

Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

■ July 2017

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 L2.5; and
- c) details of results of any acoustic investigation made in relation to Condition L4.2d); 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 July 2017 included the following:

- Bitumen sealing work
- · Earthworks including material resizing
- Continuing bridge works including deck unit installation and deck concrete pours
- Continuing works in the Pergola area near Upper Warrell Creek
- Continuing long drainage works
- · Scour rock installation
- Batter stabilisation using hydromulch (permanent design seed mix)
- Topsoil Amelioration and Blending
- Concrete Lined Drains
- · Basin Decommissioning
- Basin Maintenance including dewatering
- Installation of Erosion and Sediment Controls
- Pavement (Asphalt and Concrete)
- Line marking
- Decommissioning of the Precast Facility
- Concrete Lined Drains
- Verge / Median Placement
- Operation of concrete and asphalt batch plants
- Removal of rock platforms underneath Nambucca Bridge
- Decommissioning of the Precast Facility
- Continue removing rock platforms at Nambucca River
- Temporary waterway crossing removal

Works scheduled for next month include

- · Earthworks including material resizing
- · Continuing bridge works including deck unit installation and deck concrete pours
- Continuing long drainage works
- Scour rock installation
- Bitumen sealing work
- Batter stabilisation using hydromulch (permanent design seed mix)
- Topsoil Amelioration and Blending
- Concrete Lined Drains
- Basin Decommissioning
- Basin Maintenance including dewatering and desilting
- Permanent Basin Fit-out
- Decommissioning of the Precast Facility
- Crushing material
- Installation of Erosion and Sediment Controls
- Pavement (Asphalt and Concrete)
- Verge / Median Placement
- · Asphalt milling and removal of highway diversion under Nambucca Bridge
- Temporary waterway crossing removal
- Topsoil placement (Medians)

1.2 Consultation Activities

The project's consultation activities during July 2017 included the following:

Table 1 - Consultation Activities

Groups	Date	Key Topics
Environmental Review Group	Tuesday 11 July	Project update, environmental monitoring, upcoming out of hours, site inspection
Toolboxes	Wednesday each week	Environmental and community issues communicated to the workforce.
Nambucca Shire Council	Wednesday 12 July	Local road maintenance and repairs, traffic matters,
Community Information Sessions	Wednesday 26 July (Nambucca Heads) & Thursday 27 July (Warrell Creek)	Directional signage consultation, and other general construction topics
North Facing Ramps group	Monday 17 July	Matters pertaining to ongoing works nearby

Other Consultation Activities:

- Roll out of directional signage consultation:
 - Static displays at Macksville and Nambucca libraries, Scotts Head Bowling Club, Nambucca Plaza Shopping Centre, and Bowraville Community Technology Centre
 - o Drop-in sessions at Macksville Foodwork's and Nambucca Heads Woolworths
 - o Formal presentation at Bowraville Chamber of Commerce
- Final notification to email and text database announcing final night time girder movement for the project
- Distributed quarterly Port Macquarie to Coffs Harbour highway upgrade update to email database
- Notification to Letitia Close residents about night time saw cutting at the roundabout
- Email notification about, and invitation to attend directional signage displays and events
- Invitation to key stakeholder groups to have the project team deliver presentation on directional signage at their group meetings
- Three agreements sought for OOH Pacific Highway line-marking activity only two obtained, activity undertaken under EPL Condition L4.5
- Ongoing notifications to various stakeholders impacted by paving and saw-cutting activities north of Mattick Road, and near Bald Hill works.

At House Noise Treatments

The at house noise treatment program is currently being managed by RMS and is not part of the ACCIONA (Pacifico) Scope of Works and Technical Criteria.

<u>Upcoming Community and stakeholder activities:</u>

- Conduct next Nambucca Shire Council liaison meeting 15th August;
- Conduct next North Facing Ramps tri-weekly roadside community meetings scheduled for Mondays 7th August and 28th August;
- Letterbox drop to within 200m of alignment, the approved June 2017 to August 2017 construction quarterly Project Update;
- Distribute notification for Rosewood Road bridge opening to traffic;
- Seek global agreements with potentially impacted residents for all anticipated Out of Hours construction works through until Christmas 2017;
- Continue to consult stakeholders impacted by visual mounds along the entire alignment.

2. Weather

2.1 Discussion

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

Table 2 – Rainfall recorded at the two weather stations operated by Pacifico

Month	Total monthly rainfall	Location
1/07/2017 – 31/07/2017	8.2mm	Northern Compound
1/07/2017 – 31/07/2017	8.6mm	Albert Drive Compound

The site experienced a total of seven rain days throughout the month of July 2017.

During July, rainfall received on site was lower than the July monthly average of 77.4mm. 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 July 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 Southern Compound Automated Weather Station

July **2017**

July	/ 2017	
		TOTAL Rain
Date	Time	Gauge (mm)
1/07/2017	9:00:00	0
2/07/2017	9:00:00	0.2
3/07/2017	9:00:00	0
4/07/2017	9:00:00	0.4
5/07/2017	9:00:00	0.2
6/07/2017	9:00:00	0
7/07/2017	9:00:00	0.2
8/07/2017	9:00:00	0
9/07/2017	9:00:00	0
10/07/2017	9:00:00	0
11/07/2017	9:00:00	0
12/07/2017	9:00:00	0
13/07/2017	9:00:00	0
14/07/2017	9:00:00	0
15/07/2017	9:00:00	0
16/07/2017	9:00:00	7.2
17/07/2017	9:00:00	0.2
18/07/2017	9:00:00	0
19/07/2017	9:00:00	0.2
20/07/2017	9:00:00	0
21/07/2017	9:00:00	0
22/07/2017	9:00:00	0
23/07/2017	9:00:00	0
24/07/2017	9:00:00	0
25/07/2017	9:00:00	0
26/07/2017	9:00:00	0
27/07/2017	9:00:00	0
28/07/2017	9:00:00	0
29/07/2017	9:00:00	0
30/07/2017	9:00:00	0
31/07/2017	9:00:00	0

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

July 2017

Date Date	Time	TOTAL Rain Gauge (mm)
1/07/2017	9:00:00	0
2/07/2017	9:00:00	0
3/07/2017	9:00:00	0.2
4/07/2017	9:00:00	0
5/07/2017	9:00:00	0
6/07/2017	9:00:00	0
7/07/2017	9:00:00	0
8/07/2017	9:00:00	0.2
9/07/2017	9:00:00	0
10/07/2017	9:00:00	0
11/07/2017	9:00:00	0
12/07/2017	9:00:00	0
13/07/2017	9:00:00	0
14/07/2017	9:00:00	0
15/07/2017	9:00:00	0
16/07/2017	9:00:00	7
17/07/2017	9:00:00	0.4
18/07/2017	9:00:00	0
19/07/2017	9:00:00	0
20/07/2017	9:00:00	0
21/07/2017	9:00:00	0
22/07/2017	9:00:00	0
23/07/2017	9:00:00	0
24/07/2017	9:00:00	0.2
25/07/2017	9:00:00	0
26/07/2017	9:00:00	0
27/07/2017	9:00:00	0
28/07/2017	9:00:00	0
29/07/2017	9:00:00	0
30/07/2017	9:00:00	0.2
31/07/2017	9:00:00	0

Table 2.3: Weather conditions recorded in July 2017 at Smoky Cape by the Bureau of Meteorology.

July 2017

	July 2017 Minimum	Maximum	
	temperature	temperature	Rainfall
Date	(°C)	(°C)	(mm)
1/07/2017	9.5	17.6	0
2/07/2017	11.4	20	0
3/07/2017	10.7	20.7	0
4/07/2017	14.4	22.3	0
5/07/2017	15.2	21.8	0
6/07/2017	12.6		0
7/07/2017			0
8/07/2017		20.8	0
9/07/2017	11	20.7	0
10/07/2017	11	19.1	0
11/07/2017	10.9	20	0
12/07/2017	11	18	0
13/07/2017	10.7	20	11.8
14/07/2017	12.8	20.9	0
15/07/2017		17.2	0
16/07/2017	12	20.1	6.4
17/07/2017	10.2	21.5	0
18/07/2017	14.1	24	0
19/07/2017	12.5	17.8	0
20/07/2017	12.1	20.3	0
21/07/2017	9.1	18.5	0
22/07/2017	10.9	21.1	0
23/07/2017	12.8	22.1	0
24/07/2017	14		0
25/07/2017		23.5	0
26/07/2017	13.1	25.5	0
27/07/2017	12.2	20.4	0
28/07/2017	13.9	22.7	0
29/07/2017	10.5	21.2	0
30/07/2017	12.9	22.9	0
31/07/2017	16.1	22.5	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 12th July 2017, field testing and lab sampling was undertaken. Results are attached in Appendix A.

pH levels noted to be outside of trigger levels at:

Upper Warrell Creek recorded low pH levels downstream (6.20 recorded, 6.4 trigger), upstream was within trigger levels (6.54 recorded, 6.48 trigger). It is noted that downstream is only marginally below trigger levels.

Nambucca River recorded elevated levels upstream (7.93) and downstream (7.96). It is noted that trigger levels are 7.00, with any value outside of this being outside of trigger levels. It is also noted that these levels are within ANZECC criteria (6.5-8.0).

<u>Dissolved Oxygen (DO) noted to be below trigger levels at:</u>

Upper Warrell Creek downstream (0.87mg/L recorded, 2.6mg/L trigger level). A potential cause for the low levels is decaying vegetation within the waterway and below average rainfall for the area (8.6mm received at Southern Compound in July, 77.4mm average).

Nambucca River upstream (4.07mg/L recorded, trigger level 7.4mg/L) and downstream (4.27mg/L recorded, trigger level 7.4mg/L). It is noted that levels increased between upstream to downstream sites and therefore are unlikely to be due to construction impacts. A potential cause for the lower levels is decaying vegetation within the waterway and below average rainfall for the area.

Metals noted to be above trigger levels at:

Stony Creek recorded elevated levels of manganese downstream (0.079mg/L recorded, 0.052mg/L trigger level). It is noted that these levels are well within ANZECC criteria (1.9mg/L). Results are consistent with previous dry periods e.g. January 2017 manganese level at Stony Creek downstream was 0.127mg/L.

Lower Warrell Creek recorded elevated levels of zinc upstream (0.039mg/L recorded, 0.006mg/L trigger) and downstream (0.034mg/L recorded, 0.006mg/L trigger). It is noted that levels decreased from upstream to downstream sites and are unlikely to be attributed to construction impacts. Gumma Wetlands recorded elevated levels of zinc upstream (0.021mg/L recorded, 0.005mg/L trigger) and downstream (0.024mg/L recorded, 0.005mg/L trigger) and nickel downstream (0.004mg/L recorded, 0.001mg/L trigger). It is noted that levels for zinc decreased from upstream to downstream sites and are unlikely to be as a result of construction impacts. It is also noted that nickel levels were within ANZECC criteria (0.011mg/L). Nambucca River recorded elevated levels of zinc upstream and downstream (0.009mg/L upstream, 0.007mg/L downstream, 0.005mg/L trigger). It is noted that levels decreased from upstream to downstream and were unlikely to be resulting from construction impacts.

Nutrients noted to be above trigger levels at:

Upper Warrell Creek recorded elevated levels of nitrate upstream (0.08mg/L recorded, 0.04mg/L trigger) and downstream (0.2mg/L downstream, 0.03mg/L trigger). It is noted that these levels are well within ANZECC criteria (0.7mg/L). All controls were verified to be in place for the site.

Stony Creek recorded highly elevated levels of nitrate and nitrogen upstream (1100mg/L nitrogen recorded, 0.3mg/L trigger, 999mg/L nitrate, 0.03mg/L trigger). Downstream nitrate was also elevated (0.08mg/L recorded, 0.03mg/L trigger) while downstream nitrogen was within trigger values (0.4mg/L recorded, 0.41mg/L trigger). These levels decreased significantly from upstream to downstream sites and are not likely to be caused from construction impacts. A potential cause for the elevated levels is sampling error with agricultural matter being within the sample collected during the monitoring event. Additional testing was undertaken at the site on the 1st August 2017, nitrogen levels were below trigger levels (0.2mg/L recorded, 0.3mg/L trigger), nitrate levels were above trigger levels (0.11mg/L recorded, 0.03mg/L trigger), but are within results previously recorded at the site during dry events (e.g. 0.17mg/L March 2017).

Lower Warrell Creek recorded elevated levels of nitrate upstream and downstream (0.1mg/L recorded upstream, 0.07mg/L recorded downstream, 0.04mg/L trigger). It is noted that these levels decreased from upstream to downstream sites and are unlikely to be a result of construction impacts. It is also noted that levels are well within ANZECC criteria (0.7mg/L). All controls were verified to be in place for the site. A potential cause may be due to decaying vegetation within the waterway or nearby agricultural land, as well as the below average rainfall for the area. The results are also consistent with previous results for the site.

Gumma Wetlands recorded slightly elevated levels of ammonia downstream (0.05mg/L recorded, 0.04mg/L trigger). It is noted that these levels are well within ANZECC criteria (0.9mg/L). A potential cause for the elevated levels is decaying matter within the waterway, or nearby agricultural land. Results are consistent with previous dry event results for the site.

Nambucca River recorded elevated levels of ammonia upstream and downstream (0.06mg/L upstream, 0.08mg/L downstream, 0.03mg/L trigger). It is noted that levels are consistent between upstream and downstream sites and are therefore unlikely to be attributable to construction impacts.

4. Sediment Basin Water Monitoring

Water was released from commissioned sediment basins after rainfall events on the 28^{th} - 30^{th} June 2017, 7^{th} and 16^{th} July 2017. A statistical correlation has been developed which identified the relationship between Turbidity (NTU) and Total Suspended Solids (TSS) for water quality in the WC2NH Project sediment basins in order to determine the NTU equivalent of 50 mg/L TSS. This statistical correlation has been developed to meet EPL Licence No 20533 Condition L2.7 to determine compliance with the Water and/or Land Concentration Limits Condition L2.4. A positive correlation has been calculated between Total Suspended Solids (TSS) and Turbidity (NTU) (R² = 0.4941, p< 0.00001, n=227). The regression equation for the analytical results calculates a turbidity (NTU) value of

120.716 for a TSS value of 50mg/L. A safety factor of 30% has been applied to the NTU result of the correlation, providing a turbidity (NTU) value of 84.50, rounded to an NTU value of 85. To measure NTU in the field a Horiba U-52G multi-parameter water quality meter has been utilised, which is maintained and calibrated in accordance with manufacturer's specifications. TSS sampling is being undertaken to ensure compliance with 1 in 10 sampling to validate the correlation.

Table 3 below has the water quality results recorded for the water release events:

Table 3 – Water Release Register July 2017

Date	Basin ID	Oil and Grease (visible) (Limit = No visible)	pH (6.5- 8.5)	Turbidity (NTU) (Limit <85 NTU)	TSS (mg/L) (Limit <50mg/L)	Approx Volume Discharged (kL)	Comments
1/07/2017	B53.03	N	7.1	15	<5	200	
1/07/2017	B53.90	N	7.5	33.1		200	
1/07/2017	B45.64	N	7.29	28.9		50	
3/07/2017	B58.10	N	7.75	37.8	18	600	
3/07/2017	B45.64	N	7.07	19.8		20	
4/07/2017	B47.96	N	6.63	38.4		650	
19/07/2017	B49.45	N	7.09	39.1		600	
28/07/2017	B53.03	N	8.25	33.5		50	Released for desilting

5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 11th, 13th and 17th of July 2017 at eight locations near to construction works. Monitoring results are available in Appendix A, Table 2.

All sites were within predicted levels for the activity being undertaken or were not the dominant noise source at the nearest residence.

6. Vibration Monitoring

Vibration monitoring was undertaken during the month of July 2017. Vibration monitoring was undertaken on the 14th July 2017 at Nursery Road after concerns were raised by a resident regarding vibration from road traffic at certain parts of the road. Results were within 5mm/s vibration criteria (1.972mm/s peak value). Vibration monitoring was also undertaken on the 14th July 2017 at Old Coast Road in response to concerns raised by a resident nearby to vibratory rolling activities, results were within 5mm/s criteria (1.984mm/s peak value).

Dust Monitoring

Dust deposition gauges (DDG) were placed at nearby sensitive receivers from 1^{st} June to 3^{rd} July 2017, DDG results are available in Appendix A.

All dust deposition gauges were below the level of concern for Total Insoluble Matter (TIM) and Ash Content (AC) (4g/m2.month or increase of 2g/m2/month) during the monitoring period.

Dust mitigation measures including water carts and wetting of quarry material before arrival to site will continue.

8. Groundwater Monitoring

ACCIONA (Pacifico) undertook groundwater monitoring on the 20th of July 2017. Field testing and lab sampling was undertaken. The results from the groundwater monitoring is available in Table 4 of Appendix A.

pH levels noted to be outside of trigger levels at:

Cut 11 bores recorded low pH levels at both upgradient bore 4BH022c (5.51 recorded, 5.93 trigger) and downgradient bore (5.77 recorded, 5.81 trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that pH levels increased from upgradient to downgradient at the bore sites.

Cut 12 downgradient bore recorded low pH at bore 4BH025 (5.64 recorded, trigger 6.21). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that this bore has been relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

Fill 15 bores recorded low pH at 4BH037a (7.19 recorded, 6.51 trigger) and elevated pH at 4BH038 (6.68 recorded, 6.77 trigger). It is noted that 4BH037a has been relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

Conductivity noted to be outside of trigger levels at:

4BH037a – Fill 15 west of 9.40mS/cm (trigger value 5.55mS/cm). 4BH038 Fill 15 east recorded 1.10mS/cm. It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

Water depth noted to be outside of trigger levels at:

4BH058c – Cut 17 downgradient bore recorded 14.25m (trigger value of 13.84m). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location. The upgradient bore 4BH057 was dry with no water depth recorded.

Total Dissolved Solids (TDS) noted to be above trigger levels at:

4BH025 – Cut 12 downgradient bore recorded slightly elevated levels of TDS (0.20g/L recorded, 0.1326g/L trigger level). Bulk earthworks have been

completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH037a — Fill 15 west bore recorded elevated TDS (6.09g/L recorded, 0.1326g/L trigger level). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location. This is consistent with previous results for the bore e.g. 6.20g/L in April 2017, 5.74g/L in January 2017.

Metals noted to be outside of trigger levels at:

4BH010 – Cut 6 downgradient bore recorded elevated levels of manganese (0.2930mg/L recorded, 0.2258mg/L trigger) and iron (37.3mg/L recorded, 6.58mg/L trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor.

4BH022c – Cut 11 upgradient bore recorded elevated levels of aluminium (0.410mg/L recorded, 0.122mg/L trigger), cadmium (0.0096mg/L recorded, 0.0001mg/L trigger), copper (0.008mg/L recorded, 0.003mg/L trigger), manganese (2.38mg/L recorded, 0.4856mg/L trigger), nickel (0.129mg/L recorded, 0.0036mg/L trigger) and zinc (0.43mg/L recorded, 0.0085mg/L trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH037a - Fill 15 bore recorded elevated levels of lead (0.0020mg/L recorded, 0.0005mg/L trigger), nickel (0.0150mg/L recorded, 0.0068mg/L trigger) and zinc (0.0300mg/L recorded, 0.0186mg/L trigger). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH038 – Fill 15 bore recorded elevated levels of nickel (0.007mg/L recorded, 0.006mg/L trigger) and zinc (0.0920mg/L recorded, 0.0132mg/L trigger). It is noted that nickel levels are within ANZECC criteria (0.011mg/L). Bulk earthworks have been completed at this location.

Nutrients noted to be outside of trigger levels at:

Cut 11 recorded elevated nutrients at upgradient bore 4BH022c with nitrogen (2.7mg/L recorded, 0.5786mg/L trigger), nitrate (1.94mg/L recorded, 0.400mg/L trigger), ammonia (0.11mg/L recorded, 0.0940mg/L trigger) elevated. Downgradient bore 4BH021 levels were within trigger levels (0.3mg/L total nitrogen, 0.12mg/L nitrate, 0.03mg/L ammonia) and are not likely to be attributable to construction impacts. Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that bore 4BH022c had to be relocated from its original location due to it

being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH025 - Cut 12 downgradient bore recorded elevated total phosphorus (0.09mg/L recorded, 0.068mg/L trigger) and nitrogen (1.4mg/L recorded, 0.7mg/L. Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH037a recorded elevated levels of nitrate (0.75mg/L recorded, 0.40mg/L trigger). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

Major cations and anions outside of trigger levels at:

4BH010 – Cut 6 downgradient bore recorded slightly elevated calcium levels (7mg/L recorded, 5.99mg/L trigger level). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. Cut 11 recorded elevated major anions and cations at the upgradient bore 4BH022c for chloride (252mg/L recorded, 78.8mg/L trigger), sulfate (735mg/L recorded, 61.8mg/L trigger), sodium (197mg/L recorded, 72mg/L trigger), calcium (73mg/L recorded, 50.4mg/L trigger) and magnesium (90mg/L recorded, 11.8mg/L trigger). Downgradient bore 4BH021 levels were within trigger values except for chloride which had a minor exceedance (16mg/L recorded, 15.2mg/L trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that bore 4BH022c had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH025 – Cut 12 downgradient bore recorded elevated levels of chloride (53mg/L recorded, 24.4mg/L trigger), bicarbonate (27mg/L recorded, 18.4mg/L trigger), sodium (47mg/L recorded, 29.08mg/L trigger) and magnesium (1mg/L recorded, 0.928mg/L trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that bore 4BH025 had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH037a – Fill 15 recorded elevated levels of chloride (1760mg/L recorded, 949mg/L trigger), sulfate (3700mg/L recorded, 2056mg/L trigger), bicarbonate (704mg/L recorded, 61mg/L trigger), sodium (1340mg/L recorded, 720mg/L trigger), potassium (75mg/L recorded, 41mg/L trigger), calcium (382mg/L recorded, 190mg/L trigger) and magnesium (564mg/L recorded, 306mg/L trigger). It is noted that bore 4BH037a had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location. Results are consistent with sampling events after the bore was relocated.

9. Acoustic Investigations

Out of Hours Works undertaken during the month of July 2017 under Condition L4.2(d) of the EPL are outlined in Table 4.

Table 4 – July Out of Hours Works approved under L4.2 (d)

Out of Hours Activity	>5dB(A) above background	Complete? Y/N
Williamsons Creek Pumparound	N	N
Lower Warrell Creek Deck Pours	N	Υ
Nambucca Bridge Works	N	Υ
Rosewood Bridge Concrete Finishing Works	N	Y
Span 7 Concrete Pour - Nambucca River		Y
Bridge	N	
Rosewood Bridge Grouting Superstructure		Υ
Handrail	N	
Cleaning Pavement and Bump Car	N	Υ
Letitia Close Overbridge Parapet		Υ
Installation	N	

Acoustic Investigations (field monitoring) have been conducted for Out of Hours Works during the month of July 2017, results are included in Appendix A.

10. Complaints

9.1 Summary of Complaints for the month of July 2017

03/07/2017 – Resident contacted Pacifico regarding concerns about dust generation from haulage activities around Rosewood Bridge. Trucks were asked to slow down to reduce dust emissions and water cart attended site. Road washed down that afternoon and every day where trucks were operating. Closest dust gauge to this location has had no exceedance of compliance levels (4g/m2/month) in the last 12 months.

11/07/2017 – Resident at Old Coast Road contacted Pacifico via email regarding concerns about dust generated from Old Coast Road traffic. Investigation showed water truck was operating on the day. A vehicle survey by RMS the next day showed ratio of project vehicles not unusual. Water cart to continue to attend to site. Dust gauge has been installed on resident's property since May 2015, with no exceedances of compliance levels (4g/m2/month) in the last 12 months.

13/07/2017 – Resident at Nursery Road contacted Pacifico regarding concerns about vibration from trucks driving over road sag nearby to resident. Activity was confirmed with area superintendent to only be short-term, with driver toolboxed about reducing speed around this area with regular checks to monitor driver behaviour. Vibration monitoring was also undertaken at the location during trial worst-case scenario (truck 60km/h at worst sag point), results were well within 5mm/s limits (1.972mm/s maximum vibration level).

11. Non-Compliance

11.1 Summary of Non-compliances

No non-compliances against the ACCIONA Environmental Protection License occurred during July 2017.

Appendix A – Monitoring Results

Table 1a – Surface Water Results July 2017 – Dry Event

The column The	ı	Units	Levels of C	Concern	Uį	oper Warrell Cr	eek	Uį	Upper W	Warrell Creek	Units Levels of Concern Upper Warrell Creek Upper Warrell Creek Stony Creek					Stony Creek		Lo	w er Warrell Cre	ek	Lo	w er Warrell Cr	reek	Unnam	med Creek Gumma	ı West	Unnam	ned Creek Gumn	ma East	Unnam	ned Creek Gumm	na North	Na	mbucca River So	uth	Nambucca River South		
Part						Upstream			Dow	w nstream			Upstream			Downstream			Upstream			Dow nstream	ı		Upstream					Downstream			Upstream			Downstream .		
Control Cont	er / Estuarine		ANZECC 2000 9	95% species		Freshw ater			Fres	eshw ater			Freshw ater			Freshw ater			Freshw ater			Freshw ater			Freshw ater			Freshw ater			Freshw ater			Estuarine			Estuarine	
Company Comp	umpling		protec	cted		12-Jul-17			12	2-Jul-17			12-Jul-17			12-Jul-17			12-Jul-17			12-Jul-17			12-Jul-17			12-Jul-17			12-Jul-17			12-Jul-17			12-Jul-17	
Part	ımpling.		Freshw ater	Marine		1:08 PM			1:	1:20 PM			12:49 PM			12:20 PM			2:42 PM			2:32 PM			11:00 AM			11:42 AM			11:26 AM			3:12 PM			3:00 PM	
Control Cont																			,		ļ					,						,						
Part 150					80th %ile	20th %ile	Result	80th %ile	ile 20	0th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result
Part 150	/ data																																					
Column C																												2.21										
Control Cont				-	0.06	0.01		0.05) (0.05	0.01																					0.01	0.01	0.02	0.01	0.03
Control Cont				0.0023	-	-		-	_			-	-		0.001	0.001								0.002	0.001		0.002	0.001		0.002	0.001		0.002	0.001	0.002 <0.0001	0.002	0.001	0.001 <0.0001
Part					-	-		-	_			-				-		0.0001	0.0001		0.0001	0.0001		-	-		-	-			-		-		<0.001	-		<0.001
Second Property									_						- -													-					0.001	0.001	<0.001	0.001	0.001	<0.001
Part									_																						_		0.001	0.001	<0.001	0.001	0.001	<0.001
March Marc				0.0044	0.21	0.02		0.2	, (0.06	0.02		0.052	0.013	0.001	0.26	0.08		0.26	0.08		0.23	0.019		0.23	0.019		0.23	0.019		0.03	0.002	0.001	0.03	0.002	0.028
Control Cont				0.00	-	-		-	<u> </u>			-	-				<0.001															0.004	-	-	<0.001	-	-	<0.001
Second March Mar			0.011	-	-	-		-	\dashv	-	0.00	-	-		-	-		-	-		-	-		-	-	-0.002	-	-			-	<0.01	-		<0.01	-		<0.01
Part				0.0014	-	-		-		-		-	-		-	-		-	-		-	-		-	-	_	-	-			-		-	-	<0.001	-	-	<0.001
Mary			0.008	0.015	-	-	0.012	-		-	0.014	0.005	0.005	0.009	0.005	0.005	0.005	0.006	0.005	0.039	0.006	0.005	0.034	0.005	0.005	0.021	0.005	0.005	0.039	0.005	0.005	0.024	0.005	0.005	0.009	0.005	0.005	0.007
March Marc			-	-	0.99	0.46		0.93	3 (0.31				<0.05						0.41			0.11			<0.05			0.31			0.68	-	-	<0.05	-	-	<0.05
Section Sect			0.0006	0.0004	-	-	<0.0001	-			<0.0001	-	-		-	-	<0.0001							-	-		-	-		-	-		-	-	<0.0001	-	-	<0.0001
G. Colorado menter (F) 0, 0, 0 1	overable Hydrocarbons																																					
Control conde Control cond	ne	μg/L	16	50	16		NA	16			NA	16		NA	16		NA	16		NA	16		NA	16		NA	16		NA	16		NA	50		NA	50		NA
Column C	raction	μg/L	-	-			NA	-			NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
Colin Tender Colin Colin T		μg/L	-	-	-			-				-			-			-			-			-			-			-			-		NA	-		NA
GAT- OF PROPER OF MAY SEPTIMENT PROPERTY OF		μg/L	-	-	-		NA	-				-			-			-			-			-			-		NA	-		NA	-		NA	-		NA
Fig.		μg/L	-	-	-			-										-									-								NA	-		NA
Column C			-	-	-			-				-						-						-			-						-		NA	-		NA
Fig.	()		-	-	-			-				-			-			-			-			-			-			-			-		NA	-		NA
Section Sect	3 Fraction minus Naphthalene (F2)	μg/L	-	•	-		NA	-			NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
The content of the			050	700	050		N/A	050	_		N/A	050		NI A	050		NIA	050		N/A	050		NI A	050		ALA.	050		N/A	050		N/A	700		NA	700		NA
Description			950	700	950			950	,			950			950			950			950			950			190			950			100		NA NA	190		NA NA
160 160	ene		180	180	100			80	,			100			80			80			100			700			200			200			5		NA NA	5		NA NA
C-ylare sight 130 160 180			80	5	-			- 80				- 00			- 80			- 00									- 00			-					NA NA	-		NA
No.	.63		350	350	350			350)						350						350						350								NA NA	350		NA
Sum of ITEN	Total		-	-								-			-			-			-						-								NA	-		NA
Note			-	-	-			-				-			-			-			-			-			-			-			-		NA	-		NA
Prosphere (reactive phosphorus) Fig. F	5	- 10																																				
Total Nirrogen mgl 05 01 0.62 0.2 0.5 0.6 0.2 0.5 0.6 0.2 0.3 0.3 0.1 100 0.4 0.1 0.3 0.5 0.2 0.4 0.5 0.2 0.4 2.4 1 1 1 2.4 1 1.1 2.8 1.1 0.8 0.5 0.5 0.5 0.6 0.2 0.4 0.6 0.2 0.3 0.3 0.1 100 0.4 0.1 0.3 0.5 0.2 0.3 0.5 0.2 0.4 2.4 1 1 1 2.4 1 1.1 2.4 1 1.1 2.4 1 1 0.8 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	phorus	mg/L	0.05	0.03	0.04	0.01	0.04	0.03	3 (0.01	<0.01	0.04	0.01	0.01	0.02	0.01	<0.01	0.04	0.01	0.01	0.04	0.01	0.04	0.12	0.03	0.03	0.12	0.03	0.06	0.12	0.03	0.02	0.04	0.02	<0.05	0.04	0.02	<0.05
Total Kipshala Ninegen mgL	: (reactive phosphorus)	mg/L	-	-	-	-	<0.01	-		-	<0.01	-	-	<0.01	-	-	<0.01	0.01	0.0044	<0.01	0.01	0.0044	0.01	0.01	0.005	<0.01	0.01	0.005	<0.01	0.01	0.005	<0.01	0.01	0.008	0.01	0.01	0.008	0.01
Total Kipshala Ninegen mgL																																						
Nirrate mgL 0.7 - 0.04 0.01 0.08 0.03 0.01 0.2 0.03 0.01 999 0.03 0.01 0.01 0.01 0.01 0.01 0.01 0.01		mg/L	0.5	0.3										1100											1.1	1		1.1			1.1			0.2	<0.5	0.5	0.2	<0.5
Nitrite mg/L	dahl Nitrogen	mg/L	-	-	0.6	0.2	0.4	0.6	5	0.2	0.3	0.3	0.1	100	0.4	0.1	0.3	0.5	0.2	0.3	0.5	0.2	0.4	2.4	1	1	2.4	1	1.1	2.4	1	0.8	0.5	0.2	<0.5	0.5	0.2	<0.5
Nitrite mg/L																																						
Ammonia mgl 0.9 0.03 0.01 0.02 0.11 0.16 0.06 0.04 0.16 0.06 0.07 0.04 0.01 0.03 0.04 0.01 0.03 0.04 0.01 0.03 0.04 0.01 0.05 0.03 0.03 0.04 0.01 0.05 0.03 0.03 0.04 0.01 0.05 0.03 0.03 0.04 0.01 0.05 0.03 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.03 0.04 0.01 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.03 0.04 0.01 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.03 0.04 0.01 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.03 0.04 0.01 0.03 0.04 0.01 0.05 0.03 0.04 0.01 0.03 0.04			0.7	-	0.04	0.01	0.08				0.2			999			0.08			0.1			0.07											0.01	<0.01	0.02	0.01	<0.01
TSS			-	-	-	-		0.01	1 (0.01		0.01	0.01		0.01	0.01																<0.01		0.01	0.02	0.02	0.01	<0.01
TSS mg/L 40 40 14.8 5 <5 8 5 5 5 9 5 5 5.8 5 5 5 17.6 5 5 5 29 15 7 290 15 22 290 15 9 71 Field Physical data Temperature C		mg/L	0.9	-	-	-	0.03	-		-	<0.01	-	-	0.02	-	-	0.11	0.16	0.06	U.04	0.16	0.06	0.07	0.04	0.01	U.03	0.04	0.01	<0.01	0.04	0.01	0.05	0.03	0.01	0.06	0.03	0.01	0.08
Field Physical data C					14.0	-		0		-	-c	0				-		17.6			17.6	_		200	15	-	200	15	22	200	45		71	10		74	10	
pH	nicel date	mg/L	<40	<10	14.8	5	<>	8		5	<>	9	5	<>	5.8	5	<>	1/.b	5	<>	1/.b	5	<>	290	15	/	290	15	22	290	15	9	/1	19	<5	71	19	<5
PH	icar data				24.96	1/1 00	12.62	25.1	1 1	16.3	12 01	24.4	16	13 10	26.46	15.04	11.46	27.0	19.4	1/1.7/	27.0	18.4	1/1/22	26.5	16.2	1/1 00	26.5	16.2	16.56	26.5	16.2	1/15/1	27.0	18.1	17.38	27.9	18.1	17.25
Conductivity ms/cm 0.125-22 · 0.316 0.232 0.266 0.348 0.227 0.262 0.348 0.227 0.227 0.3338 0.2168 0.2 20.946 0.679 0.661 20.946 0.679 0.635 0.808 0.4234 0.686 0.808 0.4234 0.648 0.808 0.4234 0.656 47.32 0.27 0.27 0.27 0.27 0.27 0.27 0.27 0.2	10			65-8			6.54				6.2			6.48			6.63			6.65			6.63	7		6.14			5 94	7		6.46	7	7	7 93	7	7	7 96
Turbidly NTU 50 10 10.96 4 3.6 9.9 3.5 4.2 9.9 3.5 2.5 5.97 3.74 0.8 6.82 1.83 6.5 6.82 1.83 6 52.78 11.3 20.5 52.78 11.3 16 52.78 11.3 17.9 19.3 Dissolved Oxygen mg/L 5 5 4.98 1.91 3.07 4.8 2.6 0.87 4.8 2.6 4.88 6.34 3.52 4.81 7.98 5.07 4.18 7.98 5.07 10.6 6.4 1.75 8.77 6.4 1.75 5.93 6.4 1.75 1.89 9.1 Dissolved Oxygen % 29.9 8.5 48.1 45.6 42.6 127.2 88.3 62.8 19.2	vity		0.125-2.2	0.540							0.262	-		0.40										0.808					0.648	0.808			47 32	29.44	35.5	47.32	29.44	35.2
Dissolved Oxygen mg/L 5 5 4.98 1.91 3.07 4.8 2.6 0.87 4.8 2.6 0.87 4.8 2.6 4.88 6.34 3.52 4.81 7.98 5.07 4.18 7.98 5.07 10.6 6.4 1.75 8.77 6.4 1.75 5.93 6.4 1.75 1.89 9.1 Dissolved Oxygen % 29.9 8.5 48.1 45.6 42.6 127.2 88.3 62.8 19.2	9			10						_						0.2200							6											6.7	5.2	19.3	6.7	3
Dissolved Oxygen % 29.9 8.5 48.1 45.6 42.6 127.2 88.3 62.8 19.2 -	Oxygen		5	5							0.87			4.88						4.18			10.6											7.4	4.07	9.1	7.4	4.27
	- 70				-	-		-		-	8.5	-	-	48.1	-	-		-	-	42.6	-	-		-	-		-	-		-	-		-	-	49.8	-	-	52.2
			-		-			-				-			-			-			-			-			-			-			-		21.6	-		21.5
		J-																		-																		
Taken from ANZECC guidelines 95% protected species levels where no 80/20 trigger values provided			Taken from A	ANZECC gui	delines 95%	protected s	pecies levels	where no 80	no 80/20 t	trigger valu	ues provide	d																										
Taken from alternative trigger levels provided in ANZECC Water Guidelines Volume 1 and Volume 2 where insufficient data was available for 95%													ufficient dat	ta was availa	able for 95%	5																						
Exceedances of trigger values																																						

<u>Table 1b – Additional Surface Water Testing Stony Creek Upstream</u>

Location	Units	Levels o	f Concern		Stony Creek					
				Upstream						
Freshwater / Estuarine		ANZECC 200	0 95% species		Freshw ater					
Date of Sampling		prot	ected		1-Aug-17					
Туре				80th %ile	20th %ile	Result				
Laboratory data										
Nutrients										
Total Phosphorus	mg/L	0.05	0.03	0.04	0.01	<0.01				
Phosphate (reactive phosphorus)	mg/L	-	-	-	-	<0.01				
Total Nitrogen	mg/L	0.5	0.3	0.3	0.1	0.2				
Total Kjeldahl Nitrogen	mg/L	-	-	0.3	0.1	0.1				
Nitrate	mg/L	0.7	-	0.03	0.01	0.11				
Nitrite	mg/L	-	-	0.01	0.01	<0.01				
Ammonia	mg/L	0.9	-	-	- 0.04					

Table 2 - Noise Monitoring Results July 2017

		Location		NCA	NML	Activity	Predicted levels for activity	Laeq	LAFMAX	LAFMIN	LAF10	LAF50		Principal sources/ operations	Construction noise dominant?	Corrective actions	Notes
11/07/2017	4:07 PM	Albert Drive	74	. 1	1 50	Cut	62	54.9	79.3	48.4	1 55.6	53.3	51.2	Excavator, crusher	Υ	NA	Within predicted levels, crusher placed behind stockpile of material to reduce noise levels. Consultation also undertaken with nearby residents in relation to crushing activity
11/07/2017	3:35 PM	Cockburns Lane	16	1	1 50	Cut	65	48.1	59.9	43.2	49.6	47.8	45.9	Excavator, concreting	N	NA	Construction not audible. Dominant noise sources: mill, highway, birds
11/07/2017	4:30 PM	Bald Hill Rd	197	3	3 50	Cut	72	56	76	48	3 56.9	53.4	50.6	Roller, positrack, grader, street sweeper	Υ	NA	Within predicted levels. Stockpile in place on east side of alignment to reduce noise levels from construction activities.
17/07/2017	4:00 PM	Letitia Rd	406	2	1 59	Cut	74	50.8	69	44.7	7 51.6	48.4	46.8	Excavator, dozer	Υ	NA	Within predicted levels. Regular consultation undertaken with residents impacted by NFR construction activities.
13/07/2017	3:59 PM	Mattick Rd	442		5 44	Cut	62	51.3	68.4	44.8	3 53.9	50	48.2	Excavators	Υ	NA	Within predicted levels. Permanent noise mounds currently in place to reduce construction noise at sensitive receivers.
17/07/2017	4:20 PM	Nursery Rd	415		1 59	Cut	53	55.7	75.7	47.6	56.6	52.9	49.8	Excavator, trucks	N	NA	Construction not audible. Dominant noise sources: existing highway.
17/07/2017	5:00 PM	Wallace St	148	3	3 50	Cut	47	61.6	76.5	51.7	7 64	58.2	54.3	Excavator	N	NA	Construction not audible. Dominant noise sources: local traffic, highway.
17/07/2017	4:40 PM	Gumma Rd	383	3	3 50	Hauling material	60	53.3	76.1	44.7	7 54.9	51.5	49.4	Trucks, concreting	Υ	NA	Within predicted levels.

Table 3 - Dust Monitoring Results June-July 2017

			DDG ID		DDG1	DDG2	DDG3	DDG4	DDG5	DDG6	DDG6N	DDG7	DDG8	DDG9NE	DDG9E	DDG A1	DDG A2
			Start date of sam	pling	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017
			Finish date of san	npling	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017
Analyte	Time Period	Unit	Levels of Concern	LOR													
	Current Month	g/m².month	4	0.1	0.2	0.2	0.8	0.2	0.4	1.6	0.9	0.5	0.3	0.2	1.7		
Ash Content		mg	N/A	1	4	3	15	3	8	30	17	10	6	4	32		
Asii Content	Previous Month	g/m².month			0.1	0.4	1.2	0.3	0.7	0.8	0.6	0.5	0.2	0.2	1.5		
	Change	g/m².month	Increase of 2		0.1	-0.2	-0.4	-0.1	-0.3	0.8	0.3	0	0.1	0	0.2		
Combustible	Current Month	g/m².month	N/A	0.1	0.1	0.1	0.5	<0.1	0.3	0.7	0.4	0.1	0.2	0.1	0.7		
Matter	Current Month	mg	N/A	1	2	2	10	<1	5	13	8	1	3	2	14		
Total	Current Month	g/m².month	4	0.1	0.3	0.3	1.3	0.2	0.7	2.3	1.3	0.6	0.5	0.3	2.4		
Insoluble	Current Worth	mg	N/A	1	6	5	25	3	13	43	25	11	9	6	46		
Matter (TIM)	Previous Month	g/m².month		0.1	0.4	0.4	1.4	0.4	0.7	1	0.9	0.7	0.4	0.2	1.7		
iviattei (Tiivi)	Change	g/m².month	Increase of 2	0.1	-0.1	-0.1	-0.1	-0.2	0	1.3	0.4	-0.1	0.1	0.1	0.7		
Arsenic	Current Month	mg/L		0.001												<0.001	<0.001
Comments								Lawn mowed around gauge									_

Table 4 – Groundwater Monitoring Results July 2017

Cut/Fill Levels (GILs) from Interpretive Cut 6 - West (DS) Cut 11 - West (DS) Cut 11 - East (US) Cut 12 - West (DS) Fill 15 - West Fill 15 - East Cut 17 - West (DS) Cut 17 - East Cut 17	Location	Units	Groundwater Investigation		4BH010		4BH021			4BH022c		4BH025		4	ВН037	a	4	4BH038	3	4	BH057		4BH058c			
Description Property Proper	Cut/Fill		Levels (GILs) from	Cut 6 - West (DS)		Cut 11 - West (DS)		Cut 11 - East (US)		Cut 12 - West (DS)		Fill 15 - West		Fill 15 - East		Cut 17 - West (DS)		(DS)	Cut 1	7 - East (US)						
Properties Pro	Date of Sampling				20/07/2017			20/07/201	7	20	0/07/2017	7	2	20/07/201	7	2	0/07/201	7	20/07/2017		20/07/2017		•	20/07/2017		
Montanger Mont				Trigger leve	ls 80 / 20%ile	Results			Results			Results			Results			Results			Results			Results		I Roculte
March	Comments				•																		DRY			
American	aboratory data - awaiting	g results																								
Age	letals																									
Charlesteen Project Charlesteen Project Charlesteen Charlest			1									0.410												-		<0.01
Company												<0.001												-		<0.001
Company Comp												0.0096												-		<0.0001
Lead mg/s 0.003 0.009 0.000 0.			1									<0.001												-	$\overline{}$	<0.001 0.0010
Marganesian												<0.0000						0.0010						-		<0.0010
Nexis mg/L 0.011 0.0196 0.00000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.0000 0.00000 0.00000 0.00000 0.00000						0.001						2 380						2 0900								0.0160
Selection March Color	.,					0.0030						0.1290						0.0150			0.0070			-		<0.001
Sheft												<0.01						<0.01			<0.01			-		<0.01
200			<lor< td=""><td></td><td></td><td></td><td></td><td></td><td><0.001</td><td></td><td></td><td><0.001</td><td></td><td></td><td><0.001</td><td></td><td></td><td><0.001</td><td></td><td></td><td><0.001</td><td></td><td></td><td>-</td><td></td><td><0.001</td></lor<>						<0.001			<0.001			<0.001			<0.001			<0.001			-		<0.001
Macure M	inc	mg/L	0.008	0.0532		<0.005	0.0176		0.006	0.0085		0.430	0.0102		<0.005	0.0196		0.0300	0.0132		0.0920	0.0090		-	0.0100	< 0.005
Total Personage Find Fin	ron	mg/L	-	6.5800		37.3000															< 0.05			-		< 0.05
Nythorathons Part		mg/L	0.0006	0.0003		<0.0001	0.0001		<0.0001	0.0001		<0.0001	0.0001		<0.0001	0.0001		<0.0001	0.0003		<0.0001	0.0003		-	0.0003	<0.0001
CO-CH Fraction Upl. or pot - - - - - - - - -	lydrocarbons		-																							
CIS-CSG Fraction Upl C - pb - 50																								-		<20
C29-C36 Fraction C29-C36 Fraction L9QL or pot																								-	-	<50
Control Cont																								-		<100
Bereare Upil or ppb 950 0.5 1 0.5 0.5 0.4 0.5			-																					-		<50
Bancano		μg/L or ppb		178		<50	35		<50	226		<50	25		<50	556.0000		<50	25.0000		<50	1426.0000		-	149.0000	<50
Total Pinosphorus Mirates Mir				0.5			0.5		-44	0.5			0.5		-4	0.5000		-4	0.5000			0.5000			0.5000	
Ethybenzene wpl. or ppb										1			1											-		<1 <2
m+p-Yufene mpl or pob - 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2 1 <2				1						1			1													<2
o-Xylene yg/L or ppb	•			1						1			1											_	-	<2
Naphthalene Na			-	1			1			1			1											-		<2
Total Phosphorus			-	3		<5	2		<5	2		<5	2		<5	2.5000		<5	2.5000		<5	2.0000		-	2.0000	<5
Phosphate	•		-																							
Total Nitrogen mg/L - 0.5800		mg/L	-	0.0284		<0.01	0.0568		<0.01	0.0480		<0.01	0.0680		0.09	0.1260		<0.01	0.4064		<0.01	0.0740		-	0.0300	0.34
Total Kigledahl Nitrogen Mg/L	·	mg/L	-						<0.01			<0.01			<0.01			<0.01						-		<0.01
Nitrate mg/L - 0.0250	•		-						0.3			2.7			1.4									-		1.5
Nitrite mg/L - 0.0050			-						0.2			0.8			1.2			0.8						-		1.20
Ammonia mg/L - 0.1148 < 0.01 0.0640 0.03 0.0940 0.11 0.0440 < 0.01 0.7920 0.08 0.2300 0.05 0.0672 - 0.0310 Major anions mg/L - 1704.3 1120 15.2 16 78.8 252 24.4 53 948.800 1760 2340.3736 206 22.2000 - 39.1000 Sulfate mg/L - 53.000 38 10.392 8 61.8 735 10.6 8 2056.0000 3700 2752.0000 161 22.9680 - 35.0000 Major ations mg/L - 63.6 62 27.4 18 142.2 2 18.4 27 61.2000 704 942.0000 33 34.4000 - 29.0000 Major ations mg/L - 866 554 18 16 72.0000 197 29.0800 47 720.0000 1340 1871.5397 110 28.2000 - 51.9000 Potassium mg/L - 2.00 2.0000 0.96 <1 5.0000 4 0.5000 41 14.000 75 96.6986 4 1.5509 - 0.5700 Major ations mg/L - 5.9999 7 1.4797 1 1.50.0000 73 1.4000 75 96.6986 4 1.5509 - 0.5700 Major ations mg/L - 135 94 2 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Major ations mg/L - 135 94 2 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Major ations mg/L - 5.9999 7 1.4797 1 1.50.4000 73 1.4000 75 96.6986 4 1.5509 - 0.5700 Major ations mg/L - 135 94 2 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Major ations mg/L - 135 94 2 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Major ations mg/L - 135 94 2 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Major ations mg/L - 135 94 2 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Major ations mg/L - 135 94 2 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Major ations mg/L - 135 94 2 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Major ations mg/L - 2.00												1.94						0.7500						-		0.33
Major anions Majo												0.01												-		<0.01 <0.01
Chloride mg/L - 1704.3		IIIg/L	-	0.1140		<u> </u>	0.0040		0.03	0.0940		0.11	0.0440		<u> </u>	0.7920		0.00	0.2300		0.05	0.0072		-	0.0310	V0.01
Sulfate mg/L - 53.000 38 10.392 8 61.8 735 10.6 8 2056.0000 3700 2752.0000 161 22.9680 - 35.0000 Bicarbonate mg/L - 63.6 62 27.4 18 142.2 2 18.4 27 61.2000 704 942.0000 33 34.4000 - 29.0000 Bicarbonate mg/L - 866 554 18 16 72.0000 197 29.0800 47 720.0000 1340 1871.5397 110 28.2000 - 51.9000 Potassium mg/L - 2.00 2.0000 0.96 <1 5.0000 4 0.5000 <1 41.4000 75 96.6986 4 1.5509 - 0.5700 Calcium mg/L - 5.9909 7 1.4797 1 50.4000 73 1.4000 <1 189.6000 382 265.9524 77 2.7120 - 1.2100 Magnesium mg/L - 135 94 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Epith to standing water level from TOC PH	•	ma/I	-	1704 3		1120	15.2		16	78.8		252	24.4		53	948.8000		1760	2340.3736		206	22.2000		-	39.1000	16.0000
Bicarbonate mg/L -									8			735			8			3700						-		13.0000
Major cations mg/L - 866 554 18 16 72.0000 197 29.0800 47 720.0000 1340 1340 1871.5397 110 28.2000 - 51.9000 - 51.			-						18			2			27			704								10.0000
Potassium mg/L - 2.00																										
Calcium mg/L - 5.9909 7 1.4797 1 50.4000 73 1.4000 <1 189.6000 382 265.9524 77 2.7120 - 1.2100 Magnesium mg/L - 135 94 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Field Physical data Depth to standing water level from TOC PH PH - 6.264 4.736 5.74 6.7800 5.8100 5.77 7.0900 5.9300 5.51 6.7780 6.2080 5.64 6.5080 5.9220 7.19 7.3040 6.7680 6.68 6.9800 5.2400 - 6.3960 5.5620 Conductivity ms/cm - 3630.000 3.63 111.300 0.130 231.000 1.81 0.342 0.316 5.550 9.40 8366.000 1.10 121.100 - 132.660 Temperature C - 22.4420 30.00 22.3600 21.46 21.1500 20.95 22.6040 20.44 25.9820 19.40 22.5600 18.84 22.8200 - 23.1940			-									197			47			1340						-		17
Magnesium mg/L - 135 94 2 2 11.8000 90 0.9280 1 306.2000 564 565.0706 22 8.0077 - 2.7300 Field Physical data Depth to standing water level from TOC m - 16.802 14.89 8.7420 6.57 16.0140 1.79 8.4500 7.95 1.2000 0.54 1.3520 0.66 17.4120 - 13.8440 pH pH - 6.264 4.736 5.74 6.7800 5.8100 5.77 7.0900 5.9300 5.51 6.7780 6.2080 5.64 6.5080 5.9220 7.19 7.3040 6.7680 6.88 6.9800 5.2400 - 6.3960 5.5620 Conductivity mS/cm - 3630.000 3.63 111.300 0.130 231.000 1.81 0.342 0.316 5.550 9.40 8366.000 1.10 121.100 - 132.660 Temperature C -						2.0000			<1			4						75						-	-	<1
Depth to standing water level from TOC pH - 6.264 4.736 5.74 6.7800 5.8100 5.77 7.0900 5.9300 5.51 6.7780 6.2080 5.64 6.5080 5.920 7.19 7.3040 6.7680 6.68 6.9800 5.2400 - 6.3960 5.5620						7			1			73			<1			382						-		<1
Depth to standing water level from TOC Ph Ph Ph Ph Ph Ph Ph P	<u> </u>	mg/L	-	135		94	2		2	11.8000		90	0.9280		1	306.2000		564	565.0706		22	8.0077		-	2.7300	2
level from TOC m - 16.802 14.89 8.7420 6.57 16.0140 1.79 8.4500 7.95 1.2000 0.54 1.3520 0.66 17.4120 - 13.8440 pH pH - 6.264 4.736 5.74 6.7800 5.8100 5.77 7.0900 5.9300 5.51 6.7780 6.2080 5.64 6.5080 5.9220 7.19 7.3040 6.7680 6.68 6.9800 5.2400 - 6.3960 5.5620 Conductivity mS/cm - 3630.000 3.63 111.300 0.130 231.000 1.81 0.342 0.316 5.550 9.40 8366.000 1.10 121.100 - 132.660 Temperature C - 22.4420 30.00 22.3600 21.46 21.1500 20.95 22.6040 20.44 25.9820 19.40 22.5600 18.84 22.8200 - 23.1940																										
Conductivity mS/cm - 3630,000 3.63 111.300 0.130 231.000 1.81 0.342 0.316 5.550 9.40 8366,000 1.10 121.100 - 132.660 Temperature C - 22.4420 30.00 22.3600 21.46 21.1500 20.95 22.6040 20.44 25.9820 19.40 22.5600 18.84 22.8200 - 23.1940		m	-	16.802		14.89	8.7420		6.57				8.4500		7.95	1.2000		0.54	1.3520		0.66	17.4120		-	13.8440	14.25
Conductivity mS/cm - 3630,000 3.63 111.300 0.130 231.000 1.81 0.342 0.316 5.550 9.40 8366,000 1.10 121.100 - 132.660 Temperature C - 22.4420 30.00 22.3600 21.46 21.1500 20.95 22.6040 20.44 25.9820 19.40 22.5600 18.84 22.8200 - 23.1940	H	рН	-	6.264	4.736	5.74	6.7800	5.8100	5.77	7.0900	5.9300	5.51	6.7780	6.2080	5.64	6.5080	5.9220	7.19	7.3040	6.7680	6.68	6.9800	5.2400	_	6.3960	5.5620 5.56
Temperature C - 22,4420 30.00 22,3600 21,46 21,1500 20.95 22,6040 20.44 25,9820 19,40 22,5600 18,84 22,8200 - 23,1940	Conductivity	mS/cm	-	3630.000		3.63			0.130				0.342		0.316	5.550		9.40			1.10					0.151
	emperature	С	-															19.40						-		21.92
		g/L													0.20			6.09								0.098
Exceedance of trigger level																										

Table 5 - Vibration Monitoring Results July 2017

Table 5 – Vibration Monitoring Results July 2017											
Location	Location DATE		Triggered	Vector Sum	Comments						
	[Date]	[Time]	[Src]	[mm/s]							
Nursery Rd	14/07/2017	15:27:00	Continuous	0.217	Background						
Nursery Rd	14/07/2017	15:28:00	Continuous	0.582	2 x trucks slow middle of road						
Nursery Rd	14/07/2017	15:29:00	Continuous	0.214	background						
Nursery Rd	14/07/2017	15:30:00	Continuous	0.193	background						
Nursery Rd	14/07/2017	15:31:00	Continuous	0.189	background						
Nursery Rd	14/07/2017	15:32:00	Continuous	0.48	Loaded truck slow middle of road						
Nursery Rd	14/07/2017	15:33:00	Continuous	0.443	Loaded truck slow middle of road						
Nursery Rd	14/07/2017	15:45:00	Continuous	1.182	Unloaded truck slow southern edge						
Nursery Rd	14/07/2017	15:46:00	Continuous	0.203	background						
Nursery Rd	14/07/2017	15:47:00	Continuous	1.972	truck 60km/h unloaded southern edge of road						
Nursery Rd	14/07/2017	15:48:00	Continuous	0.831	Unloaded truck slow southern edge						
Nursery Rd	14/07/2017	15:49:00	Continuous	0.889	Unloaded truck slow southern edge						
Nursery Rd	14/07/2017	15:50:00	Continuous	1.493	Unloaded truck fast southern edge						
Nursery Rd	14/07/2017	15:51:00	Continuous	0.23	background						
Nursery Rd	14/07/2017	15:52:00	Continuous	0.399	Loaded truck slow						
Nursery Rd	14/07/2017	15:53:00	Continuous	0.347	Loaded truck slow						

				Vector	
Location	DATE	TIME	Triggered	Sum	Comments
	[Date]	[Time]	[Src]	[mm/s]	
	2017-07-				Smooth
Old Coast Road	14	17:44:00	Continuous	1.045	roller vibe
	2017-07-				Smooth
Old Coast Road	14	17:45:00	Continuous	0.849	roller vibe
	2017-07-				Smooth
Old Coast Road	14	17:46:00	Continuous	1.133	roller vibe
	2017-07-				Smooth
Old Coast Road	14	17:47:00	Continuous	1.984	roller vibe
	2017-07-				
Old Coast Road	14	17:48:00	Continuous	0.546	Background
	2017-07-				
Old Coast Road	14	17:49:00	Continuous	0.456	Background
	2017-07-				Smooth
Old Coast Road	14	17:50:00	Continuous	1.834	roller vibe
	2017-07-				Smooth
Old Coast Road	14	17:51:00	Continuous	1.473	roller vibe
	2017-07-				
Old Coast Road	14	17:52:00	Continuous	0.352	Background

Table 5 – Field Monitoring for Out of Hours Works July 2017 (Acoustic Investigation)

Description of Works	Date	Time	Location	NCA	NML (dB(A))	Laeq (dB(A))	Distance to receiver (m)	Compliant	Notes
Lower Warrell Creek - Concrete Pour	1/7/2017	7:35am	Lower Warrell Creek	1	40	40.0	300	Υ	Noise monitoring undertaken to verify compliance with L4.2(d).
Nambucca Bridge Hand Tools	1/7/2017	11:30 am	Nambucca Bridge north abutment	4	46	44.5	150	Υ	Noise monitoring undertaken to verify compliance with L4.2(d).
Williamson Creek Pump around	1/7/2017	9:55am	Williamsons Creek	1	40	38.5	150	Υ	Noise monitoring undertaken to verify compliance with L4.2(d).
Rosewood Bridge Finishing Works	3/7/2017	6:09pm	Rosewood Bridge	2	40	33.6	150	Υ	Noise monitoring undertaken to verify compliance with L4.2(d).
Nambucca River Span 7 Deck Pour	8/7/2017	1:10pm	Nambucca Bridge South	3	39	31.9	160	Y	Bridge works not audible at project boundary
Asphalting Bald Hill Road	22/7/2017	1:43pm	Bald Hill Road	3	41	42.5	150	Υ	Compliant (1.5dB(A) difference not discernible)
Nambucca Bridge Works	22/7/2017	7:15am	Nambucca Bridge north abutment	4	46	40	100	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Rosewood Bridge Grouting	22/7/2017	1:05pm	Rosewood Bridge	2	45	39	160	Υ	Noise monitoring undertaken to verify compliance with L4.2(d).
Bump Car and Pavement Cleaning	28/7/2017	6:47pm	Cut 21	6	38	32.5	50	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Letitia Bridge Parapet Installation	29/7/2017	1:05pm	Letitia Close	4	46	31.1	200	Υ	Noise monitoring undertaken to verify compliance with L4.2(d).