Newmont Tanami Operations: Multiple new discoveries supporting transformational growth in a mature mining camp

Shaun Schmeider[1], Stuart Perazzo[2], Leon Griesel[3] and Chris Robinson[4]

Newmont's Tanami Operations (100% ownership), located in the Northern Territory of Australia, has a strong history of gold production, resource development and exploration success. Current production is sourced from the Dead Bullock Soak (DBS) underground mine (**Figure 1**). Significant additions of reserves and resources to the main DBS deposits over the last five years have been due to the success of near-mine exploration and accelerated underground resource definition programmes; this has resulted in the discovery of Federation South Limb in 2013, significant extensions to the Auron Deposit during 2014 and 2015, and the latest discovery, Liberator, in 2016.

At December 2017, historic gold production from DBS comprised 1.80 Moz from open pits and 6.49 Moz from underground operations; remaining ore reserves and mineral resources are 4.41 Moz and 1.50 Moz[5] respectively, giving a total gold endowment of 14.2 Moz. With reserve conversion and resource additions of 4.47 Moz and 4.21 Moz[5] respectively since 2012, these endowment figures make the DBS gold deposits one of the largest and fastest growing gold occurrences in Australia (**Figure 2**).

[1] Geology Manager, Newmont Tanami Operations, Northern Territory 6904. Email: shaun.schmeider@newmont.com
[2] Senior Exploration Geologist, Newmont Tanami Operations, Northern Territory 6904. Email: stuart.perazzo@newmont.com
[3] Geology Superintendent, Newmont Tanami Operations, Northern Territory 6904. Email: leon.griesel@newmont.com
[4] Group Executive Exploration, Newmont Asia Pacific, Perth, Western Australia 6008. Email: chris.robinson@newmont.com
[5] Figure 2 is inclusive of Inferred Resource– see Cautionary Statement. Please refer to the Newmont 2017, Form 10K Company Annual Report filed with the SEC on February 22nd, 2018 for detailed grade and tonnage breakdown for all Reserve and Resource figures included in this Abstract.

Since their initial discovery in 1989 by North Flinders Mines Limited (NFM), the DBS gold deposits have been owned and operated by NFM (1989-1997), Normandy NFM Limited (1997-2002), and more recently by Newmont Tanami Proprietary Limited, a subsidiary of Newmont Mining Corporation (2002–present).

NFM was granted exploration licences over DBS in 1988 after the prospectivity of the area was identified based on its prominent outcrop, magnetic pattern and recorded gold occurrence (Ireland 1995). The initial discovery of gold was made on the back of systematic mapping and rock chip sampling; the maiden Inferred Resource of 0.6 Mt @ 3.3 g/t for 64 000 oz[5] for the outcropping ferruginous chert-hosted Dead Bullock Ridge deposit was announced in June 1989 (Lovett 1993). Successive discoveries of the Triumph Hill and Colliwobble Ridge deposits in the same stratigraphic unit, the informally named 'Schist Hills Iron Member', were made before the end of 1990.

Discoveries of the Villa deposit in poorly exposed ferruginous chert of the 'Orac Formation', and the more significant Callie deposit in shallowly buried planar laminated siltstone of the 'Callie Laminated Beds' and 'Magpie Schist', occurred during 1991 following the direction of exploration westward into the hinge of the anticlinorium. Open cut mining commenced at DBS in November 1991, exploiting the Dead Bullock Ridge, Triumph Hill, Colliwobble Ridge, Villa, and Callie orebodies. Production from the Callie underground mine commenced in May 1998 following sufficient development of the Callie open pit (Pendergast *et al* 2017).

The subsequent discoveries of the Auron deposit in 2007 (Pendergast 2011) and Federation South Limb deposit in 2013 (Baggott *et al* 2015, Baggott *et al* 2016) resulted from

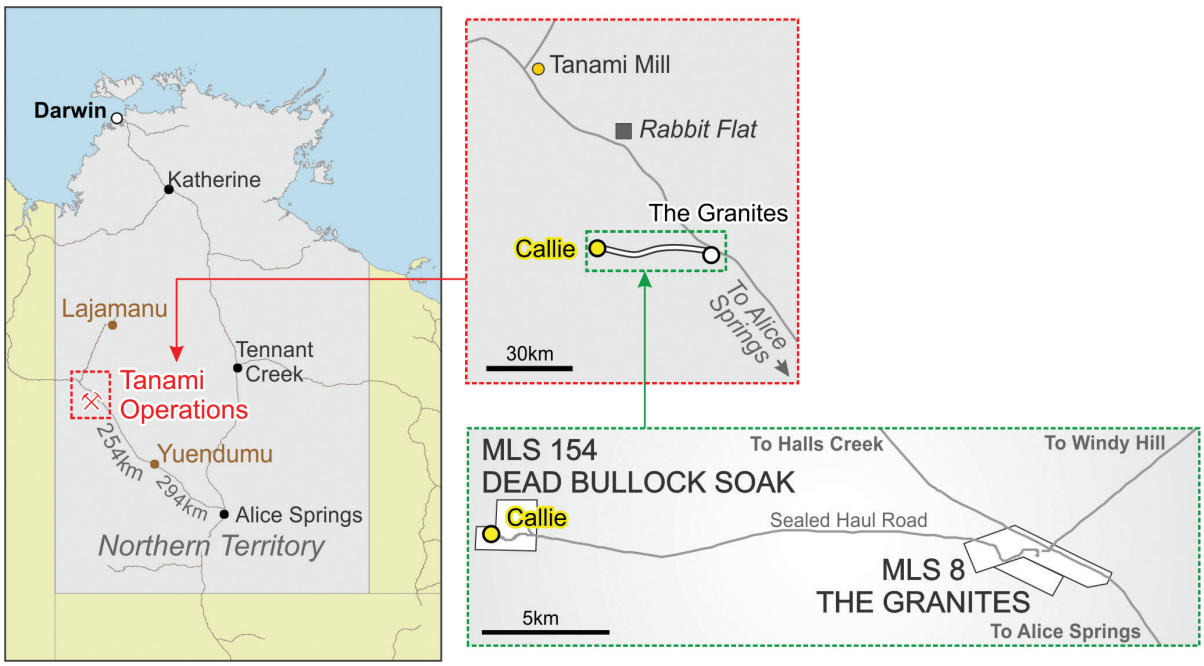

Figure 1. Location map of the Newmont Tanami Operations, Northern Territory, Australia.

a conscious effort to delineate shallow ore as the Callie and Auron mining front progressed deeper over time. Mining of the Auron deposit began in 2012; it had a pre-mining endowment of 5.83 Moz (1.62 Moz mined, 3.34 Moz reserve and 0.87 Moz Resource, including Inferred) and is expected to surpass the Callie deposit in terms of deposit size. It was discovered when geologists once again applied the same fundamental exploration strategy as they did to discover Callie: by pushing the targeting of mineralisation further into the core of the DBS anticlinorium. The deposit remains open at depth and extends below the current life-of-mine plan; current drilling is being conducted from dedicated underground exploration drill platforms to improve resource confidence.

Federation South Limb was identified in the Callie host stratigraphy approximately 200 m across strike to the south of the Callie orebody (Pendergast et al 2017); it is presently in the resource development phase. The deposit currently contains 0.36 Moz of Reserve and 0.36 Moz of Resource[1] (inclusive of Inferred); it remains open up and down plunge (Morgan 2016).

The Liberator discovery was made between 2015 and 2016 and is currently the subject of resource infill drilling with the first declaration of Inferred Resource expected at the end of 2018. The deposit is located within the same mineralised corridor as Federation South Limb, 300 m down dip within the Auron host stratigraphy where the two intersect[5].

After the discovery of Auron in 2007, the operation became focused on a production shaft solution to resolve the issue of increasing unit production costs and lower production rates related to mining at depth using trucks. Unfortunately, the Tanami Shaft project was placed on hold at the end of 2012 and the mine continued as a truck-only underground operation using a single decline. With significant additions of 4.0 Moz (2.1 Moz reserve, 1.9 Moz Resource, inclusive of Inferred) made at DBS between 2013 and 2014, it was determined that a dual access decline would be a viable option to increase production rates from Auron, lower mining costs and allow the mine to meet the processing demand of a hungry mill. This also allowed the base of the mine to extend by a further 220 m below the previous economic base and enabled new resource and reserve additions to be made during 2015 and 2016 from the Auron deposit at depth.

This consistent measured growth is the product of persistence, the drive to revisit historic data and deposit targeting models, diamond drilling strategy, and mine design. It is also a story of gaining management support for further exploration effort, applying best practices in resource definition and bringing together a team with the passion and desire to make a difference at a site that had otherwise been set for sale.

The Life of Mine of the Tanami Operations was extended from 2024 five years ago to 2029; this extension provided Newmont with the necessary support to justify funding of a US$120 million expansion of the processing facility and installation of the second decline to access the Auron deposit (as note above). The expansion was completed in September 2017 and is expected to increase gold production at the Tanami Operations by 80 000 ozpa to a total output in the range of 425 000 to 475 000 ozpa, and to lower all-in sustaining costs[6] to US$700–750/oz.

Newmont continues to sees the potential to significantly increase the current reserve and resource base at DBS through ongoing application of best practices in resource

[6] All-in sustaining costs or AISC as used in this estimate are forward-looking non-GAAP metrics defined as the sum of costs applicable to sales (including all direct and indirect costs related to current gold production incurred to execute on the current mine plan), reclamation costs (including operating accretion and amortization of asset retirement costs), G&A, exploration expense, advanced projects and R&D, treatment and refining costs, other expense, net of one-time adjustments and sustaining capital. A reconciliation has not been provided in reliance on Item 10(e)(1)(i)(B) of Regulation S-K because such reconciliation is not available without unreasonable efforts. For illustrative purposes, a reconciliation of historical AISC and 2017 AISC gold outlook on a consolidated basis can be found in the Company's most recent quarterly earnings release available at www.newmont.com.

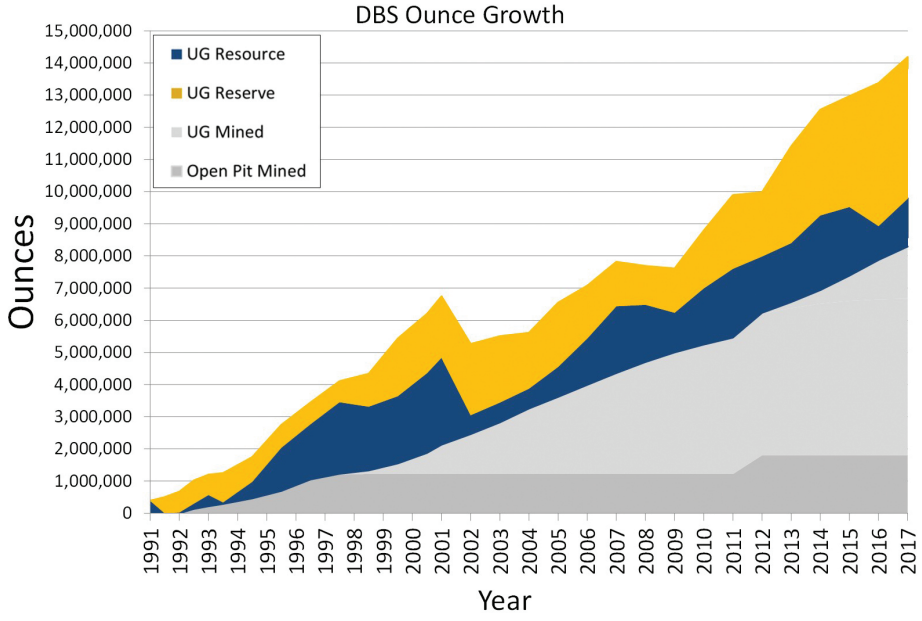

Figure 2. Graph showing historical Mine Production, Reserve and Resource growth of the DBS deposits (modified from Pendergast, 2017).

development to expand existing deposits and maintain the current and future mine production profiles. This, in conjunction with continued near mine exploration success, will be the foundation of longer-term growth for the Newmont Tanami Operations.

Acknowledgments

Newmont acknowledges the traditional owners of the land on which the mine is located, the Warlpiri people.

Acknowledgement also goes to the past and present geologists, resource geologists, engineers, metallurgists and the current management team of the Newmont Tanami Operations for your commitment to making a difference over the last four years. A special thanks to Chris Robinson, Grigore Simon and Radislav Golijanin for permission to prepare this Abstract and for their ongoing support and belief in the Tanami Operations and the world-class DBS deposits.

References

Baggott M, Schmeider S, Pendergast WJ, Robinson C and Sivwright P, 2015. Ongoing Discovery in the Gold Deposits at Dead Bullock Soak, Tanami Orogen, Northern Territory: The Emergence of a World-Class Gold Camp: in '*World-Class Ore Deposits: Discovery to Recovery*'. Society of Economic Geologists Conference Proceedings. September 27-30, 2005. Hobart, TAS, Australia.

Baggott M, Robinson C and Schmeider S, 2016. *Transformational growth and cost improvement at Newmont's Tanami Operations, Central Australia*. Abstract and Presentation. Prospectors & Developers Association of Canada (PDAC) Convention 2016.

Ireland TJ, 1995. The discovery of the Callie Gold Deposit in the Tanami Region, Northern Territory, Australia: in '*New generation gold mines: case histories of discovery*'. Australian Mineral Foundation, Adelaide, 601–6.10.

Lovett DR, Giles CW, Edmonds W, Gum JC and Webb RJ, 1993. The geology and exploration of the Dead Bullock Soak gold deposits, The Granites – Tanami Goldfield, NT: in '*Proceedings of the AusIMM Centenary Conference 1993*'.The Australasian Institute of Mining and Metallurgy: Melbourne, 73–80.

Morgan G, Vine S, Cranley A and Florea P, 2016. *Competent Person Report for Reserves and Resources, Newmont Tanami Operations*. Internal Newmont report.

Pendergast WJ, 2011: *The Discovery of the Auron lode, Newmont Tanami Operations – A case study of a ~3 Moz discovery in a "mature" field*. Abstract and Presentation. NewGenGold 2011, Perth, WA.

Pendergast J, Baggott M and Schmeider S, 2017. Dead Bullock Soak Gold Deposits: in Phillip N (editor). '*Monograph 32 - Australian Ore Deposits*'. The Australasian Institute of Mining and Metallurgy: Melbourne, 551–556.

Vine S, Wetzel N and Hart S. 2012. *Ore Reserves and Non Reserve Mineralisation (NRM) as of December 31st, 2012. Newmont Tanami Operations*. Internal Newmont report.