



Exploration Activities Report Quarter ended 31 December 2009

Highlights

HEAVY MINERAL SANDS PROJECTS

Wanna Lakes / Cyclone Deposit - Western Australia

- Continued expansion of size and quality of Cyclone HM Deposit in Western Australian side of Eucla Basin, with the identification of significant mineralisation within the overburden.
- Bulk testwork underway on 31 samples from Cyclone HM Deposit.
- Scoping studies almost complete aimed at developing deposit through to mining.
- Ooldea Range drilling identified mineralisation 120km NW of Jacinth Ambrosia HM Deposit.
- Scout drilling at Arckaringa confirms new HM province.

COPPER, GOLD & BASE METALS PROJECTS

Clermont - Queensland

- Generation of new data and concepts focussing on:
 - Rosevale Porphyry Corridor
 - Mesothermal Gold Reefs (Palmtrees Project)
 - Regional VTEM and Banded Iron Formation (BIF) targets

Bellfield - Queensland

- Two areas of primary interest identified - the Gilbert River and Twelve Mile Breccia prospects.

CORPORATE AND FINANCE

- 7,197,959 new shares were placed during the quarter at an issue price of 12.25 cents per share.

Diatreme Resources is an Australian based diversified mineral explorer with significant projects in heavy mineral sands, copper, base metals and gold.

The Company owns the zircon rich Cyclone HM Deposit in Western Australia, which is situated within the emerging world class Eucla Basin heavy mineral sands province, along with 30,000km² of underexplored ground prospective for heavy mineral sands.

The Board and senior personnel exhibit wide experience, ranging through the exploration and development phases of resource management.

Australian Securities Exchange
Code: DRX

Securities

Ordinary shares:

202,191,209

Unlisted 47c options (30 June 2011):

17,550,000

Unlisted 47c options (31 July 2011):

3,000,000

Board of Directors

Executive:

Tony Fawdon - Chairman/CEO

David Hall - Operations

Non-executive:

Lawrence Litzow

George White

Andrew Tsang

Joint Company Secretaries:

Lawrence Litzow

Leni Stanley

Key Projects:

- Eucla Basin Heavy Minerals Project
- Clermont Copper Project
- Anabama Copper Project
- Bellfield Base Metals Project

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EXPLORATION

HEAVY MINERAL SANDS PROJECTS

During the quarter over 9,379.5m of air core drilling in 154 drill holes were completed within heavy mineral sand project areas (Table 1).

State	Project Name	Tenement Name	Exploration Licence	Drill holes	Metres
SA	Ooldea	Eucla 4	3616	88	5,396.5
SA	Arckaringa	Naarack	4110	2	106.5
SA	Arckaringa	Mabel Creek	4111	7	458.0
SA	Arckaringa	Oldburra	4112	29	2,184.5
SA	Arckaringa	Marla	4113	4	219.5
SA	Arckaringa	Wintinna	4114	5	471.5
SA	Arckaringa	Mamalia	4136	17	522.5
SA	Arckaringa	Ammaroodinna	4137	2	20.5
TOTAL				154	9,379.5

Table 1: Eucla Basin and Arckaringa Project Drilling Summary for Oct - Dec 2009

Eucla Basin Mineral Sands (Zircon) Project - WA and SA (DRX 100%)

Exploration continued within the Eucla Basin well into December with final drilling for the year occurring in the SA tenements on the Ooldea Range (see Figure 1).

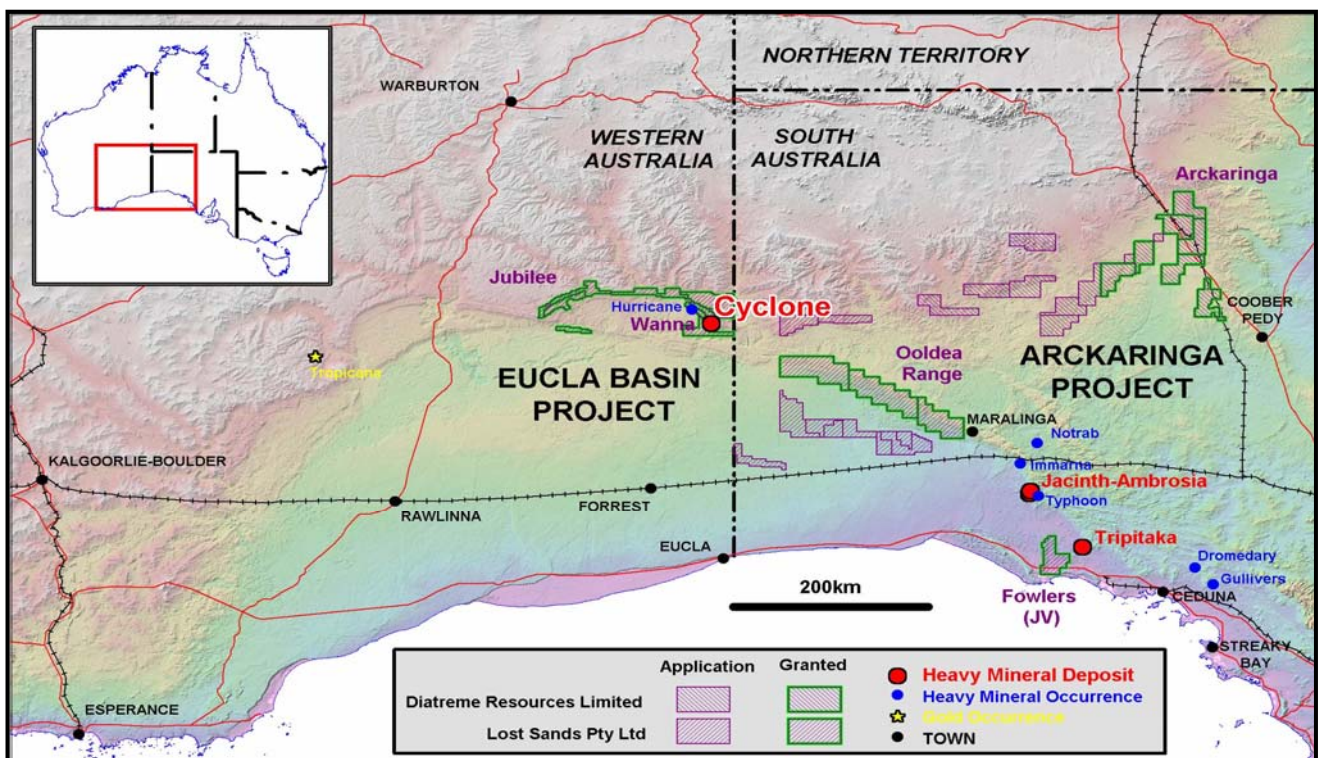


Figure 1: Eucla Basin and Arckaringa Heavy Mineral Projects

Wanna Lakes / Cyclone Deposit, WA

A resource estimate was compiled for the Cyclone Deposit by Micromine Pty Ltd in September 2009. Recent developments include the identification of mineralisation within the overburden at Cyclone with



grades varying between 0.3–3.9%HM. Initial observations of the heavy minerals indicate the mineralisation is of a similar size and quality to the underlying mineralisation. The minerals are heavily coated with clay and or iron oxides, which can be removed with acid. At this stage only one complete drilling traverse has been analysed with scattered holes throughout the remainder of the resource indicating similar results. The overburden from the whole Deposit will now be assayed and upon completion it is expected the overburden will be entirely mineralised which will significantly increase the size of the resource and dramatically improve the economics of mining the Deposit since mining of ore is expected to be from surface.

With the subsequent identification of mineralisation within the overburden at Cyclone, another resource estimate will need to be undertaken once all assays are completed. The Company is confident that the Deposit's size will further increase, significantly, as a result of the additional assays, with potential for incremental additions.

The Cyclone Deposit's resource estimate (excluding the new overburden mineralisation) currently stands at 98.4Mt, as shown in Table 2, and has very low slimes (clay) and oversize contents aiding its ability to be mined economically.

Resource Category	TONNES (Mt)	%HM	% Slimes	% Oversize
Inferred	2.51	2.38	3.53	4.08
Indicated	84.36	2.82	4.40	5.91
Measured	11.52	3.44	4.51	4.72
TOTAL	98.40	2.88	4.39	5.72

Table 2: Cyclone Deposit Resource Estimate (excluding overburden mineralisation)

Testing currently continues on mini bulk samples collected in 2009.

The Cyclone Deposit has a very attractive mineral assemblage of approximately 33% zircon, 12% rutile, 27% leucoxene and 17% altered ilmenite – refer Table 3. Further mineralogy is currently being undertaken throughout the deposit.

Mineral	% Mass	% Mass Range
Zircon	33	18-42
Rutile	12	5-24
Leucoxene	27	14-43
Altered Ilmenite	17	4-30
Others	11	

Table 3: Average Mineralogy (QEMSCAN - SGS) results from Cyclone Deposit

Image Resources NL (ASX:IMA) have recently released results of drilling on their portion of the Cyclone Deposit, known as "Cyclone Extended" which lies to the south of Diatreme's main deposit. They have reported mineralisation extending for a further 2.75km south of the Company's tenement boundary.

Hurricane Prospect - Wanna Lakes & Wanna East, WA

With exploration having concentrated on the Cyclone resource area further assessment of this prospect has been delayed until 2010. The Company needs to develop an understanding of the area before locating potential satellite HM deposits.

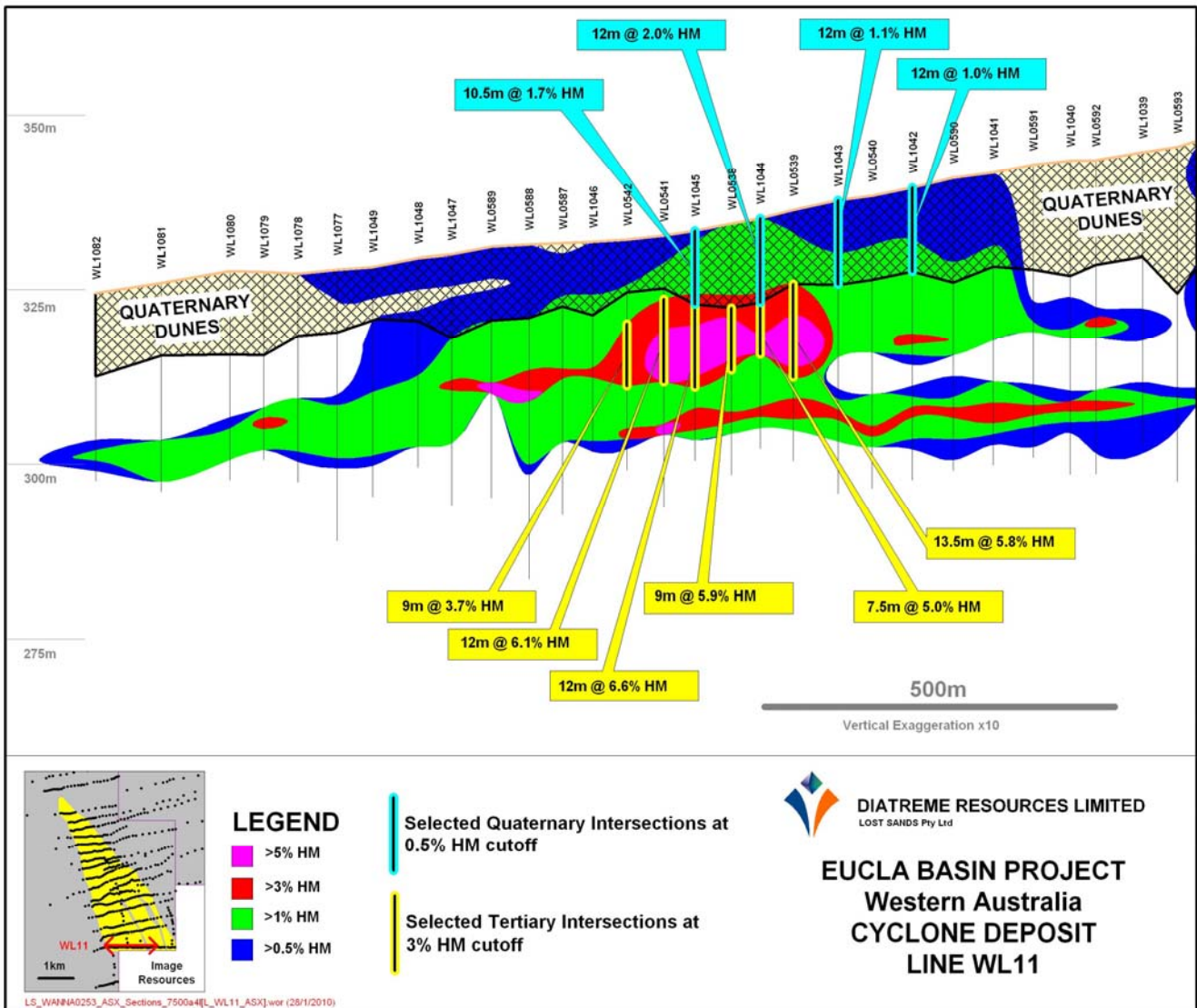


Figure 2: Cyclone Deposit Cross Section (Line WL11) and heavy mineral grade intercepts

Jubilee / Willeri Tenements, WA

Although the Company has conducted initial drilling in these areas (September 2009 Quarterly Report), the stratigraphy and mineralisation in this area is not well understood as drilling is broadly spaced. Further drilling is planned in 2010 following data review.

Ooldea Range Tenements, SA

An 88 hole (5,396m) air core drilling program was carried out over EL3616 (Eucla 4) during the quarter, infilling previous Company drilling and highlighting the area as being highly prospective. During this round of drilling, a number of strandlines were located on the Ooldea Range. Heavy mineral grades of up to 5.3 %HM were discovered. The recent drilling has helped gain an understanding of the area and further drilling along the 200km long Ooldea Range will be systematically carried out in light of the recent discoveries. It is expected that a number of mineralised beach strand systems having potential for economic extraction will be discovered on the Range. Initial observations of the mineralogy suggest the mineral assemblage to be high in valuable zircon, rutile and leucoxene.



Arckaringa Project - SA (DRX 100%)

A drilling programme was completed over of the Arckaringa tenements during the quarter. A total of 66 scout air core holes for 3,983m of drilling were completed exploring for heavy mineral sands within this project area, which has not previously been subject to mineral sand exploration by any company.

Favourable stratigraphic units for the development of heavy mineral strands were identified in the western group of tenements, on the margin of a topographic high which was recognised as a basement high (barrier system) in which mineralisation may occur. The thickness of shoreface development varied up to 15m. However, due to government requirements (only seven days access in Tallaringa Conservation Park and Woomera Prohibited Area) limited exploration in the area was achieved and therefore more drilling is required to explore this area.

It has been interpreted that the topographic highs within EL4136 and EL4137 correlate with barrier systems that show signs of beach development. Further work should be carried out in these areas, particularly where there is a distinct variation in elevation, which may indicate stronger development of a beach system, such as within the Company's Cyclone Deposit in WA.

COPPER, GOLD & BASE METAL PROJECTS

Clermont Project - QLD (DRX 100%)

The Clermont Project continues to generate new data and concepts in the Company's quest to discover significant precious and base metals in the district. Diatreme is currently pursuing a number of programs within the Clermont tenements focusing on the:

- (i) Rosevale Porphyry Corridor (Gold, Copper-Molybdenum);
- (ii) Mesothermal Gold Reefs; and
- (iii) Regional VTEM and Banded Iron Formation (BIF) targets.

(i) Rosevale Porphyry Corridor (RPC)

Progress has been made in the analysis of data from the recently completed deep diamond drilling program in the RPC, with a structural synthesis study highlighting the possibility of two previously unrecognized East-West oriented faults (inferred) dipping towards the south, from the mineralised Round Hill Breccia Prospect, into the deep aeromagnetic low immediately to the south, which is spatially related to the Elektra Cu-Mo mineralisation. These faults intersecting the centre of the aeromagnetic low at depth may hold the key in determining the possible location of a gold rich core to the system. One of these faults hosts the Red Dog Cu-Mo mineralisation at its eastern extension where it intersects a north-west trending fault.

Geochronology (age dating of rocks) results have been returned for six samples selected from the recent deep diamond drilling program at the RPC (see Table 4 and Figure 3). The age dates* yielded some interesting results, and will help to further strengthen the Company's conceptual models for Gold and Base Metals in the region.

* The age dates were acquired via the LA-ICPMS (Laser Ablation – Inductively Coupled Mass Spectrometer) method of U-Pb (Uranium-Lead) dating of zircon separates from igneous rocks, with the work being undertaken at James Cook University of North Queensland. The results obtained are as follows (Ma = Million Years old).

Prospect	Hole number	Sample Number	Rock Type Description	Age Date
Elektra North	Elektra North 01	BRGC01	Quartz Monzonite Porphyry	397 ± 4Ma
Golan Heights	Golan Heights 01	BRGC02	Porphyritic Diorite	402 ± 4Ma
Round Hill	Round Hill North A	BRGC03	Rhyolitic Breccia (Rhyolite)	No zircons in rock, no age estimate obtained
Round Hill	Round Hill A	BRGC04	Quartz Monzonite Porphyry	380 ± 4Ma
Hillview East	Hillview East B	BRGC05	Dacitic Porphyry	382 ± 4Ma
Hillview East	Hillview East B	BRGC06	Quartz Monzonite Porphyry	410 ± 4Ma

Table 4: Geochronology results from RPC - Clermont

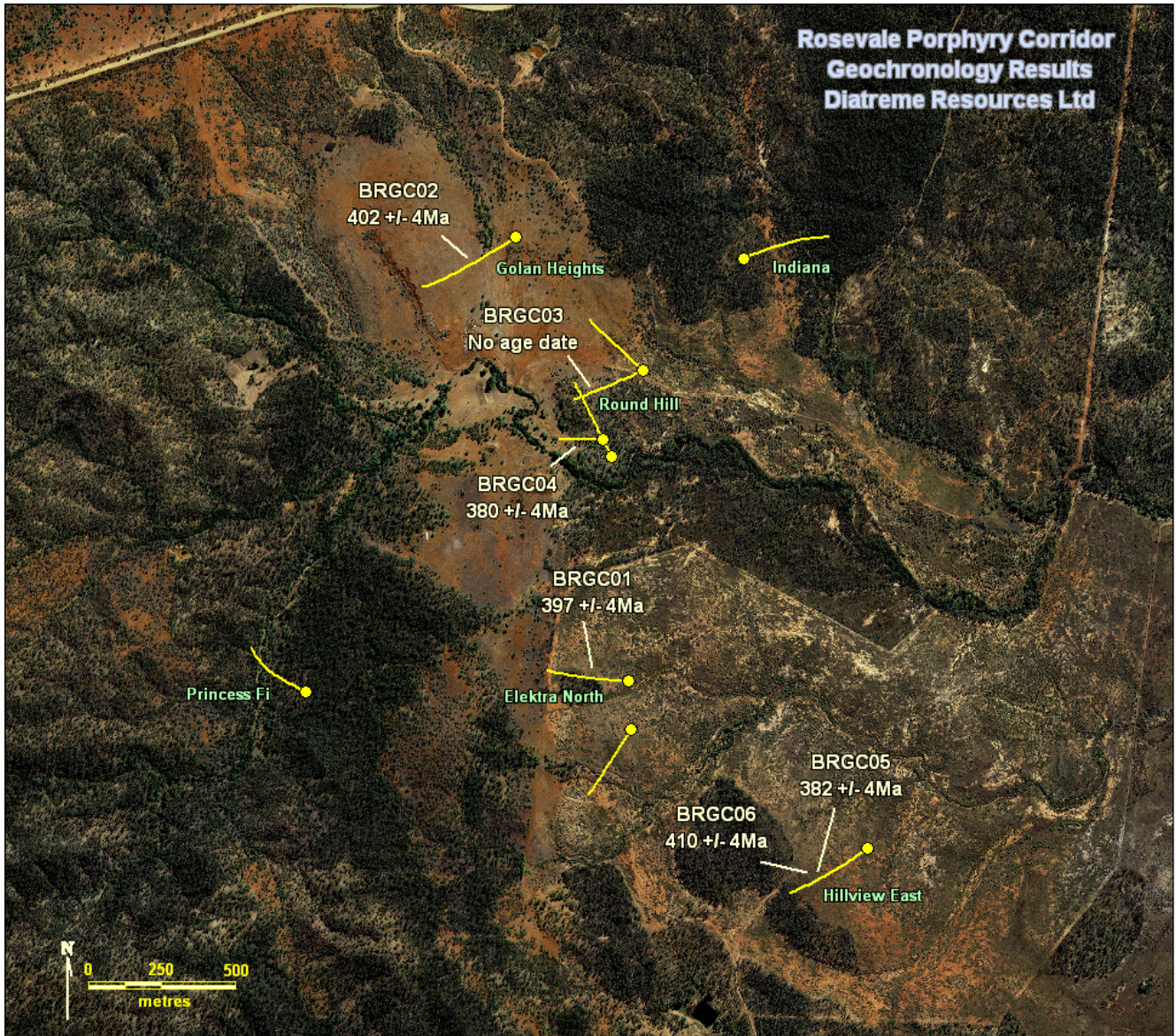


Figure 3: RPC Geochronology Sample No's BRGC01 to BRGC06 and location of associated drill holes

(ii) Mesothermal Gold Reefs (Palmtrees Project)

Recent compilation and assessment of historic data, combined with previous Diatreme collected VTEM and ground magnetic survey data, have outlined an area immediately south and south-east of Clermont with the potential to host multi-million ounce mesothermal reefs - "mother lode" style narrow vein gold mineralization (similar to the Charters Towers Goldfield, >7Moz Au and the Central Victorian Goldfield, >25Moz Au). This new prospective gold area is known as the Palmtrees Project.

The Palmtrees reefs were worked between 1862 (where they were a part of one of Queensland's major early gold rushes), and the early 20th century. Only minimal exploration work has been carried out on this local mineralization style since, despite records of reefs obtaining strike lengths of over 4km, widths up to 2m and grades in excess of 2.5oz/t gold (>70g/t Au).

Higher grade mineralization has been documented by previous workers to be related to narrow leader veins on the margins of the wider reefs that were thought to be relatively barren. However, recent work by Diatreme has shown that some of the major wider reefs, particularly those that carry sphalerite (zinc sulphide) and galena (lead sulphide), also carry high grade gold (Plate 1).



Plate 1: Visible gold grain in quartz vein (Sample QV332904) from workings associated with the Saint Patrick workings in the Mesothermal Reefs area (Palmtrees Project) 5km south of Clermont. Rock Chip assays for the sample yielded a result of 51.4 g/t Au.

Given the lack of drilling or modern day exploration on these reefs, and the identification of a number of similar structural and chemical reef/vein characteristics as those of the central Charters Towers Goldfield, these reefs have become an important focus of the Company's exploration program.

Recent rock chip sampling and geological reconnaissance over the area known as Macdonalds Flat, 5km south-east of Clermont, has helped to characterise the type of quartz lodes related to higher grade mineralization – generally those with appreciable width and an association of lead- and zinc-sulphide minerals. Table 5 details the location and assay results from three high grade rock chip results obtained in the Macdonalds Flat area.

Sample	Easting	Northing	Project Location	Reef/Lode	Au (g/t)	Ag (g/t)	Zn (ppm)	Pb (ppm)
322904	567093	7470355	Palmtrees	Bismark/Saint Patrick	51.4	2.9	1540	293
322905	567093	7470355	Palmtrees	Bismark/Saint Patrick	35.7	1.2	1120	148
322909	567093	7470355	Palmtrees	Bismark/Saint Patrick	12.7	3.6	3550	1140

Table 5: Higher grade gold in Rock Chip samples - Macdonalds Flat area - 5km southeast of Clermont

(iii) Regional VTEM targets and Banded Iron Formation (BIF) targets:

Other prospects are under review. A re-interpretation of the existing data has shown a distinct zone of high resistivity/low conductivity associated with the abovementioned mesothermal reef area situated to the south of Clermont. Further interpretation of the Company's VTEM database is on-going, particularly with respect to mapping out zones of potential major quartz stockworking and mesothermal reef development.

Bellfield Project - QLD (DRX 100%)

Field reconnaissance and mapping in the eastern section of the Bellfield and Gilbert River tenements in north Queensland has recently been concluded. Two prospect areas of primary interest have been identified – both areas host hematite-rich breccias that share some geological affinities to Iron Oxide-Copper Gold Deposits (Ernest Henry, Osborne, Olympic Dam and Prominent Hill). The Gilbert River Breccia and the Twelve Mile Breccia prospects, although having been mapped and sampled in detail historically, have never been drill tested or surveyed with high resolution ground geophysics.



The Gilbert River Breccia Prospect consists of a strongly hematized hydrothermal breccia that is associated with highly anomalous copper, as demonstrated by a recent rock chip sampling project conducted by Diatreme. Similarly, the Twelve Mile Breccia Prospect is associated locally with quartz hosted gold-copper-silver-lead-zinc-bismuth-antimony mineralization. Table 5 details the location and assay results of a number of anomalous rock chip samples from the project area.

Location	Sample	Easting	Northing	Ag (g/t)	Cu (%)	Pb (ppm)	Sb (ppm)	Zn (ppm)	Au (g/t)
12 Mile Ck	332602	776832	7859285	363	20.3	266	218	816	0.165
12 Mile Ck	332603	766832	7869285	81.6	4.19	84	130	688	0.162
Gilbert River Camp	332606	759588	7876667	12.6	0.72	82	14	138	0.01
Gilbert River Breccia	332608	758257	7876386	1.3	0.06	16	5	53	<0.005
Teutonic area	332627	775072	7871962	<0.2	0.02	134	<2	1680	<0.005
Gilbert River West	332662	757651	7878319	1.7	0.04	1200	15	769	1.545

Table 5: Bellfield Project Rock Chip samples – October/November 2009

Further ground to the north of the eastern end of the existing tenements has been secured under EPM application; this ground hosts the historically significant Ortona Reefs (Cu-Au-Ag) and Iona Reefs (Au-Cu).

CORPORATE AND FINANCE

During the quarter the Company placed 7,197,959 new ordinary shares at an issue price of 12.25 cents per share.

On 13 October 2009, the Board announced the appointment of Ms Leni Stanley as joint Company Secretary with Mr Lawrie Litzow.

Dated 29 January 2010

Anthony J Fawdon
Executive Chairman/CEO

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Competent Person Statement

The information in this report, insofar as it relates to Exploration Results and Mineral Resources is based on information compiled by company personnel under the supervision Mr David Jelley, of David Jelley Pty Ltd, who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Jelley has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he has undertaken to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Jelley consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.