



Vista Gold Australia P/L
Mt Todd Mine Site
Waste Discharge Licence 178-2

**Monthly Discharge Report
March 2013**



Executive Summary

This report presents results and information pursuant to Condition 30 of WDL 178-2 that requires Vista Gold submit a periodic report to the NT EPA for each calendar month during which a discharge has occurred.

Three controlled discharges compliant with the conditions of WDL 178-2 occurred over two days in March 2013 (third discharge ceasing 01 April 2013) with a total of 19.968 ML of RP3 treated water discharged at a dilution ratio of 1:1123 based on ecotoxicological testing performed on RP3 water as it was on the 23rd of January 2013.

Findings were as follows:

- No analytes exceeded the Australian Drinking Water Guidelines 6, 2011, Table 10.5.
- Surface water monitoring results indicate that the copper and zinc Monitoring Values of 3.0 and 33.8 µg/L were not exceeded at SW4 on any day of discharge.
- All metals with the exception of aluminium and iron were below the ANZECC 80% species protection level as measured at SW4. However the higher aluminium and iron levels observed correspond to naturally occurring high levels of these elements in upstream background waters.

1. Introduction

Condition 30 of WDL 178-2 states that:

“The Licensee must submit a periodic report to the NT EPA for each calendar month during which a discharge has occurred no later than 10 Business days after the last day of the relevant calendar month.

The periodic report must

30.1. include, for each day of the month where a discharge occurred, tabulated data including

- the factors used to assess the Dilution Factor at SW4;
- surface water monitoring results required under condition 21;
- a comparison of surface water monitoring results for monitoring point SW4 with Monitoring Values determined under condition 14;
- a comparison of surface water monitoring results for monitoring points SW2 and SW10 with applicable health guideline values from Australian Drinking Water Guidelines 6, 2011, Table 10.5; and

30.2. be made available on the Licensee's Australian website within 10 Business days of providing the report to the NT EPA.

This report presents the Edith River hydrological data, RP3 discharge data as well analytical surface water monitoring results for discharges from Mt Todd conducted in accordance with Vista Gold's Discharge Plan and pursuant to the conditions of WDL 178-2 during the month of March 2013.

2. Discharges

Three discharges over two days of RP3 treated water to the Edith River via Batman and Stow Creeks occurred over the 30th and 31st of March 2013 (third discharge ceasing 01 April 2013) as shown in the Table 1 below resulting in a total of 19.968 ML of RP3 treated water being discharged off site.

Table 1 - March 2013 Discharges

Discharge	Date	Start Time (hrs)	Stop Time (hrs)	Duration (hrs & min)	Dilution		Volume Discharged (ML)	Additional Comments
					Report Reference ¹	Rate		
1	30:03:2013	0023	1314	13hrs 14 min	RP3 Feb-13	1:1123	5.306	Nil
2	30:03:2013	1900	0438	11 hrs 38 min	RP3 Feb-13	1:1123	4.908	Nil
	31:03:2013							
3	31:03:2013	1722	0838	13 hrs 16 min	RP3 Feb-13	1:1123	9.754	Nil
	01:04:2013							

¹ These reports can be downloaded from the Mt Todd website at <http://mttodd.com.au/content/waste-discharge-licence>

Figure 1 below graphically shows the Edith River volumetric flow as well as the corresponding discharge volumes of RP3 treated water together with cumulative water released over the period of discharge. The observed spikes in flow rate are attributed to “Priming Logic” of the Variable Speed Drives (VSDs) that occurs each time a pump is started in order to prime the pumps. Changes have since been to the Priming Logic to decrease the duration and hence magnitude of these priming spikes.

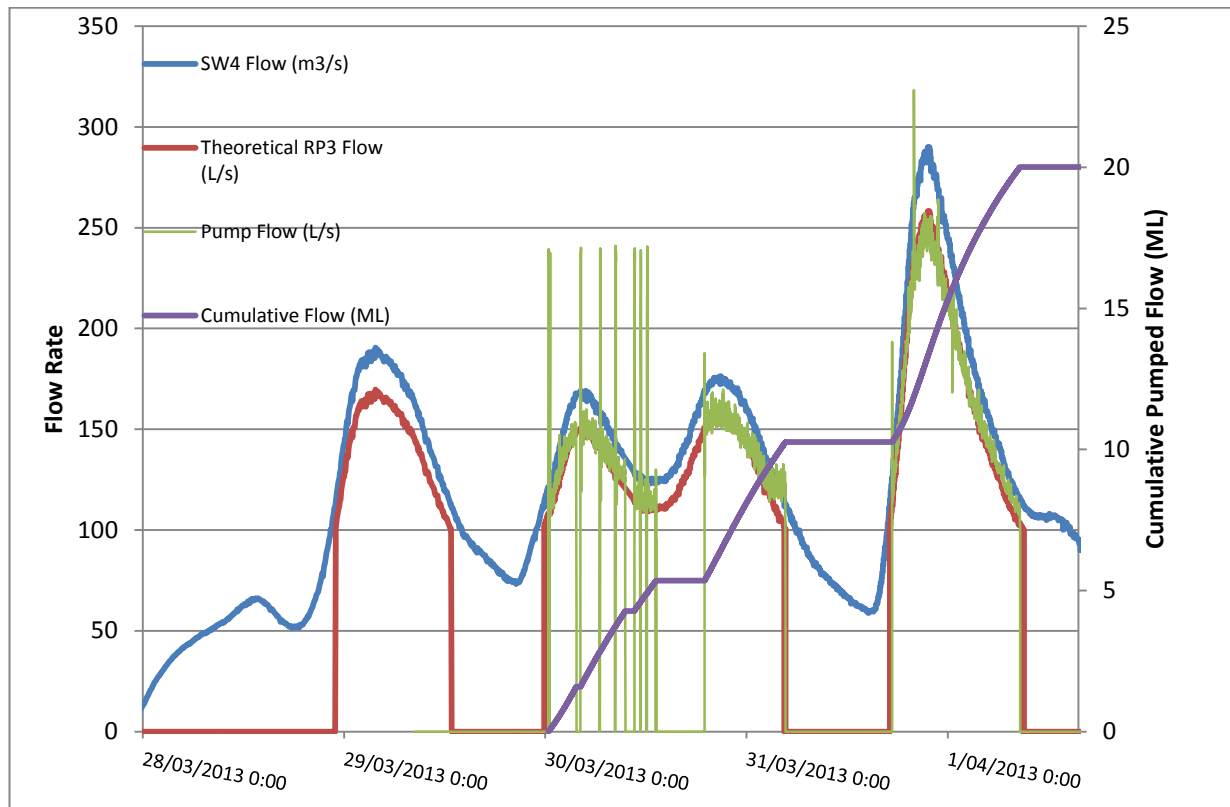


Figure 1 - RP3 treated water discharges during March 2013

Table 2 below shows the average hourly Edith River height in metres, volumetric flow in cubic metres per second and RP3 discharge pumping in litres per second at the specified dilution ratio of 1:1123.

Table 2 - Edith River height (in m), volumetric flow (in m³/s) and RP3 discharge rate in L/s

	RP1	RP3	RP7	SW4	
Latitude	-14.162	-14.1388	-14.127	-14.1703	
Longitude	132.1085	132.1015	132.1216	132.098	
Easting ¹	187843	187055	18921	186745	
Northing ¹	8432432	8434993	8436326	8431490	
Time (HH:MM)	Mean Hourly Discharge Rate	Mean Hourly Discharge Rate	Mean Hourly Discharge Rate	Mean Hourly Height	Mean Hourly Flow
	L/s	L/s	L/s	m	m ³ /s

30/03/2013

1:00	0	71.351	0	4.233	122.735
2:00	0	126.296	0	4.575	137.682
3:00	0	139.671	0	4.947	154.804
4:00	0	103.809	0	5.177	165.362
5:00	0	123.948	0	5.222	167.442
6:00	0	148.779	0	5.161	164.612
7:00	0	138.7	0	5.015	157.928
8:00	0	137.598	0	4.853	150.458
9:00	0	127.56	0	4.656	141.417
10:00	0	69.065	0	4.509	134.666
11:00	0	48.195	0	4.379	128.689
12:00	0	115.868	0	4.305	125.56
13:00	0	111.074	0	4.294	125.115
14:00	0	19.737	0	4.304	125.478
15:00	0	0	0	4.328	126.458
16:00	0	0	0	4.442	131.567
17:00	0	0	0	4.639	140.5
18:00	0	0	0	4.885	151.83
19:00	0	0.263	0	5.13	163.18
20:00	0	153.193	0	5.313	171.617
21:00	0	156.345	0	5.384	174.876
22:00	0	155.967	0	5.356	173.601
23:00	0	152.825	0	5.274	169.791
0:00	0	147.534	0	5.135	163.459

31/03/2013

1:00	0	141.21	0	4.903	153.992
2:00	0	133.188	0	4.666	143.765
3:00	0	124.395	0	4.429	133.538
4:00	0	121.424	0	4.192	123.312
5:00	0	77.486	0	3.956	113.085

	RP1	RP3	RP7	SW4	
Latitude	-14.162	-14.1388	-14.127	-14.1703	
Longitude	132.1085	132.1015	132.1216	132.098	
Easting ¹	187843	187055	18921	186745	
Northing ¹	8432432	8434993	8436326	8431490	
Time (HH:MM)	Mean Hourly Discharge Rate	Mean Hourly Discharge Rate	Mean Hourly Discharge Rate	Mean Hourly Height	Mean Hourly Flow
	L/s	L/s	L/s	m	m ³ /s
6:00	0	0	0	3.721	102.942
7:00	0	0	0	3.525	94.861
8:00	0	0	0	3.319	86.779
9:00	0	0	0	3.16	81.095
10:00	0	0	0	3.033	76.589
11:00	0	0	0	2.913	72.365
12:00	0	0	0	2.798	68.365
13:00	0	0	0	2.693	64.701
14:00	0	0	0	2.614	61.933
15:00	0	0	0	2.556	59.894
16:00	0	0	0	2.692	64.567
17:00	0	0	0	3.429	91.322
18:00	0	83.4	0	4.497	134.568
19:00	0	162.946	0	5.583	185.562
20:00	0	209.095	0	6.642	241.575
21:00	0	234.831	0	7.244	273.769
22:00	0	246.355	0	7.457	286.5
23:00	0	237.23	0	7.248	274.162
0:00	0	221.208	0	6.881	254.38

1/04/2013

1:00	0	203.46	0	6.487	233.39
2:00	0	186.794	0	6.075	211.234
3:00	0	170.857	0	5.698	190.997
4:00	0	156.633	0	5.361	173.859
5:00	0	146.418	0	5.068	160.454
6:00	0	135.955	0	4.788	147.482
7:00	0	126.169	0	4.533	135.748
8:00	0	117.055	0	4.27	124.214
9:00	0	71.015	0	4.06	115.903
10:00	0	0	0	3.904	109.836
11:00	0	0	0	3.833	106.985
12:00	0	0	0	3.822	106.541
13:00	0	0	0	3.829	106.849
14:00	0	0	0	3.763	104.416
15:00	0	0	0	3.66	100.197

	RP1	RP3	RP7	SW4	
Latitude	-14.162	-14.1388	-14.127	-14.1703	
Longitude	132.1085	132.1015	132.1216	132.098	
Easting ¹	187843	187055	18921	186745	
Northing ¹	8432432	8434993	8436326	8431490	
Time (HH:MM)	Mean Hourly Discharge Rate	Mean Hourly Discharge Rate	Mean Hourly Discharge Rate	Mean Hourly Height	Mean Hourly Flow
	L/s	L/s	L/s	m	m ³ /s
16:00	0	0	0	3.524	94.864
17:00	0	0	0	3.359	88.37
18:00	0	0	0	3.179	81.683
19:00	0	0	0	3.016	75.972
20:00	0	0	0	2.883	71.344
21:00	0	0	0	2.752	66.768
22:00	0	0	0	2.65	63.165
23:00	0	0	0	2.559	60.019
0:00	0	0	0	2.472	57.084

3. Surface Water Results

Full tabulated laboratory analytical results appear in Table 3 below.

The salient information shown by the results is as follows:

1. No analytes exceeded the Australian Drinking Water Guidelines 6, 2011, Table 10.5.
2. Surface water monitoring results indicate that the copper and zinc Monitoring Values of 3.0 and 33.8 µg/L were not exceeded at SW4 on any day of discharge.
3. Dissolved Oxygen (DO) readings suspected to be spurious due to equipment malfunction.
4. All results for total chromium were below laboratory PQL hence no speciated chromium analysis was required.
5. All results for total cyanide were below laboratory PQL hence no weak acid dissociable cyanide analysis (WAD CN) was required.
6. The ANZECC 80% species protection value for filtered (0.45 µg/L) aluminium of 150 µg/L was exceeded at SW4 over both days of discharge at SW4 returning 520 and 580 µg/L respectively. However water discharged from RP3 at Mt Todd is not the source of this excess aluminium as the aluminium content of discharged RP3 water was less than the laboratory PQL of 10 µg/L. It is also known that the catchment to the south of the Mt Todd Mineral Leases drained by Phillips Creek, has a local geological unit at surface high in aluminium feldspars that are a significant source of aluminium to the Edith River.
7. The ANZECC 80% species protection value for filtered (0.45 µg/L) iron of 300 µg/L was exceeded at SW4 over both days of discharge at SW4 returning 420 and 430 µg/L respectively. However water discharged from RP3 at Mt Todd is not the source of this excess iron as results for RP3 were less than the laboratory PQL of 10 µg/L. It is suspected that this excessive iron arises from both on site and upstream offsite catchments.
8. A comparison of discharge data against routine monthly sampling at SW4 and SW10 shows that during high flow events, a source of copper (but not zinc) downstream of the Mt Todd site but upstream of SW10 is entering the system. Copper results recorded at SW10 over the two days of discharge were 120 and 87 µg/L respectively. Given that SW4 returned a copper level of 3 µg/L and the absence any appreciably high levels of zinc observed at SW10, it is highly unlikely that Mt Todd is the source of the copper observed

Table 3 -Daily Discharge Monitoring Results for 30 & 31 March 2013

30-Mar-13			RP1	RP3	RP7	SW4	80% Species Protection Level at SW4	Monitoring Value at SW4	SW2	SW10	ADWG for Health
Latitude			-14.162	-14.1388	-14.127	14.1703			14.1718	-14.183	
Longitude			132.1085	132.1015	132.1216	132.098			132.12	132.03	
Easting ¹			187843	187055	18921	186745			189088	179781	
Northing ¹			8432432	8434993	8436326	8431490			8431347	8430015	
Metals and metalloids (0.45µm filtered)											
Aluminium	Al	µg/L	N/A	<10	N/A	640	150	N/A	260	520	#
Cadmium	Cd	µg/L	N/A	<0.1	N/A	<0.1	0.80	N/A	<0.1	<0.1	2
Cobalt	Co	µg/L	N/A	<1	N/A	<1	90	N/A	<1	<1	#
Copper	Cu	µg/L	N/A	3	N/A	3	2.5	3	1	120	2000
Chromium Total	Cr	µg/L	N/A	<1	N/A	<1	40	N/A	<1	<1	50
Chromium III	Cr III	µg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#
Chromium VI	Cr VI	µg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#
Iron	Fe	µg/L	N/A	<10	N/A	420	300	N/A	190	230	#
Lead	Pb	µg/L	N/A	<1	N/A	<1	9.4	N/A	<1	<1	10
Magnesium	Mg	mg/L	N/A	100	N/A	0.8	2.5	N/A	<0.5	<0.5	#
Manganese	Mn	µg/L	N/A	<5	N/A	<5	3600	N/A	<5	14	500
Mercury	Hg	µg/L	N/A	<0.05	N/A	<0.05	5.40	N/A	<0.05	<0.05	1
Nickel	Ni	µg/L	N/A	18	N/A	<1	17	N/A	<1	<1	20
Zinc	Zn	µg/L	N/A	5	N/A	7	31	33.8	4	9	#
Field											
Dissolved Oxygen	DO	% saturation	N/A	65	N/A	60.5	85-120	N/A	62.7	63.2	#
Temperature	Temp.	°C	N/A	29.9	N/A	26.6	N/A	N/A	26.5	26.4	#
Electrical Conductivity	EC	µS/cm	N/A	2857	N/A	27.4	20-250	N/A	16.7	19.8	#
pH	pH	pH units	N/A	7.63	N/A	7.53	6-8	N/A	6.9	6.93	#
Environmental Indicators											
Sulphate	SO ₄	mg/L	N/A	1500	N/A	2	129	N/A	<1	1	500
Bicarbonate	HCO ₃	mg/L	N/A	35	N/A	12	N/A	N/A	6	14	#
Unfiltered Alkalinity	CaCO ₃	mg/L	N/A	35	N/A	12	N/A	N/A	6	14	#
Hardness	Hardness CaCO ₃	mg/L	N/A	780	N/A	5	N/A	N/A	<3	<3	#
Total Dissolved Solids	TDS	mg/L	N/A	2800	N/A	53	N/A	N/A	45	49	#
Total Suspended Solids	TSS	mg/L	N/A	<5	N/A	7	N/A	N/A	24	22	#
Total Solids	TS	mg/L	N/A	2800	N/A	60	N/A	N/A	69	71	#
Sodium	Na	mg/L	N/A	37	N/A	1.5	N/A	N/A	0.6	1.4	#
Chloride	Cl	mg/L	N/A	7	N/A	<1	N/A	N/A	<1	<1	#
Calcium	Ca	mg/L	N/A	470	N/A	0.7	N/A	N/A	<0.5	1.1	#
Total Cyanide	Cn	mg/L	N/A	<0.004	N/A	<0.004	N/A	N/A	<0.004	<0.004	80
WAD Cyanide	WAD Cn	mg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#

ANZECC has insufficient data to set a guideline value based on health guidelines

31-Mar-13

			RP1	RP3	RP7	SW4	80% Species Protection Level at SW4	Monitoring Value at SW4	SW2	SW10	ADWG for Health
Latitude			-14.162	-14.1388	-14.127	14.1703			14.1718	-14.183	
Longitude			132.1085	132.1015	132.1216	132.098			132.12	132.03	
Easting ¹			187843	187055	18921	186745			189088	179781	
Northing ¹			8432432	8434993	8436326	or 8431490			8431347	8430015	
Metals and metalloids (0.45µm filtered)											
Aluminium	Al	µg/L	N/A	ND	N/A	580	150	N/A	310	520	#
Cadmium	Cd	µg/L	N/A	ND	N/A	<0.1	0.80	N/A	<0.1	<0.1	2
Cobalt	Co	µg/L	N/A	ND	N/A	<1	90	N/A	<1	<1	#
Copper	Cu	µg/L	N/A	ND	N/A	4	2.5	3	1	87	2000
Chromium Total	Cr	µg/L	N/A	ND	N/A	<1	40		<1	<1	50
Chromium III	Cr III	µg/L	N/A	ND	N/A	N/A	N/A	N/A	N/A	N/A	#
Chromium VI	Cr VI	µg/L	N/A	ND	N/A	N/A	N/A	N/A	N/A	N/A	#
Iron	Fe	µg/L	N/A	ND	N/A	430	300	N/A	210	260	#
Lead	Pb	µg/L	N/A	ND	N/A	<1	9.4	N/A	<1	<1	10
Magnesium	Mg	mg/L	N/A	ND	N/A	1.1	2.5	N/A	<0.5	0.6	#
Manganese	Mn	µg/L	N/A	ND	N/A	7	3600	N/A	<5	19	500
Mercury	Hg	µg/L	N/A	ND	N/A	<0.05	5.40	N/A	<0.05	<0.05	1
Nickel	Ni	µg/L	N/A	ND	N/A	2	17	N/A	<1	<1	20
Zinc	Zn	µg/L	N/A	ND	N/A	18	31	33.8	3	8	#
Field											
Dissolved Oxygen	DO	% saturation	N/A	ND	N/A	42.4	85-120	N/A	63.3	52.5	#
Temperature	Temp.	°C	N/A	ND	N/A	29.4	N/A	N/A	28.2	28.9	#
Electrical Conductivity	EC	µS/cm	N/A	ND	N/A	34.3	20-250	N/A	13.4	33.7	#
pH	pH	pH units	N/A	ND	N/A	5.87	6-8	N/A	5.66	6.37	#
Environmental Indicators											
Sulphate	SO ₄	mg/L	N/A	ND	N/A	3	129	N/A	<1	2	500
Bicarbonate	HCO ₃	mg/L	N/A	ND	N/A	13	N/A	N/A	7	15	#
Unfiltered Alkalinity	CaCO ₃	mg/L	N/A	ND	N/A	13	N/A	N/A	7	15	#
Hardness	Hardness	mg/L	N/A	ND	N/A	6	N/A	N/A	<3	5	#
Total Dissolved Solids	TDS	mg/L	N/A	ND	N/A	72	N/A	N/A	130	180	#
Total Suspended Solids	TSS	mg/L	N/A	ND	N/A	<5	N/A	N/A	5	20	#
Total Solids	TS	mg/L	N/A	ND	N/A	72	N/A	N/A	130	200	#
Sodium	Na	mg/L	N/A	ND	N/A	2.1	N/A	N/A	1	2.4	#
Chloride	Cl	mg/L	N/A	ND	N/A	1	N/A	N/A	<1	<1	#
Calcium	Ca	mg/L	N/A	ND	N/A	1.7	N/A	N/A	<0.5	1	#
Total Cyanide	Cn	mg/L	N/A	ND	N/A	<0.004	N/A	N/A	<0.004	<0.004	80
WAD Cyanide	WAD Cn	mg/L	N/A	ND	N/A	N/A	N/A	N/A	N/A	N/A	#

ANZECC has insufficient data to set a guideline value based on health guidelines

ND: No data due to cessation of discharge

01-Apr-13

	RP1	RP3	RP7	SW4	80% Species Protection Level at SW4	Monitoring Value at SW4	SW2	SW10	ADWG for Health
Latitude	-14.162	-14.1388	-14.127	14.1703			14.1718	-14.183	
Longitude	132.1085	132.1015	132.1216	132.098			132.12	132.03	
Easting ¹	187843	187055	18921	186745			189088	179781	
Northing ¹	8432432	8434993	8436326	or 8431490			8431347	8430015	

Metals and metalloids (0.45µm filtered)											
Aluminium	Al	µg/L	N/A	230	N/A	220	150	N/A	190	350	#
Cadmium	Cd	µg/L	N/A	6.1	N/A	<0.1	0.80	N/A	<0.1	<0.1	2
Cobalt	Co	µg/L	N/A	57	N/A	<1	90	N/A	<1	<1	#
Copper	Cu	µg/L	N/A	27	N/A	2	2.5	3	<1	93	2000
Chromium Total	Cr	µg/L	N/A	1	N/A	<1	40	N/A	<1	<1	50
Chromium III	Cr III	µg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#
Chromium VI	Cr VI	µg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#
Iron	Fe	µg/L	N/A	<10	N/A	160	300	N/A	140	170	#
Lead	Pb	µg/L	N/A	1	N/A	<1	9.4	N/A	<1	<1	10
Magnesium	Mg	mg/L	N/A	110	N/A	1	2.5	N/A	<0.5	<0.5	#
Manganese	Mn	µg/L	N/A	1500	N/A	11	3600	N/A	<5	16	500
Mercury	Hg	µg/L	N/A	<0.05	N/A	<0.05	5.40	N/A	<0.05	<0.05	1
Nickel	Ni	µg/L	N/A	64	N/A	<1	17	N/A	<1	<1	20
Zinc	Zn	µg/L	N/A	210	N/A	7	31	33.8	<1	2	#
Field											
Dissolved Oxygen	DO	% saturation	N/A	91.8	N/A	87	85-120	N/A	97.0	84.3	#
Temperature	Temp.	°C	N/A	26.9	N/A	27.9	N/A	N/A	27.1	26.9	#
Electrical Conductivity	EC	µS/cm	N/A	2661	N/A	27.6	20-250	N/A	9.9	23.4	#
pH	pH	pH units	N/A	7.26	N/A	6.52	6-8	N/A	5.81	6.32	#
Environmental Indicators											
Sulphate	SO ₄	mg/L	N/A	1500	N/A	3	129	N/A	<1	1	500
Bicarbonate	HCO ₃	mg/L	N/A	37	N/A	7	N/A	N/A	5	11	#
Unfiltered Alkalinity	CaCO ₃	mg/L	N/A	37	N/A	7	N/A	N/A	5	11	#
Hardness	Hardness CaCO ₃	mg/L	N/A	1600	N/A	6	N/A	N/A	<3	<3	#
Total Dissolved Solids	TDS	mg/L	N/A	1200	N/A	26	N/A	N/A	38	48	#
Total Suspended Solids	TSS	mg/L	N/A	<5	N/A	19	N/A	N/A	5	22	#
Total Solids	TS	mg/L	N/A	1200	N/A	45	N/A	N/A	43	70	#
Sodium	Na	mg/L	N/A	49	N/A	1.5	N/A	N/A	0.6	1.6	#
Chloride	Cl	mg/L	N/A	8	N/A	<1	N/A	N/A	<1	<1	#
Calcium	Ca	mg/L	N/A	440	N/A	0.9	N/A	N/A	<0.5	0.8	#
Total Cyanide	Cn	mg/L	N/A	<0.004	N/A	<0.004	N/A	N/A	<0.004	<0.004	80
WAD Cyanide	WAD Cn	mg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#

ANZECC has insufficient data to set a guideline value based on health guidelines



4. Conclusion

The controlled discharges of RP3 treated water from the Mt Todd mine site that occurred over the 30th, 31st of March and ceasing on the morning of the 1st of April 2013 complied with the conditions of WDL 178-2. It is suspected that other catchments on site (i.e. Horseshoe and Batman Creeks) may be sources of iron, copper and zinc that compound the results observed at SW4. However, the current metal load of RP3 treated water is well below that which was used for ecotoxicological testing during February 2013 and also well below concentrations required to meet the 80% species protection level at SW4.

Results also indicate that there is a high upstream background concentration of iron and aluminium in the Edith River and that there is a significant source(s) of copper downstream of the Mt Todd mine site that contributes excess copper to the environment during high flow events of the Edith River.