



Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

■ October 2015

Pacifico Project Number: WC2NH



A team consisting of RMS and Pacifico (ACCIONA Ferrovial JV) to upgrade the Pacific Highway at Warrell Creek to Nambucca Heads

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1. Introduction

Environmental Protection Licence (EPL) 20533 was issued to ACCIONA Infrastructure for the Warrell Creek to Nambucca Heads Pacific Highway Upgrade project on the 16th December 2014. Condition R1.8 of the EPL requires the licensee to provide the EPA with a monthly report containing the following information:

- a) details of all non-compliances with the conditions of this licence and measures taken, or proposed, to prevent a recurrence of such a non-compliance; and
- b) details of all discharges from the sediment basins where the water quality results exceed the limits prescribed by Condition L2.4 including the results of rainfall measurements to demonstrate compliance with Condition M4.1; and

The report referred to in this condition must be received by the EPA within 10 working days of the end of each month.

This document has been prepared to fulfil the requirements of Condition R1.8.

1.1 Description of Works

The project's construction activities during October 2015 were limited to the following:

- Clearing and Grubbing;
- Topsoil stripping;
- Earthworks including crushing;
- Production blasting;
- Commencement of piling including driven piling;
- Continuing bridge works including temporary work platforms;
- Earthworks through the flying fox area;
- Installation of erosion and sediment controls;
- Installation of permanent boundary fencing;
- Installation of monitoring instruments – extensometers, inclinometers and piezometers
- Continuing culvert installation;
- Site compound establishment (Northern Compound);
- Geotechnical Investigations;
- Installation of temporary waterway crossings; and
- Site Survey.
- Williamson Creek Realignment

The works scheduled for next month include:

- Clearing and Grubbing;
- Topsoil stripping;
- Earthworks including crushing;
- Production blasting;
- Commencement of piling including driven piling;
- Continuing bridge works including temporary work platforms;
- Earthworks through the flying fox area;
- Installation of erosion and sediment controls;

- Installation of permanent boundary fencing;
- Installation of monitoring instruments – extensometers, inclinometers and piezometers
- Continuing culvert installation;
- Site compound establishment (Northern Compound);
- Geotechnical Investigations;
- Installation of temporary waterway crossings; and
- Site Survey.
- Williamson Creek Realignment

1.2 Consultation Activities

The project’s consultation activities during October 2015 included various community letterbox drop notifications and the following:

Groups	Date	Key Topics
Environmental Review Group	20/10/15	Construction Progress, Design Update, Upcoming works, EWMS discussion, Environmental Update, Monitoring update.
Emergency Services meeting	22/10/15	General project update, girder delivery planning, upcoming temporary works, North facing ramps at North Macksville, highway patrol and a Safety update.
Drop-in session	6/10/15	The purpose of this particular drop-in session was to present the north facing ramps proposed by RMS for North Macksville to interested community members and obtain feedback about the preferred design.

At House Noise Treatments

The At House noise treatment program is currently being managed by RMS and is not part of the ACCIONA (Pacífico) Scope of Works and Technical Criteria.

Upcoming Community and stakeholder activities for 2015:

- Community drop-in session is currently scheduled for the 7th of November 2015 for the Urban Design and Landscaping package (UD01).

2. Weather

2.1 Discussion

The automatic recording weather station at the main site compounds (north and south) records rainfall totals daily at 9AM. The total rainfall received for the month is as follows: -

Month	Total monthly rainfall	Location
01/10/15 – 31/10/15	33.6mm	Northern Compound
01/10/15 – 31/10/15	41.8mm	Albert Drive Compound

The site experienced a total of 11 rain days throughout the month of October 2015.

During October, rainfall received on site was lower than the October monthly average of 92.6mm. A summary of weather conditions recorded over the month for Smoky Cape by the Bureau of Meteorology is detailed below in Table 2.3.

The daily summaries for rainfall received in October at the Albert Drive Compound and Northern Compound are shown below in Table 2.1 and 2.2.

Table 2.1 – Rainfall recorded at Albert Drive Compound Automated Weather Station

Site Name: Southern Compound		
Date	Time	TOTAL Rain Gauge
1/10/2015	9:00:00	0
2/10/2015	9:00:00	0.2
3/10/2015	9:00:00	0
4/10/2015	9:00:00	0
5/10/2015	9:00:00	0
6/10/2015	9:00:00	0
7/10/2015	9:00:00	0
8/10/2015	9:00:00	0
9/10/2015	9:00:00	0.6
10/10/2015	9:00:00	0.2
11/10/2015	9:00:00	0
12/10/2015	9:00:00	1
13/10/2015	9:00:00	0.2
14/10/2015	9:00:00	3.8
15/10/2015	9:00:00	1

16/10/2015	9:00:00	0.4
17/10/2015	9:00:00	0
18/10/2015	9:00:00	0
19/10/2015	9:00:00	0
20/10/2015	9:00:00	0
21/10/2015	9:00:00	0
22/10/2015	9:00:00	0.6
23/10/2015	9:00:00	24.8
24/10/2015	9:00:00	0.2
25/10/2015	9:00:00	0
26/10/2015	9:00:00	0
27/10/2015	9:00:00	5.2
28/10/2015	9:00:00	3.6
29/10/2015	9:00:00	0
30/10/2015	9:00:00	0
31/10/2015	9:00:00	0

Table 2.2 – Rainfall recorded at the Northern Compound Automated Weather Station

SiteName: Northern Compound		
Date	Time	TOTAL Rain Gauge
1/10/2015	9:00:00	0.2
2/10/2015	9:00:00	0
3/10/2015	9:00:00	0.2
4/10/2015	9:00:00	0
5/10/2015	9:00:00	0
6/10/2015	9:00:00	0
7/10/2015	9:00:00	0
8/10/2015	9:00:00	0
9/10/2015	9:00:00	1.2
10/10/2015	9:00:00	0.2
11/10/2015	9:00:00	0
12/10/2015	9:00:00	0.6
13/10/2015	9:00:00	0
14/10/2015	9:00:00	5
15/10/2015	9:00:00	1
16/10/2015	9:00:00	0
17/10/2015	9:00:00	0
18/10/2015	9:00:00	0
19/10/2015	9:00:00	0
20/10/2015	9:00:00	0
21/10/2015	9:00:00	0

22/10/2015	9:00:00	0
23/10/2015	9:00:00	17.4
24/10/2015	9:00:00	0
25/10/2015	9:00:00	0
26/10/2015	9:00:00	0
27/10/2015	9:00:00	3.4
28/10/2015	9:00:00	4.4
29/10/2015	9:00:00	0
30/10/2015	9:00:00	0
31/10/2015	9:00:00	0

Table 2.3: Weather conditions recorded in October 2015 at Smoky Cape by the Bureau of Meteorology.

Observations from Smoky Cape Lighthouse.

October 2015

Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
1/10/2015	15.8	24.9	0
2/10/2015	14.9	25.9	0
3/10/2015	16.8	24.9	0
4/10/2015	17.2	29.1	0
5/10/2015	20.5	29.4	0
6/10/2015	19.5	26.5	0
7/10/2015	18.9	26.5	0
8/10/2015	14.9	19.4	1
9/10/2015	15	24.2	3.2
10/10/2015	17	24.6	0
11/10/2015	18.2	23.4	0
12/10/2015	18.1	24.6	0.6
13/10/2015	19	22.7	1.3
14/10/2015	17.8	26.2	2.8
15/10/2015	18.4	26.2	0
16/10/2015	18.6	24.3	0
17/10/2015	18.6	24.9	0
18/10/2015	18.5	27.8	0
19/10/2015	17.9	26.4	0
20/10/2015	19	24.1	0
21/10/2015	18.4	24.1	0
22/10/2015	17.5	21.2	1.4
23/10/2015	15.3	22.1	11
24/10/2015	14.1	24.6	0.6
25/10/2015	15.4	24.1	0
26/10/2015	18	24	0

27/10/2015	16.4	22.7	10.8
28/10/2015	13.6	23.3	1
29/10/2015	15.4	22.6	0
30/10/2015	15.9	25.6	0
31/10/2015	18	23.8	0

3. Surface Water Monitoring

Pacifico have been provided trigger levels for baseline monitoring from RMS, these will be compared against monthly data as well as between upstream and downstream sites to determine works impact.

Monthly sampling was undertaken by ACCIONA (Pacifico):

Dry Sampling Event

A "dry" sampling event was undertaken on the 8th October, field and lab tests were undertaken. Results are available in Appendix A.

Dissolved oxygen (DO) levels noted to be below trigger values at:

Stony Creek downstream site. This is attributed to the decomposing vegetative matter present in the waterbody at this location.

All Gumma Wetland sites, both upstream and downstream. This is attributed to the high amount of decomposing vegetative matter in the water as well as the stagnant wetlands waterbody. It is also noted that there is only one set of trigger values provided by RMS for the upstream and downstream sites rather than individual trigger levels for each site. This may result in a set of trigger values not necessarily representative of each site due to the inclusion of data not applicable to each individual site.

Nambucca River sites, both upstream and downstream. It is noted that both sites were above ANZECC criteria, and that only one set of trigger values were provided for the Nambucca River.

pH levels noted to outside trigger levels at:

Nambucca River both sites. It is noted that the trigger values provided for 80/20 percentile had a pH value of 7, therefore any result other than pH 7 will cause an exceedance of the trigger value. Therefore it is more useful to compare upstream and downstream values, which had minimal change (7.72 upstream to 7.74 downstream), demonstrating that construction activities had a negligible impact on pH levels during the month of October 2015.

Turbidity levels noted to be above trigger values at:

Stony Creek downstream. The current diversion of Stony Creek is in place to minimise impact during the construction activities, all controls were verified to be stabilised and installed as per the Progressive Erosion and Sediment Control Plan.

A high turbidity reading was recorded at all Gumma Wetland sites. Gumma wetlands has variable background readings ranging from 2.4 – 951 NTUs. The tannins from vegetative matter may have influenced these results. The downstream value was comparable to upstream (376 downstream, 398 and 152 upstream), which suggests that construction had minimal impact. It is also noted that there is only one set of trigger values provided by RMS for the upstream and downstream sites rather than individual trigger levels for each site. This may result in a set of trigger values not necessarily representative of each site.

Nambucca River upstream and downstream also had elevated turbidity readings, this is likely due to the disturbance of sediment caused by tidal movements. It is noted that only one set of trigger values was provided for the Nambucca River.

Metals noted to be above trigger levels at:

Stony Creek upstream and downstream for manganese. It is noted that these are well within ANZECC criteria. Stony creek downstream also had slightly elevated levels of arsenic, although this was also within ANZECC criteria.

Lower Warrell Creek upstream and downstream had elevated zinc levels. It is noted that there was a decrease in levels from upstream to downstream sites.

Gumma wetlands had elevated arsenic, manganese and iron levels downstream. These results are consistent with upstream results, with only a minor exceedance of arsenic levels. Nickel was also elevated upstream at Gumma, but within trigger levels at the downstream site. It is noted that only one set of trigger values has been provided for both the upstream and downstream sites.

Nambucca River upstream and downstream sites had elevated Manganese and Zinc. The levels for both decreased between the upstream and downstream sites, so were unlikely to be as a result of any construction works.

Nutrient levels above trigger levels at:

Upper Warrell upstream and downstream recorded elevated levels of nitrate and total nitrogen. It is noted that these results are well within ANZECC criteria, as well as having only minor changes between upstream and downstream for both (nitrate was 0.15mg/L upstream, 0.18mg/L downstream, ammonia was 0.02mg/L upstream, 0.03mg/L downstream).

Stony Creek downstream and upstream recorded elevated levels of nitrate. Stony Creek downstream also had elevated levels of total nitrogen. This is possibly due to the amount of vegetative matter in the waterway.

Lower Warrell Creek had elevated levels of nitrate downstream. This is possibly due to the decomposing vegetative material in the waterway at the downstream site.

Gumma Wetlands have elevated levels of total phosphorus, total nitrogen, nitrate and ammonia at both upstream and downstream sites. This is possibly due to the large amount of decomposing vegetative matter in this area.

Nambucca River downstream had elevated levels of total phosphorus, nitrate and ammonia. It is noted that these results were within ANZECC criteria, with both total phosphorus and nitrate having higher levels at the upstream locations. Vegetative matter or other material from upstream may be the cause of these elevated levels.

Wet Sampling Event

On the 23rd October after >10mm of rainfall within a 24 hour period, field tests and lab samples were taken. The results are available in Appendix A.

Below exceedances of trigger levels are discussed:

Dissolved oxygen (DO) levels noted to be below ANZECC criteria at:

Upper Warrell Creek downstream location. The DO level for the downstream location is within trigger values for the upstream site, there is also an increase in DO levels from the upstream to downstream sites.

Stony Creek, both upstream and downstream. This is attributed to decomposing vegetative matter present at both sites.

Lower Warrell Creek, at the downstream location. This is attributed to decomposing vegetative matter present at the site as well as the low-flow environment.

Nambucca River, at both upstream and downstream sites. It is noted that these results are within ANZECC criteria. The downstream and upstream levels were comparable and therefore impact from construction works is minimal.

pH levels noted to outside trigger levels at:

Lower Warrell Creek upstream and downstream. It is noted that only one set of trigger values was provided for both upstream and downstream locations, which may result in pH levels being outside trigger values.

Nambucca River upstream and downstream. It is noted that only one set of trigger values was provided for both upstream and downstream locations, which may result in pH levels being outside trigger values. Minimal difference between upstream and downstream sites shows minimal impact from construction works.

Turbidity levels noted to be above trigger levels at:

All downstream sites were below trigger values for turbidity.

Metals levels noted to be above trigger levels at:

Upper Warrell Creek downstream had slightly elevated manganese levels. There was a minimal increase from downstream to upstream, although it is noted that the results were well within ANZECC criteria.

Stony Creek downstream had slightly elevated zinc and manganese levels. These were within ANZECC criteria, with zinc was also elevated upstream.

Lower Warrell Creek downstream had slightly elevated arsenic levels, although only minimally and consistent with the upstream site.

Gumma Wetlands downstream had elevated manganese, arsenic, nickel and iron. Manganese and nickel were consistent with upstream results. It is also noted that only one set of trigger values have been provided for both upstream and downstream locations, which may result in metal levels for sites showing as above overall trigger values, where they may be within trigger values for that particular site.

Nambucca River had elevated copper levels at both downstream and upstream locations. There was a decrease in copper levels from upstream to downstream, and so is unlikely to be related to construction works.

Nutrient levels noted to be above trigger levels at:

Elevated nitrate and ammonia levels were recorded at Upper Warrell Creek downstream. Nitrate was also elevated at the upstream site, with ammonia only slightly elevated (0.03mg/L downstream, 0.02mg/L upstream).

Stony Creek downstream had elevated total nitrogen levels downstream, this is potentially caused from vegetative matter within the waterway.

Gumma Wetlands had elevated total phosphorus levels. It is also noted that only one set of trigger values have been provided for both upstream and downstream locations, which may result in results for sites showing as above overall trigger values, where they may be within trigger values for that particular site.

4. Sediment Basin Water Monitoring

Water was released from commissioned sediment basins between the 1st and 28th October after rainfall and water being transferred into basins from nearby waterways. Water pumped into basins was treated and released as soon as possible, especially if rainfall is predicted in the 5 day forecast. Table 4 below has the water quality results recorded for the water release events:

Table 4 – Water Release Register

Date	Basin ID	Oil and Grease (visible)	pH	Turbidity (NTU)	TSS (mg/L)	Approx Volume Discharged (kL)	Comments
1/10/2015	B57.25	N	7.68			15	LAND IRRIGATION (IR2)
1/10/2015	B55.0	N	7.77	9.8		150	
19/10/2015	B42.3	N	7.4	39.5		2	
26/10/2015	B47.14	N	7.23	13.2		300	
26/10/2015	B42.8	N	7.82	31.5		300	
26/10/2015	B42.87	N	7.74	48.7		300	

26/10/2015	B42.87	N	6.78	26.5		240	
28/10/2015	B44.55	N	6.74	42.7		600	

- TSS is taken every third discharge on average
- **Green** = Water released from sediment trap

5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 26th October at eight locations near to construction works. Results from this are available in Appendix A.

All sites were within predicted levels for the activity being undertaken.

6. Vibration Monitoring

Vibration monitoring was undertaken as part of blasting works.

6.1 Blasting

Seven blasting events occurred in October 2015 – 1st (two), 13th, 16th, 20th, 27th (two) October 2015.

No exceedances occurred from these blasts.

There have been no exceedances for Overpressure from these three blasts, the highest recorded was 118.5dB on the 1st of October 2015.

We are required to achieve less than 5% exceedance (of 5mm/s limit) within a 12month period for those sensitive receptors that have not agreed to the 25mm/s limit. We have anticipated a total of 49 blasts. At the end of October our percentage is 14.29%.

7. Dust Monitoring

Dust deposition gauges (DDG) were placed at nearby sensitive receivers from the 11th September 2015 to 12th October 2015. DDG results are available in Appendix A. Locations of several gauges were also inspected with the Project Environmental Representative and it was identified that DDG5, DDG A2 and DDG4 will be slightly modified to better capture results for the dust catchment area they are located in.

An elevated level of 7.3g/m²/month and 4.5g/m²/month Total Insoluble Matter (TIM) was recorded at dust deposition gauge DDG6 and DDG8, respectively. It was noted that at both of these gauges organic material (insects and gecko excretion) was present in the funnel as well as the gauge bottle itself, which would contribute to the increased TIM levels. Ash Content (typically the value associated with

construction impacts) for both gauges were below 4g/m²/month, with DDG6 having 1.6g/m²/month and DDG8 having 3.6g/m²/month.

An elevated level of TIM was recorded at 9.2g/m²/month at DDG5. Extra traffic from abutment fill works has since been reduced, which should result in a significant reduction in dust levels. Street sweepers and water carts have been utilised in the area to reduce dust produced from site works, with the use of surfactants in water carts to further assist with dust suppression. Batters of the works have also been stabilised with hydromulch to reduce dust emissions. A water cart schedule has also been enacted in the month of October for use of water carts when works occur in the area. Additionally, it was identified in the October Environmental Review Group that the dust gauge be relocated further from residence to reduce impact from nearby gardening works. This was actioned at the commencement of the next monitoring cycle, which should also further reduce interference in monitoring results. Given these extra mitigation measures and completion of construction works in the area it is expected that future dust deposition results will be compliant.

Surfactant additives have been utilised on site in water carts to assist with dust mitigation. Extra water carts have also been utilised by the project to suppress dust emissions from site, as well as utilisation of water carts outside of standard construction hours to assist in reducing dust emissions from the project.

8. Groundwater Monitoring

ACCIONA (Pacifco) have undertaken groundwater monitoring on the 29/9/2015 and 30/9/2015. The results from the groundwater monitoring is available in Table 4 of Appendix A.

The groundwater monitoring results have been provided to RMS to provide advice on the trigger levels determined during the baseline sampling. The finalised groundwater report from the baseline sampling has not been issued from RMS to Pacifco including groundwater triggers.

9. Acoustic Investigations

Acoustic Investigations have been conducted for several Out of Hours Works proposed to model impact on residents during the month of October 2015. A summary of these current approvals is below in Table 9.

Table 9 – Current Out of Hours Works

OOH Request Title	Residential Agreements Required (Y/N)	Approval Date
Instrumentation Monitoring	N	7/06/2015
Small Boat Nambucca	N	6/10/2015
Water Cart Public Holiday Sat Sun	N	2/10/2015
Asphalting Albert Drive	N	29/09/2015
Erecting Formwork + Steel Fixing Land	N	4/11/2015

Barge Relocation	N	4/11/2015
Pour Concrete columns and headstocks (North Bank)	N	9/11/2015
Pumping diversion Williamsons Rosewood	N	6/11/2015
Concreting Culvert Stony Creek	N	6/11/2015
Dewatering Stony Creek	N	9/11/2015
Albert Drive Weekend Works	N	13/11/2015

10. Complaints

10.1 Summary of Complaints for the month

The following is a brief summary of environmental complaints received in October 2015.

On the 1st of October, a resident of Warrell Creek contacted AFJV regarding quality of water from his tank. The community team consulted with him regarding installation of a first flush system to mitigate the issue. Dust suppression involving additional water carts and use of a dust suppressant additive in the carts to help mitigate dust has commenced at this location.

On the 2nd of October a resident of Gumma Road contacted AFJV regarding dust generation from the construction traffic on the road as well as at house noise treatments for their property. Water carts and street sweepers have continued to be utilised to this area to reduce dust emissions as well as use of a surfactant additive in water trucks. Truck movements have been significantly reduced in this area which has resulted in a reduced generation of dust, no further complaints have been received regarding this issue.

On the 6th of October a resident of Old Coast Road contacted AFJV regarding dust generated from construction works. It was found that works to the north of their property was construction works unrelated to AFJV construction (blueberry farms). Additional works in the vicinity related to the project have water carts operating to minimise dust. Since the complaint AFJV have been utilising surfactants for use in water carts on site. Water carts are also being utilised throughout the day on Old Coast Road to further mitigate dust emissions.

11. Non-Compliance

11.1 Summary of Non-compliances

One NCR was raised in October 2015: Albert Drive Subsoil drains.

On 28th October a release of turbid water without adequate ERSED controls in place occurred during cleaning of the surface of the heavily bound pavement material and subsoil drains created run-off into a roadside table drain in which the silt fence had been removed. Works ceased immediately with the newly constructed table drain being dammed preventing the release of further turbid water beyond the construction boundary. ERSED controls were then installed, with the Superintendent, Senior Project Engineer and Area Foreman being debriefed on the incident. To prevent future occurrences a toolbox was prepared and delivered to all staff during the weekly toolbox on the 4th of November 2015. The toolbox included information that the Area Foreman, Project Engineers and Environmental Coordinators are to be consulted before removing environmental controls, with emphasis on the Project and EPA water quality requirements and levels required to be met prior to the release of water reiterated to all personnel.

Table 2 – Noise Monitoring Results October

Date	Time	Location	Rec ID	NCA	NML	Activity	Predicted levels for activity	Laeq	LAFMAX	LAFMIN	LCEQ	LAF05	LAF10	LAF50	LAF90	Principal sources/ operations	Measurements exceeding criteria, plant/ operations causing	Corrective actions	Notes
26/10/2015	1:00 PM	Albert Drive	74	1	50	Cut	62	47.9	59.8	43.4	67.8	50.3	49.5	47.5	45.9	Excavator loading moxys	NA	NA	Within predicted levels for activity
26/10/2015	12:08 PM	Cockburns Lane	16	1	50	Cut	65	54.8	79	41.6	66.5	54.7	51	46.8	44.3	Excavator, moxys, wood mill	NA	NA	Within predicted levels for activity
26/10/2015	5:00 PM	Bald Hill Rd	197	3	50	Cut	72	54.3	76.2	44.4	73.8	55.6	53.9	49.9	47.1	Dozer, scrapers	NA	NA	Within predicted levels for activity
26/10/2015	2:20 PM	Letitia Rd	406	4	59	Cut	74	50.7	69.3	43	66.5	54.1	51.5	48.3	46.4	Excavator loading moxy, PCY trucks dumping	NA	NA	Within predicted levels for activity
26/10/2015	3:27 PM	Mattick Rd	442	6	44	Cut	62	50.9	74	42.8	68.8	55.3	53.3	48.5	45.8	Excavator, dozer, truck and dogs dumping	NA	NA	Within predicted levels for activity
26/10/2015	3:55 PM	Nursery Rd	415	4	59	N/A		56.9	78.2	48.1	71.7	58.9	58	54.6	51.4	NA	NA	NA	Background - highway + local traffic, birds
26/10/2015	4:20 PM	Wallace St	148	3	50	Cut	47	53	69.8	46	71.5	56.6	53.7	49.9	47.9	NA	NA	NA	Background - highway + local traffic
26/10/2015	4:40 PM	Gumma Rd	383	3	50	Mulching (Broad Clearing)	64	57.1	68.6	44.1	66.5	64.8	63.7	48.8	46	Mulching	NA	NA	Within predicted levels - Taken along project boundary to reduce additional noise from traffic

Table 3 - Dust monitoring results September/October

	Unit	Levels of Concern	LOR										
DDG ID				DDG1	DDG2	DDG3	DDG4	DDG5	DDG6	DDG7	DDG8	DDG A1	DDG A2
Start date of sampling				11/09/2015	11/09/2015	11/09/2015	11/09/2015	11/09/2015	11/09/2015	11/09/2015	11/09/2015	11/09/2015	11/09/2015
Finish date of sampling				12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015
Ash Content	g/m ² .month	4 or increase of 2	0.1	0.2	0.7	2.5	0.8	7.7	1.6	0.5	3.6	----	----
	mg	N/A	1	4	12	45	15	141	29	10	65	----	----
Combustible Matter	g/m ² .month	N/A	0.1	0.4	0.8	0.7	0.4	1.5	5.7	0.3	0.9	----	----
	mg	N/A	1	7	15	13	6	27	105	4	18	----	----
Total Insoluble	g/m ² .month	4 or increase of 2	0.1	0.6	1.5	3.2	1.2	9.2	7.3	0.8	4.5	----	----
	mg	N/A	1	11	27	58	21	168	134	14	83	----	----
Arsenic	mg/L	0.001	0.001	----	----	----	----	----	----	----	----	0.013	0.013
Comments									Large amount of gecko/frog excretion in funnel				

Table 4 – Groundwater Monitoring Results October 2015

Location	Units	Groundwater Investigation Levels (GILs) from Interpretive Report	4BH007	4BH008	4BH010	4BH011	4BH021	4BH022	4BH025	4BH026	4BH037	4BH038	1BH49 (replacement)	4BH057	4BH061	4BH062
Cut/Fill			Cut 4	Cut 4	Cut 6	Cut 6	Cut 11	Cut 11	Cut 12	Cut 12	Fill 15	Fill 15	Cut 17	Cut 17	Cut 26	Cut 26
Date of Sampling			30/10/2015	30/10/2015	30/10/2015	29/10/2015	29/10/2015	29/10/2015	29/10/2015	29/10/2015	29/10/2015	29/10/2015	29/10/2015	29/10/2015	29/10/2015	29/10/2015
Comments			DRY	DRY	DRY	DRY				DRY			Pungent water (egg)		Dry - no logger	Dry - no logger
<i>Field Physical data</i>			-													
Depth to standing water level from TOC	m	-	-	-	15.87	-	8.33	1.56	7.65	-	0.91	1.15	17.90	14.65	-	-
pH	pH	-	-	-	4.65	-	5.81	7.19	6.53	-	6.24	7.17	5.61	6.11	-	-
Conductivity	mS/cm	-	-	-	5.330	-	0.122	0.823	0.145	-	5.67	10.500	1.180	0.291	-	-
Temperature	C	-	-	-	20.10	-	21.92	20.56	20.37	-	20.98	20.74	21.94	20.80	-	-