



Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

■ June 2016

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 June 2016 were limited to the following:

- Clearing and Grubbing
- Topsoil stripping
- Earthworks including crushing
- Production blasting
- Continuing bridge works including piling, headstock construction, pile caps, girder placement, deck unit installation and temporary work platforms
- Installation of permanent boundary fencing
- Fauna fence installation
- Installation of monitoring instruments – extensometers, inclinometers and piezometers
- Continuing culvert installation
- Scour rock installation
- Landscaping works
- Continuing utility works
- Batter stabilisation using hydromulch (permanent design seed mix)
- Girder deliveries to Nursery Road
- Site Survey
- Topsoil placement
- Sheet Piling Nursery Road
- Topsoil Amelioration and Blending
- Concrete Lined Drains
- Sealing
- Basin Decommissioning
- Girder Production

- Concrete Production
- Basin Maintenance including dewatering
- Installation of Erosion and Sediment Controls
- Line marking

Works scheduled for next month include

- Clearing and grubbing
- Topsoil stripping
- Earthworks including crushing
- Production blasting
- Continuing bridge works including piling, headstock construction, pile caps, girder placement, deck unit installation and temporary work platforms
- Installation of permanent boundary fencing
- Fauna fence installation
- Landscaping works
- Continuing culvert installation
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- Sheet Piling Nursery Road
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- Concrete Production
- Basin Maintenance including dewatering
- Installation of Erosion and Sediment Controls
- Line marking

1.2 Consultation Activities

The project's consultation activities during June 2016 included the following:

Table 1 – Consultation Activities

Groups	Date	Key Topics
Environmental Review Group	15/6/16	Construction Progress, Design Update, Upcoming works, EWMS discussion, Environmental Update, Monitoring update, Out of Hours Works, Incidents and Community Complaints

Other Consultation Activities:

- Ongoing night-time girder delivery notifications
- Several OOHW notifications were distributed and some agreements sought for works including piling for Nambucca River bridgeworks, and linemarking on the Pacific Highway sidetrack near the bridgeworks
- Early notification to emergency and essential services organisations for proposed traffic changes for Old Coast Road Central switch
- Notification to all Old Coast Road residents about the proposed Old Coast Road Central traffic switch
- Notification to database distribution list of final approval for Macksville north facing ramps

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.

Upcoming Community and stakeholder activities:

- Next quarterly community information sessions will be held August 3 and 4
- Start fortnightly look-ahead meetings with discreet resident group in relation to Macksville North Facing Ramps works
- Start engagement with local community regarding construction of asphalt plant
- School visits including construction personnel and RMS representatives likely last quarter 2016
- Change to quarterly OOHW notification to sensitive receivers may start for period July to September

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 - Precipitation

Month	Total monthly rainfall	Location
01/6/16 – 30/6/16	328.2mm	Northern Compound
01/6/16 – 30/6/16	379.2mm	Albert Drive Compound

The site experienced a total of 11 rain days throughout the month of June 2016.

During June, rainfall received on site was higher than the June monthly average of 139.6mm. 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 April 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

Date	Time	TOTAL Rain Gauge (mm)
1/06/2016	9:00:00	0
2/06/2016	9:00:00	0
3/06/2016	9:00:00	0.8
4/06/2016	9:00:00	54.4
5/06/2016	9:00:00	261.6
6/06/2016	9:00:00	1
7/06/2016	9:00:00	0
8/06/2016	9:00:00	0
9/06/2016	9:00:00	0
10/06/2016	9:00:00	0
11/06/2016	9:00:00	0
12/06/2016	9:00:00	0
13/06/2016	9:00:00	1
14/06/2016	9:00:00	2.2
15/06/2016	9:00:00	0.2
16/06/2016	9:00:00	0.2
17/06/2016	9:00:00	0
18/06/2016	9:00:00	0
19/06/2016	9:00:00	6.4
20/06/2016	9:00:00	51.2
21/06/2016	9:00:00	0
22/06/2016	9:00:00	0
23/06/2016	9:00:00	0
24/06/2016	9:00:00	0
25/06/2016	9:00:00	0
26/06/2016	9:00:00	0
27/06/2016	9:00:00	0
28/06/2016	9:00:00	0
29/06/2016	9:00:00	0
30/06/2016	9:00:00	0.2

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

Date	Time	TOTAL Rain Gauge (mm)
1/06/2016	9:00:00	0
2/06/2016	9:00:00	2
3/06/2016	9:00:00	0
4/06/2016	9:00:00	45.8
5/06/2016	9:00:00	225.8
6/06/2016	9:00:00	0
7/06/2016	9:00:00	0
8/06/2016	9:00:00	0
9/06/2016	9:00:00	0
10/06/2016	9:00:00	0
11/06/2016	9:00:00	0
12/06/2016	9:00:00	0
13/06/2016	9:00:00	0.6
14/06/2016	9:00:00	3.2
15/06/2016	9:00:00	0.4
16/06/2016	9:00:00	0.2
17/06/2016	9:00:00	0
18/06/2016	9:00:00	0
19/06/2016	9:00:00	11.2
20/06/2016	9:00:00	39
21/06/2016	9:00:00	0
22/06/2016	9:00:00	0
23/06/2016	9:00:00	0
24/06/2016	9:00:00	0
25/06/2016	9:00:00	0
26/06/2016	9:00:00	0
27/06/2016	9:00:00	0
28/06/2016	9:00:00	0
29/06/2016	9:00:00	0
30/06/2016	9:00:00	0

Table 2.3: Weather conditions recorded in June 2016 at Smoky Cape by the Bureau of Meteorology.

June 2016			
Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
1/06/2016	12.5	21.6	0
2/06/2016	13.5	22	0
3/06/2016	14.1	22	1
4/06/2016	16.5		8.6
5/06/2016		20.4	
6/06/2016	14	19.7	55

Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
7/06/2016	14.2	20.7	0
8/06/2016	14.6	22.1	0
9/06/2016	15.2	25.4	0
10/06/2016	16	23.9	0
11/06/2016	15	21.2	0
12/06/2016	12.2	19.6	0
13/06/2016	12.1	19.5	5.8
14/06/2016	12.8	21.1	2.4
15/06/2016	14	18.8	0
16/06/2016	14.8	22.5	0
17/06/2016	15.5	22.5	0
18/06/2016	17	22.4	0
19/06/2016	15.3	20.1	1.8
20/06/2016	14.5	21.7	21.2
21/06/2016	13.9	19.6	0
22/06/2016	14	20.8	0
23/06/2016	13.9	21.2	0
24/06/2016	14	23.1	0
25/06/2016	9	20.8	0
26/06/2016	9	16.3	0
27/06/2016	11	15.8	0
28/06/2016	8.6	18.1	0
29/06/2016	10.9	20.6	0
30/06/2016	13	21.1	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):

Wet Sampling Event

A "wet" sampling event was undertaken on the 6th of June, samples were taken for lab testing and field testing was undertaken.

pH levels noted to be outside of trigger levels at:

All sites recorded levels below trigger levels. This is likely as a result of the high level of rainfall causing run-off into the waterway and impacting on pH levels. Minimal changes from upstream to downstream occurred, with impacts likely to be as a result of impacts from off-site.

Turbidity levels noted to be above trigger levels at:

Upper Warrell Creek upstream (63.7) and downstream (62.1). It is noted that turbidity decreased from upstream to downstream sites. The elevated levels are therefore likely to be as a result of the high level of rainfall on the 4th and 5th June.

Lower Warrell Creek upstream (65.9) and downstream (66.4) sites recorded elevated levels. It is noted that upstream and downstream sites had similar levels of NTU, with the source likely to be as a result of the high level of rainfall.

Nambucca River upstream (241) and downstream (309) sites. It is noted that both upstream and downstream had elevated levels of NTU, with no release of sediment from site to the waterway. It is therefore likely to be as a result of the high rainfall for the elevated NTU.

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

Nambucca River upstream (6.2mg/L) and downstream (6.54mg/L) recorded low DO. It is noted that no construction activities were occurring within the waterway, with levels increasing from upstream to downstream sites. It is also noted that these levels are within ANZECC criteria (>5.0 mg/L).

Metals levels noted to be above trigger levels at:

Upper Warrell Creek downstream recorded elevated levels for aluminium (0.2mg/L) and zinc (0.014mg/L). It is noted that aluminium levels decreased from upstream (0.21mg/L) to downstream (0.2mg/L) sites.

Stony Creek recorded elevated manganese (0.172mg/L) and zinc (0.012mg/L) levels downstream. It is noted that manganese levels were well within ANZECC criteria (1.9mg/L) and that zinc levels were only slightly above ANZECC criteria (0.008mg/L), with the source likely to be as a result of high rainfall levels.

Gumma wetlands downstream recorded elevated levels for copper (0.003mg/L), nickel (0.012mg/L) and zinc (0.066mg/L). It is noted that all three metals levels decreased from upstream to downstream and thus aren't likely to be as a result of construction.

Nutrients levels noted to be above trigger levels at:

Upper Warrell Creek upstream and downstream for total phosphorus (0.06mg/L US, 0.07mg/L DS), total nitrogen (1.3mg/L US, 1.1mg/L DS) and nitrate (0.48mg/L US, 0.31mg/L DS). It is noted that levels lowered from upstream to downstream sites or had minimal increases and thus are not likely to be as a result of construction impacts. The elevated levels are possibly as a result of run-off from nearby agricultural land.

Stony Creek upstream and downstream for total nitrogen (1.5mg/L US, 1.8mg/L DS) and nitrate (1.02mg/L US, 1.31mg/L DS). It is noted that these levels had minimal increases from upstream to downstream sites. Elevated nutrient levels are possibly as a result of run-off from nearby agricultural land, as well as hydromulching treatments within the works areas.

Lower Warrell Creek upstream and downstream for total nitrogen (0.06mg/L US, 0.05mg/L DS), total nitrogen (2.6mg/L US, 1.1mg/L DS) and nitrate (1.56mg/L US, 0.48mg/L DS). It is noted that these three parameters decreased from upstream to downstream sites and are thus unlikely to be attributed to construction impacts.

Gumma wetlands recorded elevated nitrate upstream (0.34mg/L) and downstream (0.09mg/L). Levels decreased from upstream to downstream sites, and are thus unlikely to be attributed to construction impacts.

Nambucca River upstream and downstream recorded elevated levels for total phosphorus (0.33mg/L US, 0.24mg/L DS), total nitrogen (1.8mg/L US, 1.6mg/L DS) and nitrate (0.36mg/L US, 0.4mg/L DS). It is noted that levels were similar for upstream and downstream sites, and are thus unlikely to be attributed to construction impacts. Elevated nutrient levels are possibly due to run-off from agricultural land upstream.

Dry Sampling Event

A "dry" sampling event was undertaken on the 16th of June, field testing was undertaken. Results are available in Appendix A.

pH levels noted to be outside trigger levels at:

Lower Warrell Creek upstream (7.99) and downstream (8.27) recorded elevated pH levels. All controls were verified to be in place, with no construction activity being undertaken in the waterway.

Nambucca River upstream (7.48) and downstream (6.91) recorded levels outside of trigger levels, with the upstream site above and downstream below trigger levels. It is noted that trigger levels for the site are pH 7, with any deviation breaching trigger levels. Levels were also noted to be within ANZECC criteria.

Turbidity levels noted to be outside of trigger levels at:

Upper Warrell Creek upstream (12.1 NTU) and downstream (13.1 NTU). No work were being undertaken within the waterway, with all controls verified to be in place. Levels were within ANZECC criteria (50 NTU).

Lower Warrell Creek upstream (10.9 NTU) and downstream (8.9NTU). It is noted that levels decreased from upstream to downstream sites and thus are unlikely to be attributable to construction works.

Dissolved Oxygen levels noted to be outside of trigger levels at:

Lower Warrell Creek upstream (3.31mg/L) and downstream (2.57mg/L). No work was being undertaken in the waterway, with low levels attributed to decaying vegetative matter within the waterway.

Nambucca River upstream (5.26mg/L) and downstream (4.59mg/L). No work was being undertaken in the waterway, with all controls verified to be in place.

2nd Wet Sampling Event

A "wet" sampling event was undertaken after >10mm of rainfall within a 24 hour period on the 20th of June 2016. Field testing was undertaken, with results in Appendix A.

pH levels noted to be outside trigger levels at:

Lower Warrell Creek downstream (7.33). It is noted that this is within ANZECC criteria (6.5-8.0) and is only a minor increase from the upstream site (6.86).

Turbidity levels noted to be above trigger levels at:

Upper Warrell Creek upstream (51.9) and downstream (53.3). It is noted that there was only a minimal increase from upstream to downstream sites, with the elevated levels therefore likely to be as a result of run-off from further upstream. No sources were detected upstream from an initial survey 200m upstream.

Stony Creek upstream (16.4) and downstream (32.4). All controls were verified to be in place, with no construction activities being undertaken in the waterway.

Nambucca River upstream (157) and downstream (39.1). All controls were verified to be in place, with no construction activities occurring within the waterway. It is noted that NTU levels dropped from upstream to downstream sites, and were thus not likely to be as a result of construction activities.

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

Lower Warrell Creek upstream (2.48 mg/L) and downstream (2.31 mg/L). All controls were verified to be in place, with no construction activities undertaken within the waterway. The low levels are therefore likely to be attributable to decaying vegetative matter within the waterway.

Nambucca River upstream (4.13 mg/L) and downstream (4.25 mg/L). All controls were verified to be in place, with not construction activities being undertaken in the waterway. It is also noted that levels increased from upstream to downstream sites, and therefore are not likely to be as a result of construction.

4. Sediment Basin Water Monitoring

Water was released from commissioned sediment basins after rainfall events occurring on the 6th and 20th of June 2016. Water pumped into basins from site for treatment was kept below the design Sediment Storage Zone and was treated and released as soon as possible, especially if rainfall was predicted in the 5 day forecast. 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 50mg/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) ($R^2 = 0.6095$, $p < 0.00001$, $n=90$). The regression equation for the analytical results calculates a turbidity (NTU) value of 132.648 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 92.854, rounded to an NTU value of 90. 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 we maintain 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

Date	Basin ID	Oil and Grease (visible) (Limit = No Visible)	pH (6.5 – 8.5)	Turbidity (NTU) (Limit <90 ntu)	Total Suspended Solids mg/L (Limit <50mg/L)	Approx Volume Discharged (kL)	Comments
6/06/2016	B60.8	N	6.84	56.5		500	
7/06/2016	B42.30	N	6.94	60.6		1000	
7/06/2016	B44.55	N	6.83	26.5		500	
7/06/2016	B48.30	N	6.53	30		200	
7/06/2016	B55.3	N	7.84	68.9		200	
7/06/2016	B57.7	N	7.39	20		500	
7/06/2016	B57.75	N	7.26	46.8		600	
7/06/2016	B58.10	N	7.47	45.5		800	
7/06/2016	B60.85	N	7.24	13.4		450	
8/06/2016	B42.30	N	6.53	38.2		1000	
8/06/2016	B42.80	N	7.02	5.8	<5	400	
8/06/2016	B42.87	N	7.32	77.5	10	750	
8/06/2016	B43.37	N	6.78	45.8	<5	300	
8/06/2016	B43.75	N	7.22	3.5	<5	150	
8/06/2016	B44.55	N	6.8	22.5		300	
8/06/2016	B53.5	N	7.28	56.9		2008	
8/06/2016	B54.3	N	7.45	7.2	13	500	
8/06/2016	B55.5	N	7.42	6.3	6	450	
8/06/2016	B55.8	N	7.09	36.3		300	
8/06/2016	B57.03	N	7.52	7.4		150	
8/06/2016	B59.5	N	7.42	12.4	<5	400	
8/06/2016	B59.85	N	7.44	15.2	40	800	
8/06/2016	B60.3	N	7.52	12.4	9	150	
8/06/2016	B53.03				10		
9/06/2016	B42.30	N	6.75	62.8		500	
9/06/2016	B44.44	N	7.59	50.7	6	800	
9/06/2016	B45.50	N	6.96	17.2	<5	800	
9/06/2016	B47.14	N	6.94	8.6		800	
9/06/2016	B47.96	N	7.52	0.2	<5	800	
9/06/2016	B47.60B	N	6.96	34.3	<5	100	
9/06/2016	B47.96	N	7.52	0.2		800	
9/06/2016	B49.67	N	6.55	60	26	700	
9/06/2016	B53.2	N	7.26	21		500	
9/06/2016	B54.42	N	7.14	29.6	12	600	
9/06/2016	B56.4	N	6.64	60.6		300	
9/06/2016	B58.45	N	7.52	36.6	19	900	

9/06/2016	B59.78	N	7.45	16.3		600	
9/06/2016	B60.1	N	7.96	60.2	16	300	
9/06/2016	B60.5	N	7.14	16.8		300	
10/06/2016	B44.44	N	7.27	63.5		600	
10/06/2016	B45.00	N	7.21	67.1	9	680	
10/06/2016	B45.64	N	7.12	72.9	10	800	
10/06/2016	B46.35	N	7.13	79.1		800	
10/06/2016	B48.46	N	6.71	23.4		300	
10/06/2016	B49.20	N	6.57	11.3		800	
10/06/2016	B49.45	N	7.21	67.3		800	
10/06/2016	B42.30	N	7.14	30.6		450	
10/06/2016	B54.7	N	7.4	88.2		1500	
10/06/2016	B56.5	N	7.14	79.6		600	
10/06/2016	B58.03	N	7.01	60.4		500	
10/06/2016	B61.2	N	7.12	73.6		500	
11/06/2016	B45.00	N	6.73	59.8		400	
11/06/2016	B48.46	N	6.99	22.7		300	
11/06/2016	B53.90	N	8.27	5.3		1000	
11/06/2016	B54.25	N	6.83	62.9		500	
11/06/2016	B55.0	N	7.81	83.2		1500	
11/06/2016	B57.30	N	6.54	27.5		400	
11/06/2016	B59.00	N	7.14	6.1		700	
11/06/2016	B59.6	N	8.09	13.9		300	
15/06/2016	B43.21	N	6.86	35		400	Basin released after drainage works
15/06/2016	B43.21	N	6.86	35		400	Basin released after drainage works
20/06/2016	B56.40	N	8.31	37.3		700	
20/06/2016	B56.90	N	8.41	20.2		700	
20/06/2016	B49.2	N	7.3	15		700	
21/06/2016	B60.80	N	7.14	6.5		1000	WATER FROM MEDIAN FILL 32 P/O
21/06/2016	B60.30	N	6.81	72.3		200	
21/06/2016	B60.1	N	7.36	6.4		1000	
21/06/2016	B60.58	N	8.44	64.7		100	
21/06/2016	B56.50	N	8.12	39.3		800	
21/06/2016	B55.17B	N	7.86	47.9		300	
21/06/2016	B56.7	N	8.06	39.4		500	
21/06/2016	B59.78	N	7.81	46.9		500	
21/06/2016	B53.03	N	7.61	21.3		135	
21/06/2016	B54.70	N	7.86	52.3		1500	
21/06/2016	B42.3	N	7.42	42.6		1000	
21/06/2016	B47.60	N	7.8	10		500	

21/06/2016	B46.35	N	8.1	80		450	
21/06/2016	B49.45	N	6.9	80		1000	
21/06/2016	B42.8	N	7.3	10.1		200	
21/06/2016	B42.87	N	7.6	25.2		800	
21/06/2016	B43.37	N	7.92	30.8		800	
21/06/2016	B45.64	N	7.67	8.7		600	
22/06/2016	B59.00	N	8.01	7.16		550	
22/06/2016	B53.00	N	8	7.7		600	
22/06/2016	B54.70	N	8.14	63.8		1400	
22/06/2016	B60.50	N	7.26	54.9		200	
22/06/2016	B59.50	N	6.81	37.1		200	
22/06/2016	B55.0	N	7.93	75.9		1500	
23/06/2016	B58.45	N	8.2	15.6		900	
23/06/2016	B59.6	N	8.21	9.81		300	
23/06/2016	B59.00	N	8.1	10.1		500	
23/06/2016	B59.24	N	6.86	10.3		400	
23/06/2016	B55.0	N	7.73	69.1		1100	
23/06/2016	B53.90	N	7.66	12.1		1500	
23/06/2016	B53.20	N	6.51	69		600	
24/06/2016	B57.25	N	6.52	4.6		623	
24/06/2016	B61.25	N	7.73	41.2		800	
24/06/2016	B53.00	N	7.11	11.6		1000	RELEASE OF TRANSFERRED WATER FROM B53.20
27/06/2016	B53.03	N	6.96	34.3		10	RELEASE OF SSZ WATER FOR DESILTING OPERATIONS
27/06/2016	B53.00	N	7.92	19.6		200	RELEASE OF SSZ WATER FOR BASIN PICKUP
28/06/2016	B46.8	N	7.07	25.2		650	Water holding pond only (not commissioned)
29/06/2016	B53.00	N	7.92	19.6		200	RELEASE OF SSZ WATER FOR BASIN PICKUP
29/06/2016	B46.8	N	6.69	13.7		200	Water holding pond only (not commissioned)

5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 15th and 17th of June 2016 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.

6. Vibration Monitoring

Vibration monitoring was undertaken as part of blasting works during June 2016. Monitoring Results are available in Appendix A, Table 5.

6.1 Blasting

One (1) blasting event occurred in June 2016. No exceedances of overpressure or vibration limits occurred from this blast.

We are required to achieve less than 5% exceedance (of 5mm/s limit and 115dB (LinPeak)) within the reporting period for those sensitive receptors that have not agreed to the 25mm/s and 125dB limits. For the second reporting period commencing 16th December 2015, we have had thirteen blasts (13) with no exceedances of these limits.

7. Dust Monitoring

Dust deposition gauges (DDG) were placed at nearby sensitive receivers from the 4th May to 3rd June 2016. DDG results are available in Appendix A.

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

Surfactant additives have been utilised and will continue to be utilised onsite in water carts to assist with dust mitigation. Water cart usage outside of standard construction hours has been utilised to assist with reducing dust emissions from the project, during public holidays on Sundays throughout the Project. Pacifico is progressively stabilising cuts and fills that have reached their final profile.

8. Groundwater Monitoring

ACCIONA (Pacifico) have undertaken groundwater monitoring on the 17th of June 2016. 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 Pacifico including groundwater triggers.

9. Acoustic Investigations

Acoustic Investigations (modelling) have been conducted and approved for several Out of Hours Works proposed to model impact on residents during the month of June 2016. A summary of these approvals is below in Table 4.

Acoustic Investigation (Field Monitoring) of Out of Hours works has not been undertaken in June 2016 due to no high-risk activities being undertaken. Field monitoring results will continue to be provided as these activities are undertaken.

Table 4 – June Out of Hours Works Acoustic Investigation (Modelled)

OOH Request Title	>5dB(A) above background	Approval Date
Nambucca River concrete finishing work on Gumma Road	N	9/06/16
Nambucca Bridge Steel Fixing + Formwork	N	17/6/2016
Traffic Control and lighting towers – girder deliveries Rosewood Road	N	28/6/2016

10. Complaints

10.1 Summary of Complaints for the month

The following is a brief summary of environmental complaints received in June 2016.

Table 5 – Complaints

Type of event	Date of Complaint	Date of Resolution	Summary	Description & Action Taken
Phone	29 June 16	Ongoing	Felt windows vibrating and watching machinery nearby believes is causing impact on her property.	Vibration monitoring has been undertaken in response to this complaint. The results show the vibration levels are below the criteria to impact on human comfort (0.28mm/s, vibration levels measured <0.1mm/s). The full results will be provided in the July monthly report.
Email	22 June 16	Ongoing	Claims that dust is impacting health	A dust gauge has been located at complainant's property for monitoring purposes, no exceedance of the dust criteria has occurred in June. Community Team regularly visit complainant to keep communication lines open.
Phone	15 June	Ongoing	Does not want any	Complainant did not want water from

Type of event	Date of Complaint	Date of Resolution	Summary	Description & Action Taken
	16		drainage water from sediment basin going onto private property.	sediment basin pumped onto property after rainfall event. EPA and others inspected site and controls in place are appropriate and in accordance with the EPL. Alternative discharge location sought until resolution with resident through RMS.
Meeting	9 June 16	Ongoing	Site erosion and sediment controls overtopped in heavy rainfall event.	Complainant raised several issues pertaining to the sediment basin on site and other erosion and sediment controls that were overtopped during a heavy rainfall event (>320mm). Majority of actions were undertaken immediately and the site was made compliant with the Blue Book. An offer to provide a third party assessment of any damage to the complainants land was made, however this was declined. No further actions are required.
Phone	5 June 16	5 June 16	Pumping water from site	Environment Officer was pumping water into sediment basin on site and not off site. This was explained to the complainant, no further actions required.

11. Non-Compliance

11.1 Summary of Non-compliances

Two (2) Non Compliances (AFJV-NCR-000487, AFJV-NCR-000556) against the ACCIONA Environmental Protection Licence (EPL) 20533 occurred in June 2016.

AFJV-NCR-000487

Description of Non Compliance

All sediment basins were not dewatered within 5 days of cessation of the rainfall event which ended Sunday afternoon 5th June. 8 out of the 64 basins on site exceeded this time frame and were released on Saturday 11th June.

Possible Causes

The large size of the rainfall event (Southern site weather station recorded 317.8mm, Northern site station recorded 273.8mm) resulted in restricted access to site as well runoff into basins being observed up to and including Wednesday 8th June.

Remedial Action

Pre-rainfall preparations i.e. pre-dosing with gypsum, use of soil binder, pre-rainfall inspections, obtaining out of hours approval for basin treatment and release on Sundays and Public Holidays on the weekend of the 4th and 5th. Basins were treated and dewatered as soon as practical, due to runoff being observed continuing to enter basins up to and including Wednesday 8th June.

Corrective Action

Communication of the interpretation of the EPL condition O5.9 requiring release of basins within 5 days of the cessation of the rainfall event and not at the cessation of runoff which had been supported to date by site RMS representatives. Evaluation of the need for additional resources to dewater basins within the 5 day timeframe.

AFJV-NCR-000556

Description of Non Compliance

It was identified during preparation for an internal audit by the Environment Representative of the Community Involvement Plan that evidence of compliance with condition L4.4 involving a letterbox drop 48 hours prior to undertaking any out of hours works subject to written agreements (covered under L4.3) could not be substantiated. Three Out of Hours Works Permits under condition L4.3 were not able to be found for Permit 0002 (Re-linemarking Intersection – March 2015), Permit 004 (Pile Splicing Nambucca River – April 2015) and Permit 0031 (Cut 10 Repair Works – April 2016). It should be noted that AFJV believes that a letterbox drop was provided to affected sensitive receivers however, evidence of this has not been documented on site. It was also identified that letterbox notifications for these three Out of Hours Works were not provided on the RMS Project website as per L4.4.

It should be noted that all residents affected by the above Out of Hours Works were consulted regarding time, dates and activities for the works undertaken, with agreements obtained for all works prior to commencement in accordance with condition L4.3.

It should also be noted that these works have been finalised with no complaints received relating to the works.

Possible Causes

Internal miscommunication between AFJV Environmental and Community Teams. Staff changeover within the AFJV Community Team resulted in documents not being available or stored for review within AFJV Project Documents as part of the handover process.

Remedial Action

Technical non-compliance – no remedial actions required. No complaints were received as a result of the Out of Hours Works undertaken.

Corrective Action

To limit the potential for a reoccurrence of this NCR AFJV has initiated Quarterly Out of Hours Works Notifications with residents to meet EPL Condition L4.4, these documents shall also be uploaded onto the RMS Project Website. The AFJV Environmental Manager shall also be responsible for the implementation of the Out of Hours Works Process and shall ensure compliance with the EPL Conditions, removing any ambiguity between AFJV Environment and AFJV Community Teams regarding responsibilities relating to EPL Condition L4.4.

Appendix A – Monitoring Results

Table 1a - Surface Water Sampling Results June 2016 – Wet Event

Location	Units	Levels of Concern	Upper Warrell Creek			Upper Warrell Creek			Stony Creek			Stony Creek			Lower Warrell Creek			Lower Warrell Creek			Unnamed Creek Gumma West			Unnamed Creek Gumma East			Unnamed Creek Gumma North			Nambucca River South			Nambucca River South									
			Upstream			Downstream			Upstream			Downstream			Upstream			Downstream			Upstream			Downstream			Upstream			Downstream												
			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Estuarine			Estuarine												
Date of Sampling	6-Jun-16			6-Jun-16			6-Jun-16			6-Jun-16			6-Jun-16			6-Jun-16			6-Jun-16			6-Jun-16			6-Jun-16			6-Jun-16			6-Jun-16											
Time of Sampling	11:40			11:25 AM			12:30 PM			12:00 PM			3:30 PM			3:31 PM			1:10 PM			1:24 PM			1:39 PM			2:25 PM			2:30 PM											
Type	Freshwater			Marine			80th %ile			20th %ile			Result			80th %ile			20th %ile			Result			80th %ile			20th %ile			Result			80th %ile			20th %ile			Result		
Comments																												Unable to sample - w water level too low			Wind chop - sediment stirred up			Wind chop - sediment stirred up								
Laboratory data																																										
Metals																																										
Aluminium	mg/L	0.055	-	0.244	0.0162	0.21	0.194	0.016	0.2	0.098	0.02	0.04	0.114	0.01	0.03	0.28	0.01	0.19	0.28	0.01	0.2	0.25	0.02	0.09	0.25	0.02	0.47	0.25	0.02	0.09	0.11	0.01	0.05	0.11	0.01	0.06						
Arsenic	mg/L	0.024	0.0023	0.001	0.001	<0.001	0.001	0.001	<0.001	0.002	0.001	<0.001	0.002	0.001	<0.001	0.001	0.001	<0.001	0.001	0.001	<0.001	0.002	0.001	<0.001	0.002	0.001	0.002	0.002	0.001	0.001	0.001	0.001	<0.001	0.002	0.001	<0.001						
Cadmium	mg/L	0.0002	0.0055	-	-	<0.0001	-	-	0.0001	-	-	<0.0001	-	-	0.0001	0.0002	0.0001	0.0003	0.0002	0.0001	<0.0001	-	-	<0.0001	-	-	0.008	-	-	0.0012	-	-	<0.0001	-	<0.0001							
Chromium	mg/L	0.001	0.0044	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	<0.001							
Copper	mg/L	0.0014	0.0013	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	0.001	0.001	<0.001	0.001	0.001	0.026	0.001	0.001	0.003	0.001	0.001	<0.001	0.001	0.001	<0.001						
Lead	mg/L	0.0034	0.0044	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	<0.001							
Manganese	mg/L	1.9	0.98	0.3	0.01	0.061	0.158	0.0178	0.105	0.0726	0.0218	0.07	0.083	0.0164	0.172	0.35	0.087	0.29	0.35	0.087	0.061	0.49	0.011	0.023	0.49	0.011	1.24	0.49	0.011	0.265	0.076	0.006	0.056	0.076	0.006	0.059						
Nickel	mg/L	0.011	0.07	-	-	<0.001	-	-	0.003	-	-	<0.001	-	-	0.002	0.0034	0.001	0.006	0.0034	0.001	<0.001	0.002	0.001	<0.001	0.002	0.001	0.065	0.002	0.001	0.012	-	-	<0.001	-	<0.001							
Selenium	mg/L	11	-	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	<0.01							
Silver	mg/L	0.00005	0.0014	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	<0.001							
Zinc	mg/L	0.008	0.015	0.007	0.005	<0.005	0.0062	0.0042	0.014	0.0064	0.005	<0.005	0.006	0.005	0.012	0.018	0.005	0.031	0.018	0.005	<0.005	0.011	0.005	0.015	0.011	0.005	0.432	0.011	0.005	0.066	0.005	0.005	<0.005	0.005	<0.005							
Iron	mg/L	-	-	1.38	0.48	0.21	0.99	0.366	0.17	1.4	0.41	0.11	1.48	0.35	0.08	0.52	0.05	0.19	0.52	0.05	0.23	1.65	0.37	0.15	1.65	0.37	0.08	1.65	0.37	0.11	0.26	0.05	0.06	0.26	0.05	0.08						
Mercury	mg/L	0.0006	0.0004	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	<0.0001							
Total Recoverable Hydrocarbons																																										
Naphthalene	µg/L	16	50	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16	NA	16						
06 - C10 Fraction	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
06 - C10 Fraction minus BTEX (F1)	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
>C10 - C16 Fraction	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
>C16 - C34 Fraction	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
>C34 - C40 Fraction	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
>C40 - C40 Fraction (sum)	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
BTEX																																										
Benzene	µg/L	950	700	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950	NA	950						
Toluene	µg/L	180	180	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180	NA	180						
Ethylbenzene	µg/L	80	80	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80	NA	80						
m,p-Xylenes	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
o-Xylene	µg/L	350	350	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350	NA	350						
Xylenes - Total	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
Sum of BTEX	µg/L	-	-	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-						
Nutrients																																										
Total Phosphorus	mg/L	0.05	0.03	0.05	0.02	0.06	0.044	0.016	0.07	0.03	0.016	0.04	0.034	0.01	0.03	0.04	0.01	0.06	0.04	0.01	0.05	0.11	0.03	0.05	0.11	0.03	0.05	0.11	0.03	0.06	0.07	0.02	0.33	0.07	0.02							
Phosphate (reactive phosphorus)	mg/L	-	-	0.01	0.0034	<0.01	0.01	0.004	<0.01	0.018	0.0022	<0.01	0.01	0.003	<0.01	0.011	0.006	<0.01	0.011	0.006	<0.01	0.013	0.005	<0.01	0.013	0.005	0.04	0.013	0.005	<0.01	0.029	0.01	0.01	0.029	0.01	0.02						
Total Nitrogen	mg/L	0.5	0.3	0.56	0.3	1.3	0.52	0.2	1.1	0.48	0.2	1.5	0.63	0.2	1.8	0.54	0.31	2.6	0.54	0.31	1.1	3.1	0.9	0.7	3.1	0.9	1	3.1	0.9	0.7	0.46	0.2	1.8	0.46	0.2							
Total Kjeldahl Nitrogen	mg/L	-	-	0.5	0.3	0.8	0.5	0.2	0.8	0.34	0.2	0.5	0.6	0.2	0.5	0.5	0.2	1	0.5	0.2	0.6	2.8	0.8	0.6	2.8	0.8	0.7	2.8	0.8	0.6	0.3	0.2	1.4	0.3	0.2							
Nitrate	mg/L	0.7	-	0.102	0.01	0.48	0.054	0.01	0.31	0.208	0.01	1.02	0.2	0.01	1.31	0.05	0.01	1.56	0.05	0.01	0.48	0.03	0.01	0.09	0.03	0.01	0.34	0.03	0.01	0.09	0.04	0.01	0.36	0.04	0.01							
Nitrite	mg/L	-	-	-	-	<0.01	-	-	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	0.09	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01						
Ammonia	mg/L	0.9	-	0.036	0.01	<0.01	0.02	0.01	<0.01	0.046	0.02	0.02	0.062	0.01																												

Table 1c - Surface Water Sampling Results June 2016 – Wet Event

Location	Units	Levels of Concern	Upper Warrell Creek			Upper Warrell Creek			Stony Creek			Stony Creek			Lower Warrell Creek			Lower Warrell Creek			Unnamed Creek Gumma West			Unnamed Creek Gumma East			Unnamed Creek Gumma North			Nambucca River South			Nambucca River South		
			Upstream	Downstream	Result	Upstream	Downstream	Result	Upstream	Downstream	Result	Upstream	Downstream	Result	Upstream	Downstream	Result	Upstream	Downstream	Result	Upstream	Downstream	Result	Upstream	Downstream	Result	Upstream	Downstream	Result	Upstream	Downstream	Result			
Freshwater / Estuarine		ANZECC 2000 95% species protected	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater				
Date of Sampling			20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16	20-Jun-16				
Time of Sampling			3:15 PM	3:00 PM	2:30 PM	2:20 PM	4:30 PM	4:20 PM	12:34 PM	12:44 PM	12:54 PM	3:55 PM	3:40 PM																						
Type			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	80th %ile	20th %ile	Result			
Comments																																			
Field Physical data																																			
Temperature	C	-	24.3	16.27	15.86	24.52	16.79	15.87	23.98	17.36	17.17	24.7	17.65	18.22	25.9	19.5	16.48	25.9	19.5	16.63	25.84	19.1	18.99	25.84	19.1	16.96	25.84	19.1	18.41	26.56	21.32	18.99	26.56	21.32	19.03
pH	pH	6.5-8	7.478	6.23	6.41	7.192	6.42	6.5	7.138	6.61	6.6	6.98	6.21	6.71	6.86	6.46	6.86	6.86	6.46	7.33	6.9	6.08	6.18	6.9	6.08	6.37	6.9	6.08	6.3	7.56	6.58	7.2	7.56	6.58	6.9
Conductivity	mS/cm	0.125-2.2	0.3204	0.20184	0.249	0.3242	0.19076	0.248	0.313	0.2024	0.213	0.309	0.20188	0.225	20.918	0.50928	0.956	20.918	0.50928	0.104	0.842	0.334	0.564	0.842	0.334	0.322	0.842	0.334	0.465	48.42	12.65	26.3	48.42	12.65	26.7
Turbidity	NTU	50	26.16	5.94	51.9	27.32	3.72	53.3	14.98	3.34	16.4	17.16	4.59	32.4	26.1	2.4	2.3	26.1	2.4	2.1	66.8	11.6	29.2	66.8	11.6	14.7	66.8	11.6	29.7	19.04	5.81	157	19.04	5.81	39.1
Dissolved Oxygen	mg/L	5	7.43	1.5	3.65	6.88	2.28	3.65	8.472	5.08	4.44	7.59	2.63	5.5	6.65	5.02	2.48	6.65	5.02	2.31	7.3	1.78	4.68	7.3	1.78	1.45	7.3	1.78	2.7	8.47	6.88	4.13	8.47	6.88	4.25
Dissolved Oxygen	%				38.1			38.1						47.5			60.2			24.5			52			15.5			29.7			50.2			51.8
TDS	g/L				0.162			0.161						0.138			0.152			0.654			0.361			0.209			0.303			16.3			16.5

Table 2 - Noise Monitoring Results June 2016

Date	Time	Location	Rec ID	NCA	NML	Activity	Predicted levels for activity	Laeq	Principal sources/ operations	Measurements exceeding criteria, plant/ operations causing	Corrective actions	Notes
17/06/2016	1:52 PM	Albert Drive	74	1	50	Cut	62	48.4	Excavator	NA	NA	Within predicted level for activity
17/06/2016	12:01 PM	Cockburns Lane	16	1	50	Cut	65	43.3	Dozer	NA	NA	Within predicted level for activity
17/06/2016	1:10 PM	Bald Hill Rd	197	3	50	Cut	72	50.4	Moxy, concrete truck	NA	NA	Within predicted level for activity
15/06/2016	3:53 PM	Letitia Rd	406	4	59	Cut	74	54.2	Excavator, hand tools, tractor broom	NA	NA	Within predicted level for activity
15/06/2016	3:27 PM	Mattick Rd	442	6	44	Cut	62	54.5	Moxy dumping, compactor rolling	NA	NA	Within predicted level for activity
15/06/2016	4:10 PM	Nursery Rd	415	4	59	Bridgeworks	45	59.9	NA	NA	NA	Construction not audible - other sources: birds, highway traffix
17/06/2016	12:01 PM	Wallace St	148	3	50	Cut	47	51.5	NA	NA	NA	Construction not audible - other sources: highway, traffic
15/06/2016	4:30 PM	Gumma Rd	383	3	50	Bridgeworks	67	54.4	Hand tools	NA	NA	Within predicted level for activity

Table 3 - Dust Monitoring Results May/June 2016

Analyte	Time Period	Unit	DDG ID	LOR	DDG1	DDG2	DDG3	DDG4	DDG5	DDG5E	DDG5W	DDG6	DDG7	DDG8	DDG9N	DDG9NE	DDG A1	DDG A2
					Start date of sampling	Finish date of sampling	Levels of Concern	DDG1	DDG2	DDG3	DDG4	DDG5	DDG5E	DDG5W	DDG6	DDG7	DDG8	DDG9N
Ash Content	Current Month	g/m ² .month	4	0.1	0.2	0.6	0.2	0.5	0.9	0.7	0.5	0.7	0.3	1.2	0.2	0.5	----	----
	Previous Month	mg	N/A	1	4	11	4	8	16	13	8	13	6	21	4	8	----	----
	Change	g/m ² .month	Increase of 2		0	0.1	-1.4	-3.1	-23.7	0.2	-346.5	0.2	-0.1	NA	-0.3	0.2	----	----
Combustible Matter	Current Month	g/m ² .month	N/A	0.1	0.2	0.1	0.1	<0.1	0.2	0.1	<0.1	0.1	0.2	0.2	0.3	0.1	----	----
	Previous Month	mg	N/A	1	3	2	1	1	4	2	<1	2	2	4	4	3	----	----
Total Insoluble Matter (TIM)	Current Month	g/m ² .month	4	0.1	0.4	0.7	0.3	0.5	1.1	0.8	0.5	0.8	0.5	1.4	0.5	0.6	----	----
	Previous Month	mg	N/A	1	7	13	5	9	20	15	8	15	8	25	8	11	----	----
	Change	g/m ² .month	Increase of 2	0.1	0.5	0.7	2.2	4.4	26.8	1.1	372	1	0.6	2.8	0.5	0.8	----	----
Arsenic	Current Month	mg/L		0.001	----	----	----	----	----	----	----	----	----	----	----	0.033	<0.001	
Comments					Small insects in gauge		Leaf in gauge							Leaf in gauge				

Table 4 – Groundwater Monitoring Results June 2016

Location	Units	Groundwater Investigation Levels (GILs) from Interpretive Report	4BH007	4BH008	4BH010	4BH011	4BH021	4BH022	4BH025	4BH026	4BH037	4BH038	1BH49	4BH058	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			17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016	17/06/2016
Comments			DRY	DRY		DRY				DRY			DRY	Unable to sample	DRY	DRY
Field Physical data																
Depth to standing water level from TOC	m	-	-	-	18.53	-	6.80	1.42	5.97	-	0.48	0.64	-	-	-	-
pH	pH	-	-	-	6.6	-	6.39	7.01	6.52	-	6.85	7.32	-	-	-	-
Conductivity	mS/cm	-	-	-	1.71	-	0.183	0.663	0.184	-	8.9	10.8	-	-	-	-
Temperature	C	-	-	-	21.2200	-	20.79	20.90	20.70	-	18.14	19.54	-	-	-	-

Table 5 – Blasting Monitoring Result June 2016

Vibration and Overblast Tracking Register for Production Blasting

Date	Blast no.	Cut	BCM	Monitor 1 (PPV)	Monitor 2 (PPV)	Monitor 3 (PPV)	Monitor 1 (dB)	Monitor 2 (dB)	Monitor 3 (dB)	EPA Exceedances (5mm/s)	EPA Exceedances (10mm/s)	EPA Exceedance (120dB)	EPA Exceedance (115dB) 5%	No. of Blasts
30-Jun	11-001	11	1008	5.46	2.67	2.67	106.00	108.40	101.90	1				1
07-Jul	11-002	11	1622	5.77	3.51	2.35	108.00	103.50	108.40	1				2
27-Jul	11-003	11	7002	6.17	3.96	0.00	104.20	103.50	0.00					3
03-Aug	11-004	11	3616	11.64	3.43	1.03	113.10	107.00	95.92					4
06-Aug	10-001	10	8319	6.08	0.73	0.00	118.20	107.00	0.00					5
10-Aug	11-005	11	7006	14.67	7.68	2.45	114.60	115.60	104.20					6
13-Aug	10-002	10	3500	4.35	1.20	0.47	117.09	103.50	109.90					7
17-Aug	11-006	11	5382	12.99	6.45	1.79	118.20	118.60	104.20					8
20-Aug	10-003	10	10263	4.46	1.35	1.45	107.50	112.10	103.50					9
25-Aug	11-007	11	16100	6.21	1.78	0.00	115.60	98.84	0.00					10
31-Aug	11-008	11	14430	10.07	5.18	5.37	113.50	111.50	106.50	1				11
7-Sep	10-004	10	10281	9.76	1.94	0.70	119.90	112.30	98.84					12
17-Sep	10-005	10	7901.25	16.940	5.520	3.533	119.400	114.800	114.200					13
25-Sep	10-006	10	13200	19.490	6.092	-	113.800	118.800	-					14
1-Oct	11-009	11	8190	5.173	2.831	1.426	110.600	110.200	88.000					15

1-Oct	10-007	10	4485	10.240	1.308	-	118.500	88.000	-				16
13-Oct	10-008	10	6563.75	24.150	6.717	-	117.500	117.900	-				17
16-Oct	11-010	11	4641.25	3.126	1.926	-	109.200	1.926	-				18
20-Oct	10-009	10	9034.375	5.337	1.442	-	116.100	107.000	-				19
27-Oct	10-010	10	12247.5	5.039	3.297	-	97.500	117.500	-				20
27-Oct	11-011	11	11708.75	2.973	1.295	1.308	104.900	107.500	98.840				21
3-Nov	10-011	10	14462.5	6.971	2.012	0.684	124.000	117.200	102.800				22
12-Nov	10-012	10		3.919	0.933	-	88.000	116.300	-				23
16-Nov	8-001	8		*	8.638	4.591	*	112.300	108.800				24
24-Nov	8-002	8		8.875	1.308	1.000	124.900	98.840	107.000				25
26-Nov	10-013	10		12.100	1.024	-	119.800	106.500	-				26
1-Dec	10-014	10		8.371	-	-	120.600	-	-				27
2-Dec	8-003	8		15.39**	1.332	-	106.500	95.120	-				28
8-Dec	10-015	10		8.951	1.157	-	113.800	116.600	-				29
15-Dec	10-016	10		20.120	6.275	3.295	117.200	118.500	112.300				30
17-Dec	10-017	10		4.879	1.301	-	106.000	109.500	-				31
14-Jan	10-018	10		5.180	2.010	-	113.100	105.500	-				32
28-Jan	10-019	10		16.410	-	-	115.200	-	-				33
9-Feb	10-020	10		8.716	8.344	-	124.000	119.800	-				34
3-Mar	9-001	9		-	1.198	-	-	122.10	-				35
3-Mar	10-021	10		16.760	4.195	1.212	113.30	113.50	102.80				36
16-Mar	10-022	10		16.500	3.056	1.092	115.70	110.60	88.00				37
31-Mar	10-023	10		5.887	4.773	2.879	114.200	110.600	88.000				38
7-Apr	10-024	10		14.290	5.62	1.178	118.600	114	88.000				39
27-Apr	9-002	9		2.518	-	-	115.200	-	-				40
27-Apr	8-004	8		4.519	2.976	0.568	91.480	91.480	114.800				41
3-May	10-025	10		7.699	5.974	2.910	111.800	111.500	91.480				42
2-Jun	10-026	10		2.345	1.809	1.000	93.980	108.000	104.200				43

Note	17 July 2015 blasting criteria increase approved by DP&E with signed agreements	Totals No of Exceedances	3	EPL 2nd Reporting Period Exceedances	0
	16 December is Anniversary date of EPL	Current Percentage exceedance	6.98%		
	Monitor 3 is the only monitor where an agreement does not exist for 25mm/ from blast no. 3 onwards DP&E Approval 26/02/16 to extend the duration of blasting up to 25mm/s and overpressure up to 125 dBA for cut 10 widening	EPL Percentage exceedance at 16th December 2015	10.00%	* Flat Battery ** Power Pole - Did not trigger	