

## Cyclone Feasibility Affirmed

Cape Bedford EPM granted

### Recommendation

**BUY, High Risk**

### Price

**1.2c**

### Valuation

**6.0c**

### Products :

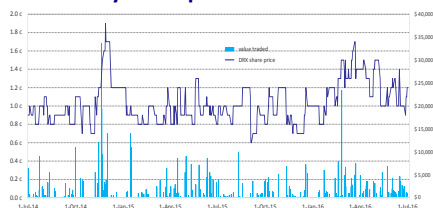
**Mineral Sands**

- On 15 June, DRX announced that Sedgman had reviewed the PFS of the Cyclone project, affirming its profitability.
- Environmental approval for the Cyclone project is imminent, though delayed. The DFS will follow on.
- DRX announced that it had been granted the EPM for its Cape Bedford project; high grade silica sand and Valuable Heavy Minerals project, with high proportions of zircon and rutile.
- Beer & Co has revised our valuation lower due to a higher AUD-USD rate of 0.750.

### Snapshot

Market Cap	\$9.7m
Cash on hand (March. 2016)	\$0.15m
Includes \$1.67m drawn on Convertible Note	
Shares on Issue	809.96m
52 Week High	1.8c
52 Week Low	0.6c
1 month / 6 month VWAP	1.15 c / 1.27c

### DRX : daily share price v. value traded



In March 2012, DRX announced the results of its Pre-Feasibility Study on the Cyclone mineral sands deposit, with a pay-back period of 2.1 years.

DRX had announced, in August 2010, an MOU with the largest end user of zircon in China. Four key assurances are required; 3 have now been delivered, with the final, environmental clearance for an access road, now imminent.

A formal commitment to project construction can be expected in 2016, with first product in early 2018.

DRX also has an EL at Cape Bedford which has high grade silica sands and Heavy Mineral Sands, as well as 50% of the Tick Hill Gold project.

**Author :** Pieter Bruinstroop  
[pbruinstroop@beerandco.com.au](mailto:pbruinstroop@beerandco.com.au)

### Project Enhancement and Update Study

Sedgman has reviewed DRX's PFS and affirmed that the project is profitable, with a revised mine plan based on 14 years at 10Mt/yr.

Completing the DFS will focus on :

- Execution of further metallurgical testwork, potentially testing Reflux Classifier concentration in the wet plant;
- Updating capital cost estimates; and
- Updating operating costs.

The DFS will be used as a basis for negotiation of project involvement by interested Chinese parties.

### Environmental Approval Imminent

DRX received a draft approval from the WA EPA, and provided its assent to the draft terms, in May. Final approval was to be presented to the Minister who has 14 days to sign off.

The final approval, for mining operations, will follow after DRX has submitted its' detailed, month by month, mine plan. The current mine plan is quarterly.

### Cape Bedford EPM

DRX has received its EPM for Cape Bedford. Final approval with the Traditional Owners needs to be agreed.

Beer & Co is very positive about the Cape Bedford project.

### Beer & Co's valuation revised. Now 6.0c/share

Beer & Co's has tweaked its model from that in our 1 February report. The major change is an increase in our L-R AUD-USD rate, from 0.700 to 0.750.

Beer & Co assume that DRX sells a stake in the Cyclone to assist in the financing of its development. This value will depend on commodity prices assumed in that assessment.

### Beer & Co conclusions

Beer & Co expects the major driver of the DRX share price will be the conclusion of an investment agreement. However, there is a high risk around our valuation. We affirm our BUY, High Risk recommendation.

This report was produced by Beer & Co Research, an independent research and advisory firm.  
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## DRX Summary

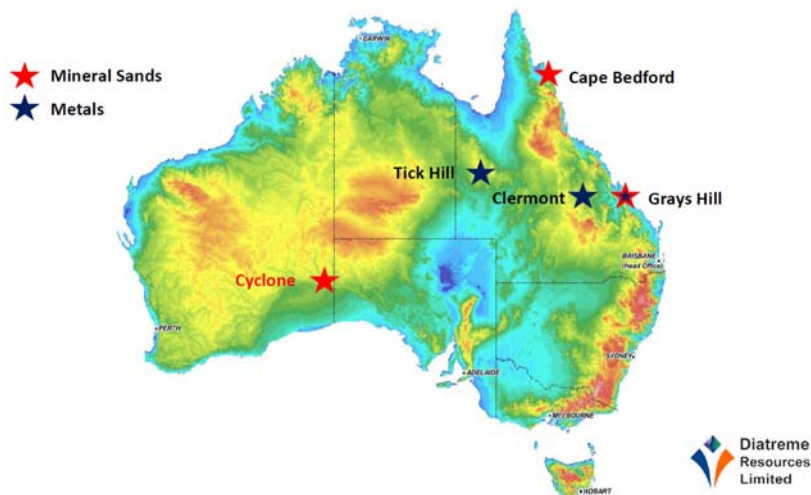
### Diatreme Resources : 3 key projects

Figure 1 shows that DRX has 5 projects in total; all in Australia.

Figure 1 : Diatreme Resources' projects.

DRX has title to 5 projects in Australia

- Cyclone dominates Beer & Co's valuation;
- Beer & Co includes nominal values for both Tick Hill and Cape Bedford
- Clermont and Grays Hill are "no cost" options



Source : DRX Presentation, March 2016

However, as shown in Figure 2, Beer & Co's valuation is dominated by Cyclone, with nominal values for each of Tick Hill and Cape Bedford, and no value for Clermont or Grays Hill.

Figure 2 : Beer & Co's valuation of DRX

Beer & Co's base case valuation of DRX is 6.0c/share.

	discount rate = 12.0 %	31-Dec-15		5-Jul-16	
		risk :	100%	Product	per share
Cyclone	70 %	\$ 56m	\$ 39m	3.7 c	4.0 c
franking credits	40 %	\$ 12m	\$ 5m	0.5 c	0.5 c
Cape Bedford	nom	\$ 5m	\$ 5m	0.5 c	0.5 c
Tick Hill	nom	\$ 4m	\$ 4m	0.4 c	0.4 c
Corporate	100 %	(\$24m)	(\$24m)	(2.3c)	(2.3c)
Exploration	80 %	\$ 0m	\$ 0m	0.0 c	0.0 c
Asset Sales	70 %	\$ 37m	\$ 26m	2.4 c	1.2 c
Cash to be raised	100 %	\$ 2m	\$ 2m	0.2 c	0.1 c
Cash	100 %	(\$3m)	(\$3m)	(0.2c)	1.8 c
<b>TOTAL</b>		<b>\$ 92m</b>	<b>\$ 57m</b>	<b>5.4 c</b>	<b>6.0 c</b>
Shares on issue		809.7m	FPO shares	56.6m	options
		243m	Issued later	0.0m	ex'd

Source : Beer & Co estimates

### Tick Hill Gold Project

Beer & Co estimates Tick Hill would generate \$8m - \$9m in cash for DRX.

Figure 2 shows that Beer & Co has a nominal value of \$4m for DRX's 50% of the Tick Hill gold project, which has a JORC Indicated Resource of 21.8koz.

As outlined in our 1 February report on DRX, Beer & Co's valuation is based on costs of about \$A 1,000/oz, assuming contract mining and processing.

At current prices, this is a margin of nearly \$A 800/oz for DRX's 10,900oz, or \$8.6m.

## Cape Bedford

**DRX has just been granted an Exploration Permit for Minerals (EPM) for its Cape Bedford project.**

**40km north Cooktown**

**Surrounding the Cape Flattery Silica Mine, which has been in operation since 1967**

Figure 1 shows that DRX’s Cape Bedford project is in on the coast of Far North Queensland; about 40km north of Cooktown, or 200km north of Cairns.

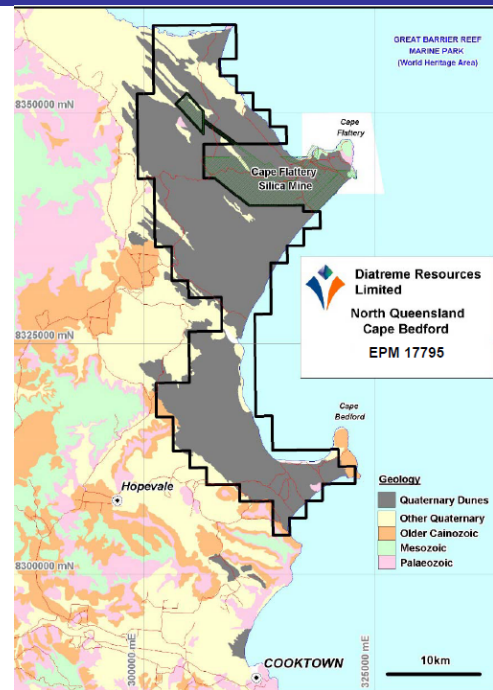
On 24 June, 2016, DRX announced that it had been granted Exploration Permit for Minerals No. 17795, as shown in Figure 3.

Figure 3 shows that the EPM is about 700km<sup>2</sup> in area, and surrounds Cape Flattery Silica Mines (CFSM), which is wholly owned subsidiary of Mitsubishi Corporation.

CFSM began production of high grade silica, which is used in the production of glass, in 1967. It is the largest global exporter of silica sand and has the highest production of silica sand of any mine in the world.

Figure 4 shows the material at Cape Bedford, showing that it is likely to free flowing and the purity of the silica is shown by its whiteness.

**Figure 3 : Cape Bedford EPM**



Source : DRX Announcement to ASX, 24 June 2016

**Cape Bedford has grade (white) silica sands with some zircon and rutile**

**Exploration can be quick and low cost**

**Figure 4 : Cape Bedford**



Source : DRX presentation, March 2016

There has been previous exploration in the area, in the 1960s and the 1980s, and DRX will quickly add to this as drilling will be a low cost.

The areas of interest are inland from the coastal dunes, while the Traditional Owners are focussed on coastal areas and fishing.

DRX has a tenement area of about 700km<sup>2</sup>.

Beer & Co believes that Cape Bedford is a very high potential project

- It covers about 700km<sup>2</sup> in area, compared with 63km<sup>2</sup> for Cape Flattery;
- The pictures show a very white sand with some black, which shows high quality silica sands and valuable heavy minerals, which previous geological work has shown to have good values of high value rutile and zircon;
- Mining is likely to be very similar to that practiced on Stradbroke Island by Consolidated Rutile, which had low cost operations due to the free flowing nature of the sands, even though grades were modest, though dominated by higher value rutile.
- Cape Flattery is the largest silica sand mine in the world, and Cape Bedford is likely to have similar silica, while DRX has experience in mineral sands.

DRX is well ahead of its required expenditure requirements at Clermont, so can afford to be patient.

## Other Projects

Figure 2 shows that DRX's key project is Cyclone, which is discussed separately further below.

### Clermont

Clermont is a copper-gold porphyry project. Expenditure to date is well ahead of that required to keep the permit in good standing.

Grays Hill is still in application

A large copper-gold porphyry project, while potentially very valuable, requires significant capital to properly define and DRX is seeking to farm-down its interest.

### Grays Hill

DRX has an application over the Grays Hill area, but the application has yet to be granted. DRX is seeking to manage its commitments in relation to this project.

## Cyclone

DRX has 94% of the Cyclone project.

DRX has a 94% in the Cyclone project, having sold a 6% stake in the project in July 2013, for \$2.0m. This implies a value for 100% of the project of \$33m which, given the time since then, is very consistent with Beer & Co's risk-adjusted valuation.

### Required Milestones imminent

The development plan is for a major consumer of the product to invest in the project.

To get further external investment to develop the project, DRX needed to :

DRX has had good discussion with 2 different Chinese parties in this regard.

However, these companies have set out a number of pre-conditions to concluding a deal. DRX has delivered on most of these conditions, while those that are not yet satisfied are expected to be so in the near future. These conditions are :

- **Assure water supply**
  - done
- **Receive Mining Licence, including Native Title agreement**
  - done

- Assurance of water supply
  - Production of the heavy mineral concentrate is by a wet (gravity) separation process, requiring significant, secure, volumes of water;
  - DRX announced on 11 November 2013 that it had intersected a significant aquifer, exceeding 200m, from 530m depth, with sufficient flow
- Mining Licence granted, for which the major issue was an agreement with the Traditional Owners
  - Agreement was announced on 15 November 2014 and the ML was granted on 18 November 2014

- Have all permits issued
  - Environmental Approval is the last and it is imminent
- Submit a DFS, with costs +/- 10%

Much of the work of the DFS has either been completed or nearly finalised.

- Update capital costs, based on Sedgman's global procurement hub, based in Shanghai
- Update operating costs; and
- Assess Reflux Classifiers for Wet Concentration

- All required permits in place
  - The major issue outstanding is environmental clearance of the haul road, which goes through the Great Victoria Desert nature Reserve, to a rail siding at Forrest

Environmental Approval has taken significantly longer than expected, due largely to changes in the process used by the EPA.

- The data was submitted to the WA Government in November 2014
- The Public Environmental Review period was from June to August 2015
- DRX submitted the final document, taking into account all the comments, in October
- In their 14 December 2015 announcement of a new Reserve estimate, DRX stated that the final approvals are expected by February 2016.

DRX will then complete its Definitive Feasibility Study :

- The Wet Concentration Plant in the PFS is based on using spirals developed by Mineral Technologies, while Sedgman claim that Reflux Classifiers can achieve a higher recovery of the non-magnetic fraction, especially the higher TiO<sub>2</sub> fractions;
- Update capital cost estimates, using Sedgman's global procurement hub, which is based on Shanghai; and
- Update operating costs for lower oil prices and contractor pricing.

## Reserves / Mining Plan

In their 15 June announcement, DRX included more detail on their mining plan, as shown in Figure 5. It shows a total mining inventory of 137.8Mt over a 14 year mine life.

**Figure 5 : Reserves / Mining Plan**

Cyclone Project - Annualised Ore Reserve											
Year	Overburden Mm <sup>3</sup>	Strip Ratio	Ore Mt	HM %	HM kt	Zircon kt	Rutile kt	Leucos kt	HiTi kt	Alit Ilm kt	Si TiOx kt
1	3.3	0.6	10.0	2.7	275	95	10	20	50	25	60
2	4.5	0.8	10.0	3.1	305	105	10	25	55	30	60
3	5.0	0.8	10.0	2.7	265	90	10	20	45	25	60
4	7.0	1.2	10.0	1.9	195	70	10	15	25	15	45
5	7.7	1.3	10.0	2.3	230	80	10	20	35	20	55
6	6.7	1.1	10.0	3.1	305	85	5	15	80	30	80
7	6.8	1.2	10.0	2.8	280	75	5	15	80	35	60
8	7.0	1.2	10.0	2.7	275	75	5	20	70	30	65
9	4.5	0.8	10.0	1.8	180	50	5	10	40	35	35
10	3.6	0.6	10.0	2.2	220	60	10	15	45	30	45
11	4.6	0.8	10.0	2.3	230	50	10	20	55	35	50
12	7.1	1.2	10.0	3.0	300	70	5	20	70	40	80
13	7.7	1.3	10.0	2.5	255	50	5	15	65	55	50
14	7.5	1.6	7.8	2.5	200	25	0	5	90	45	30
TOTAL	82.8	1.0	137.8	2.5	3520	990	105	235	810	445	780

Source : DRX announcement to ASX, 15 June 2016

Beer & Co's modelling is now based on the detail of the 14 year mine plan, rather an average of the Reserves

Beer & Co's previous updated research report on DRX, on 1 February 2016 (see : [DiatremeResources\\_2016February01.pdf](#)) detailed most of the changes to our modelling.

Beer & Co expects construction to start in April 2017 and first product in June 2018

With the more detailed mine plan, from the data in Figure 5, Beer & Co has revised our expected production profile, with Figure 6 showing the revised plan.

The key assumptions relates to timing, with Beer & Co projecting:

- September 2016 : DFS completed
- December 2016 : agreements with investors;
- March 2017 : Finance in place

- 12 months for construction;
- 3 months for commissioning
- June 2018 : First product.

Figure 6 : Revised production plan

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Overburden	2,925 kt	6,000 kt	8,000 kt	8,000 kt	12,000 kt	13,000 kt	11,250 kt	12,000 kt	11,000 kt	7,500 kt	6,500 kt	10,000 kt	12,500 kt	13,000 kt	3,803 kt
Ore Mined	4,875 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	10,000 kt	2,925 kt
<b>Zircon</b>															
grade	0.96 %	0.96 %	1.06 %	0.91 %	0.71 %	0.81 %	0.83 %	0.76 %	0.69 %	0.53 %	0.58 %	0.61 %	0.61 %	0.42 %	0.33 %
WCP Recovery	79 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %
zircon in HMC	37 kt	82 kt	91 kt	78 kt	61 kt	69 kt	72 kt	65 kt	60 kt	46 kt	50 kt	52 kt	52 kt	36 kt	8 kt
MSP Recovery	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %	86 %
final product	32 kt	71 kt	78 kt	67 kt	52 kt	59 kt	61 kt	56 kt	51 kt	39 kt	43 kt	45 kt	45 kt	31 kt	7 kt
<b>HITI 87</b>															
grade	0.30 %	0.30 %	0.35 %	0.30 %	0.25 %	0.30 %	0.20 %	0.22 %	0.23 %	0.18 %	0.27 %	0.28 %	0.23 %	0.14 %	0.07 %
WCP Recovery	66 %	77 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %
HITI 87 in HMC	10 kt	23 kt	28 kt	24 kt	20 kt	24 kt	16 kt	17 kt	18 kt	14 kt	21 kt	22 kt	18 kt	11 kt	2 kt
MSP Recovery	65 %	65 %	65 %	65 %	65 %	65 %	65 %	65 %	65 %	65 %	65 %	65 %	65 %	65 %	65 %
final product	6 kt	15 kt	18 kt	16 kt	13 kt	16 kt	11 kt	11 kt	12 kt	9 kt	14 kt	14 kt	12 kt	7 kt	1 kt
<b>HITI 67</b>															
grade	0.30 %	0.30 %	0.35 %	0.30 %	0.25 %	0.30 %	0.20 %	0.22 %	0.23 %	0.18 %	0.27 %	0.28 %	0.23 %	0.14 %	0.07 %
WCP Recovery	66 %	77 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %
HITI 67 in HMC	10 kt	23 kt	28 kt	24 kt	20 kt	24 kt	16 kt	17 kt	18 kt	14 kt	21 kt	22 kt	18 kt	11 kt	2 kt
MSP Recovery	70 %	70 %	70 %	70 %	70 %	70 %	70 %	70 %	70 %	70 %	70 %	70 %	70 %	70 %	70 %
final product	7 kt	16 kt	20 kt	17 kt	14 kt	17 kt	11 kt	12 kt	13 kt	10 kt	15 kt	16 kt	13 kt	8 kt	1 kt
<b>HMC Sold</b>	59 kt	134 kt	153 kt	131 kt	105 kt	122 kt	108 kt	103 kt	100 kt	77 kt	96 kt	100 kt	92 kt	60 kt	12 kt

Source : Beer & Co projections

Figure 7 shows Beer & Co's revised estimates for on-site costs for DRX's Cyclone project, while Figure 8 details the off-site costs, showing annual total costs around \$A 63m.

Figure 7 : Beer & Co's projections for Cyclone site costs

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
<b>Overburden</b>	\$ 4.0 m	\$ 8.3 m	\$ 11.5 m	\$ 11.5 m	\$ 16.7 m	\$ 18.0 m	\$ 15.7 m	\$ 16.7 m	\$ 15.4 m	\$ 10.7 m	\$ 9.3 m	\$ 14.1 m	\$ 17.3 m	\$ 18.0 m
AUD/t Material	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t	\$ 1.4/t
AUD/t HMC	\$ 68/t	\$ 62/t	\$ 75/t	\$ 87/t	\$ 159/t	\$ 147/t	\$ 146/t	\$ 162/t	\$ 154/t	\$ 140/t	\$ 97/t	\$ 140/t	\$ 189/t	\$ 301/t
<b>Ore Mining</b>	\$ 4.4 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m	\$ 8.8 m
AUD/t Material	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t	\$ 0.9/t
AUD/t HMC	\$ 75/t	\$ 66/t	\$ 58/t	\$ 67/t	\$ 84/t	\$ 72/t	\$ 82/t	\$ 86/t	\$ 89/t	\$ 115/t	\$ 92/t	\$ 88/t	\$ 96/t	\$ 148/t
<b>Mine Planning</b>	\$ 1.7 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m	\$ 2.3 m
AUD/t Material	\$ 0.3/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t	\$ 0.2/t
AUD/t HMC	\$ 29/t	\$ 17/t	\$ 15/t	\$ 17/t	\$ 22/t	\$ 19/t	\$ 21/t	\$ 22/t	\$ 23/t	\$ 29/t	\$ 24/t	\$ 23/t	\$ 25/t	\$ 38/t
<b>Wet Concentrator</b>	\$ 5.1 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m	\$ 11.5 m
AUD/t Material	\$ 1.1/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t	\$ 1.2/t
AUD/t HMC	\$ 88/t	\$ 86/t	\$ 75/t	\$ 88/t	\$ 110/t	\$ 94/t	\$ 107/t	\$ 112/t	\$ 116/t	\$ 150/t	\$ 120/t	\$ 115/t	\$ 125/t	\$ 193/t
<b>Site Admin &amp; Sale</b>	\$ 3.0 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m	\$ 4.5 m
AUD/t Material	\$ 0.6/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t	\$ 0.5/t
AUD/t HMC	\$ 52/t	\$ 34/t	\$ 30/t	\$ 35/t	\$ 43/t	\$ 37/t	\$ 42/t	\$ 44/t	\$ 45/t	\$ 59/t	\$ 47/t	\$ 45/t	\$ 49/t	\$ 76/t
<b>TOTAL SITE COSTS</b>	\$ 18 m	\$ 35 m	\$ 39 m	\$ 39 m	\$ 44 m	\$ 45 m	\$ 43 m	\$ 44 m	\$ 43 m	\$ 38 m	\$ 36 m	\$ 41 m	\$ 44 m	\$ 45 m
AUD/t HMC	\$ 311/t	\$ 266/t	\$ 253/t	\$ 294/t	\$ 418/t	\$ 369/t	\$ 397/t	\$ 425/t	\$ 426/t	\$ 492/t	\$ 380/t	\$ 411/t	\$ 484/t	\$ 755/t

Source : Beer & Co projections

Figure 8 : Beer & Co's projections for Cyclone off-site costs

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
On to Ship	\$ 4.2 m	\$ 9.7 m	\$ 11.1 m	\$ 9.5 m	\$ 7.6 m	\$ 8.9 m	\$ 7.8 m	\$ 7.5 m	\$ 7.2 m	\$ 5.6 m	\$ 7.0 m	\$ 7.3 m	\$ 6.7 m	\$ 4.3 m
Shipping	\$ 3.5 m	\$ 8.0 m	\$ 9.2 m	\$ 7.9 m	\$ 6.3 m	\$ 7.3 m	\$ 6.5 m	\$ 6.2 m	\$ 6.0 m	\$ 4.6 m	\$ 5.8 m	\$ 6.0 m	\$ 5.5 m	\$ 3.6 m
AUD/t HMC	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t	\$ 133/t
MSP Fee	\$ 3.0 m	\$ 6.6 m	\$ 7.6 m	\$ 6.6 m	\$ 5.4 m	\$ 6.3 m	\$ 5.6 m	\$ 5.5 m	\$ 5.4 m	\$ 4.4 m	\$ 5.3 m	\$ 5.6 m	\$ 5.3 m	\$ 3.7 m
AUD/t HMC	\$ 51/t	\$ 50/t	\$ 50/t	\$ 50/t	\$ 51/t	\$ 52/t	\$ 52/t	\$ 53/t	\$ 54/t	\$ 57/t	\$ 55/t	\$ 55/t	\$ 57/t	\$ 62/t
<b>TOTAL</b>	\$ 29 m	\$ 60 m	\$ 66 m	\$ 63 m	\$ 63 m	\$ 68 m	\$ 63 m	\$ 63 m	\$ 61 m	\$ 52 m	\$ 54 m	\$ 60 m	\$ 62 m	\$ 57 m
AUD/t HMC	\$ 494/t	\$ 448/t	\$ 435/t	\$ 477/t	\$ 601/t	\$ 554/t	\$ 582/t	\$ 610/t	\$ 613/t	\$ 681/t	\$ 567/t	\$ 599/t	\$ 674/t	\$ 949/t

Source : Beer & Co projections

**Beer & Co expects Cyclone to ship a Heavy Mineral Concentrate for processing in China, where there is existing, spare capacity**

Figures 7 & 8 show that Beer & Co's analysis assumes that DRX produces a Heavy Mineral Concentrate (HMC) at Cyclone, grading about 95% valuable heavy minerals, which is "sold" to a suitable Mineral Separation Plant (MS) in China, where there is significant spare / idle dry plant capacity.

## Cyclone Project Economics

Figure 9 incorporates Beer & Co's projected production, from Figure 6, with our projections of cash costs, from Figures 7 & 8, with our projections of commodity prices, to show the overall project economics.

**Figure 9 : Beer & Co's projections for Cyclone project economics**

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
AUD/USD	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Zircon USD /t	1,113	1,225	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
HiTi 87 USD/t	682	752	824	824	824	824	824	824	824	824	824	824	824	824	824
HiTi 67 USD/t	292	322	353	353	353	353	353	353	353	353	353	353	353	353	353
Final Product Volume															
Zircon	0 kt	32 kt	71 kt	78 kt	67 kt	52 kt	59 kt	61 kt	56 kt	51 kt	39 kt	43 kt	45 kt	45 kt	31 kt
HiTi 87	0 kt	6 kt	15 kt	18 kt	16 kt	13 kt	16 kt	11 kt	11 kt	12 kt	9 kt	14 kt	14 kt	12 kt	7 kt
HiTi 67	0 kt	7 kt	16 kt	20 kt	17 kt	14 kt	17 kt	11 kt	12 kt	13 kt	10 kt	15 kt	16 kt	13 kt	8 kt
Revenue, AUD m	0	76	174	196	168	133	154	145	136	128	99	117	122	116	49
Cash Costs	0	(29)	(60)	(66)	(63)	(63)	(68)	(63)	(63)	(61)	(52)	(54)	(60)	(62)	(34)
<b>E B I T D A</b>	<b>0</b>	<b>47</b>	<b>114</b>	<b>130</b>	<b>106</b>	<b>70</b>	<b>86</b>	<b>82</b>	<b>73</b>	<b>67</b>	<b>46</b>	<b>62</b>	<b>62</b>	<b>54</b>	<b>15</b>
Dep'n & Amort'sn	0	(6)	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(6)
Interest Expense	(1)	(6)	(5)	(4)	(3)	(1)	(0)	0	0	0	0	0	0	0	0
Tax Expense	0	(5)	(17)	(20)	(15)	(7)	(11)	(11)	(7)	(3)	(6)	(6)	(6)	(4)	(0)
<b>N P A T</b>	<b>(1)</b>	<b>30</b>	<b>80</b>	<b>94</b>	<b>76</b>	<b>49</b>	<b>63</b>	<b>59</b>	<b>52</b>	<b>48</b>	<b>31</b>	<b>44</b>	<b>44</b>	<b>38</b>	<b>9</b>
Project Cap. Ex	(127)	(3)	0	0	0	0	0	0	0	0	0	0	0	0	0
Sus. Cap. Ex	0	(1)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	0

Source : Beer & Co projections

**Compared with our analysis in February, our NPV is down due to a higher AUD-USD rate, now 0.750**

In comparison with our previous report ([DiatremeResources\\_2016February01.pdf](#)), Figure 9 shows that our commodity price projections have not changed, apart from the AUD-USD rate, which was previously 0.700 and is now 0.750.

Our other assumptions are largely the same.

Figure 10 shows that the high AUD-USD rate has reduced the NPV of the project; the IRR is not impacted as we now have assumed a quicker ramp-up.

**Figure 10 : Change in project value**

	February 2016		July 2016	
	NPV at 10%	IRR	NPV at 10%	IRR
Project cashflows	\$A 129m	27%	\$A 107m	28%
Cashflows to equity	\$A 146m	42%	\$A 114m	41%

Source : Beer & Co projections

## Valuation of DRX

### Background

One of the reasons Beer & Co is attracted to DRX is that DRX has potential product users who wish to invest in the project. These Chinese investors, while making an equity investment, will also facilitate debt.

As a result, as detailed in our update of DRX of 1 February 2016, Beer & Co assumes that the capital cost of the project is financed :

**We expect that DRX will sell a major project take to a third party that will assist with financing the project into production.**

- 50% by debt funding; and
- DRX sells a 45% stake in the project, which
  - (i) covers DRX's remaining equity requirement to develop the Cyclone project; and
  - (ii) leaves DRX with a 49% stake

Further, Beer & Co assumes that the equity stake is sold at a discount to its NPV.

## Base Case Valuation

Figure 11 shows the detail of the resulting valuation of DRX.

**Figure 11 : Beer & Co's Base case valuation of DRX**

discount rate = 12.0 %	risk :	31-Dec-15		5-Jul-16		
		100%	Product	per share		
	Cyclone	70 %	\$ 56m	\$ 39m	3.7 c	4.0 c
	franking credits	40 %	\$ 12m	\$ 5m	0.5 c	0.5 c
	Cape Bedford	nom	\$ 5m	\$ 5m	0.5 c	0.5 c
	Tick Hill	nom	\$ 4m	\$ 4m	0.4 c	0.4 c
	Corporate	100 %	(\$24m)	(\$24m)	(2.3c)	(2.3c)
	Exploration	80 %	\$ 0m	\$ 0m	0.0 c	0.0 c
	Asset Sales	70 %	\$ 37m	\$ 26m	2.4 c	1.2 c
	Cash to be raised	100 %	\$ 2m	\$ 2m	0.2 c	0.1 c
	Cash	100 %	(\$3m)	(\$3m)	(0.2c)	1.8 c
	<b>TOTAL</b>		<b>\$ 92m</b>	<b>\$ 57m</b>	<b>5.4 c</b>	<b>6.0 c</b>
	Shares on issue		809.7m	FPO shares	56.6m	options
			243m	Issued later	0.0m	ex'd

**Beer & Co's base case production is now 6.0c/share**

Source : Beer & Co projections

## Risks

**Our valuation is sensitive to commodity prices and is subject to execution risk.**

The major risk to our valuation is commodity prices. Figure 12 shows that our commodity price assumptions have a significant impact.

The impact is more significant in this case as the value we have assumed the investors buys in at is determined by the project value and so is lower at current, spot prices.

**Figure 12 : Sensitivity**

	Zircon	
	\$ 1,050/t	\$ 1,250/t
<b>Rutile</b>		
\$ 850/t	1.2 c	5.4 c
\$ 1,000/t	2.1 c	6.3 c

Source : Beer & Co projections

## Conclusions

**DRX is more than just the Cyclone project**

**Beer & Co retains a**

**BUY, High Risk,**

**recommendation on DRX**

Beer & Co's valuation of DRX is sensitive to the commodity prices assumed in the project valuation for the purposes of the sale of a stake in the project.

Beer & Co is strongly of the view that

- The Cyclone project will proceed, due to its connections with consumers of the product; and
- DRX is more than just Cyclone.

Beer & Co retains a BUY, High Risk, recommendation.



Beer & Co Research

Diatreme Minerals (DRX.ASX)

July 2016

Year ended December	2015	2016	2017	2018	2019	2020	
<b>Section 1 - P&amp;L</b>							
Sales revenue	\$A m	0	0	0	29	66	74
Interest revenue	\$A m	0	0	1	0	0	1
Other revenue	\$A m	0	0	0	0	0	0
<b>Total Revenue</b>	\$A m	0	0	1	29	66	75
Cost of Goods Sold	\$A m	0	0	0	(13)	(26)	(29)
Royalties	\$A m	0	0	0	(2)	(4)	(4)
Exploration Expense	\$A m	0	0	0	0	0	0
Corporate Costs	\$A m	(1)	(1)	(2)	(4)	(4)	(4)
<b>Total Operating Expenses</b>	\$A m	(1)	(1)	(2)	(18)	(34)	(37)
<b>EBITDA</b>	\$A m	(1)	(1)	(1)	11	32	37
Dep'n & Amort'sn	\$A m	0	0	0	(3)	(6)	(6)
<b>EBIT</b>	\$A m	(1)	(1)	(1)	8	26	31
Interest Expense	\$A m	0	0	(0)	(3)	(2)	(2)
Other	\$A m						
<b>Pre-Tax Profit</b>	\$A m	(1)	(1)	(2)	5	24	29
Tax Expense	\$A m	0	0	1	(2)	(7)	(9)
<b>NPAT</b>	\$A m	(1)	(1)	(1)	4	17	21

**Section 2 - Key Data**

		2015	2016	2017	2018	2019	2020
Ordinary shares - year end	m	810	1,053	1,053	1,053	1,053	1,053
Fully diluted shares on issue	m	810	1,053	1,053	1,053	1,053	1,053
Weighted # shares	m	799	931	1,053	1,053	1,053	1,053
Earnings per Share	(0.1c)	(0.1c)	(0.1c)	(0.1c)	0.3 c	1.6 c	2.0 c
Dividends Per Share	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c

**Section 3 - Balance Sheet**

		2015	2016	2017	2018	2019	2020
Cash	\$A m	(1)	42	10	12	26	44
Receivables	\$A m	0	0	0	8	10	11
Other	\$A m	0	0	0	0	0	0
<b>CURRENT ASSETS</b>	\$A m	(1)	42	10	20	35	55
Receivables	\$A m	0	0	0	0	0	0
P, P & E	\$A m	0	0	63	62	57	52
Mining Properties / Exploration	\$A m	6	7	7	7	6	5
Other	\$A m	0	0	0	0	0	0
<b>NON-CURRENT ASSETS</b>	\$A m	7	8	70	69	63	58
<b>TOTAL ASSETS</b>	\$A m	6	50	80	89	99	112
Payables	\$A m	0	0	0	2	3	3
Debt	\$A m	0	0	2	6	7	7
Other	\$A m	0	0	0	0	0	0
<b>CURRENT LIABILITIES</b>	\$A m	0	0	2	6	7	7
Long Term Debt	\$A m	0	0	29	23	17	10
Deferred Tax Liability	\$A m	0	0	0	0	0	0
Other	\$A m	0	0	0	0	0	0
Provisions	\$A m	0	0	0	0	0	0
<b>NON-CURRENT LIABILITIES</b>	\$A m	0	0	29	23	17	10
<b>TOTAL LIABILITIES</b>	\$A m	0	0	31	29	23	17
<b>NET ASSETS</b>	\$A m	6	50	49	60	76	96
Accumulated Profit (Loss)	\$A m	(33)	(34)	(35)	(32)	(15)	6
Reserves	\$A m	(9)	33	33	39	38	37
Contributed Equity	\$A m	48	50	50	50	50	50
<b>Total Equity</b>	\$A m	6	50	48	58	73	93

**Section 4 - Cashflow**

		2015	2016	2017	2018	2019	2020
Net Cashflow from operations	\$A m	(1)	(1)	(2)	11	32	36
Net Interest Paid	\$A m	0	0	(0)	(3)	(2)	(2)
Taxes Paid	\$A m	0	0	0	0	0	0
Change in Working Capital	\$A m	(0)	0	0	(6)	(2)	(1)
<b>OPERATING CASHFLOW</b>	\$A m	(1)	(1)	(2)	2	27	34
Exploration Expenditures	\$A m	(1)	(1)	0	0	0	0
Maintenance Capex	\$A m	0	0	0	(1)	(1)	(1)
Expansion Capex	\$A m	0	0	(62)	(1)	0	0
<b>PPE Acquisitions (Total Capex)</b>	\$A m	(1)	(1)	(62)	(2)	(1)	(1)
PPE Divestments	\$A m	0	41	0	0	0	0
<b>INVESTING CASHFLOW</b>	\$A m	(1)	40	(62)	(2)	(1)	(1)
Change in Equity	\$A m	1	2	0	0	0	0
Dividends Paid	\$A m	0	0	0	0	0	0
Change in Debt	\$A m	0	0	31	(2)	(6)	(7)
<b>FINANCING CASHFLOW</b>	\$A m	1	2	31	(2)	(6)	(7)
<b>Free Cashflow</b>	\$A m	(2)	38	(65)	0	26	32
<b>Net Cashflow</b>	\$A m	(1)	41	(33)	(1)	20	26

**Major Shareholders**

		5-Jul-16
Andrew Tsang	111.5m	Non-Executive Director 13.8%
Zhenbin Jiang	82.0m	10.1%
Yufeng Zhang	59.6m	Non-Executive Director 7.4%
Chenxia Zhou	50.0m	6.2%
Longqiang Zhuang	41.7m	5.1%

**Year ended December**

	2017	2018	2019	2020	2021	2022
<b>Commodity price assumptions</b>						
AUD/USD	0.750	0.750	0.750	0.750	0.750	0.750
Zircon USD /t	1,113	1,225	1,250	1,250	1,250	1,250
Rutile USD /t	828	913	1,000	1,000	1,000	1,000
HITI 87 USD/t	682	752	824	824	824	824
HITI 67 USD/t	292	322	353	353	353	353

**Mine Production, 100% basis**

	2017	2018	2019	2020	2021	2022
Mine production '000t	0	4,875	10,000	10,000	10,000	10,000
Zircon in HMC, '000t	0	37	82	91	78	61
HITI 87 in HMC, '000t	0	0	10	23	28	24
HITI 67 in HMC, '000t	0	0	10	23	28	24
TOTAL HMC '000t	0	0	59	134	153	131

**Attributable production (DRX share)**

	2017	2018	2019	2020	2021	2022
Heavy Mineral Conc. '000t	0	0	29	65	75	64

**Resources**

	1.0% cut-off	H M	Zircon	70% - 95%	<70%	SiTiOx
Measured	156 Mt	2.4%	0.69%	0.77%	0.32%	0.53%
Indicated	55 Mt	1.8%	0.36%	0.61%	0.55%	0.31%
<b>TOTAL</b>	211 Mt	2.2%	0.60%	0.73%	0.33%	0.47%
<b>Cyclone</b>	<b>1.5% cut-off</b>	<b>H M</b>	<b>Zircon</b>	<b>70% - 95%</b>	<b>&lt;70%</b>	<b>SiTiOx</b>
Measured	102 Mt	3.1%	0.87%	0.96%	0.40%	0.67%
Indicated	24 Mt	2.5%	0.50%	0.82%	0.55%	0.45%
<b>TOTAL</b>	127 Mt	3.0%	0.80%	0.93%	0.43%	0.63%

**Assumed mining inventory**

	H M	Zircon	HITI 87	HITI 67	
TOTAL	138 Mt	2.54%	0.72%	0.25%	0.91%

**Asset based Valuation**

	discount rate = 12.0 %	31-Dec-15	05-Jul-16		
	risking	100%	Product per share		
Cyclone	70 %	\$ 56m	\$ 39m	3.7 c	4.0 c
franking credits	40 %	\$ 12m	\$ 5m	0.5 c	0.5 c
Cape Bedford	nom	\$ 5m	\$ 5m	0.5 c	0.5 c
Tick Hill	nom	\$ 4m	\$ 4m	0.4 c	0.4 c
Corporate	100 %	(\$24m)	(\$24m)	(2.3c)	(2.3c)
Exploration	80 %	\$ 0m	\$ 0m	0.0 c	0.0 c
Asset Sales	70 %	\$ 37m	\$ 26m	2.4 c	1.2 c
Cash to be raised	100 %	\$ 2m	\$ 2m	0.2 c	0.1 c
Cash	100 %	(\$3m)	(\$3m)	(0.2c)	1.8 c
<b>TOTAL</b>		\$ 92m	\$ 57m	5.1 c	6.0 c
Shares on issue		809.7m	FPO shares	56.6m	options
		243.2m	Issued later	0.0m	ex'd

**per US \$ /t of HMC**

	LoM	2018	2019	2020	2021	2022
<b>Estimated Revenue</b>	960	973	976	963	962	952
<b>Estimated Cash Costs</b>						
Overburden	99	51	47	56	66	119
Ore Mining	63	56	50	43	51	63
Mine Planning	17	22	13	11	13	16
Wet Concentrator	82	66	65	57	66	82
Site Admin & Sales	33	39	25	22	26	32
Transport of HMC	101	101	101	101	101	101
MSP Fee	227	222	223	222	224	227
Royalties	43	45	45	44	44	44
<b>TOTAL</b>	665	601	568	558	590	684

**Financial Ratios**

Year ended December	2015	2016	2017	2018	2019	2020	
Revenue	\$A m	0	0	1	29	66	75
EBITDA	\$A m	(1)	(1)	(1)	11	32	37
EBIT	\$A m	(1)	(1)	(1)	8	26	31
Adjusted EPS (cps)	(0.1c)	(0.1c)	(0.1c)	0.3 c	1.6 c	2.0 c	
EPS Growth (%)	94 %	(36%)	(21%)	394 %	350 %	24 %	
DPS (c)	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	
Dividend Yield (%)	0 %	0 %	0 %	0 %	0 %	0 %	
PE adj. (x)	x	(17)	(12)	(10)	3	1	1
EV / EBITDA	x	35	(26)	(20)	1	(0)	0
EV / EBIT (x)	x	35	(26)	(20)	1	(1)	0
Gearing (%)	0 %	0 %	39 %	33 %	23 %	15 %	
Return on Assets	(15%)	(3%)	(2%)	9 %	26 %	28 %	
Return on Equity	(10%)	(2%)	(3%)	6 %	22 %	21 %	
EBITDA Margin (%)	n/a	n/a	n/a	38 %	49 %	50 %	
Interest Covt	x	n/a	n/a	(4.1)	2.9	10.8	17.0

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The author of this report has an indirect equity interest in Diatreme Resources.

### **Analyst Certification**

The analyst responsible for this research report certifies that all of the views expressed reflect his personal views about the securities and the issuer.

Report prepared by : Pieter Bruinstroop [pbruinstroop@beerandco.com.au](mailto:pbruinstroop@beerandco.com.au)

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Beer & Co Pty Ltd ABN 88 158 837 186

**AUTHORISED REPRESENTATIVE MELBOURNE VENTURE SECURITIES PTY LTD AFSL No. 224 313**

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Melbourne Office:  
Suite 4, Level 2, Bank House  
11 - 19 Bank Place,  
Melbourne, Vic, Australia 3000

Telephone: (+613) 9600 3599  
Facsimile: (+613) 9602 2291  
Email: [info@beerandco.com.au](mailto:info@beerandco.com.au)  
Web : [www.beerandco.com.au](http://www.beerandco.com.au)