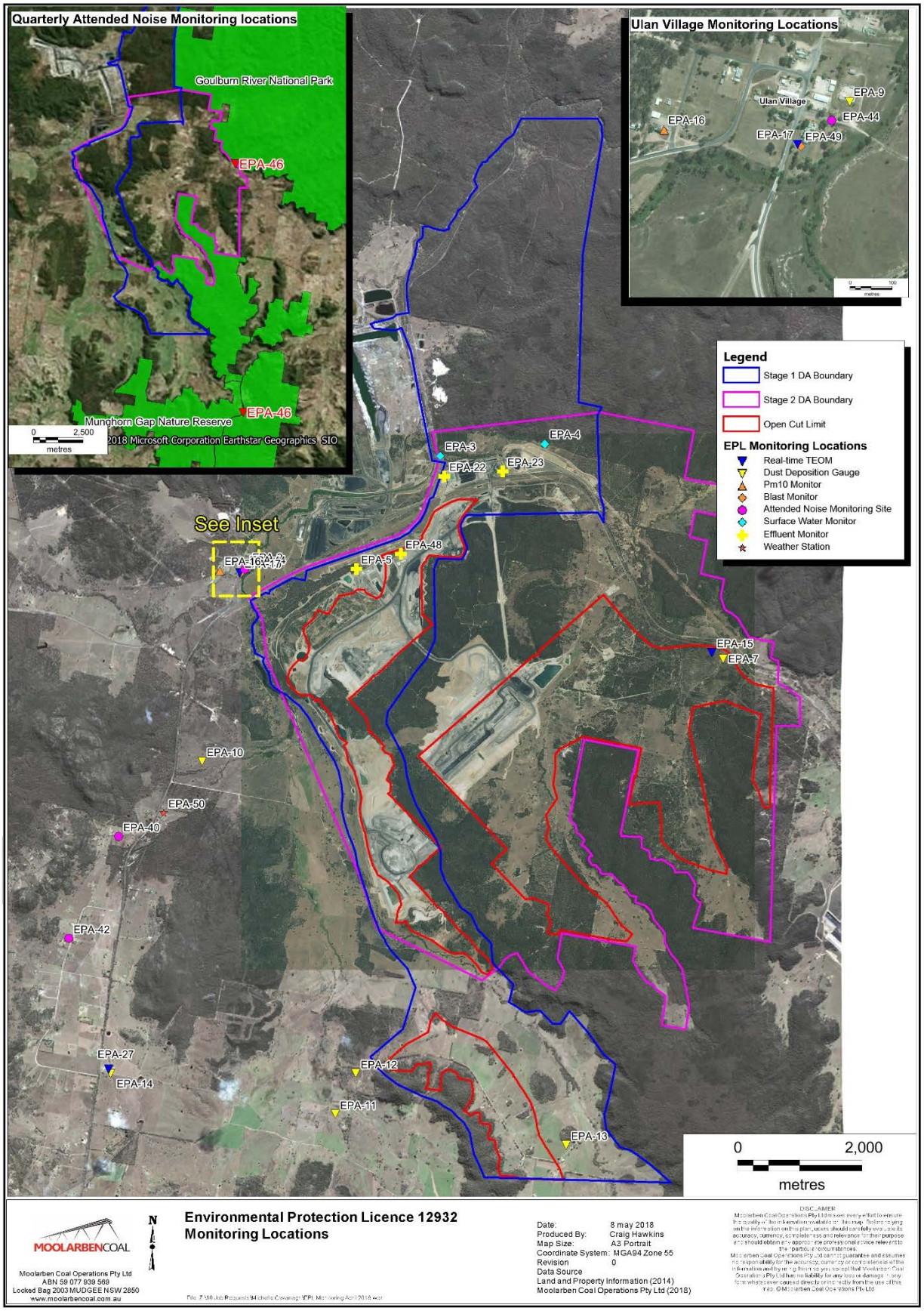
Monthly Environmental Monitoring Report

For the Month Ending 30 November 2018

Name of Operation	Moolarben Coal Complex
Name of License Holder	Moolarben Coal Operations Pty Ltd
Premises	Moolarben Coal Mine 12 Ulan-Wollar Rd, Ulan NSW 2850
Environmental Protection Licence Number	12932
EPL Link	http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=75423&SYSUID=1&LICID=12932
Premises	Moolarben Coal Mine
Reporting Period	1 November 2018 to 30 November 2018
Date last sampled data obtained	20 December 2018
Publication Date	31 December 2018
Version	1
Author	M. Yeatman
Approver	G. Chase

EPL 12932 MCO Environmental Monitoring Network



Concentration Monitoring Summary

Air Quality Monitoring

EPL ID	Location	Pollutant	Unit of Measure	EPL Monitoring Frequency	No. of Samples collected and analysed	Date Sampled	Value	Annual Average (Rolling)	Annual 100%ile concentration limit
6	DG01	Particulates – Deposited Matter	$g/m^2/month$	Monthly	1	29/11/2018	2.2	0.87	4.0
7	DG12	Particulates – Deposited Matter	$g/m^2/month$	Monthly	1	28/11/2018	c*	1.86	4.0
9	DG04	Particulates – Deposited Matter	$g/m^2/month$	Monthly	1	29/11/2018	1.1	1.08	4.0
10	DG05	Particulates – Deposited Matter	$g/m^2/month$	Monthly	1	29/11/2018	3.6	1.65	4.0
11	DG06	Particulates – Deposited Matter	$g/m^2/month$	Monthly	1	29/11/2018	0.7	1.07	4.0
12	DG07	Particulates – Deposited Matter	$g/m^2/month$	Monthly	1	29/11/2018	1.5	1.25	4.0
13	DG08	Particulates – Deposited Matter	$g/m^2/month$	Monthly	1	29/11/2018	2.1	1.32	4.0
14	DG09	Particulates – Deposited Matter	$g/m^2/month$	Monthly	1	28/11/2018	1.2	1.46	4.0
N/A	DG13	Particulates – Deposited Matter	$g/m^2/month$	N/A	1	29/11/2018	1.1	1.25	4.0

c*- sample contaminated

EPL ID	Location	Pollutant	Unit of Measure	No. of Samples collected and analysed	Date Sampled	12 mth rolling average			Annual 100%ile concentration limit
						Min Value	Mean Value	Max Value	
15	TEOM 6	PM10	$\mu g/m^3$	100%	Continuous	14.82	15.08	15.31	N/A
16	PM01	PM10	$\mu g/m^3$	5	Every 6 days	15.59	15.95	16.56	30
N/A	PM02	PM10	$\mu g/m^3$	5	Every 6 days	16.57	16.93	17.44	30
17	TEOM 1	PM10	$\mu g/m^3$	100%	Continuous	14.52	14.60	14.69	30
27	TEOM 7	PM10	$\mu g/m^3$	100%	Continuous	15.05	15.38	15.65	30
N/A	TEOM 4	PM10	$\mu g/m^3$	100%	Continuous	17.9	18.06	18.17	30

EPL ID	Location	Pollutant	Unit of Measure	EPL Monitoring Frequency	No. of Samples collected and analysed	Date Sampled	Min Value	Mean Value	Max Value	100%ile concentration limit
15	TEOM 6	PM10	µg/m^3	Continuous (24 Hr Average)	100%	Continuous	2.2	13.9	32.4	N/A
16	PM01	PM10	µg/m^3	Every 6 days	5	Every 6 days	11	25.4	24 (60)*	50
N/A	PM02	PM10	µg/m^3	N/A	5	Every 6 days	14	27.2	22 (62)*	50
17	TEOM 1	PM10	µg/m^3	Continuous (24 Hr Average)	100%	Continuous	5	13.3	25.3	50
27	TEOM 7	PM10	µg/m^3	Continuous (24 Hr Average)	100%	Continuous	7	16.97	33.6	50
N/A	TEOM 4	PM10	µg/m^3	N/A (24 Hr Average)	100%	Continuous	8	17.9	29.4	50

*Elevated readings influenced by regional dust event on the 21/11/2018

Surface Water Quality Monitoring

EPL ID	Location	Pollutant	Unit of Measure	No. of samples required by Licence	No. of Samples collected and analysed	Date Sampled	Min Value	Mean Value	Max Value
N/A	SW01	Conductivity	µS/cm	N/A	1	13/11/2018	877	877	877
		pH	pH	N/A	1	13/11/2018	7.68	7.68	7.68
		Total Suspended Solids	mg/L	N/A	1	13/11/2018	5	5	5
N/A	SW02	Conductivity	µS/cm	N/A	1	13/11/2018	906	906	906
		pH	pH	N/A	1	13/11/2018	7.66	7.66	7.66
		Total Suspended Solids	mg/L	N/A	1	13/11/2018	5	5	5
N/A	SW04	Conductivity	µS/cm	N/A	0	13/11/2018	No Flow	No Flow	No Flow
		pH	pH	N/A	0	13/11/2018	No Flow	No Flow	No Flow
		Total Suspended Solids	mg/L	N/A	0	13/11/2018	No Flow	No Flow	No Flow
N/A	SW05	Conductivity	µS/cm	N/A	1	13/11/2018	625	625	625
		pH	pH	N/A	1	13/11/2018	7.15	7.15	7.15
		Total Suspended Solids	mg/L	N/A	1	13/11/2018	8	8	8
N/A	SW07	Conductivity	µS/cm	N/A	0	13/11/2018	No Flow	No Flow	No Flow
		pH	pH	N/A	0	13/11/2018	No Flow	No Flow	No Flow
		Total Suspended Solids	mg/L	N/A	0	13/11/2018	No Flow	No Flow	No Flow
N/A	SW08	Conductivity	µS/cm	N/A	1	13/11/2018	4560	4560	4560
		pH	pH	N/A	1	13/11/2018	7.1	7.1	7.1
		Total Suspended Solids	mg/L	N/A	1	13/11/2018	46	46	46
N/A	SW09	Conductivity	µS/cm	N/A	1	13/11/2018	5230	5230	5230
		pH	pH	N/A	1	13/11/2018	6.93	6.93	6.93
		Total Suspended Solids	mg/L	N/A	1	13/11/2018	5	5	5
4	SW10	Conductivity	µS/cm	Special Frequency 1	0	13/11/2018	Dry	Dry	Dry
		Oil and Grease	mg/L	Special Frequency 1	0	13/11/2018	Dry	Dry	Dry
		pH	pH	Special Frequency 1	0	13/11/2018	Dry	Dry	Dry
		Total Suspended Solids	mg/L	Special Frequency 1	0	13/11/2018	Dry	Dry	Dry
3	SW11	Conductivity	µS/cm	Special Frequency 1	0	13/11/2018	Dry	Dry	Dry
		Oil and Grease	mg/L	Special Frequency 1	0	13/11/2018	Dry	Dry	Dry
		pH	pH	Special Frequency 1	0	13/11/2018	Dry	Dry	Dry

EPL ID	Location	Pollutant	Unit of Measure	No. of samples required by Licence	No. of Samples collected and analysed	Date Sampled	Min Value	Mean Value	Max Value
		Total Suspended Solids	mg/L	Special Frequency 1	0	13/11/2018	Dry	Dry	Dry
N/A	SW12	Conductivity	µS/cm	N/A	1	13/11/2018	577	577	577
		pH	pH	N/A	1	13/11/2018	7.3	7.3	7.3
		Total Suspended Solids	mg/L	N/A	1	13/11/2018	5	5	5
N/A	SW15	Conductivity	µS/cm	N/A	0	13/11/2018	Dry	Dry	Dry
		pH	pH	N/A	0	13/11/2018	Dry	Dry	Dry
		Total Suspended Solids	mg/L	N/A	0	13/11/2018	Dry	Dry	Dry
N/A	SW16	Conductivity	µS/cm	N/A	0	13/11/2018	Dry	Dry	Dry
		pH	pH	N/A	0	13/11/2018	Dry	Dry	Dry
		Total Suspended Solids	mg/L	N/A	0	13/11/2018	Dry	Dry	Dry
N/A	SW17	Conductivity	µS/cm	N/A	0	13/11/2018	No Flow	No Flow	No Flow
		pH	pH	N/A	0	13/11/2018	No Flow	No Flow	No Flow
		Total Suspended Solids	mg/L	N/A	0	13/11/2018	No Flow	No Flow	No Flow
N/A	SW18	Conductivity	µS/cm	N/A	0	13/11/2018	Dry	Dry	Dry
		pH	pH	N/A	0	13/11/2018	Dry	Dry	Dry
		Total Suspended Solids	mg/L	N/A	0	13/11/2018	Dry	Dry	Dry
N/A	SW19	Conductivity	µS/cm	N/A	0	13/11/2018	No Flow	No Flow	No Flow
		pH	pH	N/A	0	13/11/2018	No Flow	No Flow	No Flow
		Total Suspended Solids	mg/L	N/A	0	13/11/2018	No Flow	No Flow	No Flow
N/A	SW20	Conductivity	µS/cm	N/A	0	13/11/2018	Dry	Dry	Dry
		pH	pH	N/A	0	13/11/2018	Dry	Dry	Dry
		Total Suspended Solids	mg/L	N/A	0	13/11/2018	Dry	Dry	Dry

*No flow when sample was taken

Blasting

EPL ID	Location	Pollutant	Unit of Measure	Frequency	No. of Blasts during the reporting period	Min Value	Mean Value	Max Value	Limits dBL
49	BM1 Ulan School	Blast Overpressure	dBL	Every Blast	12	87.3	97.4	106	115 (95% of Blasts) 120 (100% of Blasts)
		Ground Vibration	mm/s	Every Blast		0.06	0.28	0.76	5mm/s (95% of Blasts) 10mm/s (100% of Blasts)
N/A	BM5 Ridge Rd	Blast Overpressure	dBL	Every Blast	12	89.5	97.18	107.2	115 (95% of Blasts) 120 (100% of Blasts)
		Ground Vibration	mm/s	Every Blast		0.02	0.3	0.61	5mm/s (95% of Blasts) 10mm/s (100% of Blasts)

Noise

Location	Start Date and Time[2]	Measured Level[1] $L_{A1,1minute}$ dB	Measured Level[1] L_{Aeq} dB	Limit(s)[2]	Weather[4]	Observation	(Potential) Non-Compliance/Breach[5]
NA1	06/11/2018 10:49	NA	IA	Daytime (07:00 – 18:00) $L_{Aeq,15minute}$: 43 dB	Cloud Cover 8/8, wind at 10m 1.1m/s, Stability Class D	**Attended monitoring, nomination of noise sources:** Road traffic noise and birds generated all measured levels. Local industrial noise was also noted. **Estimate of contribution of subject noise source:** MCO was inaudible.	Nil
NA6	05/11/2018 23:20	32	30	Night time (22:00 – 07:00) $L_{Aeq,15minute}$: 37 dB $L_{A1,1minute}$: 45 dB	Cloud Cover 8/8, wind at 10m 0.8m/s, Stability Class E	**Attended monitoring, nomination of noise sources:** Road traffic tyre noise generated the measured L_{A1}, L_{A10} and L_{Aeq} and contributed to the measured L_{A50}. MCO continuum generated the measured L_{A90}. **Estimate of contribution of subject noise source:** MCO was audible throughout the measurement as general mining continuum, which generated the site-only $L_{Aeq,15minute}$ of 30 dB and $L_{A1,minute}$ of 32 dB.	Nil

Location	Start Date and Time[2]	Measured Level[1] $L_{A1,1minute}$ dB	Measured Level[1] L_{Aeq} dB	Limit(s)[2]	Weather[4]	Observation	(Potential) Non-Compliance/Breach[5]
NA12	06/11/2018 00:14	<25	<25	Night time (22:00 – 07:00) $L_{Aeq,15minute}$: 35 dB $L_{A1,1minute}$: 45 dB	Cloud Cover 6/8, wind at 10m 0.8m/s, Stability Class F	**Attended monitoring, nomination of noise sources:** Road traffic tyre noise generated the measured L_{A1}, L_{A10} and L_{Aeq}. MCO continuum, road traffic tyre noise and insects generated the measured L_{A50}. MCO continuum and insects generated the measured L_{A90}. **Estimate of contribution of subject noise source:** MCO was audible as low-level mining continuum throughout the measurement. Dozer tracks were also noted. These sources generated the site-only $L_{Aeq,15minute}$ and $L_{A1,1minute}$ of less than 25 dB.	Nil
GRNP	05/11/2018 22:00	NA	<20	All periods $L_{Aeq,15minute}$: 50 dB	Cloud Cover 5/8, wind at 10m 0.9m/s, Stability Class F	**Attended monitoring, nomination of noise sources:** Train noise generated the measured L_{A1}, L_{A10} and L_{Aeq}. Other mine continuum and insects generated the measured L_{A50} and L_{A90}. **Estimate of contribution of subject noise source:** Low-level mining continuum and track noise were audible from MCO at times during the measurement, generating the site-only $L_{Aeq,15minute}$ of less than 20 dB and the site-only $L_{A1,1minute}$ of less than 25 dB.	Nil

Location	Start Date and Time[2]	Measured Level[1] $L_{A1,1minute}$ dB	Measured Level[1] L_{Aeq} dB	Limit(s)[2]	Weather[4]	Observation	(Potential) Non-Compliance/Breach[5]
MGNR	06/11/2018 01:49	NA	<20	All periods $L_{Aeq,15minute}$: 50 dB	Cloud Cover 6/8, wind at 10m 0.2m/s, Stability Class F	**Attended monitoring, nomination of noise sources:** Birds and insects primarily generated the measured levels. Owls contributed to the measured L_{A1}. **Estimate of contribution of subject noise source:** Low-level mining continuum was audible from MCO throughout the measurement, generating the site-only $L_{Aeq,15minute}$ and $L_{A1,minute}$ of less than 20 dB. Track noise and impact noises were also noted.	Nil

Notes:

1. *Levels in these columns are MCO only;*
2. *Measurement period is 15 minutes;*
3. *As detailed in the EPL, noise emission limits apply under all meteorological conditions except:*
   - *Wind speeds greater than 3 m/s at 10 metres above ground level; or*
   - *Stability class F temperature inversion conditions, and wind speeds greater than 2 m/s at 10 metres above ground level; or*
   - *Stability class G temperature inversions;*
4. *Cloud cover from field sheet observations. Wind speed, wind direction and stability class based on WCM weather station data; and*
5. *NA in last column means atmospheric conditions outside those specified in EPL and so criterion is not applicable.*

Effluent Discharge Points

EPL ID	Pollutant	Unit of Measure	No. of samples required by Licence	No. of Samples collected and analysed	Date Sampled	Min Value	Mean Value	Max Value
5	BOD	mg/L	Quarterly	0				
	Nitrogen (total)	mg/L	Quarterly	0				
	Oil and Grease	mg/L	Quarterly	0				
	pH	pH	Quarterly	0				
	Phosphorus (total)	mg/L	Quarterly	0				
	Total Suspended Solids	mg/L	Quarterly	0				
22	BOD	mg/L	Quarterly	0				
	Nitrogen (total)	mg/L	Quarterly	0				
	Oil and Grease	mg/L	Quarterly	0				
	pH	pH	Quarterly	0				
	Phosphorus (total)	mg/L	Quarterly	0				
	Total Suspended Solids	mg/L	Quarterly	0				
23	BOD	mg/L	Quarterly	0				
	Nitrogen (total)	mg/L	Quarterly	0				
	Oil and Grease	mg/L	Quarterly	0				
	pH	pH	Quarterly	0				
	Phosphorus (total)	mg/L	Quarterly	0				
	Total Suspended Solids	mg/L	Quarterly	0				
48	BOD	mg/L	Quarterly	0				
	Nitrogen (total)	mg/L	Quarterly	0				
	Oil and Grease	mg/L	Quarterly	0				
	pH	pH	Quarterly	0				
	Phosphorus (total)	mg/L	Quarterly	0				
	Total Suspended Solids	mg/L	Quarterly	0				

Discharge Points

Moolarben Coal did not have any licensed discharges during the period.

EPL ID	Pollutant	Unit of Measure	No. of samples required by Licence	No. of Samples collected and analysed	Date Sampled	Min Value	Mean Value	Max Value	100%ile concentration limit
1	Conductivity	µS/cm	Continuous during discharge	0					900
	Iron	mg/L	Daily During Discharge	0					
	Oil and Grease	mg/L	Daily During Discharge	0					10
	pH	pH	Continuous during discharge	0					6.5-8.5
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Continuous during discharge	0					25
	Zinc	mg/L	Daily During Discharge	0					
	Discharge Volume	Megalitres per day	Continuous during discharge	0					10
2	Conductivity	µS/cm	Continuous during discharge	0					900
	Iron	mg/L	Daily During Discharge	0					
	Oil and Grease	mg/L	Daily During Discharge	0					10
	pH	pH	Continuous during discharge	0					6.5-8.5
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Continuous during discharge	0					25
	Zinc	mg/L	Daily During Discharge	0					
	Discharge Volume	Megalitres per day	Continuous during discharge	0					10
24	Oil and Grease	mg/L	Daily During Discharge	0					
	pH	pH	Daily During Discharge	0					6.5-8.5
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Daily During Discharge	0					25
26	Oil and Grease	mg/L	Daily During Discharge	0					
	pH	pH	Daily During Discharge	0					6.5-8.5

EPL ID	Pollutant	Unit of Measure	No. of samples required by Licence	No. of Samples collected and analysed	Date Sampled	Min Value	Mean Value	Max Value	100%ile concentration limit
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Daily During Discharge	0					25
28	Conductivity	µS/cm	Continuous during discharge	0					900
	Iron	mg/L	Daily During Discharge	0					
	Oil and Grease	mg/L	Daily During Discharge	0					10
	pH	pH	Continuous during discharge	0					6.5-8.5
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Continuous during discharge	0					25
	Zinc	mg/L	Daily During Discharge	0					
	Discharge Volume	Kilolitres per day	Continuous during discharge	0					1
29	Oil and Grease	mg/L	Daily During Discharge	0					
	pH	pH	Daily During Discharge	0					6.5-8.5
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Daily During Discharge	0					25
30	Oil and Grease	mg/L	Daily During Discharge	0					
	pH	pH	Daily During Discharge	0					6.5-8.5
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Daily During Discharge	0					25
31	Oil and Grease	mg/L	Daily During Discharge	0					
	pH	pH	Daily During Discharge	0					6.5-8.5
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Daily During Discharge	0					25
33	Oil and Grease	mg/L	Daily During Discharge	0					
	pH	pH	Daily During Discharge	0					6.5-8.5

EPL ID	Pollutant	Unit of Measure	No. of samples required by Licence	No. of Samples collected and analysed	Date Sampled	Min Value	Mean Value	Max Value	100%ile concentration limit
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Daily During Discharge	0					25
35	Oil and Grease	mg/L	Daily During Discharge	0					
	pH	pH	Daily During Discharge	0					6.5-8.5
	Total Suspended Solids	mg/L	Daily During Discharge	0					50
	Turbidity	NTU	Daily During Discharge	0					25