

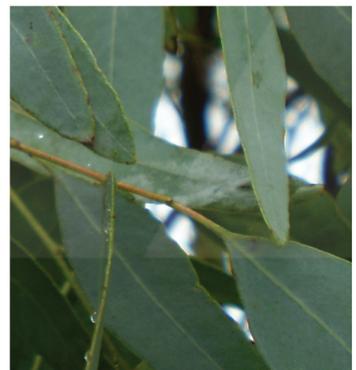
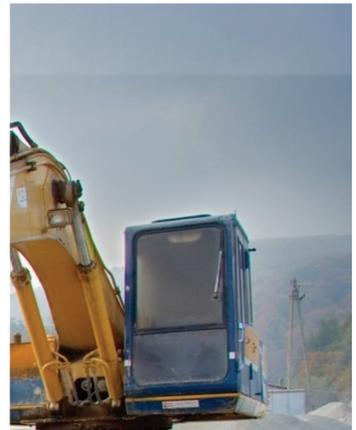


CONSULTING

DUNLOE SANDS QUARRY

Ramtech Pty Ltd
Pottsville Mooball Rd,
Pottsville

Annual Environmental Monitoring Report
November 2011 - October 2012



Review and Amendments Schedule – PLANIT CONSULTING PTY LTD

		Date
Author	BL	November 2012
Reviewer	AS	November 2012

Amendments

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Planit Consulting Pty Ltd declares that it does not have, nor expect to have, a beneficial interest in the subject project.

PLANIT CONSULTING PTY LTD®
November 2012

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Executive Summary & Introduction



Introduction & Context

Development consent for Ramtech Pty Ltd's (Ramtech) proposal to construct and operate a sand quarry at Lot 1 in DP 755721 & Lots 1 & 2 in DP 780199 Pottsville Mooball Road, Mooball was granted by the Minister for Planning on 24th November 2008. Schedule 3 of the development consent requires that individual management plans for the key environmental issues be prepared and that environmental management and monitoring conditions be fulfilled. To this end, an EMP was approved by the Department of Planning which integrates the prescribed environmental monitoring programs in accordance with Condition 2 of Schedule 5 into a planning and operations framework.

Construction commenced on a general trial basis in September 2010 with formal commencement occurring in October of 2010. Operations are at a basic level with estimated annual production in the order of 20,000 tonnes per annum only at this stage.

Within Schedule 5 of the consent, Condition No.5 requires that within twelve (12) months of the date of the approval and annually thereafter, Ramtech is to submit an Annual Environmental Management Report (AEMR). This AEMR is to be submitted to the Director General of the Department of Planning and other relevant agencies in accordance with the abovementioned Condition 5. This AEMR describes works undertaken, provides a summary and analysis of any complaints and monitoring results, identifies any trends in the monitoring results and identifies any non compliance over the preceding 12 months. Also included is any proposed construction, extraction and rehabilitation activities planned for the following 12 months.

Description of Resource

Concrete Sand

The Dunloe Park sand, after washing, is suitable as a concrete sand additive. It is expected that this will be the major use of the sand. Low extraction costs will make the sand competitive within the local Pottsville markets. As sand demand increases, the Dunloe Park sand may become competitive within the Brisbane market.

Loam

Further investigation into loam resources were carried out in mid 2007 (Coffey Geosciences, 2007), the area selected for investigation being the initial mining area proposed for the sand quarry (Gilbert and Sutherland, 2007). A 200m x 200m area approximately 1.2 m deep in the alluvial soil below the topsoil (which averaged approximately 0.3m depth) equating to approximately 90,000t of loam, was sampled by auger drilling and assessed for suitability as a loam.

Fill Material

Fill material represents a portion of demand in South East Queensland and Northern NSW. The sand appears to match Rocla specifications for fill sand in NSW (Rocla, 2007). From investigations carried out by Coffey Mining, it is considered that the Dunloe Park sand can be used as "low grade" fill material which is not dissimilar to fill material supplied into the northern and central coast of NSW. Major local sources of fill include sandstone fill from Kangaroo Creek (near Grafton) which also provides road base and hard materials.

Plastering and Rendering Sand

Coffey Mining is of the opinion that the sand in the Dunloe Park Resource, when washed, will be suitable for lower grade plastering and rendering sand and this is similar to current material supplied into the northern and central NSW market. To confirm this, it is recommended that the following be completed:

- Washed material be prepared and provided to agents for trialing and feedback.
- Laboratory tests be completed for fineness modulus, clay/silt content (<3%), organics and shell content.

Other Uses

Other “specialist” products which fit closely to the grading of the Dunloe Park sands include:

- Golf course sands – colour (usually whiteness) is a major issue.
- Grout sands.
- Fine filter sands.

Sale of these sands (except for local demand) is not considered to be a major opportunity for Dunloe Park due to established marketing strategies (including bagging of filter sands and grout sands) by other manufacturers. If these products are required in the future, then blending with imported (generally coarser size ranges) will be required. This is commonplace within the sand industry.

Dunloe Park *in situ* Indicated Mineral Resources

Pit	Overburden Mm ³	Sand Mm ³	Total Mm ³
North Pit	0.14	3.70	3.84
South Pit	0.08	2.96	3.04
Total	0.22	6.66	6.88

Extraction rates are not to exceed 300,000 tonnes per annum in accordance with Condition 7 of Schedule 2 of the Development Consent. Condition 5 of Schedule 2 provides for operations being permitted until 1 January 2035.

Monitoring

Planit Consulting has been contracted by Ramtech Pty Ltd to prepare this report based on environmental monitoring undertaken upon site by the proponents.

The monitoring includes;

- Blue Green Algae;
- Vegetation Management and Regeneration (within a separate report);
- Ground Waters; and
- Surface Waters.

All monitoring was undertaken by Ramtech staff.

This report was prepared by Planit Consulting and includes the following;

- Algae Level results for November 2011 to October 2012;
- Ground Water chemical results for November 2011 to October 2012;
- Quarterly Surface Water chemical results; and
- Rainfall levels from November 2011 to October 2012.

Water samples for algae were collected monthly between November 2011 to October 2012 at the Lake Site Number 1. The results gathered between November 2011 and October 2012 shows small algal outbreaks during the months of February, July, August and September. These samples were also undertaken as Cyanophyta was sighted within the lake sample area. The algae was appropriately treated by way of reducing the dosage of the water with the regular alkalinity enhancer (concrete dust) and returned to regular readings in the next month given that acidity increased. In this regard, the maximum water quality objectives presented within the EMP are 50,000cells/mL. The September sample was the only sample cited as breaching this target. Explanation behind the high sample has been attributed to the large periods on below average rainfall, the possible over dosing of the lake with alkalinity enhancer and also the potential intrusion of stock in and around the lake area (since rectified). The algal blooms were treated appropriately, by way of reducing the alkalinity of the water, increasing

the relative acidity, such that a balance was achieved and removing potential for stock intrusion. Further monitoring of the algae will continue to ensure the ongoing management of any outbreaks.

Groundwater was sampled monthly over a 12-month period between November 2011 to October 2012. Monthly monitoring provided levels of pH, Electrical Conductivity (EC), Redox Potential and Dissolved Oxygen (DO) from locations DLP1 to DLP7. The pH level across the site varied however the majority of the samples maintained within the pH interim target range presented within the Environmental Management Plan (EMP). Groundwater sampling locations as approved by the DoP are contained at **Appendix B**.

Surface water samples were collected for the quarterly sampling event in December 2011, March 2012, June 2012 and September 2012 at sites SW3 to SW10. Additional sampling was also undertaken during the February 2012 Rainfall Event. **Surface water sampling locations** as approved by the DoP are contained at **Appendix B**.

The Bureau of Meteorology (BOM) recorded rainfall within surrounding suburbs over the 12 month period from November 2011 to October 2012. The recorded rainfall averaged from three sites – Coolangatta, Murwillumbah and Byron Bay – was approximately 1724.03mm over the 12 month period.

Complaints Recorded

No complaints have been registered by the proponents to date.

Chapter 1.0 Sampling Program



Sampling Program

Dunloe Sand Quarry conducts environmental monitoring in accordance to Development Consent, Condition 2 of Schedule 5 and the approved Environmental Management Plan (EMP). Ramtech undertake algae, surface water and groundwater monitoring for the project.

Groundwater sites are monitored monthly for pH, EC, Redox Potential and DO and quarterly for Chloride, Calcium, Magnesium, Sodium, Potassium, Sulphate, Arsenic, Iron and Manganese. Samples are collected from sites DLP1 to DLP7. Sites locations are shown on the **Ground Water Location Map** under **Appendix A**.

Surface water analysis includes pH, conductivity, DO, suspended solids, total phosphorus and total nitrogen is conducted quarterly at sites SW3 to SW10. Site locations are depicted within the **Surface Water Location Map** under **Appendix B**.

Note: No sampling was undertaken during January due to heavy rainfall and comprehensive flooding of the area. It is considered that the two (2) samples taken during February illustrate that acceptable monitoring levels remain evident in the sampling area.

All of the **Sampling Raw Data** that has been used to compile this report is included in **Appendix C**.

Chapter 2.0 Monthly Monitoring Results



2.1 Groundwater Depth

Ground water boreholes (Depth)										
DLP1	DLP2	DLP3	DLP4	DLP5	DLP6	DLP7	DLP8	DLP9	DLP10	DLP11
0.61	0.62	0.58	0.59	0.68	0.61	0.62	0.62	0.58	0.57	0.59

As referenced in the levels above the groundwater depth has stayed quite uniform across the site with no marked difference detected relative to the proximity to the Extraction Lake or operational area.

2.2 Algae Results

The results of the algae monitoring for the period of November 2011 to October 2012 are displayed within **Table 1**. Results are presented in cells/mL.

Table 1: Dunloe Sands – Lake – Algae Results November 2011 to October 2012

	30/11 2011	22/12 2011	02/02 2012	20/02 2012	28/02 2012	27/03 2012	30/05 2012	27/06 2012	26/07 2012	27/08 2012	27/09 2012	29/10 2012
Cyanophyta (cells/mL)	240	800	<100	700	14375	1200	<100	130	16360	24640	68000	<100
Chlorophyta (cells/mL)	-	-	-	-	-	-	-	<0.01	2520	3720	35000	-
Cryptophyta (cells/mL)	-	-	-	-	-	-	-	-	-	-	80	-

The results gathered between November 2011 and October 2012 shows an algal outbreak during the months of February, July, August and September. These samples were also undertaken as cyanophyta was sighted within the lake sample area. The algae was appropriately treated and returned to regular readings in the next month. The maximum water quality objectives presented within the EMP are 50,000cells/mL. The September sample was the only sample cited as breaching this target. Explanation behind the high sample has been attributed to the large periods on below average rainfall, the possible over dosing of the lake with alkinity enhancer and also the potential intrusion of stock in and around the lake area (since rectified). The algal blooms were treated appropriately, by way of reducing the alkalinity of the water, increasing the relative acidity (still within acceptable limits), such that a balance was achieved and removing potential for stock intrusion. Further monitoring of the algae will continue to ensure the ongoing management of any outbreaks.

The algal blooms were treated appropriately and have returned to acceptable levels. Further monitoring of the algae will continue to ensure the ongoing management of any outbreaks.

2.3 Ground Water & Lake Results

Monthly ground water monitoring was conducted between November 2011 and October 2012. Samples monitored the pH, EC, Redox Potential and DO levels of six (6) sample sites; including five ground water and one lake sample site. The locations of the DLP sites are illustrated within the **Ground Water Locations Map - Appendix B**.

The results are displayed within four separate graphs illustrating the results of each test site over the six month monitoring period. **Figure 2** depicts the pH test results, **Figure 3** illustrates the EC, **Figure 4** shows the Redox Potential and **Figure 5** presents DO levels.

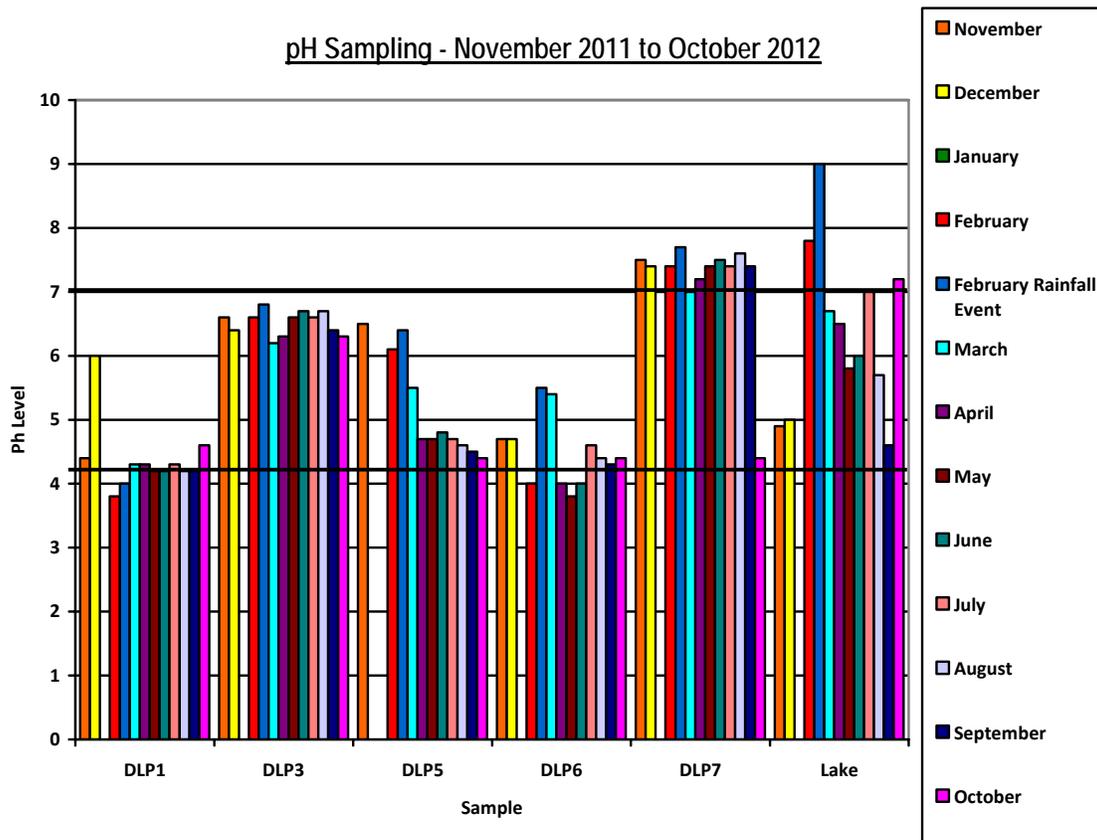


Figure 1: Dunloe Sands - Ground Water - Chemical (pH Test) Results November 2011 to October 2012

The EMP provides the interim target range regarding the pH levels of ground water sampling. The majority of the results displayed are between the minimum of 4.2pH and maximum of 7.0pH (shown as black lines).

DLP 7 and the Lake sample provided results outside of the maximum interim target levels. This presents a more alkaline pH level than the target range. These minimal exceedances of pH at DLP7 and Lake are not considered to be of any significance as small fluctuations in groundwater pH is common within regions which experience both high and low levels of rainfall. DLP 1 and 6 were the only sample sites to test at below the minimum target level of 4.2pH. These sites are to be monitored for any acidic pH trend, with it noted that both DLP 6 and DLP 1 providing for known background levels with a low pH in their natural state.

Groundwater Electroconductivity - November 2011 to October 2012

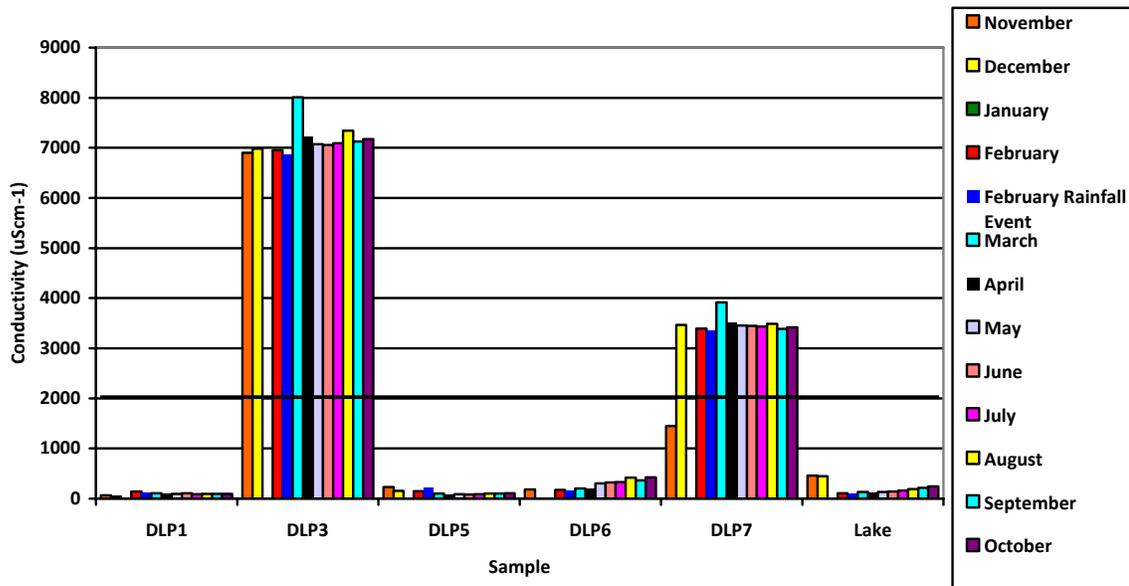


Figure 2: Dunloe Sands - Ground Water - Chemical (EC Test) Results November 2011 to October 2012

The majority of the samples taken produce considerably low EC levels when compared to the EMP maximum interim target. However, two samples sites; DLP3 and DLP7 present conductivity levels well above the maximum interim target of 2,000uS/cm⁻¹ stated within the EMP (shown as a black line). These sites also expressed similar levels of EC within background testing. This can be explained by the sampling wells being installed in the low-lying portion of the floodplain, in close proximity to both Mooball Creek and establish estuarine riparian areas. The wells are adjacent to sections of Mooball Creek and the main agricultural drainage line which can be subject to tidal influences. It is therefore considered likely that some localised salinisation of surficial groundwater has occurred within the vicinity of monitoring locations DLP3 and DLP7.

Given the constant readings above the thresholds (relative to background conditions), further liaison with the DOP is recommended in respect of removing and or potentially lessening the regularity of sampling on these bores, with preference given to alternate locations that may give a more accurate reading of impacts that the operations may or may not have.

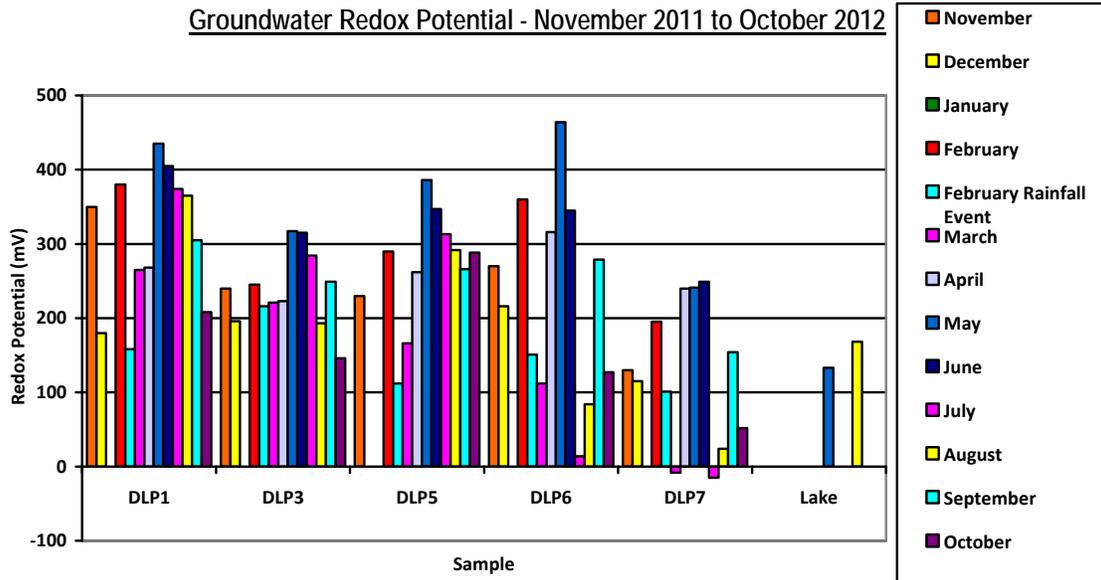


Figure 3: Dunloe Sands - Ground Water - Chemical (Redox Potential Test) Results November 2011 to October 2012

The EMP does not provide an interim target level for Redox Potential but instead states that results should be monitored for outlier samples. There is a slight split in the results with DLP 1 to DLP 6 presenting a marginally higher Redox Potential. Redox changes are likely to be related to the decomposition of sub surface organic matter given the location immediately proximate to the adjacent wetland.

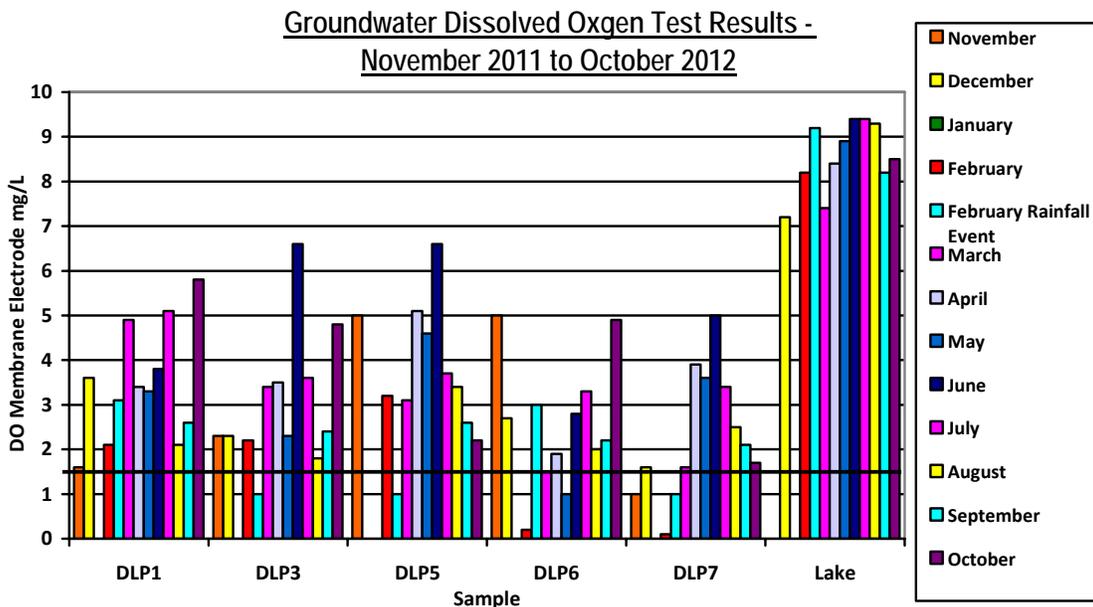


Figure 4: Dunloe Sands - Ground Water - Chemical (DO Test) Results November 2011 to October 2012

The minimum DO level provided within the EMP is 1.5mg/mL (shown as a black line). The results vary in DO levels considerably with the majority not presenting or conforming to a pattern over the 12 month monitoring period. The majority of the groundwater samples that were collected are above the minimum interim target.

A small number of samples present below the 1.5mg/L target. Whilst background testing indicates generally low DO levels inherently across the site, these low results require some further consideration; particularly with respect to the temperature of samples at these locations as exceedingly warm samples will automatically generate a low DO reading. Low results may also be related to excessive faecal matter and nutrients associated with livestock use. Each of these potential reasons should be considered in the context of future sample results so as to look towards potential ameliorative measures.

These readings should be discussed with an auditor consistent with the bi annual engagement of an auditor. It is also important that sampling for DO be undertaken very early in the morning (cool conditions) and for livestock to be excluded from the bore areas.

Results for tests of turbidity, suspended solids, oil and grease, total phosphorus and total nitrogen were only collected within the lake sample site. Figures 6 and 7 present the sample levels compared to the EMP interim target levels.

Chemical Results - Lake Sample - November 2011 to October 2012

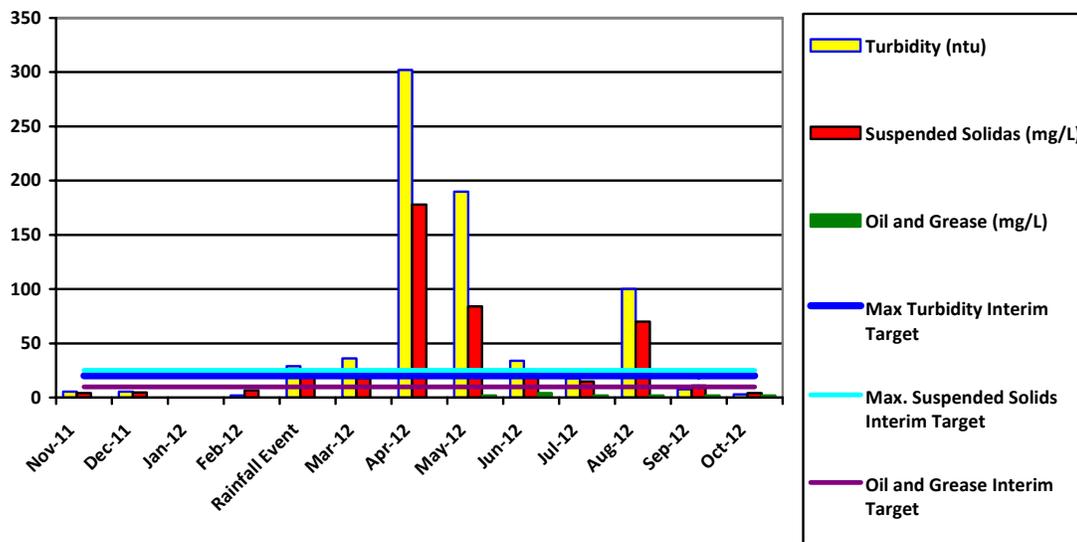


Figure 5: Dunloe Sands - Lake - Chemical Results – November 2011 and October 2012

Interim target levels for turbidity present a maximum level of 20ntu within the EMP. The levels recorded over the 12 month monitoring period show 6 of the 13 samples exceeding these maximum levels. This is not surprising given the use and given that in general, samples up to 100ntu are encountered in aquaculture facilities. In this instance, it would appear that turbidity levels in April, May and August for example may have been high simply through more intensive dredging activities in the lake. Further consideration into the effectiveness of the existing surface water containment measures is to be noted and further monitoring of the levels is required. It is also important that surface water inflows must not flow into the lake from external sources (inclusive of the plant area) as this heightens the turbidity levels that are sampled.

The maximum interim target level for the suspended solids within the EMP is 25mg/L. The April, May and August samples exceed the interim target. The September and October sample back at acceptable levels. The further monitoring of the Lake site with regard to potential factors that may be affecting the samples is to be assessed into the future.

The EMP states a maximum level of 10mg/L in regard to oil and grease. Levels of oil and grease within the samples are consistent over the 12 month monitoring period at less than 2mg/L.

Chemical Results - Lake Samples - November 2011 to October 2012

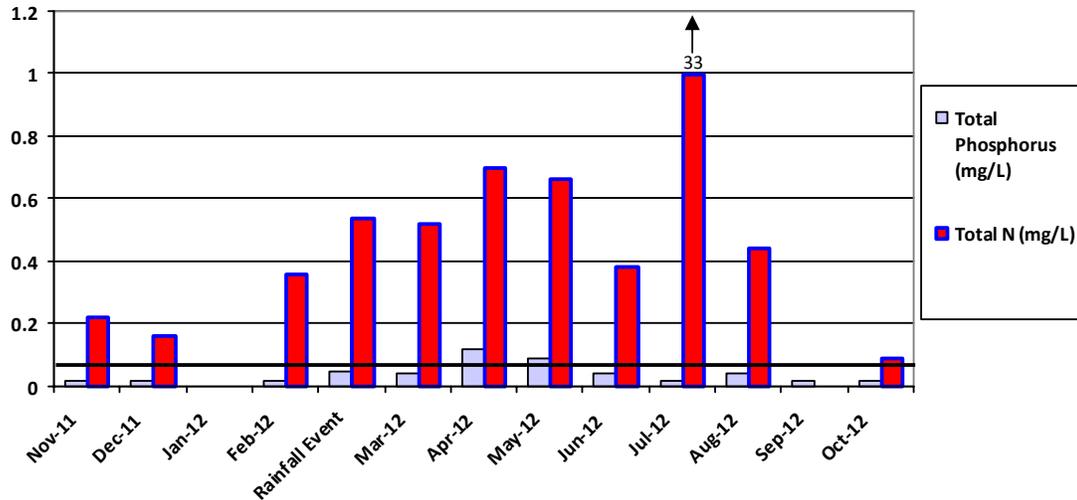


Figure 7: Dunloe Sands - Lake - Chemical Results – November 2011 to October 2012

Total phosphorus levels have a maximum interim target of 0.08mg/L (shown as black line). Of the samples all contains levels of below the maximum interim target levels contained within the EMP.

The majority of total nitrogen levels remain lower than the interim target of 20mg/L. The July sample has shown an exceeding reading of 33mg/L. Explanation for the elevated nitrogen levels in the July lake sample can be deduced from a bad or contaminated sample given the substantially lower nitrogen levels prior to and after. There also appears to be no correlation between the identified exceedance and algal counts, given that nitrogen levels quickly dropped back to well below the maximum in August and September. An assessment of the sampling process is to be carried out to ensure that no bad samples are taken in the future. Nitrogen levels will also be continually monitored as a precaution.

2.4 Recorded Rainfall

The Bureau of Meteorology (BOM) have recorded rainfall within the surrounding areas of Pottsville; including Coolangatta (24.3km from Pottsville), Murwillumbah – Bray Park (18.9km from Pottsville) and Byron Bay (28.5km from Pottsville). The results are illustrated within Figure 8 along with the recorded rainfall average.

Total Rainfall - November 2011 to October 2012

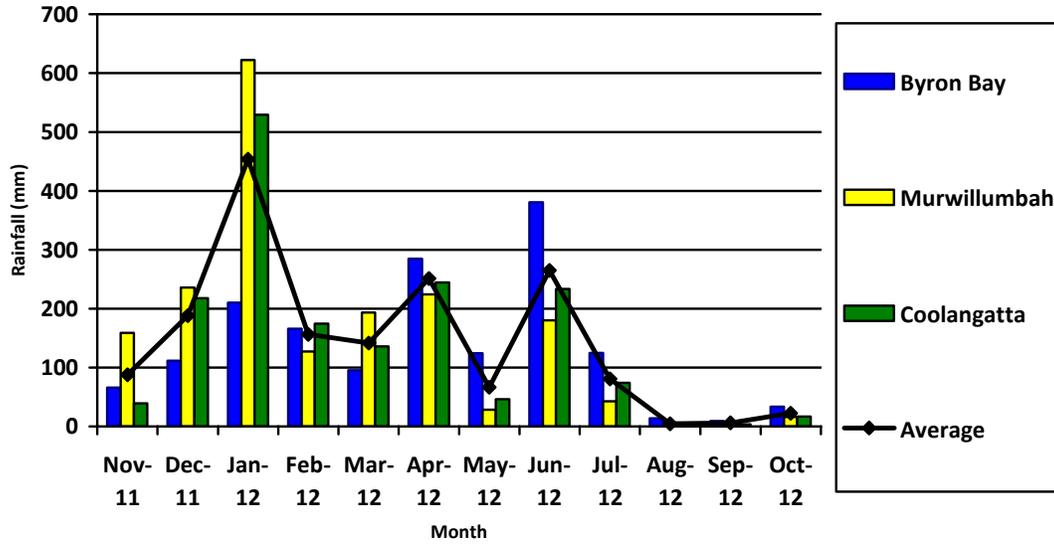


Figure 8: Recorded Rainfall November 2011 to October 2012

The recorded rainfall of the three suburbs surrounding Pottsville has been averaged to produce an approximate on-site rainfall. January 2012 presented the highest level of rainfall within the region with an average of 454mm of total rainfall being recorded. In total over the 12 month period approximately 1724.03mm of rain was recorded on-site.

Chapter 3.0 Quarterly Monitoring Results



3.1 Ground Water Results

Quarterly monitoring of the ground waters on-site within locations DLP 1 to DLP 7 have been undertaken to determine levels of chloride (Table 2), calcium (Table 3), magnesium (Table 4), sodium (Table 5), potassium M8 (Table 6), sulphate (Table 7), arsenic (Table 8), iron (Table 9) and Manganese (Table 10). Samples were collected in December 2011, March 2012, June 2012 and September 2012. Tables present the results compared against the interim target criteria contained within the EMP.

The majority of the samples collected are consistent with the interim target criteria of the EMP. Some variants are illustrated within the results. These variants have been highlighted with bold text.

Table 2: Dunloe Sands - Ground Water - Chemical (Chloride Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	13.0	2,300.0	-	14.0	680.0
Interim Target	285.0	285.0	285.0	285.0	285.0
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	17.0	2400.0	14.0	14.0	710.0
Interim Target	285.0	285.0	285.0	285.0	285.0
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	20.0	2220.0	17.0	14.0	700.00
Interim Target	285.0	285.0	285.0	285.0	285.0
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	15.0	2280.0	19.0	15.0	730.0
Interim Target	285.0	285.0	285.0	285.0	285.0

Comments: As highlighted previously, two (2) samples sites (DLP3 and DLP7) presented conductivity levels well above the maximum interim target of 2,000uS/cm⁻¹ stated within the EMP, each of which also expressed similar levels of EC within background testing. The latter also correlates with the high chloride levels shown above, which indicate a high level of saltwater intrusion at these points. This is quite easily explained as these sampling wells have been installed in the low-lying portion of the floodplain adjacent to the sections of Mooball Creek and the main agricultural drainage line that are subject to tidal influences. It is also not unexpected in the instance of DLP 7 given that it sits immediately adjacent the existing wetland which would in itself act as a 'drawer' of permanently saline conditions in order to sustain its dominant vegetative makeup. It is therefore considered likely that some localised salinisation of surficial groundwater has occurred within the vicinity of DLP3 and DLP7 due to tidal influences within these nearby waterways and wetlands.

Table 3: Dunloe Sands - Ground Water - Chemical (Calcium Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	0.2	72.0	-	2.7	16.0
Interim Target	55.0	55.0	55.0	55.0	55.0
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	0.2	66.0	0.5	3.3	17.0
Interim Target	55.0	55.0	55.0	55.0	55.0
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	0.6	70.0	0.6	7.3	17.0
Interim Target	55.0	55.0	55.0	55.0	55.0
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	0.5	63.0	0.7	11.0	15.0
Interim Target	55.0	55.0	55.0	55.0	55.0

NB. Major cation

Comments: The spike associated with DLP3 is consistent with background testing and consistent with the sites location proximate to the adjacent tidal waterway. Remedial works are planned for this sample location to prevent the tidal influence.

Table 4: Dunloe Sands - Ground Water - Chemical (Magnesium Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	0.4	119.0	-	3.6	39.0
Interim Target	40.0	40.0	40.0	40.0	40.0
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	0.4	109.0	1.0	4.5	37.0
Interim Target	40.0	40.0	40.0	40.0	40.0
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	0.6	112.0	1.3	12.0	36.0
Interim Target	40.0	40.0	40.0	40.0	40.0
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	0.3	100.0	1.4	14.0	32.0
Interim Target	40.0	40.0	40.0	40.0	40.0

NB. Major cation

Comments: The spike associated with DLP3 is consistent with background testing and consistent with the sites location proximate to the adjacent tidal waterway. Remedial works are planned for this sample location to prevent the tidal influence.

Table 5: Dunloe Sands - Ground Water - Chemical (Sodium Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	4.0	842.0	-	4.9	451.0
Interim Target	280.0	280.0	280.0	280.0	280.0
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	5.4	1081.0	9.1	8.4	649.0
Interim Target	280.0	280.0	280.0	280.0	280.0
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	11.0	1119.0	9.2	10.0	561.0
Interim Target	280.0	280.0	280.0	280.0	280.0
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	8.4	1060.0	10.0	12.0	530.0
Interim Target	280.0	280.0	280.0	280.0	280.0

NB. Major cation

Comments: As highlighted previously, two (2) sample sites (DLP3 and DLP7) presented conductivity levels well above the maximum interim target of 2,000uS/cm⁻¹ stated within the EMP, each of which also expressed similar levels of EC within background testing. The latter also correlates with the high sodium levels shown above, which indicate a high level of saltwater intrusion at these points. This is quite easily explained as the sampling wells were installed in the low-lying portion of the floodplain adjacent to the sections of Mooball Creek and the main agricultural drainage line that are subject to tidal influences. It is also not unexpected in the instance of DLP 7 given that it sits immediately adjacent the existing wetland, which would in itself act as a 'drawer' of permanently saline conditions in order to sustain its dominant vegetative makeup. It is therefore considered likely that some localised salinisation of surficial groundwater has occurred within the vicinity of DLP3 and DLP7 due to tidal influences within these nearby waterways and wetlands.

Table 6: Dunloe Sands - Ground Water - Chemical (Potassium M8 Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	< 5.0	72.0	-	< 5.0	36.0
Interim Target	17.5	17.5	17.5	17.5	17.5
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	< 5.0	< 5.0	< 5.0	< 5.0	28.0
Interim Target	17.5	17.5	17.5	17.5	17.5
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	<5.0	48.0	<5.0	<5.0	30.0
Interim Target	17.5	17.5	17.5	17.5	17.5
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	<5.0	50.0	<5.0	<5.0	28.0
Interim Target	17.5	17.5	17.5	17.5	17.5

NB. Major cation

Comments: As highlighted previously, two samples sites (DLP3 and DLP7) presented conductivity levels well above the maximum interim target of 2,000uS/cm⁻¹ stated within the EMP, each of which also expressed similar levels of EC within background testing. The latter also correlates with the high potassium levels shown above, which indicate a high level of saltwater intrusion at these points. This is quite easily explained as the sampling wells were installed in the low-lying portion of the floodplain adjacent to the sections of Mooball Creek and the main agricultural drainage line that are subject to tidal influences. It is also not unexpected in the instance of DLP 7 given that it sits immediately adjacent the existing wetland, which would in itself act as a 'drawer' of permanently saline conditions in order to sustain its dominant vegetative makeup. It is therefore considered likely that some localised salinisation of surficial groundwater has occurred within the vicinity of DLP3 and DLP7 due to tidal influences within these nearby waterways and wetlands.

Table 7: Dunloe Sands - Ground Water - Chemical (Sulphur as Sulphate Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	3.5	136.0	-	37.0	207.0
Interim Target	175	175	175	175	175
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	4.8	126.0	5.9	42.0	210.0
Interim Target	175	175	175	175	175
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	5.3	143.0	4.3	104.0	214.0
Interim Target	175	175	175	175	175
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	6.7	147.0	8.5	130.0	226.0
Interim Target	175	175	175	175	175

Comments: Minor exceedance was experienced during both sampling periods at DLP 7.

This is quite easily explained as the sampling well is installed in the low-lying portion of the floodplain adjacent the existing wetland, which would in itself act as a 'drawer' of permanently saline conditions in order to sustain its dominant vegetative makeup. We also note that background levels for Sulphate were in the order of 753mg/L. We also note that the Departments recommended criteria for Sulphate, in recognition of background levels) was set at 800mg/L.

Table 8: Dunloe Sands - Ground Water - Chemical (Arsenic Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	< 0.005	< 0.005	-	< 0.005	< 0.005
Interim Target	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Interim Target	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Interim Target	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Interim Target	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

Comments: The samples are fully compliant with the interim targets as set out by the EMP.

Table 9: Dunloe Sands - Ground Water - Chemical (Iron Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	1.34	0.74	-	9.48	0.34
Interim Target	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	1.32	1.25	2.51	17.0	0.28
Interim Target	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	2.49	1.94	1.01	17.0	0.32
Interim Target	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	3.25	2.11	0.89	24.0	1.11
Interim Target	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5

Comments: Minor exceedances of the target iron levels are noted at DLP 6, which again is consistent with background readings of 43mg/L. Ongoing monitoring is recommended, cognisant of background readings.

Table 10: Dunloe Sands - Ground Water - Chemical (Manganese Test) Results (mg/L)

December 2011	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	< 0.01	0.53	-	0.02	0.04
Interim Target	0.15	0.15	0.15	0.15	0.15
March 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	< 0.01	0.51	< 0.01	0.02	0.03
Interim Target	0.15	0.15	0.15	0.15	0.15
June 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	<0.01	0.53	<0.01	0.11	0.05
Interim Target	0.15	0.15	0.15	0.15	0.15
September 2012	DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Sample	<0.01	0.51	<0.01	0.16	0.02
Interim Target	0.15	0.15	0.15	0.15	0.15

Comments: Manganese is typically associated brackish or slightly saline conditions and therefore the readings at DLP3 and DLP6 are entirely expected and consistent with background sampling. No further action required for the minor exceedances.

3.2 Surface Water Results

Quarterly monitoring of the surface waters on site within locations SW 3 to SW 10 sample water for levels of pH (Table 11), EC (Table 12), DO (Table 13), suspended solids (Table 14), phosphorus (Table 15) and nitrogen (Table 16). Samples were collected in December 2011, March 2012, June 2012 and September 2012. Tables present the results compared against the interim target criteria contained within the EMP.

The majority of the samples collected are consistent with the interim target criteria of the EMP. Some variants are illustrated within the results. These variants have been highlighted with bold red text.

Table 11: Dunloe Sands - Surface Water - Chemical (pH Test) Results (pH)

December 2011	SW 3	SW 4	SW 9	SW 10
Sample	6.0	6.4	6.4	6.2
Interim Target	5 – 8.5	5 – 8.5	5 – 8.5	5 – 8.5
March 2012	SW 3	SW 4	SW 9	SW 10
Sample	5.4	6.0	6.1	5.7
Interim Target	5 – 8.5	5 – 8.5	5 – 8.5	5 – 8.5
June 2012	SW 3	SW 4	SW 9	SW 10
Sample	6.0	6.2	6.1	6.4
Interim Target	5 – 8.5	5 – 8.5	5 – 8.5	5 – 8.5
September 2012	SW 3	SW 4	SW 9	SW 10
Sample	6.7	7.0	7.3	7.4
Interim Target	5 – 8.5	5 – 8.5	5 – 8.5	5 – 8.5

Comments: All of the samples taken are compliant with the interim target levels outlined within the EMP.

Table 12: Dunloe Sands - Surface Water - Chemical (EC Test) Results (uS/cm¹)

December 2011	SW 3	SW 4	SW 9	SW 10
Sample	253	1,504	657	492
Interim Target	< 5,500	< 5,500	< 5,500	< 5,500
March 2012	SW 3	SW 4	SW 9	SW 10
Sample	227	458	704	546
Interim Target	< 5,500	< 5,500	< 5,500	< 5,500
June 2012	SW 3	SW 4	SW 9	SW 10
Sample	314	805	575	805
Interim Target	< 5,500	< 5,500	< 5,500	< 5,500
September 2012	SW 3	SW 4	SW 9	SW 10
Sample	17676	23790	13557	12749
Interim Target	< 5,500	< 5,500	< 5,500	< 5,500

Comments: Quarterly sampling from December, March and June are compliant with the interim target levels outlined within the EMP. The September sampling exceeds the target at all sampling sites. It is highly likely, given the readings are consistent with saltwater, that sampling was taken on the incoming tide, which has therefore compromised the sample (this also occurred in baseline sampling resulting in readings of approximately 45,000). This has been conveyed to the proponents for rectification in future sampling.

Table 13: Dunloe Sands - Surface Water - Chemical (DO Test) Results - (mg/L)

December 2011	SW 3	SW 4	SW 9	SW 10
Sample	8.4	5.3	7.8	7.5
Interim Target	> 4	> 4	> 4	> 4
March 2012	SW 3	SW 4	SW 9	SW 10
Sample	5.5	6.8	6.5	4.3
Interim Target	> 4	> 4	> 4	> 4
June 2012	SW 3	SW 4	SW 9	SW 10
Sample	7.8	8.6	5.4	6.7
Interim Target	> 4	> 4	> 4	> 4

September 2012	SW 3	SW 4	SW 9	SW 10
Sample	7.6	7.0	9.1	9.4
Interim Target	> 4	> 4	> 4	> 4

Comments: All of the samples taken are compliant with the interim target levels outlined within the EMP.

Table 14: Dunloe Sands - Surface Water - Chemical (Suspended Solids Test) Results (mg/L)

December 2011	SW 3	SW 4	SW 9	SW 10
Sample	8.0	12.0	13.0	23.0
Interim Target	< 25	< 25	< 25	< 25
March 2012	SW 3	SW 4	SW 9	SW 10
Sample	11.0	6.7	36.0	31.0
Interim Target	< 25	< 25	< 25	< 25
June 2012	SW 3	SW 4	SW 9	SW 10
Sample	12	7.7	10	22
Interim Target	< 25	< 25	< 25	< 25
September 2012	SW 3	SW 4	SW 9	SW 10
Sample	5.2	10	13	14
Interim Target	< 25	< 25	< 25	< 25

Comment: The increased suspended solids reading at SW 9 and SW 10 (in June) are outlier samples when compared to background sampling (which had upper level readings of 43mg/L). It is recommended that these surface water sites are monitored in addition to the function of the flood gates that are upstream of the site, particularly as it relates to Sample Site 10, which traditionally has lower levels than that registered. This higher than normal sample may also be relative to disturbance from stock which are readily accessible to this site.

Table 15: Dunloe Sands - Surface Water - Chemical (Total Phosphorus Test Results (mg/L))

December 2011	SW 3	SW 4	SW 9	SW 10
Sample	0.03	0.03	0.03	0.04
Interim Target	< 0.08	< 0.08	< 0.08	< 0.08
March 2012	SW 3	SW 4	SW 9	SW 10
Sample	0.02	0.03	0.09	0.03
Interim Target	< 0.08	< 0.08	< 0.08	< 0.08
June 2012	SW 3	SW 4	SW 9	SW 10
Sample	0.05	0.04	0.04	0.07
Interim Target	< 0.08	< 0.08	< 0.08	< 0.08
September 2012	SW 3	SW 4	SW 9	SW 10
Sample	0.03	<0.02	0.02	0.04
Interim Target	< 0.08	< 0.08	< 0.08	< 0.08

Comments: Sample SW 9 has shown a minor discrepancy during March sampling but has returned to acceptable levels. There does not appear to be any distinct correlation between the March reading and algal growth.

Table 16: Dunloe Sands - Surface Water - Chemical (Total Nitrogen Test) Results (mg/L)

December 2011	SW 3	SW 4	SW 9	SW 10
Sample	0.50	0.63	0.53	0.54
Interim Target	< 20	< 20	< 20	< 20
March 2012	SW 3	SW 4	SW 9	SW 10
Sample	0.96	0.81	1.31	0.73
Interim Target	< 20	< 20	< 20	< 20
June 2012	SW 3	SW 4	SW 9	SW 10
Sample	0.70	0.78	0.60	0.86
Interim Target	< 20	< 20	< 20	< 20
September 2012	SW 3	SW 4	SW 9	SW 10
Sample	0.52	0.27	0.53	0.84
Interim Target	< 20	< 20	< 20	< 20

Comments: All of the samples taken are compliant with the interim target levels outlined within the EMP.

3.3 Dust Monitoring

Due to functional issues in taking dust samples, it has been recommended that additional (new) background dust monitoring be commissioned. At the time of writing, high volume particulate matter sampling had been commissioned and should be completed shortly. This will be reported on at the next CCC meeting along with the six monthly monitoring reports.

3.4 Vegetation Rehabilitation & Regeneration

Monitoring of the proposed regeneration has been ongoing and to date has progressed well, primarily due to the investment in secure fencing surrounding the regeneration precincts.

Chapter 4.0 Conclusion



4.1 Conclusion

This report represents the ongoing monitoring for the operation of the Dunloe Sands Quarry. It is to be utilised in respect of operational compliance and environmental characteristics on the site, as well as to be cross referenced with future monitoring reports. This will allow the identification of potential trends and areas requiring intervention and environmental amelioration.

The results within this report demonstrate that the environmental characteristics on-site remain consistent with background readings and within the acceptable limit set out within the consent and approved EMP.

Brock Lamont
Town Planner
Planit Consulting

November 2012

Adam Smith
Director
Planit Consulting

November 2012

Steve Petersen
Director
RAMTECH

November 2012

Appendix A Ground Water Location Map





Legend

-  Stage 01 Ground Water Monitoring Location
-  Stage 02 Ground Water Monitoring Location
-  Stage 01 & 02 Ground Water Monitoring Location
-  Excavation Area



Appendix B Surface Water Location Map





Legend

 Stage 01 & 02 Surfacewater Monitoring Location

 Excavation Area



Appendix C Sampling Raw Data



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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/1478-A
Copy To: Fax: 02 6672 3896 **Client Reference:**
Date of Report: 31/05/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 30/05/2012 **Date Testing Commenced:** 30/05/2012
Date Received: 30/05/2012 **Date Testing Completed:** 31/05/2012

Sample Description: Dunloe Sands Lake Water Sample - Algae

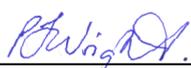
LIMS NO.	Sample/Site No	Sample/Site Description
12/1478-A/1	1	Lake Water

COMMENTS:

Results refer to samples as received at the Laboratory.



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(Laboratory Coordinator)
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Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address: 30-32 Lundberg Drive
MURWILLUMBAH

Attention: Steve Peterson

Sample Description: Dunloe Sands Lake Water Sample - Algae

Lims1 Report No: 12/1478-A
Date Testing Completed: 31/05/2012
Date of Report: 31/05/2012

	Algal Identification	Method Code	Units	Count
LIMS NO.	12/1478-A/1			
	Mixed Algae (No Cyanophyta Detected)	B9	cells/mL	<100



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Date of Report: 13/06/2012

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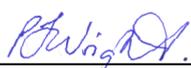
Taken By: Client **No of Samples:** 6
Date Taken: 30/05/2012 **Date Testing Commenced:** 30/05/2012
Date Received: 30/05/2012 **Date Testing Completed:** 13/06/2012

Sample Description: Dunloe Sands Water Samples - Chemical

Sample/Site No	Sample/Site Description
1	DLP 1
2	DLP 3
3	DLP 5
4	DLP 6
5	DLP 7
6	Lake Sample



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Attention: Steve Peterson

Lims1 Report No: 12/1478-C

Date Testing Completed: 13/06/2012

Date of Report: 13/06/2012

Sample Description: Dunloe Sands Water Samples - Chemical

COMMENTS:

Results refer to samples as received at the Laboratory.

* Tests not covered by NATA accreditation.

Dissolved Oxygen, Redox and pH should be performed on site.

The results may not reflect the true level at the time of sampling.

Tweed Laboratory Centre

Client: Ramtech Pty Ltd
Address: 30-32 Lundberg Drive
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 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/1478-C
Date Testing Completed: 13/06/2012
Date of Report: 13/06/2012

Sample Description: Dunloe Sands Water Samples - Chemical

Sample Identification:			DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Date Taken:			30/05/2012	30/05/2012	30/05/2012	30/05/2012	30/05/2012
Date Received:			30/05/2012	30/05/2012	30/05/2012	30/05/2012	30/05/2012
Date Testing Commenced:			30/05/2012	30/05/2012	30/05/2012	30/05/2012	30/05/2012
Test	Method	Units	12/1478-C-1	12/1478-C-2	12/1478-C-3	12/1478-C-4	12/1478-C-5
pH	P1	pH units	4.2	6.6	4.7	3.8	7.4
Conductivity	P2	μScm^{-1}	98	7,074	92	302	3,451
DO (membrane electrode)	P12	mg/L	3.3	2.3	4.6	1	3.6
*Redox Potential	P16	mV	+435	+317	+386	+464	+241
Turbidity	P8	ntu	--	--	--	--	--
Suspended Solids	P4	mg/L	--	--	--	--	--
Oil and Grease	C8	mg/L	--	--	--	--	--
Total Phosphorus-P	C17	mg/L	--	--	--	--	--
Total-N	C7	mg/L	--	--	--	--	--

Sample Identification:			Lake Sample
Date Taken:			30/05/2012
Date Received:			30/05/2012
Date Testing Commenced:			30/05/2012
Test	Method	Units	12/1478-C-6
pH	P1	pH units	5.8
Conductivity	P2	μScm^{-1}	133
DO (membrane electrode)	P12	mg/L	8.9
*Redox Potential	P16	mV	--
Turbidity	P8	ntu	190
Suspended Solids	P4	mg/L	84
Oil and Grease	C8	mg/L	<2
Total Phosphorus-P	C17	mg/L	0.09
Total-N	C7	mg/L	0.66

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Date of Report: 10/07/2012

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Taken By: Client **No of Samples:** 4
Date Taken: 27/06/2012 **Date Testing Commenced:** 27/06/2012
Date Received: 27/06/2012 **Date Testing Completed:** 10/07/2012

Sample Description: Dunloe Sands SW Water Samples - Chemical

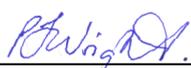
Sample/Site No	Sample/Site Description
1	SW 3
2	SW 4
3	SW 9
4	SW 10

COMMENTS:

Results refer to samples as received at the Laboratory.
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Attention: Steve Peterson

Lims1 Report No: 12/1732-C
Date Testing Completed: 10/07/2012
Date of Report: 10/07/2012

Sample Description: Dunloe Sands SW Water Samples - Chemical

Sample Identification:			SW 3	SW 4	SW 9	SW 10
Date Taken:			27/06/2012	27/06/2012	27/06/2012	27/06/2012
Date Received:			27/06/2012	27/06/2012	27/06/2012	27/06/2012
Date Testing Commenced:			27/06/2012	27/06/2012	27/06/2012	27/06/2012
Test	Method	Units	12/1732-C-1	12/1732-C-2	12/1732-C-3	12/1732-C-4
pH	P1	pH units	6.0	6.2	6.1	6.4
Conductivity	P2	μScm^{-1}	314	805	575	805
DO (membrane electrode)	P12	mg/L	7.8	8.6	5.4	6.7
Turbidity	P8	NTU	36	26	25	45
Suspended Solids	P4	mg/L	12	7.7	10	22
Total-N	C7	mg/L	0.70	0.78	0.60	0.86
Total Phosphorus-P	C17	mg/L	0.05	0.04	0.04	0.07
Calcium	M8	mg/L	8.2	10.0	32.0	35.0

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Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
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Date of Report: 10/07/2012

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Taken By: Client **No of Samples:** 5
Date Taken: 27/06/2012 **Date Testing Commenced:** 27/06/2012
Date Received: 27/06/2012 **Date Testing Completed:** 10/07/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample/Site No	Sample/Site Description
1	DLP 1
2	DLP 3
3	DLP 5
4	DLP 6
5	DLP 7

COMMENTS:

Results refer to samples as received at the Laboratory.

* Tests not covered by NATA accreditation.

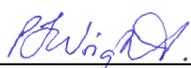
Dissolved Oxygen, Conductivity, Redox and pH should be performed on site.

The results may not reflect the true level at the time of sampling.

NP = Not Present.



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Lims1 Report No: 12/1731-C
Date Testing Completed: 10/07/2012
Date of Report: 10/07/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample Identification:			DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Date Taken:			27/06/2012	27/06/2012	27/06/2012	27/06/2012	27/06/2012
Date Received:			27/06/2012	27/06/2012	27/06/2012	27/06/2012	27/06/2012
Date Testing Commenced:			27/06/2012	27/06/2012	27/06/2012	27/06/2012	27/06/2012
Test	Method	Units	12/1731-C-1	12/1731-C-2	12/1731-C-3	12/1731-C-4	12/1731-C-5
pH	P1	pH units	4.2	6.7	4.8	4.0	7.5
Conductivity	P2	μScm^{-1}	105	7,057	81	324	3,446
DO (membrane electrode)	P12	mg/L	3.8	6.6	6.6	2.8	5.0
*Redox Potential	P16	mV	+405	+315	+347	+345	+249
P-Alkalinity as CaCO ₃	C10	mg/L	NP	NP	NP	NP	NP
Alkalinity as CaCO ₃	C10	mg/L	<1	150	2	<1	550
Bicarbonate HCO ₃	C10	mg/L	<1	94	1	<1	336
Chloride	C20	mg/L	20	2,220	17	14	700
Calcium	M8	mg/L	0.6	70.0	0.6	7.3	17.0
Magnesium	M8	mg/L	0.6	112.0	1.3	12.0	36.0
Sodium	M8	mg/L	11.0	1,119.0	9.2	10.0	561.0
Potassium M8	M8	mg/L	<5.0	48.0	<5.0	<5.0	30.0
Sulphur as Sulphate	M8	mg/L	5.3	143.0	4.3	104.0	214.0
Aluminium (Total)	M8	mg/L	0.56	0.10	0.37	0.72	0.34
Arsenic (Total)	M7	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Iron (Total)	M8	mg/L	2.49	1.94	1.01	17.0	0.32
Manganese (Total)	M8	mg/L	<0.01	0.53	<0.01	0.11	0.05



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Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/1730-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 10/07/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 27/06/2012 **Date Testing Commenced:** 27/06/2012
Date Received: 27/06/2012 **Date Testing Completed:** 10/07/2012

Sample Description: Dunloe Sands Lake Water Sample - Chemical

Sample/Site No	Sample/Site Description
1	Lake 1

COMMENTS:

Results refer to samples as received at the Laboratory.

* Tests not covered by NATA accreditation.

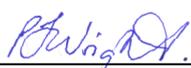
Dissolved Oxygen, Conductivity and pH should be performed on site.

The results may not reflect the true level at the time of sampling.

NP = Not Present.



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Dr Paul J Wright
(Laboratory Coordinator)
paulw@tweed.nsw.gov.au

Tweed Laboratory Centre

Client: Ramtech Pty Ltd
Address: 30-32 Lundberg Drive
 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/1730-C
Date Testing Completed: 10/07/2012
Date of Report: 10/07/2012

Sample Description: Dunloe Sands Lake Water Sample - Chemical

Sample Identification:			Lake 1
Date Taken:			27/06/2012
Date Received:			27/06/2012
Date Testing Commenced:			27/06/2012
Test	Method	Units	12/1730-C-1
pH	P1	pH units	6.0
Conductivity	P2	μScm^{-1}	143
DO (membrane electrode)	P12	mg/L	9.4
P-Alkalinity as CaCO ₃	C10	mg/L	NP
Alkalinity as CaCO ₃	C10	mg/L	3
Bicarbonate HCO ₃	C10	mg/L	2
Turbidity	P8	NTU	34
Suspended Solids	P4	mg/L	23
Oil and Grease	C8	mg/L	4
Total Phosphorus-P	C17	mg/L	0.04
Total-N	C7	mg/L	0.38
Chloride	C20	mg/L	8
Calcium	M8	mg/L	13.0
Magnesium	M8	mg/L	1.5
Sodium	M8	mg/L	6.3
Potassium M8	M8	mg/L	<5.0
Sulphur as Sulphate	M8	mg/L	41.0
Aluminium (Total)	M8	mg/L	1.21
Arsenic (Total)	M7	mg/L	<0.005
Iron (Total)	M8	mg/L	1.01
Manganese (Total)	M8	mg/L	0.03



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www.tweedlab.com.au

FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 3
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/1729-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 02/07/2012

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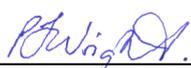
Taken By: Client **No of Samples:** 4
Date Taken: 27/06/2012 **Date Testing Commenced:** 27/06/2012
Date Received: 27/06/2012 **Date Testing Completed:** 02/07/2012

Sample Description: Dunloe Sands-Lake Depth Water Samples - Chemical

Sample/Site No	Sample/Site Description
1	Lake - 2m
2	Lake - 3m
3	Lake - 4m
4	Lake - 5m



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Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address: 30-32 Lundberg Drive

MURWILLUMBAH

NSW 2484

Attention: Steve Peterson

Lims1 Report No: 12/1729-C

Date Testing Completed: 02/07/2012

Date of Report: 02/07/2012

Sample Description: Dunloe Sands-Lake Depth Water Samples - Chemical

COMMENTS:

Results refer to samples as received at the Laboratory.

* Tests not covered by NATA accreditation.

Dissolved Oxygen, Redox and pH should be performed on site.

The results may not reflect the true level at the time of sampling.

Tweed Laboratory Centre

Client: Ramtech Pty Ltd
Address: 30-32 Lundberg Drive
 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/1729-C
Date Testing Completed: 02/07/2012
Date of Report: 02/07/2012

Sample Description: Dunloe Sands-Lake Depth Water Samples - Chemical

Sample Identification:			Lake - 2m	Lake - 3m	Lake - 4m	Lake - 5m
Date Taken:			27/06/2012	27/06/2012	27/06/2012	27/06/2012
Date Received:			27/06/2012	27/06/2012	27/06/2012	27/06/2012
Date Testing Commenced:			27/06/2012	27/06/2012	27/06/2012	27/06/2012
Test	Method	Units	12/1729-C-1	12/1729-C-2	12/1729-C-3	12/1729-C-4
pH	P1	pH units	6.1	6.1	6.2	6.5
Conductivity	P2	μScm^{-1}	144	144	144	144
DO (membrane electrode)	P12	mg/L	9.4	9.5	9.6	9.5
*Redox Potential	P16	mV	+257	+267	+264	+261



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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/1729-A
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 28/06/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 27/06/2012 **Date Testing Commenced:** 27/06/2012
Date Received: 27/06/2012 **Date Testing Completed:** 27/06/2012

Sample Description: Dunloe Sands Lake Water Sample - Algae

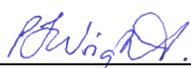
LIMS NO.	Sample/Site No	Sample/Site Description
12/1729-A/1	1	Lake Water

COMMENTS:

Results refer to samples as received at the Laboratory.



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Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address:
30-32 Lundberg Drive
MURWILLUMBAH

Attention: Steve Peterson

Sample Description: Dunloe Sands Lake Water Sample - Algae

Lims1 Report No: 12/1729-A
Date Testing Completed: 27/06/2012
Date of Report: 28/06/2012

	Algal Identification	Method Code	Units	Count
LIMS NO.	12/1729-A/1			
	<i>Phormidium</i> (Cyanophyta)	B9	cells/mL	130
	<i>Phormidium</i> Biovolume	B20	mm ³ /L	<0.01



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Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2303-A
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 28/08/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 27/08/2012 **Date Testing Commenced:** 27/08/2012
Date Received: 27/08/2012 **Date Testing Completed:** 27/08/2012

Sample Description: Dunloe Sands Lake Water Sample - Algae

LIMS NO.	Sample/Site No	Sample/Site Description
12/2303-A/1	1	Lake Water

COMMENTS:

Results refer to samples as received at the Laboratory.



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Sally Everson
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sallye@tweed.nsw.gov.au

Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address:
30-32 Lundberg Drive
MURWILLUMBAH

Attention: Steve Peterson

Sample Description: Dunloe Sands Lake Water Sample - Algae

Lims1 Report No: 12/2303-A
Date Testing Completed: 27/08/2012
Date of Report: 28/08/2012

LIMS NO.	Algal Identification	Method Code	Units	Count
12/2303-A/1				
	<i>Pseudanabaena</i> (Cyanophyta)	B9	cells/mL	24,640
	<i>Pseudanabaena</i> Biovolume	B20	mm ³ /L	0.59
	Chlorophyta	B9	cells/mL	3,720



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Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
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Attention: Steve Peterson **Lims1 Report No:** 12/2010-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 30/07/2012

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Taken By: Client **No of Samples:** 5
Date Taken: 26/07/2012 **Date Testing Commenced:** 26/07/2012
Date Received: 26/07/2012 **Date Testing Completed:** 30/07/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample/Site No	Sample/Site Description
1	DLP 1
2	DLP 3
3	DLP 5
4	DLP 6
5	DLP 7

COMMENTS:

Results refer to samples as received at the Laboratory.

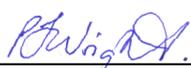
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Dissolved Oxygen, Conductivity, Redox and pH should be performed on site.

The results may not reflect the true level at the time of sampling.



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Tweed Laboratory Centre

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 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/2010-C
Date Testing Completed: 30/07/2012
Date of Report: 30/07/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample Identification:			DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Date Taken:			26/07/2012	26/07/2012	26/07/2012	26/07/2012	26/07/2012
Date Received:			26/07/2012	26/07/2012	26/07/2012	26/07/2012	26/07/2012
Date Testing Commenced:			26/07/2012	26/07/2012	26/07/2012	26/07/2012	26/07/2012
Test	Method	Units	12/2010-C-1	12/2010-C-2	12/2010-C-3	12/2010-C-4	12/2010-C-5
pH	P1	pH units	4.3	6.6	4.7	4.6	7.4
Conductivity	P2	μScm^{-1}	87	7,093	92	331	3,434
DO (membrane electrode)	P12	mg/L	5.1	3.6	3.7	3.3	3.4
*Redox Potential	P16	mV	+374	+284	+313	+14	-15



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Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2009-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 09/08/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 26/07/2012 **Date Testing Commenced:** 26/07/2012
Date Received: 26/07/2012 **Date Testing Completed:** 09/08/2012

Sample Description: Dunloe Sands Lake Water Sample - Chemical

Sample/Site No	Sample/Site Description
1	Lake Water

COMMENTS:

Results refer to samples as received at the Laboratory.

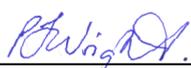
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Dr Paul J Wright
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paulw@tweed.nsw.gov.au

Tweed Laboratory Centre

Client: Ramtech Pty Ltd
Address: 30-32 Lundberg Drive
 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/2009-C
Date Testing Completed: 09/08/2012
Date of Report: 09/08/2012

Sample Description: Dunloe Sands Lake Water Sample - Chemical

Sample Identification:			Lake Water
Date Taken:			26/07/2012
Date Received:			26/07/2012
Date Testing Commenced:			26/07/2012
Test	Method	Units	12/2009-C-1
pH	P1	pH units	7.0
Conductivity	P2	μScm^{-1}	164
DO (membrane electrode)	P12	mg/L	9.4
Turbidity	P8	NTU	18
Suspended Solids	P4	mg/L	15
Oil and Grease	C8	mg/L	<2
Total Phosphorus-P	C17	mg/L	0.02
Total-N	C7	mg/L	33.00



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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2009-A
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 27/07/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 26/07/2012 **Date Testing Commenced:** 26/07/2012
Date Received: 26/07/2012 **Date Testing Completed:** 26/07/2012

Sample Description: Dunloe Sands Lake Water Sample - Algae

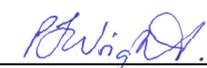
LIMS NO.	Sample/Site No	Sample/Site Description
12/2009-A/1	1	Lake Water

COMMENTS:

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Dr Paul J Wright
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paulw@tweed.nsw.gov.au

Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address:
30-32 Lundberg Drive
MURWILLUMBAH

Attention: Steve Peterson

Sample Description: Dunloe Sands Lake Water Sample - Algae

Lims1 Report No: 12/2009-A
Date Testing Completed: 26/07/2012
Date of Report: 27/07/2012

LIMS NO.	Algal Identification	Method Code	Units	Count
12/2009-A/1				
	<i>Pseudanabaena</i> (Cyanophyta)	B9	cells/mL	16360
	<i>Pseudanabaena</i> Biovolume	B20	mm ³ /L	0.39
	Chlorophyta	B9	cells/mL	2520



Tweed Laboratory Centre, 46 Enterprise Avenue, Tweed Heads South NSW 2486 Australia
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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2303-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 11/09/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 27/08/2012 **Date Testing Commenced:** 27/08/2012
Date Received: 27/08/2012 **Date Testing Completed:** 11/09/2012

Sample Description: Dunloe Sands Lake Water Sample - Chemical

Sample/Site No	Sample/Site Description
1	Lake Water

COMMENTS:

Results refer to samples as received at the Laboratory.

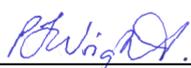
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Tweed Laboratory Centre

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Address: 30-32 Lundberg Drive
 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/2303-C
Date Testing Completed: 11/09/2012
Date of Report: 11/09/2012

Sample Description: Dunloe Sands Lake Water Sample - Chemical

Test	Method	Units	12/2303-C-1
Sample Identification:			Lake Water
Date Taken:			27/08/2012
Date Received:			27/08/2012
Date Testing Commenced:			27/08/2012
pH	P1	pH units	5.7
Conductivity	P2	μScm^{-1}	188
DO (membrane electrode)	P12	mg/L	9.3
*Redox Potential	P16	mV	+168
Turbidity	P8	NTU	100
Suspended Solids	P4	mg/L	70
Oil and Grease	C8	mg/L	2
Total Phosphorus-P	C17	mg/L	0.04
Total-N	C7	mg/L	0.44



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Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2304-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 30/08/2012

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Taken By: Client **No of Samples:** 5
Date Taken: 27/08/2012 **Date Testing Commenced:** 27/08/2012
Date Received: 27/08/2012 **Date Testing Completed:** 30/08/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample/Site No	Sample/Site Description
1	DLP 1
2	DLP 3
3	DLP 5
4	DLP 6
5	DLP 7

COMMENTS:

Results refer to samples as received at the Laboratory.

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The results may not reflect the true level at the time of sampling.



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Tania Collins
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tcollins@tweed.nsw.gov.au

Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address: 30-32 Lundberg Drive

MURWILLUMBAH

NSW 2484

Attention: Steve Peterson

Lims1 Report No: 12/2304-C

Date Testing Completed: 30/08/2012

Date of Report: 30/08/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample Identification:			DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Date Taken:			27/08/2012	27/08/2012	27/08/2012	27/08/2012	27/08/2012
Date Received:			27/08/2012	27/08/2012	27/08/2012	27/08/2012	27/08/2012
Date Testing Commenced:			27/08/2012	27/08/2012	27/08/2012	27/08/2012	27/08/2012
Test	Method	Units	12/2304-C-1	12/2304-C-2	12/2304-C-3	12/2304-C-4	12/2304-C-5
pH	P1	pH units	4.2	6.7	4.6	4.4	7.6
Conductivity	P2	μScm^{-1}	98	7,343	103	419	3,492
DO (membrane electrode)	P12	mg/L	2.1	1.8	3.4	2.0	2.5
*Redox Potential	P16	mV	+365	+193	+292	+84	+24



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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2620-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 09/10/2012

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Taken By: Client **No of Samples:** 4
Date Taken: 27/09/2012 **Date Testing Commenced:** 27/09/2012
Date Received: 27/09/2012 **Date Testing Completed:** 09/10/2012

Sample Description: Dunloe Sands SW Water Samples - Chemical

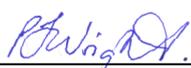
Sample/Site No	Sample/Site Description
1	SW 3
2	SW 4
3	SW 9
4	SW 10

COMMENTS:

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Dr Paul J Wright
(Laboratory Coordinator)
paulw@tweed.nsw.gov.au

Tweed Laboratory Centre

Client: Ramtech Pty Ltd
Address: 30-32 Lundberg Drive
 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/2620-C
Date Testing Completed: 09/10/2012
Date of Report: 09/10/2012

Sample Description: Dunloe Sands SW Water Samples - Chemical

Sample Identification:			SW 3	SW 4	SW 9	SW 10
Date Taken:			27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date Received:			27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date Testing Commenced:			27/09/2012	27/09/2012	27/09/2012	27/09/2012
Test	Method	Units	12/2620-C-1	12/2620-C-2	12/2620-C-3	12/2620-C-4
pH	P1	pH units	6.7	7.0	7.3	7.4
Conductivity	P2	μScm^{-1}	17,676	23,790	13,557	12,749
DO (membrane electrode)	P12	mg/L	7.6	7.0	9.1	9.4
Turbidity	P8	NTU	10	5.1	4.8	7.7
Suspended Solids	P4	mg/L	5.2	10	13	14
Total Phosphorus-P	C17	mg/L	0.03	<0.02	0.02	0.04
Total-N	C7	mg/L	0.52	0.27	0.53	0.84

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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2619-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 04/10/2012

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Taken By: Client **No of Samples:** 5
Date Taken: 27/09/2012 **Date Testing Commenced:** 27/09/2012
Date Received: 27/09/2012 **Date Testing Completed:** 04/10/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample/Site No	Sample/Site Description
1	DLP 1
2	DLP 3
3	DLP 5
4	DLP 6
5	DLP 7

COMMENTS:

Results refer to samples as received at the Laboratory.

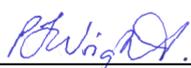
* Tests not covered by NATA accreditation.

Dissolved Oxygen, Conductivity and pH should be performed on site.

The results may not reflect the true level at the time of sampling.



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Dr Paul J Wright
(Laboratory Coordinator)
paulw@tweed.nsw.gov.au

Tweed Laboratory Centre

Client: Ramtech Pty Ltd
Address: 30-32 Lundberg Drive
 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/2619-C
Date Testing Completed: 04/10/2012
Date of Report: 04/10/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample Identification:			DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Date Taken:			27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date Received:			27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date Testing Commenced:			27/09/2012	27/09/2013	27/09/2014	27/09/2015	27/09/2012
Test	Method	Units	12/2619-C-1	12/2619-C-2	12/2619-C-3	12/2619-C-4	12/2619-C-5
pH	P1	pH units	4.2	6.4	4.5	4.3	7.4
Conductivity	P2	μScm^{-1}	94	7,130	102	363	3,385
DO (membrane electrode)	P12	mg/L	2.6	2.4	2.6	2.2	2.1
*Redox Potential	P16	mV	+305	+249	+266	+279	+154
P-Alkalinity as CaCO ₃	C10	mg/L	NP	NP	NP	NP	NP
Alkalinity as CaCO ₃	C10	mg/L	<1	120	<1	<1	430
Bicarbonate HCO ₃	C10	mg/L	<1	75	<1	<1	265
Chloride	C20	mg/L	15	2,280	19	15	730
Calcium	M8	mg/L	0.5	63.0	0.7	11.0	15.0
Magnesium	M8	mg/L	0.3	100.0	1.4	14.0	32.0
Sodium	M8	mg/L	8.4	1,060.0	10.0	12.0	530.0
Potassium M8	M8	mg/L	<5.0	50.0	<5.0	<5.0	28.0
Sulphur as Sulphate	M8	mg/L	6.7	147.0	8.5	130.0	226.0
Aluminium (Total)	M8	mg/L	0.70	0.05	0.59	1.34	0.60
Arsenic (Total)	M7	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Iron (Total)	M8	mg/L	3.25	2.11	0.89	24.0	1.11
Manganese (Total)	M8	mg/L	<0.01	0.51	<0.01	0.16	0.02

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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2618-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 09/10/2012

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Taken By: Client **No of Samples:** 4
Date Taken: 27/09/2012 **Date Testing Commenced:** 27/09/2012
Date Received: 27/09/2012 **Date Testing Completed:** 09/10/2012

Sample Description: Dunloe Sands Lake Water Samples - Chemical

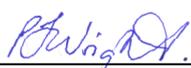
Sample/Site No	Sample/Site Description
1	Lake - 1m
2	Lake - 2m
3	Lake - 3m
4	Lake - 4m

COMMENTS:

Results refer to samples as received at the Laboratory.
* Tests not covered by NATA accreditation.
Dissolved Oxygen, Conductivity and pH should be performed on site.
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Tweed Laboratory Centre

Client: Ramtech Pty Ltd
Address: 30-32 Lundberg Drive
 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/2618-C
Date Testing Completed: 09/10/2012
Date of Report: 09/10/2012

Sample Description: Dunloe Sands Lake Water Samples - Chemical

Sample Identification:			Lake - 1m	Lake - 2m	Lake - 3m	Lake - 4m
Date Taken:			27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date Received:			27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date Testing Commenced:			27/09/2012	27/09/2013	27/09/2014	27/09/2015
Test	Method	Units	12/2618-C-1	12/2618-C-2	12/2618-C-3	12/2618-C-4
pH	P1	pH units	4.6	4.6	4.6	4.6
Conductivity	P2	μScm^{-1}	214	214	214	213
DO (membrane electrode)	P12	mg/L	8.2	8.2	8.2	8.2
Alkalinity as CaCO ₃	C10	mg/L	<1	--	--	--
Bicarbonate HCO ₃	C10	mg/L	<1	--	--	--
Turbidity	P8	NTU	7.8	2.2	14	5.8
Suspended Solids	P4	mg/L	11	4.5	30	9.2
Oil and Grease	C8	mg/L	<2	--	--	--
Total Phosphorus-P	C17	mg/L	0.02	0.02	0.03	0.02
Chloride	C20	mg/L	10	--	--	--
Calcium	M8	mg/L	22.0	--	--	--
Magnesium	M8	mg/L	1.9	--	--	--
Sodium	M8	mg/L	9.0	--	--	--
Potassium M8	M8	mg/L	<5.0	--	--	--
Sulphur as Sulphate	M8	mg/L	65.0	--	--	--
Aluminium (Total)	M8	mg/L	0.47	--	--	--
Arsenic (Total)	M7	mg/L	<0.005	--	--	--
Iron (Total)	M8	mg/L	0.41	--	--	--
Manganese (Total)	M8	mg/L	0.05	--	--	--

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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2618-A
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 28/09/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 27/09/2012 **Date Testing Commenced:** 27/09/2012
Date Received: 27/09/2012 **Date Testing Completed:** 27/09/2012

Sample Description: Dunloe Sands Lake Water Sample - Algae

LIMS NO.	Sample/Site No	Sample/Site Description
12/2618-A/1	1	Lake Water

COMMENTS:

Results refer to samples as received at the Laboratory.



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Sally Everson
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sallye@tweed.nsw.gov.au

Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address:
30-32 Lundberg Drive
MURWILLUMBAH

Attention: Steve Peterson

Sample Description: Dunloe Sands Lake Water Sample - Algae

Lims1 Report No: 12/2618-A
Date Testing Completed: 27/09/2012
Date of Report: 28/09/2012

	Algal Identification	Method Code	Units	Count
LIMS NO.	12/2618-A/1			
	<i>Pseudanabaena</i> (Cyanophyta)	B9	cells/mL	68,000
	<i>Pseudanabaena</i> Biovolume	B20	mm ³ /L	1.62
	Chlorophyta	B9	cells/mL	35,000
	Cryptophyta (Cryptophytes)	B9	cells/mL	80



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Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
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NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2917-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 30/10/2012

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Taken By: Client **No of Samples:** 5
Date Taken: 29/10/2012 **Date Testing Commenced:** 29/10/2012
Date Received: 29/10/2012 **Date Testing Completed:** 30/10/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

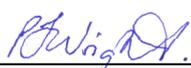
Sample/Site No	Sample/Site Description
1	DLP 1
2	DLP 3
3	DLP 5
4	DLP 6
5	DLP 7

COMMENTS:

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Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address: 30-32 Lundberg Drive

MURWILLUMBAH

NSW 2484

Attention: Steve Peterson

Lims1 Report No: 12/2917-C

Date Testing Completed: 30/10/2012

Date of Report: 30/10/2012

Sample Description: Dunloe Sands DLP Water Samples - Chemical

Sample Identification:			DLP 1	DLP 3	DLP 5	DLP 6	DLP 7
Date Taken:			29/10/2012	29/10/2012	29/10/2012	29/10/2012	29/10/2012
Date Received:			29/10/2012	29/10/2012	29/10/2012	29/10/2012	29/10/2012
Date Testing Commenced:			29/10/2012	29/10/2012	29/10/2012	29/10/2012	29/10/2012
Test	Method	Units	12/2917-C-1	12/2917-C-2	12/2917-C-3	12/2917-C-4	12/2917-C-5
pH	P1	pH units	4.6	6.3	4.4	4.4	7.2
Conductivity	P2	μScm^{-1}	96	7,177	108	425	3,416
DO (membrane electrode)	P12	mg/L	5.8	4.8	2.2	4.9	1.7
*Redox Potential	P16	mV	+208	+146	+288	+127	+52

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FINAL CERTIFICATE OF ANALYSIS

Client: Ramtech Pty Ltd Page 1 of 2
Address: 30-32 Lundberg Drive
MURWILLUMBAH
NSW 2484

Attention: Steve Peterson **Lims1 Report No:** 12/2916-C
Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 09/11/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 29/10/2012 **Date Testing Commenced:** 29/10/2012
Date Received: 29/10/2012 **Date Testing Completed:** 09/11/2012

Sample Description: Dunloe Sands Lake Water Sample - Chemical

Sample/Site No	Sample/Site Description
1	Lake Water

COMMENTS:

Results refer to samples as received at the Laboratory.

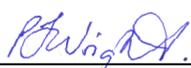
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 MURWILLUMBAH
 NSW 2484
Attention: Steve Peterson

Lims1 Report No: 12/2916-C
Date Testing Completed: 09/11/2012
Date of Report: 09/11/2012

Sample Description: Dunloe Sands Lake Water Sample - Chemical

Sample Identification: Date Taken: Date Received: Date Testing Commenced: Test	Method	Units	Lake Water 29/10/2012 29/10/2012 29/10/2012 12/2916-C-1
pH	P1	pH units	4.2
Conductivity	P2	μScm^{-1}	246
DO (membrane electrode)	P12	mg/L	8.5
Turbidity	P8	NTU	2.9
Suspended Solids	P4	mg/L	4.0
Oil and Grease	C8	mg/L	<2
Total Phosphorus-P	C17	mg/L	<0.02
Total-N	C7	mg/L	0.09



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Copy To: Fax: 02 6672 3896 & Adam Smith **Client Reference:**
Date of Report: 30/10/2012

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Taken By: Client **No of Samples:** 1
Date Taken: 29/10/2012 **Date Testing Commenced:** 29/10/2012
Date Received: 29/10/2012 **Date Testing Completed:** 30/10/2012

Sample Description: Dunloe Sands Lake Water Sample - Algae

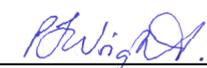
LIMS NO.	Sample/Site No	Sample/Site Description
12/2916-A/1	1	Lake Water

COMMENTS:

Results refer to samples as received at the Laboratory.



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Tweed Laboratory Centre

Client: Ramtech Pty Ltd

Address: 30-32 Lundberg Drive
MURWILLUMBAH

Attention: Steve Peterson

Sample Description: Dunloe Sands Lake Water Sample - Algae

Lims1 Report No: 12/2916-A
Date Testing Completed: 30/10/2012
Date of Report: 30/10/2012

	Algal Identification	Method Code	Units	Count
LIMS NO.	12/2916-A/1			
	Mixed Algae (No Cyanophyta Detected)	B9	cells/mL	<100

