

## Spec. buy

Current Price \$0.85  
Valuation \$1.22

Tuesday, 9 March 2021

## De Grey Mining Ltd (DEG)

### Mallina progress

John Macdonald

#### Quick Read

De Grey made geological and metallurgical ground in early 2021. Speculative buy recommendation maintained.

#### Main points

**Hemi drilling:** Since our January 2021 report De Grey reported assays from about 80 RC and diamond holes at Falcon, Crow, Diucon and Eagle, bringing the tally at Hemi to about 380 reported RC and diamond holes (104,000 drill metres) in just over 12 months since discovery.

The known mineralisation at Falcon was extended from 200m to 300m depth, along about 500m of Falcon's total 1km strike length. Infill drilling to partial 40m by 40m spacing at Crow enabled recognition of a north-west trending structure at Crow (called McLeod). The best Hemi intercept so far below 250m depth from surface (52m at 2.0g/t from 520m), was recorded in March 2021 beneath the western end of Aquila. Wide spaced lines drilled 1km west of Crow identified two new mineralised, intrusive hosted prospects, called Diucon and Eagle. Step out drilling at Diucon and Eagle continues to the west and down dip. More prospects extend 6km to the west between Eagle and Antwerp. Aircore drilling at Scooby, targeting a 2km long coincident geochem and IP anomaly, intersected mineralisation in altered intrusives. Initial RC drilling at Scooby is in progress.

All up, the drilling results since January 2021 add about 5% to our 3-4Moz inventory presumption, (call it 3.2-4.2Mozs), before Diucon and Eagle come into calculations. We expect an active month or two ahead as the cut off for resource estimation drilling data will occur sometime in April.

**Conventional refractory ore processing:** Interim findings from ongoing metallurgical tests include 1. up to 27% gravity recovery from three tested Brolga samples, 2. an average of 86% of the gold into a flotation concentrate averaging 7.5% of the starting material, from four Brolga samples, 3. 92-95% recovery to bullion responses to POX, BIOX and Albion processes from five composite Brolga samples and one regional composite.

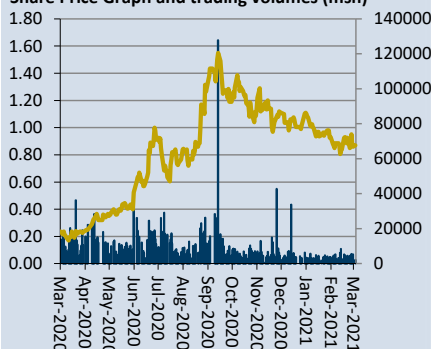
Tests continue, with three alternative routes (POX, BIOX and Albion) under consideration. Argonaut assumes POX, akin to a sledgehammer approach. If gravity methods, and Glencore's Albion technology, prove effective they could help contain costs. So far, metallurgical testwork points to mid-90s recoveries with conventional methods, as Argonaut presumed previously.

#### Recommendation

De Grey advanced Mallina on several fronts in the first months of 2021. The change to our valuation from 129 to 122cps is due to long term AUDUSD adjustment from 0.72 to 0.75. Continuing exploration threatens to push up our project assumptions.

Code:	DEG		
Sector:	Materials		
* All figures in AUD unless stated otherwise			
Shares on Issue (M):	1,288		
Market Cap (\$M):	1,088		
Net cash (\$M Sep 2020, post raise)	115		
Enterprise value (\$M):	973		
52 wk High/Low (ps):	\$1.55	\$0.17	
12m av. daily vol. (Mshs):	9.70		
<b>Key Metrics</b>			
	FY24e	FY25e	FY26e
P/E (x)	9.2	4.8	4.8
EV/EBITDA (x)	5.8	2.8	2.8
<b>Financials:</b>			
	FY24e	FY25e	FY26e
Revenue (\$M)	328	657	657
EBIT (\$M)	151	286	284
NPAT (A\$M)	118	226	225
Net assets (\$M)	481	687	894
Op CF (\$M)	151	283	284
<b>Per share data:</b>			
EPS (c)	9.2	17.5	17.5
Dividend (cps)	0.0	0.0	0.0
Yield (%)	-	-	-
CF/Share (cps)	11.7	21.9	22.0
Prod (koz Au)	140.8	281.5	281.5

Share Price Graph and trading volumes (msh)



Please refer to important disclosures at end of the report (from page 9)

## De Grey Mining

## Equities Research

Analyst: John Macdonald

Recommendation **Speculative buy**  
 Current Price **\$0.85**  
 Valuation **\$1.22**

Sector **Metals & Mining**  
 Issued Capital (Mshs) **1,288**  
 Market Cap (M) **\$1,088**  
 Tuesday, 9 March 2021

Profit & loss (\$M) 30 June	2021E	2022E	2023E	2024E
Sales Revenue	0	0	0	328
+ Other income/forwards	0	0	0	0
- Operating costs	0	0	0	-138
- Royalties	0	0	0	-13
- Corporate & administration	-9	-9	-9	-9
<b>Total Costs</b>	<b>-9</b>	<b>-9</b>	<b>-9</b>	<b>-160</b>
<b>EBITDA</b>	<b>-9</b>	<b>-9</b>	<b>-9</b>	<b>168</b>
- margin	0%	0%	0%	51%
- D&A	0	0	0	-17
<b>EBIT</b>	<b>-9</b>	<b>-9</b>	<b>-9</b>	<b>151</b>
+ Finance Income/Expense	0	0	0	-3
<b>PBT</b>	<b>-9</b>	<b>-9</b>	<b>-9</b>	<b>148</b>
- Tax expense	2	1	2	-30
- Impairments and other				
<b>NPAT</b>	<b>-7</b>	<b>-8</b>	<b>-7</b>	<b>118</b>

Cash flow (\$M)	2021E	2022E	2023E	2024E
+ Revenue	0	0	0	328
- Cash costs	-9	-9	-9	-160
- Forwards	0	0	0	0
- Tax payments	0	0	0	-14
+ Interest & other	0	0	0	-3
<b>Operating activities</b>	<b>-9</b>	<b>-8</b>	<b>-9</b>	<b>151</b>
- Property, plant, mine devel.	0	-31	-301	-354
- Exploration	-32	-32	-32	-20
<b>Investment activities</b>	<b>-32</b>	<b>-63</b>	<b>-333</b>	<b>-374</b>
+ Borrowings	0	0	100	300
- Dividends	0	0	0	0
+ Equity	103	1	270	0
<b>Financing activities</b>	<b>103</b>	<b>1</b>	<b>370</b>	<b>300</b>
<b>Cash change</b>	<b>62</b>	<b>-70</b>	<b>28</b>	<b>77</b>

Balance sheet	2021E	2022E	2023E	2024E
<b>Cash &amp; bullion</b>	<b>90</b>	<b>21</b>	<b>49</b>	<b>126</b>
Other Current Assets	0	0	0	0
<b>Total current assets</b>	<b>90</b>	<b>21</b>	<b>49</b>	<b>126</b>
Property, plant & equip.	50	81	382	719
Investments/other	0	0	0	0
<b>Total non-curr. assets</b>	<b>50</b>	<b>81</b>	<b>382</b>	<b>719</b>
<b>Total assets</b>	<b>140</b>	<b>101</b>	<b>430</b>	<b>845</b>
Trade payables	5	10	5	42
Short term borrowings	0	0	0	120
Other	5	5	80	42
<b>Total curr. liabilities</b>	<b>10</b>	<b>15</b>	<b>85</b>	<b>84</b>
Long term borrowings	0	0	100	280
Other	0	0	0	0
<b>Total non-curr. liabil.</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>280</b>
<b>Total liabilities</b>	<b>10</b>	<b>15</b>	<b>185</b>	<b>364</b>
<b>Net assets</b>	<b>130</b>	<b>86</b>	<b>245</b>	<b>481</b>

Shares	2021E	2022E	2023E	2024E
New shs issued/exerciseable	118	4	201	0
Average issue price	0.88	0.35	1.35	0.00
Ordinary shares - end	1291	1294	1495	1495
Diluted shares - end	1295	1295	1495	1495

Financial ratios		2024E	2025E	2026E	2027E
GCFPS	AC	11.7	21.9	22.0	22.0
CFR	X	7.2	3.9	3.8	3.8
EPS	AC	9.2	17.5	17.5	17.4
PER	X	9.2	4.8	4.8	4.8
DPS	AC	0.0	0.0	0.0	0.0
Yield	%	0.0%	0.0%	0.0%	4.7%
Interest cover	x	46.6	80.6	120.8	245.1
ROCE	%	21%	43%	46%	50%
ROE	%	31%	41%	31%	30%
Gearing	%	58%	23%	4%	4%

Operations summary	2024E	2025E	2026E	2027E
<b>Pilbara project</b>				
Ore processed (Mt)	3.0	6.0	6.0	6.0
Head grade (g/t)	1.52	1.52	1.52	1.52
Met. recovery	0.96	0.96	0.96	0.96
Gold prodn (koz)	141	282	282	282
Cost per milled tonne (A\$/t)	46	46	47	47
Cash costs pre royalty (A\$/oz)	1077	1080	1085	1090
Sustaining capital (\$M)	0	0	0	0
All in sustaining costs (A\$/oz)	1170	1174	1179	1184
Growth capital (\$M)	354	7	8	7
CAIC (A\$/oz)	3918	1419	1416	1414

Price assumptions	2024E	2025E	2026E	2027E
AUDUSD	0.75	0.75	0.75	0.75
Gold	1750	1750	1750	1750

Valuation summary	A\$M	A\$/sh
Mallina project 7% real after tax DR	1176	0.91
Exploration, all sites	353	0.27
Corporate overheads	-46	-0.04
Cash and bullion	115	0.09
Debt	0	0.00
Tax benefit	10	0.01
Hedging	0	0.00
Option/equity dilution	-30	-0.02
<b>NAV</b>	<b>1,578</b>	<b>1.22</b>

Directors, management	
Simon Lill	Non-Executive Chairman
Glenn Jardine	Managing Director
Andy Beckwith	Executive Director
Peter Hood	Non-Executive Director
Ed Eshuys	Non-Executive Director
Bruce Parncutt	Non-Executive Director

Top shareholders	M shs	%
DGO Gold Limited	193.0	15.0
Van Eck	65.0	5.0
Northwest Nonferrous	51.0	4.0

Resources June '20	Mt	g/t Au	Kozs	Mkt cap/oz
<b>Pilbara gold project</b>	<b>37.4</b>	<b>1.80</b>	<b>2,163</b>	<b>503</b>
Measured & indicated	18.9	1.70	1,033	
Inferred	18.5	1.90	1,130	

Argonaut model Dec '20	Mt	g/t Au	Kozs	
<b>TOTAL INVENTORY</b>	<b>78.0</b>	<b>1.52</b>	<b>3,820</b>	<b>285</b>
Hemi open pit	60.0	1.50	2,894	
Satellite open pit	18.0	1.60	926	

## Mallina gold project – recent developments

### Hemi drilling reported 23 February 2021 and 4 March 2021,

Assays were reported from 15 RC and diamond holes at Falcon, and 50 holes into Crow and Aquila. Intercepts include;

- 26m at 2.3 g/t from 309m down hole HERC298D, Falcon.
- 34m at 1.8 g/t from 212m HERC407D, Falcon.
- 65m at 1.4 g/t from 324m HERC416D, Falcon.
- 33m @ 4.9 g/t from 171m HERC607, Crow.
- 25m @ 2.1 g/t from 308m HERC039D, Crow.
- 18 m @ 3.4 g/t from 210m HERC623, Crow.
- 52 m @ 2.0 g/t from 520m HEDD012, Aquila.
- 12 m @ 3.6 g/t from 371m HERC208D, Aquila.

The results extend the known mineralisation at Falcon from 200m to 300m depth along about 500m of strike length, with lower grade mineralisation open at depth on most sections. At Crow, De Grey interprets a north-west trending lode called McLeod. At the western end of Aquila, De Grey recorded the best Hemi intercept so far below 250m depth from surface (52m at 2.0g/t from 520m). Subject to further drilling, the western end of Aquila looks like a sub-vertical plunging shoot with mineralised dimensions of 100-150m strike, 30m average width and gold grades above 2g/t.

### Diucon and Eagle drilling, reported 29 January 2021 and 9<sup>th</sup> March 2021.

De Grey reported assays in January from 12 RC holes and 6 aircore holes at the Diucon and Eagle prospects 1km west of Crow, followed by 17 RC holes in March.

Wide spaced lines identified two new mineralised intrusive hosted prospects. By March, three fences 160m apart with 80m spaced holes had been drilled across both prospects. RC intercepts at Diucon include;

- o 99m at 1.0 g/t from 114m down hole, HERC382
- o 29m at 1.1 g/t from 55m down hole, HERC435
- o 121m at 1.1 g/t from 80m HERC452
- o 36m at 2.0 g/t from 224m HERC441 ended in mineralisation,
- o 34m at 1.8 g/t from 40m HERC449

RC intercepts at Eagle include;

- o 6m at 2.0 g/t from 78m, and 18m at 1.3 g/t from 96m, HERC377
- o 123m at 1.0 g/t from 229m HERC454
- o 35m at 0.7g/t from 51m HERC454

Broad mineralisation has been intersected at Diucon on two lines 160m apart. Step out drilling continues to the west and at depth of both prospects. De Grey says the sulphide alteration is similar to that seen at Aquila, Crow, Brolga and Falcon.

### Scooby and Antwerp drilling assays, reported 4 February 2021.

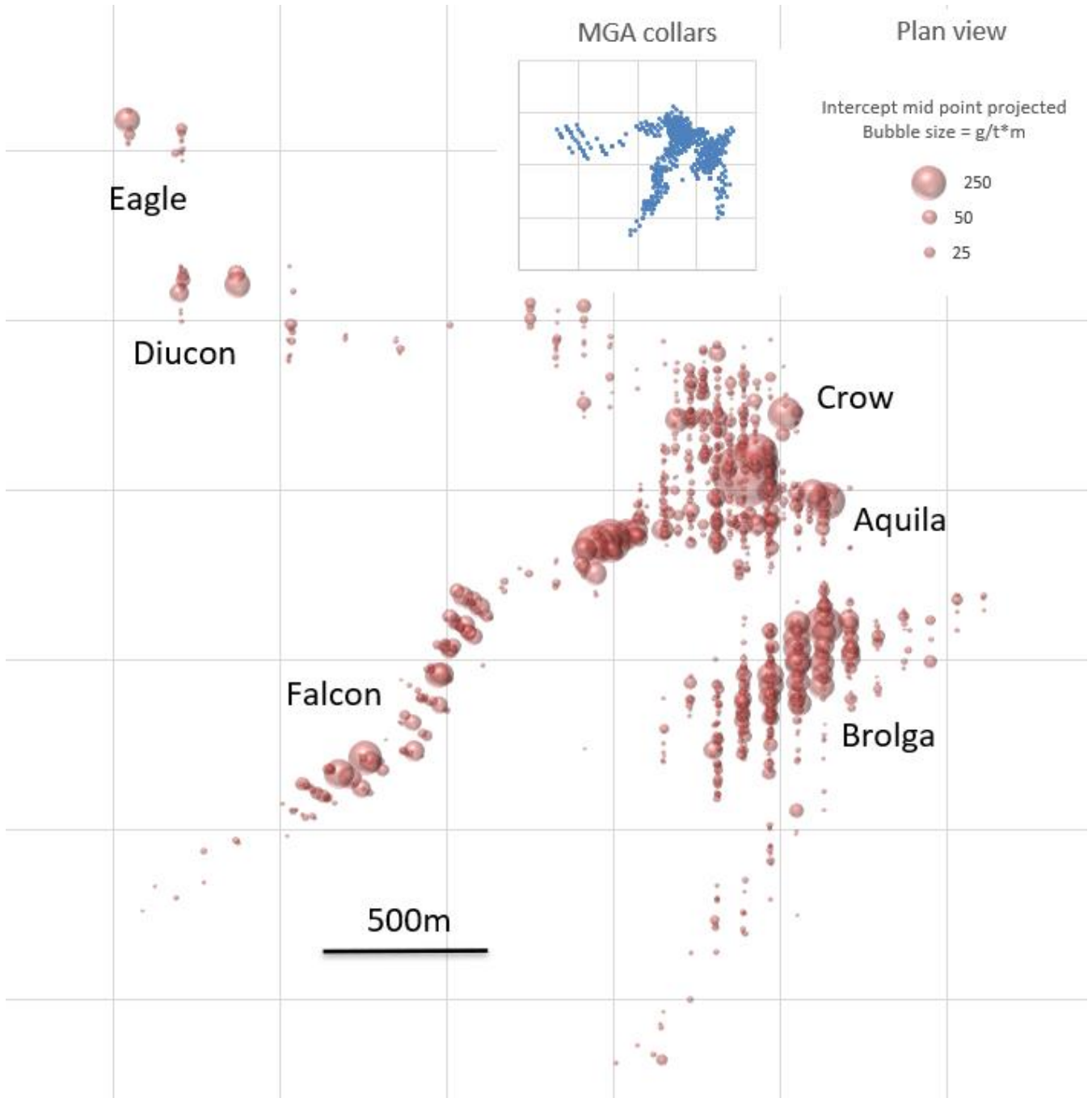
Scooby aircore intercepts included;

- o 3m at 97.4 g/t from 45m BXAC437
- o 2m at 4.8 g/t from 39m BXAC436, collared 40m from BXAC437

The aircore drilling targeted a coincident geochem and IP anomaly that extends over 2km. Limited RC drilling had been done to date. The intercepts are in altered intrusives. De Grey

sees the results as an early affirmation of the IP trial at Scooby which will help drill targeting over the project. RC drilling at Scooby will start soon. At Antwerp, 6km to the west of Scooby, De Grey sees potential for a mineralised link to the Eagle intrusive complex. IP is planned over these areas.

Fig. 1: Hemi plan view with drill intercept representation, March 2021. Intercepts projected to surface with bubble size proportionate to intercept  $g/t \cdot m$ .



Source: De Grey ASX announcements, Argonaut research

Fig. 2: Hemi reported drilling, statistical summary, including changes since January 13 2021.

Hemi reported drilling since 2019	9/03/2021	13/01/2021	Change
Reported holes	379	300	79
Total metres	104061	79930	24131
Average hole length (m)	270	263	2.8%
Number of intercepts reported	1179	945	24.8%
Total intercept metres	11665	9930	17.5%
Proportion intercept	11.2%	12.4%	-9.8%
Ave intercept length (m)	9.9	10.5	-5.8%
Ave intercept grade g/t	1.75	1.81	-3.2%
Ave intercept g/t*m	17.3	19.0	-8.9%
Intercepts/hole	3.1	3.1	-1.2%
Ave agg intercept length/hole (m)	30.8	33.1	-7.0%
Ave agg. intercept g/t*m/hole	53.9	59.8	-10.0%
Intercept metres* average intercept grade	20416	17954	13.7%
Average total hole grade g/t/m	0.20	0.22	-12.7%
Max g/t*m single intercept	825	825	0.0%
Weighted depth from surface	142	135	4.5%

Source: De Grey ASX announcements, Argonaut research

## Argonaut inventory assumption

As of March 9 2021, De Grey had reported assays from about 380 holes (104,000m) drilled at the Brolga, Aquila, Crow, Falcon, Diucon and Eagle zones (Hemi). Excepting Diucon and Eagle, most of the drilling has been completed to 80m by 40m spacing or 40 by 40m spacing, with a several holes penetrating to 600m vertical depth. Infill and extensional drilling are ongoing with the aim of estimating a resource in mid-2021.

Sufficient data is available for Argonaut to estimate the scale of the inventory uncovered so far at Hemi. Based on assay and collar data we estimate a work in progress inventory of 3.2-4.2 million ounces in the top 300m from surface. Our estimate lacks downhole surveys, density details, geological control, and the complete data set, hence the broad range. Up to 30% of the inventory could be oxide and transitional material. The Diucon and Eagle zones do not yet form part of our workings pending further drill data. Our presumptions will be revised as more data becomes available.

Prior to the discoveries at Hemi, De Grey estimated total measured, indicated and inferred Mallina gold project resources at 37Mt at 1.8 g/t (2.2Mozs), within 12 separate deposits ranging 10-60km from Hemi. The measured and indicated pit component of resources is 19Mt at 1.6 g/t (1.0Mozs), divided 46% oxide, 54% sulphide. Most of the measured and indicated pit resources are estimated for Withnell (240koz), Toweranna (293koz), and Wingina (216koz). Assuming not all of the measured and indicated resources will convert to reserves, and some of the inferred resources will contribute with further drilling, we add 1Mozs to our model for satellite sources, with the extra trucking costs included.

## Presuming development

De Grey and its predecessors have been operating in the belt for many years. De Grey's March 2020 resource estimate includes 12 separate deposits found over 120km of east west geology. Resources are designated oxide and fresh. In February 2019, prior to Hemi's discovery, GR Engineering designed and costed a 2Mtpa plant for the Mallina gold project, incorporating flotation, pressure oxidation (POX), and CIL processing (the costings are not available). The discoveries at Hemi have since lifted the potential scale of the

development proposal. The basic process flowsheet remains under consideration for the Mallina project including Hemi.

Subject to further tests of representative samples, De Grey has indicated 10% mass pull for 92% flotation recovery (96% total recovery). Average 10% mass pull suggests a pressure oxidation circuit treating 7-10% of the crushed and milled ore, allowing for a proportion of direct CIL feed. We presume 78Mt at 1.5 g/t (3.8Mozs) as a starting point mine inventory, a 6Mtpa ore treatment operation, and 450ktpa of concentrate destined for pressure oxidation.

Without many relevant yardsticks, we assume capital costs of A\$500-800M (A\$650M mid-point) for a 6Mtpa Mallina project operation. Operating costs will be higher than for equivalent straight CIL, but not necessarily by much. We assume \$25/t ore processing costs.

### **Pressure oxidation (POX)**

While more capital intensive than alternatives, POX technology is often the most efficient process solution for refractory gold ores, and the most environmentally acceptable.

In pressure oxidation circuits, the sulphides in which the gold is locked are oxidised in a reaction chamber (autoclave). The autoclave typically operates at +190°C and 2,000 kPa with a retention time of 30 – 60 minutes. POX circuits can operate on whole ore and/or flotation concentrates. Better than 90% gold recovery to a flotation concentrate usually justifies a float circuit rather than whole ore POX. The higher the recovery of gold to concentrate and the smaller the mass pull, the smaller the required pressure oxidation plant and throughput rate. For concentrate POX, autogenous autoclave reactions reduce energy needs. Acid produced by sulphide oxidation must be neutralised with lime or limestone, at a cost. Tailings disposal design must negate the potential for acid generation and arsenic mobility.

### **De Grey metallurgical test-work**

De Grey's tests of fresh Broilga material reported in July 2020 and February 2021 found that flotation recovered over 90% of the gold into a concentrate containing 7.5-9.4% by weight of the feed, and that cyanidation of the float tail recovered 60-67% of the gold in the tails. While tests at this stage are preliminary, Argonaut presumes an outcome process design including flotation-pressure oxidation, and cyanidation of both the concentrate and the concentrate tails, and +90% total recovery. Prior to the discoveries at Hemi, De Grey was considering 50-100ktpa POX with Withnell sulphide ore as base load feed (90% total recovery, 9% mass pull). Withnell is 30km from Hemi and will now form a satellite proposal to Hemi.

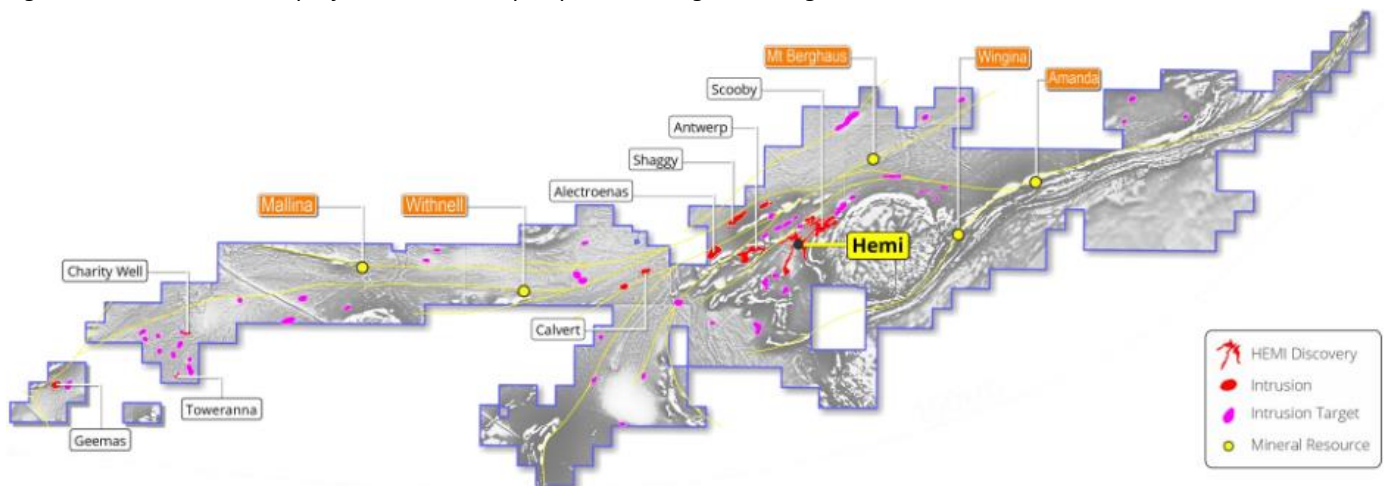
Hemi has significant oxide and transition components amenable to direct cyanidation. Depth of oxidation is typically 80-100m, suggesting up to 30-40% of mineralised material discovered so far at Hemi could be direct CIL feed rather than POX. Mt Berghaus and Wingina (10-20km from Hemi) have estimated M&I oxide resources of 240kcozs (1.7g/t). Withnell has an oxide component of 45kcozs, M&I. Mallina (45km from Hemi) has 30kcozs oxide M&I resources (1.3 g/t). Toweranna's 290kcozs M&I (4.3Mt at 2.1 g/t Au open pit, 60km from Hemi) was assessed in mid-2019 as free milling. Based on the prevalence of oxide and free milling ores throughout the project we assume 25% of the mine inventory is direct CIL feed.

## Exploration

Hemi's discovery created a new locus of gold exploration in the Archaean Pilbara. Larger than previous finds in the belt, and interpreted as a sanukitoid (intrusion) related gold system, in contrast to the shear hosted deposits targeted in the past, Hemi opens up the belt's apparent exploration potential.

De Grey has eight drill rigs (3 RC, 3 diamond and 2 aircore) drilling at Hemi and surrounds in early 2021. Objectives include a resource estimate in mid-2021. Aircore drilling and follow up RC drilling continues in the greater Hemi area, testing intrusion prospects at Scooby, Shaggy, Antwerp and Alectroenas. Aircore drilling of regional intrusions identified at Charity Well, Calvert and Geemas, began in the first half of 2021

Fig. 3: Mallina Gold project. Tenure and prospects on magnetic image.



Source: De Grey

## Valuation

The valuation is based on a discounted cash flow valuation of the Mallina project, and an informal estimate of exploration assets value and nominal assessment of De Grey's other assets and liabilities, as at December 2020. Argonaut's modelled pit inventory is 78Mt at 1.5 g/t, comprising 60Mt at 1.5 g/t at Hemi and 18Mt at 1.6 g/t in satellite pits, including but not restricted to Toweranna, Withnell, Wingina and Mallina. Waste:ore of 4:1 is assumed for all pits. Earth moving rates of \$9-10/bcm material are used. Ore trucking costs of 12c/t/km are included. Resource/reserve drilling and evaluation costs of \$30M and other pre-production capital costs of A\$650M are assumed. Site administration costs and ore processing costs are estimated at \$10Mpa and \$25/t ore respectively. An estimate of the NPV of corporate overhead costs is included in the valuation. A real, after tax discount rate of 7% is used. Future tax benefits are added back as an estimate of present value. Argonaut's base case commodity and currency forecasts, set out in the summary table, are used to estimate the base case NAV.

Fig. 4: Valuation summary

Valuation summary	A\$M	A\$/sh
Mallina project 7% real after tax DR	1176	0.91
Exploration, all sites	353	0.27
Corporate overheads	-46	-0.04
Cash and bullion	115	0.09
Debt	0	0.00
Tax benefit	10	0.01
Hedging	0	0.00
Option/equity dilution	-30	-0.02
<b>NAV</b>	<b>1,578</b>	<b>1.22</b>

Source: Argonaut research

## Key risks to valuation

### Mineable inventory

Argonaut's estimates of mineable inventories at Mallina are based on incomplete information, subjective calls on future drilling, and pre-emption of De Grey's development decisions. A 10% change in total ore tonnes (+/-8Mt at 1.5g/t) changes the De Grey valuation by 7-8%.

### Metallurgy

De Grey's early tests indicate high rates of recovery using conventional processes.

### Gold price

Our estimates of De Grey cash flows are sensitive to the gold price. Each 10% change in the Australian dollar gold price changes our valuation by 20%.

### Costs.

Cost assumptions are based on incomplete information or informal estimates. Operating and capital costs assumptions rely on our knowledge of industry rates. There are few relevant yardsticks for POX circuit operating and capital costs, so risks are higher than for most gold projects.

### Exploration success

De Grey may invest its cash and any future free cash flows in exploration and/or other mineral asset acquisitions. Valuation assumes that future exploration and investments achieve acceptable returns. Subjective value is attributed to exploration assets at Mallina.

### Interest rates/discount rates

Argonaut takes cash flow risk into account when choosing discount rates for different projects. Our valuation is sensitive to the discount rate used. A 2% change in the (after tax) discount rate makes a 16-20% difference to our De Grey valuation.



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