EDISON

Endeavour Mining

Initiation of coverage

From the ground upwards

Metals & mining

Since new management was engaged in late-2015 and its strategy reset, Endeavour has built itself into the largest gold producer in the Côte d'Ivoire and one of the top three producers in Burkina Faso in the space of three years, offering immediate cash flow from production and near-term growth from projects. Now, in the aftermath of its corporate expansion, it has instigated a major exploration programme, expending c US$45m per year with the target of expanding its resources by c 10–15Moz to offer long-term upside from brown- and green-fields exploration.

Year end	Revenue (US$m)	EBITDA (US$m)	PBT* (US$m)	Operating cash flow per share (US$)	Capex (US$m)	Net debt (US$m)
12/16	566.5	213.9	103.4	1.91	212.3	21.4
12/17	652.1	201.2	51.6	2.25	441.4	216.8
12/18e	709.1	247.3	49.4	1.51	287.9	304.1
12/19e	762.1	369.4	156.2	2.71	230.5	273.2

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and discontinued operations.

Exploration forcing engineering to play 'catch up'

Endeavour's five-year plan is based on the strategic prioritising of prospects with a screening methodology used in the oil and gas industry. The initial focus is on its flagship Ity and Houndé mines and the goal is to augment production at the newly developed Ity CIL project to 250koz per year for the first 10 years of operations to support group production of c 800koz per year at an all-in sustaining cost (AISC) of less than US$800/oz.

Enviable development record

Endeavour has an enviable record in developing projects on time and within budget, which it achieves, as far as possible, by replicating its operations using a dedicated, centralised, in-house construction team. Most recently, this strategy saw the Houndé project brought into production on time and below budget in late 2017; this now looks likely to be repeated at the Ity carbon-in-leach (CIL) project, after which Endeavour is targeting the payment of a dividend to shareholders. Once the CIL project is completed, next to be developed is Kalana, after which future growth is anticipated to come from organic (rather than corporate M&A) sources.

Valuation: US$29.76 per share

If successful, Endeavour's exploration programme should be capable of supporting near-term production at elevated levels, as well as extending the lives of its mines by 5.4–17.2 years, on average. In valuing Endeavour, therefore, we have opted to discount potential cash flows back over four years from end-FY18 and then to apply an ex-growth, ad infinitum terminal multiple of 10x (consistent with a discount rate of 10%) to forecast cash flows in that year (FY22). In the case of Endeavour, our estimate of cash flow in FY22 is US$3.38 per share (including exploration expenditure), in which case our terminal valuation of the company at end-FY22 is US$33.76/share, which (in conjunction with forecast intervening cash flows) discounts back to a value of US$29.76/share at the start of FY19.

16 October 2018

Price	**C$21.25**
Market cap	**C$2.3bn**
	C$1.2977/US$
Net debt (US$m) at end June 2018	399.9
Shares in issue	107.8m
Free float	70.1%
Code	EDV
Primary exchange	TSX
Secondary exchange	US OTC

Share price performance

%	1m	3m	12m
Abs	12.1	(5.3)	(13.2)
Rel (local)	16.5	1.8	(11.0)
52-week high/low	C$26.57	C$18.49	

Business description

Endeavour Mining is an intermediate gold producer, with five mines in Côte d'Ivoire (Agbaou and Ity), Burkina Faso (Houndé, Karma) and Mali (Tabakoto) and two major development projects (Ity CIL and Kalana) in the highly prospective west African Birimian greenstone belt.

Next events

Q318 results	November 2018
Kari-Pump & Feketro maiden resource	Q418
Kalana updated resource & feasibility	Q418 & H119
Ity CIL production	Mid-FY19

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Edison profile page

Investment summary

Company description: Specialist West African gold miner

Endeavour is an intermediate gold producer, with five mines in Côte d'Ivoire (Agbaou and Ity), Burkina Faso (Houndé, Karma) and Mali (Tabakoto) and two major development projects (Ity CIL and Kalana) in the highly prospective west African Birimian greenstone belt. Although not restricted to a particular geography or mode of operation, it has a preference for operating in francophone west Africa and for owner-operated (rather than contractor) mining. Its target is for all of its mines to have operational lives (on average) in excess of 10 years at an AISC of production below US$800/oz.

Valuation: Potential 29% IRR in US$ terms over four years

In valuing the company, however, we have opted to discount potential cash flows back over four years from end-FY18 and then to apply an ex-growth, ad infinitum terminal multiple of 10x (consistent with using a standardised discount rate of 10%) to forecast cash flows in that year (FY22). In the normal course of events, exploration expenditure would be excluded from such a calculation on the basis that it is an investment. In the case of Endeavour, however, we have included it in our estimate of FY22 cash flows on the grounds that it may be a critical component of ongoing business performance in its ability to continually extend the lives of the company's assets. Our estimate of Endeavour's cash flow is US$3.38 per share in FY22, in which case our terminal valuation of the company at end-FY22 is US$33.76/share, which (in conjunction with forecast intervening cash flows) discounts back to a value of US$29.76/share at the start of FY19.

Sensitivities: As expected

In qualitative terms, the principal risks to which Endeavour's projects are immediately exposed are geographical/sovereign, geological, metallurgical, engineering, financing and management risk. For its mines that are successfully in production, most of these technical risks will be perceived to have been mitigated and others, such as commercial, commodity price and global economic risks will have taken their place. For its projects that have yet to enter production (Ity CIL and Kalana), the whole suite of risks may be summarised as execution risk, ie management's ability to bring the projects to account within their geographical jurisdictions and the required technical parameters. However, these risks are also mitigated by management's proven track record in successfully bringing mines into production in time and on budget. From a purely empirical perspective, on average, for each ±10% by which the gold price moves, our valuation changes by ±US$6.93/share; for each ±10% by which unit costs change, our valuation changes by ±US$2.91/share.

Financials: Net debt free by end FY21

Endeavour had US$216.8m in net debt (including US$1.3m restricted cash) at end FY17. The company has embarked on a major period of capital expenditure in FY18 relating to the Ity CIL project, which we estimate will amount to c US$351m over the course of the next 12 months, such that it will have net debt on its balance sheet of US$304m as at end FY18 (including restricted cash cf Exhibit 23, which excludes it). This level of debt equates to a gearing (net debt/equity) ratio of 31.6% and leverage (net debt/[net debt+equity]) ratio of 24.0%. Endeavour will then have approximately one year's respite in FY19, before (in our estimation) embarking on another round of c US$171m in capital expenditure in FY20–21. However, we expect this to be more than covered by operational cash flows, such that the company will be net debt free at end FY21, at which point it will be able to make distributions of dividends to shareholders.

Company description: West African gold miner

Corporate history

In its current form, Endeavour Mining is the corporate progeny of both the private La Mancha group (Endeavour's largest shareholder) and Endeavour itself. In its earliest foray into gold mining in the early 2000s, La Mancha developed interests in multi-million ounce deposits in both west Africa (in the form of Ity) and Sudan via a reverse takeover of Cominor, which had been created to house the African assets of Normandy Mining before the latter's takeover by Newmont in 2002. In the intervening years, Cominor was acquired by the French nuclear parastatal, AREVA, in 2000, before being reversed into La Mancha in 2006. La Mancha quickly sold its interest in its Sudanese asset to focus more intensively on its West African asset, which it would eventually develop and grow into a resource of c 4Moz. In 2012, La Mancha was acquired by Egyptian billionaire, Naguib Sawaris, and, rather than develop Ity as a standalone asset within a single asset company, La Mancha proceeded to search for a suitable corporate vehicle that would simultaneously benefit from the critical mass that Ity would confer on it as well as diversifying its risk profile.

Around the same time, Canadian-listed Endeavour Mining embarked on an aggressive corporate growth strategy, which involved acquiring Etruscan Resources (including the Agbaou mine) in 2010, followed by Perth-based Adamus Mining and then Avion Gold (including the Tabakoto mine and Houndé prospect) in 2011 and 2012. After the gold price decline of early 2013, Endeavour switched strategy to focus on debt repayment rather than organic growth via exploration, with the result that (in La Mancha's opinion) its equity became undervalued in the public markets. In 2015 therefore, it concluded a deal with La Mancha whereby La Mancha injected its then 55% interest in Ity plus US$63m into Endeavour in return for a 30% interest in the company. In addition, La Mancha's management transferred to the enlarged Endeavour. Since the completion of the transaction in late 2015, Endeavour has changed the strategy of the company to focus on its cash flow margin. It has also sold two assets (Youga and Nzema) that it regarded as not in line with its corporate objectives at the same time as developing both the Houndé and Ity CIL projects and buying two additional projects in the form of Karma (via its 2016 acquisition of True Gold) and Kalana (via its 2017 acquisition of Avnel). In 2017, it also increased its stake in Ity back up to 80% by buying an additional 25% from the Côte d'Ivoire's state miner, the Société pour le Développement Minier de la Côte d'Ivoire (SODEMI).

As it stands, in 2018 Endeavour is the only pure, multiple asset gold miner in West Africa, with two mines in the Côte d'Ivoire (Agbaou and Ity), two in Burkina Faso (Houndé and Karma) and one in Mali (Tabakoto) and two major development projects, Ity CIL and Kalana, in the Côte d'Ivoire and Mali, respectively.

Corporate strategy

Endeavour management's stated objective is to build a premier African gold producer. To achieve this, it has set itself three strategic objectives and four strategic levers by which those objectives will be reached. The levers are operational excellence; project development; unlocking exploration value; and portfolio and balance sheet management. The three objectives are achieving:

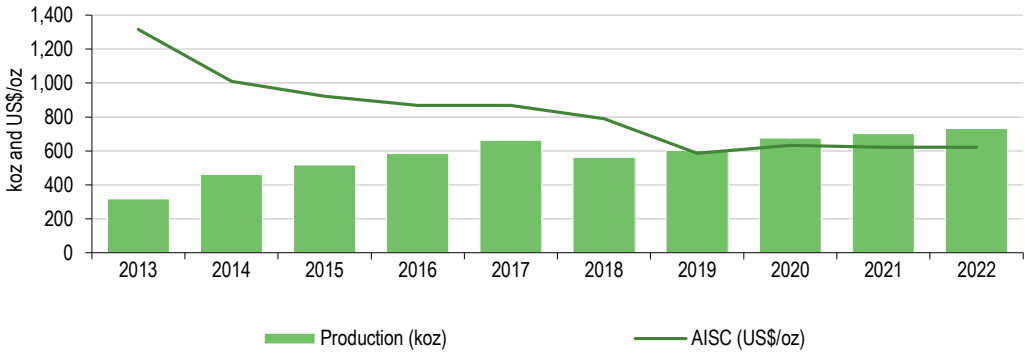
- over 10 years of group production visibility
- a group-wide AISC of US$800/oz (US$800/oz in FY19)
- in excess of 800koz of production per year

Scorecard

In terms of achieving a visible operational life of over 10 years, a brief consideration of Exhibits 2 & 5 will demonstrate this is an objective that has been achieved on average for the group, albeit with three individual assets falling short (Agbaou, Tabakoto and Karma). The asset that least meets this objective – Tabakoto – has already been sold. Simultaneously, Agbaou and Karma are the subject of intensive exploration intended to increase the resources of each by around eight years and seven years of milling life, respectively (see Exhibit 6).

In the meantime, to all intents and purposes, Endeavour has now also achieved its second objective of producing gold at an AISC below US$800/oz. The company produced 663koz of gold in FY17 at an AISC of US$869/oz. Excluding Nzema, however, which was sold during that year, it produced 547koz at a mine-level AISC of US$809/oz and (similarly excluding Tabakoto), we estimate it will produce 562koz Au at a mine-level AISC of US$790/oz in FY18. Nevertheless, attaining this objective should be seen within the context of the group having produced 317koz of gold in FY13 at an AISC of US$1,317/oz (ie 54.9% above target), as shown in the graph below:

Exhibit 1: Endeavour Mining, production (koz) and AISC (US$/oz), FY13–22

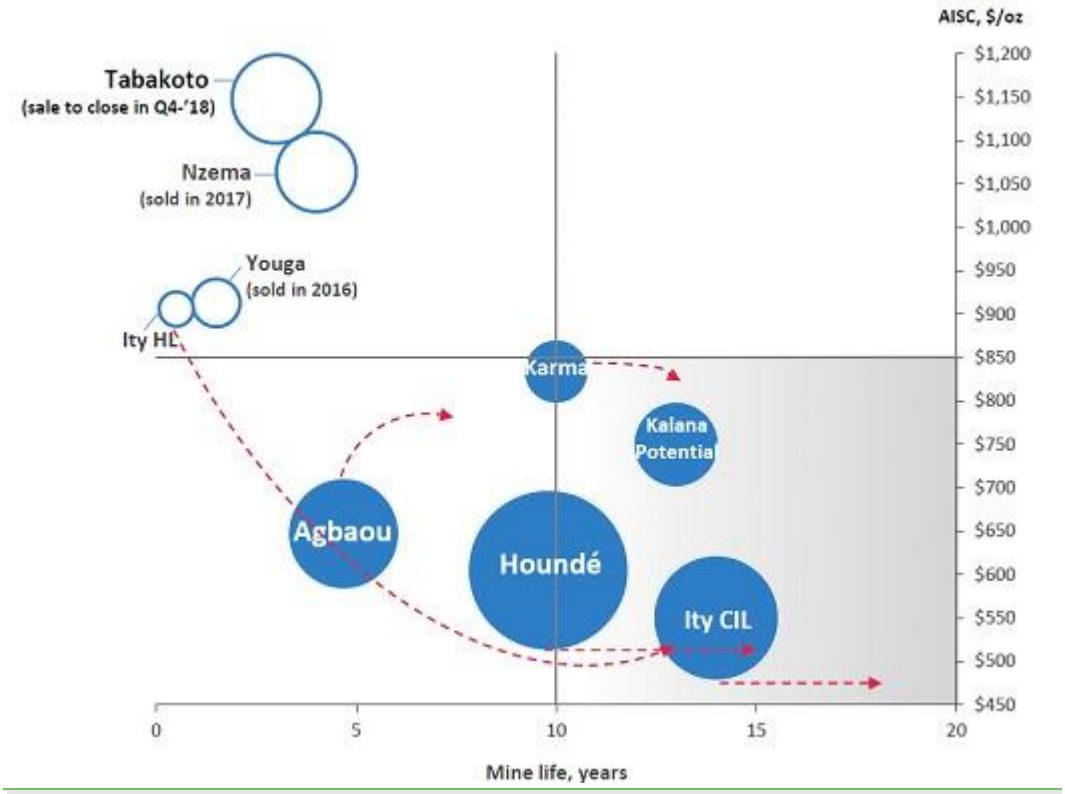


Source: Endeavour Mining, Edison Investment Research

Influenced by the start of the Ity CIL project in mid-FY19, we estimate that Endeavour will continue producing gold at a mine-level AISC of less than US$800/oz from FY18 until FY28 at the earliest.

Together, the two objectives of 10-year mine life and AISC demonstrate management's use of its fourth lever – portfolio and balance sheet management – in determining its goals according to the following graphic:

Exhibit 2: Endeavour Mining portfolio management

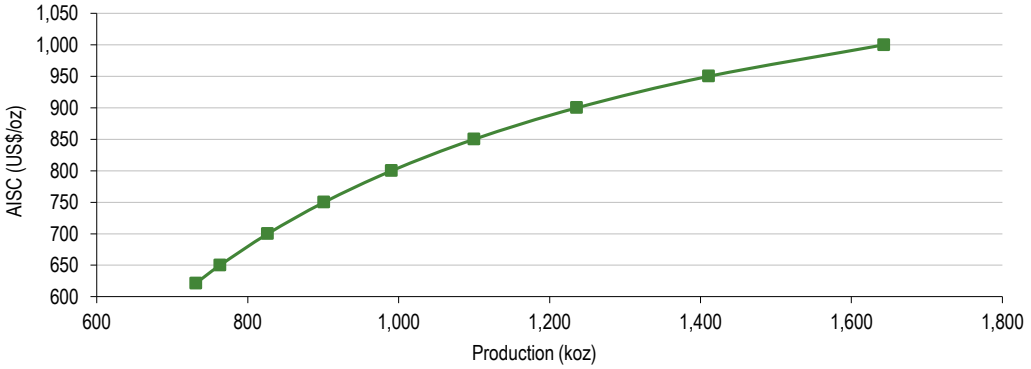


Source: Endeavour Mining

In general, assets failing to meet both objectives are typically sold (the exception being Ity, which has been transformed at an operational level; see below), whereas assets failing the mine life objective have hitherto been the subject of organic initiatives (typically incremental exploration) to reposition them.

We believe Endeavour's third objective (production of over 800koz per year) will be the last to be explicitly achieved by the group. Notwithstanding the Tabakoto sale, we estimate that production will increase strongly from 562koz in FY18 to 731koz in FY22 (on a like-for-like basis) at an AISC of US$621/oz (in real terms). However, the group should attain the potential to achieve an annualised production rate of 800koz pa from mid-FY19 and exploration success at Houndé or Ity, in particular, would easily be capable of allowing the group to realise this objective. Insofar as Endeavour may not achieve actual production at this level in any particular year, we would regard it as relatively unimportant, since producing 731koz at an AISC of US$621/oz in FY22 (in real terms), as per Edison's forecasts, would generate the same aggregate profitability (based on AISC margin) as producing 991koz at an AISC of US$800/oz or 1,100koz at an AISC of US$850/oz. An indifference curve designed to demonstrate equivalent (gross) profitability from a range of production rates and AISCs is provided in the graph below:

Exhibit 3: Endeavour Mining FY22, production and AISC indifference curve



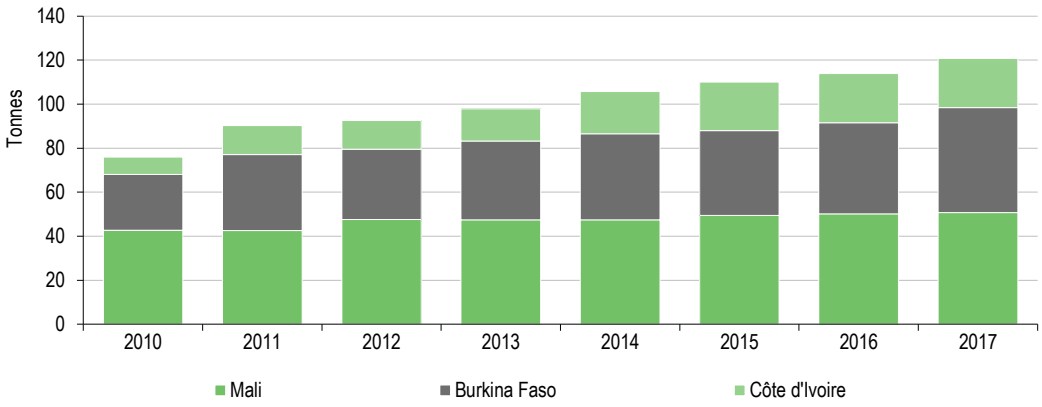
Source: Edison Investment Research

West African bias

Although not restricted to a particular geography, Endeavour has a preference for operating in west Africa and, in particular, the eight francophone countries that comprise the West African Economic & Monetary Union and share the West African CFA franc (XOF, not to be confused with the Central African CFA franc denoted XAF), which is pegged to the euro at a rate of 100 CFA francs per former (nouveau) French francs or €0.152449. Alternatively, one euro converts into 655.957 CFA francs. Although theoretically separate, the two CFA franc currencies have always been at parity and are effectively interchangeable. However, they could theoretically have different values if one of the two CFA monetary authorities, or France, decided upon it. The three countries in which Endeavour operates (Côte d'Ivoire, Burkina Faso and Mali) have held democratic elections within the last 10 years and all are closely monitored by the IMF.

Apart from macroeconomic and geopolitical considerations, all three (and the region in general) offer a prospective geological environment for gold exploration. Approximately 79Moz (2,457t) of gold have been discovered in west Africa between 2006 and 2016, which is the most in any region in the world. As a result, it has attracted the largest exploration budget in the world after Canada and Australia and has accounted for more equity raised for exploration for any region other than Canada. As a result, production in Endeavour's three countries of operation has grown from 2.4Moz (75.9t) in 2010 to 3.9Moz (120.8t) over the seven years since 2010, equivalent to a compound growth rate of 6.9% per year and making it the 11th largest gold producing region in the world:

Exhibit 4: Côte d'Ivoire, Burkina Faso and Mali gold production, 2010–2017 (tonnes)



Source: Metals Focus

Within this context, it is notable that Burkina Faso and Côte d'Ivoire, arguably Endeavour's two most important countries of operation, together account for 60% of west Africa's Birimian greenstone belt (see below) but only 35% of recent discoveries and 25% of production from the region.

Operations

Agbaou (85% interest)

Agbaou is located in southern Côte d'Ivoire approximately 200km north of Abidjan, the economic capital (and erstwhile political capital) of the country. The mine is connected to the national electrical grid by a 15km, 91kV electrical transmission line and substation at site and the permit, which comprises the mine area, is reached by tarred and secondary gravel roads.

History

Alluvial gold has been known and exploited by local artisanal miners (colloquially 'orpailleurs' in the region) for many years. Gold mineralization, in bedrock, was first reported at Agbaou during the late 1980s, while the ground was held by a joint-venture between BHP and SODEMI. Significant exploration was undertaken between 1988 and 1994, including regional and detailed soil sampling, pit sampling, ground geophysics and a programme of eight diamond drill-holes over 1,680m (210m/hole). However, BHP allowed its permit to lapse and, between 1996 and 2000, the property was held by Diversified Mineral Resources (DMR). DMR was subsequently taken over by Hargraves Resources in 1999, which undertook an exploration programme that included semi-regional soil sampling, pit sampling, 36 RAB holes over 1,682m (average 47m/hole) and 203 RC drill holes over 22,149m (109m/hole).

Hargraves was acquired by Durban Roodeport Deep in late 1999. However, the permit was withdrawn by the government on the grounds of insufficient expenditure and, on 27 November 2003 following the completion of a bidding process, the Ministry of Mines and Energy for Côte d'Ivoire granted the Agbaou exploration permit to Etruscan Resources. Endeavour purchased Etruscan by degrees in 2009 and 2010, after which Etruscan's name was changed to Endeavour.

Commercial production was achieved at Agbaou in January 2014.

Geology

Côte d'Ivoire is almost completely underlain by Precambrian rocks of the Leo-Man shield. The north-south trending Sassandra Fault marks the boundary between the Archean Kenema-Man domain, along the western country border and the Birimian Baoule-Mossi domain.

The Agbaou area is underlain by rocks of the Archean-Proterozoic Man Shield, which forms the southern half of the larger West African Craton. The shear-zone hosted gold mineralization of the Agbaou deposit occurs within a sheared volcano-sedimentary succession that was subjected to lower green-schist facies metamorphism, forming the Birimian age Oumé-Fetekro Greenstone Belt, surrounded by granodioritic intrusions. At Agbaou itself, the greenstone belt is folded into an antiform and the Agbaou deposit lies near the hinge of the fold, on the eastern limb.

Gold occurs in a mesothermal auriferous sulphide (pyrite + pyrrhotite) assemblage associated with quartz veins. The quartz veins are characterized by a wide range of quartz-vein types, brecciation, boudinage, sericitic and carbonate alteration. However, the mineralized quartz veins have a very distinctive texture that has been described as 'mottled' and are easily identifiable in the drill intersections and pit mapping.

Mining and processing

The Agbaou operation comprises a conventional open pit, selective mining method (using BCM as its mining contractor) followed by conventional gravity/CIL processing.

The Agbaou plant is designed to recover gold from a variably weathered orebody at a total treatment rate of 1.3–1.6 Mtpa. The average feed grade for Agbaou over the life of operations is expected to be 2.4g/t (cf an average resource grade of 2.36g/t and an average reserve grade of 2.34g/t; see Exhibit 6). The comminution circuit of the process plant is composed of a primary jaw crusher, followed by SAG and ball mills. A dedicated gravity circuit consists of a concentrator, intensive cyanidation package and an electro-winning cell. The rest of the milled product is processed in the CIL circuit. The CIL tails slurry undergoes cyanide destruction prior to disposal in the tailings dam. Loaded carbon is acid washed and rinsed prior to elution. The electrolyte leaving the elution circuit undergoes electro-winning where gold sludge is produced. The sludge is dewatered using a pot filter and dried in a drying oven ahead of smelting. Fluxes are added to the dried gold sludge and the mixture placed in the smelting furnace. After smelting the furnace crucible contents are poured into cascading moulds. The gold bars are cleaned, sampled, labelled and prepared for shipping.

Exploration potential

An ongoing exploration programme initiated in 2016 is focused on the North and South Pit extensions, the Agbaou South target, and on generating targets beyond current resource boundaries to replenish otherwise depleting reserves.

Agbaou's 2017 exploration programme amounted to US$6m, totalling 31,400m of drilling. The primary objective was to conduct in-pit drilling at the North Pit and to test gold in soil anomalies on parallel shear zones. The campaign at the North Pit confirmed that its mineralisation extends at depth with occurrences of higher grade intercepts.

A US$4m exploration programme, totalling approximately 16,000m, has been planned for 2018 with the aim of delineating the depth potential of the North Pit (with the goal of delineating a resource) and further investigating targets on parallel trends.

Karma (90% interest)

Karma is located in north central Burkina Faso, 20km east of the city of Ouahigouya and approximately 185km northwest of the capital, Ouagadougou. It comprises eight exploration permits (Kao Nord, Kao Sud, Youba, Rounga, Tougou, Bogoya, Bonguirga and Namissiguima-Ouest) and the Karma exploitation permit. The Karma mine was acquired by Endeavour in 2016 and announced first gold production in April 2016. It includes six identified gold deposits and is a shallow open pit with no blasting required and a low strip ratio. Commercial production was declared on 1 October 2016.

Geology

The geology of Burkina Faso may be divided into three major litho-tectonic domains: a Paleoproterozoic (Birimian) basement underlying most of the country; a Neoproterozoic sedimentary cover developed along the western, northern and southeastern portions of the country; and a Cenozoic mobile belt that forms small inliersin the northwestern and extreme eastern regions of the country.

Karma is located in the Paleoproterozoic Baole-Mossi domain (see Tabakoto, above) and, within this, on the regionally east-west trending Goren greenstone belt, which is one of the larger Birimian greenstone belts in central north Burkina Faso. Local geology consists of a folded sequence of greywacke, siltstone, shale and volcanoclastic rocks. The western margin of the project area

contains a broad, north-south magnetic lineament that is interpreted as a first-order, crustal scale, sinistral, shear zone named the Ouahigouya Shear Zone, which branches into a series of north-east trending sub-shears that cross the Karma property and extends to the south into the Houndé Greenstone Belt. Regional gold metallogenesis is tightly constrained to the Eburnean Orogeny between 1.98–2.13bn years ago. At least six mineral deposits have been defined on the property, including Kao, North Kao, Goulagou I, Goulagou II, Nami and Rambo.

The Karma deposits may best be described as structurally controlled, orogenic, hydrothermal deposits. Elements of stratigraphic control may result from mineralisation/alteration being channelled along specific structural/lithological controls such as competency contrasts between intrusive and sedimentary rocks that have affected porosity and fluid flow.

- The Kao deposit is composed of a structurally controlled alteration and veining system. The bulk of the highest grades and thickest intercepts occur along a northeast dipping set of structures and, in particular, at their intersections with a dominant north-south structure. The structures are weakly to intensely foliated, hydrothermally altered and are host to multiple generations of quartz-sericite-pyrite-arsenopyrite veining. A combination of arsenopyrite and the presence of quartz veining generally correlate with higher gold grades.
- The North Kao deposit is predominantly intrusive-hosted and consists of a stacked sequence of structurally-controlled tabular bodies, defined by pervasive quartz-sericite-pyrite alteration, breccia and locally distributed stockwork, shear and extension veining. Gold is closely associated with each of these features, with the sheared breccia and quartz-sericite-pyrite veins carrying the highest grades.
- Goulagou I consists of up to 10 discrete lenses of gold mineralised rock over an east-west strike length of 2.1km, ranging from 5–40m thick and dipping near-vertically. It is open along strike and down dip below 200m.
- Goulagou II is similar to Goulagou I, except that it consists of three to five steeply dipping lenses, with widths ranging from 5–30m over 2.4km of east-west strike. Higher grade, steeply plunging shoots occur at distinct flexures along strike.
- Rambo Main comprises several relatively small mineralised lenses with the main zone containing a steeply plunging mineralised shoot. Thicknesses of the mineralised zones range from c 2.5–25.0m and exhibit good continuity. The deposit is open to the east and down dip.
- Nami is composed of three mineralised lenses with shallow dips towards the west-southwest. The strike length of the deposit is c 550m, with a down plunge extent of 300m and thicknesses ranging from c 2.5–25.0m, with good continuity. Again, the deposit is open to the west, north and south.

Mining and processing

The Karma mine plan envisages the development of five pit areas in sequence to provide the ore feed for heap leach operations. The mining method is conventional open pit mining with medium-sized equipment (eg 90t capacity haul trucks) with target ore production during the life of the mine of 4.0Mtpa from no more than two open pits at any one time. As is typical for open pit operations in West Africa, three types of material are being mined – oxide, transition and sulphide material. The oxides and some of the transition material do not require blasting. However, harder, deeper rocks do.

Karma's process plant consists of two crushing circuits (one for soft ore and one for hard ore), followed by a process of agglomeration, stacking, heap leaching with cyanide solution, gold adsorption, elution and smelting. Note that some of the sulphide material at Goulagou and Kao is of a refractory nature and therefore unsuitable for heap leaching. In addition, a minor amount of preg-robbing material may also reside in some of the ore, with the result that this material will be stockpiled for processing at the end of the life of the mine.

Exploration potential

Karma consists of six contiguous exploration permits (Goulagou, Rambo, Kao, Rounga, Youba and Tougou) totalling more than 856km^2 and including more than 45 high-priority targets with high grade rock values associated with gold-in-soil anomalies and historical workings that remain untested to date.

Karma's 2017 exploration programme amounted to US$3m, totalling 41,520m of drilling focused primarily on the northeast extension of the North Kao deposit and on the Yabonsgo target. Drilling at the North Kao deposit extension confirmed the deposit's continuity. A US$2m exploration programme totalling approximately 32,000m has been planned for 2018 with the aim of delineating indicated resources at both North Kao and Yabonsgo in addition to near-mill targets such as Rounga and on the recently acquired Zanna exploration licence.

Ity (80% interest)

Ity is located close to the Liberian and Guinean borders, approximately 700km northwest of Abidjan, and is accessible by paved road via Yamoussoukro or by aeroplane via Man. It has the longest history of any gold mine in Côte d'Ivoire and is closely linked to the local Yacouba community, which is based in eight villages around the project site.

Copper and gold were first discovered near the village of Ity in the 1950s by France's Bureau Minière de la France Outre-Mer. However, initial attempts at recovery were unsuccessful owing to the fineness of the ore rheology (ie its flow and deformation). In 1983, the Société Minière d'Ity was incorporated to develop the Flotouo deposit, which poured its first gold in 1991. Substantial subsequent exploration was then responsible for identifying many other deposits in the region.

The project, as it is currently constituted, comprises a total of nine prospect areas, including four that have been, or are being, mined (namely Mont Ity, Ity Flat, ZiaNE and Walter), two near-mine deposits (Gbeitouo and Daapleu), two rock waste dumps (Teckraie and Verse Ouest) and a discontinued heap leach pad (Aires). All lie within an area approximately 5km by 3km.

Geology

The Mont Ity deposits are located in the Lower Proterozoic Birimian Formation of the Toulepleu-Ity klippe (a remnant portion of a sheet-like body after it has been isolated by the erosion of the surrounding rock), which is a small remnant of the Birimian in the West African Craton.

The Ity area itself is characterised by a series of granodiorite intrusions into a sedimentary sequence of volcano-sediments and carbonates, with all formations having been subjected to regional metamorphism. The Ity Gold project deposits are orogenic gold deposits and generally described as skarn or shear zone styles of mineralisation. Skarn deposits within the Ity Gold project include Mont Ity, Ity Flat, ZiaNE and Walter and are developed at the contacts of the granodiorite with the carbonates. Similarly, the Teckraie, Verse Ouest and Aires assets are derived from material originally mined from skarn deposits. The Daapleu deposit is characterised by the presence of a rhyolitic intrusive surrounded by a package of volcano-sediments (the rhyolite is locally known as 'daaplite' and is microgranular, schistose and rich in micas).

The main lithologies within the Ity project area are laterites, saprolites, metavolcanic sediments, carbonates, granodiorites, daapleu rhyolites, diorites and skarns. The mineralised portions of the reduced saprolites correspond to the decarbonation of marble and exoskarn (ie a skarn formed from a sedimentary, rather than igneous, rock). The reduced saprolites are the transition zone between oxidised material and the fresh rock. The oxidised saprolites form the major part of the mineralisation at Mont Ity. The mineralisation was originally skarn but has subsequently undergone severe supergene alteration, which was enhanced by the dissolution of the sulphides. In this case,

the alteration was also responsible for the generation of karst, into which the saprolite material then collapsed.

In the meantime, the Daapleu and Gbeitouo deposits resemble typical shear zone deposits of the West African granite-greenstone terrane between two contrasting lithologies. Both deposits are associated with the major regional shear zone, but developed on secondary structures. The gold mineralisation is mesothermal in origin and occurs as free gold in quartz vein stockworks and zones of silicification, associated with arsenopyrite and, to a lesser extent, pyrite and antimony. It is found in linear shear zones in, or near, the contacts between two different rock types that show evidence of shearing. Alteration is weak to severe, depending on the development of the system. Mineralisation may also be spatially related to the emplacement of intrusives.

Mining and processing

Until recently, the Ity complex has been operated as two conventional open pit mines (Mont Ity and Tontouo) using articulated 40t trucks and hydraulic backhoes or 80t front shovel excavators. Limited drill and blast activities were required, as the material that was mined was largely oxidised clay and/or laterites.

There remain several years of heap leach reserves to be mined and additional opportunities exist to increase these reserves with known oxidised material. Ore facies not containing sulphide are substantially free milling and do not show any preg-robbing characteristics. However, the ore facies containing sulphide are partially refractory and direct cyanidation yields a lower gold recovery. As a result, as oxide ore has become depleted Endeavour has studied alternatives for the development and exploitation of the deeper, sulphide ores, including considerable metallurgical testwork to confirm the response to a CIL plant by ALS in Kamloops, British Columbia. In particular, testwork results have indicated that Daapleu primary ores contain significant arsenopyrite and that a standard cyanide leach will extract only 60–65% contained gold, whereas the oxide ores are free milling with leach extraction of 90–96%.

In conclusion, the Ity CIL plant will process a range of ore types (oxide, transition and fresh) with variable ore characteristics, gold grades and metallurgical treatment requirements. Note that the primary ores are significantly more competent than the oxide ores. Key project and ore specific design criteria that the plant must meet are:

- 4Mtpa of blended ore; 51% primary and 49% oxide (LOM)
- Single-stage primary crushing to produce a crushed product size of 100% passing (P_{100}) 326mm (P_{80} of 166mm)
- Two-stage SAG/ball milling to produce a P80 grind size of 75µm
- Gravity concentration
- A CIL circuit incorporating eight CIL tanks
- Elution, electro-winning and smelting to produce doré
- Tailings pumping to the tailings storage facility (TSF)

Electrical power will be supplied from the Ivoirian national grid and back-up diesel generators.

BFS and subsequent optimisation

Endeavour completed a bankable feasibility study on the Ity CIL project in December 2016. Successful subsequent exploration then allowed it re-size the plant and to update the BFS in 2017 and to increase annual throughput from 3Mtpa to 4Mtpa. A summary of the optimised study relative to the original BFS is provided in the table below:

Exhibit 5: Ity CIL project optimised study vs original BFS

	2016 feasibility study	2017 optimisation study	Change (units)	Change (%)
Mining schedule				
Mine life	12	15	3	25
Total material moved (kt)	125,448	166,752	41,304	32.9
Total waste moved (kt)	85,087	109,559	24,472	28.8
Total ore mined (kt)	40,362	57,194	16,832	41.7
Stripping ratio	2.11	1.92	-0.19	-9.1
Grade (g/t)	1.42	1.57	0.15	10.3
Contained gold (oz)	1,845,275	2,883,339	1,038,064	56.3
Processing schedule				
Total ore processed (kt)	41,042	57,000	15,958	38.9
Grade (g/t)	1.42	1.57	0.14	9.9
Contained gold (oz)	1,881,667	2,872,370	990,704	52.7
Recovery (%)	83.1	85.8	2.7	3.3
Gold produced (oz)	1,563,322	2,464,485	901,163	57.6
Payable gold (oz)	1,561,759	2,462,020	900,261	57.6
Payable silver (oz)	3,136,196	4,943,761	1,807,565	57.6
Operating costs				
Mining (US$/t ore)	7.81	8.30	0.49	6.3
Processing and maintenance (US$/t)	10.56	11.96	1.41	13.3
Site G&A (US$/t)	2.81	2.23	-0.58	-20.8
Total operating costs (US$/t)	21.05	22.52	1.47	7.0
Capex				
LOM capex (US$000's)	364,000	452,500	88,500	24.3
Economics*				
Post-tax IRR (%)	36	40	4	11.1
Post-tax NPV_5	411	710	299	72.7
Payback period (years)	2.1	1.8	-0.3	-14.3

Source: Endeavour Mining, Edison Investment Research. Note: *Company calculated. Totals may not add up owing to rounding.

Exploration potential

In 2017, Endeavour invested US$14m in the Ity exploration programme, totalling 58,500m of drilling. Following the successful drilling campaigns at the Bakatouo, Ity, Daapleu and Verse Ouest deposits, and the recent Le Plaque discovery, more than 1Moz of indicated resources were added to the CIL project as a result.

Given its strong prospectivity and potential to extend the life of the CIL project, Ity has recently accounted for the largest single portion of Endeavour's exploration budget. Most recently, this has involved in-fill drilling at the Daapleu and Mount Ity deposits, in-fill and extension drilling at the new Bakatouo and Colline Sud discoveries and initial drilling on strong auger anomalies such as the Yacetouo and Vavoua targets.

In 2018, Endeavour will invest a further US$2m in an exploration campaign to further explore the Le Plaque target in addition to several other near-mill opportunities, with the continued aim of delineating additional resources for the CIL project. An additional US$5m will be dedicated to greenfield targets within the 100km corridor along the Ity mine.

Houndé (90% interest)

Endeavour has a 90% interest in the 1,000km^2 Houndé project, which is located approximately 250km southwest of the capital of Burkina Faso, Ouagadougou, 2.7km from a paved highway, as close as 200m to a 225kV power line and 25km from railway line that extends to the port of Abidjan (the commercial capital of Côte d'Ivoire).

History

Mineral exploration in the Houndé area began in 1939 by the Bureau de Recherches Geologiques et Minières and the Bureau de Mines et de la Géologie du Burkina Faso and continued until 1982. Endeavour began its interest in the project with a 40,534m in-fill programme over the Vindaloo and Madras NW zones in 358 holes (average 113m/hole) in late October 2012. Including previous owners of the project area, during the period from 2007 to 2013, Endeavour, Avion, Goldbelt and African Barrick (now Acacia Mining) completed 751 core and RC holes over 103,677m (average 138m/hole) along the trend of the Vindaloo and Madras NW zones (see below).

Geology

Rocks in the core Vindaloo and Madras NW zones are north- to northeast-trending greenschist-metamorphosed intermediate volcanics and sediments that are intruded by later gabbro sills and dykes. The Vindaloo zones, in particular, are hosted by Proterozoic age, Birimian Group, intensely sericite- and silica-altered mafic intrusion and similarly altered, sheared and altered intermediate to mafic volcanoclastics and (occasionally) sediments. The mineralisation is often quartz stockwork-style and is weakly to moderately pyritic. Drilling along the c 1.2km strike of the central core of the system has defined a coherent, gold-mineralised zone that has been traced to at least 350m depth. The entire mineralised package strikes north-northeast and dips steeply to the west to vertical. Mineralisation to the north and south varies from weak to quite strong over relatively short vertical and/or horizontal distances, leading to nodes of higher-grade mineralisation connected by zones of weaker mineralisation. The Vindaloo trend has been drill tested for a distance of c 7.7km along strike. The Vindaloo deposit itself comprises a group of closely spaced gold-mineralised structures that represent a c 4.8km section of the Vindaloo zone and a 0.9km-long section of the Madras NW zone and is open both along strike and at depth. In addition, within the modelled area, there are indications of further hanging wall, parallel gold zones and gold mineralised cross-structures.

Mining and processing

Primary ores make up 82% of the deposit, with saprolite and transition ores the remaining 18%. Primary ores from the Vindaloo pit make up 80% of those primary ores and are the major component of the Houndé deposit. Pits have been designed for Vindaloo main, south and north, Vindaloo 1 and Vindaloo 2 and Madras NW south and Madras NW north.

Houndé's processing plant comprises a 3.0Mtpa CIL plant and semi-autogenous ball mill crusher milling circuit to produce a fraction of 80% passing 90µm grind size. Ground fresh ore is then fed to continuous centrifugal gravity concentrators to recover free and occluded gold in heavy particles (pyrite) to a low mass gravity concentrate. This concentrate is reground to 80% passing 10µm grind size and fed to a concentrate leach circuit. Gravity concentration tails plus saprolite ore are thickened and fed into a standard CIL, elution and electro-winning circuit, with leach tails passing into a cyanide destruction (SO_2/air technology) process before being pumped to storage.

The tailings storage facility has capacity for 25Mt and has the potential to provide storage for up to 50Mt of tailings by increasing the embankment height and/or adding a saddle embankment to the south of the facility. The TSF is not lined owing to a near-surface, clay rich layer that limits the migration of tailings fluids away from the site. It is designed to withstand up to a one in 100 year wet event and will need to be covered at the end of operations to isolate the facility and prevent the migration of tailings.

Water

Houndé's water requirements are met from TSF decant, pit dewatering (including precipitation on the pit area) and runoff from the ROM pad and stockpiles with any shortfall supplied from a water

storage dam fed by a water harvesting dam. Groundwater resources are very small, but are sufficient for potable water use.

Exploration potential

The Houndé exploration tenement covers more than 1,075km^2. Following a two-year period of no exploration, activities resumed in 2017 with US$5m spent on a drilling programme totalling approximately 76,000m. The campaign yielded positive results with the discovery of high-grade intercepts at both the Kari Pump target and the Sia/Sianikoui targets. In 2018, Houndé will be a key focus for Endeavour with a US$9m exploration programme (20% of the group total) totalling approximately 125,000m planned with the aim of drilling the entire Kari anomaly and delineating a maiden resource.

Kalana (80% interest)

Kalana is located in southwestern Mali, approximately 250km south of the capital, Bamako, near the border with Guinea. It covers an area of 387.4km^2, within which the Kalana Main project is located near the centre of the northern part of the permit, 1km from the town of Kalana.

History

Between 1985 and 1991, the Kalana mine was operated by the Société de la mine d'or de Kalana, which used two vertical shafts to mine flat dipping quartz veins and stockwork mineralisation at an average grade of 13g/t down to a depth of 108m via largely Soviet methods. The Kalana mine was restarted by Avnel (a former client of Edison) as an underground mine, although this was largely to comply with permit commitments while it conducted exploration with a view to a more modern exploitation. In the 12 years from 2004 to 2015 the mine produced 170koz of gold (average 14koz pa) from 531kt of ore at an average grade of 11.5g/t and 86% metallurgical recovery.

Geology

The Kalana project is located close to the western edge of the large Bagoe basin, which is a component of the Man-Leo shield of the West African Craton (see Tabakoto, above) and is a Paleoproterozoic orogenic gold deposit associated with a diorite intrusion within sedimentary rocks of the lower part of the Upper Birimian group. Mineralisation is hosted in narrow, shallow-dipping quartz and associated inter-vein mineralisation, which together define the vein packages. The predominant strike and direction of the quartz vein packages varies across the deposit, but has a relatively consistent orientation locally.

Mining and processing

The mine plan for Kalana provides for a single open pit to be developed in 12 stages via conventional open pit techniques, using a maximum of 31 90t haul trucks and two excavators to support an average mining rate of 12Mtpa and a peak mining rate of 18.7Mtpa to support an average processing rate of 1.26Mtpa and a peak processing rate of 1.5Mtpa. Mining is categorised into bulk and selective areas, where drilling and blasting is needed on 10m and 5m benches, respectively. Stages 1–11 of the mine plan contain c 60% of the reserve ore tonnes and 65% of the reserve gold ounces, but only 54% of the waste tonnes. Moreover, approximately 50% of stages 1–11 are in the softer, saprolite material, which is mainly free digging. For the first three years of production, operations are focused almost exclusively on stages 1–6 in the higher grade, saprolite material, which requires minimal drilling and blasting.

The Kalana Main process plant design is based on a gravity/CIL flowsheet with a nominal 1.2Mtpa capacity when treating competent, fresh ore and 1.5Mtpa capacity when treating softer, saprolite ore. Gold is to be recovered by a combination of gravity concentration/intensive leaching and by a

cyanide CIL process for the treatment of gravity tailings. Given the pronounced effect of coarse gold encountered in testing and the high gravity gold recovery achieved historically, the gravity circuit has been designed to treat the full ball mill discharge.

The TSF at Kalana will be operated as a self-raised dry wall facility with deposition starting behind a starter embankment. The average rate of rise over the life of the facility will be 2.2m per year and the basin will be lined with a 1.5mm high density polyethylene geomembrane laid on reworked soils.

Water and power

The Kalana mine has existing, limited grid electrical supply from the local utility, Energie du Mali, which will be used initially during construction and latterly to provide power to the mining infrastructure and mine accommodation. Power for the plant will be provided by a combination of heavy fuel oil and diesel-fuelled generators.

Water will be sourced from return water from the TSF, water pumped from the Kalana open pit and surrounding de-watering. As the water balance of the operation is positive, there is no requirement for additional water extraction and, in fact, it is possible that excess water may need to be discharged into the environment; a water treatment plant has therefore been designed to accommodate this contingency.

Development and strategic optimisation potential

The present feasibility study, prepared by Avnel, anticipates producing an average of 101koz per year at an AISC of $730/oz over an 18-year mine life. Endeavour expects to take advantage of its project execution expertise, operating synergies and exploration experience to re-design and optimise the current feasibility study by the end of FY18. With an expanded plant capacity (eg similar to the Ity CIL project – see Exhibit 5), Endeavour believes that Kalana has the potential to increase its annual production profile to more than 150koz pa. Construction is expected to begin in mid-2019 following the completion of the Ity CIL project.

Exploration potential

Following its acquisition of Avnel in 2017, Endeavour is working to integrate Kalana into its five-year exploration strategy (see Exhibit 7). In the meantime, the Kalana permit, covering 387km², has significant exploration potential and hosts a number of exploration prospects. Two of the most advanced of these are Kalanako and Djirila, which have both been drill-tested and are within a reasonable trucking distance of the anticipated Kalana plant site. However, management also believes there is a possibility the main deposit may be replicated in parallel structures.

A $5m exploration programme is planned for 2018, with the objective of completing 45,000m of drilling to provide an updated resource which is expected to form the basis for the updated feasibility study. Exploration is focused on in-fill and extension drilling at Kalana, as well as further drilling on the previously discovered Kalanako deposit. Additional exploration is also expected to take place on the recently acquired Fougadian licence and on permits that are expected to be granted shortly.

Tabakoto (80–90% interest, sale announced)

Tabakoto is located in western Mali, approximately 360km west of the capital, Bamako and less than 20km from the border with Senegal. It is accessed via a national highway (RN13) to the government administrative centre of Kenieba and, from there, 15km to the north on all-weather, graded dirt roads. It is also approximately 26km southeast of Randgold Resources' Loulo mine.

Following Endeavour's acquisition of Avion in 2012, the Segala open pit mine was converted into an underground mine, the Kofi C open pit mine was commissioned in Q115 and, in 2013, the mill's capacity was expanded from 2,000 to 4,000tpd. Nevertheless, after a strategic assessment in Q218, management launched a sales process for Tabakoto and, on 4 September, the company announced that the mine had been sold to Algom Resources (a subsidiary of BCM Investments) for a total cash consideration of US$60.0m payable on closure of the transaction (anticipated in Q418). Relative to the US$73.2m of assets held for sale on Endeavour's balance sheet as at end-Q218, US$60.0m in consideration implies that EDV will book an exceptional (non-cash) loss in the order of US$13.2m on conclusion of the sale in Q418 (see Exhibits 12 and 23). However, Endeavour will continue to retain ownership of the high potential greenfield Kofi exploration land package north of the Tabakoto mine, along trend with Randgold's Loulo mine.

History

Alluvial gold has been exploited in the Tabakoto area since at least the 1940s. Western Mali became the focus of exploration programmes in the 1960s and, in the 1980s, the United Nations Development Programme completed airborne geophysical and geochemical surveys that identified anomalies at Tabakoto, Segala and Kofi Nord. Thereafter, numerous western companies undertook exploration programmes in the area. Nevsun was the first to complete a feasibility study on the Tabakoto and Segala deposits in 2002. After an abortive attempt to enter production however, the project was sold to Avion in 2008, which also acquired the Kofi property in 2010.

Endeavour's involvement in Tabakoto, Segala and Kofi Nord began in 2013, when it acquired Avion. Subsequent exploration largely focused on in-fill programmes, including 16 diamond drill holes over 8,020m (an average 501m/hole) and 406 RC holes over 34,969m (average 86m/hole) on the Segala exploitation permit and 41 diamond drill holes over 5,556m (average 136m/hole) and 860 RC drill holes over 53,412m (average 62m/hole) on the Kofi Nord exploitation permit.

Geology

Malian geology is dominated by the West African Craton and smaller portions of eastern Mali are part of the Tuareg Shield. Regional gold exploration has focused on the southern Leo-Man-Ghana micro-craton (referred to as the Man shield), which contains the Kenema-Man domain Archean core and the Baoule-Mossi Proterozoic domain, the latter of which is associated with the gold prolific Birimian sedimentary sequences, which account for the majority of West African gold deposits. Western Mali is underlain by the Paleoproterozoic Kedougou-Kenieba inlier (an area of older rocks surrounded by younger rocks, typically formed by the erosion of the younger overlying rocks to reveal a limited exposure of the older underlying rocks), which is effectively a window of the Man shield and is the westernmost exposure of the West African Craton. However, extensive weathering has produced large areas of laterite over the region, which masks the underlying geology of these areas and renders outcrops rare and difficult to characterise.

The Tabakoto and Kofi properties are located in the eastern part of the Kedougou-Kenieba inlier. The Birimian rocks of the inlier have been subdivided into four formations: the western Mako Series (granite-greenstone belt), the Diale-Dalema Series (metasedimentary rocks), the Faleme Series (carbonate rich sedimentary rocks) and the eastern Kofi Series (detrital sedimentary rocks). The Senegal-Mail shear zone is a major, regional-scale, north-south shear zone and marks the boundary between the Diale-Dalema and Feleme Series to the west and the Kofi Series to the east. The major gold deposits of the Kedougou-Kenieba inlier are located along second, or higher, order shears associated with this structure. The Tabakoto and Kofi deposits themselves occur east of the Senegal-Mali shear zone in the eastern part of the Kedougou-Kenieba inlier and are underlain by rocks of the Kofi Series (Birimian, turbiditic sedimentary rocks). The entire package of rocks has then been deformed and metamorphosed during the Eburnean orogeny (mountain building

process). While individual structures associated with each of the deformational events can host mineable deposits, multiple generations of structure enhances the probability of mineable ore.

Mineralisation at Tabakoto, Segala and Kofi is typically associated with disseminated to massive sulphides, pyrite, pyrrhotite, arsenopyrite and, occasionally, chalcopyrite and sphalerite. The gold is associated with either quartz veining or moderate to intense silicification and/or albitisation. The deposits may be characterised into three main types:

- shear zone hosted (Segala and Segala NW)
- fracture and cross structure hosted (Dar Salam, Tabakoto, Dioulafoundou and Kofi C)
- intrusive hosted (Djambaye II)

Mining and processing

Tabakoto mining operations consist of two underground operations (Tabakoto and Segala) and one open pit (Kofi C) with gravity/CIL processing facilities. The Tabakoto underground deposits are accessed from two portals at the bottom of the Tabakoto pit. The northern portal is used to exploit the northwest trending zones in the northern half of the mine and the southern portal for both the northeast trending zones and the southern zones in the southern half of the mine. The Segala Main Zone (the largest single deposit on the property) is accessed by a portal from the side of the Segala open pit. This zone consists of several parallel structures that run along the length of the ore body. The spacing and the thickness of these structures vary. Individual veins, which may be less than 1m thick, are grouped into ore zones that can collectively be up to 35m thick. In total, there are five veins being exploited by underground mining methods, each of which uses a variation of long-hole stoping, variously with or without backfill, which may be consolidated. The mining of the Kofi C deposit, which is ostensibly to augment underground feed, is by means of conventional drill and blast and load and haul open pit mining methods.

Following an expansion in 2013, the Tabakoto plant has been designed to recover gold from a variably weathered orebody at a design capacity treatment rate of 4,000tpd. The average feed grade for Tabakoto over the life of the mine is expected to be 3.6g/t (cf a resource grade of 3.13g/t and a reserve grade of 3.35g/t) and the process design criteria consist of crushing, ore stockpiling, milling, classification and in-line leach reacting, CIL, tailings disposal, acid wash, elution, electro-winning and smelting. Sodium cyanide consumption is c 0.6kg/t and lime consumption is a fairly modest c 2.0kg/t.

Owing to a lack of immediate grid power, Tabakoto owns and operates a power station equipped with 19 diesel-driven Cummins alternators with a total nominal capacity of 22.4MW.

Exploration potential

Given its relatively short mine life, Tabakoto had hitherto been an exploration priority at Endeavour after Houndé and Ity, with a programme focusing on both surface exploration and underground drilling, with the aim of delineating resources within trucking distance of the plant.

In 2017, Endeavour dedicated $8m to Tabakoto's exploration programme, totalling 56,200m of drilling. The campaign was focused on both underground resource delineation and testing near-mill open-pit targets. Depleted ounces were replaced and a portion of the new measured and indicated resource was converted into reserves.

As Endeavour will retain ownership of the high potential greenfield Kofi exploration land package near the Tabakoto mine, Endeavour is investing an additional US$6m in the 2018 exploration programme, totalling approximately 45,000m of drilling. This will be allocated equally between near-mill targets (both underground and open pit) and greenfield targets on both the Kofi permit and on the new permits acquired in 2017, located immediately north of Kofi and on-trend with Randgold's Loulo deposits.

Group reserves and resources

Exhibit 6 shows the reserves and resources of Endeavour's individual operations, as well as on a group-wide basis. It includes reserves as a percentage of resources and maximum potential reserve and resource lives, given an operation's processing rate (with the proviso this may vary depending on the type of material being processed, eg hard or soft, etc).

Exhibit 6: Endeavour Mining group reserves and resources

	Resources				Reserves				Reserves as % of resources			EDV interest	Attrib resources	Attrib reserves	Milling rate	Reserve life	Resource life
Mine	Category	Mt	g/t	koz		Mt	g/t	koz	%	%	%	(%)	koz	koz	ktpa	Yrs	Yrs
Agbaou	Measured	1.0	1.43	47	Proven	1.0	1.41	44	100.0	98.6	94.4	85.0	39.9	37.7	1,600	0.6	0.6
	Indicated	9.3	2.54	757	Probable	7.9	2.45	624	84.9	96.5	82.4	85.0	643.9	530.6	1,600	4.9	5.8
	Inferred	1.0	1.74	54	Possible*			0	0.0	0.0	0.0	85.0	45.9	0.0	1,600	0.0	0.6
	Total	11.3	2.36	858	Total	8.9	2.34	669	78.8	98.9	77.9	85.0	729.6	568.3	1,600	5.6	7.1
Tabakoto	Measured	7.4	2.99	715	Proven	2.4	3.32	251	32.4	111.0	35.1	80.0	572.0	200.8	**1,600	1.5	4.6
	Indicated	12.4	3.03	1,211	Probable	2.4	3.40	266	19.4	112.2	22.0	82.8	1,003.0	214.0	**1,600	1.5	7.8
	Inferred	7.4	3.40	810	Possible*			0	0.0	0.0	0.0	81.0	656.0	0.0	**1,600	0.0	4.6
	Total	27.2	3.13	2,736	Total	4.8	3.35	518	17.6	107.2	18.9	81.5	2,231.0	414.8	**1,600	3.0	17.0
Ity	Measured	0.7	0.63	15	Proven	0.3	1.41	14	42.9	223.8	89.6	80.0	12.1	10.9	4,000	0.1	0.2
	Indicated	73.1	1.57	3,680	Probable	58.6	1.59	3,001	80.2	101.3	81.5	80.0	2,943.9	2,400.5	4,000	14.7	18.3
	Inferred	18.7	1.31	785	Possible*			0	0.0	0.0	0.0	80.0	627.7	0.0	4,000	0.0	4.7
	Total	92.5	1.51	4,480	Total	58.9	1.59	3,014	63.7	105.7	67.3	80.0	3,583.7	2,411.4	4,000	14.7	23.1
Karma	Measured	0.7	0.63	15	Proven	0.7	0.63	15	100.0	100.0	100.0	90.0	13.7	13.7	4,000	0.2	0.2
	Indicated	81.0	1.10	2,856	Probable	33.8	0.89	971	41.7	80.9	34.0	90.0	2,570.1	874.0	4,000	8.5	20.3
	Inferred	21.4	1.32	909	Possible*			0	0.0	0.0	0.0	90.0	818.3	0.0	4,000	0.0	5.4
	Total	103.1	1.14	3,780	Total	34.5	0.89	986	33.5	78.0	26.1	90.0	3,402.0	887.7	4,000	8.6	25.8
Kalana	Measured	9.5	4.19	1,280	Proven	5.1	3.00	492	53.7	71.6	38.4	80.0	1,023.8	393.5	1,350	3.8	7.0
	Indicated	14.2	3.96	1,810	Probable	16.6	2.76	1,472	116.9	69.7	81.3	80.0	1,447.9	1,177.6	1,350	12.3	10.5
	Inferred	1.7	4.39	240	Possible*			0	0.0	0.0	0.0	80.0	192.0	0.0	1,350	0.0	1.3
	Total	25.4	4.08	3,330	Total	21.7	2.81	1,964	85.4	69.0	59.0	80.0	2,663.7	1,571.2	1,350	16.1	18.8
Houndé	Measured	3.6	2.40	281	Proven	3.6	2.25	263	100.0	93.8	93.8	90.0	252.7	237.1	3,000	1.2	1.2
	Indicated	33.7	2.01	2,178	Probable	26.5	1.98	1,693	78.6	98.5	77.7	90.0	1,960.0	1,523.7	3,000	8.8	11.2
	Inferred	3.2	2.64	275	Possible*			0	0.0	0.0	0.0	90.0	247.2	0.0	3,000	0.0	1.1
	Total	40.5	2.10	2,733	Total	30.1	2.02	1,956	74.3	96.3	71.6	90.0	2,459.9	1,760.7	3,000	10.0	13.5
Total	**Measured**	**22.9**	**3.20**	**2,353**	**Proven**	**13.1**	**2.56**	**1,080**	**57.2**	**80.2**	**45.9**	**81.3**	**1,914**	**894**	**15,550**	**0.8**	**1.5**
	Indicated	**223.7**	**1.74**	**12,492**	**Probable**	**145.8**	**1.71**	**8,027**	**65.2**	**98.6**	**64.3**	**84.6**	**10,569**	**6,720**	**15,550**	**9.4**	**14.4**
	Inferred	**53.4**	**1.79**	**3,074**	**Possible***			**0**	**0.0**	**0.0**	**0.0**	**84.1**	**2,587**	**0**	**15,550**	**0.0**	**3.4**
	Total	**300.0**	**1.86**	**17,919**	**Total**	**158.9**	**1.78**	**9,106**	**53.0**	**95.9**	**50.8**	**84.1**	**15,070**	**7,614**	**15,550**	**10.2**	**19.3**

Source: Edison Investment Research, Endeavour Mining. Note: *Archaic; **operating above design capacity of 4,000tpd.

Exploration target

In the aftermath of a period of frenetic corporate expansion (of which the sale of Tabakoto is the final example), Endeavour has now switched strategy to one of consolidation, to which end it has instigated a major exploration programme with the target of expanding its resources by c 10–15Moz at a discovery cost of c US$15/oz over a five-year period. The plan is based on the strategic prioritising of prospects with a screening methodology used in the oil and gas industry, with the initial focus on its flagship Ity and Houndé mines:

Exhibit 7: Endeavour exploration budget and targets, FY18–FY22 (100% basis)

Region	Exploration target (Moz)	Estimated life extension (yrs)	Budget (US$m)	Pro-rata budget pa (US$m)	Q118 expenditures (US$m)	H118 expenditure (US$m)	FY18 budget allocation (US$m)	Estimated discovery cost (US$/oz)
Greater Ity	4.0–6.0	25.8	55	11	3.0	9.2	8.0	11.00
Houndé	2.5–3.5	14.8	45	9	3.6	6.5	9.0	15.00
Tabakoto*	1.5–2.5	12.4	30	6	1.9	2.7	7.0	15.00
Agbaou	0.5–1.5	8.2	25	5	1.4	3.5	4.0	25.00
Karma	0.5–1.5	6.8	15	3	0.8	2.3	2.0	15.00
Kalana					5.2	6.6	6.0	
Regional Côte d'Ivoire	0.5–1.0		10	2	4.0	5.0	10.0	13.33
Total	9.5–16.0	13.4	180	36	19.9	35.8	46.0	14.12

Source: Endeavour Mining, Edison Investment Research. Note: *Sale announced 4 September 2018.

At Endeavour's average grade of 1.86g/t (see Exhibit 6), a resource of 9.5–16.0Moz would be contained within 159.0–267.9Mt of mineralised material and would support a reserve of 84.2–141.9Mt ore, which would be sufficient to support mining operations for an additional 5.4–9.1 years, and potentially as much as 10.2–17.2 years, at its aggregate annual milling rate (on a 100% basis).

Exhibit 8: Exploration target conversion into reserves and mine life

	Implied resource			Implied reserve			Aggregate milling rate (kt)	Reserve life (years)	Resource life (years)
Exploration target	Mt	g/t	koz	Mt	g/t	koz			
Lower limit	159.0	1.86	9,500	84.2	1.78	4,828	15,550	5.4	10.2
Upper limit	267.9	1.86	16,000	141.9	1.78	8,131	15,550	9.1	17.2

Source: Edison Investment Research

Assumptions

Endeavour has five operational mines. One, Tabakoto, has been sold (as at end-FY18). One (the heap leach at Ity) is expected to cease operations by the end of the current financial year to be superseded by the Ity CIL operation in mid-FY19. After Ity CIL, the next of Endeavour's projects to be developed will be Kalana in Mali, with a mine life of almost 20 years.

For the purposes of our valuation of Endeavour, our gold price forecasts are those set out in our report, Mining overview: Unlocking the price to NPV discount, published in November 2017 and reproduced below in real terms:

Exhibit 9: Edison forecast gold price, H218–FY34 (US$/oz, real)

Year	H218	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33
Gold price (US$/oz)	1,225	1,263	1,482	1,437	1,304	1,303	1,264	1,235	1,319	1,428	1,500	1,574	1,401	1,401	1,401	1,401

Source: Edison Investment Research

At the same time, our principal operating assumptions for Endeavour's immediately foreseeable remaining six projects are as follows:

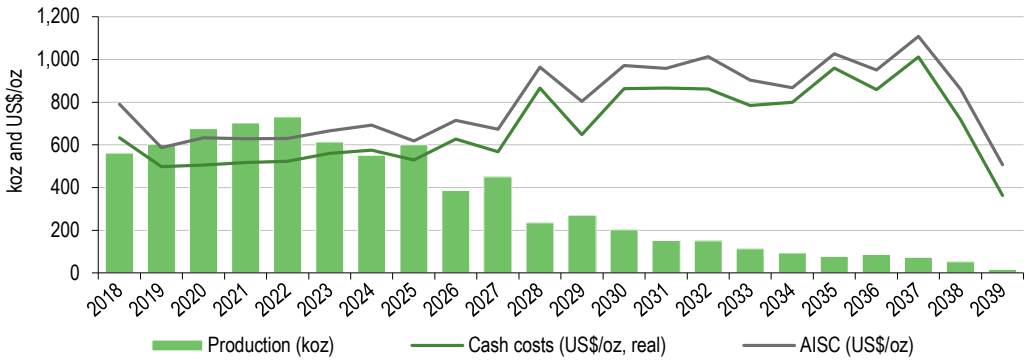
Exhibit 10: Principal operating assumptions

	Unit mining cost (US$/t)		Unit processing cost (US$/t)		G&A (US$/t)		Tax rate	Minority	Annual/annualised production rate (koz pa)		Final production year	LOM capex
	Target	Q2 actual	Target	Q2 actual	Target	Q2 actual	(%)	(%)	Target	Q2 actual		(US$m)
Houndé	2.31	2.00	13.99	11.41	3.28	7.40	17.5	10.0	179	278	2025	71.5
Agbaou	2.65	2.65	7.50	7.54	4.21	4.14	25.0	15.0	100	135	2021	0.0
Karma	1.82	2.08	7.27	10.50	1.75	4.02	17.5	10.0	96	84	2027	37.9
Ity CIL	2.85	N/A	11.96	N/A	2.23	N/A	25.0	20.0	164	0	2032	452.5
Tabakoto*	9.72	10.67	18.09	17.76	10.74	10.87	30.0	10.0-20.0	116	107	**2018	**10.4
Kalana	3.33	N/A	17.37	N/A	6.71	N/A	30.0	20	96	0	2039	319.4

Source: Edison Investment Research, Endeavour Mining. Note: *Sale announced 4 September 2018. **For forecasting purposes relating to Endeavour only.

Note that, of the above six projects, four are already in production. The two exceptions – Ity CIL and Kalana – are presumed by Edison to enter production in mid-FY19 and FY21, respectively. On the basis of these assumptions, we expect Endeavour's group-wide production and cash costs to evolve as follows over the course of the formal life of its operations:

Exhibit 11: Endeavour Mining forecast gold output, cash costs and AISC, FY17–FY39e



Source: Edison Investment Research, Endeavour Mining

Short-term forecasts

Endeavour has a good history of meeting its production and cost guidance targets. Guidance for FY18 is for production of 555–590koz at an AISC of US$760–810/oz. We would caution against placing too much reliance on the accuracy of quarterly earnings for mining companies generally. However, our forecasts for Q318 and Q418, within the context of current guidance, typical seasonality between Q3 and Q4 (reflecting the impact of the rainy season in Q3 in particular) and the actual results reported in Q118 and Q218, are as follows:

Exhibit 12: Endeavour Mining FY18 earnings forecasts, by quarter (US$000s unless otherwise indicated)

	*Q118	Q218	Q318e	Q418e	FY18e
Houndé production (koz)	73.8	66.9	58.4	58.4	258
Agbaou production (koz)	32.1	33.7	34.3	39.8	140
Karma production (koz)	28.2	21.0	22.0	33.5	105
Ity heap leach production (koz)	18.3	25.0	11.1	5.6	60
Tabakoto production (koz)	32.4	26.8	25.7	32.7	117
Total gold produced (koz)	152	147	126	137	562
Total gold sold (koz)	154	151	126	137	568
Gold price (US$/oz)	1,328	1,306	1,212	1,225	1,249
Cash costs (US$/oz)	524	608	758	667	633
All-in sustaining costs (US$/oz)	669	768	924	828	790
Revenue					
- Gold revenue	198,894	189,515	152,506	168,189	709,104
Cost of sales					
- Operating expenses	83,276	92,646	95,375	91,547	362,844
- Royalties	12,183	10,254	8,801	10,005	41,243
Gross profit	103,435	86,615	48,330	66,637	305,017
Depreciation	(39,504)	(43,538)	(46,120)	(47,034)	(176,196)
Expenses					
- Corporate costs	(6,488)	(6,130)	(5,957)	(5,957)	(24,532)
- Impairment of mining interests	0	0	0	(13,195)	(13,195)
- Acquisition and restructuring costs	0	0	0	0	0
- Share based compensation	(2,668)	(10,109)	(5,986)	(5,986)	(24,749)
- Exploration costs	(2,754)	(2,284)	(1,720)	(1,720)	(8,478)
Total expenses	(11,910)	(18,523)	(13,663)	(26,858)	(70,954)
Earnings/(loss) from operations	52,021	24,554	(11,453)	(7,255)	57,867
Interest income	0	0			0
Interest expense	(7,496)	(4,549)	(4,818)	(4,818)	(21,681)
Net interest	(7,496)	(4,549)	(4,818)	(4,818)	(21,681)
Loss on financial instruments	(11,403)	10,922			(481)
Other expenses	(165)	(818)			(983)
Profit before income tax expense	32,957	30,109	(16,271)	(12,073)	34,722
Current income tax	10,772	17,095	1,823	5,000	34,691
Deferred income tax	(4,881)	4,432	0	0	(449)
Total tax	5,891	21,527	1,823	5,000	34,242
Marginal tax rate	*17.9*	*71.5*	(11.2)	(41.4)	98.6
Profit after tax	27,066	8,582	(18,094)	(17,074)	480
Net profit from discontinued operations	593	(24,025)	(9,798)	(2,466)	(35,696)
Total net and comprehensive loss	27,659	(15,443)	(27,892)	(19,540)	(35,216)
Minority interest	14,567	(132)	(3,369)	400	11,466
Do. (%)	*52.7*	*0.9*	12.1	(2.0)	(32.6)
Profit attributable to shareholders	13,092	(15,311)	(24,523)	(19,940)	(46,682)
Dividend	0	0			0
Retained earnings	13,092	(15,311)	(24,523)	(19,940)	(46,682)
Basic EPS from continuing operations (US$)	0.116	0.081	(0.137)	(0.162)	(0.102)
Diluted EPS from continuing operations (US$)	0.116	0.081	(0.136)	(0.162)	(0.100)
Basic EPS (US$)	0.122	(0.142)	(0.228)	(0.185)	(0.433)
Diluted EPS (US$)	0.121	(0.142)	(0.227)	(0.185)	(0.424)
Normalised basic EPS from continuing operations (US$)	0.222	(0.020)	(0.137)	(0.040)	0.025
Normalised diluted EPS from continuing operations(US$)	0.221	(0.020)	(0.136)	(0.040)	0.025
Weighted average number of shares in issue (000s)	107,634.310	107,727.522	107,727.522	107,727.522	107,704.219
Derivatives (000s)	314.052	260.309	260.309	260.309	2,383.195
Fully diluted average number of shares in issue (000s)	107,948.362	107,987.831	107,987.831	107,987.831	110,087.414

Source: Endeavour Mining, Edison Investment Research. Note: *Q1 restated in Edison model to include Tabakoto as a 'discontinued operation'.

Valuation

Endeavour had US$216.8m in net debt at end FY17, including US$1.3m in restricted cash (cf Exhibit 23, which excludes it). The company has embarked on a major period of capital expenditure in FY18 relating to the Ity CIL project, which we estimate will amount to c US$351m over the course of the next 12 months (partially offset by the proceeds of the Tabakoto sale), such that it will have net debt on its balance sheet of US$304m as at end FY18. It will then have approximately one year's respite in FY19, before embarking on another major period of capital expenditure in FY20–21 relating to Kalana, which we estimate will amount to US$171m over two years. However, we expect this to be more than covered by operational cash flows, such that we estimate Endeavour will be net debt free as at end FY21, at which point it will be able to make distributions of dividends to shareholders.

Absolute valuation

Based on the assumptions made in Exhibits 9 and 10, we are able to calculate a sum-of-the-parts valuation of the company's four continuing operations as at end-FY18, by project discounted cash flow excluding working capital, as follows:

Exhibit 13: Endeavour sum-of-the-parts valuation as at end FY18 (US$000s)

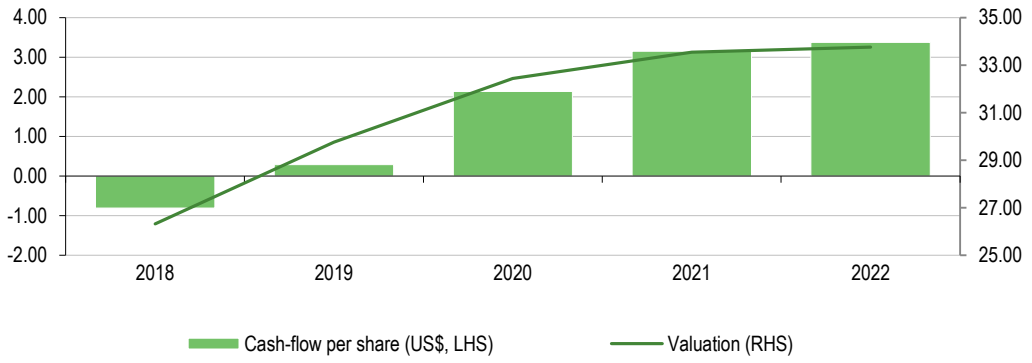
Asset	*Valuation (US$000s)	Percentage of total (%)
Agbaou	188,252	11.7
Karma	270,388	16.8
Ity CIL	861,878	53.4
Houndé	419,650	26.0
Kalana	177,084	11.0
Net cash/(debt)	(304,128)	(18.9)
Total	**1,613,124**	**100.0**
Total (US$/share)	**14.97**	

Source: Edison Investment Research. Note: *Attributable. Totals may not add up owing to rounding.

In valuing a company (as opposed to the individual assets), we would ordinarily discount maximum potential dividends over the life of operations back to FY18 to derive a valuation for a single-asset company. However, Endeavour is a multi-asset company that has shown a willingness and desire to trade assets maintain production, reduce costs and to maximise returns to shareholders (eg the sale of Youga in FY16 and Nzema in FY17). Hence, we prefer to discount potential cash flows back over four years from end-FY18 and then to apply an ex-growth terminal multiple of 10x (consistent with using a standardised discount rate of 10%) to forecast cash flows in that year (ie FY22). In the normal course of events, exploration expenditure would be excluded from such a calculation on the basis that it is an investment. In the case of Endeavour, however, we have included it in our estimate of FY22 cash flows on the grounds that it may be a critical component of ongoing business performance in its ability to continually extend the lives of the company's assets.

Our estimate of Endeavour's cash flow is US$3.38 per share in FY22, on which basis our terminal valuation of the company at end-FY22 is US$33.76/share, which (in conjunction with forecast intervening cash flows) discounts back to a value of US$26.32/share at the start of FY18 and US$29.76/share at the start of FY19:

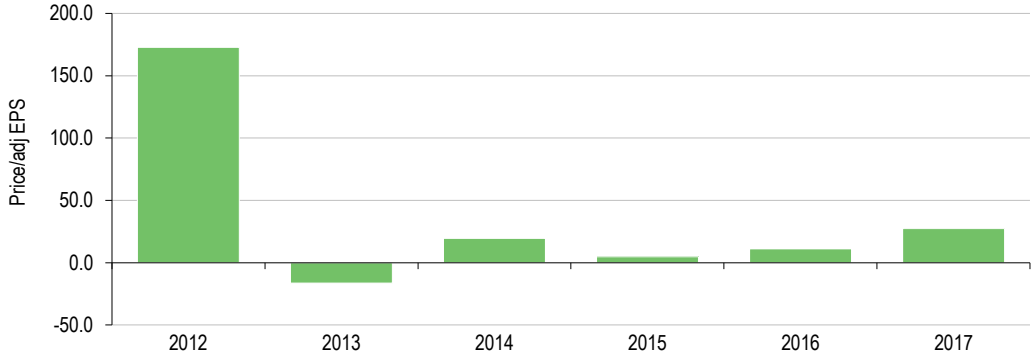
Exhibit 14: Endeavour forecast valuation and cash flow per share, FY18–FY22 (US$/share)



Source: Edison Investment Research

This valuation and methodology are supported by Endeavour's historical valuation. In this case, since 2014 Endeavour has traded on an average contemporary current year (positive) P/E ratio of 15.7x (the share price in the year in question divided by adjusted earnings in the year in question). Note that this compares to an 7.89x multiple for the FTSE Mining sub-index, currently.

Exhibit 15: Endeavour Mining price:adjusted EPS ratio, FY12–17



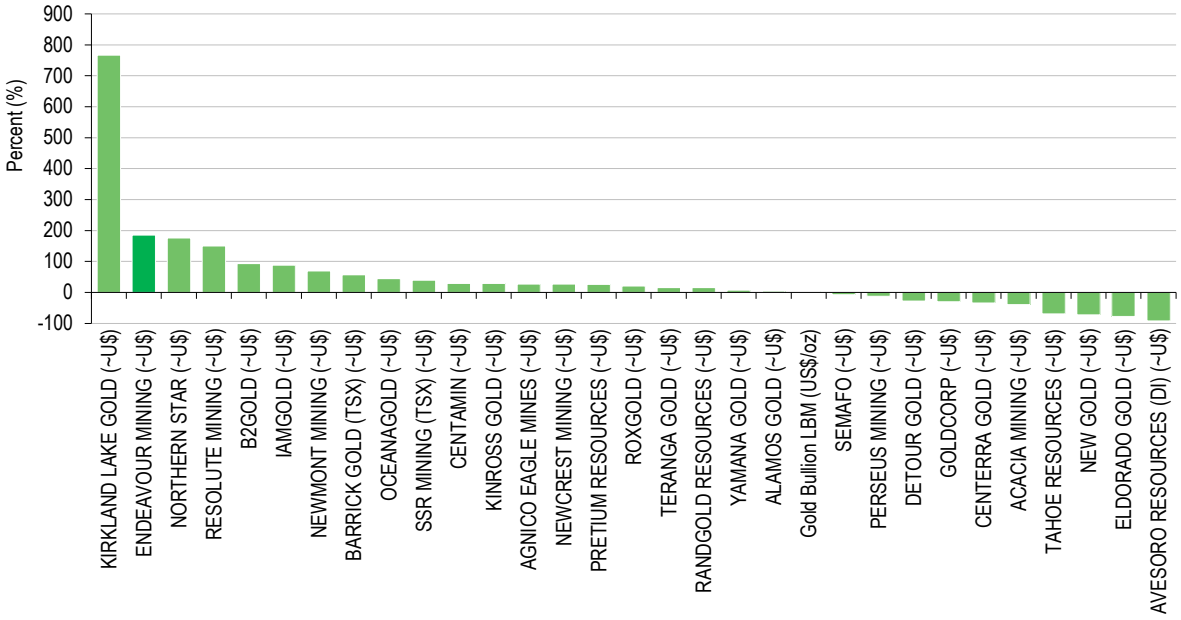
Source: Edison Investment Research, Bloomberg

Applying this multiple to our forecast for basic EPS in FY22 implies a share price in that year of US$40.16, which then discounts back (in conjunction with dividends potentially payable) to a value of US$26.87/share at the start of FY18 and US$29.55/share at the start of FY19, at Edison's customary discount rate of 10%, and within 1% of the US$29.76 calculated above). Stated alternatively, investors buying Endeavour shares now at a price of C$21.25, or US$16.38 and selling them in FY22 at a price of US$40.16 per share (having collected the potential intervening dividends) would record an internal investment return equivalent to 27.8% per year on their investment over the 4.25–year period in question in US dollar terms.

Relative valuation

Over the past three years, Endeavour's shares have been the second-best performing of 30 peers (see Exhibit 16, below) and the bullion price in US dollar terms:

Exhibit 16: Gold mining companies' share price performances, over three years (Endeavour highlighted)



Source: Thomsom Reuters Datastream, Edison Investment Research

Endeavour's valuation on a series of commonly used measures, relative to the same selection of gold mining majors, international peers and UK-listed peers, is as follows:

Exhibit 17: Endeavour valuation relative to peers

		Price/cash flow (x)			EV/EBITDA (x)		
Company	**Ticker**	**Yr1**	**Yr2**	**Yr3**	**Yr1**	**Yr2**	**Yr3**
Endeavour (Edison)	**EDV**	**10.9**	**6.0**	**4.0**	**7.1**	**4.8**	**3.2**
Endeavour (consensus)	**EDV**	**6.7**	**5.1**	**4.1**	**6.9**	**5.6**	**4.4**
Majors							
Barrick	ABX	7.0	6.9	7.0	6.9	6.5	6.7
Newmont	NEM	8.7	7.8	7.7	8.1	7.3	7.5
Goldcorp	G	8.3	5.7	5.0	9.0	6.0	5.4
Newcrest	NCM AU	8.4	7.6	8.2	7.5	6.7	7.5
Kinross	K	3.8	3.8	3.8	3.9	4.1	3.9
Agnico-Eagle	AEM	13.8	11.4	8.9	12.9	10.5	8.2
Eldorado	ELD	7.2	5.3	4.7	7.2	5.9	5.0
Average		**8.2**	**6.9**	**6.5**	**7.9**	**6.7**	**6.3**
International peers							
Alamos Gold	AGI	8.5	7.0	5.8	7.4	6.0	4.7
B2Gold	BTO	5.7	5.3	5.5	5.1	5.2	5.4
Centerra Gold	CG	3.9	3.1	2.1	3.2	2.9	2.1
Detour Gold	DGC	5.5	6.1	5.4	5.6	6.5	5.6
Iamgold	JMG	5.4	5.0	4.5	3.8	3.6	3.5
Kirkland Lake	KL	10.4	9.0	8.5	8.9	7.3	6.7
New Gold	NGD	1.9	1.9	1.5	5.8	4.3	3.2
Northern Star	NST AU	9.8	9.0	8.4	7.8	6.8	6.4
OceanaGold	OGC	5.2	5.8	5.7	5.1	5.2	5.4
Perseus Mining	PRU AU	3.1	2.8	2.5	3.7	3.2	1.9
Pretium Resources	PVG	7.3	5.3	4.8	9.9	6.5	6.0
Resolute Mining	RSG AU	5.4	5.1	4.4	5.1	3.3	2.8
Roxgold	ROXG	3.1	2.5	2.7	2.5	2.1	2.1
Semafo	SMF	6.9	3.2	3.1	6.4	3.1	2.9
SSR Mining	SSRM	12.4	9.1	6.7	7.3	6.6	4.6
Tahoe Resources	TAHO	8.5	4.4	2.6	6.1	3.1	2.0
Teranga Gold	TGZ	4.1	5.4	2.6	2.5	2.9	1.9
Yamana Gold	YRI	4.4	4.3	3.6	6.2	5.3	4.5
Average		**6.2**	**5.2**	**4.5**	**5.7**	**4.7**	**4.0**
UK-listed peers							
Randgold Resources	RRS LN	14.4	11.6	11.3	12.2	10.2	9.8
Centamin	CEY LN	5.9	6.6	6.0	4.7	3.7	3.3
Acacia Mining	ACA LN	6.2	2.8	3.4	3.7	2.8	2.7
Avesoro	ASO LN	2.8	2.8	2.1	3.6	4.5	3.0
Average		**7.3**	**5.9**	**5.7**	**6.1**	**5.3**	**4.7**

Source: Edison Investment Research, Bloomberg. Note: Priced at 16 October 2018.

Of note is that in almost every single instance Endeavour's valuation in year three is near to or below average consensus expectations for the majors, its international peers and its UK-listed peers (regardless of whether Edison forecasts or consensus are used for Endeavour). This suggests Endeavour's share price is discounting the next three years of results to end-FY20 (as Agbaou approaches the end of its operational life) but fails to discount the upside thereafter (as the Ity CIL project, Kalana and, to a lesser extent, Karma, maximise their contributions to the group).

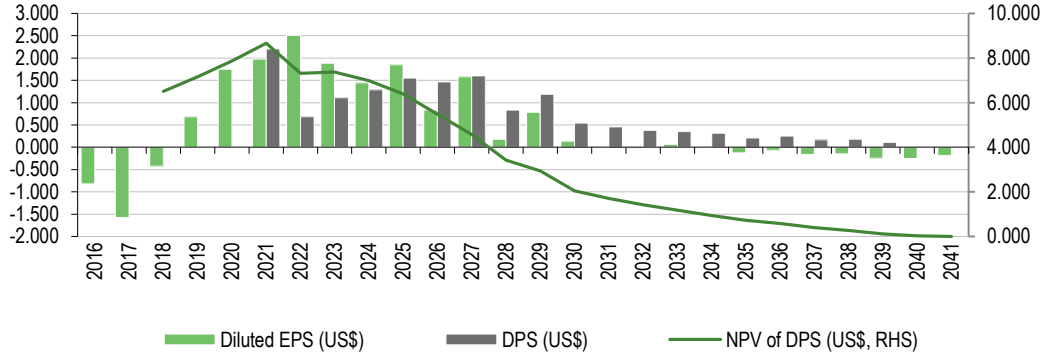
Sensitivities

Exploration

A critical sensitivity for our valuation of Endeavour is the company's ability to replenish its resources and reserves such that it can maintain its FY22 operating performance (effectively) indefinitely. In the worst-case scenario, Endeavour would invest its budgeted US$180m in exploration expenditure over the next five years for zero geological return. In the (very unlikely) event of this occurring, and with the company then deciding to run its mines and maximise its dividend pay-outs to

shareholders, we estimate Endeavour's EPS and (maximum potential) DPS over its official operational life, to be as shown in the graph below:

Exhibit 18: Endeavour forecast diluted EPS and (maximum potential) DPS, FY16–41



Source: Edison Investment Research, Endeavour Mining

In this (unlikely) worst-case scenario, the net present value of dividends potentially payable to shareholders as at end-FY18 (at a similar 10% discount rate) is US$7.16/share, rising to US$8.66 at the start of FY21 when we estimate that basic EPS of c US$2.00 per share is achievable and the first dividend distribution to shareholders is likely or possible.

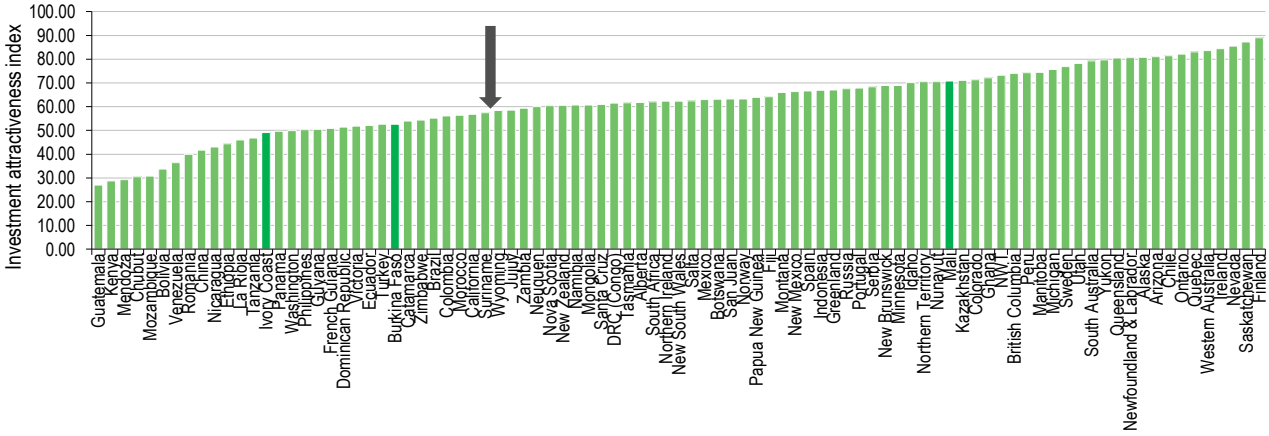
Stated alternatively, Endeavour is planning to invest c US$0.426 per share per year in exploration activities, with a net present value of US$1.35/share in the hope or expectation of adding US$22.60 (the difference between US$29.76, see above, and US$7.16 per share) to the value of its shares. Within this context therefore, its current share price of US$16.38 appears to discount a 40.8% ([16.38−7.16]/22.60) probability of exploration success relative to the aim of indefinitely extending the lives of its operations.

General

In qualitative terms, the principal risks to which Endeavour's projects are immediately exposed are geographical/sovereign, geological, metallurgical, engineering, financing and management risk. For its projects that have yet to enter production (namely Ity CIL and Kalana) the whole suite of risks may be summarised as execution risk, ie management's ability to bring the projects to account within their geographical jurisdictions and the required technical parameters. However, these risks are also mitigated by management's proven track record in successfully bringing mines into production in time and on budget. For its mines that are successfully in production, most of the technical risks will have been perceived to have reduced and others, such as commercial, commodity price and global economic risks, will have become relatively more significant.

In respect of geographical/sovereign risk, Endeavour operates in three countries in West Africa: Côte d'Ivoire, Burkina Faso and Mali. The overall rankings of these three in terms of investment attractiveness, according to the Fraser Institute's most recent annual survey, are shown in the graph below. On average, the simple average of all three is an index level of 57.5 (vs a simple average of the population of 62.0), which equates to a ranking between Suriname and Wyoming (see arrow):

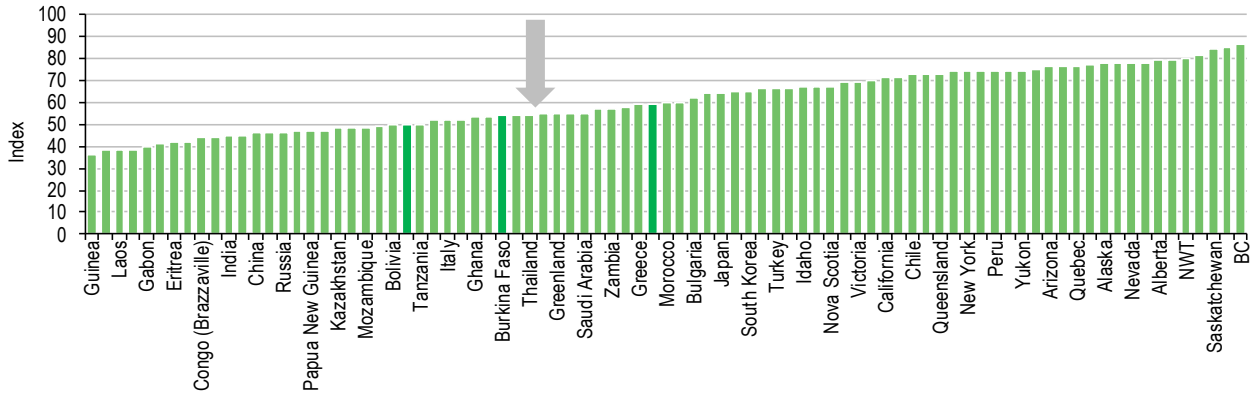
Exhibit 19: Fraser Institute index of investment attractiveness 2017 (Mali, Burkina Faso and Côte d'Ivoire/Ivory Coast highlighted)



Source: Fraser Institute

By contrast, the overall rankings of the same three in terms of hard risk (as determined in the Mining Journal's annual survey) are shown in the graph below. On average, the simple average of all three is an index level of 54.3 (vs a simple average of the population of 60.8), which equates to a ranking between Thailand and Botswana (see arrow):

Exhibit 20: Mining Journal index of hard risk 2017 (Mali, Burkina Faso and Côte d'Ivoire/Ivory Coast highlighted)



Source: Mining Journal

From a purely empirical perspective, our valuation of Endeavour is sensitive to the price of gold and unit costs to the following extent:

Exhibit 21: Endeavour valuation sensitivity to gold price and unit costs

		Gold price change (%)				
	Valuation (US$/share)	-20	-10	u/c	+10	+20
Unit cost change (%)	+20	8.45	16.71	24.10	30.95	37.65
	+10	11.99	20.17	26.95	33.71	40.36
	u/c	15.50	23.02	**29.76**	36.42	43.07
	-10	19.00	25.85	32.50	39.14	45.78
	-20	21.86	28.61	35.21	41.84	48.49

Source: Edison Investment Research

Similarly, our valuation is sensitive to the discount rate applied to future dividends, as follows:

Exhibit 22: Endeavour valuation sensitivity with respect to discount rate

Discount rate (%)	0%	5%	10%	15%	20%	25%	30%
Valuation (US$/share)	N/A	63.26	**29.76**	18.74	13.32	10.12	8.04

Source: Edison Investment Research

Financials

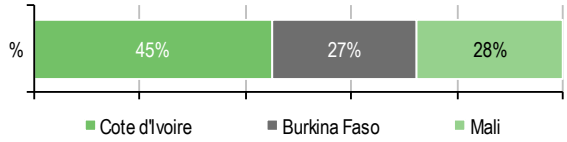
Endeavour had US$216.8m in net debt on its balance sheet as at end FY17 (including restricted cash). Note that this figure accords with Endeavour's accounts; it differs from the figure of US$231.7m quoted in some of the company's other materials since the accounting treatment of the finance leases in particular requires future cash flows to be discounted back to present value, whereas the higher figure is quoted on an undiscounted basis; in addition, the higher figure does not include restricted cash. In percentage terms however the difference between the two numbers is only 6.4% and is not deemed material by Edison. Since year-end 2017, Endeavour has embarked on a major period of capital expenditure in FY18 relating to the Ity CIL project, of which a US$221m is allocated for the period mid-FY18 to mid-FY19, such that it will have net debt on its balance sheet of US$304m at end-FY18 (including restricted cash cf Exhibit 23, which excludes restricted cash). This level of debt equates to a maximum gearing (net debt/equity) ratio of 31.6% and a maximum leverage (net debt/[net debt+equity]) ratio of 24.0% and will be financed via US$330m in convertible loan notes (with a conversion price of C$29.47/share and a maturity in 2023) and a further US$330m available under an undrawn revolving credit facility. Endeavour will then have approximately one year's respite in FY19, before (in our estimation) embarking on another major period of capital expenditure in FY20–21 relating to Kalana, which we estimate will amount to US$171m over two years. However, we expect this to be more than covered by operational cash flows, such that we estimate Endeavour will be net debt free as at end FY21.

Exhibit 23: Financial summary

US$'000s	2016	2017	2018e	2019e	2020e
December	IFRS	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS					
Revenue	566,486	652,079	709,104	762,133	1,002,952
Cost of Sales	(376,794)	(597,528)	(475,041)	(392,688)	(444,552)
Gross Profit	189,692	54,551	234,063	369,445	558,400
EBITDA	213,916	201,166	247,258	369,445	558,400
Operating Profit (before amort. and except.)	127,981	70,379	71,062	186,634	361,902
Intangible Amortisation	0	0	0	0	0
Exceptionals	(36,272)	(149,942)	(13,676)	0	0
Other	(1,989)	(2,242)	(983)	0	0
Operating Profit	89,720	(81,805)	56,403	186,634	361,902
Net Interest	(24,593)	(18,789)	(21,681)	(30,413)	(27,315)
Profit Before Tax (norm)	103,388	51,590	49,381	156,221	334,587
Profit Before Tax (FRS 3)	65,127	(100,594)	34,722	156,221	334,587
Tax	(27,643)	(32,945)	(34,242)	(53,071)	(91,957)
Profit After Tax (norm)	73,756	16,403	14,156	103,150	242,630
Profit After Tax (FRS 3)	37,484	(133,539)	480	103,150	242,630
Average Number of Shares Outstanding (m)	80.6	98.5	107.7	107.7	107.7
EPS - normalised (c)	(37.8)	(6.5)	(30.6)	70.2	178.6
EPS - normalised and fully diluted (c)	(37.5)	(6.5)	(30.0)	68.7	174.8
EPS - (IFRS) (c)	28.8	(114.5)	(10.2)	70.2	178.6
Dividend per share (p)	0.0	0.0	0.0	0.0	0.0
Gross Margin (%)	33.5	8.4	33.0	48.5	55.7
EBITDA Margin (%)	37.8	30.8	34.9	48.5	55.7
Operating Margin (before GW and except.) (%)	22.6	10.8	10.0	24.5	36.1
BALANCE SHEET					
Fixed Assets	1,073,562	1,331,745	1,312,582	1,360,304	1,349,739
Intangible Assets	29,978	6,267	6,267	6,267	6,267
Tangible Assets	1,039,529	1,317,952	1,298,789	1,346,511	1,335,946
Investments	4,055	7,526	7,526	7,526	7,526
Current Assets	283,536	361,766	284,821	330,978	630,073
Stocks	110,404	141,898	144,715	155,537	204,684
Debtors	36,572	95,212	102,797	107,155	126,948
Cash	124,294	122,702	35,387	66,364	296,519
Other	12,266	1,954	1,922	1,922	1,922
Current Liabilities	(149,626)	(241,185)	(213,258)	(180,043)	(202,000)
Creditors	(145,311)	(223,527)	(195,600)	(162,385)	(184,342)
Short term borrowings	(4,315)	(17,658)	(17,658)	(17,658)	(17,658)
Long Term Liabilities	(246,811)	(451,705)	(393,991)	(393,991)	(393,991)
Long term borrowings	(146,651)	(323,184)	(323,184)	(323,184)	(323,184)
Other long term liabilities	(100,160)	(128,521)	(70,807)	(70,807)	(70,807)
Net Assets	960,661	1,000,621	990,154	1,117,248	1,383,822
CASH FLOW					
Operating Cash Flow	164,522	244,092	196,999	344,994	535,360
Net Interest	(19,626)	(15,212)	(21,681)	(30,413)	(27,315)
Tax	(10,625)	(22,301)	(34,691)	(53,071)	(91,957)
Capex	(212,275)	(441,396)	(287,942)	(230,533)	(185,934)
Acquisitions/disposals	32,098	(37,332)	60,000	0	0
Financing	174,702	116,536	0	0	0
Dividends	(2,612)	(5,177)	0	0	0
Net Cash Flow	126,184	(160,790)	(87,315)	30,976	230,155
Opening net debt/(cash)	152,856	26,672	218,140	305,455	274,478
HP finance leases initiated	0	0	0	0	0
Other	0	(30,678)	0	0	0
Closing net debt/(cash)*	26,672	218,140	305,455	274,478	44,323

Source: Company sources, Edison Investment Research. Note: Includes discontinued operations; *excludes restricted cash.

EDISON

Contact details	Revenue by geography
5 Young Street London. W8 5EH United Kingdom +44 203 011 2723 www.endeavourmining.com	

Management team

President and CEO: Sebastien de Montessus

During Mr de Montessus's tenure as CEO of the La Mancha Group, the company doubled its production such that the Sawiris family was able to become the main shareholder in both Evolution Mining in Australia and also Endeavour Mining in November 2015. Previously, Mr de Montessus was group deputy CEO of France's nuclear parastatal, AREVA, CEO of AREVA Mining (uranium) and on the board of ERAMET from 2010-2012. Before joining AREVA in 2002, he was an investment banker at Morgan Stanley in London (M&A and Equity Capital Markets) and is a graduate of the ESCP-Europe Business School in Paris.

Executive VP and CFO: Vincent Benoit

Mr Benoit has more than 25 years of corporate finance, investor relations and M&A experience in the mining, energy and telecom sectors. He joined Endeavour in November 2015 following the transaction with La Mancha, which he led. Before joining La Mancha in 2013, he was EVP mergers and acquisitions at Orange, where he was also head of strategy and investor relations. Previously, he held positions with Areva, Bull Information System and PwC. He holds a business degree from ESC-Bordeaux Business School and is a Chartered Accountant.

Chairman: Michael E. Beckett

Mr Beckett has more than 40 years of experience in the mining sector and he has been involved in the development of some of the world's largest gold mines in Africa and Papua New Guinea, some of the largest iron ore mines in West Australia and some of the world's largest platinum mines in South Africa as well as industrial minerals in the Ukraine, Russia and Indonesia. As a former chair of Ashanti and a former managing director of Consolidated Gold Fields, he has extensive knowledge of mining in Africa. He is also a non-executive director of International Hotels Investment, Northam Platinum, Orica, Petroamerica Oil Corporation and The Egypt Trust.

COO and executive VP projects: Jeremy Langford

Mr Langford has extensive West African experience, having built and delivered over six projects in the past 12 years. Since joining Endeavour in 2009, he has successfully managed the development and construction of its Nzema, Agbaou and Tabakoto expansion projects (among others). He is managing the Houndé project construction, the Karma plant optimisation and overseeing the pre-development of the Ity CIL project. Prior to joining Endeavour, he was project director at Ampella Mining, Adamus Resources and Ausenco Services. He began his career as an engineer with the Royal Australian Navy and holds an honours degree in Mechanical Engineering from RMIT University in Melbourne.

Principal shareholders	(%)
La Mancha	29.85
BlackRock	10.93
Van Eck	10.13
Prudential	4.06
Massachusetts Mutual Life Insurance Co.	3.10
Royal Bank of Canada	2.99
FMR LLC	1.65

Companies named in this report

Endeavour Mining (EDV), Avnel, Avion, African Barrick Gold, Acacia Mining, La Mancha, Evolution Mining, AREVA, ERAMET, Orange, Bull, Ashanti, Consolidated Gold Fields, Northam Platinum, Ampella, Adamus Resources, Ausenco, BHP, Diversified Mineral Resources (DMR), Hargraves Resources, Durban Roodepoort Deep, Etruscan Resources, Goldbelt, Nevsun, Barrick, Newmont, Goldcorp, Newcrest, Kinross, Agnico-Eagle, Eldorado, Yamana, Randgold Resources, Centamin.

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