



Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

■ February 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 February 2016 were limited to the following:

- Clearing and Grubbing;
- Topsoil stripping;
- Earthworks including crushing;
- Production blasting;
- Continuation of piling including driven piling;
- Continuing bridge works including temporary work platforms;
- Clearing for Warrell Creek Twin Bridge Abutment A;
- Earthworks through the flying fox area;
- Installation of erosion and sediment controls;
- Installation of permanent boundary fencing;
- Fauna fence installation
- Installation of monitoring instruments – extensometers, inclinometers and piezometers
- Continuing culvert installation;
- Scour rock installation
- Continuing utility works
- Batter stabilisation using hydromulch (permanent design seed mix)
- Albert Drive Intersection works
- Installation of temporary waterway crossings
- Site Survey
- Heavily bound placement
- Spray seal
- Topsoil placement
- First U-Beam delivery to Nursery Road

- Pile Driving Gumma Rd
- Pile Capping
- Basin Installation
- Girder Production
- Concrete Batching

The works scheduled for next month include:

- Clearing and Grubbing;
- Topsoil stripping;
- Earthworks including crushing;
- Production blasting;
- Continuing bridge works including 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
- Continuing utility works
- Batter stabilisation using hydromulch (permanent design seed mix)
- Girder deliveries to Nursery Road
- Site Survey
- Topsoil placement
- Sheet Piling Nursery Road
- Basin Decommissioning
- Girder Production
- Concrete Production

1.2 Consultation Activities

The project’s consultation activities during February 2016 included and the following:

Table 1 – Consultation Activities

Groups	Date	Key Topics
Environmental Review Group	16/2/16	Construction Progress, Design Update, Upcoming works, EWMS discussion, Environmental Update, Monitoring update, Out of Hours Works, Incidents and Community Complaints
Quarterly Community Information Sessions	February 17 and 18	General information and update about the Project

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:

- Quarterly community information sessions will be held in 2016.
- Community Construction Tours will commence in early 2016. The free tours will be held monthly (bookings are essential).
- Two community drop-in sessions for the future temporary closure of Warrell Creek will occur on the 16th and 19th of March 2016 which included a mail-out of about 800 letters to marine stakeholders.
- Pacifico will have a stand at the annual Macksville Show on the 8th and 9th of April 2016.

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
01/2/16 – 29/2/16	36.2mm	Northern Compound
01/2/16 – 29/2/16	83.4mm	Albert Drive Compound

The site experienced a total of 10 rain days throughout the month of February 2016.

During February, rainfall received on site was lower than the February monthly average of 171.3mm. 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 February 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)
1/02/2016	9:00:00	0
2/02/2016	9:00:00	0
3/02/2016	9:00:00	0
4/02/2016	9:00:00	0
5/02/2016	9:00:00	16.2
6/02/2016	9:00:00	11
7/02/2016	9:00:00	4.4
8/02/2016	9:00:00	0
9/02/2016	9:00:00	0.4
10/02/2016	9:00:00	1.2
11/02/2016	9:00:00	0
12/02/2016	9:00:00	0
13/02/2016	9:00:00	0
14/02/2016	9:00:00	0
15/02/2016	9:00:00	0
16/02/2016	9:00:00	0
17/02/2016	9:00:00	0
18/02/2016	9:00:00	0
19/02/2016	9:00:00	1.4
20/02/2016	9:00:00	0.2
21/02/2016	9:00:00	10.8
22/02/2016	9:00:00	34.6
23/02/2016	9:00:00	0.4
24/02/2016	9:00:00	0
25/02/2016	9:00:00	0
26/02/2016	9:00:00	0
27/02/2016	9:00:00	0
28/02/2016	9:00:00	2.8
29/02/2016	9:00:00	0

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

Date	Time	TOTAL Rain Gauge (mm)
1/02/2016	9:00:00	0
2/02/2016	9:00:00	0
3/02/2016	9:00:00	0
4/02/2016	9:00:00	0
5/02/2016	9:00:00	9
6/02/2016	9:00:00	8.8
7/02/2016	9:00:00	2.4
8/02/2016	9:00:00	0

9/02/2016	9:00:00	0.2
10/02/2016	9:00:00	0.6
11/02/2016	9:00:00	0
12/02/2016	9:00:00	0
13/02/2016	9:00:00	0
14/02/2016	9:00:00	0
15/02/2016	9:00:00	0
16/02/2016	9:00:00	0
17/02/2016	9:00:00	0
18/02/2016	9:00:00	2.6
19/02/2016	9:00:00	0
20/02/2016	9:00:00	0
21/02/2016	9:00:00	0.6
22/02/2016	9:00:00	9
23/02/2016	9:00:00	0.2
24/02/2016	9:00:00	0
25/02/2016	9:00:00	0
26/02/2016	9:00:00	0
27/02/2016	9:00:00	0
28/02/2016	9:00:00	2.6
29/02/2016	9:00:00	0.2

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

February 2016			
Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
1/02/2016	22.3	30.5	0
2/02/2016	20.5	29.1	0
3/02/2016	21.3	31	0
4/02/2016	22.5	26.8	0
5/02/2016	18.8	25.1	32
6/02/2016	19	25.1	8.4
7/02/2016	18.2	26.9	7.8
8/02/2016	19.3	28.2	0.8
9/02/2016	19	26.1	0.7
10/02/2016	19	29	3.8
11/02/2016	20.5	29.4	0
12/02/2016	21.8	29.5	0
13/02/2016	20	29.6	0
14/02/2016	20.5	29.5	0
15/02/2016	20.9	30.8	0
16/02/2016	22.2	30.9	0

Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
17/02/2016	20.5	28.5	0.4
18/02/2016	20.4	30.6	0.6
19/02/2016	22.5	29.8	1.2
20/02/2016	24		0
21/02/2016		29.5	
22/02/2016	20.5	30.5	2.2
23/02/2016	20.2	30	0.7
24/02/2016	21.7	29.4	0
25/02/2016	22	29	0
26/02/2016	22.5	31.6	0
27/02/2016	22.5	31	0
28/02/2016	21.4	29.8	1
29/02/2016	20.8	29.9	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 5th of February after >10mm of rainfall in a 24 hour period, field and lab tests were undertaken. Results are available in Appendix A.

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

Upper Warrell Creek downstream. This is attributed to decaying vegetative matter and the low-flow nature of the water body. No works were being undertaken which would have impacted on DO levels.

Lower Warrell Creek upstream and downstream sites. This is attributed to the decomposing vegetative matter in the waterbody, this is applicable particularly at the downstream site as opposed to upstream which is sampled where there is less vegetative matter (boat ramp).

Nambucca River upstream and downstream sites. It is noted that the DO levels increased from upstream to downstream sites (4.05mg/L upstream to 5.34mg/L downstream) and thus are unlikely to be attributable to construction.

pH levels noted to be outside trigger levels at:

Upper Warrell Creek downstream. The pH decreased only minimally from upstream to downstream (6.28 to 6.04). No works were being undertaken in the area that would have impacted on pH levels.

Lower Warrell Creek upstream and downstream. It is noted that pH increased minimally (7.53 upstream to 7.7 downstream), and that no works were being undertaken in the area that would have impacted on pH levels.

Metals noted to be above trigger levels at:

Upper Warrell Creek upstream and downstream for manganese (0.363mg/L upstream, 0.264mg/L downstream). It is noted that the levels decreased from upstream to downstream and are within ANZECC criteria (1.9mg/L).

Stony creek upstream and downstream for manganese (0.252mg/L upstream, 0.261mg/L downstream). It is noted that these levels are well within ANZECC criteria (1.9mg/L).

Unnamed channel Gumma upstream (east) have elevated levels of copper (0.004mg/L), nickel (0.015mg/L) and Zinc (0.036mg/L). No readings for the downstream site were able to be taken due to low water levels. It is noted that these levels are only minor exceedances and there were no trigger level pH exceedances.

Nutrient levels above trigger levels at:

Upper Warrell Creek downstream for nitrate (0.06mg/L). It is noted that this within ANZECC guidelines (0.7mg/L), and that no works were being undertaken that would impact on runoff into the river.

Nambucca River upstream and downstream for total nitrogen. It is noted no works impacting on runoff into the river were being undertaken, so the increased levels are attributed to vegetative matter as well as runoff from agricultural areas upstream.

Turbidity levels above trigger levels at:

Stony Creek upstream and downstream. It is noted that turbidity levels only increased marginally from upstream (58.3 NTU) to downstream (58.5 NTU), construction erosion and sediment controls were in place as per Progressive Erosion and Sediment Control Plans and effective. These readings are therefore attributed to non-construction runoff as a result of the rainfall in the previous 24 hours.

Nambucca River upstream and downstream. It is noted that turbidity levels were elevated at both upstream (70.6 NTU) and downstream (89.9 NTU). We have reviewed works undertaken on the 5th of February and no piling or other activities that have the potential to cause turbidity were being undertaken at this time. Therefore the turbidity levels are more likely to be attributed to the tidal flow causing movement of sediment from the exposed river bank (sampling was undertaken approximately 30 minutes before low tide).

Wet Sampling Event

A "wet" monitoring event was conducted on the 22nd of February 2016 after >10mm of rainfall in a 24 hour period, field tests were undertaken. Below exceedances of trigger levels are discussed.

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

Upper Warrell Creek upstream and downstream, with a decrease from upstream to downstream sites (0.46mg/L upstream, 0.33mg/L downstream). No construction activities were being undertaken which could impact on DO levels, therefore the low levels are attributed to decaying vegetative matter as well as the low-flow environment of the water body.

Stony Creek upstream and downstream, with a minimal decrease from upstream to downstream (2.5mg/L upstream, 2.37mg/L downstream). No construction activities were being undertaken which could impact on DO levels, and so the low levels are attributed to decaying vegetative matter as well as the low-flow environment of the water body. It is also noted that the downstream site was much closer to the downstream trigger levels than the upstream site (5.08mg/L upstream, 2.63mg/L downstream).

Lower Warrell Creek upstream and downstream, although the levels increased from upstream to downstream (2.21mg/L upstream, 2.47mg/L downstream) and so are unlikely to be attributed to construction impacts.

Unnamed Creek at Gumma Wetlands upstream and downstream, although the levels increased from upstream to downstream (1.36mg/L upstream, 1.63mg/L downstream) and so are unlikely to be attributed to construction impacts.

Nambucca River upstream and downstream, although levels decreased only marginally from upstream to downstream (4.21mg/L upstream, 3.9mg/L downstream). All controls were verified to be in place for works, and so the results are unlikely to be attributable to construction activities.

pH noted to be outside trigger values at:

Stony Creek upstream and downstream had elevated pH levels, although it is noted that there was a decrease from upstream (7.45) to downstream (7.33) levels, indicating that the low levels are unlikely to be related to construction activities.

Lower Warrell Creek upstream (7.53) and downstream (7.7) recorded elevated pH levels. No activities were being undertaken which would have impacted on pH levels, with all controls in place. It is therefore unlikely that the elevated readings were as a result of construction works.

Unnamed Creek Gumma Wetlands recorded elevated pH levels upstream and downstream. It is noted that the levels decreased from upstream (7.42) to downstream (7.13), all controls were in place.

Nambucca River upstream and downstream recorded elevated pH levels, although the levels decreased from upstream (8.61) to downstream (8.5), indicating that the results are unlikely to be as a result of construction activities.

Turbidity noted to be outside trigger values at:

Upper Warrell Creek upstream and downstream. It is noted that levels decreased from upstream (133 NTU) to downstream (63.7 NTU) and thus are unlikely to be attributed to construction activities.

Stony Creek upstream and downstream. It is noted that levels only increased minimally from upstream (16.2 NTU) to downstream (19.5 NTU), all control were in place.

Dry Sampling Event

On the 26th February a "dry" monitoring event was undertaken, lab samples were collected and field tests were undertaken. The results are available in Appendix A.

Below exceedances of trigger levels are discussed:

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

Upper Warrell Creek downstream. No works were being undertaken that would impact on water quality within the waterway. The low DO was attributed to the low-flow environment of the waterway as well as decaying vegetative matter within the creek.

Stony Creek downstream, no works were being undertaken that would impact on water quality within the waterway. This is attributed to the low-flow environment as well as decaying vegetative matter present in the waterbody.

Lower Warrell Creek upstream and downstream. It is noted that DO levels increased from upstream (4.5mg/L) to downstream (4.81mg/L) and are unlikely to be attributed to construction works.

Nambucca River upstream and downstream. It is noted that DO levels increased from upstream (4.55mg/L) to downstream (4.69mg/L) and are unlikely to be attributed to construction works.

pH levels noted to outside trigger levels at:

Lower Warrell Creek upstream and downstream with elevated pH levels. It is noted that levels only increased minimally from upstream to downstream (7.79 upstream, 7.9 downstream). It is also noted that these levels are within ANZECC criteria (pH6.5 - pH8). No construction activities that would have potential to increase pH (i.e. concreting) have been undertaken during this period.

Nambucca River with elevated upstream (8.53) and downstream (8.41) values. It is noted that trigger levels provided do not have any difference between 20th percentile and 80th percentile values are 7, with any value other than 7 triggering these. It is also noted that the pH level decreased from upstream to downstream and are therefore unlikely to be attributable to construction works.

Metals levels noted to be above trigger levels at:

Upper Warrell Creek upstream (0.266mg/L) and downstream (0.368mg/L), Stony Creek upstream (0.09mg/L) and downstream (0.154mg/L) for manganese. It is

noted that these levels are well within ANZECC criteria (1.9mg/L). Upper Warrell Creek and Stoney Creek did not have pH level outside of trigger levels.

Nutrient levels noted to be above trigger levels at:

Stoney Creek downstream for total nitrogen (0.5mg/L) (0.2mg/L upstream), total phosphorus (0.03mg/L) (0.02mg/L upstream) and nitrate (0.04mg/L) (0.03mg/L upstream). It is noted that these levels were within ANZECC criteria (0.5mg/L for total N, 0.05mg/L for total P. 0.7mg/L for nitrate). No temporary or permanent rehabilitation has been undertaken in or around Stoney Creek, therefore source of increase is unknown.

Turbidity levels noted to be above trigger levels at:

Nambucca River downstream (44.5mg/L) (42.9mg/L upstream). It is noted that low tide did not occur until 7:44PM, which resulted in a high tidal flow at time of sampling (2:36PM). This is likely to have contributed to the elevated turbidity reading due to sediment being mobilised from the river bed in the strong flow.

4. Sediment Basin Water Monitoring

Water was released from commissioned sediment basins between the 8th and 29th of February 2016 after rainfall. Water pumped into basins was kept below design Sediment Storage Zone and was treated and released as soon as possible, especially if rainfall is predicted in the 5 day forecast. Table 3a and 3b below has the water quality results recorded for the water release events:

Table 3a – Water Release Register

Date	Basin ID	Oil and Grease (visible)	pH	Turbidity (NTU)	TSS (mg/L)	Approx Volume Discharged (kL)
8/02/2016	B43.21	N	6.94	39.4		200
8/02/2016	B49.67	N	7.6	31.2		200
9/02/2016	B43.37	N	6.96	59.6		300
9/02/2016	B49.67	N	7.17	73.5		400
10/02/2016	B48.87	N	7.31	20.2		400
11/02/2016	B42.86	N	7.26	3.7		600
11/02/2016	B42.87	N	7.06	31.9		400
12/02/2016	B43.37	N	8.20	68.3		500
13/02/2016	B47.00	N	7.34	40.3		200
17/02/2016	B43.37	N	8.31	77.4		550
23/02/2016	B42.80	N	7.15	6.64	<5	700
23/02/2016	B42.87	N	7.03	30.7	40	500
24/02/2016	B45.00	N	7.16	78.7		650
26/02/2016	B45.5	N	6.79	1.5	<5	120
27/02/2016	B45.00	N	6.52	70.2		75
27/02/2016	B47.14	N	6.99	20.2		450

29/02/2016	B42.87	N	7.66	26.2		375
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Table 3b – ASSTA Pad Releases

Date	Pad ID	Oil and Grease (visible)	pH	Turbidity (NTU)	Conductivity	Aluminium (mg/L)	Iron (mg/L)	Approx Volume Discharged (kL)
28/02/2016	Bald Hill North Sump 2	N	7.51	16.1	0.325	0.01	<0.05	0.2

5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 13th and 18th of February 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 February 2016. Monitoring Results are available in Appendix A, Table 5.

6.1 Blasting

One blasting event occurred in February 2016 on the 9th of February. 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 four blasts with no exceedances of these limits.

7. Dust Monitoring

Dust deposition gauges (DDG) were placed at nearby sensitive receivers from the 8th January 2016 to the 5th February 2016. DDG results are available in Appendix A, Table 3.

All dust deposition gauges were below the level of concern (4g/m².month) during the monitoring period, with the exception of gauge DDG5, which recorded an elevated reading of 58.1g/m².month for total insoluble matter. Ash content was slightly lower with a reading of 49.4g/m².month. It was noted that the result was very unusual due to the lack of dust generating construction activities over the time period at this location and the exceedingly high result. Further gauges have been installed to help verify the cause of the exceedance, as to whether this is related to construction activity or another source, such as the unsealed road near the council yard or interference with gauges. It was noted during collection of the latest round of gauges (5th February 2016 to 8th March 2016) that, while results have not yet been obtained, the gauges (DDG5 and DDG5W) appeared to have clumps of dirt within them, which would be unlikely to be attributable to wind-blown dust from construction.

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.

8. Groundwater Monitoring

ACCIONA (Pacifico) have undertaken groundwater monitoring on the 24th and 25th of February 2016. The results from the groundwater monitoring is available in Appendix A, Table 4.

The groundwater monitoring results have been provided to RMS to advise 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 by the end of February 2016.

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 February 2016. A summary of these approvals is below in Table 4 below.

Field monitoring was conducted for Out of Hours Works undertaken in February 2016. These results are attached in Appendix A (Table 6), no works were found to exceed Noise Management Levels for any receivers.

Table 4 – February Out of Hours Works Assessed

OOH Request Title	>5dB(A) above background	Approval Date
Nambucca River Concreting Pier 7 + 8	N	2/2/2016
Northern Generator Connection	N	4/2/2016
Butchers Steel Fixing + Formwork	N	19/2/2016
Northern Compound and Precast Yard Generator Connection	N	22/2/2016

10. Complaints

10.1 Summary of Complaints for the month

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

On 2nd February, Nambucca Council contacted AFJV regarding concerns about noise generated by piling activities on the South bank of the Nambucca River. AFJV organised a meeting with the affected workers, advised of the respite periods in place and the minimisation of duration of works, where possible. Council advised that they were satisfied with the response from AFJV regarding the matter.

On 11th February, a resident of Wedgewood Drive contacted AFJV regarding concerns about air brake noise pollution from a truck on the alignment. AFJV contacted the superintendent responsible for the area, who addressed the issue at the next global toolbox meeting. No further complaints have been raised regarding the issue.

On 19th February, a resident of O'Dells Road contacted AFJV regarding concerns about dust produced from stockpiles and construction activities from the Project, particularly in regard to his water tank and pool. AFJV installed a first-flush system on the resident's water tank to help reduce any dust from entering the resident water supply. Additionally, 2 dust gauges have been installed along the boundary of the Project to verify the resident's concerns. Stockpiles near the Project boundary are also being compacted, sealed and stabilised with polymer binder product to minimise fugitive dust production. Water carts are also being utilised with surfactant product in the area to minimise dust production from plant movements.

On 19th February, a resident of Old Coast Road contacted AFJV regarding concerns about dust produced from Old Coast Road relating to a strong north-easterly wind which exacerbated the issue. AFJV organised for water carts utilising surfactant additives to focus on this area to ensure that fugitive dust was minimised. No further issues were raised regarding the issue.

On 19th February, a resident contacted AFJV regarding damage to the windscreen of their vehicle from a rock which they claimed was from a truck and dog on the project. AFJV are processing this claim as per the usual procedure.

On the 22nd February, a resident of Old Coast Road contacted AFJV regarding dust and noise generation from excavation activities adjacent to their property. It was noted that a resident at the property suffers from a medical condition which is exacerbated from dust generation. A meeting was organised between AFJV and the resident with the frequency of excavators altered at this location to ensure that only two excavators will be conducting cut works at any given time. A water cart was also dedicated to this area when works are being undertaken to further reduce the dust generation during construction activities.

11. Non-Compliance

11.1 Summary of Non-compliances

One (1) Non Compliance occurred on the 22nd of February 2016 relating to failure to install Erosion and Sediment Controls as per the Progressive Erosion and Sediment Control Plans resulting in sediment being deposited outside of the approved project boundary at Rosewood Tributary and Butchers Creek.

AFJV breached licence condition O5.4 which states that drainage from all areas that will mobilise suspended solids when stormwater runs over these areas must be controlled and diverted through appropriate erosion and sediment control measures. Under section 64 of the Protection of the Environment Operation Act 1997 it is an offence to contravene any licence condition.

Corrective and Preventative Actions included in-house Erosion and Sediment Control Training to be provided to PACIFICO leading hands and foreman who did not attend the field training. A plan (based off hierarchy of controls) is being developed by PACIFICO to ensure future compliance as administrative controls (training) alone is no guarantee of future compliance. An investigation has also been completed with the Superintendent, foreman and engineer to determine the root cause of this noncompliance with Licence Condition O5.4

Table 2 – Noise Monitoring Results February 2016

Date	Time	Location	Rec ID	NCA	NML	Activity	Predicted levels for activity	Laeq	LAFMAX	LAFMIN	LCEQ	LAF05	LAF10	LAF50	LAF90	Principal sources/ operations	Measurements exceeding criteria, plant/ operations causing	Corrective actions	Notes
18/02/2016	1:40 PM	Albert Drive	74	1	50	Services	70	48.9	68	40.2	65.1	52.5	49.7	45.4	43.1	Utilities works			Within predicted levels for activity
18/02/2016	2:11 PM	Cockburns Lane	16	1	50	Cut	65	47.1	68.3	40	62.1	48.4	47.3	44.8	42.5	Excavator			Within predicted levels for activity
18/02/2016	1:15 PM	Bald Hill Rd	197	3	50	Cut	72	53.6	79.4	38.4	66.9	55.3	52.6	44	41.5	Moxy, truck + dog, excavator			Within predicted levels for activity
18/02/2016	12:09 PM	Letitia Rd	406	4	59	Cut	74	61.9	80.2	45	75.2	68.5	64.3	54.9	50.4	Scrapers, dozer			Within predicted levels for activity
24/02/2016	2:38 PM	Mattick Rd	442	6	44	Cut	62	57.3	86.6	45	73.9	61	57.5	50.4	47.3	Moxy, loader, utilities, trailer			Within predicted levels for activity
18/02/2016	12:30 PM	Nursery Rd	415	4	59	NA	NA	46.9	55.4	41.1	60.2	50.1	49	46.2	43.6	Highway Traffic			Background - construction not audible
18/02/2016	12:50 PM	Wallace St	148	3	50	NA	NA	57.4	74.2	43.1	65.7	61.9	58.5	50.7	43.2	Highway, local traffic			Background - construction not audible
18/02/2016	11:39 AM	Gumma Rd	383	3	50	Bridgeworks	67	54.1	64.1	42.8	79.2	56.9	56.4	54	49.4	Roller, crane			Within predicted levels for activity

Table 3 - Dust Monitoring Results January/February 2016

		DDG ID		DDG1	DDG2	DDG3	DDG4	DDG5	DDG6	DDG7	DDG8	DDG A1	DDG A2
		Start date of sampling		8/01/2016	8/01/2016	8/01/2016	8/01/2016	8/01/2016	8/01/2016	8/01/2016	8/01/2016	8/01/2016	8/01/2016
		Finish date of sampling		5/02/2016	5/02/2016	5/02/2016	5/02/2016	5/02/2016	5/02/2016	5/02/2016	5/02/2016	29/02/2016	5/02/2016
Analyte	Time Period	Unit	Levels of Concern	LOR									
Ash Content	Current Month	g/m ² .month	4	0.1	0.4	0.5	2.2	0.6	49.4	0.8	0.6	1.2	----
		mg	N/A	1	6	9	36	10	814	14	10	19	----
	Previous Month	g/m ² .month			0.1	0.4	0.9	0.4	15.7	0.8	0.4	0.7	----
	Change	g/m ² .month	Increase of 2		0.3	0.1	1.3	0.2	33.7	0	0.2	0.5	----
Combustible Matter	Current Month	g/m ² .month	N/A	0.1	0.5	0.5	0.5	0.4	8.7	0.5	0.1	0.5	----
		mg	N/A	1	9	7	9	6	144	7	2	9	----
Total Insoluble Matter (TIM)	Current Month	g/m ² .month	4	0.1	0.9	1	2.7	1	58.1	1.3	0.7	1.7	----
		mg	N/A	1	15	16	45	16	958	21	12	28	----
	Previous Month	g/m ² .month		0.1	0.2	0.9	1.5	0.4	18.6	0.8	0.7	1.3	----
	Change	g/m ² .month	Increase of 2	0.1	0.7	0.1	1.2	0.6	39.5	0.5	0	0.4	----
Arsenic	Current Month	mg/L		0.001	----	----	----	----	----	----	----	----	----
Comments					Insects in gauge		Sprouted grass seeds in gauge	Insects in gauge	Vegetation + insects in gauge, appeared cloudy			Vegetation in gauge	insects in gauge

Table 4 – Groundwater Monitoring Results February 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			24/02/2016	24/02/2016	24/02/2016	24/02/2016	25/02/2016	25/02/2016	25/02/2016	25/02/2016	25/02/2016	25/02/2016	25/02/2016	25/02/2016	25/02/2016	25/02/2016
Comments			DRY	DRY		DRY				DRY				DRY	DRY	DRY
<i>Field Physical data</i>																
Depth to standing water level from TOC	m	-	-	-	16.20	-	7.58	1.18	6.98	-	0.72	0.92	0.42	-	-	-
pH	pH	-	-	-	4.78	-	6.20	7.20	5.90	-	6.20	7.10	6.00	-	-	-
Conductivity	mS/cm	-	-	-	4.60	-	0.118	0.694	0.131	-	5.620	9.420	72.000	-	-	-
Temperature	C	-	-	-	20.60	-	19.60	25.80	23.00	-	21.20	21.00	20.60	-	-	-



ANZECC (2000) Water Quality Guidelines Volume 1 & 2

Table 5 – Blasting Monitoring Results February 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

Note 17 July blasting criteria increase approved by DP&E with signed agreements
 16 December is Anniversary date of EPL
 Monitor 3 is the only monitor where an agreement does not exist for 25mm/s
 DP&E Approval 26/02/16 to extend the duration of blasting up to 25mm/s and overpressure up to 125 dBA

2nd Reporting Period

Totals No of Exceedances	3	Exceedances	0
Percentage exceedance	8.82%		
Percentage exceedance at 16th December 2015	10.00%		

* Flat Battery
 ** Power Pole
 - Did not trigger

Table 6 – Acoustic Investigation February 2016



Out of Hours Works Field Verification

Permit #	Description of Works	Date	Time	Location	Rec ID	NCA	NML	Laeq at monitoring location	Distance to receiver	Calculated level at receiver	Compliant	Principal sources/ operations	Notes
12	Asphalting Albert Drive	19/02/2016	9:53 PM	Albert Drive	81	1	40	75.1	300	35.6	Y	Pavement milling, lighting towers	Highway traffic also impacted on noise level
40	Butchers Creek Pump + Reo Fixing	6/02/2016	10:40 AM	Butchers	16	1	40	53.6	482	27.7	Y	Pump, hand tools	
43	Northern Earthworks + drainage	13/02/2016	10:21 AM	OC9	Type 1	6	37	58.5	280	35	Y	Excavator, grader, refuelling truck	
Unexpected	Railway Corridor Signal Works	13/02/2016	12:37 PM	Railway Corridor	19	1	40	44.7	200	8.7	Y	Hand tools	