

# HIGHLIGHTS

## EXPLORATION ACTIVITIES REPORT QUARTER ENDED 30 SEPTEMBER 2015

### HIGHLIGHTS

- Significant gold assays returned from systematic drilling of Tick Hill tailings, strengthening prospects for reprocessing of tailings from historically rich mine
- Tick Hill tailings bulk samples submitted for metallurgical testwork, with further studies to determine mineral resource estimate and pathway towards mining
- Submissions received for Cyclone Project Public Environmental Review (PER); final report and environmental approvals anticipated before year-end

### TICK HILL GOLD PROJECT (QLD)

Two programs of exploration drilling have been completed over the Tick Hill ML's during the quarter, with the primary focus being the tailings dam which is thought to contain 600,000 – 650,000t of tailings material. Reconnaissance drilling of the tailings dam in July returned significant gold grades, and infill drilling in September confirmed the presence of mineralised tailings, giving a combined grade of 1.08 g/t Au for the tailings dam, with the eastern paddock averaging 1.42 g/t Au and the western paddock 0.81 g/t Au. A total of 55 holes for 398m has been completed, with 373 samples analysed.

Two bulk samples have been submitted for metallurgical characterisation testwork as the first step in a program to assess potential gold recovery options and process flowsheet design. Results from this work will allow completion of a scoping study and guide further work.

### CYCLONE ZIRCON PROJECT (WA)

The Public Environmental Review (PER) for the Cyclone Zircon Project was released on 29 June, with the WA EPA setting a public review period of five weeks followed by a four-month consultation period with the EPA. The Office of the Environmental Protection Authority (OEPA) received submissions from eight respondents during the public review period and DRX submitted its report responding to the public submissions on 6 October 2015. An assessment report for final approvals is anticipated in December 2015.

Diatreme Resources Limited is an Australian based diversified mineral explorer with significant projects in WA and QLD.

#### Key Projects:

- Cyclone Zircon Project
- Tick Hill Gold Project
- Cape Bedford Silica/HMS Project
- Clermont Copper Project

The Company seeks to develop the Cyclone Zircon Deposit in WA, through a joint venture arrangement, and conducts exploration over a number of project areas prospective for heavy mineral sands, silica sand, gold and copper.

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

Australian Securities Exchange  
Codes: DRX, DRXO

Board of Directors - Non-executive:  
William Wang - Chairman  
Andrew Tsang  
Daniel Zhuang

Executive:  
Neil McIntyre – Chief Executive  
Tuan Do – CFO & Co. Secretary  
Ian Reudavey – Chief Geologist

Registered Office:  
Level 2, 87 Wickham Terrace  
Spring Hill, QLD 4000

Postal Address:  
PO Box 10288  
Brisbane Adelaide Street  
QLD 4000

Diatreme Resources Limited Contact:  
Neil McIntyre – Chief Executive  
Phone: +61 7 3832 5666  
Email: [manager@diatreme.com.au](mailto:manager@diatreme.com.au)

### TICK HILL GOLD PROJECT (QLD)

The Tick Hill Gold Project comprises three granted Mining Lease No's 7094, 7096 and 7097 (totaling 390ha). The Tick Hill Gold Deposit was mined between 1991 and 1995 by Carpentaria Gold Pty Ltd (a subsidiary of MIM Holdings Limited) for the production of 513,333 ounces of gold from 705,000 tonnes of ore at a recovered grade of 22.6 g/t gold (source: MIM – Annual Reports). This makes it one of the highest grade gold deposits in Australia's recent gold producing history.

The transfer of the three ML's to Diatreme Resources was confirmed by the Department in March 2015, triggering the commencement of the DRX Farm-In and Joint Venture Agreement with Superior Resources Limited (ASX:SPQ) over the Tick Hill Gold Project. Under the Joint Venture Agreement, Superior Resources has the right to earn a 50% interest in the project by:

- Completing \$750,000 of exploration expenditure;
- Making a payment to DRX of \$100,000; and
- Lodging 50% of the Queensland Government security bond on the tenements.

Exploration and assessment of the surface material within the leases (including alluvials, tailings and waste dumps) is to be conducted as a joint operation, with each party contributing 50% of the costs.

The Tick Hill Gold Mine operated from August 1991 through to March 1995, with commissioning of the site processing plant in December 1991. The plant comprised crushing and milling circuits delivering a product with a p80 of 70µm to a CIL circuit. Tailings were discharged in to a tailings dam comprising two paddocks of a "turkeys nest" construction in which a perimeter embankment with a clay core retains tailings. Wall heights range from 6m to 10.5m. Since decommissioning the surface has been capped and both the surface and batters seeded, with good vegetation cover now present.

The total reported production for the Tick Hill Gold Mine was 705,000t at 22.6 g/t Au for 15,900kg Au at 97% gold recovery. Some high grade open pit ore was mined and transported to the Carpentaria Gold operations at Ravenswood to provide early cash flow to the project, this has been estimated at 20,000t based on the reported 19,000oz produced at Ravenswood in the 1991/1992 financial year (with head grades for that year of 30.2 g/t Au). This suggests that approximately 685,000t of tailings remain on site, with an estimated grade around 0.7 g/t Au.

A reconnaissance drilling program was undertaken by Diatreme Resources at the Tick Hill Gold Project from Friday 17<sup>th</sup> July to Monday 20<sup>th</sup> July 2015. Drilling was completed by the company-owned and operated aircore drilling rig and included:

- 24 holes for 180m in the Tailings Dam, with 173 geochemical samples and 9 environmental samples collected. Holes were drilled at 50m x 50 spacing, with sampling commencing upon intersection of tails.
- 8 holes for 18m in the Tailings Decant Pond, with 12 geochemical samples and 5 environmental samples collected.
- 15 holes for 26m over a soil geochemical anomaly in an area of alluvial sheet wash 400m NW of the pit, with 29 geochemical samples collected.

Encouraging results were returned from the Tailings Dam, with an overall average grade of 1.04 g/t Au. Minor variability was seen in the assays, but all tailings material is mineralised within a range of 0.24 g/t Au to 3.96 g/t Au. The eastern tailings paddock returned an average grade of 1.42 g/t Au from 78 samples, whilst the western tailings dam which has been filled to a slightly higher elevation, returned 0.73 g/t Au from 91 samples.

Tailings material from the decant pond was also mineralised, with an average of 0.46 g/t Au returned from the 7 holes sampled (11 samples).

Results from the reconnaissance drilling of a historical soil gold geochemical anomaly NW of the open pit to assess the alluvial/eluvial potential were generally disappointing, with only one significant assay returned from the upper section of one hole. Weathered bedrock was encountered at generally shallow depths (between 1m and 2m) and it appears that there is insufficient mineralisation and volume of alluvium to warrant further investigation in this area.

An infill drilling program was undertaken by Diatreme Resources at the Tick Hill Gold Project from Thursday 3<sup>rd</sup> September to Friday 4<sup>th</sup> September 2015. Drilling was completed by the company-owned and operated aircore drilling rig and included:

- 31 holes for 218m in the Tailings Dam, with 200 geochemical samples collected and subsequently submitted for analysis. Holes were drilled at 50m x 50m spacing with an equidistant offset from the reconnaissance drilling.

Encouraging results were again returned from the Tailings Dam, with an overall weighted average grade of 1.12 g/t Au. Some variability was seen in the assays, but all tailings material is mineralised within a range of 0.13 g/t

## QUARTERLY REPORT

Au to 43.4 g/t Au. For the purposes of reporting, the single high grade result of 43.4 g/t Au which was returned from the southern edge of the western tails dam (i.e. coincident with tails deposition outlets) was cut to 4.0 g/t Au so that it did not unduly influence average grade calculations

The eastern tailings paddock returned a weighted average grade of 1.43 g/t Au from 86 samples, whilst the western tailings dam which has been filled to a slightly higher elevation, returned 0.81 g/t Au from 113 samples.

These infill results show good correlation with the reconnaissance drilling results, with the combined weighted average grade for the eastern paddock calculated at 1.42 g/t Au (74.1m at 1.42 g/t Au from reconnaissance drilling and 81.2m at 1.43 g/t Au from infill drilling) and the combined weighted average grade for the western paddock calculated at 0.81 g/t Au (88.8m at 0.73 g/t Au from reconnaissance drilling and 107.1m at 0.88 g/t Au from infill drilling).

The tailings dam is calculated to have an average weighted grade of **1.08 g/t Au** based on the combination of reconnaissance and infill drilling (including a top cut of 4.0 g/t Au).

Bulk samples were collected during the infill drilling and a ~50kg composite sample from the central N-S line of drilling through each of the tailings paddocks has been submitted for metallurgical testwork. Results are awaited.

Upon receipt of positive metallurgical testwork results, a mineral resource estimate will be undertaken in-house and reported to market.

## CYCLONE ZIRCON PROJECT (WA)

The Public Environmental Review (PER) Report for the Cyclone Project was released for public review on 29 June for a period of five weeks as required by the WA Environmental Protection Authority (EPA). The Office of the Environmental Protection Authority (OEPA) received submissions from eight respondents during the public review period and provided copies of the submissions to DRX on 24 August 2015. The OEPA also provided a summary of the submissions identifying the principle issues requiring attention by DRX.

The principle issues raised in the submissions and comments from the public included environmental and social issues as well as issues focussed on questions of fact and technical aspects of the proposal. Although not all the comments made in the submissions were of an environmental nature, DRX has responded to all the public comments and questions which are relevant to the project proposal. DRX submitted its report responding to the public submissions on 6 October 2015 to the OEPA.

As part of the approvals process DRX is negotiating an offsets package for the proposed disturbance to the Great Victoria Desert Nature Reserve which will be required for construction of the haul road from the Cyclone mine to the Forrest rail siding. DRX is continuing to provide additional project information as required to the OEPA and other regulatory authorities during the environmental approval process.

The OEPA is currently assessing the project proposal for consideration by the EPA and a recommendation is expected to be finalised by 24 November 2015. The EPA will then prepare and finalise its assessment report over a five week period including 2 weeks consultation on the draft environmental conditions with Lost Sands and key Government Agencies. Completion of the PER process is expected to result in a positive recommendation to the Minister of Environment by the EPA for approval of the Cyclone Project. This recommendation will cover the mining operation, support services, and all infrastructure, including the haul road from Cyclone to the Forrest rail siding. The timing of these activities should result in DRX receiving environmental approval for the Cyclone Project in late December 2015.

DRX plans to engage a recognised mineral sands engineering firm during the second half of 2015 to undertake a value engineering study of the mining units and wet concentrator plant planned for the Cyclone mine site. The study will review the current engineering design to identify opportunities to reduce the capital and operating cost estimates that were prepared for the PFS. One key objective is to design a compact relocatable wet concentrator which would allow significant reductions in pumping costs from the mining units to the concentrator and from the concentrator to the tailings disposal areas.

During the quarter DRX continued to engage with suppliers regarding revised pricing for logistics and services which have been subject to review due to the impacts of changes in the fuel price and exchange rate, and the downturn in the mining industry. This work is part of the preparations for completing the DFS as soon as an agreement for funding the definitive study is finalised. Indications are for more competitive pricing from suppliers than was the situation during the mining boom when the PFS was prepared.

The new phase of evaluation of the Cyclone Project continues to focus on production of heavy mineral concentrate (HMC) rather than zircon and HiTi final products. The DFS plan has been reviewed on the basis of the new project strategy and a revised budget continues to be developed as part of ongoing discussions with Chinese investors. There is surplus capacity in Chinese mineral separation plants and a shortage of heavy

## QUARTERLY REPORT

mineral resources in China to supply these plants with HMC. High priority activities for the DFS have been identified and these activities are expected to be implemented in the coming quarter on completion of the funding agreement currently being negotiated.

### **EUCLA BASIN HM PROJECT (WA)**

No field work was undertaken during the quarter, and no exploration field work is planned for the December quarter as the company will be focussed on the Tick Hill Gold Project and Cyclone Project PER.

### **CAPE BEDFORD SILICA/HMS PROJECT (QLD)**

Discussions are ongoing with traditional landowners to facilitate an exploration agreement for the Cape Bedford area and a letter of support for grant of EPM. This project has been identified as an important company priority to allow exploration activities to commence as soon as possible on site.

### **CLERMONT COPPER PROJECT (QLD)**

A review of the Clermont project, and in particular the Rosevale Porphyry Corridor, is continuing, with development of a proposed exploration program and identification of project tenement area that could be relinquished. A series of partial relinquishments for all three Clermont EPM's have been accepted by the Qld DNRm.

### **GRAYS HILL PROJECT (QLD)**

The company has identified a number of topographic features within Quaternary sediments on the coastal plain in the eastern part of EPM25117 that may represent targets for HM accumulation. Discussions have commenced with the primary landholder to facilitate access for reconnaissance exploration. A partial relinquishment for 50% of EPM25117 was accepted by the Qld DNRm.

### **PROJECT TENEMENT RATIONALISATION**

Diatreme's tenement holdings and applications have been reassessed throughout 2014/15 with numerous non-core tenement holdings either relinquished or abandoned.

Since launching its strategic divestment process, Diatreme has systematically consolidated its tenement portfolio from 29 exploration properties (including 13 applications and no mining leases) in early 2014, to just nine high value exploration properties (including one application) and four mining leases at the Company's flagship Cyclone Zircon Project and the Tick Hill Gold Project.

This action has reduced tenement administration costs and will allow Diatreme to focus activity on its core projects.

### **CASH POSITION**

The Company's cash position at 30 September 2015 (Appendix 5B) was \$515K.

### **APPENDIX 1**

Appendix 1 provides information required under ASX listing rule 5.3.3 for mineral exploration entities.

Dated 27 October 2015

Neil J McIntyre

Chief Executive

Company contact details:

Tel : +61 7 3832 5660

Email : [manager@diatreme.com.au](mailto:manager@diatreme.com.au)

---

### **Competent Person Statements**

The information in this report that relates to Exploration Results from the Tick Hill Gold Project is based on information compiled by Mr Ian Reudavey, a Competent Person who is a Member of the Australian Institute of Geoscientists. Mr Reudavey is a full time employee of Diatreme Resources Limited. Mr Reudavey has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Reudavey consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

APPENDIX 1

Appendix 1 provides information required under ASX listing rule 5.3.3 for mineral exploration entities.

**Mining tenements held at the end of the quarter and their location**

State	Tenement Name	Tenement ID	Location	Interest	Holder	Comments
WA	Wanna Lakes	E69/1920	Eucla Basin	100%	LSPL	Granted
WA	Wanna Lakes East	E69/2408	Eucla Basin	100%	LSPL	Granted
WA	Wanna South	E69/2425	Eucla Basin	100%	LSPL	Granted
WA	Cyclone	M69/141	Eucla Basin	100%	LSPL	Granted
WA	Cyclone Extended	R69/1	Eucla Basin	100%	DRX	Granted
QLD	Clermont	EPM17968	Clermont	100%	CHAL	Granted
QLD	Parapet	EPM19189	Clermont	100%	CHAL	Granted
QLD	Expedition Creek	EPM19544	Clermont	100%	CHAL	Granted
QLD	Grays Hill	EPM25117	Yeppoon	100%	DRX	Granted
QLD	Cape Bedford	EPM(A)17795	Cape Bedford	100%	DRX	Application
QLD	Tick Hill	ML7094	Duchess	100%	DRX	Granted
QLD	Tick Hill	ML7096	Duchess	100%	DRX	Granted
QLD	Tick Hill	ML7097	Duchess	100%	DRX	Granted

**Mining tenements acquired and disposed of during the quarter and their location**

State	Tenement Name	Tenement ID	Location	Interest	Holder	Comments
-	-	-	-	-	-	-

**Beneficial percentage interests held in farm-in or farm-out agreements at end of the quarter**

State	Project Name	Agreement Type	Parties	Interest held at end of quarter by exploration entity or child entity	Comments
WA	Cyclone Zircon Project	Farm-out Heads of Agreement	LSPL and Perpetual Mining Holding Limited	94%	HoA announced Jan 2014, initial 6% farm-out completed 18 Sept 2014
QLD	Tick Hill Gold Project	Farm-out and Joint Venture Agreement	DRX and Superior Resources Limited	100%	Proposed JV announced Aug 2011, formal Agreement announced June 2013, Joint Venture commenced Jan 2015

**Beneficial percentage interests in farm-in or farm-out agreements acquired or disposed of during the quarter**

State	Project Name	Agreement Type	Parties	Interest held at end of quarter by exploration entity or child entity	Comments
-	-	-	-	-	-

Abbreviations:

E	Western Australia	Exploration Licence	DRX - Diatreme Resources Limited
M	Western Australia	Mining Lease	CHAL - Chalcophile Resources Pty Ltd
R	Western Australia	Retention Licence	LSPL - Lost Sands Pty Ltd
EPM(A)	Queensland	Exploration Permit for Minerals (Application)	
EPM	Queensland	Exploration Permit for Minerals	
ML	Queensland	Mining Lease	