

MOUNT TODD GOLD MINE

Monthly Discharge Monitoring Report
January 2021
WDL 178-08

Prepared for:

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Vista Gold Australia Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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1 Introduction

1.1 Background

This Monthly Discharge Report details the results of water quality monitoring undertaken during discharge of treated water during January 2021 from Batman Pit to the Edith River at the Mount Todd Gold Mine. The Monthly Discharge Report is a requirement of Waste Discharge Licence (WDL) 178-08 issued by the Northern Territory Environment Protection Authority (NT EPA) under section 74 of the NT *Water Act*.

1.2 Site

The Mount Todd Gold Mine is located within the Daly River Catchment area in the Northern Territory. The Edith River is located directly to the south of the mine site and intersects Mineral Lease Number (MLN) 1127. The Edith River is the largest of various tributary rivers and creeks to the Fergusson River, which ultimately flows into the Daly River.

The Edith River has a high ecological and recreational value, with the mine site located approximately 9 km downstream of Edith Falls situated within Nitmiluk National Park. The Edith River is fed by several ephemeral creeks, five of which run through the Mt Todd mine site and currently receive runoff from site related catchments within the mineral leases. The regional drainage pathway and catchment plan of the Edith River sub-catchment is described in detail in the Mount Todd Gold Mine Water Management Plan (WMP 2020).

Vista Gold Australia Pty Ltd (Vista Gold) have operated the care and maintenance phase of the Mount Todd Gold Mine since 2006; the site was previously mined for gold during the 1990s before its closure in 2000. Vista Gold's water management strategy for the Mount Todd Gold Mine respects that water management is an integral part of managing the mine site and its interaction with the surrounding environment. In accordance with their objectives Vista Gold have adopted an integrated multiple lines of evidence approach to manage the environmental impacts from active and passive discharges entering the Edith River, including water quality, macroinvertebrate, ecotoxicology and sediment monitoring programs.

Vista Gold's water management strategy includes onsite storage, treatment and licenced water discharges, to reduce the risk of uncontrolled discharges offsite. Water is treated in-situ within Batman Pit prior to active discharge. Discharge of treated water only occurs during the wet season, to manage additional inputs from rainfall, ensure integrity of site water storages, and minimise the risk of uncontrolled discharge.

1.3 WDL Requirements

WDL 178-08 licences Vista Gold to discharge treated water from Batman Pit into the Edith River, subject to conditions. The licence was granted on 30 November 2020, and is valid until 30 November 2022. The licence allows for active discharge of treated water from the Batman Pit (RP3), at the authorised discharge point, from where it flows to the Edith River via Stow Creek. The compliance monitoring point is SW4, which is downstream of the mine and receives flow from the upstream Edith River catchment.

This report has been prepared to fulfil Condition 50 of WDL 178-08, being:

"50 - The licensee must submit to the Administering Agency a Monthly Discharge Report for any month when a discharge occurs via the authorised discharge point by emailing waste@nt.gov.au. The Monthly Discharge Report is due by the last business day of the following month and must include:

- 50.1. *tabulated water quality data for RP3 and SW4 for each day of the month where a discharge occurred. Data must be provided electronically in Microsoft Excel format;*
- 50.2. *tabulated daily environmental field data, relating to the particular month, for SW4 and RP3 (Batman Pit) as required in Appendix 1. Data must be provided electronically in Microsoft Excel format;*
- 50.3. *tabulated water quality data for all monitoring locations associated with this licence and specified in Appendix 1. Data must be provided electronically in Microsoft Excel format;*
- 50.4. *surface water quality management actions taken in the event of trigger value exceedance measured at SW4;*
- 50.5. *assessment of surface water monitoring results for SW4 against the SSTVs specified in Appendix 1;*
- 50.6. *where SSTVs were exceeded an assessment of the environmental impact, resulting from the discharge activity and exceedances, on the receiving environment at SW4; and*
- 50.7. *details of current water inventory on site."*

2 Water Quality

2.1 Discharge dates

Vista Gold actively discharged treated water from Batman Pit in January 2021. Table 1 shows the dates and volumes of discharge of treated water from Batman Pit.

Table 1 Mt Todd January 2021 Discharges

| Dates of discharge | Number of days discharging | Average discharge rate per day (L/s) | ML Discharge (ML) |
|--------------------|----------------------------|--------------------------------------|-------------------|
| 1 -3 January 2021 | 3 | 253 | 65.664 |
| 25 – 31 January | 7 | 524 | 317 |
| Total | | Total | 382.664 |

Water quality monitoring is undertaken in accordance with Appendix 1 of Waste Discharge Licence (WDL 178-08). Monitoring locations, frequency and parameters are outlined in the WDL. This report, consistent with Condition 50 of the WDL, focusses on water quality data from RP3 (Batman Pit), SW2 (upstream in Edith River) and SW4 (compliance point in Edith River). The results of monitoring which occurred at these three points over the reporting period is summarised in Table 2 and Table 3 to meet the requirement of the following condition:

Condition 50.5. assessment of surface water monitoring results for SW4 against the SSTVs specified in Appendix 1;

Table 2 Water quality field readings summary for January 2021 Discharges

| Analyte | SW4 SSTV | 1 January 2021 | | | 2 January 2021 | | | 3 January 2021 | | |
|---------------------------------|----------|-----------------|-----|-------|-----------------|-----|-------|-----------------|-----|-------|
| | | SW2 | SW4 | RP3 | SW2 | SW4 | RP3 | SW2 | SW4 | RP3 |
| Water discharge characteristics | | | | | | | | | | |
| EC (µS/cm) | 250 | 19 | 57 | 3,077 | 22 | 125 | 3,032 | 24 | 169 | 2,994 |
| pH | 6.0-8.0 | 6.1 | 6.2 | 4.2 | 6.1 | 6.9 | 4.6 | 6.9 | 6.9 | 4.4 |
| Temperature (°C) | - | 30 | 30 | 29 | 30 | 30 | 29 | 31 | 31 | 29 |
| DO (mg/L) | - | 7.0 | 7.1 | 7.4 | 6.8 | 7.0 | 7.5 | 6.6 | 7.0 | 7.6 |
| DO (%saturated) | 85-120 | 92 | 95 | 98 | 90 | 94 | 99 | 89 | 93 | 99 |
| Analyte | SW4 SSTV | 25 January 2021 | | | 26 January 2021 | | | 27 January 2021 | | |
| | | SW2 | SW4 | RP3 | SW2 | SW4 | RP3 | SW2 | SW4 | RP3 |
| Water discharge characteristics | | | | | | | | | | |
| EC (µS/cm) | 250 | 42 | 23 | 3,074 | 17 | 104 | 3,067 | 18 | 139 | 3,056 |
| pH | 6.0-8.0 | 6.3 | 6.3 | 6.9 | 6.3 | 6.3 | 7.0 | 6.4 | 6.3 | 7.0 |
| Temperature (°C) | - | 30 | 30 | 27 | 29 | 30 | 26 | 29 | 29 | 27 |
| DO (mg/L) | - | 6.8 | 6.8 | 7.8 | 7.3 | 7.2 | 7.8 | 7.2 | 7.2 | 7.9 |

| | | | | | | | | | | |
|---------------------------------|-------------|-----------------|-----|-------|-----------------|-----|-------|-----------------|-----|-------|
| DO (%saturated) | 85-120 | 90 | 89 | 99 | 95 | 96 | 97 | 92 | 93 | 99 |
| Analyte | SW4 SSTV | 28 January 2021 | | | 29 January 2021 | | | 30 January 2021 | | |
| | | SW2 | SW4 | RP3 | SW2 | SW4 | RP3 | SW2 | SW4 | RP3 |
| Water discharge characteristics | | | | | | | | | | |
| EC (µS/cm) | 250 | 21 | 219 | 3,091 | 19 | 123 | 3,051 | 19 | 205 | 3,049 |
| pH | 6.0-8.0 | 6.4 | 6.4 | 7.0 | 6.3 | 6.4 | 7.0 | 6.3 | 6.4 | 7.0 |
| Temperature (°C) | - | 30 | 30 | 26 | 29 | 29 | 26 | 29 | 29 | 25 |
| DO (mg/L) | - | 7.2 | 7.1 | 7.8 | 7.2 | 7.3 | 7.8 | 7.3 | 7.3 | 8.2 |
| DO (%saturated) | 85-120 | 95 | 95 | 97 | 94 | 96 | 97 | 95 | 96 | 101 |
| Analyte | SW4 SSTV | 31 January 2021 | | | | | | | | |
| | | SW2 | SW4 | RP3 | | | | | | |
| Water discharge characteristics | | | | | | | | | | |
| EC (µS/cm) | 250 | 20 | 243 | 3,099 | | | | | | |
| pH | 6.0-8.0 | 6.3 | 6.4 | 6.8 | | | | | | |
| Temperature (°C) | - | 33 | 30 | 26 | | | | | | |
| DO (mg/L) | - | 7.0 | 7.2 | 7.7 | | | | | | |
| DO (%saturated) | 85-120 | 98 | 95 | 95 | | | | | | |

Note: Shaded cells denote an exceedance of the SSTV at SW4.

Table 3 Water quality summary during discharge January 2021

| Analyte | SW4 SSTV | 3 January 2021 | | | 25 January 2021 | | | 27 January 2021 | | |
|------------------|-------------|----------------|-----|-------|-----------------|-----|-----|-----------------|-----|-----|
| | | SW2 | SW4 | RP3 | SW2 | SW4 | RP3 | SW2 | SW4 | RP3 |
| Dissolved metals | | | | | | | | | | |
| Aluminium (µg/L) | 150 | 60 | 20 | 4,300 | 100 | 80 | 30 | 130 | 20 | 30 |
| Cadmium (µg/L) | 0.8 | 0.1 | 0.4 | 20 | 0.1 | 0.1 | 7.8 | 0.1 | 0.2 | 7.3 |
| Cobalt (µg/L) | 13 | 1.0 | 3.0 | 120 | 1.0 | 1.0 | 25 | 1.0 | 1.0 | 25 |
| Copper (µg/L) | 2.5 | 1.0 | 6.0 | 930 | 1.0 | 1.0 | 5.0 | 1.0 | 1.0 | 5.0 |
| Chromium (µg/L) | - | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Iron (µg/L) | 350 | 340 | 150 | 160 | 300 | 240 | 10 | 290 | 100 | 10 |
| Lead (µg/L) | 9.4 | 1.0 | 1.0 | 12 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Manganese (µg/L) | 3,600 | 14 | 120 | 1,500 | 5.0 | 10 | 310 | 5.0 | 28 | 290 |
| Nickel (µg/L) | 17 | 1.0 | 4.0 | 170 | 1.0 | 1.0 | 73 | 1.0 | 2.0 | 71 |
| Zinc (µg/L) | 31 | 1.0 | 71 | 3,500 | 3.0 | 13 | 360 | 1.0 | 12 | 340 |
| Major ions | | | | | | | | | | |

| | | | | | | | | | | |
|-----------------------|-------------|-----------------|-------|-------|-----|-------|-------|-----|-------|-------|
| Bicarbonate (1.0mg/L) | 319 | 10 | 10 | 5.0 | 9.0 | 9.0 | 21 | 9.0 | 9.0 | 23 |
| Chloride (mg/L) | 64 | 2 | 2.0 | 7.0 | 1.0 | 1.0 | 7.0 | 1.0 | 1.0 | 7.0 |
| Magnesium (mg/L) | 21 | 0.8 | 7.0 | 210 | 0.7 | 1.1 | 240 | 0.6 | 5.9 | 230 |
| Sulphate (mg/L) | 129 | 1.0 | 53 | 1,900 | 1.0 | 3.0 | 2,000 | 1.0 | 45 | 2,000 |
| Total Cyanide (mg/L) | 0.007 | - | 0.004 | - | - | 0.004 | - | - | 0.004 | - |
| Analyte | SW4 SSTV | 31 January 2021 | | | | | | | | |
| | | SW2 | SW4 | RP3 | | | | | | |
| Dissolved metals1.0 | | | | | | | | | | |
| Aluminium (µg/L) | 150 | 50 | 10 | 20 | | | | | | |
| Cadmium (µg/L) | 0.8 | 0.1 | 0.3 | 7.4 | | | | | | |
| Cobalt (µg/L) | 13 | 1.0 | 2.0 | 26 | | | | | | |
| Copper (µg/L) | 2.5 | 1.0 | 1.0 | 4.0 | | | | | | |
| Chromium (µg/L) | - | 1.0 | 1.0 | 1.0 | | | | | | |
| Iron (µg/L) | 350 | 310 | 110 | 10 | | | | | | |
| Lead (µg/L) | 9.4 | 1.0 | 1.0 | 1.0 | | | | | | |
| Manganese (µg/L) | 3,600 | 8.0 | 50 | 310 | | | | | | |
| Nickel (µg/L) | 17 | 1.0 | 4.0 | 71 | | | | | | |
| Zinc (µg/L) | 31 | 1.0 | 24 | 360 | | | | | | |
| Major ions | | | | | | | | | | |
| Bicarbonate (mg/L) | 319 | 9.0 | 9.0 | 22 | | | | | | |
| Chloride (mg/L) | 64 | 2.0 | 2.0 | 7.0 | | | | | | |
| Magnesium (mg/L) | 21 | 0.7 | 12 | 22 | | | | | | |
| Sulphate (mg/L) | 129 | 1.0 | 94 | 2,000 | | | | | | |
| Total Cyanide (µg/L) | 0.007 | - | 0.004 | - | | | | | | |

Note: Shaded cells denote an exceedance of the SSTV at SW4.

2.2 Water quality data

An excel spreadsheet containing water quality data from the Mt Todd site taken during discharge for January 2021 has been supplied to the regulator with this report to meet the following conditions of WDL 178-08:

Condition 50.1. tabulated water quality data for RP3 and SW4 for each day of the month where a discharge occurred. Data must be provided electronically in Microsoft Excel format;

Condition 50.2. tabulated daily environmental field data, relating to the particular month, for SW4 and RP3 (Batman Pit) as required in Appendix 1. Data must be provided electronically in Microsoft Excel format;

Condition 50.3. tabulated water quality data for all monitoring locations associated with this licence and specified in Appendix 1. Data must be provided electronically in Microsoft Excel format;

3 Discussion of SSTV exceedances

3.1 Metal exceedances

As shown in Table 3, copper and zinc exceeded the SSTV at SW4 on 3 January 2021. Dissolved copper was measured at 6 µg/L and dissolved zinc was measured at 71 µg/L. The copper concentration triggered a non-compliance of WDL 178-08 under Condition 47.2 of WDL 178-08 as it was greater than two times the SSTV of 2.5 µg/L. The zinc exceedance did not trigger a non-compliance of the WDL.

Vista Gold provided the NT EPA an Incident investigation report on the copper exceedance and subsequent zinc exceedance recorded in January and shown in Table 3. The incident report incorporating the December 2020 and January 2021 exceedances was attached to the Mt Todd December 2020 Monthly Report provided to the Administrating Agency on 28 January 2021.

To meet the following condition of WDL 178-08:

Condition 50.6. where SSTVs were exceeded an assessment of the environmental impact, resulting from the discharge activity and exceedances, on the receiving environment at SW4;

Environmental impacts resulting from the SSTV exceedances are considered unlikely as evidenced by historical macroinvertebrate and ecotoxicology results sampled after similar metal exceedances. Further, this conclusion is supported by the 2020 macroinvertebrate, sediment and ecotoxicology data, which indicates that discharge of water from Batman Pit at current dilution ratios is not having a measurable impact on aquatic ecosystem health downstream of the mine site. The copper and zinc concentrations have not exceeded the SW4 SSTVs subsequent to the 3 January.

3.2 Management actions – 31 January 2021

This section describes the management actions taken to meet the following WDL 178-08 condition:

Condition 50.4. surface water quality management actions taken in the event of trigger value exceedance measured at SW4;

As discussed in the Mt Todd December 2020 Monthly Report, management actions were implemented by Vista Gold immediately upon receipt of the analytical results from the laboratory on 31 December 2020. The following actions were undertaken to address the December 2020 and January 2021 exceedances of the SW4 SSTVs:

1. Vista Gold contacted the laboratory to confirm the results.
2. The dilution ratio was immediately changed from 1:25 to 1:168.
3. The water sampling frequency was increased to two - three times a week to improve monitoring resolution.

4 Mt Todd Water Inventory

Table 4 is provided to meet the WDL 1787-08 condition 50.7 below and gives an approximate estimate of the water inventory on site:

Condition 50.7. details of current water inventory on site.

Table 4 Water inventory January 2021

| Date | RP1 (GL) | RP3 (Batman Pit) (GL) | RP7 (GL) | Total (GL) |
|------------------|----------|--------------------------|----------|------------|
| 31 December 2020 | 0.881 | 1.685 | 2.690 | 5.256 |
| 31 January 2021 | 0.881 | 1.429 | 2.950 | 5.250 |
| Difference | 0.0 | -0.256 | 0.260 | 0.004 |

Note: the total for the Batman Pit reduction is estimated at 0.260GL and the measured discharge shown in Table 1 is 0.383 GL. This variation may be due to water from other sources entering the pit - including rainfall and ingress.

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