Annual Technical Report

GR449 AMALGAMATED REPORT

TITLES MLN582, MLN1121, MLN1122, MLN1123, MLN1124 AND MLN1125

Title Holder: Mount Isa Mines Limited
Operator: McArthur River Mining Pty Ltd
Commodities: Zn & Pb
For the period 5 January 2017 – 4 January 2018

Bauhinia Downs 1:250,000 SE53-3
Borroloola and Glyde 1:100,000, 6165 and 6164

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Department, Area	Mining Technical Services, Geology
Prepared by	MRM Geology

Disclaimer

Amalgamated reporting was approved on 12 April 2017 and as such has been assigned the reporting code GR449. This amalgamated report includes the Mineral Leases MLN582, MLN1121, MLN1122, MLN1123, MLN1124 and MLN1125 which is owned by Mount Isa Mines Pty Ltd and operated by McArthur River Mining Pty Ltd.

Abstract

The McArthur River mine is one of the world's largest zinc, lead and silver mines, situated approximately 65km south-west of Borroloola, near the Gulf of Carpentaria in the Northern Territory. It is operated by McArthur River Mining (MRM), a subsidiary of the Swiss mining company Glencore. Although discovered in 1955, when it was originally named the HYC ("Here's Your Chance") deposit, mining operations did not commence until 1995. Initially an underground mining operation, the mine transitioned across to an open-cut operation in 2006. The sediment-hosted stratiform HYC deposit is approximately 1.5km long and 1km wide with an average thickness of 55m. The HYC deposit has similarities with ore-bodies at Mount Isa in Queensland. The mine site is contained within five contiguous leases (MLN1121, MLN1122, MLN1123, MLN1124 and MLN1125), located on McArthur River Station Pastoral Lease, with MLN582 located west of these contiguous leases by a distance of approximately 4.5km. During the reporting period a drilling campaign was completed across MLN1121, MLN1122, MLN1123 and MLN1124 which was designed to identify zones or features of relatively high hydraulic conductivity representing potential conduits for groundwater flow recharge to the old underground; better define the hydraulic properties of the northern section of the Western Fault block; identify and determine the impact of the Whelans Fault on groundwater recharge and pit wall stability in the Footwall Quarry; better define regional groundwater flow adjacent to the Western Production Run-off Dam (WPROD); and, resource development of the south-west limits of the HYC deposit. The drilling campaign consisted of 28 diamond drillholes totalling 4,154m, 7 reverse circulation drillholes totalling 140m, and 6 sonic drillholes totalling 62m. The findings from the 2017 drilling programme are highlighted by; the Western Fault block to be a low conductive structural feature, especially across the Western Fault and Cooley textural contact; and, the Mt Stubbs and Bald Hill fault intercept to be highly conductive and karstic. No drilling activities were conducted on MLN582 or MLN1125 as they are located outside the current operational area.

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1.0 Location and Lease Details

The McArthur River Mine is located 65km south-west of the township of Borroloola in the Gulf Region of the Northern Territory, approximately 900km south-east of Darwin as shown below in Figure 1.

The mine site is contained within five contiguous leases (MLN1121, MLN1122, MLN1123, MLN1124 and MLN1125), located on McArthur River Station Pastoral Lease, with MLN582 located west of these contiguous leases by a distance of approximately 4.5km. The bulk of the mines infrastructure is located on Barney Hill, on the western end of MLN1122. The McArthur River mine site lease boundaries are shown below in Figure 2 using an aerial photography overlay, with Figure 3 displaying the pit location relative to the boundaries of MLN1121. Table 1 below summarises the lease details.

TABLE 1. MCARTHUR RIVER MINING LEASE DETAILS. MODIFIED FROM GRENFELL, 2012.

Lease Type	Lease Name	Lease Number	Owner	Date Granted	Expiry Date
MLN	REWARD	MLN582	MIM	01/09/1958	31/12/2019
MLN	HYC	MLN1121	MIM	05/01/1993	04/01/2043
MLN	GLYDE	MLN1122	MIM	05/01/1993	04/01/2043
MLN	BUFFALO	MLN1123	MIM	05/01/1993	04/01/2043
MLN	EMU	MLN1124	MIM	05/01/1993	04/01/2043
MLN	EMU EAST	MLN1125	MIM	05/01/1993	04/01/2043

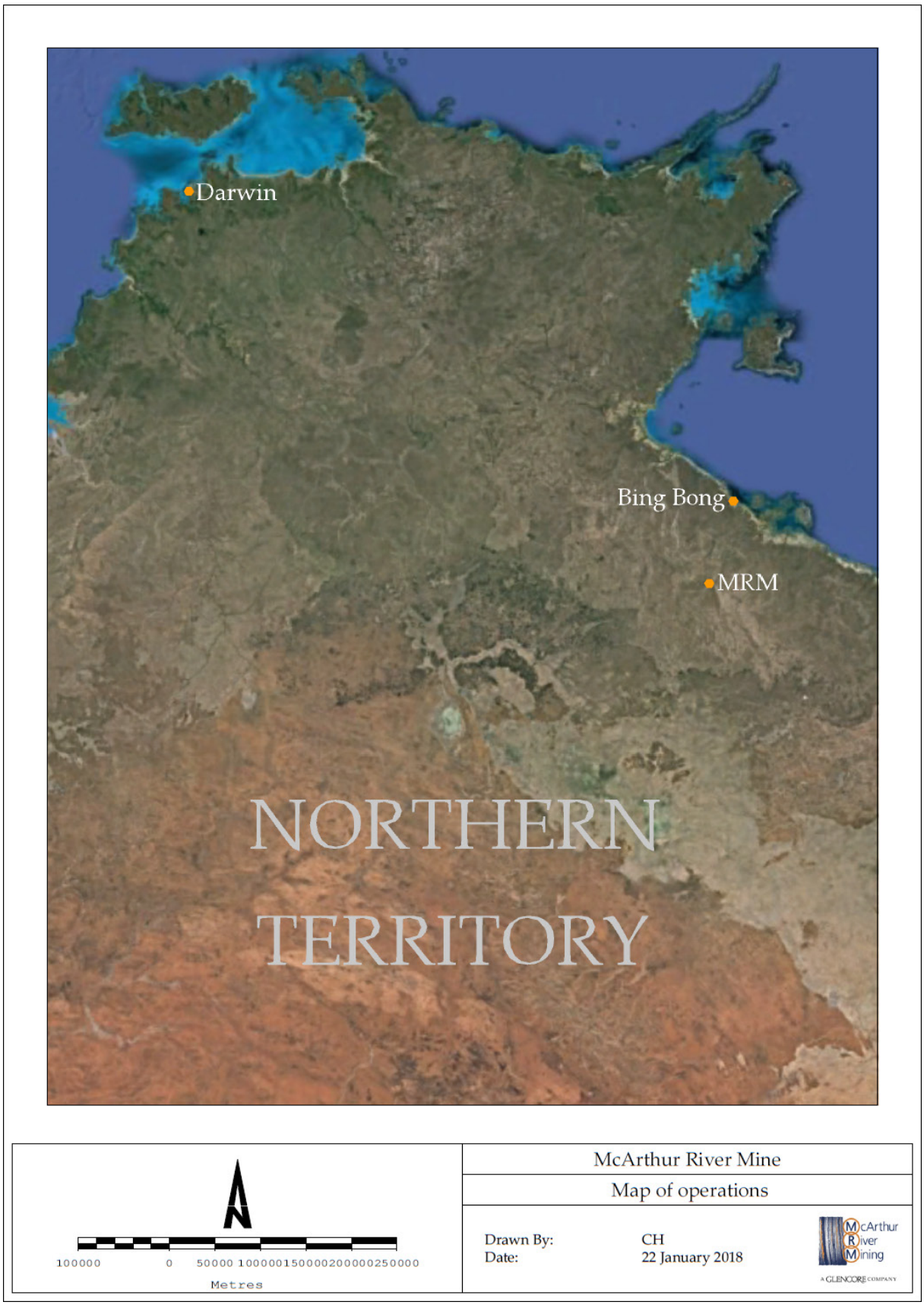

FIGURE 1. MCARTHUR RIVER MINE LOCATION.

FIGURE 2. MCARTHUR RIVER MINING MINERAL LEASE WITH 2013 AERIAL PHOTOGRAPHY OVERLAY.

FIGURE 3. MLN1121 OVERLAY WITH 2013 AERIAL PHOTOGRAPHY OVERLAY.

2.0 History

The orebody, named Here's Your Chance (HYC) on MLN1121, was discovered by Mount Isa Mines Limited geologists in 1955, but development did not commence until 1995. This gap in time between the deposit's discovery and development resulted from the unusual structure and extensive faulting of the orebodies and the extremely fine-grained nature of the ore, which combined to make commercial exploitation of the resource unfeasible for many years. A number of technological advancements in mining, ore treatment and concentrate transport, were necessary before the project could proceed on an economic basis. Trial work failed to develop an economically viable technique of ore beneficiation in the 1960's and 1970's.

A small decline and pilot plant were constructed on site in 1975, with the consequent preparation of a feasibility study and environmental report in 1979. That study was based on a high-tonnage, open-pit operation. In addition to poor recovery rates, no market existed at that time for the low-grade lead and zinc concentrates produced by the pilot plant. Subsequent metallurgical developments in fine grinding technology and the emergence of a market for high-grade bulk concentrate suitable for feeding Imperial Smelting Process smelters, allowed the project to be re-evaluated in 1989.

Construction of the project commenced in 1994, with the first shipment of concentrate loaded in mid-1995. In 2005, MRM announced its intention to convert the underground Zn-Pb-Ag mine to an open pit operation to enable the mine to continue production. Approval from the NT Government was granted in 2006 and a test pit was developed and later expanded. In March 2007, MRM announced an AUD $50 million expansion of its concentrator to increase its capacity from an annual throughput of 1.8 million tonnes of ore to 2.5 million tonnes.

On 17 December 2008, a decision by the Full Bench of the Australian Federal Court invalidated the original approach granted for the MRM expansion due to a procedural error by the Federal Government. As a result, all mining and civil works were suspended. MRM resubmitted its application to the Federal Environment Minister shortly after this judgement and on 22 January, the Minister gave preliminary conditional approval for the expansion subject to a 10-day consultation period. Stockpiled ore was processed at the site while mining was suspended but was depleted by 23 January at which time the operation was placed into care and maintenance. On 20 February, the Minister approved MRM's open pit development and operations and mining recommenced.

In March 2011, Xstrata Zinc announced it was investigating an integrated development plan involving its European and Canadian smelters to increase capacity at MRM. The plan would secure the long-term future of the operation in the face of a decline in the traditional international markets for the bulk zinc-lead concentrate produced by the mine.

The MRM Phase 3 Development Project proposes increasing capacity from 2.5 million tonnes of ore per annum to 5.5 million tonnes and increasing production from 360,000 dry metric tonnes to 800,000 dry metric tonnes per annum.

A draft Environmental Impact Statement was lodged in January 2012 followed by a Supplementary EIS in May 2012. On 17 July 2012, the Northern Territory Government released an environmental assessment report which recommended the project can be managed without unacceptable environmental impacts and could proceed subject to commitments on seven operational issues being enforced under an approved Mining Management Plan.

3.0 Geology

The McArthur Basin comprises Carpentarian and Adelaidean rocks extending from the Alligator River in the Northern Territory to the Queensland border including the greater part of Arnhem Land and the Gulf of Carpentaria drainage region.

The sediment hosted stratiform HYC deposit has similarities with ore-bodies at Mount Isa and Hilton in Queensland. It is about 1.5km long and 1km wide with an average thickness of 55m.

The sediment hosted stratiform HYC deposit occurs near the base of the HYC pyritic shale member, within the Middle Proterozoic McArthur Group. The member comprises a sequence of inter-bedded pyritic bituminous dolomitic siltstones, sedimentary breccias and volcanic tuffs.

The HYC deposit has been folded and eroded along its western margin, which is covered with 30m of soil. The western margin contains the Hinge zone, which is sub-vertical with a strike length of 1km and vertical height of 200m. The northern margins inter-finger with sedimentary breccias and the southern margin grades into thinned nodular barren pyritic siltstone. On the eastern margin the ore-body thickens and is folded to form the Lower Fold Zone, which has a strike length of over 600m. The south-eastern corner is down faulted 110m by the north-eastern trending Woyzbun Fault.

4.0 Physiography and Hydrology

The mine site is situated adjacent to the McArthur River, in the middle reaches of the river's catchment, between the confluences of the Kilgour and Glyde Rivers. The catchment area of the river above the mine site is approximately 10,000km^2. The 100 year average recurrence interval (ARI) flood level at the mine site is 39.5m. All major infrastructure on the site is located above this level. With the exception of some spring fed tributaries, most of the flow of the McArthur River comes from wet season rains. The river ceases to flow in some dry seasons, and most stretches, particularly in the vicinity of the mine area, can dry to a series of large isolated pools. During the wet season the river can become extremely turbid when in flood. Flow data for the McArthur River in terms of ARI is 7,250 (m^3/s) for 1 in 100 year event (RL 40m), whilst 1,000 (m^3/s) for 1 in 2 year event (DEIS, 1992).

The main creek systems which bound the tailings and mine site, are Barney and Surprise Creeks. Barney Creek has a catchment area of 600km^2 at the mine site. The creeks are dry throughout most of the year. This is particularly the case for Surprise Creek, which has a catchment size of only 85km^2, and normally flows for only a few days each wet season.

McArthur River mine site has two main aquifers in the immediate vicinity, the alluvial aquifer and the lower fault aquifer. The alluvial aquifer is readily linked to the McArthur River and contains good quality fresh water. The faults in the dolomite and shales contain groundwater that is linked to the alluvial aquifer in part.

The dominant relief is low escarpments, plateaux and ridges, with limestone or dolomite rocks of Palaeozoic age or older in the western part of the McArthur River catchment upstream of the project site, and sandstone and conglomerate rocks in the eastern sub- catchments, including the Kilgour and Glyde Rivers.

The tailings storage facility (TSF) is located adjacent to the Carpentaria Highway. This structure stands approximately 17m high over 200 hectares. Current disturbance for McArthur River Mining Leases totals 1,483 hectares, which represents 12% of the mining lease area.

5.0 Climate

The climate of the McArthur River region is tropical monsoonal, with a pronounced wet season between December and March and generally dry conditions for the remainder of the year, although a build-up to the wet season with some rain often occurs during November.

Mean annual rainfall for the mine site is 715mm with the area around the port at Bing Bong receiving a mean annual total of 1,040mm. Mean annual evaporation varies from 3,000mm at the mine site to around 2,300mm at the coast. Average daily minimum and maximum temperatures for McArthur River are 12°C to 29°C in June whilst in December they range from 25°C to 38°C.

Winds during the dry season blow predominantly from the south-east to south in the morning and change to blow from the east to north-east in the afternoon. During the wet season, there is no predominant wind direction in the morning, whilst in the afternoon winds predominate from the north to east. McArthur River has more calm observations than those in coastal locations (DEIS, 1992).

Extreme events include cyclones, floods, droughts and fire. Cyclones are an annual threat to coastal areas in the Gulf region. The McArthur River mine site is outside the cyclone risk area but is affected by the tropical low pressure systems that can result in flooding. Flooding is an annual risk at McArthur River. Gross departures from the normal annual cycle are possible.

6.0 Land Use

Land use is predominantly cattle grazing on large pastoral properties and the occasional mining activity. Encompassing all mining leases is McArthur River Station, which is 100% owned by Colinta Holdings, an MIM Holdings subsidiary. Other regional pastoral enterprises are owned by private persons, companies, and Aboriginal groups.

McArthur River Station stocks approximately 10,000 head of cattle over 8,000 square kilometres, utilising approximately one third of the area for grazing. Cattle have been excluded from the Barney Hill mining and processing areas.

McArthur River Mine is located in one of the more sparsely populated areas of Northern Australia. Populations of townships fluctuate with people leaving outstations in the wet season.

7.0 Drilling

The following section outlines drilling activities undertaken during the 2017 reporting period, with each Mineral Lease presented separately.

7.1 MLN582

No drilling activities were conducted on MLN582 and no drilling activities are scheduled for the forthcoming year. The area will continued to be used for mining operations.

7.2 MLN1121

Seven diamond drillholes were drilled within MLN1121 (Figure 4) and is summarised below in Table 2.

Three geotechnical drillholes were drilled within the open pit targeting the footwall sediments of the HYC sequence, totalling 680m. Vibrating Wire Piezometers were installed downhole to identify and determine the impact of the Whelans Fault on groundwater recharge and pit wall stability in the Footwall Quarry. This drilling highlighted fractured rock mass in drillhole GT17001 which intersected the Whelans Fault from 163.58m to 169m. These drillholes were fully grouted.

Four drillholes were drilled for groundwater purposes into the hangingwall sediments of the HYC sequence, totalling 689m. Vibrating Wire Piezometers were installed downhole to identify zones or features of relatively high hydraulic conductivity representing potential conduits for groundwater flow recharge to the old underground. The hydraulic tests conducted on drillhole GW17010 show the area to be highly conductive and karstic. These drillholes were fully grouted.

All drillholes were geology logged, however, were not sampled for assaying.

TABLE 2. SUMMARY OF MLN1121 DRILLING.

Hole Purpose	Hole Type	Hole Number Range	No. of Holes	Total Metres
Geotechnical	Diamond	GT17 001-003	3	680
Groundwater	Diamond	GW17 003, 010, 012, 035	4	689
Total			**7**	**1,369**

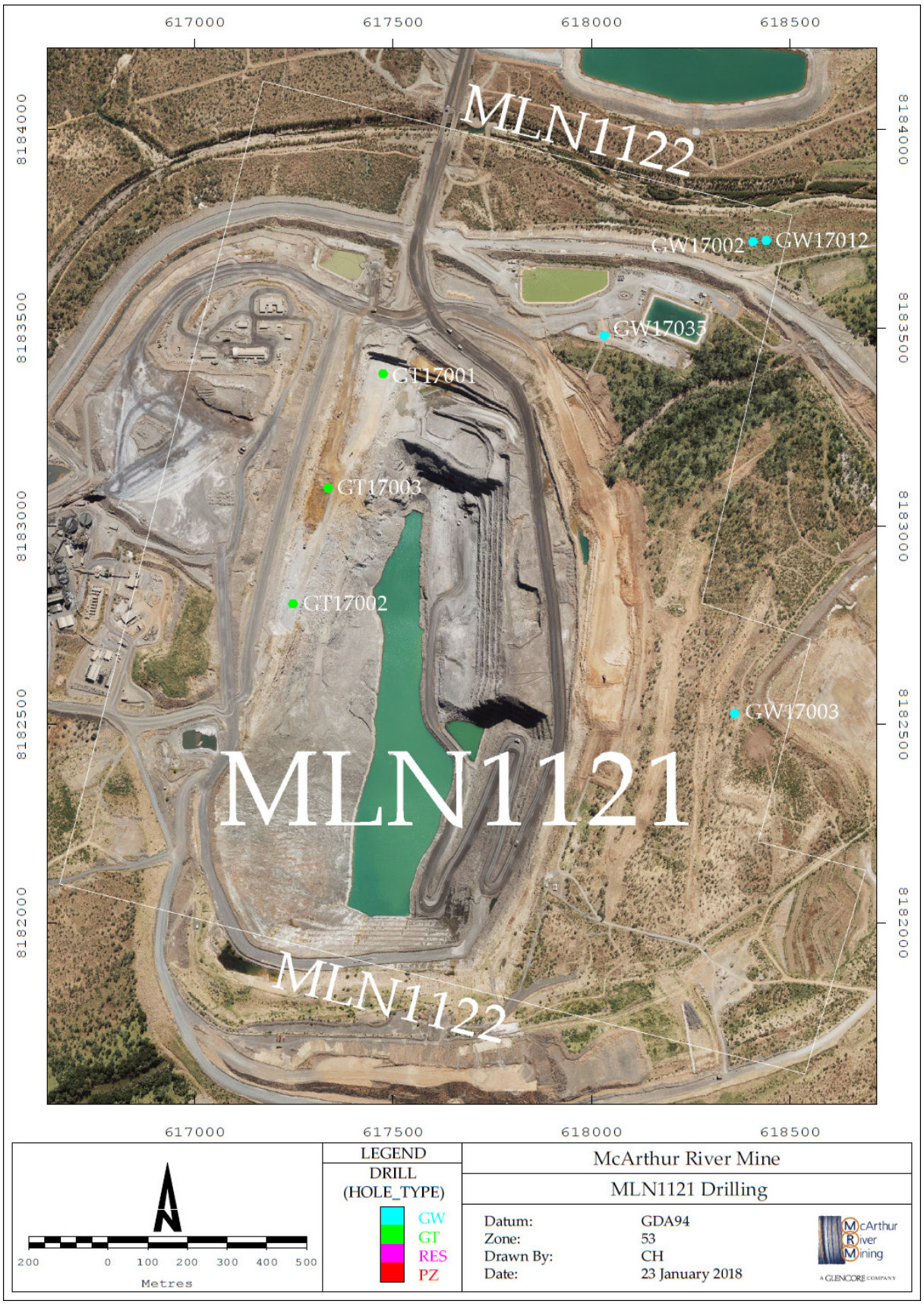

FIGURE 4. MLN1121 DRILLHOLE LOCATIONS.

7.3 MLN1122

Sixteen diamond and 6 sonic drillholes were drilled within MLN1122 (Figure 5) and is summarised below in Table 3.

Sixteen drillholes were drilled for groundwater purposes into the hangingwall sediments of the HYC sequence and north of the Barney Channel, totalling 1,717m. Vibrating Wire Piezometers were installed downhole to identify zones or features of relatively high hydraulic conductivity representing potential conduits for groundwater flow recharge to the old underground, and to better define the hydraulic properties of the northern section of the Western Fault block. The packer tests indicated a low conductive structural feature, especially across the Western Fault and Cooley textural contact. These drillholes were fully grouted, geology logged, however, were not sampled for assaying.

Six drillholes totalling 814m were drilled directly south of the pit as part of resource development to improve confidence with the following:

- Grade;
- Geology model (ore geometry and spatial thickness);
- Geometallurgy;
- Groundwater interaction; and
- Geotechnical assessment of pit wall stability.

These drillholes were geology logged and are currently being sampled for assaying. Its expected assay results will be available by the end of Q1 2018.

TABLE 3. SUMMARY OF MLN1122 DRILLING.

Hole Purpose	Hole Type	Hole Number Range	No. of Holes	Total Metres
Groundwater	Diamond	GW17 001-002, 011, 025, 027-030, 033, 034	10	1,655
Groundwater	Sonic	GW17 004-009	6	62
Resource	Diamond	GE17 001, 003, 005-006, 010, 015	6	814
Total			**22**	**2,531**

FIGURE 5. MLN1122 DRILLHOLE LOCATIONS.

7.4 MLN1123

One diamond and 3 reverse circulation drillholes were drilled within MLN1123 (Figure 6) and is summarised below in Table 4.

All four drillholes were drilled for groundwater purposes totalling 82m. Vibrating Wire Piezometers were installed downhole to better define regional groundwater flow adjacent to the Western Production Run-off Dam. These drillholes were fully grouted.

All drillholes were geology logged, however, were not sampled for assaying.

TABLE 4. SUMMARY OF MLN1123 DRILLING.

Hole Purpose	Hole Type	Hole Number Range	No. of Holes	Total Metres
Groundwater	Diamond	GW17 016	1	22
Groundwater	RC	GW17 018-020	3	60
Total			**4**	**82**

FIGURE 6. MLN1123 DRILLHOLE LOCATIONS.

7.5 MLN1124

Four diamond and 4 reverse circulation drillholes were drilled within MLN1124 (Figure 7) and is summarised below in Table 5.

Two diamond and 4 reverse circulation drillholes were shallow piezometer holes totalling 120m, which looked to better define regional groundwater flow adjacent to the Western Production Run-off Dam. Vibrating Wire Piezometers were installed downhole and the holes were fully grouted.

Two diamond drillholes totalling 255m were drilled for groundwater purposes into the Mt Stubbs South Fault block, which is located north-east of the HYC sequence. Vibrating Wire Piezometers were installed downhole to identify zones or features of relatively high hydraulic conductivity representing potential conduits for groundwater flow recharge to the old underground. The packer tests indicated a low conductive structural feature, especially across the Western Fault and Cooley textural contact. These drillholes were fully grouted.

All drillholes were geology logged, however, were not sampled for assaying.

TABLE 5. SUMMARY OF MLN1124 DRILLING.

Hole Purpose	Hole Type	Hole Number Range	No. of Holes	Total Metres
Groundwater	Diamond	GW17 015, 017, 031-032	4	295
Groundwater	RC	GW17 021-024	4	80
Total			**8**	**375**

FIGURE 7. MLN1124 DRILLHOLE LOCATIONS.

7.6 MLN1125

No drilling activities were conducted on MLN1125 and no drilling activities are scheduled for the forthcoming year. The area will continued to be used for mining operations.

8.0 Conclusions and Recommendations

In conjunction with normal mining operations, a drilling campaign was completed across MLN1121, MLN1122, MLN1123 and MLN1124 which was designed to:

- Identify zones or features of relatively high hydraulic conductivity representing potential conduits for groundwater flow recharge to the old underground;
- Better define the hydraulic properties of the northern section of the Western Fault block;
- Identify and determine the impact of the Whelans Fault on groundwater recharge and pit wall stability in the Footwall Quarry;
- Better define regional groundwater flow adjacent to the Western Production Run-off Dam; and
- Resource development of the south-west limits of the HYC deposit.

The drilling campaign consisted of 28 diamond drillholes totalling 4,154m, 7 reverse circulation drillholes totalling 140m, and 6 sonic drillholes totalling 62m. The findings from the 2017 drilling programme highlight the following:

- The Western Fault block to be a low conductive structural feature, especially across the Western Fault and Cooley textural contact; and
- The Mt Stubbs and Bald Hill fault intercept to be highly conductive and karstic.

The resource development drillholes are currently being sampled for assaying and its expected assay results will be available by the end of Q1 2018.

Further drilling and/or exploration activities within the mining lease may be completed in the forthcoming reporting period, pending budget approvals.

References

Grenfell, K, (2012). MLN1121 Annual Technical Report, Statutory Government Report, McArthur River Mining, 17p.

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