 3.742               |
| NAH-02       | 21.0                | 22.0              | 1.0                  | 1.358               |
| NAH-02       | 22.0                | 23.0              | 1.0                  | 1.286               |
| NAH-02       | 23.0                | 24.0              | 1.0                  | 2.017               |
| NAH-02       | 24.0                | 25.0              | 1.0                  | 1.519               |
| NAH-03       | 12.0                | 13.0              | 1.0                  | 1.650               |
| NAH-03       | 15.0                | 16.0              | 1.0                  | 1.614               |
| NAH-03       | 17.0                | 18.0              | 1.0                  | 1.2                 |
| NAH-03       | 18.0                | 19.0              | 1.0                  | 1.131               |
| NAH-03       | 28.0                | 29.0              | 1.0                  | 1.108               |
| NAH-03       | 29.0                | 30.0              | 1.0                  | 1.319               |
| NAH-03       | 30.0                | 31.0              | 1.0                  | 1.378               |
| NAH-03       | 33.0                | 34.0              | 1.0                  | 1.498               |
| NAH-03       | 37.0                | 38.0              | 1.0                  | 1.147               |
| NAH-03       | 38.0                | 39.0              | 1.0                  | 1.035               |
| NAH-03       | 40.0                | 41.0              | 1.0                  | 2.156               |
| NAH-03       | 42.0                | 43.0              | 1.0                  | 1.45                |
| NAH-03       | 43.0                | 44.0              | 1.0                  | 3.087               |
| NAH-03       | 44.0                | 45.0              | 1.0                  | 1.541               |
| NAH-03       | 45.0                | 46.0              | 1.0                  | 2.023               |
| NAH-03       | 46.0                | 47.0              | 1.0                  | 1.957               |
| NAH-03       | 48.0                | 49.0              | 1.0                  | 1.507               |
| NAH-03       | 49.0                | 50.0              | 1.0                  | 3.808               |
| NAH-03       | 50.0                | 51.0              | 1.0                  | 9.196               |
| NAH-03       | 61.0                | 62.0              | 1.0                  | 1.022               |
| NAH-03       | 67.0                | 68.0              | 1.0                  | 1.259               |
| NAH-03       | 68.0                | 69.0              | 1.0                  | 15.109              |
| NAH-03       | 69.0                | 70.0              | 1.0                  | 1.839               |
| NAH-03       | 70.0                | 71.0              | 1.0                  | 20.299              |
| NAH-04       | 17.0                | 18.0              | 1.0                  | 1.959               |
| NAH-04       | 21.0                | 22.0              | 1.0                  | 1.383               |
| NAH-04       | 29.0                | 30.0              | 1.0                  | 3.325               |
| NAH-04       | 30.0                | 31.0              | 1.0                  | 7.5                 |
| NAH-04       | 31.0                | 32.0              | 1.0                  | 2.441               |
| NAH-04       | 32.0                | 33.0              | 1.0                  | 2.171               |
| NAH-04       | 33.0                | 34.0              | 1.0                  | 1.108               |
| NAH-04       | 34.0                | 35.0              | 1.0                  | 1.349               |
| NAH-05       | 29.0                | 30.0              | 29.0                 | 1.245               |
| NAH-05       | 30.0                | 31.0              | 30.0                 | 1.143               |
| NAH-05       | 33.0                | 34.0              | 33.0                 | 4.522               |
| NAH-05       | 37.0                | 38.0              | 37.0                 | 1.098               |
| NAH-05       | 38.0                | 39.0              | 38.0                 | 2.532               |
| NAH-05       | 39.0                | 40.0              | 39.0                 | 2.277               |
| NAH-05       | 46.0                | 47.0              | 1.0                  | 2.15                |
| NAH-05       | 58.0                | 59.0              | 1.0                  | 1.273               |

### Jameelah

PHME collected and analysed for gold a total of 47 rock chip and grab samples from the Jameelah prospect, results included a maximum value of 2.26g/t Au and an overall average value of 0.27g/t Au. Five RC holes (for 450m) were drilled to test the upper, lower and stockwork vein lodes along the length of the exposed vein system.

The most significant assay results are from hole JAM-01 (Table 10.4\_5) which contained some fairly wide zones of anomalous >0.1g/t Au, including 5m @ 1.32g/t from 45m to 50m. Results from drillholes JAM-02 to JAM-05 were generally disappointing, effectively downgrading the potential of southern portion of the prospect.

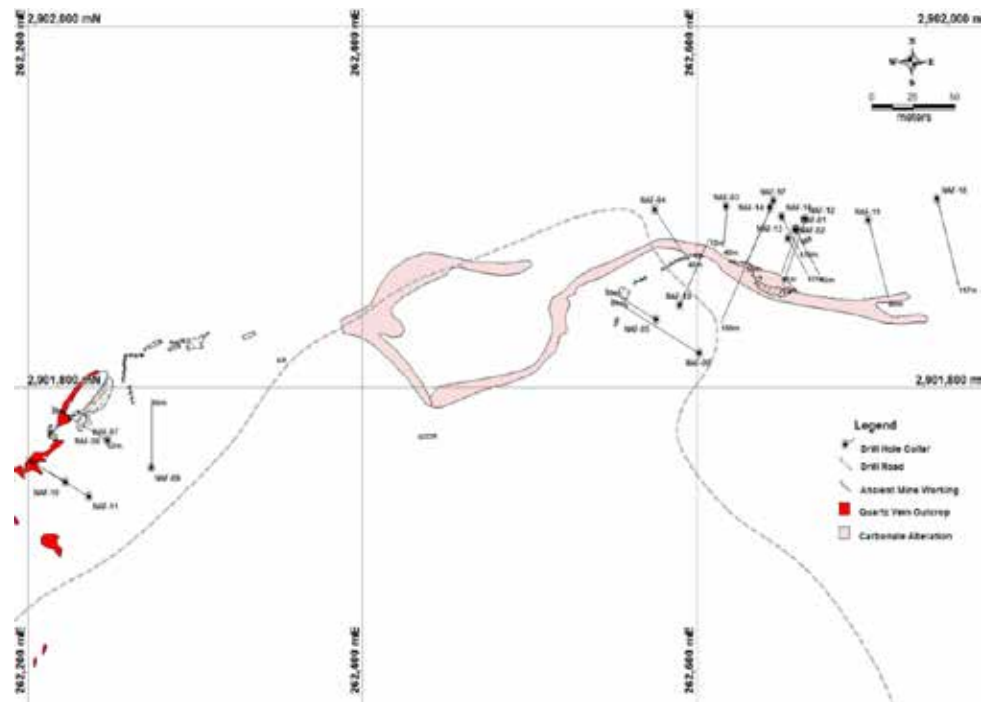
| Table 10.4_5<br>Jameelah – Significant Drillhole Intersections |          |        |           |          |
|----------------------------------------------------------------|----------|--------|-----------|----------|
| DH ID                                                          | From (m) | To (m) | Width (m) | Au (g/t) |
| JAM-01                                                         | 14.0     | 15.0   | 1.0       | 1.693    |
| JAM-01                                                         | 45.0     | 46.0   | 1.0       | 1.786    |
| JAM-01                                                         | 46.0     | 47.0   | 1.0       | 0.479    |
| JAM-01                                                         | 47.0     | 48.0   | 1.0       | 2.2      |
| JAM-01                                                         | 48.0     | 49.0   | 1.0       | 1.084    |
| JAM-01                                                         | 49.0     | 50.0   | 1.0       | 1.052    |
| JAM-01                                                         | 53.0     | 54.0   | 1.0       | 1.739    |
| JAM-01                                                         | 55.0     | 56.0   | 1.0       | 1.87     |
| JAM-01                                                         | 59.0     | 60.0   | 1.0       | 1.12     |
| JAM-01                                                         | 60.0     | 61.0   | 1.0       | 1.316    |
| JAM-02                                                         | 15.0     | 16.0   | 1.0       | 1.418    |
| JAM-03                                                         | 15.0     | 16.0   | 1.0       | 1.052    |
| JAM-04                                                         | 13.0     | 14.0   | 1.0       | 1.443    |
| JAM-04                                                         | 14.0     | 15.0   | 1.0       | 2.707    |
| JAM-05                                                         | 6.0      | 7.0    | 1.0       | 1.478    |
| JAM-05                                                         | 9.0      | 10.0   | 1.0       | 1.234    |

Given JAM-01's location at the far northern end of the prospect, any future work (including drilling) should focus on potential northern extensions of the system. Overall, however, the potential of this prospect has been downgraded.

### Abu Nafilah

Exploration by PHME included mapping, rock chip sampling and RC drilling (19 holes for 1329m). The best drilling intercepts are from the eastern zone (Figure 10.4\_4; Table 10.4\_6). Although the vein system at Abu Nafilah prospect (Figure 10.3.2\_3) returned some very significant assay results, the current extent of drilling is insufficient to determine whether there is a mineable Au resource. Further definition drilling is required to test the lateral extent of the vein systems. It also appears that the mineralised vein system will most likely taper off at depth (possibly <100m depth from surface). However, due to the significant, albeit erratic, Au grades returned at depth further drill testing at depth is warranted.

**Figure 10.4\_4**  
**Abu Nafilah - Drillhole Location Map**



(PHME, 2011)

**Table 10.4\_6**  
**Abu Nafilah – Significant Drilling Results**

| Hole-ID | From | To | Interval width (m) | Au (g/t) |
|---------|------|----|--------------------|----------|
| NAF-02  | 33   | 40 | 7                  | 6.82     |
| NAF-10  | 0    | 3  | 3                  | 4.29     |
| NAF-12  | 45   | 50 | 5                  | 2.16     |
| NAF-12  | 73   | 78 | 5                  | 2.78     |
| NAF-13  | 61   | 73 | 12                 | 3.18     |
| NAF-14  | 43   | 53 | 10                 | 1.45     |
| NAF-16  | 86   | 92 | 6                  | 8.1      |
| NAF-18  | 51   | 59 | 8                  | 3.39     |
| NAF-19  | 37   | 41 | 4                  | 10.65    |

The apparent lack of rock chip sampling of the surface outcrops along the veins should be corrected, with shallow cross trenches to expose the lateral extent of the vein system, particularly to the east.

#### Tefel

PHME collected and analysed for gold 61 rock chip and grab samples from the Tefel prospect; results included a maximum value of 44.35g/t Au and an overall average value of 1.39g/t Au. Eight RC holes (for 435m) were drilled at the Tefel prospect (Table 10.4\_7). The preliminary first-pass program of six RC holes targeted the main body of quartz veining, with an additional two holes being completed on a less significant vein zone immediately to the north.

Results from the drilling indicate a broad zone of mineralisation in several holes (TEF-01 to TEF-03). More significant mineralisation occurs on the western side of the vein system, closely associated with the most prominent lens of quartz veining. Gold is hosted by both veins and sheared host rock vein margins. The dip of these lodes is difficult to determine from the current drilling.

Drillhole TEF 06, located at the northern end of the prospect, despite quartz veining appearing to pinch out, returned anomalous results, suggesting that the mineralised system may still be open to the north. Additional drilling is recommended to test northern and southern extensions of the deposit, in particular the mineralisation at depth in the TEF-01-TEF-03 area.

**Table 10.4\_7**  
**Tefel – Significant Drilling Results**

| DH ID  | Depth    |        | Width (m) | Au (g/t) |
|--------|----------|--------|-----------|----------|
|        | From (m) | To (m) |           |          |
| TEF-01 | 3        | 4      | 1         | 1.077    |
| TEF-01 | 5        | 6      | 1         | 1.786    |
| TEF-01 | 11       | 12     | 1         | 1.418    |
| TEF-01 | 19       | 20     | 1         | 2.369    |
| TEF-01 | 20       | 21     | 1         | 2.932    |
| TEF-01 | 21       | 22     | 1         | 1.187    |
| TEF-02 | 5        | 6      | 1         | 2.204    |
| TEF-02 | 6        | 7      | 1         | 1.041    |
| TEF-02 | 7        | 8      | 1         | 1.526    |
| TEF-02 | 8        | 9      | 1         | 2.522    |
| TEF-02 | 13       | 14     | 1         | 1.095    |
| TEF-02 | 19       | 20     | 1         | 1.261    |
| TEF-02 | 22       | 23     | 1         | 1.504    |
| TEF-02 | 23       | 24     | 1         | 1.433    |
| TEF-02 | 41       | 42     | 1         | 3.844    |
| TEF-03 | 3        | 4      | 1         | 3.885    |
| TEF-03 | 4        | 5      | 1         | 10.026   |
| TEF-03 | 8        | 9      | 1         | 2.401    |
| TEF-03 | 11       | 12     | 1         | 1.992    |
| TEF-03 | 12       | 13     | 1         | 3.784    |
| TEF-03 | 13       | 14     | 1         | 2.339    |
| TEF-03 | 16       | 17     | 1         | 1.024    |
| TEF-03 | 18       | 19     | 1         | 3.391    |
| TEF-06 | 21       | 22     | 1         | 1.139    |
| TEF-06 | 22       | 23     | 1         | 1.343    |
| TEF-06 | 27       | 28     | 1         | 1.076    |
| TEF-06 | 28       | 29     | 1         | 0.805    |

#### Ash Shuwaytah

Exploration by PHME consisted of trenching (120m), RC drilling (16 holes for 840m), together with further reconnaissance work, geological mapping and rock chip sampling. First-pass RC drilling (was designed to test the potential for a shallow open pit resource, centred on the historical Ash Shuwaytah workings (Figure 10.4\_5).

The drilling confirmed both the pinch and swell nature of the dominant vein sets and the presence of discontinuous stockwork zones, primarily hosted in hangingwall rocks. Overall, the veining orientation appears to conform with the interpreted geometry of the Shuwaytah thrust zone. Volcaniclastic metasedimentary host rocks have been moderately to intensely sheared and altered (sericite and carbonate). However, the drilling showed that the widths of the vein and alteration zone decreased rapidly down to 1m or less down dip from the outcrops.

None of the 21 rock samples collected from the trenches assayed >1g/t Au. The highest Au value was 0.91g/t from Trench 4. Eight intervals from seven drillholes assayed >1g/t Au. The best intercept was 2m @ 2.78g/t Au in SHU-13 (Table 10.4\_8).

| <b>Table 10.4_8</b><br><b>Ash Shuwaytah - Significant Drilling Results</b> |          |        |           |          |
|----------------------------------------------------------------------------|----------|--------|-----------|----------|
| DH ID                                                                      | Depth    |        | Width (m) | Au (g/t) |
|                                                                            | From (m) | To (m) |           |          |
| SHU – 2                                                                    | 62       | 63     | 1         | 1.123    |
| SHU – 4                                                                    | 10       | 11     | 1         | 2.297    |
| SHU – 4                                                                    | 22       | 23     | 1         | 1.241    |
| SHU – 5                                                                    | 33       | 34     | 1         | 1.659    |
| SHU – 9                                                                    | 24       | 25     | 1         | 1.19     |
| SHU – 10                                                                   | 17       | 19     | 2         | 1.767    |
| SHU – 13                                                                   | 21       | 23     | 2         | 2.785    |
| SHU – 15                                                                   | 23       | 24     | 1         | 1.246    |

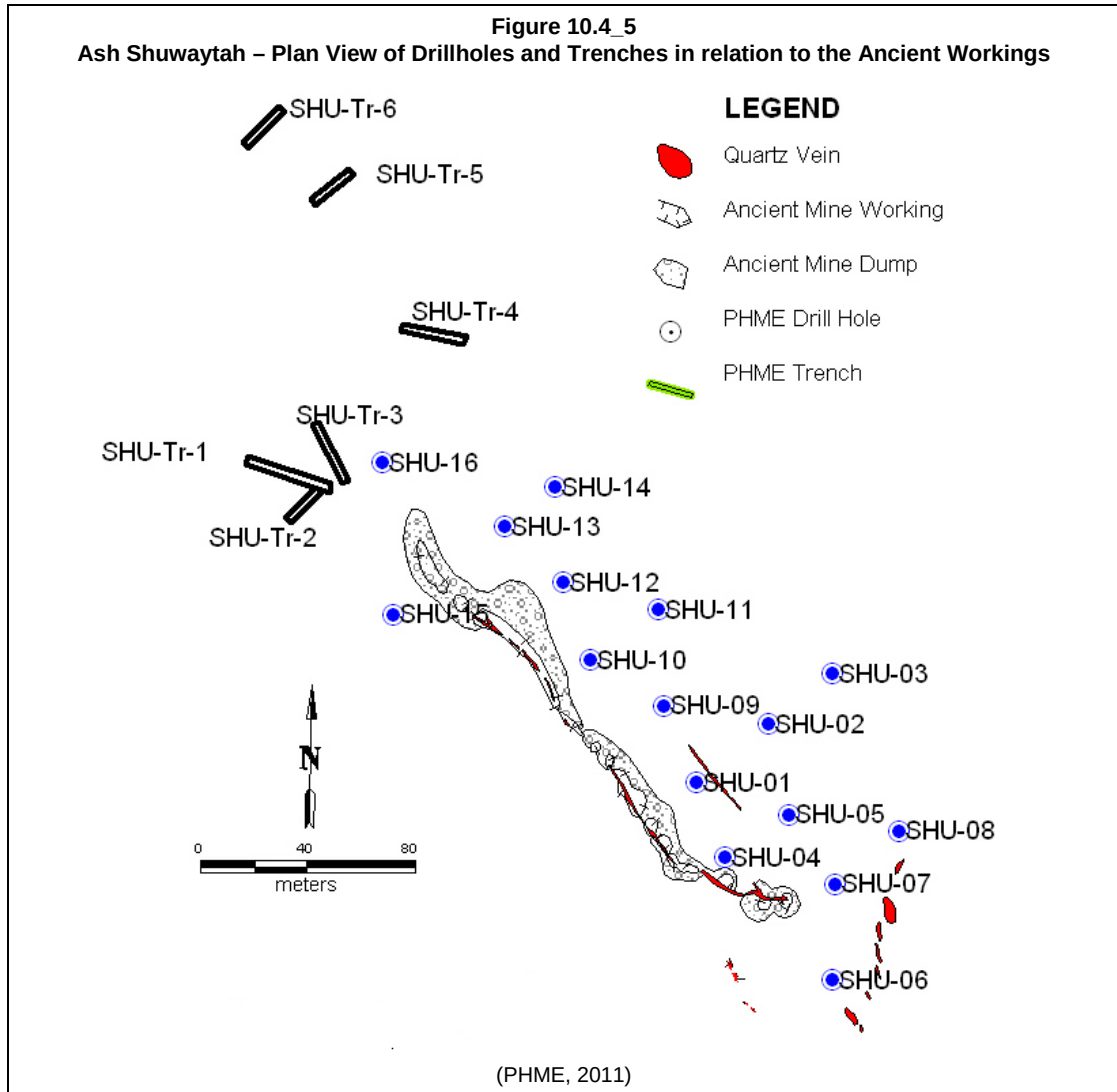
The Ash Shuwaytah prospect has been adequately tested. The prospect has no significant economic gold mineralisation at shallow depth. The drilling results indicate that the veins decrease in width rapidly down dip so the potential for significant mineralisation at depth is considered insufficient to justify further exploration.

#### Umm Al Qurayyat

Reconnaissance examination of the prospect by PHME showed that hydrothermal alteration was relatively widespread and extended to the south, east and north of the ancient mine area. Rock chip sampling has produced a number of significant Au assay values of >1g/t, with a maximum value of over 27g/t Au. The rock sample data also show anomalous As values over the entire sampled area of 0.40km<sup>2</sup>. The data suggest the possibility of a much larger mineralised system which is exposed intermittently beneath unaltered meta-volcanic rocks. A drilling program (20 RC holes) has been designed to test this larger target area.

#### P823

P823 is a newly discovered prospect comprising a zone of approximately 100m by 600m silica-carbonate-sericite alteration in volcanic rocks, with quartz-carbonate stockworks and some pods of gossan. P823 is about 1km north of Um Al Qurayyat. This area has not been sampled in recent times.



## 10.5 Coffey Mining Conclusions and Recommendations

### 10.5.1 Conclusions and Exploration Potential

Coffey considers that much of the mineralisation at Miyah tends to be narrow and low-grade (typically isolated 1m intersections of 1-3g/t Au), but with a few exceptions such as Ah Nahdayn, Abu Nafilah and, possibly, Tefel. At this stage any further exploration should concentrate on the Ah Nahdayn and Abu Nafilah prospects; however, the possibility of a large deposit, is unlikely. Considering that near-surface material has been mined out, and the generally narrow zones of mineralisation, it is also likely that any deposits discovered may be more amenable to small-scale underground mining than to open-pit mining (except Ah Nahdayn, Abu Nafilah and Tefel).

### 10.5.2 Coffey Mining Recommendations

Coffey Mining recommends completion of the following:

- § Compilation, verification and review of all exploration data and compilation of a robust database;
- § Exploration, in the first instance, using soil geochemistry or shallow drilling, to generate new targets; and
- § Drilling of new targets, and infill and/or deeper drilling at Ah Nahdayn and Abu Nafilah.

## 11 GARITH EXPLORATION LICENSE

### 11.1 Introduction

The Garith Exploration License is located in the western part of the Kingdom of Saudi Arabia. The license contains three segment areas (GAR-1, GAR-2, GAR-3) covering an area of 363.66km<sup>2</sup> and is located entirely within Mecca Province about 350km east of Jeddah. Access to the area is via the sealed Jeddah-Taif road followed by several kilometres of desert tracks.

The topography in the license area has low to moderate relief (Figure 11.1\_1) with elevations ranging from 600 to 1200m. Wadis in the area generally drain to the north and east.

**Figure 11.1\_1**  
**Garith - General Topographic View of Project**



(Coffey, 2011)

## 11.2 Mineral Tenure

The location of the Garith license is shown in Figure 1.1\_2 and details of the tenement schedule are given in Appendix A.

Coffey has not independently validated the licensing details and the present status of tenements, agreements and legislation described in this report is based on information provided by MEMC.

## 11.3 Project Geology and Mineralisation

### 11.3.1 Geology

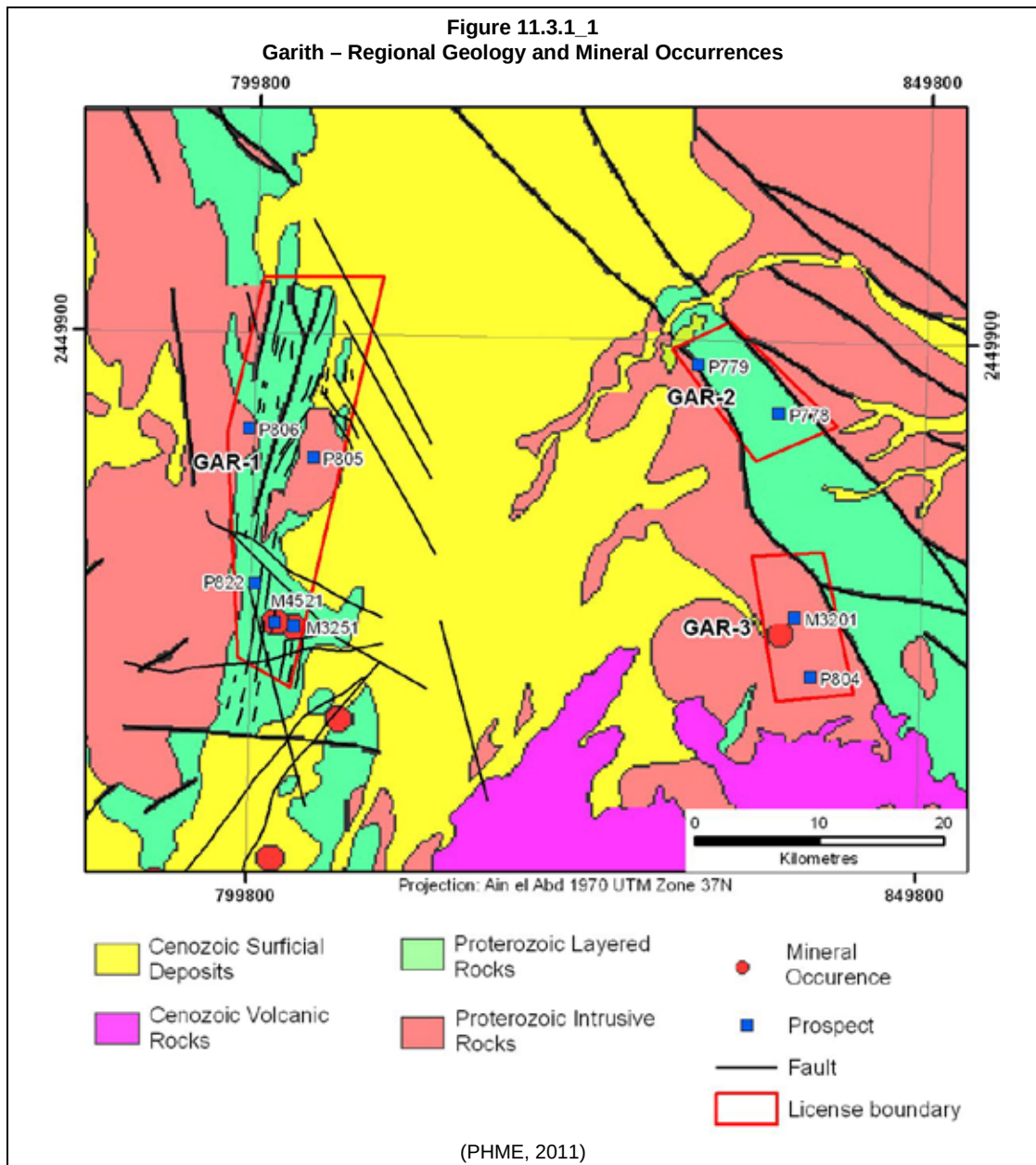
The Al Garith Exploration license is underlain by rocks of the Asir Composite Terrane. The exposures of Neoproterozoic rocks are bounded to the west and south by the Tertiary to Quaternary lava flows of Harrats Hadn and Nawasif. The exploration license also has extensive areas which are covered by Tertiary to Recent sediments (Figure 11.3.1\_1).

The Neoproterozoic layered rocks are part of the Shawas structural complex and may be the northern continuation of the Wadi Shwass Belt which is located south of Harrat Nawasif. In the western part of the license, east of the Turabah Fault, the Muwayah Formation outcrops in a N- to NE-trending belt. The age of the unit is estimated to be 840Ma. The principal lithologies are interbedded basalt, andesite and rhyolite lavas, conglomerates, sandstones and quartzites, all of which are metamorphosed to greenschist facies.

In the western part of the license the Sarjuj and Dighem formations crop out in a northwest-trending belt. The Dighem formation comprises strongly deformed greenschist to lower amphibolite facies metamorphosed volcanic and volcano-sedimentary rocks. Basalt and andesite lava flows and agglomerate of the Sarjuj formation unconformably overlie the Dighem formation. The age of the Sarjuj Formation is estimated at 725-720Ma.

A variety of pre-, syn- and post-tectonic Proterozoic intrusive rocks are present in the Al Garith license area. The oldest intrusive rocks are elongate N-S-trending granodiorite plutons of the Shir Complex which have an estimated age of 810Ma. The Jaf Complex (790-780Ma) is a group of elongate N-trending diorite, tonalite and quartz monzonite plutons, dykes and sills which crop out in the western part of the license. The Hadhaq Complex (780-720Ma) underlies much of the eastern part of the license area. It is a heterogeneous intrusive complex composed of gneissic monzogranite and diorite orthogneiss. The Tin Complex (685Ma) consists of tonalite-granodiorite orthogneiss with subordinate diorite gneiss and migmatite which outcrops on the east edge of the license near the Ruwah Fault zone.

Post-tectonic intrusive rocks in the license area include the Kawr, Ar Raha and Thalath Complexes which are all roughly contemporary in age. The Kawr Complex (645-605Ma) is a broadly NW-trending group of sub-circular alkali-feldspar granite, monzogranite and syenogranite plutons which crop out in the central part of the license area. The Ar Raha Complex (approximately 625Ma) consists of irregularly shaped plutons of monzogranite which locally form thick sills. The Thalath Complex (620-615Ma) comprises discrete circular to oval plutons of olivine gabbro, leucogabbro and anorthosite.



The Neoproterozoic layered rocks within the license area are generally strongly foliated and folded. The Turabah Fault zone crosses the western edge of the license area. The Ruwah Fault zone and numerous splay faults cross the eastern part of the license. The Ruwah and related faults are part of the “Najd” fault system.

### 11.3.2 Mineralisation

There are 26 metallic mineral occurrences reported within the Al Garith license area. In eastern parts, there are five Cu-Au occurrences which consist of chalcopryrite, malachite and possibly gold in quartz veins hosted by meta-volcanic rocks or diorite. The northernmost four of these occurrences are found in exposures of Neoproterozoic rocks at the base of narrow valleys eroded into Harrat Nawasif.

On the western side, there are scattered, poorly-described magnetite lenses and Cu-Au- and W-bearing quartz vein occurrences. North-trending Ba-Mn occurrences lie near the Turabah Fault zone. These consist of veinlets containing disseminated manganese oxides and base metal sulphides hosted by Cainozoic algal reef limestones.

The P778 prospect (GAR-2) comprises two veins clusters about 2.5km apart, within the Najd Fault Zone and along (parallel) the trend of the zone to the north, consisting of several quartz veins, lenses and pods with limonite, hematite, Mn oxides and malachite staining. The trends of the individual veins are mainly N-S and dip east or west, but the vein distribution follows the northwesterly trend of the fault zone. The host rock is "greenschist" and "greenstone" (most probably mafic metamorphosed rocks). Vein widths range from <1m to >3m.

#### 11.4 Exploration History

The earliest recorded modern geological work in the Garith License area was 1:500,000 geological mapping and mineral exploration of the southern Hijaz quadrangle by the USGS in the early 1960s. From 1978 to 1984, the USGS and DGMR completed 1:100,000 reconnaissance geological mapping of the area. The mapping included locating and in some cases sampling of mineral occurrences.

In the early 1980s, various topical geological studies were carried out, mainly evaluating ornamental stone potential and on the Cainozoic volcanic and sedimentary rocks in the area by DGMR and BRGM. This work included evaluation of the phosphate potential of some Cainozoic sedimentary units in the area and of the mineral potential of the Neoproterozoic granites in the Ranyah Belt.

Metallic mineral exploration in the license area has been very limited. In 1982-1983, the BRGM explored the Turabah-Kurmah area and this program may have extended into the eastern part of the Garith license area. In 1982, DGMR conducted follow-up rock sampling at ancient mine workings in the Bir Nami area; however, the results of this work have never been published. In 1986, the BRGM conducted exploration, possibly including drilling, of mineral occurrences in the western part of the license, but these results also have never been published. In 1987, DGMR conducted a ground magnetic survey over several magnetite occurrences in the Al Garith area.

The most recent geological work in the region was the compilation of 1:250,000 geological maps during the 1980s.

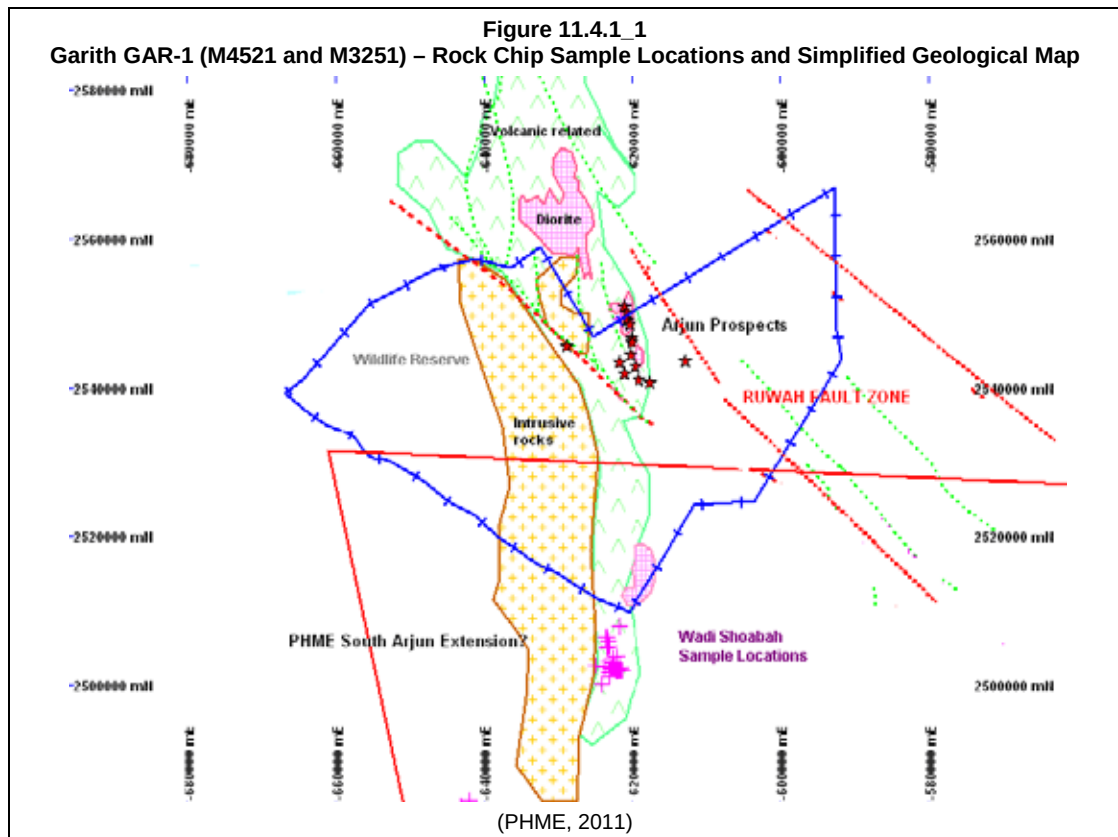
The GAR-1 license contains the Al Shoabah prospects (MODS 4521,3251) which are interpreted as lying within the same volcanic/volcaniclastic package believed to host the N-S trending 2.225Moz Ar Rjum Au deposits located some 30km to the north (SRK,2007).

In the GAR-1 area, PHME has conducted several campaigns of exploration which include reconnaissance prospecting (with mapping), rock chip sampling at selected locations, and also RC (43 holes for 2,573m) and post hole (181 holes for 1,959m) drilling at the three prospects (M4521, M3251 and P822). 825 rock chip samples have been collected.

Some reconnaissance prospecting, mapping and rock chip sampling has been carried out at GAR-2 and GAR-3.

#### 11.4.1 GAR-1

307 composite rock chip and dump samples were collected by PHME from the M4521 and M3251 prospects and environs (Figure 11.4.1\_1). The sampling program returned 5 samples with >1g/t, with one sample assaying 27g/t Au.



At P822, sampling of quartz rubble and vein subcrops-outcrops indicates that quartz veining has an association with a N-trending zone of shearing extending over an area of 1.7km by 6km, presumably similar to the geological setting of Ar Rjum prospect which reputedly contains >2Moz Au.

Two lines of post holes were drilled across a series of quartz veins and subcrops. The holes were sampled over 10m intervals. The objective was to check for mineralisation at depth within the 1.7km by 6.0km zone of shearing; 733 samples were collected. The depth of holes ranges from 10m to 15m, depending on rock type and alteration. Alteration zones were intersected on lines 1200S between 1370W and 1410W and 1700S between 1000W and 1500W. Most of altered zones contain quartz veining and carbonate alteration and, locally, sericite. Few significant assay results were returned from the vertical shallow post holes with best result being 0.255g/t Au.

A follow-up RC drilling program was carried out to determine whether the anomalous Au grades from the rock sampling campaigns continue at depth and to determine the extent of the mineralisation beneath the surface. Out of 43 RC holes drilled, only few holes show a significant Au and Ag grades at depth (Table 11.4\_1). Best results include: 1m @ 4.881g/t Au and 10.4ppm Ag in SHU-09; 11m @ 0.42g/t Au and 2.77ppm Ag in SHU-19; 12m @ 0.27g/t Au and 7m @ 0.165ppm Ag in SHU-12; 8m @ 1.20ppm Ag in SHU-28; and 5m @ 0.855g/t Au in SHU-31.

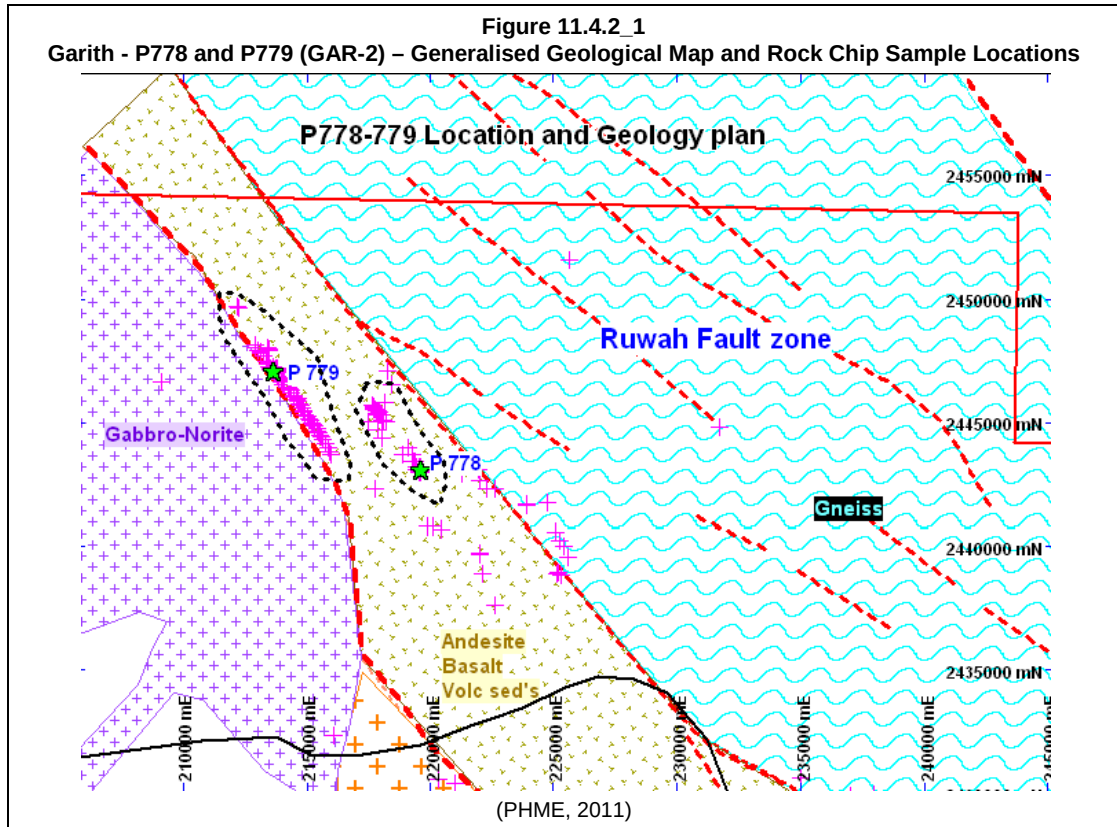
| Table 11.4_1                                          |           |    |        |         |        |                              |
|-------------------------------------------------------|-----------|----|--------|---------|--------|------------------------------|
| Garith GAR-1 – Significant RC Drillhole Intersections |           |    |        |         |        |                              |
| Hole                                                  | Depth (m) |    | Length | Average |        | Remarks                      |
|                                                       | From      | To |        | Au g/t  | Ag ppm |                              |
| SHU-05                                                | 3         | 4  | 1.00   | 1.133   | 1.10   | including 1.0m @ 2.818g/t Au |
| SHU-09                                                | 57        | 58 | 1.00   | 4.881   | 10.40  |                              |
| SHU-31                                                | 50        | 52 | 2.00   | 1.592   |        |                              |

#### 11.4.2 GAR-2 and GAR-3

A total of 196 composite rock outcrop and dump samples were collected at the P778 prospect (GAR-2; Figure 11.4.2\_1). Assay results indicate 3 samples with >1.0g/t Au, with one sample assaying 68g/t Au.

At prospect P779 (Figure 11.4.2\_1), a NW-trending zone of intense and extensive carbonate alteration occurs along a deformed contact zone between a volcanic and an intrusive package of rocks. Structurally, the area is interpreted as lying within the Ruwah fault complex–suture zone. This zone of alteration appears to extend north through to at least Wadi Khurmah, where it becomes less intense and patchy. The alteration is interpreted to be hosted by units with elevated Mg contents within the fault zone. Deformation and alteration in this carbonate zone appear to be multi-phase, with late-stage brittle veins clearly overprinting earlier carbonate and silica alteration. Outcropping rocks suggest that the Ruwah fault zone has had a long and protracted history of deformation. However, no sulphides (or oxidised equivalents) were observed in the carbonate and silica alteration, and there is no evidence of any ancient mining activity along this alteration zone.

Wadi Mishqar (MODS M3201) is an isolated ancient working at GAR-3 with abundant quartz-carbonate veining which are generally subcropping. A few quartz veins are ferruginous and carry some disseminated pyrite. A total of 151 composite rock outcrop and dump samples were collected. Ten samples contain >1g/t and 6 samples with 6.00-13.015g/t Au.



## 11.5 Coffey Mining Conclusions and Recommendations

### 11.5.1 Conclusions and Exploration Potential

Coffey considers that much of the drilled mineralisation at Garith tends to be narrow and low-grade (typically isolated 1m intersections rarely >1g/t Au). At this stage any further exploration should concentrate on acquiring new targets. This can be accomplished by acquiring suitably detailed geophysical data and by conducting low-level soil geochemical or shallow drilling surveys.

### 11.5.2 Coffey Mining Recommendations

Coffey Mining recommends completion of the following:

- § Compilation, verification and review of all exploration data and compilation of a robust database;
- § Geophysical targeting;
- § Exploration, in the first instance, using soil geochemistry or shallow drilling, to generate new targets; and
- § Drilling of new targets.

## 12 OTHER PROJECTS

### 12.1 Introduction

In addition to the eight licences discussed above, MEMC holds another eight exploration licenses comprising the; Madha, Khadra, Mutahil, Matran, Harb, Silaila, Nabagha and Buwaydah projects. These other licences have varying prospectivity and are summarised below. Exploration to date has focused on rock chip sampling exposed veins associated with ancient workings and then following up with RC drilling beneath the workings where notable gold results were detected. Reconnaissance style RC drilling has been completed by PHME at Madha, Khadra, Mutahil and Matran. Only rock chip sampling results are available for the others. No systematic surface geochemistry or regolith geochemical drilling has been completed at any of these projects. The license locations are shown in Figure 1.1\_1 for the northern licenses and Figure 1.1\_2 for the southern licenses.

### 12.2 Madha Gold Project

The Madha Exploration License comprises two segments (MAD-1, and MAD-2) covering a total area of 77.22km<sup>2</sup>. The license locations are shown in Figure 1.1\_2 and details listed in the tenement schedule in Appendix A. PHME undertook geological mapping, surface rock sampling (255), and drilling of 22 RC holes for 1,210m.

The main prospects comprise ancient workings at Jabal Al Hamra and Gata Al Masana where quartz veining in granitoids has been worked. Only two of the 22 holes drilled at Jabal Al Hamra returned >1g/t Au intersections with 1m @ 3.022g/t Au, and 1m @ 2.327g/t in holes JAH-02, and JAH-08. At Gata Al Masana, rock chip sampling of four isolated quartz veins returned nine samples over 2g/t Au and six samples with more than 6g/t Au.

### 12.3 Khadra Gold Project

The Khadra Exploration License comprises two segment areas (KHD-1 and KHD-2) covering a total area of 26.16km<sup>2</sup>. The license locations are shown in Figure 1.1\_2 and details listed in the tenement schedule in Appendix A. PHME undertook geological mapping, surface rock sampling (122), and drilling of 16 RC holes for 1,025m.

The license contains a number of ancient gold mines at the Jabal Sawdah, M'hadat Junub and M'hadat Shamal prospects. Gold mineralisation is associated with quartz veins. The veins are hosted by volcanic flows and flow breccias, pyroclastic tuffs, and volcanoclastic sediments of the Khadra Formation and associated with microdiorite and other fine grained mafic dykes. Veins contain grey and white quartz with very sparse pyrite, chalcopyrite, galena, and stibnite.

At Jabal Sawdah, drillhole SAW-07 returned 6m @ 43.78g/t Au from 20m to 26m, 9m averaging 9.18g/t Au from 40m to 49m. This intersection is associated with an 80m long quartz vein.

## 12.4 Mutahil Gold Project

The Mutahil Exploration License comprises one segment covering an area of 68.59km<sup>2</sup>. The license location is shown in Figure 1.1\_1 and details listed in the tenement schedule in Appendix A. PHME undertook geological mapping, surface rock sampling (30), and drilling of 18 RC holes for 1,221m.

Several groups of ancient gold workings are located within the license. The three most significant ones are prospects, M1061, M1062 and M4181 in the west of the license, in the An Numraniyah area. Mineralisation within the Mutahil-Numraniyah area is described as pyrite and secondary copper minerals in ferruginous quartz veins, stringers, breccia and shear zones with envelopes of ferruginous alteration. Many mineralised zones are associated with northwest trending mafic and felsic dykes. Quartz veins with sericite-pyrite alteration are typically 0.4m to 1.0m wide and up to 300m long.

M1062 was the only prospect returning gold intersections >1g/t Au with 1m @ 1.14g/t Au from 24m to 25m (MUT-06); 1m @ 1.43g/t Au from 14m to 15m (MUT-08); and 1m @ 1.52g/t Au from 43m to 44m (MUT-13). Of the rock samples collected, three contained >2g/t Au from quartz veins within ancient workings of minor prospects in the western portion of the licence (2.47g/t Au and 13.96g/t Au at M4180 and 6.87g/t Au at M1064).

## 12.5 Matran Gold Project

The Matran Exploration License comprises two segment areas (MTR-1 and MTR-2) covering a total area of 119km<sup>2</sup>. The license locations are shown in Figure 1.1\_1 and details listed in the tenement schedule in Appendix A. PHME undertook geological mapping, surface rock sampling (763), and drilling of 40 RC holes for 2,005m and 6 diamond holes for 714.1m.

Numerous ancient gold workings are within the Matran license. The three most significant prospects were drilled, Qal'at Zumurrud (MTR-1), Jabal Ess and Al Ula (MTR-2). At Jabal Ess, two of the 16 drillholes (8 RC and 6 diamond drillholes) intersected anomalous gold. The most significant intersection is drillhole JBE-02, which returned 7m @ 4.02g/t Au from 22m to 29m including 2m @ 13.07g/t Au. At Qal'at Zumurrud drillhole MTR-26 returned 4m @ 1.05g/t Au from 15m to 19m, including 2m @ 1.68g/t Au.

## 12.6 Nabaghah Gold Project

The Nabaghah Exploration License comprises one segment covering an area of 77.74km<sup>2</sup>. The license location is shown in Figure 1.1\_1 and details listed in the tenement schedule in Appendix A. PHME have undertaken geological mapping and surface rock sampling (117).

Nabaghah (M1415), the main prospect identified comprises a complex quartz vein/breccia system trending 300° and dipping 60-70°NE. Two veins can be identified throughout the 800m of exposed quartz veining. The area between the two vein sets is mostly highly altered and sheared rock with quartz veins. The vein system is best developed in diorite and pinches out at each end in metavolcanic rocks.

In addition to the main system, there are ancient gold workings in the diorite and metavolcanic rocks. A drill program of 8 diamond holes for 405m is proposed for this prospect.

The Wadi Unaybik prospect corresponds to a gold and tungsten anomaly defined by an earlier alluvial study, within auriferous veins striking 1km north-northeast and steeply dipping east. Sampling within the quartz veins returned four values >1g/t Au. Scheelite was identified in one of the veins.

Of the 117 rock samples collected over the Nabaghah license, 34 returned >1g/t Au and 5 >10g/t Au, with the maximum value 74g/t Au.

## 12.7 Harb Gold Project

The Harb Exploration License comprises one segment covering an area of 10.08km<sup>2</sup>. The license location is shown in Figure 1.1\_1 and details listed in the tenement schedule in Appendix A. PHME have undertaken geological mapping and surface rock sampling (108).

Prospect M1416 corresponds to fenced off ancient workings, approximately 200m in strike, dipping to the west. Of the 108 rock samples collected, 9 returned >1g/t Au and 5 >5g/t Au with the maximum value 10g/t Au. A drill program of 4 diamond holes for 230m is proposed for this prospect.

## 12.8 Silaila Gold Project

The Silaila Exploration License comprises one segment covering an area of 64.43km<sup>2</sup>. The license location is shown in Figure 1.1\_1 and details listed in the tenement schedule in Appendix A. PHME have undertaken geological mapping and surface rock sampling (1,007).

Within the Silaila district, known gold anomalies are interpreted as associated with a tonalite-diorite pluton; stocks of the pluton are also observed in the Silaila, Buwaydah and Nabaghah licenses.

The Silaila license comprises four gold prospects: P196 (Khadrah Mine Area), M1423 (Hawawit), M1424 (Silaila) and M1422 (Marrah). Scattered ancient workings consist of pits, trenches, steep declines and shafts. In the Khadrah Mine area, zones of veining and carbonate/sericite alteration occur along approximately 1.5km of strike length, trending north-northeast. A total of 361 samples were collected from the prospect, of which 122 samples returned >1g/t Au and 15 >10g/t Au with the maximum value 60g/t Au. At Hawawit prospect, of 484 samples, 48 returned >1g/t Au with the maximum value 15g/t Au.

M1424 prospect has two small ancient pits dug into a quartz stringer zone. The rock samples collected (116) returned 29 >1g/t Au and 7 >10g/t Au, with the maximum value 90g/t Au. The Marrah prospect extends for approximately 1km. Thirteen samples were collected, of which 2 were >1g/t Au, with the maximum value 23g/t Au.

A diamond drilling program is proposed for each of the prospects comprising 10 drillholes for 565m at Khadrah Mine area; 8 drillholes for 545m at Hawawit; and 3 drillholes for 150m at M1424.

## 12.9 Buwaydah Gold Project

The Buwaydah Exploration License comprises one segment covering an area of 92.62km<sup>2</sup>. The license location is shown in Figure 11.1\_1 and details listed in the tenement schedule in Appendix A. PHME have undertaken geological mapping and surface rock sampling (163).

The two main prospects within the license are: M1421 (Al Buwaydah) and P751. Ancient workings within M1421 consist of a single >8m stope of limited strike length, dug into a quartz pod/boudin hosted within sheared granitoid rocks. A total of 144 samples were collected from Buwaydah prospect with an average grade of 3.01g/t Au; the maximum sample value is 311g/t Au.

## 12.10 Coffey Mining Conclusions and Recommendations

The remaining eight exploration licenses are generally assigned lower priority by MEMC. Accordingly only summary information was reviewed by Coffey. It is recommended that a more comprehensive data review is completed should Lawson proceed to acquire equity in the MEMC Saudi exploration assets. All eight licenses contain ancient workings which have been rock chip sampled and in some cases drilled by PHME. At Madha, Mutahil, Nabagha and Harb, generally low gold levels (1-2g/t Au) were reported from rockchips and drilling. Generally more interesting results were reported from Khadra, Matran, Silaila and Buwaydah and these should be reviewed first.

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## 14 GLOSSARY OF TECHNICAL TERMS

|                                    |                                                                                                                                                                                                                                                                                            |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| %                                  | Percent                                                                                                                                                                                                                                                                                    |
| <i>-40 mesh sampling</i>           | A method of stream sediment or soil sampling which involves the collection of sieved material less than 360 microns in diameter.                                                                                                                                                           |
| <i>-80 mesh sampling</i>           | A method of stream sediment or soil sampling which involves the collection of sieved material less than 180 microns in diameter.                                                                                                                                                           |
| <i>aeolian</i>                     | Formed or deposited by the action of wind.                                                                                                                                                                                                                                                 |
| <i>aeromagnetic</i>                | A survey undertaken by helicopter or fixed-wing aircraft for the purpose of recording magnetic characteristics of rocks by measuring deviations of the earth's magnetic field.                                                                                                             |
| <i>Ag</i>                          | Chemical symbol for silver.                                                                                                                                                                                                                                                                |
| <i>AIG</i>                         | Australian Institute of Geoscientists.                                                                                                                                                                                                                                                     |
| <i>airborne geophysical data</i>   | Data pertaining to the physical properties of the earth's crust at or near surface and collected from an aircraft.                                                                                                                                                                         |
| <i>airborne geophysical survey</i> | Survey pertaining to the physical properties of the earth's crust at or near surface and collected from an aircraft.                                                                                                                                                                       |
| <i>airborne magnetic data</i>      | Data collected from a survey undertaken by helicopter or fixed-wing aircraft for the purpose of recording magnetic characteristics of rocks by measuring deviations in the earth's magnetic field.                                                                                         |
| <i>airborne magnetic survey</i>    | A survey undertaken by helicopter or fixed-wing aircraft for the purpose of recording magnetic characteristics of rocks by measuring deviations of the earth's magnetic field.                                                                                                             |
| <i>airborne magnetics</i>          | Data collected from a survey undertaken by helicopter or fixed-wing aircraft for the purpose of recording the magnetic characteristics of rocks by measuring deviations in the earth's magnetic field.                                                                                     |
| <i>airborne radiometrics</i>       | Data collected from a survey undertaken by helicopter or fixed-wing aircraft for the purpose of recording natural radioactivity emitted by rocks.                                                                                                                                          |
| <i>alluvium</i>                    | Clay silt, sand, gravel, or other rock materials transported by flowing water and deposited in comparatively recent geologic time as sorted or semi-sorted sediments in riverbeds, estuaries, and flood plains, on lakes, shores and in fans at the base of mountain slopes and estuaries. |
| <i>alteration</i>                  | Change in mineral and chemical composition of rock, commonly brought about by reactions to weathering or to hydrothermal solutions.                                                                                                                                                        |
| <i>alteration halo</i>             | The volume of rock, which is chemically altered surrounding a mineral deposit.                                                                                                                                                                                                             |
| <i>amphibolite facies</i>          | An assemblage of minerals formed at moderate to high temperatures (450° to 700°) during regional metamorphism, characterised by the presence of the minerals hornblende and biotite.                                                                                                       |
| <i>andesite</i>                    | A mafic volcanic rock containing between 55% and 65% SiO <sub>2</sub> , and composed essentially of andesine and one or more mafic minerals.                                                                                                                                               |
| <i>anomalous</i>                   | An area where exploration has revealed results higher (or sometimes lower) than the local background level.                                                                                                                                                                                |
| <i>anticlinal axis</i>             | The median plane of a folded anticline, from which the strata dip away on either side.                                                                                                                                                                                                     |

|                                    |                                                                                                                                                                              |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>anticlinal structure</i>        | A fold in the rocks in which strata dip in opposite directions away from the central axis.                                                                                   |
| <i>anticline</i>                   | A fold in rocks in which strata dip in opposite directions away from the central axis and whose core contains older rocks.                                                   |
| <i>antiform</i>                    | An anticline-like structure.                                                                                                                                                 |
| <i>aplite</i>                      | A pale coloured (felsic) dyke with a fine-grained texture, typically similar to granite in composition.                                                                      |
| <i>arc, volcanic arc</i>           | Chain or belt of islands or mountains generated by volcanic activity.                                                                                                        |
| <i>arsenopyrite</i>                | An iron and arsenic sulphide mineral, FeAsS.                                                                                                                                 |
| <i>As</i>                          | Chemical symbol for arsenic.                                                                                                                                                 |
| <i>assay</i>                       | The testing and quantification of the abundance of elements of compounds of interest within a sample.                                                                        |
| <i>Au</i>                          | Chemical symbol for gold.                                                                                                                                                    |
| <i>AusIMM</i>                      | The Australasian Institute of Mining and Metallurgy.                                                                                                                         |
| <i>axial plane</i>                 | The geometric plane that intersects the crest or trough of a fold, about which the limbs are more or less symmetrically arranged.                                            |
| <i>back-arc basin</i>              | Basin developed behind an island arc volcanic chain.                                                                                                                         |
| <i>barite</i>                      | A sulphate of barium, BaSO <sub>4</sub> .                                                                                                                                    |
| <i>basal</i>                       | Refers to the lowermost stratum in a sedimentary sequence.                                                                                                                   |
| <i>base metal</i>                  | A non-precious metal, usually referring to copper, lead and zinc.                                                                                                            |
| <i>base of oxidation</i>           | Term referring to the subsurface horizon below which no weathering has occurred.                                                                                             |
| <i>basement</i>                    | Crust of the earth underlying younger sedimentary deposits.                                                                                                                  |
| <i>basin</i>                       | A large depression within which sediments are sequentially deposited and lithified.                                                                                          |
| <i>bias</i>                        | In assays, the characteristic of one set of data being consistently higher or lower than the other.                                                                          |
| <i>boudinaged</i>                  | Highly deformed by elongation such that the structure thickens and thins dramatically along strike.                                                                          |
| <i>breccia</i>                     | Rock comprising angular fragments enclosed in a matrix, usually the result of persistent fracturing by tectonic or hydraulic means.                                          |
| <i>brecciated</i>                  | Condition applied to an intensely fractured body of rock.                                                                                                                    |
| <i>brittle deformation</i>         | Fracturing and brecciation caused by applied stress, usually evident in competent rocks.                                                                                     |
| <i>brittle-ductile deformation</i> | A combination of both brittle and plastic deformation produced in response to changes in stress orientation or changes in the rock competency due to progressive alteration. |
| <i>Cainozoic</i>                   | The era of geological time spanning the period from 65 million years ago to the present.                                                                                     |
| <i>calcite</i>                     | A mineral of composition CaCO <sub>3</sub> (calcium carbonate) which is an essential constituent of limestones and marbles.                                                  |

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| <i>calc-silicate</i>        | A fine grained metamorphic rock containing a high abundance of calcium and/or magnesium silicate minerals.                                                                                                                                                                                                                    |
| <i>capital costs</i>        | Costs assigned to the purchase of plant and equipment for a project, or for the development of infrastructure, which can be depreciated or amortised.                                                                                                                                                                         |
| <i>capital development</i>  | Mine development work carried out under a capital budget, as opposed to an operating budget, and depreciated for tax purposes as project capital.                                                                                                                                                                             |
| <i>carbonate</i>            | Rock of sedimentary or hydrothermal origin, composed primarily of calcium, magnesium or iron and CO <sub>3</sub> . Essential component of limestones and marbles.                                                                                                                                                             |
| <i>carbonate alteration</i> | The modification of a rock by the introduction of calcium rich fluids to form calcium carbonate.                                                                                                                                                                                                                              |
| <i>carbonate rocks</i>      | Rocks comprised predominantly of the carbonate-bearing minerals; commonly calcite (calcium carbonate or CaCO <sub>3</sub> ), dolomite (magnesian carbonate) and siderite (iron carbonate).                                                                                                                                    |
| <i>cerussite</i>            | A lead carbonate, PbCO <sub>3</sub> .                                                                                                                                                                                                                                                                                         |
| <i>chalcopyrite</i>         | A copper iron sulphide, CuFeS <sub>2</sub> .                                                                                                                                                                                                                                                                                  |
| <i>channel sample</i>       | Sample taken from the wall of a mine opening, or along a surface exposure, trench or costean, in which a furrow is made and the sample is combined over designated intervals for analysis.                                                                                                                                    |
| <i>chip sampling</i>        | The collection of selective or representative samples of rock fragments within a limited area for analysis.                                                                                                                                                                                                                   |
| <i>chlorite</i>             | A green coloured hydrated aluminium-iron-magnesium silicate mineral common in metamorphic rocks.                                                                                                                                                                                                                              |
| <i>chrysocolla</i>          | A monoclinic mineral, (Cu,Al) <sub>2</sub> H <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> (OH) <sub>4</sub> .nH <sub>2</sub> O; cryptocrystalline or amorphous; soft; bluish green to emerald green; forms incrustations and thin seams in oxidized parts of copper-mineral veins; a source of copper and an ornamental stone. |
| <i>clastic rock</i>         | Consolidated sedimentary rock composed principally of broken fragments that are derived from pre-existing rocks.                                                                                                                                                                                                              |
| <i>clasts</i>               | A fragment of rock or pebble surrounded by matrix in a breccia or conglomerate.                                                                                                                                                                                                                                               |
| <i>claystone</i>            | A term applicable to indurated clay in the same sense as sandstone is applicable to indurated or cemented sand.                                                                                                                                                                                                               |
| <i>cleavage</i>             | Close-spaced, planar fracture fabric rock produced by the alignment and segregation of platy minerals during folding and shearing.                                                                                                                                                                                            |
| <i>column leach testing</i> | The laboratory irrigation and leaching of coarsely crushed ore by cyanide solution to determine the quantity and rate at which gold can be extracted from the ore, imitating the heap leach process.                                                                                                                          |
| <i>comminution</i>          | The breaking, crushing, or grinding by mechanical means of stone, coal, or ore, for direct use or further processing.                                                                                                                                                                                                         |
| <i>conformable</i>          | The relationship of stratigraphic units emplaced in an uninterrupted succession, or structural features with an attitude consistent with this succession.                                                                                                                                                                     |
| <i>conglomerate</i>         | A rock composed predominantly of rounded pebbles, cobbles or boulders deposited by the action of water.                                                                                                                                                                                                                       |

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| <i>copper</i>                    | A reddish metallic element, used as an electrical conductor and the basis of brass and bronze.                                                                                                |
| <i>copper carbonate staining</i> | Green or blue coloured staining on a rock surface respectively produced by the copper carbonate minerals malachite and azurite, indicating the presence of copper mineralisation.             |
| <i>core</i>                      | A tube of rock produced by diamond drilling.                                                                                                                                                  |
| <i>core recovery</i>             | The amount of the drilled rock withdrawn in core drilling, generally expressed as a percentage of the total length of the interval cored.                                                     |
| <i>country rock</i>              | The rock traversed by or adjacent to an ore deposit or igneous body.                                                                                                                          |
| <i>Cretaceous</i>                | Applied to the third and final period of the Mesozoic era, 141 to 65 million years ago.                                                                                                       |
| <i>cross-section</i>             | A profile portraying an interpretation of a vertical section of the earth explored by geophysical and/or geological methods.                                                                  |
| <i>Cu</i>                        | Chemical symbol for copper.                                                                                                                                                                   |
| <i>cutoff</i>                    | The value of an ore variable below which material is classified as waste.                                                                                                                     |
| <i>Dacite</i>                    | Felsic volcanic rock composed predominantly of the mineral plagioclase and minor quartz, amphibole and biotite, and containing intermediate to high abundances of silica (SiO <sub>2</sub> ). |
| <i>deformed</i>                  | A general term for the process of folding, faulting, shearing, compression or extension of rocks as a result of stress.                                                                       |
| <i>deposits</i>                  | Mineral occurrences in significant quantities or concentrations.                                                                                                                              |
| <i>detection limit</i>           | Lower threshold of detection for a laboratory analytical method.                                                                                                                              |
| <i>detrital</i>                  | Term applied to particles of minerals, or rock that have been derived from pre-existing rock by weathering and erosion.                                                                       |
| <i>dextral</i>                   | Lateral movement on a fault, whereby the far-side block has moved right, relative to the near-side.                                                                                           |
| <i>diamond core</i>              | Cylindrical core of rock produced by drilling with a diamond set or diamond impregnated bit.                                                                                                  |
| <i>diorite</i>                   | The coarse-grained plutonic equivalent of an andesite.                                                                                                                                        |
| <i>dip</i>                       | The angle at which a rock stratum or structure is inclined from the horizontal.                                                                                                               |
| <i>disconformably</i>            | Time break between parallel strata demonstrating erosional relief.                                                                                                                            |
| <i>dolerite</i>                  | A medium-grained mafic intrusive igneous rock composed mostly of pyroxenes and sodium-calcium feldspar.                                                                                       |
| <i>dolomite</i>                  | A rock or mineral composed of calcium and magnesium carbonate.                                                                                                                                |
| <i>dome</i>                      | An anticlinal structure that plunges in all directions.                                                                                                                                       |
| <i>ductile deformation</i>       | Deformation of rocks or rock structures involving stretching or bending in a plastic manner without breaking.                                                                                 |
| <i>dyke</i>                      | A tabular body of intrusive igneous rock, crosscutting the host strata at an oblique angle.                                                                                                   |
| <i>Eocene</i>                    | An epoch of the Tertiary period between 45 million and 38 million years before the present.                                                                                                   |
| <i>epiclastic</i>                | Consisting of the consolidated detritus of pre-existent rocks, not of volcanic origin.                                                                                                        |

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| <i>epidote</i>                 | A rock-forming aluminium-calcium-iron silicate mineral which is a common secondary component of igneous rocks.                              |
| <i>epigenetic</i>              | Mineralisation deposited later than the enveloping rocks.                                                                                   |
| <i>epithermal</i>              | A term applied to precious metal deposits formed at shallow depths from ascending hydrothermal solutions of low relative temperature.       |
| <i>euxenite</i>                | An ore mineral or uranium, (Y,Ca,Ce,U,La,Th)(Nb,Ta,Ti) <sub>2</sub> O <sub>6</sub> , commonly found in pegmatites.                          |
| <i>evaporite</i>               | Sediment, including various salts, deposited from aqueous solution as a result of evaporation.                                              |
| <i>exhalite</i>                | A chemical sediment formed by the expulsion of volcanically derived fluids on the sea floor.                                                |
| <i>fault</i>                   | A fracture in a rock along which there has been relative movement either vertically or horizontally.                                        |
| <i>felsic</i>                  | Light colour rocks containing an abundance of any of the following - feldspars, feldspathoids and silica.                                   |
| <i>felsic volcanic</i>         | A volcanic extrusive rock which has a high proportion of silica, potassium and sodium and low iron and magnesium.                           |
| <i>ferromagnesian minerals</i> | Minerals containing iron and magnesium usually in the form of amphibole, pyroxene, biotite and olivine.                                     |
| <i>ferruginous</i>             | Iron rich.                                                                                                                                  |
| <i>fold</i>                    | A planar sequence of rocks or a feature bent about an axis.                                                                                 |
| <i>fold axis</i>               | The central part of a fold, about which strata are bent.                                                                                    |
| <i>foliation</i>               | The banding or lamination of metamorphic rocks as distinguished from stratification in sedimentary rocks.                                   |
| <i>footwall</i>                | The mass of rock lying below a fault, vein or zone of mineralisation.                                                                       |
| <i>g/cm<sup>3</sup></i>        | Grams per cubic centimetre, a standard mass unit for demonstrating the bulk density of a rock sample.                                       |
| <i>gabbro</i>                  | A fine- to coarse-grained, dark coloured, igneous rock composed mainly of calcic plagioclase, clinopyroxene and sometimes olivine.          |
| <i>gahnite</i>                 | A zinc-aluminium oxide mineral, ZnAl <sub>2</sub> O <sub>4</sub> , often found in pegmatites and associated veins.                          |
| <i>galena</i>                  | A grey sulphide ore of lead, PbS.                                                                                                           |
| <i>garnet</i>                  | A brown-red silicate mineral.                                                                                                               |
| <i>gneiss</i>                  | A coarse grained, banded, high grade metamorphic rock.                                                                                      |
| <i>goethite</i>                | A hydrated oxide mineral of iron, FeO(OH).                                                                                                  |
| <i>gossan</i>                  | A ferruginous deposit remaining after the oxidation of the original sulphide minerals in a vein or ore zone.                                |
| <i>graben</i>                  | An elongate depression of the earth's crust, which is bounded on at least two sides by faults.                                              |
| <i>granite (granitoid)</i>     | A coarse-grained igneous rock containing mainly quartz and feldspar minerals and subordinate micas. (granite-like rock, <i>sensu lato</i> ) |
| <i>granodiorite</i>            | A coarse grained intermediate igneous intrusive rock composed of quartz, feldspar and hornblende and/or biotite.                            |

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| <i>greenschist</i>                 | A metamorphosed basic igneous rock which owes its colour and schistosity to abundant chlorite.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>greenschist facies</i>          | A classification of the metamorphic grade of a rock, diagnostically defined by the metamorphic formation of chlorite at generally lower pressures and temperatures.                                                                                                                                                                                                                                                                                                                                               |
| <i>growth faulting</i>             | Incremental propagation of a fault through time, usually implying vertical movement.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>hangingwall</i>                 | The mass of rock above a fault, vein or zone of mineralisation.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>hematite</i>                    | Iron oxide mineral, $\text{Fe}_2\text{O}_3$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <i>hessite</i>                     | A silver telluride                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>horst</i>                       | An elongate, relatively uplifted block of the earth's crust that is bounded on at least two sides by faults.                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>host rocks</i>                  | A body of rock serving as a host for other rocks or for mineral deposits; e.g. a pluton containing xenoliths, or any rock in which ore deposits occur. It is a somewhat more specific term than country rock.                                                                                                                                                                                                                                                                                                     |
| <i>hydrothermal alteration</i>     | Rocks altered to different minerals through the action of hot fluids generated from or driven by igneous bodies, commonly producing or associated with mineralisation.                                                                                                                                                                                                                                                                                                                                            |
| <i>Indicated Resource</i>          | As defined in the JORC Code, "that part of mineralisation where the nature, quality, amount and distribution of data are such as to allow confident interpretation of the geological framework and to assume continuity of mineralisation. Confidence in the estimate is sufficient to allow the appropriate application of technical and economic parameters and to enable an evaluation of economic viability".                                                                                                 |
| <i>induced polarisation (IP)</i>   | A ground-based geophysical survey technique measuring the intensity of an induced electric current, used to identify disseminated sulphide deposits.                                                                                                                                                                                                                                                                                                                                                              |
| <i>Inferred Resource</i>           | As defined in the JORC Code, "An 'Inferred Mineral Resource' is that part of a Mineral Resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes which may be limited or of uncertain quality and reliability". |
| <i>intermediate volcanic rocks</i> | Extrusive rocks having a silica content of 54% to 65%, intermediate in composition between basalt and rhyolite.                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>intrusion</i>                   | A body of igneous rock which has forced itself into pre-existing rocks.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>IP</i>                          | Induced Polarisation survey, an electrical geophysical method used to detect buried deposits formed by disseminated sulphide minerals.                                                                                                                                                                                                                                                                                                                                                                            |
| <i>island arc</i>                  | A chain of islands usually arising from calc-alkaline volcanic activity.                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <i>isoclinal</i>                   | Describes a tight fold whereby the limbs dips in the same direction at the same angle.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>jarosite</i>                    | A potassium sulphate mineral, $\text{KFe}_3(\text{SO}_4)_2(\text{OH})_6$ , frequently associated with oxidised portions of sulphide mineral deposits.                                                                                                                                                                                                                                                                                                                                                             |
| <i>lithological</i>                | Pertaining to the compositional character of the rock.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>lithological contacts</i>       | The contacts between different rock types.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| <i>low-grade</i>          | Pertaining to ores that have a relatively low content of metal compared with other richer material from the same general area.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Ma</i>                 | Million years ago.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>mafic</i>              | Pertaining to, or composed dominantly of, the dark coloured ferromagnesian rock forming silicates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>magnetic anomaly</i>   | Zones where the magnitude and orientation of the earth's magnetic field is distorted by magnetic rocks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>malachite</i>          | A green hydrated carbonate ore of copper $\text{Cu}_2(\text{OH})_2\text{CO}_3$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Measured Resource</i>  | As defined in the JORC Code, "that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes. The locations are spaced closely enough to confirm geological and/or grade continuity".                                                                                 |
| <i>metamorphic grade</i>  | The intensity or rank of metamorphism, measured by the amount or degree of difference between the original parent rock and the metamorphic rock. It indicates in a general way the pressure-temperature environment or facies in which the metamorphism took place.                                                                                                                                                                                                                                                                                                                   |
| <i>metasedimentary</i>    | A rock formed by metamorphism of sedimentary rocks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>metavolcanic rocks</i> | Rocks derived from volcanic activity and subsequently metamorphosed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>Mineral Resource</i>   | A Mineral Resource is defined in the JORC Code as "a concentration or occurrence of material of intrinsic economic interest in or on the earth's crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge. Mineral Resources are subdivided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. |
| <i>mineralisation</i>     | The concentration of metals and their chemical compounds within a body of rock.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>-80 mesh</i>           | Material fraction passing a screen size equivalent to approximately 80 apertures per inch, equating to an aperture size of $180\mu\text{m}$ .                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Miocene</i>            | The fourth of the five epochs into which the Tertiary period is divided, between 25 million years and 5 million years before present.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Mississippi Valley</i> | A particular type of base metal deposit, originally described in North America.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>monzogranite</i>       | A granular plutonic rock containing approximately equal amounts of orthoclase and plagioclase feldspar, but usually with a low quartz content.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>monzonite</i>          | A granular plutonic rock containing approximately equal amounts of orthoclase and plagioclase and thus, intermediate between syenite and diorite.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <i>Neoproterozoic</i>     | Late Proterozoic era of geological time, between 1,000 million years and 545 million years ago.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>Oligocene</i>          | Epoch of the Tertiary period between 23 million years and 38 million years before the present.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>ophiolite</i>          | A sequence of mafic and ultramafic igneous rocks (usually metamorphosed) formed at the sea floor as part of the oceanic crust.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| <i>outcrop</i>        | Surface expression of underlying rocks.                                                                                                                            |
| <i>oxidation</i>      | Alteration of rock, most commonly by due to natural weathering.                                                                                                    |
| <i>palaeochannel</i>  | A preserved, inactive river channel in-filled with partially consolidated fluvial sediments.                                                                       |
| <i>paragenesis</i>    | The sequence of formation or development of a mineral deposit.                                                                                                     |
| <i>Pb</i>             | A chemical symbol of Lead.                                                                                                                                         |
| <i>phyllite</i>       | A metasedimentary rock displaying a platy cleavage.                                                                                                                |
| <i>Pleistocene</i>    | A period of time which is a sub-division of the Tertiary, ranging between 11 million and 1.8 million years before present.                                         |
| <i>pluton</i>         | A body of igneous rock that has formed beneath the surface of the earth by consolidation from magma.                                                               |
| <i>porphyry</i>       | A rock with conspicuous crystals in a fine grained ground mass.                                                                                                    |
| <i>ppm</i>            | Parts per million, quantitative equivalent of g/t.                                                                                                                 |
| <i>prospect</i>       | A mineral deposit which warrants further investigation.                                                                                                            |
| <i>Proterozoic</i>    | An era of geological time spanning the period from 2,500 million years to 570 million years before present.                                                        |
| <i>protolith</i>      | The parent rock prior to alteration or metamorphism.                                                                                                               |
| <i>quartz diorite</i> | Igneous rock consisting of an aggregate of the minerals plagioclase feldspar, hornblende and pyroxene, and containing in excess of 10% quartz by volume.           |
| <i>Quaternary</i>     | That period of time between 1.8 million years before present and the present day.                                                                                  |
| <i>radiometric</i>    | Data relating to the radioactivity emitted by rocks at or near the earth's surface.                                                                                |
| <i>RC drilling</i>    | Drilling method employing a percussive action to break the rock, and in which sample material is delivered to the surface inside the rod string by compressed air. |
| <i>Recent</i>         | A geological Epoch of the Quaternary Period.                                                                                                                       |
| <i>rhyolite</i>       | Fine-grained felsic igneous rock containing high proportion of silica and feldspar.                                                                                |
| <i>rift</i>           | A linear depression or basin caused by the subsidence of a central block of ground between two semi-parallel fault surfaces.                                       |
| <i>sandstone</i>      | A sedimentary rock composed of cemented or compacted detrital minerals, principally quartz grains.                                                                 |
| <i>scarp</i>          | An escarpment, cliff or steep stope along the margin of a plateau, mesa, terrace or bench.                                                                         |
| <i>schist</i>         | A crystalline metamorphic rock having a foliated or parallel structure due to the recrystallisation of the constituent minerals.                                   |
| <i>sericite</i>       | A mica mineral very common as an alteration product in metamorphic and hydrothermally altered rocks.                                                               |
| <i>shear</i>          | A zone in which rocks have been deformed primarily by ductile means in a response to applied stresses.                                                             |
| <i>shield</i>         | A large area of earth's crust consisting mainly of Precambrian rocks which is generally shield-like in form.                                                       |

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| <i>silica</i>                          | Dioxide of silicon, SiO <sub>2</sub> , usually found as the various forms of quartz.                                                                                               |
| <i>silicification</i>                  | Replacement by, or introduction of, appreciable quantities of silica.                                                                                                              |
| <i>sinistral</i>                       | Lateral movement on a fault, whereby the far side block has moved left, relative to the near side.                                                                                 |
| <i>sphalerite</i>                      | A black to brown sulphide ore of zinc, ZnS.                                                                                                                                        |
| <i>stockwork</i>                       | A network of (usually) quartz veinlets of varying orientation, produced during pervasive brittle fracture.                                                                         |
| <i>stream sediment</i>                 | The fine material such as silt found in drainages.                                                                                                                                 |
| <i>stream sediment sample</i>          | Bulk or sieved sample of sand or silt collected from an active or ephemeral stream-bed and analysed as representative of the area drained by the stream.                           |
| <i>stringer</i>                        | A small discontinuous or irregular veinlet.                                                                                                                                        |
| <i>subcrop</i>                         | Poorly exposed bedrock.                                                                                                                                                            |
| <i>supracrustal rocks</i>              | Layered upper-crustal rock succession sitting on an older deformed basement.                                                                                                       |
| <i>suture</i>                          | A tectonic zone associated with the amalgamation of blocks or plates of the earth's crust.                                                                                         |
| <i>syncline</i>                        | A fold in rocks in which the strata dip inward from both sides towards the axis.                                                                                                   |
| <i>talc</i>                            | A hydrous magnesium silicate, usually formed due to weathering of magnesium silicate rocks.                                                                                        |
| <i>telluride</i>                       | A mineral compound that is a combination of tellurium with a metal.                                                                                                                |
| <i>terrane</i>                         | A terrane/terrain is a crustal block or fragment that preserves a distinctive geologic history that is different from the surrounding areas and that is usually bounded by faults. |
| <i>tetrahedrite</i>                    | A copper-antimony-sulphide mineral, (Cu,Fe) <sub>12</sub> Sb <sub>4</sub> S <sub>13</sub> .                                                                                        |
| <i>Tholeiitic</i>                      | A term applied to basic or ultramafic rocks composed predominantly of magnesium rich feldspar and pyroxene minerals.                                                               |
| <i>Thrust fault</i>                    | Reverse fault, defined as a fault on which the principal movement is top block over the bottom block, with a low angle of dip on the fault plane.                                  |
| <i>Tonalite</i>                        | A coarse-grained granitic rock composed of quartz, sodium-calcium feldspar and a high proportion of iron rich minerals.                                                            |
| <i>Transient electromagnetic (TEM)</i> | A geophysical technique whereby transmitted electromagnetic fields are used to energise and detect conductive material beneath the earth's surface.                                |
| <i>trench</i>                          | In geological exploration, a narrow, shallow ditch cut across a mineral deposit to obtain samples or to observe character.                                                         |
| <i>tuff</i>                            | A rock formed of compacted volcanic fragments, generally smaller than 4 millimetres in diameter.                                                                                   |
| <i>unconformity</i>                    | A term applied to a contact between stratigraphic units emplaced in an interrupted succession and not in parallel position.                                                        |
| <i>volcaniclastic</i>                  | Pertaining to clastic rock containing volcanic material.                                                                                                                           |
| <i>volcanic</i>                        | Pertaining to igneous material poured out on the surface of the earth in a molten state and to fragmental material of all sizes erupted from volcanic vents.                       |

*volcanogenic massive  
sulphide ("VMS")*

Mineral deposit formed by the exhalation of sulphide rich solutions and subsequent precipitation of sulphides onto the sea floor surrounding a hydrothermal vent.

*wallrocks*

Rock forming the walls of veins, lodes or igneous intrusions.

*XRD*

X-Ray diffraction technique, whereby the molecular structure of minerals can be measured.

*XRF*

X-ray Refraction, an analytical method using the refractive properties of the sample constituents to X-rays.

*Zn*

Chemical symbol for zinc.

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# Appendix A

## Tenement Schedule

| Tenement ID  | Project Name   | Title Holder | MEMC Equity | Grant Date                | Expiry Date                  | Area (Sq Km) | Statutory Expenditure Commitment* |
|--------------|----------------|--------------|-------------|---------------------------|------------------------------|--------------|-----------------------------------|
| 59 / G       | Tathlith       | MEMC         | 100%        | 5 <sup>th</sup> Oct 2009  | 21 <sup>st</sup> Aug 2013    | 674.954      | 4,175,715.413                     |
| 55 / G       | Turabah – Aqiq | MEMC         | 100%        | 1 <sup>st</sup> Nov 2009  | 17 <sup>th</sup> Sep 2013    | 254.094      | 1,571,994.88                      |
| 56 / G       | Garith         | MEMC         | 100%        | 10 <sup>th</sup> Nov 2009 | 26 <sup>th</sup> Sep 2013    | 363.66       | 2,249,843.2                       |
| 60 / G       | Matran         | MEMC         | 100%        | 10 <sup>th</sup> Nov 2009 | 26 <sup>th</sup> Sep 2013    | 118.664      | 734,134.6133                      |
| 57 / G       | Mutahil        | MEMC         | 100%        | 10 <sup>th</sup> Nov 2009 | 26 <sup>th</sup> Sep 2013    | 68.59        | 424,343.4667                      |
| 58 / G       | Khadra         | MEMC         | 100%        | 10 <sup>th</sup> Nov 2009 | 26 <sup>th</sup> Sep 2013    | 26.092       | 161,422.5067                      |
| 54 / G       | Madha          | MEMC         | 100%        | 10 <sup>th</sup> Nov 2009 | 26 <sup>th</sup> Sep 2013    | 77.22        | 477,734.4                         |
| 46 / G       | Arin           | MEMC         | 100%        | 3 <sup>rd</sup> June 2007 | 9 <sup>th</sup> April 2012** | 98.75        | 808,433.3333                      |
| 45 / G       | Kitnah         | MEMC         | 100%        | 3 <sup>rd</sup> June 2007 | 9 <sup>th</sup> April 2012** | 99.05        | 810,889.3333                      |
| 70 / G       | Ajer           | MEMC         | 100%        | 9 <sup>th</sup> Sep 2008  | 17 <sup>th</sup> July 2013   | 99.76        | 816,701.8667                      |
| 74 / G       | Buwaydah       | MEMC         | 100%        | 9 <sup>th</sup> Sep 2008  | 17 <sup>th</sup> July 2013   | 92.62        | 758,249.0667                      |
| 68 / G       | Harb           | MEMC         | 100%        | 9 <sup>th</sup> Sep 2008  | 17 <sup>th</sup> July 2013   | 10.08        | 82,521.6                          |
| 69 / G       | Miyah          | MEMC         | 100%        | 9 <sup>th</sup> Sep 2008  | 17 <sup>th</sup> July 2013   | 99.83        | 817,274.9333                      |
| 73 / G       | Nabaghah       | MEMC         | 100%        | 9 <sup>th</sup> Sep 2008  | 17 <sup>th</sup> July 2013   | 77.74        | 636,431.4667                      |
| 71 / G       | Silaila        | MEMC         | 100%        | 9 <sup>th</sup> Sep 2008  | 17 <sup>th</sup> July 2013   | 64.43        | 527,466.9333                      |
| 72 / G       | Qubbah         | MEMC         | 100%        | 9 <sup>th</sup> Sep 2008  | 17 <sup>th</sup> July 2013   | 21.64        | 177,159.4667                      |
| -            | Arin MLA       | MEMC         | 100%        | Under application         | NA                           | 50.00        | NA                                |
| -            | Kitnah MLA     | MEMC         | 100%        | Under application         | NA                           | 50.00        | NA                                |
| <b>Total</b> |                |              |             |                           |                              |              | <b>15,230,316</b>                 |

\* Total life of tenement.

\*\* The exploration licences have expired but Mining Licenses were applied for on 28 March 2012 through Mawarid Energy and Mining Company (MMEC)

## Appendix B

### Field Locations

| MEMC Saudi Projects - Coffey Mining Site Visit Waypoints and Sample Locations |              |               |           |            |          |                   |                                                                                                                                                  |
|-------------------------------------------------------------------------------|--------------|---------------|-----------|------------|----------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Tenement                                                                      | Location No. | Prospect      | Easting   | Northing   | UTM Zone | Collected By      | Description                                                                                                                                      |
| Ajer                                                                          | 341          | Jabal Dhaylan | 315049.69 | 2822958.06 | 37       | Paul Mazzoni      | New Gossan East drill collar CO-07                                                                                                               |
| Ajer                                                                          | 342          | Jabal Dhaylan | 315066.95 | 2823057.91 | 37       | Paul Mazzoni      | Trench spoil, gossan with hemimorphite (Rock)                                                                                                    |
| Ajer                                                                          | 343          | Jabal Dhaylan | 315102.43 | 2823139.87 | 37       | Paul Mazzoni      | W dipping interbedded calc sandstone -claystone overlain by calc rudite                                                                          |
| Ajer                                                                          | 344          | Jabal Dhaylan | 314936.83 | 2823027.98 | 37       | Paul Mazzoni      | Calc rudite draped over medium to coarse grained granodiorite                                                                                    |
| Ajer                                                                          | 345          | Jabal Dhaylan | 314938.33 | 2823031.11 | 37       | Paul Mazzoni      | Grey vuggy dolomitised limestone                                                                                                                 |
| Ajer                                                                          | 346          | Jabal Dhaylan | 314829.86 | 2823047.78 | 37       | Paul Mazzoni      | Drillhole collar GOS-41                                                                                                                          |
| Ajer                                                                          | 347          | Jabal Dhaylan | 314753.05 | 2823162.34 | 37       | Paul Mazzoni      | Drillhole collar GOS-03                                                                                                                          |
| Ajer                                                                          | 348          | Jabal Dhaylan | 314778.20 | 2823261.91 | 37       | Paul Mazzoni      | Percussion drillhole spoil: claystone and siltstone with abundant anhydrite fragnepts                                                            |
| Ajer                                                                          | 349          | Jabal Dhaylan | 314785.83 | 2823200.32 | 37       | Paul Mazzoni      | Fe and Mn rich gossan with abundant fine grained hydrozincite and minor hemimorphite                                                             |
| Ajer                                                                          | 350          | Jabal Dhaylan | 314784.83 | 2823177.74 | 37       | Paul Mazzoni      | Drillhole collar GOS-CO-1                                                                                                                        |
| Ajer                                                                          | 351          | Jabal Dhaylan | 314775.41 | 2823216.06 | 37       | Paul Mazzoni      | Windblown sand: concealed drillhole collar GOS-15                                                                                                |
| Ajer                                                                          | 352          | Jabal Dhaylan | 315083.30 | 2825224.34 | 37       | Paul Mazzoni      | JJM3M drill collar CH3                                                                                                                           |
| Ajer                                                                          | 353          | Jabal Dhaylan | 315077.69 | 2825203.68 | 37       | Paul Mazzoni      | JJM3M drill collar not legible. Photo looking NE to Calamine Hill                                                                                |
| Ajer                                                                          | 354          | Jabal Dhaylan | 315080.87 | 2825179.66 | 37       | Paul Mazzoni      | JJM3M drill collar CH17                                                                                                                          |
| Ajer                                                                          | 355          | Jabal Dhaylan | 315082.09 | 2825179.55 | 37       | Paul Mazzoni      | Costean. Photo of banded manganiferous gossan in dolomitised calc rudite                                                                         |
| Ajer                                                                          | 356          | Jabal Dhaylan | 315079.64 | 2825176.60 | 37       | Paul Mazzoni      | Photo looking SW to west dipping manganiferous dolo rudite overlying sandstone/claystone                                                         |
| Ajer                                                                          | 357          | Jabal Dhaylan | 315106.68 | 2825131.24 | 37       | Paul Mazzoni      | JJM3M drill collar CH39. Vuggy carbonate with Mn and hemimorphite, hydrozincite and smithsonite in veins (Rock)                                  |
| Ajer                                                                          | 358          | Jabal Dhaylan | 315132.96 | 2825165.06 | 37       | Paul Mazzoni      | W dipping vuggy dolomite with Mn veins and clots containing hemimorphite overlying interbedded calc sandstone -claystone                         |
| Ajer                                                                          | 359          | Jabal Dhaylan | 315154.26 | 2825146.05 | 37       | Paul Mazzoni      | JJM3M drill collar CH43                                                                                                                          |
| Ajer                                                                          | 360          | Jabal Dhaylan | 315142.72 | 2825167.53 | 37       | Paul Mazzoni      | Photo looking W to W-NW steep dipping manganiferous dolo rudite overlying claystone                                                              |
| Ajer                                                                          | 361          | Jabal Dhaylan | 315139.53 | 2825168.19 | 37       | Paul Mazzoni      | Vuggy dolorudite with abundant bladed hemimorphite and botryoidal hydrozincite(Rock)                                                             |
| Ajer                                                                          | 362          | Jabal Dhaylan | 315147.99 | 2825219.00 | 37       | Paul Mazzoni      | JJM3M drill collar CH40                                                                                                                          |
| Ajer                                                                          | 363          | Jabal Dhaylan | 315183.36 | 2825244.73 | 37       | Paul Mazzoni      | JJM3M drill collar CH30                                                                                                                          |
| Ajer                                                                          | 364          | Jabal Dhaylan | 315165.94 | 2825210.46 | 37       | Paul Mazzoni      | Photo location looking towards WPT363                                                                                                            |
| Ajer                                                                          | 365          | Jabal Dhaylan | 315234.67 | 2825256.42 | 37       | Paul Mazzoni      | Photo NE to coarse grained clayey arkose overlain by red (lateritised?) claystone...(palaeosol)                                                  |
| Ajer                                                                          | 366          | Jabal Dhaylan | 315536.79 | 2825134.32 | 37       | Paul Mazzoni      | Photo location view N to JJM3M                                                                                                                   |
| Ajer                                                                          | 367          | Jabal Dhaylan | 317378.53 | 2821693.28 | 37       | Paul Mazzoni      | JJM-4M drill collar JA25...photo looking SE                                                                                                      |
| Ajer                                                                          | 368          | Jabal Dhaylan | 317380.03 | 2821693.25 | 37       | Paul Mazzoni      | JJM-4M drill collar JA25...photo looking NW                                                                                                      |
| Ajer                                                                          | 369          | Jabal Dhaylan | 317436.79 | 2821634.56 | 37       | Paul Mazzoni      | navigation point                                                                                                                                 |
| Ajer                                                                          | 370          | Jabal Dhaylan | 317451.04 | 2821615.35 | 37       | Paul Mazzoni      | Collar of drillhole JA20 in mineralised Mn dolo rudite with hemimorphite (Rock)                                                                  |
| Ajer                                                                          | 371          | Jabal Dhaylan | 317467.13 | 2821648.45 | 37       | Paul Mazzoni      | Collar of hole JA13                                                                                                                              |
| Ajer                                                                          | JD1          | Jabal Dhaylan | 315081    | 2823092    | 37       | Marian Skwarnecki | outcrop of secondary Zn mineralisation in calcirudite                                                                                            |
| Ajer                                                                          | JD2          | Jabal Dhaylan | 314865    | 2823103    | 37       | Marian Skwarnecki | outcrop of secondary Zn mineralisation in calcirudite                                                                                            |
| Ajer                                                                          | JD3          | Jabal Dhaylan | 314749    | 2823139    | 37       | Marian Skwarnecki | claystone outcrop with gypsum                                                                                                                    |
| Ajer                                                                          | JD4          | Jabal Dhaylan | 314786    | 2823197    | 37       | Marian Skwarnecki | New Gossan West; dark reddish black to yellow ferruginous ± Mn oxides gossan with fine-grained hydrozincite and/or hemimorphite                  |
| Ajer                                                                          | JD5          | Jabal Dhaylan | 315177    | 2825243    | 37       | Marian Skwarnecki | Calamine Hill: sandstone unit overlain by limestones                                                                                             |
| Ajer                                                                          | JD6          | Jabal Dhaylan | 315252    | 2825226    | 37       | Marian Skwarnecki | reddish-brown and yellow clays along trench below mineralised zone                                                                               |
| Ajer                                                                          | JD7          | Jabal Dhaylan | 317448    | 2821622    | 37       | Marian Skwarnecki | outcropping m ineralisation in marble associated with yellow-brown/orange-brown goethitic material (transitional to gossan)                      |
| Arin                                                                          | 177          | Kutam         | 350201.15 | 1946425.17 | 38       | Paul Mazzoni      | navigation point                                                                                                                                 |
| Arin                                                                          | 178          | Kutam         | 350214.02 | 1946439.46 | 38       | Paul Mazzoni      | Kutam drillhole collar KU-18; secondary green Cu staining in ancient workings cross cutting foliation                                            |
| Arin                                                                          | 179          | Kutam         | 350254.68 | 1946407.17 | 38       | Paul Mazzoni      | Green secondary Cu stained quartz sericite schist                                                                                                |
| Arin                                                                          | 180          | Kutam         | 350300.05 | 1946392.45 | 38       | Paul Mazzoni      | Chlorite -quartz-muscovite -garnet schist with thin gossanous quartz veinlets                                                                    |
| Arin                                                                          | 181          | Kutam         | 350356.94 | 1946422.47 | 38       | Paul Mazzoni      | Chlorite --garnet schist in footwall of mineralised zone                                                                                         |
| Arin                                                                          | 182          | Kutam         | 350415.15 | 1946459.19 | 38       | Paul Mazzoni      | quartz-chlorite-biotite-carbonate- garnet schist                                                                                                 |
| Arin                                                                          | 183          | Kutam         | 350464.60 | 1946389.58 | 38       | Paul Mazzoni      | fine grained dark green quartz-chlorite-biotite-garnet metasediment                                                                              |
| Arin                                                                          | 184          | Kutam         | 350353.71 | 1946371.41 | 38       | Paul Mazzoni      | Drillhole collar KA-4                                                                                                                            |
| Arin                                                                          | 185          | Kutam         | 350305.51 | 1946336.60 | 38       | Paul Mazzoni      | sericite-quartz schists locally containing thin gossanous quartz veins and minor malachite                                                       |
| Arin                                                                          | 186          | Kutam         | 350272.58 | 1946369.07 | 38       | Paul Mazzoni      | Drillhole collar KU 32. Narrow selective ancient workings paralle to and cross cutting foliation. Some driven down on steep plunging fold hinges |
| Arin                                                                          | 187          | Kutam         | 350246.06 | 1946390.25 | 38       | Paul Mazzoni      | silica rich boudins in sericite quartz schist                                                                                                    |
| Arin                                                                          | 188          | Kutam         | 350263.73 | 1946400.12 | 38       | Paul Mazzoni      | photo looking N where ancient workings pass under young flat lying cross bedded sandstones                                                       |
| Arin                                                                          | 189          | Kutam         | 350208.20 | 1946385.46 | 38       | Paul Mazzoni      | HW of mineralised zone with quartz veined fine grained sericite- quartz-chlorite-garnet schist                                                   |
| Arin                                                                          | 190          | Kutam         | 350220.81 | 1946289.62 | 38       | Paul Mazzoni      | navigation point                                                                                                                                 |

| Tenement     | Location No. | Prospect | Easting   | Northing   | UTM Zone | Collected By      | Description                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------|--------------|----------|-----------|------------|----------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Arin         | 191          | Kutam    | 350222.36 | 1946288.76 | 38       | Paul Mazzoni      | yellow brown vuggy jasperoidal silica (silcrete?)                                                                                                                                                                                                                                                                                                                                              |
| Arin         | 192          | Kutam    | 350204.96 | 1946261.66 | 38       | Paul Mazzoni      | medium grained mafic intrusive (gabbro - diorite), float of slag (rock)                                                                                                                                                                                                                                                                                                                        |
| Arin         | 193          | Kutam    | 350173.40 | 1946403.59 | 38       | Paul Mazzoni      | fine grained chlorite schist with coarse grained porphyroblastic garnet                                                                                                                                                                                                                                                                                                                        |
| Arin         | 194          | Kutam    | 350132.42 | 1946490.94 | 38       | Paul Mazzoni      | boudinaged 5cm - 15cm quartz veins cross cutting foliation in quartz sericite schist also containing flat lying malachite stained gossanous veinlet exploited by ancient workings                                                                                                                                                                                                              |
| Arin         | 195          | Kutam    | 350168.86 | 1946596.94 | 38       | Paul Mazzoni      | ancient workings focused around tightly folded steep plunging foliation                                                                                                                                                                                                                                                                                                                        |
| Arin         | 196          | Kutam    | 350117.22 | 1946634.02 | 38       | Paul Mazzoni      | north end of eastern line of ancient workings overlain by flat dipping cross bedded young sandstones                                                                                                                                                                                                                                                                                           |
| Arin         | 197          | Kutam    | 350119.75 | 1946631.37 | 38       | Paul Mazzoni      | north end of western line of main ancient workings ; photo looking S                                                                                                                                                                                                                                                                                                                           |
| Arin         | 198          | Kutam    | 350071.79 | 1946723.21 | 38       | Paul Mazzoni      | yellow brown jasperoidal silica with some quartz veins (silcrete?)                                                                                                                                                                                                                                                                                                                             |
| Arin         | 199          | Kutam    | 350011.22 | 1946735.12 | 38       | Paul Mazzoni      | sericite schist and chlorite-quartz-sericite schist with fine grained garnet porphyroblasts and malachite staining                                                                                                                                                                                                                                                                             |
| Arin         | 200          | Kutam    | 349990.94 | 1946754.73 | 38       | Paul Mazzoni      | drill collar KU-16                                                                                                                                                                                                                                                                                                                                                                             |
| Arin         | 201          | Kutam    | 349903.98 | 1946601.96 | 38       | Paul Mazzoni      | HW of mineralised zone with coarse grained (conglomeratic) clastic/volcaniclastic                                                                                                                                                                                                                                                                                                              |
| Arin         | KU1          | Kutam    | 350215    | 1946437    | 38       | Marian Skwarnecki | old working ~1m wide; minor malachite on joints/fractures and along/in discontinuous quartz veinlets; quartz-rich sericite schist; dip 70 to 214; steep lineation down dip; in some zones get thin (<10cm) lensoid siliceous stringers parallel to foliation containing hematite-chlorite/biotite/sericite-malachite-quartz veinlets and local garnet; quartz veinlets may contain chrysocolla |
| Arin         | KU2          | Kutam    | 350081    | 1946471    | 38       | Marian Skwarnecki | weathered chlorite-sericite schist; locally with quartz veinlets                                                                                                                                                                                                                                                                                                                               |
| Arin         | KU3          | Kutam    | 350041    | 1946464    | 38       | Marian Skwarnecki | weathered biotite-amphibole-feldspar rock; locally foliated                                                                                                                                                                                                                                                                                                                                    |
| Arin         | KU4          | Kutam    | 350113    | 1946515    | 38       | Marian Skwarnecki | quartz-sericite schist with minor garnet porphyroblasts and quartz-sericite-chlorite schist with rounded quartz ?clasts and rare garnet porphyroclasts and local quartz veinlets; minor impregnations of malachite; shallow opencut (~3m wide) possibly started on ferruginous zone with quartz veining and locally disseminated sulphides (chalcopyrite-pyrite-?sphalerite)                   |
| Arin         | KU5          | Kutam    | 350234    | 1946637    | 38       | Marian Skwarnecki | unconformity between Proterozoic and Mesozoic; steeply westerly-dipping quartz-rich clastic rock unconformably overlain by subhorizontal thinly bedded (and locally cross-bedded) white sandstone                                                                                                                                                                                              |
| Arin         | KU6          | Kutam    | 350173    | 1946504    | 38       | Marian Skwarnecki | quartz-rich quartz-sericite schist with minor malachite along foliation planes                                                                                                                                                                                                                                                                                                                 |
| Arin         | KU7          | Kutam    | 350241    | 1946411    | 38       | Marian Skwarnecki | old opencut with 3-4 zones of workings 2-5m wide generally along foliation; some underground mining in zones <1m wide; quartz-sericite schist with garnet porphyroblasts and malachite staining on joints and fractures and along foliation planes; mined material was possibly ferruginous and ?silicified with malachite and local relict sulphides                                          |
| Arin         | KU8          | Kutam    | 350283    | 1946433    | 38       | Marian Skwarnecki | sericite-rich hematitic zone up to ~0.5m wide with quartz (mainly on the footwall contact) and ferruginous veinlets and malachite within quartz-sericite schists locally containing malachite                                                                                                                                                                                                  |
| Garith GAR-1 | GA1          | Garith   | 802254    | 2426720    | 37       | Marian Skwarnecki | outcrop of massive and unaltered basalt                                                                                                                                                                                                                                                                                                                                                        |
| Garith GAR-1 | GA10         | Garith   | 802429    | 2426597    | 37       | Marian Skwarnecki | ~1m wide quartz vein trending 130                                                                                                                                                                                                                                                                                                                                                              |
| Garith GAR-1 | GA11         | Garith   | 802440    | 2426585    | 37       | Marian Skwarnecki | ~1m wide quartz vein trending 135                                                                                                                                                                                                                                                                                                                                                              |
| Garith GAR-1 | GA12         | Garith   | 802474    | 2426625    | 37       | Marian Skwarnecki | ~0.3-0.5m wide quartz vein trending 160                                                                                                                                                                                                                                                                                                                                                        |
| Garith GAR-1 | GA13         | Garith   | 802516    | 2426568    | 37       | Marian Skwarnecki | ~0.2m wide quartz vein trending 130                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA14         | Garith   | 802520    | 2426561    | 37       | Marian Skwarnecki | ~0.2m wide quartz vein trending 185                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA15         | Garith   | 802533    | 2426548    | 37       | Marian Skwarnecki | ~0.5m wide quartz vein trending 155                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA16         | Garith   | 802542    | 2426535    | 37       | Marian Skwarnecki | ~0.4-0.5m wide quartz vein trending 170                                                                                                                                                                                                                                                                                                                                                        |
| Garith GAR-1 | GA17         | Garith   | 802561    | 2426500    | 37       | Marian Skwarnecki | at least 1m wide quartz veining trending 090; 140 and 150                                                                                                                                                                                                                                                                                                                                      |
| Garith GAR-1 | GA18         | Garith   | 802581    | 2426488    | 37       | Marian Skwarnecki | ~1.5m wide quartz vein trending 150                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA19         | Garith   | 802592    | 2426467    | 37       | Marian Skwarnecki | ~1m wide quartz vein trending 080                                                                                                                                                                                                                                                                                                                                                              |
| Garith GAR-1 | GA2          | Garith   | 802382    | 2426711    | 37       | Marian Skwarnecki | subcrop of 0.3m wide quartz vein trending ~140                                                                                                                                                                                                                                                                                                                                                 |
| Garith GAR-1 | GA20         | Garith   | 802600    | 2426472    | 37       | Marian Skwarnecki | ~0.3m wide quartz vein trending 130                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA21         | Garith   | 802618    | 2426465    | 37       | Marian Skwarnecki | ~1m wide quartz veiningbtrending 110-130                                                                                                                                                                                                                                                                                                                                                       |
| Garith GAR-1 | GA22         | Garith   | 802638    | 2426463    | 37       | Marian Skwarnecki | ~0.5m wide quartz vein trending 110                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA23         | Garith   | 802647    | 2426462    | 37       | Marian Skwarnecki | ~0.1m wide quartz vein trending 160                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA24         | Garith   | 802676    | 2426528    | 37       | Marian Skwarnecki | ~1m wide quartz veins trending 090 and 150                                                                                                                                                                                                                                                                                                                                                     |
| Garith GAR-1 | GA25         | Garith   | 802652    | 2426540    | 37       | Marian Skwarnecki | ~0.3-1m wide quartz veins trending 110; 010 and possibly 060                                                                                                                                                                                                                                                                                                                                   |
| Garith GAR-1 | GA26         | Garith   | 802564    | 2426620    | 37       | Marian Skwarnecki | ~0.5m wide quartz vein trending 070                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA3          | Garith   | 802403    | 2426687    | 37       | Marian Skwarnecki | ~0.3m wide quartz vein trending 060 and 140                                                                                                                                                                                                                                                                                                                                                    |
| Garith GAR-1 | GA4          | Garith   | 802406    | 2426653    | 37       | Marian Skwarnecki | ~0.3m wide quartz vein trending 160                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA5          | Garith   | 802424    | 2426641    | 37       | Marian Skwarnecki | ~0.3m wide quartz vein trending 140                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA6          | Garith   | 802431    | 2426629    | 37       | Marian Skwarnecki | ~0.5m wide quartz vein trending 140                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA7          | Garith   | 802455    | 2426658    | 37       | Marian Skwarnecki | ~0.3m wide quartz vein trending 150                                                                                                                                                                                                                                                                                                                                                            |
| Garith GAR-1 | GA8          | Garith   | 802447    | 2426691    | 37       | Marian Skwarnecki | zone of qv ~0.5m wide trending 150                                                                                                                                                                                                                                                                                                                                                             |
| Garith GAR-1 | GA9          | Garith   | 802445    | 2426608    | 37       | Marian Skwarnecki | ~0.5m wide quartz vein trending 135                                                                                                                                                                                                                                                                                                                                                            |
| Kitnah       | 203          | Majma    | 394654.03 | 1966589.87 | 38       | Paul Mazzoni      | Majma drill collar MA55                                                                                                                                                                                                                                                                                                                                                                        |
| Kitnah       | 204          | Majma    | 394648.40 | 1966681.76 | 38       | Paul Mazzoni      | Wadi near drill hole MA12                                                                                                                                                                                                                                                                                                                                                                      |

| Tenement | Location No. | Prospect   | Easting   | Northing   | UTM Zone | Collected By      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|--------------|------------|-----------|------------|----------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kitnah   | 205          | Majma      | 394623.07 | 1966678.27 | 38       | Paul Mazzoni      | medium grained felsic intrusive (aplite/pegmatite) with tourmaline and muscovite; hosts quartz stockwork veining; sharp (tectonic?) contact with quartz veined phyllite                                                                                                                                                                                                                                                                                                                     |
| Kitnah   | 206          | Majma      | 394603.09 | 1966694.94 | 38       | Paul Mazzoni      | ~ 1m wide irregular quartz vein breccia zone; trends N-S                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Kitnah   | 207          | Majma      | 394605.50 | 1966717.14 | 38       | Paul Mazzoni      | strongly lenticular 5cm to 35cm quartz breccia vein intruding crenulated cleavage in phyllites (rock)                                                                                                                                                                                                                                                                                                                                                                                       |
| Kitnah   | 208          | Majma      | 394607.64 | 1966686.97 | 38       | Paul Mazzoni      | 4 subparallel 1cm to 3cm thick and 2m to 3m long N_S trending quartz veins in phyllite                                                                                                                                                                                                                                                                                                                                                                                                      |
| Kitnah   | 209          | Majma      | 394594.53 | 1966692.97 | 38       | Paul Mazzoni      | 30cm thick vein quartz (+- carbonate ) breccia, strikes discontinuously S for 20m(rock)                                                                                                                                                                                                                                                                                                                                                                                                     |
| Kitnah   | 210          | Majma      | 394583.37 | 1966695.16 | 38       | Paul Mazzoni      | 5cm to 15cm thick boudinaged quartz veins hosted by calcareous phyllite                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Kitnah   | 211          | Majma      | 394569.09 | 1966694.55 | 38       | Paul Mazzoni      | 1cm to 5cm thick foliation parallel west dipping quartz veins                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Kitnah   | 212          | Majma      | 394605.87 | 1966517.95 | 38       | Paul Mazzoni      | north end of 1m thick gossanous zonenear drillhole MA01 (rock)                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Kitnah   | 213          | Majma      | 394626.83 | 1966379.15 | 38       | Paul Mazzoni      | collar of drillhole MA8                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Kitnah   | 214          | Majma      | 394627.72 | 1966345.80 | 38       | Paul Mazzoni      | irregular quartz veining in schistose metasediment comprising 1cm thick folition parallel veins and <1m thick foliation discordant veins                                                                                                                                                                                                                                                                                                                                                    |
| Kitnah   | 215          | Majma      | 394611.52 | 1966485.11 | 38       | Paul Mazzoni      | restricted exposure of quartz stockwork veinlets in phyllite (rock)                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Kitnah   | 216          | Majma      | 394614.60 | 1966471.20 | 38       | Paul Mazzoni      | boulder of stockwork veined intense silica-carbonate alteration                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Kitnah   | 217          | Majma      | 394605.82 | 1966473.39 | 38       | Paul Mazzoni      | outcrop of quartz (+- carbonate) stockwork veining in phyllite (rock)                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Kitnah   | 218          | Majma      | 394601.53 | 1966469.77 | 38       | Paul Mazzoni      | outcrop of quartz (+- carbonate) stockwork veining in phyllite                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Kitnah   | 219          | Majma      | 394603.59 | 1966453.38 | 38       | Paul Mazzoni      | quartz vein breccia zone up to 2m thick in phyllite/schist (rock)                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Kitnah   | 220          | Majma      | 394580.29 | 1966394.91 | 38       | Paul Mazzoni      | collar of DDH MA56. Zoned quartz-carbonate stringer veins cutting foliation in phyllite                                                                                                                                                                                                                                                                                                                                                                                                     |
| Kitnah   | 221          | Majma      | 394597.75 | 1966380.38 | 38       | Paul Mazzoni      | Ancient workings adjacent to W trending 2cm to 5cm thick gossanous veins cutting foliation in chrysocolla stained schists (rock)                                                                                                                                                                                                                                                                                                                                                            |
| Kitnah   | 222          | Majma      | 394605.47 | 1966372.89 | 38       | Paul Mazzoni      | footwall contact of S dipping, 240° trending gossan zone up to 2m thick adjacent to ancient workings                                                                                                                                                                                                                                                                                                                                                                                        |
| Kitnah   | 223          | Majma      | 394607.82 | 1966365.71 | 38       | Paul Mazzoni      | pinch out of gossanous quartz vein on E limb of tight S plunging fold                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Kitnah   | 224          | Majma      | 394619.98 | 1966286.42 | 38       | Paul Mazzoni      | photo location view N to E dipping, boudinaged stratigraphic unit                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Kitnah   | 225          | Majma      | 394561.04 | 1966258.53 | 38       | Paul Mazzoni      | E dipping 1cm to 3cm quartz -carbonate veins with limonitic alteration selvedge                                                                                                                                                                                                                                                                                                                                                                                                             |
| Kitnah   | 226          | Majma      | 394542.35 | 1966265.15 | 38       | Paul Mazzoni      | boudinaged gently E dipping 5cm to 20cm thick quartz veins                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Kitnah   | 227          | Majma      | 394539.52 | 1966276.50 | 38       | Paul Mazzoni      | Fragmented gossanous quartz carbonate vein..photo                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Kitnah   | 228          | Majma      | 394516.05 | 1966277.89 | 38       | Paul Mazzoni      | Rare gossan float in creek bed...cobble to boulder size                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Kitnah   | 229          | Majma      | 394639.25 | 1965916.35 | 38       | Paul Mazzoni      | collar of drillhole MA41                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Kitnah   | 230          | Majma      | 394663.17 | 1965854.27 | 38       | Paul Mazzoni      | collar of drillhole MA40                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Kitnah   | 231          | Majma      | 394628.85 | 1965845.14 | 38       | Paul Mazzoni      | north end of 4m wide zone of scattered foliation parallel 1cm to 3cm thick quartz veinlets                                                                                                                                                                                                                                                                                                                                                                                                  |
| Kitnah   | 232          | Majma      | 394633.65 | 1965794.30 | 38       | Paul Mazzoni      | north end of 4m wide zone of scattered foliation parallel 1cm to 3cm thick quartz veinlets                                                                                                                                                                                                                                                                                                                                                                                                  |
| Kitnah   | 233          | Majma      | 394626.30 | 1965790.03 | 38       | Paul Mazzoni      | photo waypoint looking N to quartz vein zone on N side of creek                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Kitnah   | M1           | Majma      | 394618    | 1966684    | 38       | Marian Skwarnecki | weathered pale yellow-brown lenticular unit (felsic dyke/pegmatite/aplite: quartz-feldspar-rare ?tourmaline-rare Fe oxides after pyrite) cut by quartz veinlets possibly perpendicular to the trend of the felsic body; alteration (mainly silicification and some carbonate veining) on the upper side of the body extending for about 1.5m from the contact; a relatively narrow zone of veinlets on lower contact; upper contact semi-conformable; lower contact strongly disconformable |
| Kitnah   | M10          | Majma      | 394602    | 1966298    | 38       | Marian Skwarnecki | weathered quartz-sericite schists with quartz veinlets and carbonate alteration; a more schistose zone with hematite-goethite-silicification-?tourmaline dipping 60 to 040 on footwall side of more competent unit with ladder veining perpendicular to contact                                                                                                                                                                                                                             |
| Kitnah   | M2           | Majma      | 394611    | 1966502    | 38       | Marian Skwarnecki | weakly ferruginous (after carbonate) zone of quartz veining                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Kitnah   | M3           | Majma      | 394616    | 1966371    | 38       | Marian Skwarnecki | strongly deformed (kinked) quartz-sericite schist generally dipping E; kinks plunge 20 to 336; strongly weathered schist and quartz-carbonate pod on uphill side                                                                                                                                                                                                                                                                                                                            |
| Kitnah   | M4           | Majma      | 394614    | 1966367    | 38       | Marian Skwarnecki | strongly deformed (kinked) quartz-sericite schist; dips 75 to 070; kink bands plunge 26 to 330                                                                                                                                                                                                                                                                                                                                                                                              |
| Kitnah   | M5           | Majma      | 394607    | 1966365    | 38       | Marian Skwarnecki | crenulated schist with quartz and quartz-carbonate boudins; general dip ~45E; plunge of crenulations 10 to 030; a thin band of chloritic schist present                                                                                                                                                                                                                                                                                                                                     |
| Kitnah   | M6           | Majma      | 394606    | 1966373    | 38       | Marian Skwarnecki | closure of pod of zone of quartz-carbonate veining and boudins locally with intercalations of silicified quartz-sericite schist dipping 28 to 106                                                                                                                                                                                                                                                                                                                                           |
| Kitnah   | M7           | Majma      | 394596    | 1966382    | 38       | Marian Skwarnecki | old working trending 240; minor malachite on spoil; host rock appears to be chloritic schist dipping 30 to 070                                                                                                                                                                                                                                                                                                                                                                              |
| Kitnah   | M8           | Majma      | 394582    | 1966396    | 38       | Marian Skwarnecki | silicified quartz-sericite schits with quartz veinlets dipping 55 to 112                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Kitnah   | M9           | Majma      | 394556    | 1966208    | 38       | Marian Skwarnecki | chloritic schists dipping 60 to 060 with local quartz+carbonate veinlets within foliation                                                                                                                                                                                                                                                                                                                                                                                                   |
| Miyah    | AN1          | An Nahdayn | 264221    | 2896492    | 37       | Marian Skwarnecki | silicified chloritic schists dipping 50 to 063; stretching lineation 10 to 150                                                                                                                                                                                                                                                                                                                                                                                                              |
| Miyah    | AN2          | An Nahdayn | 264218    | 2896494    | 37       | Marian Skwarnecki | white quartz vein (~2m wide) trending 40 to 080 cross-cutting schist; vein pinches out along strike and down-dip; host rock is chlorite+sericite schist locally with quartz boudins                                                                                                                                                                                                                                                                                                         |
| Miyah    | AN3          | An Nahdayn | 264213    | 2896514    | 37       | Marian Skwarnecki | narrow (<1m wide) digging along contact between quartz vein (45 to 113) and quartz-chlorite schist (40 to 050); quartz vein locally vuggy with partial euhedral quartz crystals                                                                                                                                                                                                                                                                                                             |
| Miyah    | AN4          | An Nahdayn | 264232    | 2896521    | 37       | Marian Skwarnecki | old working; narrow quartz veinlets in schist in footwall to main quartz vein; somewhat irregular quartz veinlets trend 230 (3-4mm) and 260 (~5cm); wallrock is sheared and silicified with some development of carbonate                                                                                                                                                                                                                                                                   |
| Miyah    | AN5          | An Nahdayn | 264231    | 2896528    | 37       | Marian Skwarnecki | weathered siliceous schist (80 to 054); two cleavages: 70 to 060 and 50 to 060                                                                                                                                                                                                                                                                                                                                                                                                              |
| Miyah    | AN6          | An Nahdayn | 264265    | 2896524    | 37       | Marian Skwarnecki | old working; inclined shaft in footwall of quartz vein                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Miyah    | AN7          | An Nahdayn | 264248    | 2896524    | 37       | Marian Skwarnecki | old shallow opencut largely along hangingwall of massive quartz vein in silicified schist with white quartz veining (2mm-15cm; trending 200) related to a bend in the quartz vein or the junction of two separate veins; the quartz veining trends 200 and 290; two cleavages: 80 to 050 and 48 to 090                                                                                                                                                                                      |

| Tenement        | Location No. | Prospect     | Easting   | Northing   | UTM Zone | Collected By      | Description                                                                                                                                                                                                                                                                                                                  |
|-----------------|--------------|--------------|-----------|------------|----------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Miyah           | ANF1         | Abu Nafilah  | 262577    | 2901868    | 37       | Marian Skwarnecki | old working to at 5m depth along zone of quartz veining trending 070                                                                                                                                                                                                                                                         |
| Miyah           | ANF10        | Abu Nafilah  | 262211    | 2901784    | 37       | Marian Skwarnecki | shallow surface scrapings along zone of quartz veining trending: 220; 200, 120 and 090; 200-220 set is dominant; veining varies in width - up to ~2,5m                                                                                                                                                                       |
| Miyah           | ANF11        | Abu Nafilah  | 262250    | 2901824    | 37       | Marian Skwarnecki | old workings trending ~080 and ~190 at termination; workings possibly along quartz veining and are up to ~1m wide; some quartz splays into hangingwall of main vein                                                                                                                                                          |
| Miyah           | ANF2         | Abu Nafilah  | 262598    | 2901877    | 37       | Marian Skwarnecki | old working along quartz veining                                                                                                                                                                                                                                                                                             |
| Miyah           | ANF3         | Abu Nafilah  | 262625    | 2901869    | 37       | Marian Skwarnecki | silicified zone with carbonate alteration in hangingwall of main quartz vein trending ~100                                                                                                                                                                                                                                   |
| Miyah           | ANF4         | Abu Nafilah  | 262619    | 2901873    | 37       | Marian Skwarnecki | old working along footwall of quartz vein trending ~100; between ANF3 and 4 - the vein has been mined only intermittently                                                                                                                                                                                                    |
| Miyah           | ANF5         | Abu Nafilah  | 262640    | 2901859    | 37       | Marian Skwarnecki | silicified and carbonate-altered schist - 65 to 070; schist is cut by veinlets generally <1cm trending 290, 350 and 090                                                                                                                                                                                                      |
| Miyah           | ANF6         | Abu Nafilah  | 262627    | 2901875    | 37       | Marian Skwarnecki | unaltered pale grey-green undeformed and massive siliceous rock comprising rounded quartz grains in a mtrix of chlorite; minor fine-grained opaques                                                                                                                                                                          |
| Miyah           | ANF7         | Abu Nafilah  | 262556    | 2901861    | 37       | Marian Skwarnecki | line of old workings along a quartz vein curving to the S at one end; mined material is either the quartz vein or along the footwall of the vein (or possibly an internal zone within the vein)                                                                                                                              |
| Miyah           | ANF8         | Abu Nafilah  | 262308    | 2901837    | 37       | Marian Skwarnecki | old working following quartz vein (80 to 030); immediate host rock is silicified, is sericitic and contains appreciable carbonate                                                                                                                                                                                            |
| Miyah           | ANF9         | Abu Nafilah  | 262320    | 2901832    | 37       | Marian Skwarnecki | splay off the main zone of quartz veining trending ~070; host rocks strike 335 and dip 80NE                                                                                                                                                                                                                                  |
| Miyah           | T1           | Tefel        | 263918    | 2897344    | 37       | Marian Skwarnecki | subvertical massive quartz vein trending ~310; several subparallel veins extend for about 500m along strike and 150-200m across strike - some veins at the periphery are small; fissile quartz-sericite-chlorite schists 60 to 040                                                                                           |
| Qubbah          | 372          | Qubbah       | 259788.47 | 2921280.74 | 37       | Paul Mazzoni      | outcrop of coarse grained gabbro-diorite                                                                                                                                                                                                                                                                                     |
| Qubbah          | 373          | Qubbah       | 259747.40 | 2921272.01 | 37       | Paul Mazzoni      | drillhole collar QUB5                                                                                                                                                                                                                                                                                                        |
| Qubbah          | 374          | Qubbah       | 259748.21 | 2921250.13 | 37       | Paul Mazzoni      | 2cm to 5cm thick, 060 trending SE dipping quartz vein (rock)                                                                                                                                                                                                                                                                 |
| Qubbah          | 375          | Qubbah       | 259754.91 | 2921261.82 | 37       | Paul Mazzoni      | photo waypoint looking eastwards to S dipping ancient workings                                                                                                                                                                                                                                                               |
| Qubbah          | 376          | Qubbah       | 259760.97 | 2921296.94 | 37       | Paul Mazzoni      | ancient workings with 1cm to 3cm thick quartz veins in hematite stained partly sheared gabbro. Trends 030, dips 65 SE                                                                                                                                                                                                        |
| Qubbah          | 377          | Qubbah       | 259762.07 | 2921298.81 | 37       | Paul Mazzoni      | ancient workings with 2cm thick quartz veins in hematite stained partly sheared gabbro. E-W strike steep S dip (rock)                                                                                                                                                                                                        |
| Qubbah          | 378          | Qubbah       | 259760.54 | 2921298.45 | 37       | Paul Mazzoni      | trench trending ~ 260                                                                                                                                                                                                                                                                                                        |
| Qubbah          | 379          | Qubbah       | 259708.58 | 2921307.57 | 37       | Paul Mazzoni      | trench in locally sheared gabbro with mnor quartz vein spoil                                                                                                                                                                                                                                                                 |
| Qubbah          | 380          | Qubbah       | 259707.14 | 2921307.54 | 37       | Paul Mazzoni      | trench in locally sheared gabbro                                                                                                                                                                                                                                                                                             |
| Qubbah          | 381          | Qubbah       | 259688.07 | 2921277.70 | 37       | Paul Mazzoni      | ancient workings in locally sheared gabbro                                                                                                                                                                                                                                                                                   |
| Qubbah          | 382          | Qubbah       | 259675.63 | 2921266.90 | 37       | Paul Mazzoni      | drillhole collar Hole 3                                                                                                                                                                                                                                                                                                      |
| Qubbah          | 383          | Qubbah       | 259674.83 | 2921264.28 | 37       | Paul Mazzoni      | drillhole collar Hole 3                                                                                                                                                                                                                                                                                                      |
| Qubbah          | 384          | Qubbah       | 259640.99 | 2921272.57 | 37       | Paul Mazzoni      | 250 trending trench                                                                                                                                                                                                                                                                                                          |
| Qubbah          | 385          | Qubbah       | 259623.06 | 2921259.48 | 37       | Paul Mazzoni      | 250 trending trench                                                                                                                                                                                                                                                                                                          |
| Qubbah          | 386          | Qubbah       | 259625.54 | 2921229.20 | 37       | Paul Mazzoni      | planned drillhole pad QB11 with network of thin quartz veinlets exposed in pad wall                                                                                                                                                                                                                                          |
| Qubbah          | 387          | Qubbah       | 259508.09 | 2921198.68 | 37       | Paul Mazzoni      | new drill pad, 200 striking 65 E dipping 2cm thick quartz vein with hematite alteration hosted by gabbro-diorite                                                                                                                                                                                                             |
| Qubbah          | 388          | Qubbah       | 259564.79 | 2921186.74 | 37       | Paul Mazzoni      | hill top photo waypoint view west to waypoint 387                                                                                                                                                                                                                                                                            |
| Qubbah          | 389          | Qubbah       | 259662.70 | 2921233.11 | 37       | Paul Mazzoni      | trench with metal sample tag number 559377                                                                                                                                                                                                                                                                                   |
| Qubbah          | 390          | Qubbah       | 259719.14 | 2921225.42 | 37       | Paul Mazzoni      | 4cm quartz vein in trench                                                                                                                                                                                                                                                                                                    |
| Qubbah          | 391          | Qubbah       | 259731.77 | 2921237.30 | 37       | Paul Mazzoni      | 4cm quartz vein in trench                                                                                                                                                                                                                                                                                                    |
| Qubbah          | 392          | Qubbah       | 259738.38 | 2921238.71 | 37       | Paul Mazzoni      | collar of drillhole QUB-01                                                                                                                                                                                                                                                                                                   |
| Qubbah          | 393          | Qubbah       | 259768.55 | 2921204.94 | 37       | Paul Mazzoni      | hornfelsic fine grained metasediments (mudstone) with chlorite fracture veinlets.                                                                                                                                                                                                                                            |
| Qubbah          | Q1           | Qubbah       | 259787    | 2921280    | 37       | Marian Skwarnecki | weathered slightly melanocratic granitic rock (feldspar, biotite, minor quartz)                                                                                                                                                                                                                                              |
| Qubbah          | Q2           | Qubbah       | 259759    | 2921295    | 37       | Marian Skwarnecki | recent working following thin (1-2cm) quartz veinlets (some with thin alteration selvedges comprising 'rotten' granite with some goethite/hematite surrounded by slightly silicified and reddened granite)' individual zones of alteration and veining ~1m wide; quartz veinlets: 70 to 120; 70 to 190; 50 to 060; 60 to 130 |
| Qubbah          | Q3           | Qubbah       | 259703    | 2921306    | 37       | Marian Skwarnecki | feldspar-biotite-amphibole rock along edge of old working trending 070                                                                                                                                                                                                                                                       |
| Qubbah          | Q4           | Qubbah       | 259674    | 2921258    | 37       | Marian Skwarnecki | quartz veinlet (~1-2cm wide) associated with weak silicification and hematite in irregular zone (~1-10cm) in hangingwall; 45 to 200; host rock is microfractured ?diorite                                                                                                                                                    |
| Qubbah          | Q5           | Qubbah       | 259581    | 2921303    | 37       | Marian Skwarnecki | subvertical aplite dyke trending ~030; contains disseminated Fe oxides after pyrite                                                                                                                                                                                                                                          |
| Qubbah          | Q6           | Qubbah       | 259596    | 2921176    | 37       | Marian Skwarnecki | dioritic rock with minor quartz veinlets (<0.5cm thick) along microfractures                                                                                                                                                                                                                                                 |
| Qubbah          | Q7           | Qubbah       | 259601    | 2921149    | 37       | Marian Skwarnecki | shallow old excavation on weathered diorite with quartz veinlets along microfractures                                                                                                                                                                                                                                        |
| Qubbah          | Q8           | Qubbah       | 259644    | 2921133    | 37       | Marian Skwarnecki | old working into hillside following quartz veinlets with reddened zones of silicification; 5-6 zones of alteration gebnerally <20cm thick occur                                                                                                                                                                              |
| Qubbah          | Q9           | Qubbah       | 259854    | 2921116    | 37       | Marian Skwarnecki | weathered granitic rock (quartz-feldspar-biotite)                                                                                                                                                                                                                                                                            |
| Tathilith TTH-1 | 239          | Gariat Avala | 362144.65 | 2175151.57 | 38       | Paul Mazzoni      | drillhole collar CO-04                                                                                                                                                                                                                                                                                                       |
| Tathilith TTH-1 | 240          | Gariat Avala | 362188.45 | 2175160.92 | 38       | Paul Mazzoni      | photo waypoint looking NE to ancient workings near bucky quartz reef at wpt241                                                                                                                                                                                                                                               |
| Tathilith TTH-1 | 241          | Gariat Avala | 362207.81 | 2175167.88 | 38       | Paul Mazzoni      | 2m thick white quartz reef with 2m wide carbonate (+- sericite) alteration zone, ancient workings on margin                                                                                                                                                                                                                  |
| Tathilith TTH-1 | 242          | Gariat Avala | 362220.59 | 2175192.51 | 38       | Paul Mazzoni      | 1m thick E dipping white quartz reef with carbonate (+- sericite) alteration zone, ancient workings on HW (east) margin                                                                                                                                                                                                      |
| Tathilith TTH-1 | 243          | Gariat Avala | 362221.82 | 2175191.80 | 38       | Paul Mazzoni      | 1m thick E dipping white quartz reef with carbonate (+- sericite) alteration zone, ancient workings on HW (east) margin                                                                                                                                                                                                      |
| Tathilith TTH-1 | 244          | Gariat Avala | 362222.10 | 2175210.92 | 38       | Paul Mazzoni      | 15cm thick E dipping white quartz reef with carbonate (+- sericite) alteration zone, numerous thin W diping quartz stringer veins on HW (east) margin                                                                                                                                                                        |
| Tathilith TTH-1 | 245          | Gariat Avala | 362226.63 | 2175229.61 | 38       | Paul Mazzoni      | sigmoidal tension gash quartz vein in strongly altered mafic. Photo looking E down line of drilling (AVL CO-2, 7 and 12)                                                                                                                                                                                                     |

| Tenement           | Location No. | Prospect     | Easting   | Northing   | UTM Zone | Collected By      | Description                                                                                                                                                                                                                                                                                       |
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| Tathilith TTH-1    | 246          | Gariat Avala | 362228.88 | 2175255.97 | 38       | Paul Mazzoni      | SGS rock sample site 908/909. photolooking NW to drillhole AVL CO-09                                                                                                                                                                                                                              |
| Tathilith TTH-1    | 247          | Gariat Avala | 362225.16 | 2175256.03 | 38       | Paul Mazzoni      | SGS rock sample site 908/909. photolooking NW to drillhole AVL CO-09                                                                                                                                                                                                                              |
| Tathilith TTH-1    | 248          | Gariat Avala | 362257.06 | 2175151.86 | 38       | Paul Mazzoni      | drillhole collar AVL CO-01                                                                                                                                                                                                                                                                        |
| Tathilith TTH-1    | GR1          | Gariat Avala | 362230    | 2175198    | 38       | Marian Skwarnecki | on edge of quartz vein; weathered gabbro with zones of grey quartz breccia in quartz-epidote rock or in pink porphyry; locally with disseminated Fe oxide after pyrite; porphyry mostly in the footwall; coarse-grained euhedral quartz in quartz-epidote rock close to contact with gabbro dyke  |
| Tathilith TTH-3    | 272          | Bir Cananah  | 322129.99 | 2196141.22 | 38       | Paul Mazzoni      | navigation waypoint..driver lost..~4km north of prospect...extensive outcrop.                                                                                                                                                                                                                     |
| Tathilith TTH-4    | 251          | Lugatah      | 337277.29 | 2173807.78 | 38       | Paul Mazzoni      | drillhole collar LUG 24                                                                                                                                                                                                                                                                           |
| Tathilith TTH-4    | 252          | Lugatah      | 337275.33 | 2173805.74 | 38       | Paul Mazzoni      | drillhole collar LUG 24 repeat waypoint                                                                                                                                                                                                                                                           |
| Tathilith TTH-4    | 253          | Lugatah      | 337309.50 | 2173753.94 | 38       | Paul Mazzoni      | drillhole collar LUG CO 04                                                                                                                                                                                                                                                                        |
| Tathilith TTH-4    | 254          | Lugatah      | 337293.99 | 2173653.87 | 38       | Paul Mazzoni      | end of trench TR6                                                                                                                                                                                                                                                                                 |
| Tathilith TTH-4    | 255          | Lugatah      | 337337.84 | 2173645.25 | 38       | Paul Mazzoni      | above hole CO-03, W dipping 2m -3m thick quartz reef in sheared metasediments/ metavolcaniclastics (rock)                                                                                                                                                                                         |
| Tathilith TTH-4    | 256          | Lugatah      | 337343.45 | 2173613.78 | 38       | Paul Mazzoni      | gently west dipping 2m-3m thick quartz vein                                                                                                                                                                                                                                                       |
| Tathilith TTH-4    | 257          | Lugatah      | 337357.62 | 2173586.48 | 38       | Paul Mazzoni      | subvertical to steep E dipping 2m -3m wide zone of epidote - carbonate clay alteration with quartz vienlet swarm                                                                                                                                                                                  |
| Tathilith TTH-4    | 258          | Lugatah      | 337347.51 | 2173542.33 | 38       | Paul Mazzoni      | ancient workings in stringer quartz veinlets in FW of main W dipping quartz reef.                                                                                                                                                                                                                 |
| Tathilith TTH-4    | 259          | Lugatah      | 337341.53 | 2173531.31 | 38       | Paul Mazzoni      | small deep shaft in 1m wide quartz vein                                                                                                                                                                                                                                                           |
| Tathilith TTH-4    | 260          | Lugatah      | 337332.43 | 2173554.05 | 38       | Paul Mazzoni      | photo waypoint, view N to ancient workings in vein swarm in FW of W dipping 2-3m thick quartz reef.                                                                                                                                                                                               |
| Tathilith TTH-4    | 261          | Lugatah      | 337323.14 | 2173954.60 | 38       | Paul Mazzoni      | new drill pad in feldspar phyrice fine to medium grained mafic intrusive, panoramic photos over whole prospect                                                                                                                                                                                    |
| Tathilith TTH-4    | 262          | Lugatah      | 337321.82 | 2174006.71 | 38       | Paul Mazzoni      | feldspar phyrice, fine grained mafic intrusive, drillhole collar SGS hole LUG CO-07                                                                                                                                                                                                               |
| Tathilith TTH-4    | 263          | Lugatah      | 337336.41 | 2174007.68 | 38       | Paul Mazzoni      | intense shearing with strong foliation developed in altered mafic                                                                                                                                                                                                                                 |
| Tathilith TTH-4    | 264          | Lugatah      | 337387.31 | 2174005.66 | 38       | Paul Mazzoni      | quartz vein exposed on edge of trench (eastern end of trench)                                                                                                                                                                                                                                     |
| Tathilith TTH-4    | 265          | Lugatah      | 337356.70 | 2174005.74 | 38       | Paul Mazzoni      | quartz vein exposed in trench                                                                                                                                                                                                                                                                     |
| Tathilith TTH-4    | 266          | Lugatah      | 337405.40 | 2174007.10 | 38       | Paul Mazzoni      | quartz vein exposed in western end of trench (rock)                                                                                                                                                                                                                                               |
| Tathilith TTH-4    | 267          | Lugatah      | 337407.38 | 2173998.92 | 38       | Paul Mazzoni      | sheared unaltered mafic                                                                                                                                                                                                                                                                           |
| Tathilith TTH-4    | 268          | Lugatah      | 337386.81 | 2173973.66 | 38       | Paul Mazzoni      | old decline into E dipping 1cm-5cm thick quartz vein swarm (rock)                                                                                                                                                                                                                                 |
| Tathilith TTH-4    | 269          | Lugatah      | 337397.94 | 2173944.97 | 38       | Paul Mazzoni      | south plunging folded 20cm thick quartz vein (rock)                                                                                                                                                                                                                                               |
| Tathilith TTH-4    | 270          | Lugatah      | 337376.60 | 2173947.81 | 38       | Paul Mazzoni      | large irregular gnetly W dipping quartz breccia mass in ancient workings with quartz vein stringer zone in epidote altered FW (rock: 270 main vein, 270b FQ stringer veins)                                                                                                                       |
| Tathilith TTH-4    | 271          | Lugatah      | 337385.39 | 2173897.35 | 38       | Paul Mazzoni      | historical rock chip sampling point in quartz reef.                                                                                                                                                                                                                                               |
| Tathilith TTH-4    | L1           | Lugatah      | 337268    | 2173535    | 38       | Marian Skwarnecki | finely foliated quartz-chlorite schist dipping 65 to 275; locally with lenses of carbonate within foliation                                                                                                                                                                                       |
| Tathilith TTH-4    | L12          | Lugatah      | 337312    | 2174010    | 38       | Marian Skwarnecki | contact between schist and dark grey-green feldspar-phyric porphyry                                                                                                                                                                                                                               |
| Tathilith TTH-4    | L13          | Lugatah      | 337377    | 2174007    | 38       | Marian Skwarnecki | gradational contact between sheared and unsheared feldspar-phyric porphyry; grades laterally into weathered sheared carbonate altered porphyry                                                                                                                                                    |
| Tathilith TTH-4    | L14          | Lugatah      | 337321    | 2174006    | 38       | Marian Skwarnecki | weathered feldspar-phyric porphyry                                                                                                                                                                                                                                                                |
| Tathilith TTH-4    | L15          | Lugatah      | 337330    | 2174003    | 38       | Marian Skwarnecki | sheared porphyry; some silicification-carbonate spotting-development of biotite                                                                                                                                                                                                                   |
| Tathilith TTH-4    | L16          | Lugatah      | 337347    | 2173996    | 38       | Marian Skwarnecki | start of quartz-rich rubble and boulder lag                                                                                                                                                                                                                                                       |
| Tathilith TTH-4    | L17          | Lugatah      | 337353    | 2173995    | 38       | Marian Skwarnecki | weathered chloritic schist with quartz veinlets                                                                                                                                                                                                                                                   |
| Tathilith TTH-4    | L18          | Lugatah      | 337361    | 2173998    | 38       | Marian Skwarnecki | weathered chlorite-quartz schist with carbonate alteration                                                                                                                                                                                                                                        |
| Tathilith TTH-4    | L19          | Lugatah      | 337371    | 2174002    | 38       | Marian Skwarnecki | weathered chlorite-quartz schist with carbonate alteration                                                                                                                                                                                                                                        |
| Tathilith TTH-4    | L2           | Lugatah      | 337335    | 2173556    | 38       | Marian Skwarnecki | old working trending ~100 apparently along a zone of veining and alteration along the footwall of a more massive zone of quartz veining; the mined zone extends discordantly laterally into silicified quartz-veined epidotic country rock (dipping 20W) below the zone of massive quartz veining |
| Tathilith TTH-4    | L20          | Lugatah      | 337384    | 2174004    | 38       | Marian Skwarnecki | edge of quartz veining and epidote alteration in chloritic schist; extensive quartz veinlets grading into more massive veining                                                                                                                                                                    |
| Tathilith TTH-4    | L21          | Lugatah      | 337394    | 2174007    | 38       | Marian Skwarnecki | chlorite-quartz schist                                                                                                                                                                                                                                                                            |
| Tathilith TTH-4    | L22          | Lugatah      | 337450    | 2174005    | 38       | Marian Skwarnecki | edge of zone of massive quartz veining; associated with massive relatively silicified schist locally with quartz veinlets                                                                                                                                                                         |
| Tathilith TTH-4    | L23          | Lugatah      | 337426    | 2173998    | 38       | Marian Skwarnecki | slightly silicified chloritic schist with minor quartz veining                                                                                                                                                                                                                                    |
| Tathilith TTH-4    | L3           | Lugatah      | 337349    | 2173543    | 38       | Marian Skwarnecki | at crest of ridge above the old workings; strongly silicified host rock; quartz veining associated with epidote and minor carbonate alteration                                                                                                                                                    |
| Tathilith TTH-4    | L4           | Lugatah      | 337338    | 2173485    | 38       | Marian Skwarnecki | chlorite-quartz schist with carbonate spots and minor veinlets containing thin and slightly irregular porphyry dykes oriented slightly discordantly to foliation                                                                                                                                  |
| Tathilith TTH-4    | L5           | Lugatah      | 337313    | 2173487    | 38       | Marian Skwarnecki | thin zone of quartz veining and silicification with traces of epidote alteration in porphyry                                                                                                                                                                                                      |
| Tathilith TTH-4    | L6           | Lugatah      | 337265    | 2173459    | 38       | Marian Skwarnecki | old trench; narrow zone (<0.5m) of weathered porphyry in chloritic schists                                                                                                                                                                                                                        |
| Tathilith TTH-4    | L7           | Lugatah      | 337252    | 2173991    | 38       | Marian Skwarnecki | contact between dark grey porphyry with quartz-feldspar-amphibole phenocrysts and green metasedimentary rock (?siltstone)                                                                                                                                                                         |
| Tathilith TTH-4    | L8           | Lugatah      | 337264    | 2173997    | 38       | Marian Skwarnecki | edge of shear zone; chlorite-quartz±amphibole schist (sheared porphyry)                                                                                                                                                                                                                           |
| Tathilith TTH-4    | L9           | Lugatah      | 337271    | 2174001    | 38       | Marian Skwarnecki | sheared and silicified metasedimentary rock                                                                                                                                                                                                                                                       |
| Turabah-Aqiq TBA-1 | 278          | Aqiq Ghamid  | 780188.26 | 2251837.81 | 37       | Paul Mazzoni      | navigation waypoint..photos looking S to trench 16                                                                                                                                                                                                                                                |
| Turabah-Aqiq TBA-1 | 279          | Aqiq Ghamid  | 780215.74 | 2251633.56 | 37       | Paul Mazzoni      | collar of drillhole M24-RC13                                                                                                                                                                                                                                                                      |
| Turabah-Aqiq TBA-1 | 280          | Aqiq Ghamid  | 780255.37 | 2251611.73 | 37       | Paul Mazzoni      | trench T16, filled in. Quartz vein spoil from trench on surface (rock)                                                                                                                                                                                                                            |
| Turabah-Aqiq TBA-1 | 281          | Aqiq Ghamid  | 780227.32 | 2251452.12 | 37       | Paul Mazzoni      | collar of drillhole M24-RC09, chips of granodirite and vein quartz                                                                                                                                                                                                                                |

| Tenement           | Location No. | Prospect    | Easting   | Northing   | UTM Zone | Collected By      | Description                                                                                                                                                                                                                                                                            |
|--------------------|--------------|-------------|-----------|------------|----------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Turabah-Aqiq TBA-1 | 282          | Aqiq Ghamid | 780230.88 | 2251475.59 | 37       | Paul Mazzoni      | west end of "posthole" drill traverse, phot looking E down line.                                                                                                                                                                                                                       |
| Turabah-Aqiq TBA-1 | 283          | Aqiq Ghamid | 780057.29 | 2251416.90 | 37       | Paul Mazzoni      | collar of drillhole M24-RC11, chips of chlotitised biotite granodirite with disseminated pyrite and minor vein quartz                                                                                                                                                                  |
| Turabah-Aqiq TBA-1 | 284          | Aqiq Ghamid | 780207.22 | 2251403.92 | 37       | Paul Mazzoni      | rehabilitated trench                                                                                                                                                                                                                                                                   |
| Turabah-Aqiq TBA-1 | 285          | Aqiq Ghamid | 780302.66 | 2251697.73 | 37       | Paul Mazzoni      | uncertain location of hole RC15, site totally disturbed by bulldozing                                                                                                                                                                                                                  |
| Turabah-Aqiq TBA-1 | 286          | Aqiq Ghamid | 780305.35 | 2251720.48 | 37       | Paul Mazzoni      | trench TR14 with spoil of blue and white quartz vein (rock 286b white quartz, 286 blue quartz)                                                                                                                                                                                         |
| Turabah-Aqiq TBA-1 | 287          | Aqiq Ghamid | 780454.83 | 2251970.18 | 37       | Paul Mazzoni      | collar of drillhole M24-RC02                                                                                                                                                                                                                                                           |
| Turabah-Aqiq TBA-1 | 288          | Aqiq Ghamid | 780486.13 | 2251934.44 | 37       | Paul Mazzoni      | collar of drillhole M24-RC03, chips of altered granodiorite with disseminated pyrite and minor vein quartz                                                                                                                                                                             |
| Turabah-Aqiq TBA-1 | 289          | Aqiq Ghamid | 780467.79 | 2251927.16 | 37       | Paul Mazzoni      | laminated quartz vein spoil from rehabilitated trench (rock)                                                                                                                                                                                                                           |
| Turabah-Aqiq TBA-1 | 290          | Aqiq Ghamid | 780318.75 | 2251895.77 | 37       | Paul Mazzoni      | ancient village wall                                                                                                                                                                                                                                                                   |
| Turabah-Aqiq TBA-1 | 291          | Aqiq Ghamid | 780339.67 | 2251982.04 | 37       | Paul Mazzoni      | lenticular to boudinaged 2cm to 10cm thick quartz veins strike 070 dip 85S                                                                                                                                                                                                             |
| Turabah-Aqiq TBA-1 | 292          | Aqiq Ghamid | 780347.93 | 2251984.82 | 37       | Paul Mazzoni      | lenticular to boudinaged 2cm to 10cm thick quartz veins in sheared granodiorite                                                                                                                                                                                                        |
| Turabah-Aqiq TBA-1 | 293          | Aqiq Ghamid | 780217.99 | 2251851.57 | 37       | Paul Mazzoni      | ancient workings on W side of ancient village                                                                                                                                                                                                                                          |
| Turabah-Aqiq TBA-1 | 294          | Aqiq Ghamid | 780215.86 | 2251861.87 | 37       | Paul Mazzoni      | main line of deep workings trending 268-272                                                                                                                                                                                                                                            |
| Turabah-Aqiq TBA-1 | 295          | Aqiq Ghamid | 780185.49 | 2251861.94 | 37       | Paul Mazzoni      | 15cm to 30cm thick 270 trending quartz vein in main workings                                                                                                                                                                                                                           |
| Turabah-Aqiq TBA-1 | 296          | Aqiq Ghamid | 780352.57 | 2252281.63 | 37       | Paul Mazzoni      | west end of trench T18, schistose metasediments and meta mafics                                                                                                                                                                                                                        |
| Turabah-Aqiq TBA-1 | 297          | Aqiq Ghamid | 780374.43 | 2252258.33 | 37       | Paul Mazzoni      | 10m wide zone of 4 or 5 thin foliaton parallel quatrz veins in schistise metasediments                                                                                                                                                                                                 |
| Turabah-Aqiq TBA-1 | 298          | Aqiq Ghamid | 780400.06 | 2252248.39 | 37       | Paul Mazzoni      | east end of trench T18, schistose metasediments and meta mafics with thin laminated quartz vein float                                                                                                                                                                                  |
| Turabah-Aqiq TBA-1 | 299          | Aqiq Ghamid | 780366.95 | 2252293.81 | 37       | Paul Mazzoni      | 5cm to 10cm thick 070 trending quartz vein in granodiorite                                                                                                                                                                                                                             |
| Turabah-Aqiq TBA-1 | 300          | P777        | 780190.08 | 2254538.11 | 37       | Paul Mazzoni      | repeat waypoint , collar of drillhole P777-18 in sheared diorite                                                                                                                                                                                                                       |
| Turabah-Aqiq TBA-1 | 301          | P777        | 780189.10 | 2254537.99 | 37       | Paul Mazzoni      | collar of drillhole P777-18 in sheared diorite                                                                                                                                                                                                                                         |
| Turabah-Aqiq TBA-1 | 302          | P777        | 780193.68 | 2254568.22 | 37       | Paul Mazzoni      | collar of drillhole P777-17 in weakly sheared diorite                                                                                                                                                                                                                                  |
| Turabah-Aqiq TBA-1 | 303          | P777        | 780196.89 | 2254562.28 | 37       | Paul Mazzoni      | 160 trending en echelon array of thin quartz veinlets                                                                                                                                                                                                                                  |
| Turabah-Aqiq TBA-1 | AG1          | Aqiq Ghamid | 780255    | 2251606    | 37       | Marian Skwarnecki | filled-in trench; grey and white quartz veining in weathered sericitic schist and granitoid; veins locally contain minor calcite and black Fe oxide after pyrite; some chlorite along vein selvages                                                                                    |
| Turabah-Aqiq TBA-1 | AG10         | Aqiq Ghamid | 780326    | 2251960    | 37       | Marian Skwarnecki | weakly sheared granitoid                                                                                                                                                                                                                                                               |
| Turabah-Aqiq TBA-1 | AG11         | Aqiq Ghamid | 780312    | 2251965    | 37       | Marian Skwarnecki | weathered sheared granitoid                                                                                                                                                                                                                                                            |
| Turabah-Aqiq TBA-1 | AG12         | Aqiq Ghamid | 780337    | 2251982    | 37       | Marian Skwarnecki | weakly sheared to undeformed weathered granitoid locally with quartz veining (<10cm wide) in a zone ~0.4m wide and extending for ~5m in outcrop along strike; veining trends 050 and dips 85 to 140; further to the west more irrgular and slightly thicker (~15cm) veining trends 020 |
| Turabah-Aqiq TBA-1 | AG13         | Aqiq Ghamid | 780254    | 2251960    | 37       | Marian Skwarnecki | pale grey silicified granitoid                                                                                                                                                                                                                                                         |
| Turabah-Aqiq TBA-1 | AG14         | Aqiq Ghamid | 780222    | 2251841    | 37       | Marian Skwarnecki | old working in sheared/silicified granitoid; workings trend 268; 300; 020; 160                                                                                                                                                                                                         |
| Turabah-Aqiq TBA-1 | AG15         | Aqiq Ghamid | 780379    | 2252769    | 37       | Marian Skwarnecki | weathered chlorite-quartz schist dipping 87 to 300                                                                                                                                                                                                                                     |
| Turabah-Aqiq TBA-1 | AG16         | Aqiq Ghamid | 780394    | 2252252    | 37       | Marian Skwarnecki | weathered granitoid                                                                                                                                                                                                                                                                    |
| Turabah-Aqiq TBA-1 | AG17         | Aqiq Ghamid | 780379    | 2252282    | 37       | Marian Skwarnecki | weathered granitoid                                                                                                                                                                                                                                                                    |
| Turabah-Aqiq TBA-1 | AG18         | Aqiq Ghamid | 780368    | 2252300    | 37       | Marian Skwarnecki | silicified chlorite-quartz schist with carbonate alteration                                                                                                                                                                                                                            |
| Turabah-Aqiq TBA-1 | AG19         | Aqiq Ghamid | 780377    | 2252295    | 37       | Marian Skwarnecki | weathered granitoid; on S side of Trench 18: thin quartz veining trends 220 in schist; on N side quartz veining trends 070 in granitoid                                                                                                                                                |
| Turabah-Aqiq TBA-1 | AG2          | Aqiq Ghamid | 780202    | 2251628    | 37       | Marian Skwarnecki | old shallow digging; grey/white quartz veining in quartz-feldspar-biotite granitoid and dolerite                                                                                                                                                                                       |
| Turabah-Aqiq TBA-1 | AG20         | Aqiq Ghamid | 780376    | 2252296    | 37       | Marian Skwarnecki | ?raft of chlorite-quartz schist in granitoid                                                                                                                                                                                                                                           |
| Turabah-Aqiq TBA-1 | AG3          | Aqiq Ghamid | 780252    | 2251682    | 37       | Marian Skwarnecki | weathered granitoid                                                                                                                                                                                                                                                                    |
| Turabah-Aqiq TBA-1 | AG4          | Aqiq Ghamid | 780289    | 2251723    | 37       | Marian Skwarnecki | weathered granitoid; possibly weakly sheared                                                                                                                                                                                                                                           |
| Turabah-Aqiq TBA-1 | AG5          | Aqiq Ghamid | 780306    | 2251754    | 37       | Marian Skwarnecki | old digging; weakly sheared granitoid locally with quartz boudins                                                                                                                                                                                                                      |
| Turabah-Aqiq TBA-1 | AG6          | Aqiq Ghamid | 780328    | 2251772    | 37       | Marian Skwarnecki | weathered granitoid                                                                                                                                                                                                                                                                    |
| Turabah-Aqiq TBA-1 | AG7          | Aqiq Ghamid | 780369    | 2251946    | 37       | Marian Skwarnecki | weakly sheared pale grey-green siliceous ?clastic rock with round ?clasts of quartz in contact with locally sheared quartz-rich felsic rock with sericite (?chilled margin of granitoid)                                                                                               |
| Turabah-Aqiq TBA-1 | AG8          | Aqiq Ghamid | 780361    | 2251949    | 37       | Marian Skwarnecki | "contact" of ?chilled margin with granitoid                                                                                                                                                                                                                                            |
| Turabah-Aqiq TBA-1 | AG9          | Aqiq Ghamid | 780355    | 2251949    | 37       | Marian Skwarnecki | silicified granitoid grading into sheared granitoid                                                                                                                                                                                                                                    |
| Turabah-Aqiq TBA-1 | AG9a         | Aqiq Ghamid | 780343    | 2251949    | 37       | Marian Skwarnecki | shallow pit possibly with quartz veining; quartz veining further the north further downslope                                                                                                                                                                                           |
| Turabah-Aqiq TBA-1 | P1           | P777        | 780187    | 2254539    | 37       | Marian Skwarnecki | weathered granitoid                                                                                                                                                                                                                                                                    |
| Turabah-Aqiq TBA-1 | P2           | P777        | 780176    | 2254536    | 37       | Marian Skwarnecki | pale grey fine-grained siliceous rock; biotite on foliation planes                                                                                                                                                                                                                     |
| Turabah-Aqiq TBA-1 | P3           | P777        | 780170    | 2254553    | 37       | Marian Skwarnecki | quartz veining in silicified shear zone; veining trends 070; 035; 020; 190; 340                                                                                                                                                                                                        |
| Turabah-Aqiq TBA-5 | 308          | Mulhal      | 748199.17 | 2275378.81 | 37       | Paul Mazzoni      | navigation and photo waypoint                                                                                                                                                                                                                                                          |
| Turabah-Aqiq TBA-5 | 309          | Mulhal      | 747886.82 | 2274084.01 | 37       | Paul Mazzoni      | navigation and photo waypoint                                                                                                                                                                                                                                                          |
| Turabah-Aqiq TBA-5 | 310          | Mulhul      | 747858.64 | 2273510.48 | 37       | Paul Mazzoni      | concrete collar plinth of drillhole MUL-19, disturbed and not in correct location                                                                                                                                                                                                      |
| Turabah-Aqiq TBA-5 | 311          | Mulhul      | 747913.98 | 2273506.54 | 37       | Paul Mazzoni      | ancient copper workings in gossanous shear zone                                                                                                                                                                                                                                        |
| Turabah-Aqiq TBA-5 | 312          | Mulhul      | 747826.60 | 2273516.84 | 37       | Paul Mazzoni      | trench T50, 7m wide kaolinised-limonite-hematite stained alteration shear zone with 1m wide core of 035 trending multiple gossanous quartz veins (rock)                                                                                                                                |

| Tenement           | Location No. | Prospect | Easting   | Northing   | UTM Zone | Collected By      | Description                                                                                                                                                                                                                |
|--------------------|--------------|----------|-----------|------------|----------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Turabah-Aqiq TBA-5 | 313          | Mulhul   | 747807.19 | 2273490.31 | 37       | Paul Mazzoni      | 1m wide steep dipping gossanous shear zone with moiror quartz veining                                                                                                                                                      |
| Turabah-Aqiq TBA-5 | 314          | Mulhul   | 747798.46 | 2273473.35 | 37       | Paul Mazzoni      | <0.5m wide gossanous shear zone with quartz veining                                                                                                                                                                        |
| Turabah-Aqiq TBA-5 | 315          | Mulhul   | 747799.15 | 2273443.06 | 37       | Paul Mazzoni      | 25 NNE plunging fold nose in chloritised intermediate volcanics                                                                                                                                                            |
| Turabah-Aqiq TBA-5 | 316          | Mulhul   | 747822.66 | 2273431.21 | 37       | Paul Mazzoni      | steep NNE plunging fold nose in chloritised volcaniclastic seds                                                                                                                                                            |
| Turabah-Aqiq TBA-5 | 317          | Mulhul   | 747819.13 | 2273427.73 | 37       | Paul Mazzoni      | NNE plunging fold nose in chloritised volcaniclastic seds                                                                                                                                                                  |
| Turabah-Aqiq TBA-5 | 318          | Mulhul   | 747837.61 | 2273421.06 | 37       | Paul Mazzoni      | 30m to 40m wide medium grained poorly foliated mafic body                                                                                                                                                                  |
| Turabah-Aqiq TBA-5 | 319          | Mulhul   | 747849.46 | 2273468.89 | 37       | Paul Mazzoni      | concrete collar plinth of drillhole MUL-1, disturbed and not in correct location                                                                                                                                           |
| Turabah-Aqiq TBA-5 | 320          | Mulhul   | 747863.02 | 2273488.99 | 37       | Paul Mazzoni      | concrete collar plinth of drillhole MUL-3, disturbed and not in correct location                                                                                                                                           |
| Turabah-Aqiq TBA-5 | 321          | Mulhul   | 747858.79 | 2273367.81 | 37       | Paul Mazzoni      | navigatio and photo waypoint looking S, 100% outcrop, minor quartz veins but no visible alteration                                                                                                                         |
| Turabah-Aqiq TBA-5 | 322          | Mulhul   | 747874.76 | 2273470.34 | 37       | Paul Mazzoni      | 20cm thick flat lying quartz vein in folded and schistose altered intermediate volcanics                                                                                                                                   |
| Turabah-Aqiq TBA-5 | 323          | Mulhul   | 747875.41 | 2273506.32 | 37       | Paul Mazzoni      | concrete collar plinth of drillhole MUL-20, disturbed and not in correct location, photo looking S back to waypoint 322                                                                                                    |
| Turabah-Aqiq TBA-5 | 324          | Mulhul   | 747906.57 | 2273557.22 | 37       | Paul Mazzoni      | end of west trending trench in schistose metasediemnts, minor quartz vein stringers                                                                                                                                        |
| Turabah-Aqiq TBA-5 | 325          | Mulhul   | 747932.99 | 2273602.46 | 37       | Paul Mazzoni      | concrete collar plinth of drillhole MUL-17, photo looking N to gossanous zonein T250                                                                                                                                       |
| Turabah-Aqiq TBA-5 | 326          | Mulhul   | 747957.72 | 2273597.88 | 37       | Paul Mazzoni      | mafic outcrop minor quartz veinlet float                                                                                                                                                                                   |
| Turabah-Aqiq TBA-5 | 327          | Mulhul   | 747941.65 | 2273698.91 | 37       | Paul Mazzoni      | trench T-250; folded, bleached to chloritic and gossanous schist                                                                                                                                                           |
| Turabah-Aqiq TBA-5 | 328          | Mulhul   | 747950.46 | 2273700.49 | 37       | Paul Mazzoni      | trench T-250; folded, bleached to chloritic and gossanous schist with numerous fragmented gossanous quartz veinlets                                                                                                        |
| Turabah-Aqiq TBA-5 | MUL1         | Mulhul   | 747908    | 2273506    | 37       | Marian Skwarnecki | old working (Cu); malachite-goethite-hematite-barite-secondary yellow/yellow-green Cu minerals in shear zone in sheared mafic rock; outer alteration is chloritic; inner alteration is sericitic; foliation dips 50 to 300 |
| Turabah-Aqiq TBA-5 | MUL2         | Mulhul   | 747887    | 2273701    | 37       | Marian Skwarnecki | contact between sericite-quartz schist and dolerite; minor quartz boudins along contact; foliation dips 70 to 290                                                                                                          |
| Turabah-Aqiq TBA-5 | MUL3         | Mulhul   | 747864    | 2273710    | 37       | Marian Skwarnecki | sericite-quartz schist with quartz veining (~0.4-0.5m wide); schist dips 70 to 092                                                                                                                                         |
| Turabah-Aqiq TBA-5 | MUL4         | Mulhul   | 747961    | 2273706    | 37       | Marian Skwarnecki | weathered chloritic schist with black Fe oxide after pyrite along foliation planes; yellow jarosite incrustations associated with bleaching                                                                                |
|                    | 163          |          | 719858.63 | 2116862.91 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 164          |          | 773485.46 | 2007081.46 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 165          |          | 211933.43 | 1963767.30 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 166          |          | 230957.46 | 1983924.01 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 167          |          | 236067.30 | 2013074.79 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 168          |          | 237684.70 | 2014187.87 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 169          |          | 237996.38 | 2013751.54 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 170          |          | 265202.88 | 2009164.55 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 171          |          | 267908.58 | 2001855.22 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 172          |          | 298776.91 | 2000184.68 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 173          |          | 329056.89 | 1977683.43 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 174          |          | 342538.02 | 1953533.21 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 175          |          | 342546.80 | 1953462.02 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 176          |          | 342531.18 | 1953478.07 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 202          |          | 363084.90 | 1977973.20 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 234          |          | 397268.33 | 1973905.43 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 235          |          | 427195.31 | 2006673.69 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 236          |          | 416531.28 | 2048699.84 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 237          |          | 386213.57 | 2177219.09 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 238          |          | 379296.14 | 2183907.13 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 249          |          | 342708.80 | 2161314.25 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 250          |          | 339792.80 | 2171840.78 | 38       | Paul Mazzoni      | navigation waypoint, mafic granodiorite tor photos                                                                                                                                                                         |
|                    | 273          |          | 311951.86 | 2176964.10 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 274          |          | 272339.17 | 2197383.08 | 38       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 275          |          | 250576.05 | 2213121.91 | 38       | Paul Mazzoni      | navigation waypoint, Bisha hotel                                                                                                                                                                                           |
|                    | 276          |          | 781914.42 | 2248191.61 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 277          |          | 781899.23 | 2248216.82 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 304          |          | 777834.61 | 2244592.00 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 305          |          | 752047.72 | 2279612.49 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 306          |          | 752057.99 | 2279591.53 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 307          |          | 751675.74 | 2278424.76 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 329          |          | 751623.12 | 2275239.59 | 37       | Paul Mazzoni      | navigation waypoint                                                                                                                                                                                                        |
|                    | 330          |          | 750453.20 | 2266787.30 | 37       | Paul Mazzoni      | navigation waypoint, core farm                                                                                                                                                                                             |

| Tenement | Location No. | Prospect | Easting   | Northing   | UTM Zone | Collected By | Description         |
|----------|--------------|----------|-----------|------------|----------|--------------|---------------------|
|          | 331          |          | 722274.17 | 2311918.69 | 37       | Paul Mazzoni | navigation waypoint |
|          | 332          |          | 647223.88 | 2352915.48 | 37       | Paul Mazzoni | navigation waypoint |
|          | 333          |          | 647092.24 | 2352851.51 | 37       | Paul Mazzoni | navigation waypoint |
|          | 334          |          | 327067.21 | 2765107.12 | 37       | Paul Mazzoni | navigation waypoint |
|          | 335          |          | 325552.88 | 2767386.31 | 37       | Paul Mazzoni | navigation waypoint |
|          | 336          |          | 325161.00 | 2768684.78 | 37       | Paul Mazzoni | navigation waypoint |
|          | 337          |          | 324970.97 | 2768602.65 | 37       | Paul Mazzoni | navigation waypoint |
|          | 338          |          | 314117.24 | 2819669.29 | 37       | Paul Mazzoni | navigation waypoint |
|          | 339          |          | 244058.02 | 2906962.72 | 37       | Paul Mazzoni | navigation waypoint |
|          | 340          |          | 314387.27 | 2820264.33 | 37       | Paul Mazzoni | navigation waypoint |
|          | 394          |          | 244044.96 | 2906962.64 | 37       | Paul Mazzoni | navigation waypoint |

## Appendix C

**Coffey Mining Samples for Analysis**

| SAMPLE ID                       | Description                                                                                                                                                                           | Au(AR)<br>ppb | Ag<br>ppm | As<br>ppm | Ba<br>ppm | Bi<br>ppm | Cd<br>ppm | Cu<br>ppm | Fe<br>% | In<br>ppm | K<br>% | Mn<br>ppm | Mo<br>ppm | Ni<br>ppm | Pb<br>ppm | Rb<br>ppm | S<br>ppm | Sb<br>ppm | Se<br>ppm | Te<br>ppm | Tl<br>ppm | U<br>ppm | W<br>ppm | Zn<br>ppm |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|-----------|--------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|----------|----------|-----------|
| TEFEL T1                        | massive quartz vein trending ~310 in quartz-sericite-chlorite schists                                                                                                                 | 27            | -0.5      | 171       | 25        | -0.1      | -0.5      | 20        | 1.31    | -0.02     | 0.02   | 98        | 4.2       | 14        | 1         | 1.4       | 300      | 1.48      | -5        | 0.2       | 0.2       | 0.1      | 1.5      | 20        |
| MIYAH ANF53<br>(waypoint ANF3)  | quartz veining and silicification trending 090                                                                                                                                        | 21            | -0.5      | 4         | -5        | -0.1      | -0.5      | 10        | 0.63    | -0.02     | 0.02   | 56        | 1.9       | 14        | -1        | 1.2       | 100      | 1.88      | -5        | -0.2      | 0.3       | -0.1     | 1        | 8         |
| MIYAH ANF356<br>(waypoint ANF5) | silicified quartz vein wallrock with carbonate alteration and quartz veinlets trending 070                                                                                            | 76            | -0.5      | 35        | 190       | -0.1      | -0.5      | 90        | 5.97    | 0.04      | 1.28   | 962       | 0.3       | 16        | 1         | 51.6      | 300      | 1.78      | -5        | -0.2      | 0.4       | 0.4      | 1        | 98        |
| MIYAH Abu Nafilah AN2           | white quartz vein (~2m wide) in chlorite±sericite schist locally with quartz boudins                                                                                                  | 777           | -0.5      | 115       | 15        | -0.1      | -0.5      | 15        | 0.77    | -0.02     | 0.08   | 78        | 3.6       | 12        | -1        | 4.2       | 150      | 0.6       | -5        | -0.2      | -0.1      | -0.1     | 1        | 10        |
| MAJMA M-12-205                  | medium grained felsic intrusive hosts quartz stockwork veining                                                                                                                        | 23            | 1         | 100       | 25        | -0.1      | -0.5      | 70        | 1.68    | -0.02     | 0.07   | 80        | 2.1       | 14        | 3         | 3.4       | 400      | 16.4      | -5        | -0.2      | -0.1      | 3.3      | 1        | 20        |
| MAJMA M-12-206                  | ~ 1m wide irregular quartz vein breccia zone; trends N-S                                                                                                                              | 82            | 1         | 182       | 75        | -0.1      | -0.5      | 10        | 2.52    | 0.14      | 0.27   | 1120      | 2.1       | 10        | -1        | 12.8      | 200      | 3.62      | -5        | -0.2      | -0.1      | 0.3      | 0.5      | 18        |
| MAJMA M-12-207                  | strongly lenticular 5cm to 35cm quartz breccia vein intruding crenulated cleavage in phyllites (rock)                                                                                 | 767           | 1         | 312       | 230       | 0.8       | -0.5      | 10        | 2.31    | 0.16      | 0.91   | 100       | 2.8       | 10        | 2         | 42        | 2200     | 6.68      | -5        | -0.2      | 0.3       | 0.7      | 2        | 12        |
| MAJMA M-12-209                  | 30cm thick vein quartz (+- carbonate ) breccia, strikes discontinuously S for 20m(rock)                                                                                               | 25            | -0.5      | 58        | 170       | -0.1      | -0.5      | 10        | 5.41    | 0.06      | 0.62   | 1420      | 1.9       | 18        | 2         | 28.8      | 350      | 2.8       | -5        | -0.2      | 0.2       | 0.8      | -0.5     | 46        |
| MAJMA WAT-12-212                | north end of 1m thick gossanous zonenear drillhole MA01 (rock)                                                                                                                        | 5710          | 1         | 5600      | 1460      | 6.4       | 0.5       | 150       | 44.9    | 0.44      | 0.29   | 510       | 6.8       | 108       | 7         | 10.6      | 8750     | 32        | 25        | 1.6       | 0.1       | 1.2      | -0.5     | 114       |
| MAJMA WAT-12-215                | restricted exposure of quartz stockwork veinlets in phyllite (rock)                                                                                                                   | 117           | 2         | 75        | 320       | 0.2       | -0.5      | 25        | 4.18    | 0.3       | 2.02   | 1810      | 3.7       | 32        | 2         | 88.6      | 750      | 17.4      | -5        | -0.2      | 0.4       | 3.2      | 4        | 60        |
| MAJMA WAT-12-218                | outcrop of quartz (+- carbonate) stockwork veining in phyllite                                                                                                                        | 58            | 1.5       | 40        | 155       | 0.6       | 1         | 125       | 6.41    | 0.42      | 0.58   | 4000      | 2.2       | 34        | 2         | 27.4      | 650      | 34.6      | -5        | -0.2      | 0.2       | 1.7      | 0.5      | 444       |
| MAJMA WAT-12-219                | quartz vein breccia zone up to 2m thick in phyllite/schist (rock)                                                                                                                     | 58            | 4         | 1140      | 180       | 8         | 1         | 1340      | 18.6    | 0.98      | 0.22   | 3000      | 5.3       | 150       | 6         | 11        | 550      | 159       | -5        | 0.2       | -0.1      | 1.1      | -0.5     | 222       |
| MAJMA WAT-12-221                | 2cm to 5cm thick gossanous veins cutting foliation in chrysocolla stained schists (rock)adjacent toAncient workings                                                                   | 16300         | 139       | 11500     | 60        | 125       | 7         | 9310      | 52.5    | 35.2      | 0.09   | 200       | 3.9       | 48        | 135       | 3.8       | 6850     | 2160      | 5         | 0.8       | -0.1      | 2        | -0.5     | 340       |
| MAJMA WAT-12-227                | Fragmented gossanous quartz carbonate vein                                                                                                                                            | 245           | -0.5      | 85        | 30        | -0.1      | -0.5      | 115       | 20.5    | 0.4       | 0.06   | 4490      | 4.4       | 14        | 5         | 3         | 400      | 11.1      | -5        | -0.2      | -0.1      | 0.9      | -0.5     | 100       |
| QUBBAH WAT-374                  | 2cm to 5cm thick, 060 trending SE dipping quartz vein (rock)                                                                                                                          | 476           | -0.5      | 1060      | 30        | 0.2       | -0.5      | 15        | 1.43    | 0.04      | 0.08   | 240       | 0.3       | 10        | 2         | 3.4       | 100      | 4.88      | -5        | -0.2      | 0.2       | 0.2      | 1        | 26        |
| QUBBAH-377                      | 2cm thick quartz veins in hematite stained partly sheared gabbro in ancient working                                                                                                   | 17800         | 1         | 302       | 10        | 9.2       | 0.5       | 10        | 0.93    | 0.38      | 0.07   | 202       | 1.8       | 10        | 370       | 2.6       | 100      | 5.08      | -5        | -0.2      | -0.1      | -0.1     | 3        | 110       |
| QUBBAH-390                      | 4cm quartz vein in trench                                                                                                                                                             | 433           | 8         | 213       | -5        | 3.2       | -0.5      | 15        | 0.9     | -0.02     | 0.02   | 128       | 2.8       | 18        | 289       | 0.8       | 150      | 4.12      | -5        | -0.2      | -0.1      | -0.1     | 1.5      | 18        |
| MULHUL 312                      | trench T50, 7m wide kaolinised-limonite-hematite stained alteration shear zone with 1m wide core of 035 trending multiple gossanous quartz veins (rock)                               | 38            | 9         | 8         | 95        | -0.1      | -0.5      | 35        | 0.91    | -0.02     | 0.02   | 68        | 1.7       | 14        | 11        | 1.8       | 150      | 0.66      | -5        | -0.2      | 0.1       | -0.1     | 1        | 30        |
| MULHUL 312B                     | trench T50, 7m wide kaolinised-limonite-hematite stained alteration shear zone with 1m wide core of 035 trending multiple gossanous quartz veins (rock)                               | 21            | 6         | 6         | 45        | -0.1      | -0.5      | 45        | 1.36    | 0.04      | 0.01   | 78        | 4.9       | 12        | 8         | 0.6       | 200      | 0.52      | -5        | -0.2      | -0.1      | -0.1     | 1.5      | 42        |
| GARITH GA-9                     | ~0.5m wide quartz vein trending 135                                                                                                                                                   | 23            | -0.5      | 3         | 20        | 0.1       | -0.5      | 15        | 1.17    | -0.02     | 0.05   | 106       | 7.4       | 18        | -1        | 1.6       | 250      | 0.78      | -5        | -0.2      | -0.1      | -0.1     | 1.5      | 32        |
| KUTAM KU-4                      | quartz-sericite schist with minor garnet porphyroblasts and local quartz veinlets; minor impregnations of malachite; locally disseminated sulphides (chalcopyrite-pyrite-?sphalerite) | 593           | 8.5       | 16        | 200       | 9.1       | 1         | 675       | 4.89    | 0.28      | 0.99   | 1320      | 2.8       | 12        | 8         | 35.4      | 3150     | 2.4       | 20        | 6.2       | 0.4       | 0.2      | 1        | 4930      |
| KUTAM KU-7                      | old opencut mining in zones <1m wide; quartz-sericite schist with garnet porphyroblasts and malachite staining and local relict sulphides                                             | 51            | -0.5      | 6         | 180       | 7.8       | 17.5      | 7320      | 15.4    | 2.04      | 0.56   | 3810      | 6.2       | 8         | 480       | 17.2      | 750      | 0.52      | 50        | 3.6       | 0.3       | 1.6      | 1        | 6790      |
| KUTAM KU-8                      | sericite-rich hematitic zone up to ~0.5m wide with quartz and ferruginous veinlets and malachite                                                                                      | 13            | -0.5      | 7         | 255       | 1.9       | -0.5      | 1900      | 17      | 0.06      | 0.66   | 3760      | 11.9      | 18        | 12        | 24.4      | 400      | 3.6       | -5        | -0.2      | 0.3       | 1.7      | 15       | 370       |
| KUTAM-178                       | secondary green Cu staining in ancient workings cross cutting foliation                                                                                                               | 198           | 1.5       | 13        | 325       | 107       | 1.5       | 3910      | 23.1    | 2.56      | 1.42   | 1070      | 12        | 10        | 15        | 31        | 800      | 1.82      | 95        | 64        | 0.2       | 1.1      | 1        | 3010      |
| KUTAM-180                       | Chlorite -quartz-muscovite -garnet schist with thin gossanous quartz veinlets                                                                                                         | 10            | -0.5      | 3         | 25        | 0.9       | -0.5      | 570       | 5.26    | 0.02      | 0.08   | 1980      | 1.4       | 6         | -1        | 3.2       | 50       | 0.24      | -5        | 1.2       | -0.1      | 0.3      | 0.5      | 628       |
| KUTAM-180B                      | Chlorite -quartz-muscovite -garnet schist with thin gossanous quartz veinlets                                                                                                         | 18            | 3.5       | 6         | 270       | 2.1       | -0.5      | 38700     | 25.3    | 0.36      | 0.89   | 152       | 14        | 30        | 10        | 19.6      | 250      | 1.02      | -5        | 1         | 0.1       | 11.9     | 1.5      | 2020      |
| KUTAM-186                       | Drillhole collar KU 32. Narrow selective ancient workings parallel to and cross cutting foliation. Some driven down on steep plunging fold hinges                                     | 15            | -0.5      | 3         | 10        | 1.4       | -0.5      | 530       | 5.99    | 0.02      | 0.01   | 1790      | 0.6       | 6         | 3         | 0.6       | 150      | 0.36      | -5        | 1         | -0.1      | 0.4      | 1        | 544       |
| KUTAM-191                       | yellow brown vuggy jasperoidal silica (silcrete?)                                                                                                                                     | 227           | 10        | 9         | 50        | 4.6       | -0.5      | 550       | 20.6    | 0.06      | 0.01   | 1590      | 0.9       | 20        | 634       | 0.4       | 100      | 6.2       | 5         | 7.2       | -0.1      | 1.7      | 2        | 3770      |
| KUTAM-192                       | medium grained mafic intrusive (gabbro - diorite)                                                                                                                                     | 26            | -0.5      | 6         | 100       | 0.1       | -0.5      | 75        | 8.5     | 0.04      | 0.21   | 1800      | 0.1       | 22        | 24        | 5         | 200      | 0.94      | -5        | 0.2       | -0.1      | 0.2      | -0.5     | 102       |
| KUTAM SL<br>(waypoint 192)      | slag                                                                                                                                                                                  | 25            | 3.5       | 6         | 225       | 3.4       | 1.5       | 16300     | 20      | 0.82      | 0.5    | 4910      | 5.7       | 8         | 23        | 16.2      | 1150     | 0.94      | -5        | -0.2      | 0.3       | 1.4      | 1.5      | 4890      |
| KUTAM-193                       | fine grained chlorite schist with coarse grained porphyroblastic garnet                                                                                                               | 53            | -0.5      | 13        | 715       | 0.3       | 2         | 55        | 4.67    | 0.04      | 0.52   | 6280      | 0.8       | 8         | 20        | 12.6      | 300      | 0.3       | -5        | 0.4       | 0.2       | 0.6      | 1        | 1020      |
| KUTAM-199                       | sericite schist and chlorite-quartz-sericite schist with fine grained garnet porphyroblasts and malachite staining                                                                    | 21            | 3.5       | 2         | 445       | 1         | -0.5      | 4980      | 7.51    | 0.06      | 1.04   | 2430      | 2.1       | 8         | 8         | 20.6      | 100      | 0.18      | -5        | 1         | 0.1       | 0.9      | 1        | 478       |
| LUGATAH-255                     | above hole CO-03, W dipping 2m -3m thick quartz reef in sheared metasediments/ metavolcaniclastics (rock)                                                                             | 869           | 2         | 1070      | 25        | 0.5       | -0.5      | 45        | 0.97    | -0.02     | 0.25   | 40        | 0.6       | 8         | 129       | 13.4      | 450      | 14.9      | -5        | -0.2      | -0.1      | 0.4      | 4.5      | 14        |

| SAMPLE ID          | Description                                                                                                                                | Au(AR)<br>ppb | Ag<br>ppm | As<br>ppm | Ba<br>ppm | Bi<br>ppm | Cd<br>ppm | Cu<br>ppm | Fe<br>% | In<br>ppm | K<br>% | Mn<br>ppm | Mo<br>ppm | Ni<br>ppm | Pb<br>ppm | Rb<br>ppm | S<br>ppm | Sb<br>ppm | Se<br>ppm | Te<br>ppm | Tl<br>ppm | U<br>ppm | W<br>ppm | Zn<br>ppm |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|-----------|--------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|----------|----------|-----------|
| LUGATAH-266        | quartz vein exposed in western end of trench (rock)                                                                                        | 21            | -0.5      | 21        | 10        | 0.2       | -0.5      | 20        | 0.9     | -0.02     | 0.08   | 74        | 3.1       | 10        | 3         | 5.6       | 50       | 3.32      | -5        | -0.2      | -0.1      | -0.1     | 1.5      | 22        |
| LUGATAH-268        | old decline into E dipping 1cm-5cm thick quartz vein swarm (rock)                                                                          | 1090          | 4.5       | 22        | 95        | -0.1      | -0.5      | 100       | 1.33    | -0.02     | 0.88   | 254       | 1.6       | 20        | 9         | 68.8      | 100      | 7.98      | -5        | -0.2      | 0.3       | 0.5      | 88.5     | 170       |
| LUGATAH-269        | south plunging folded 20cm thick quartz vein (rock)                                                                                        | 63            | -0.5      | 7         | 5         | -0.1      | -0.5      | 10        | 1.01    | -0.02     | -0.01  | 82        | 4.3       | 18        | 3         | 3.2       | 100      | 2.3       | -5        | -0.2      | -0.1      | -0.1     | 2.5      | 2         |
| LUGATAH-270        | quartz breccia mass in ancient workings with quartz vein stringer zone in epidote altered FW (rock: 270 main vein, 270b FQ stringer veins) | 183           | 1.5       | 103       | 25        | -0.1      | -0.5      | 20        | 0.86    | -0.02     | 0.04   | 274       | 3         | 10        | 69        | 3.6       | 300      | 3.2       | -5        | -0.2      | 1.7       | 1.7      | 0.5      | 5060      |
| LUGATAH-270B       | quartz veinstringer zone in epidote altered FW                                                                                             | 361           | -0.5      | 905       | 295       | -0.1      | -0.5      | 15        | 1.32    | 0.04      | 3.05   | 46        | 2.6       | 10        | 18        | 254       | 850      | 13.8      | -5        | -0.2      | 1.1       | 3.9      | 31.5     | 140       |
| AQIQ GHAMID-280    | trench T16, filled in. Quartz vein spoil from trench on surface (rock)                                                                     | 21            | -0.5      | 6         | 70        | -0.1      | -0.5      | -5        | 0.84    | -0.02     | 0.11   | 398       | 0.2       | 14        | 19        | 8.6       | 100      | 0.4       | -5        | -0.2      | -0.1      | -0.1     | 1.5      | 24        |
| AQIQ GHAMID-280B   | trench T16, filled in. Quartz vein spoil from trench on surface (rock)                                                                     | 11            | -0.5      | -1        | 25        | -0.1      | -0.5      | 15        | 0.93    | -0.02     | 0.08   | 244       | 3.1       | 14        | 526       | 5         | 100      | 0.28      | -5        | -0.2      | -0.1      | -0.1     | 1        | 400       |
| AQIQ GHAMID-283    | collar of drillhole M24-RC11, chips of chlotitised biotite granodirite with disseminated pyrite and minor vein quartz                      | 24            | -0.5      | 6         | 15        | -0.1      | -0.5      | 10        | 0.67    | -0.02     | 0.04   | 122       | 2         | 16        | 21        | 2.2       | 50       | 0.36      | -5        | -0.2      | -0.1      | -0.1     | 1        | 28        |
| AQIQ GHAMID-286    | trench TR14 with spoil of blue and white quartz vein (rock 286b white quartz, 286 blue quartz)                                             | 31            | -0.5      | 8         | 20        | -0.1      | -0.5      | 10        | 0.99    | -0.02     | 0.08   | 130       | 4.6       | 14        | 132       | 3.8       | 100      | 0.26      | -5        | -0.2      | -0.1      | 0.1      | 1.5      | 4640      |
| AQIQ GHAMID-286B   | white quartz                                                                                                                               | 39            | -0.5      | 3         | 15        | -0.1      | -0.5      | 5         | 0.99    | -0.02     | 0.05   | 200       | 2.8       | 12        | 349       | 2.6       | 150      | 0.26      | -5        | -0.2      | -0.1      | -0.1     | 3        | 120       |
| AQIQ GHAMID-289    | laminated quartz vein spoil from rehabilitated trench (rock)                                                                               | 93            | -0.5      | 7         | 45        | -0.1      | -0.5      | 5         | 0.49    | -0.02     | 0.16   | 68        | 1.3       | 10        | 10        | 5.4       | 100      | 0.38      | -5        | 0.4       | -0.1      | -0.1     | 1        | 80        |
| AQIQ GHAMID-295    | 15cm to 30cm thick 270 trending quartz vein in main workings                                                                               | 542           | -0.5      | 17        | 140       | -0.1      | -0.5      | 10        | 0.98    | -0.02     | 0.16   | 318       | 0.2       | 12        | 33        | 5         | 100      | 0.28      | -5        | 1.8       | -0.1      | -0.1     | -0.5     | 124       |
| AQIQ GHAMID-295B   | 15cm to 30cm thick 270 trending quartz vein in main workings                                                                               | 479           | -0.5      | 14        | 90        | -0.1      | -0.5      | -5        | 0.81    | -0.02     | 0.12   | 246       | 0.2       | 10        | 11        | 4         | 100      | 0.26      | -5        | 1.2       | -0.1      | -0.1     | -0.5     | 78        |
| JABAL DHAYLAN-342  | Trench spoil, gossan with hemimorphite (Rock)                                                                                              | 90            | -5        | 25        | 150       | -1        | -10       | -50       | 2.75    | -0.2      | 0.1    | 9700      | -5        | -50       | 3190      | 20        | 0.22     | -2        | -50       | -1        | 96        | 64       | 5        | 284000    |
| JABAL DHAYLAN-350  | Collar GOS-CO-1, gossan float/subcrop                                                                                                      | 5             | -5        | 30        | 10        | -1        | -10       | -50       | 35.9    | -0.2      | 0.1    | 6900      | 30        | -50       | 206000    | 20        | 0.17     | -2        | -50       | -1        | 4         | 5.5      | -5       | 107000    |
| JABAL DHAYLAN-357  | JJM3M drill collar CH39. Vuggy carbonate with Mn and hemimorphite, hydrozincite and smithsonite in veins (Rock)                            | 2             | -5        | 15        | 130       | -1        | 840       | -50       | 0.3     | -0.2      | -0.1   | 29600     | -5        | -50       | 10100     | -20       | 0.05     | -2        | -50       | -1        | 3         | 1.5      | -5       | 111000    |
| JABAL DHAYLAN-361  | Vuggy dolorudite with abundant bladed hemimrorphite and botryoidal hydrozincite(Rock)                                                      | 10            | -5        | 35        | 190       | -1        | 2700      | -50       | 0.29    | -0.2      | -0.1   | 44300     | 15        | -50       | 29100     | -20       | 0.1      | -2        | -50       | -1        | 6         | 3.5      | 20       | 96300     |
| JABAL DHAYLAN-370  | Collar of drillhole JA20 in mineralised Mn dolo rudite with hemimorphite (Rock)                                                            | 11            | -5        | 5         | 560       | -1        | -10       | -50       | 1.16    | -0.2      | -0.1   | 20900     | -5        | -50       | 1920      | -20       | 0.03     | -2        | -50       | -1        | 78        | 1.5      | -5       | 9350      |
| JABAL DHAYLAN-370B | Collar of drillhole JA20 in mineralised Mn dolo rudite with hemimorphite (Rock)                                                            | 17            | -5        | -5        | 230       | -1        | -10       | 200       | 0.37    | -0.2      | -0.1   | 12500     | -5        | -50       | 260       | -20       | 0.16     | -2        | -50       | -1        | 5         | 2.5      | 5        | 4750      |