

Semi-annual Report

January 2020

## **PNG: HIGHLANDS REGION ROAD IMPROVEMENT INVESTMENT PROGRAM (HRRIIP) – TRANCHE 3**

### **PANGIA-WIRU LOOP ROAD SUB-PROJECT**

Prepared by Highlands Road Management Group (HRMG), Department of Works for the Asian Development Bank

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## **PNG: HIGHLANDS REGION ROAD IMPROVEMENT INVESTMENT PROGRAM (TRANCHE 3)**



### **Pangia to Wiru Loop Sub-Road Project**

**CSTB# 3532**

**Submission date: 31 January 2019**

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## ABBREVIATION

ADB	- Asian Development Bank
APs	- Affected Persons
BTOR	- Back To Officer Report
CB	- Capacity Building
CEMP	- Contraction Environmental Management Plan
CEPA	- Conservation and Environment Protection Authority
CHW	- Community Health Worker
CRO	- Community Relations Officer
CSC	- Construction Supervision Consultant
DOW	- Department of Works
EA	- Executing Agency
EMP	- Environmental Management Plan
EMR	- Environmental Monitoring Report
EO	- Environmental Officer
ESSU	- Environment and Social Safeguards Unit
GOPNG	- Government of Papua New Guinea
GRC	- Grievance Redress Committee
HCRN	- Highlands Region Core Road Network
HIV	- Human Immunodeficiency Virus
HRMG	- Highlands Roads Management Group
HRRIP	- Highland Region Road Improvement Investment Program
IA	- Implementing Agency
IEE	- Initial Environment Examination
NRA	- National Road Authority
PIU	- Project Implementation Unit
PNG	- Papua New Guinea
PSC	- Project Supervision Consultant
PPE	- Personal Protective Equipment
QMP	- Quarry Management Plan
SHP	- Southern Highlands Province
SPS	- Safeguards Policy Statement

## FACT SHEET

<b>Loan</b>	3076/3077 PNG
<b>Project Number</b>	40173-044
<b>Contract Number</b>	CSTB # 3532
<b>Subproject</b>	Pangia-Wiru Loop Road Sub-project
<b>Road Length</b>	31.40 km
<b>Contract Amount</b>	K88, 908, 670.34
<b>Improvement Works</b>	K79, 385, 106.01
<b>Long Term Maintenance</b>	K9, 523, 564.33
<b>Commencement Date</b>	16 <sup>th</sup> October 2017
<b>Completion Date</b>	24 months (estimated – 16 <sup>th</sup> November 2019)
<b>Executing Agency</b>	The Department of Works (DOW) is the executing agency for the Highlands Region Road Improvement Investment Program (HRRIP). It has overall responsibility to manage the planning, implementation and monitoring for all road improvement works including acquiring use rights for additional land to implement HRRIP subprojects, as well as compensation for damages on project-affected land DOW is also responsible for reporting to ADB and the recruitment of the organization to conduct independent monitoring
<b>Implementing Agency/Unit</b>	<p>The DOW will also be the Implementing Agency for the road improvement works. The DOW has delegated to the Highlands Road Management Group (HRMG), the responsibility to carry out the planning, implementation and monitoring for land acquisition and/or resettlement activities, as required. The more relevant delegated responsibilities include the following.</p> <ol style="list-style-type: none"> <li>1. Review and endorse the draft RP as prepared by its consultant prior to submitting it to DOW and, subsequently, to ADB for approval.</li> <li>2. Monitor the process of allocation and disbursement of funds for compensation and ensure that funds are available, and compensation is paid in a timely manner.</li> <li>3. Coordinate and carry out consultations with affected communities to ensure that all stakeholders are informed in a timely manner about its policies and procedures; ensure that all public disclosure of the provisions for land acquisition and compensation are carried out; and, oversee and monitor the grievance redress process;</li> <li>4. Carry out all other activities related to internal monitoring of land acquisition activities and collaborate with and support the work of the independent monitoring organisation.</li> <li>5. Coordinate with civil works contractors to ensure that required land is cleared in a timely manner, that unforeseen damages and losses are recorded and compensation paid and that all other steps and measures are taken to complete the civil works in an efficient manner.</li> </ol> <p>The NRA will be the Implementing Agency for road maintenance. This will include all road maintenance works contracted directly by the NRA or transferred from the DOW. A project implementation unit will be established in the NRA.</p>
<b>Coverage of Semi - Annual Environmental Monitoring Report # 4</b>	Semi - annual Environmental Monitoring Report – July to December 2019

## EXECUTIVE SUMMARY

- I. This semi-annual environmental report is prepared for the civil works carried out by the contractor and its associated environmental impacts and mitigations for the 31.400 kilometres of Pangia-Wiru Loop road project from July to December 2019.
- II. The associated environmental impacts were minor and mitigated well by the contractor for the identified monitoring activities from July to December 2019. The monitoring activities were; clearing and grubbing, side excavation, embankment and capping layer, construction of line drainages, construction of protection headwalls and slope protection, construction of gabion baskets, application of sub-base and base materials and fine sand, compaction, trimming and priming, sealing, quarry operations, bridge construction, camp management and batching plant and asphalt preparation sites.
- III. The Elu rock quarry at CH 8+000 has been closed by the contractor and other two (2) more quarries namely: Kabulbul quarry at CH.13+600 and Tomiare quarry at CH.22+000 therefore a quarry closure and rehabilitation plan has been submitted to the Consultant for approval, inspection and further implementation.
- IV. Monitoring using in-situ equipment showed all results within accepted levels, however the dBA readings for station 2 (Polea) and 3 (Wandue) were still high where machines were working, thus the operators need to have ear protections when operating machines during the monitoring periods.
- V. The following civil earth works activities are in progress in October 2019.
  - i) Laying of subbase and base coarse gravels continuing from 29+428 – 31+000
  - ii) Embankment fill is continuing from chainage 30+200 – 31+040
  - iii) No sealing done during the month
  - iv) Continuous final trimming from 29+400 – 31+000
- VI. The resettlement issue for the Paiyama ceremonial ground has been addressed and the landowners have agreed through Grievances Redress Committees (GRCs) for payment for improvements and structures at chainage 28+600 when funds are available.
- VII. The project has impacted the livelihoods of the people and they have benefited a lot from construction activities as hired labours; rentals for land lease; quarry operations and local hires and purchases.
- VIII. For the covered period, it is estimated that the contractor paid the 965 workers and paid a total of Kina 482,500.00 or an average of Kina 80,416.70 per month. Out of this total, Kina 60, 000.00 was paid to female workers from July to December 2019.

## **1.0 INTRODUCTION**

1. Department of Works (DOW), through the Project Implementing Unit (PIU), Highlands Roads Management Group (HRMG) has prepared the Semi-annual Environment Monitoring Report (EMR) from July to December 2019 for the Pangia Wiru Loop (31.40KM) sub project in the Southern Highlands Province. The Pangia Wiru Loop Road sub project is under the Tranche 3 projects and which has been identified in the Highlands Region Improvement and Investment Program (HRRIP) for rehabilitation and upgrading.
2. The fourth (4) Semi-annual Environmental Monitoring Report (EMR) from July to December 2019 highlights the monitoring of construction activities and works in progress undertaken by the contractor and the implementation of the Construction Environmental Management Plan (CEMP) and sub plans.
3. The report covers the construction activities and the associated environmental impacts on the identified monitoring parameters. The 21 unified monitoring environmental parameters have been monitored. Some non-compliance parameters have been observed during the monitoring months but were minor and manageable.
4. The in-situ equipment for water quality, air quality and noise level were used for monitoring. The results obtained all parameters were at acceptable levels. The contractor was mostly complying with the CEMP and sub plans during the implementation of the road project. The results have been discussed as per the monitoring parameter in the main body of the report.

## **1.1 Background Information**

5. The Highlands Region of Papua New Guinea (PNG), comprising the Provinces of Western Highlands, Southern Highlands, Eastern Highlands, Enga, Jiwaka and Chimbu, is a major contributor to the PNG economy through its agricultural production, mineral resources and the much anticipated Oil and Gas industry in the country from the Southern Highlands and HELA provinces.
6. A well-maintained road network is essential to facilitate the movement of goods and services. The Government of PNG (GoPNG) has made significant investment in improving the road network but a lack of maintenance has resulted in deterioration of the roads such that the Highlands Core Road Network (HCRN) is now in poor condition. Therefore, GoPNG has sought financial assistance from ADB Loans 3404/3408 PNG SF to upgrade and rehabilitate the identified roads in the HRRIP.
7. The GoPNG through the DoW has identified 13 road projects in the Highlands Region and are classified as Tranche Projects which are being funded by ADB. Tranche Project 1 projects are Laiagam to Pogera and Mendi to Kandep sub projects which have been successfully completed and now embarking on Tranche 2 sub projects which are Mendi to Tambul (55.53 KM), Kotna to Lapramb (31.65 KM) and Ialibu to Kagua (31.778 KM) in Southern Highlands/Western Highlands, Western Highlands and Southern Highlands respectively.
8. The rehabilitation and upgrade of Tranche 3 projects are; Nipa-Munihu (27.70 KM and Pangia-Wiru Loop (30.40KM) road sub-projects in the Southern Highlands Province (SHP), Gewa-Gembolg (21.025 KM) in Chimbu Province and Henganofi-Nupuru (34.200 KM) in the Eastern Highlands Province.



9. The executing agency (EA) for the project is the Department of Works (DOW) and the Project Implementing Unit (PIU) is Highlands Road Management Group (HRMG). The Tranche 3 sub project covers 31.40 kilometres starting from Pangia Station and ends at Williame Village. The project is supervised by Project Supervision Consultant (PSC), Renardet S.A Consultancy Engineers for the implementing period.
10. The contract was awarded to COVEC (China) Limited on the 18<sup>th</sup> of January 2017 and commenced operations on the 16<sup>th</sup> of October 2017 for a period of twenty-four (24) months for the rehabilitation and upgrade of the 31.460 KM road length from Pangia Station to Williame Village.
11. It is expected that the project will be completed by 16 of November 2019. Thus, the defects liability period of one year begins and after the end of the liability period, the maintenance program of ten (10) years will take effect. Once the road is built, it will provide an effective link from Pangia to South Wiru local level government in the SHP.

## **1.2 Project Description**

12. The Pangia Wiru Loop road sub-project road length of 31.460 KM stretches from Pangia Station at O+000KM (Kauwo Ward) to Williame village (31.460KM) in Ialibu Pangia District in the Southern Highlands Province (SHP).
13. The road passes through twenty-four (24) council wards. The first thirteen (13) wards have road access by vehicles. The remaining road length has been neglected overtime and impassable by vehicles starting from Tunde Primary School (chainage 24+500) to Williame village (ch.30+460)
14. The project has an average elevation of 2000 metres above sea level and runs through three big (3) creeks (Iperei, Polea and Wandue) and other two (2) small perennial creeks. There will be three (3) new steel deck bridges with a lot of culverts to be constructed. The contractor has so far completed many culverts, line drainages and gabion baskets. The contractor has recently completed constructing the Iperei Bridge at chainage 27+880.
15. The project runs through a ceremonial ground at chainage 28+600, Paiyama Village. Negotiations and meetings have been held through the Grievances Redress Committees (GRC) and locals at Paiyama village to settle the outstanding issues regarding the ceremonial ground. Genuine persons have been identified and endorsed by the GRC for payment through the HRMG Office. Once funds are ready, payments will proceed immediately for the smooth progress of the road without any delay and disturbances from the locals.
16. The Pangia Wiru Loop road sub-project starts at Pangia Station and ends at Williame Station for a total length of 31.40KM. The map below shows the location of the road (black line).

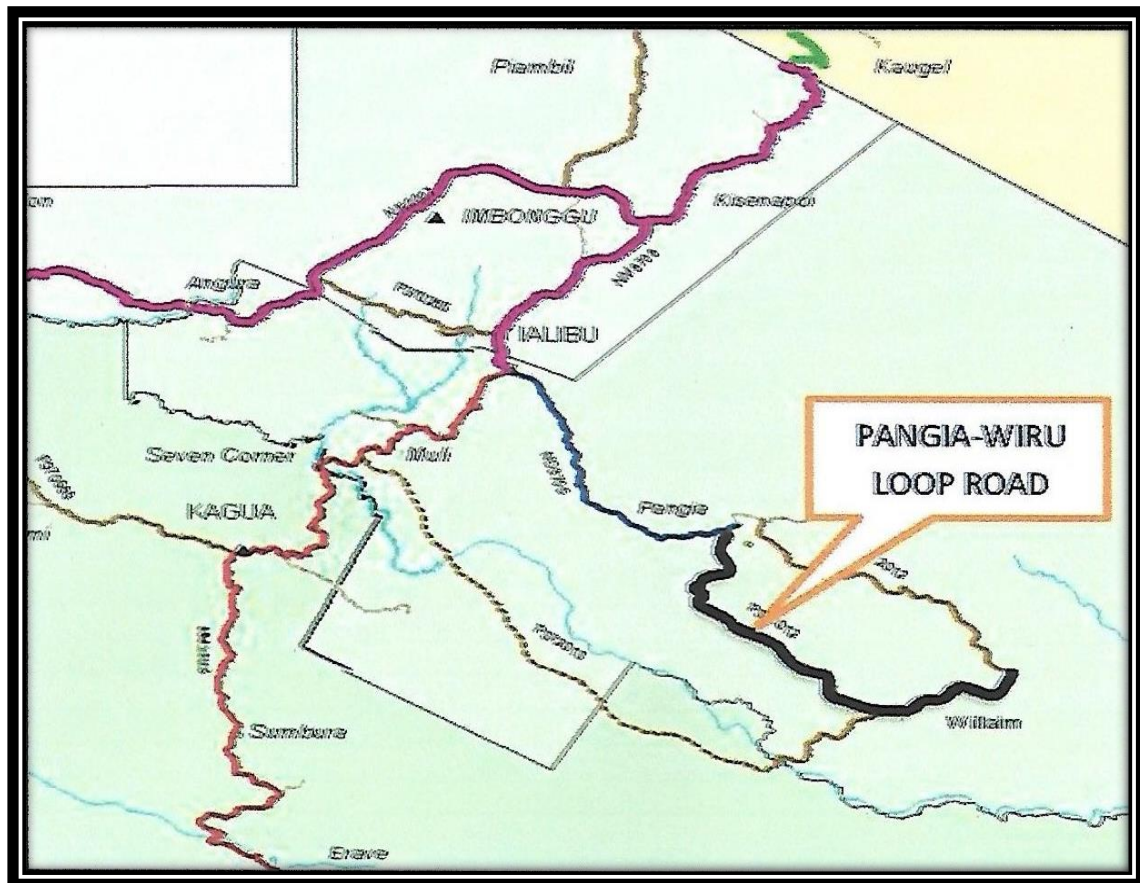


Figure 1: Map showing the site location of Pangia-Wiru Loop Road Project

### 1.3 Purpose of the Monitoring Report

17. The purpose of the semi - annual Environmental Monitoring Report is prepared to update and provide the Project Implementation Unit (PIU), Highlands Road Management Group and the Executing Agency (EA), Department of Works for the quarterly construction activities carried out by the contractor and its compliance with the CEMP and sub plans from July to December 2019.
18. The effectiveness of the implementation of the CEMP and the sub plans by the contractor has been on average. The semi - annual report is prepared to update the employer (DOW) the effectiveness and weaknesses in the implementation of the CEMP and the sub plans by the contractor for the civil works during the implementation period.
19. The semi - annual EMR is prepared to capture the construction activities using the twenty-one (21) unified monitoring parameters. The report intends to highlight and emphasis on the implementation process of the CEMP and the sub plans. The implementation of the CEMP and the sub plans is the prerequisite of the contractor. The CEMP is a bid document; therefore, the employer (DOW) needs to know the implementation processes involved together with other minor management plans.

## 1.4 Methodology

20. The semi - annual EMR for the project is prepared using; (i) brief back to office reports (BTOR), (ii) monthly monitoring reports (combined report – HRMG and PSC), (iii) community consultations and (iv) checklists of 21 unified parameters and the use of the in-situ equipment.
21. Most of the empirical data with descriptive information obtained in this report has been derived from the monthly reports jointly conducted by PSC and the contractor. The in-situ equipment was used in the monitoring months for the identified monitoring parameters. The contractor was complying by buying their own in-situ equipment for monitoring for air quality, noise level and water quality (parameters).

## 2.0 MONITORING ACTIVITIES AND FINDINGS

22. The semi - annual EMR consists of the following monitoring activities using the twenty- one (21) parameters. (i) Road Construction Activities, (ii) Quarry Operations, (iii) Camp Facility Management, (iv) Batching Plant and Asphalt Preparation site, (v) (vi) Impacts of the project and (vii) Benefits of the sub project. The unified 21 monitoring parameters are tabulated below in table 1 inclusive of the summary.

**Table 1: The table of monitoring parameters and summary on compliance**

#	Monitoring Stations (STN <sup>1</sup> )	Unified Monitoring Parameters
1	STN 2.0	Summary of compliance and non-compliance
2	STN 3.0	Training, Mentoring and Meetings
3	STN 4.0	Health and Safety Issues
4	STN 5.0	Contractor's Camp and Yard
5	STN 6.0	Earthworks
6	STN 7.0	Erosion and Sedimentation
7	STN 8.0	Water Quality
8	STN 9.0	Air Quality
9	STN 10.0	Noise Level
10	STN 11.0	Waste Management
11	STN 12.0	Hazardous Waste Management
12	STN 13.0	Aggregates Extraction
13	STN 14.0	Ancillary Facilities Management
14	STN 15.0	Tree Removal and Vegetation Management
15	STN 16.0	Socio-Economic Issues of Workers
16	STN 17.0	Socio-Impacts to the community
17	STN 18.0	Public Safety
18	STN 19.0	Traffic Management
19	STN 20.0	Prevention of /HIV/AIDS and STIs
20	STN 21.0	Existing Infrastructure Issues
21	STN 22.0	Environmental Related Issues

<sup>1</sup> STN – station- is the monitoring station where environmental parameters are been checked, measured and result used in this reporting period.

23. The contractor has commenced on the 16<sup>th</sup> of October 2017 and has employed an Environmental Officer, Mr. Rodney Karu to oversee the implementation of the CEMP for the construction works during the implementation period of the project. Rodney has been regular monitoring the environmental parameters stipulated in the CEMPs and provide sound guidance on environmental mitigation works to the construction team.
24. The semi - annual Environmental Monitoring Report is the summary of compliance and non-compliance parameters from July to December 2019. The summary of compliance and non-compliance has been derived from the jointly monthly reports by PSC, HRMG and the contractor. Table 2 shows the summary of compliance and non-compliance from July to December 2019.

**Table 2: Summary of compliance and non-compliance from July-Dec 2019**

Monitoring Parameters x=non-compliance, ✓=compliance, N/A = Not Applicable		Months					
		July	Aug	Sept	Oct	Nov	Dec
STN02	Summary						
STN03	Training, Mentoring and Meetings	✓	✓	✓	✓	✓	
STN04	Health and Safety Issues	✓	✓	✓	✓	✓	
STN05	Contractor's camp and Yard	✓	✓	✓	✓	✓	
STN06	Earth Works	✓	✓	✓	✓	✓	
STN07	Erosion and Sedimentation	✓	✓	✓	✓	✓	
STN08	Water Quality	✓	✓	✓	✓	✓	
STN09	Air Quality	✓	✓	✓	✓	✓	
STN10	Noise Management	✓	✓	✓	✓	✓	
STN11	Waste Management	✓	✓	✓	✓	✓	
STN12	Hazardous Waste Management	✓	✓	✓	✓	✓	
STN13	Aggregates Extraction	✓	✓	✓	✓	✓	
STN14	Ancillary Facilities Management	✓	✓	✓	✓	✓	
STN15	Tree Removal & Vegetation Mgmt.	N/A	N/A	N/A	N/A	N/A	
STN16	Socio-economic Issues of Workers	✓	✓	✓	✓	✓	
STN17	Socio-Economic impacts – Comm.	✓	✓	✓	✓	✓	
STN18	Public Safety	✓	✓	✓	✓	✓	
STN19	Traffic Management	✓	✓	✓	✓	✓	
STN20	Prevention of HIV/AIDS and STIs	✓	✓	✓	✓	✓	
STN21	Existing Infrastructure issues	N/A	N/A	N/A	N/A	N/A	
STN22	Environmental Related Grievances	✓	✓	✓	✓	✓	

25. The contractor has mostly complied with the CEMP most especially when its nearing the end of project and strictly adhere in complying with the environmental monitoring parameters.
26. The non-conformance parameters monitored during the monitoring months have been highlighted and reported in the monthly reports for corrective action. The copies of the reports were given to the Resident Engineer (RE), and the non-conformance issues were addressed through the RE to the contractor and immediate mitigation measures have been taken to combat associated impacts from the construction activities.

## 2.1 Training, Mentoring and Meetings

27. The contractors' Environmental officers participated in the Quarry Closure and Rehabilitation training conducted by the PSC International Environmental and Social Safeguards Specialist at Kimininga Lodge on the 9th of September 2019.



Picture 1: CB Training on quarry closure and rehabilitation plan at Kimininga Hotel

## 2.2 Health and Safety Issues

- 28 Conduct regular camp facility inspections and make recommendation to management for improvement if any required
- 29 Conduct fortnightly trainings/meetings to our employees on safety, health and personal hygiene
- 30 First aid kit was made available onsite to treat minor illnesses and injuries. All major injuries and illnesses are referred to Pangia Health Centre or Ialibu hospital. No major illnesses and accidents reported during the month

## 2.3 Contractor's Camp and Yard

- 31 The contractor's camp and yard were generally clean. The Waste Management Plan was properly executed during the monitoring months and wastes were being properly segregated for proper disposal.
- 32 All human wastes are disposed into sewerage septic systems provided in the Chinese camp and administration building for employees and public to use
- 33 The used oil from workshop are given to the locals to paint their house posts to prevent mites destroying the posts and advised workshop supervisor to keep the workshop area clean and tidy
- 34 Adequate fence built around the camp and yard area to keep all personal and company properties safe



## 2.4 Earthworks progress

- 35. Clearing and grubbing has reached the end of the project while other civil works continue.
- 36. Construction of the bridge foundation at 30+800 Wandue Creek is currently underway.
- 37. Sealing has reached Ch:28+000 Iperei bridge. All sealing works have been carried out neatly without any spillages or excessive bitumen.
- 38. Embankment and capping works undertaken between Ch:29+000 and Ch:31+000.
- 39. Road furniture have been installed between Ch:00+000-14+000



Picture 2: Guardrails installed and painted along Ch 12+000



Picture 3: Bridge foundation construction at Ch 30+800 at Wandue Creek

## 2.5 Erosion and Sedimentation

- 40 Erosion and sedimentation from construction works have been fully controlled during the monitoring months from July to December 2019. Most excavated wastes have been removed and dumped at designated sites as agreed by the landowners. Clearing and grubbing has completed and less erosion and sedimentation. There was only slight sedimentation at construction sites like line drainages, culvert and gabions baskets, slope and protection head wall and Iperei Bridge but were only temporarily.

- 41 The contractor has constructed stone pitching and stone walls on certain locations where erosion will most likely to occur to prevent erosion
- 42 No noticeable major erosions and sedimentation on our construction sites during the month.
- 43 Were able to dispose all our construction wastes on the stable flat land to avoid erosion as per agreed and signed by landowners and engineer onsite.
- 44 Regularly clear all sediments and debris along our construction site every day when there is landslides and landslips on the roadbed and along the drainage to ensure the rainwater flow freely.



**Picture 4: Stormwater drainage and protection works at Ch 21+100**

## **2.6 Water Quality**

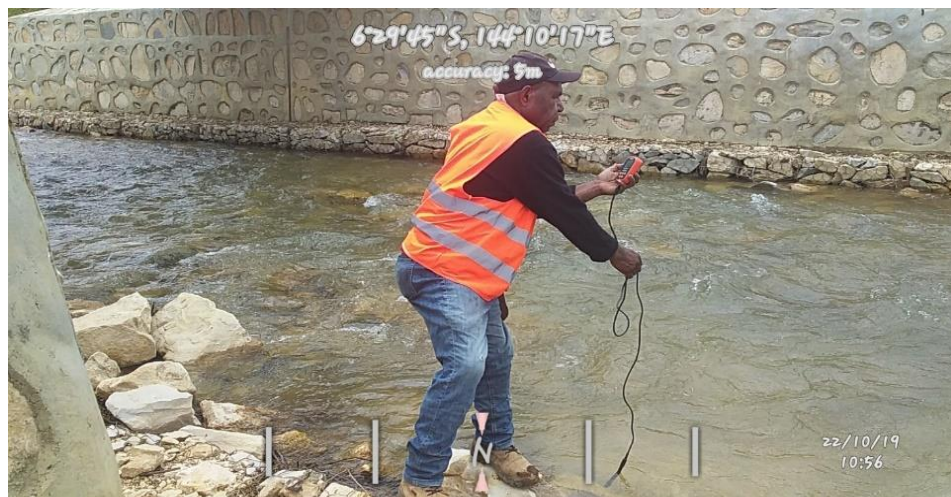
- 45 There are small perennial creeks from the start of the project and three major creeks towards the end of the project. The construction works have reached towards the end of the project where the rivers were, and in-situ equipment was used for the water parameters during the monitoring months. The contractor was compliant by buying own in-situ equipment for monitoring.
- 46 The results obtained from the in-situ equipment are tabulated in table (3) below for the identified rivers/creeks from July to December 2019 monitoring period.

**Table 3: Results from in-situ equipment for water parameters against baseline data**

STATION	Water Parameters	July	August	September	October	Nov
<b>Iperei Creek</b> <b>27+880</b>	Dissolved Oxygen (DO)	8.26mg/L	5.25mg/L	4.62mg/L	4.62mg/L	x
	Presence of Hydrogen (pH)	6.8	7.3	6.38	6.38	x
	Turbidity NTU	12.36 NTU	10.86 NTU	29.40 NTU	29.40 NTU	x
	Temperature	69.8F	68.7 F	68.8 F	68.8 F	x



<b>Poleo Creek</b>  <b>29+431</b>	Dissolved Oxygen (DO)	7.88mg/L	4.52mg/L	4.28mg/L	4.28mg/L	x
	Presence of Hydrogen (pH)	6.5	6.8	5.9	5.9	x
	Turbidity NTU	12.68 NTU	12.78 NTU	20.22 NTU	20.22 NTU	x
	Temperature	75.6F	70.8 F	70.4 F	70.4 F	x
<b>Wandue Creek</b>  <b>30+086</b>	Dissolved Oxygen (DO)	x	6.46	8.12	8.12	x
	Presence of Hydrogen (pH)	x	7.2	5.7	5.7	x
	Turbidity NTU	x	13.54 NTU	20.14 NTU	20.14 NTU	x
	Temperature	x	x	66.9F	66.9F	x



Picture 5: Water quality testing of dissolved oxygen at Iperei River, Station 1



Picture 6: Water quality testing of dissolved oxygen at Poleo Creek, Station 2





**Picture 7: Water quality testing of dissolved oxygen at Wandue River Station 3**

## 2.7 Air Quality

- 47 Dust was evident where works were in progress but was minor. The contractor used water trucks to suppress dust. The monitoring months had experienced most rainfall and not much impact had on the environmental receptors. The contractor needs to provide dust control barriers like humps and public entities like schools and markets.
- 48 The suspended air particulate matter for fine to coarse materials (PM<sub>2.5</sub> and PM<sub>10</sub>) has been at acceptable levels from less than 10µm/m<sup>3</sup> and 20µm/m<sup>3</sup> respectively. The in-situ equipment for air quality was used at the identified monitoring stations during the monitoring months July to December 2019. The contractor was compliant by sampling for air quality using their own in-situ equipment for July to October 2019. The results from the in-situ equipment are tabulated in table (4) below.

**Table 4: Results obtained from the in-situ equipment for air quality**

Station		Air Quality (mg/m <sup>3</sup> )							
		July		August		September		October	
		PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
0+000	Start								
27+880	Iperai Creek	0.6mg/ m <sup>3</sup> (Good)	2.2mg/ m <sup>3</sup> (Good)	2.6mg/ m <sup>3</sup> (Good)	3.2mg/ m <sup>3</sup> (Good)	0.5mg/ m <sup>3</sup> (Good)	1.2mg/ m <sup>3</sup> (Good)	1.3mg/ m <sup>3</sup>	2.7mg/ m <sup>3</sup>
29+431	Poleo Creek	0.5mg/ m <sup>3</sup> (Good)	1.3mg/ m <sup>3</sup> (Good)	2.4mg/ m <sup>3</sup> (Good)	3.6mg/ m <sup>3</sup> (Good)	3.1mg/ m <sup>3</sup> (Good)	6.2mg/ m <sup>3</sup> (Good)	0.7mg/ m <sup>3</sup> (Good)	1.2mg/ m <sup>3</sup> (Good)
30+086	Wandue Creek			2.0mg/ m <sup>3</sup> (Good)	3.4mg/ m <sup>3</sup> (Good)	0.6mg/ m <sup>3</sup> (Good)	1.0mg/ m <sup>3</sup> (Good)	0.6mg/ m <sup>3</sup> (Good)	0.8mg/ m <sup>3</sup> (Good)
31+400	Willame	No work							

- 49 The results show that the general air quality was at acceptable level. The reporting months have experienced a lot of rainfall and the contractor used water trucks to water the road surfaces to suppress dust during working sites.



Picture 8: EO checking the air quality at Iperei bridge at Ch 27+600



Picture 9: EO checking air quality at Poleo Creek at Ch 28+400



Picture 10: EO Checking air quality at Wandue bridge site



50 Air quality was serene and beautiful during this reporting period. There were no dust and the project vicinity were free of dust. Most of the road sections were sealed. This monitoring was conducted during rainy season so there was no problem of dust. However, contractor is advised to use it water trucks during the dry season to suppress dust during working hours as and when needed.



Picture 11: Dust free environment with good air quality after the road sealing

## 2.8 Noise Management

- 51 Noise and vibration were minimal and is at acceptable levels which is not harmful. Most of the noise and vibration can be heard and felt at the operational quarries and crusher sites away from the main village and where people are residing.
- 52 Workers at the quarry plant sites were given protective gears suitable to their working environment. However, some do not have those gears available. The local workers must be given ear muffers and eye protective goggles and they must use them.

Table 5: Results obtained from in-situ equipment for air testing (Jul-Dec 2019)

Monitoring STNs		Noise Level in Decibel (dBAs)			
		July	August	September	October
0+000	Start				
27+880	Iperei Creek	56.4dBAs Noise from the river	68.6 dBAs (Noise from the river)	60.4 dBAs (Noise from the river)	60.4 dBAs (Noise from the river)
29+431	Poleo Creek	67.2dBAs (Noise from big trucks working)	83.8 dBAs (Noise from	90.6 dBAs (Noise from	90.6 dBAs (Noise from

			machines working)	machines working)	machines working)
30+086	Wanduwe Creek		82.5 dBAs (Noise from machines working)	78.1 dBAs (Noise from machines working)	78.1 dBAs (Noise from machines working)



**Picture 12: EO Measuring noise level at Iperei station**

53 The EO using the in-situ measuring equipment for measuring noise level have used to measure other stations at Poleo and Wanduwe river stations. The findings are reported in Table 5. So far noise level is minimal and isolated during this reporting period. Also there is no complaints reported.

## 2.9 Waste Management

- 54 All camp generated wastes are collected by local subcontractor and disposed of into designated disposal sites as per agreed by the landowners at Kabulbul quarry site
- 55 All workshop wastes are collected and disposed into latrines and used oil are stored in empty drums to give away to locals to paint their house posts to keep mites away
- 56 Human wastes are disposed into septic provided at the camp and yard area and the leakage from the Chinese quarter's sewerage had been rectified by building another leaching field to contain all wastes going out into waterways.
- 57 All our construction wastes including spoils are disposed into either side of the road as per agreed by landowners to plant crops
- 58 The contractor manages to display proper management of its wastes at the campsite and yard as well as spoils disposals.
- 59 Waste bitumen drums were sold to locals at K5.00/per drum while used tires were normally collected by individuals who use them for various purposes.

## **2.10 Hazardous Materials Management**

- 60 The contractor has been mostly complying with the storing and handling of hazardous materials during this period. There were no explosives used for the project especially at quarry operations. The contractor used only rock hammers to crush the rocks for road works.
- 61 Used oils and lubricants were properly disposed of at designated sites. Bitumen and asphalt preparation area had minor spillages/leakages and were mitigated by the contractor. There were no major issues of hazardous spillages or in incidences during the monitoring months.
- 62 The contractor continues to maintain proper transportation, storage and refuelling of fuel.
- 63 All workshop lubricants and oils were adequately managed. While used oil were collected and stored in drums and disbursed to locals for timber treatment.
- 64 Spillage traps were created along the fencing line using sand and rocks.
- 65 The contractor was advised to properly label the types of lubricants and store them at safe place at the storeroom. Leakages were to be covered with dust/saw dust and remove and dump at proper dump site area. Drip trays have been provided at gen set house and workshop area in case of leakages. The issue of safety for the workers was not properly addressed.

## **2.11 Aggregates Extraction**

- 66 The contractor has submitted the Quarry Management Plan (QMP) and was evaluated and approved later by the Department of Works through the Executing Agency, Environmental and Social Safeguards Unit (ESSU) of DOW in April 2018 for Elu Quarry and Kabulbul Quarry respectively. The Tomiare Quarry at chainage 22+300 got the approved QMP on the 30<sup>th</sup> of July 2018 and the new quarry, Kumarini got the QMP approved in February.
- 67 Elu and Kabulbul are existing quarries while Tomiare and Kumarini are new quarries. The Tomiare and Kumarini quarries have observed some environmental damages done by the contractor. The landowners have agreed to have their land cleared for the extraction of the aggregates and were paid some lump sums for the removal of improvements and structures. Tomiare and Kumarini quarries have been continuously experiencing slips due to over burden as not being disposed of the excavated wastes at proper place.
- 68 The landowners have agreed with the contractor by signing a Memorandum of Agreement to sell their aggregates at a rate of K1.30/m<sup>3</sup>. Therefore, the contractor has paid a lump sum of PNG Kina of 105, 1920.10 to the landowners of the quarries from January to June 2019 as tabulated in table 6 below. For an isolated community in Pangia–lalibu district this amount is huge return as benefits brought to the community by the project.

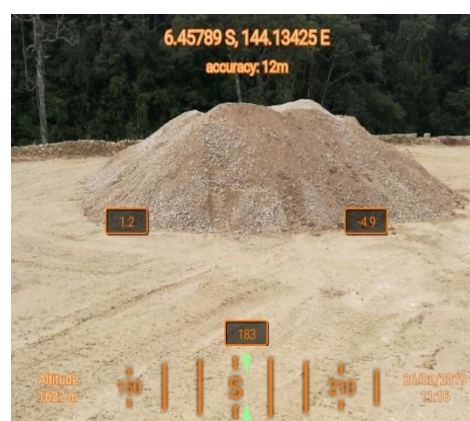
**Table 6: Rock aggregates paid at K1.30/m<sup>3</sup> quarry from July to December 2019**

Month	Elu Quarry (m <sup>3</sup> )	Kabulbul Quarry (m <sup>3</sup> )	Tomiare Quarry (m <sup>3</sup> )	Kumarini Quarry (M3)	Total M <sup>3</sup>	Total
July	92	369	278	398	1,137	14,781.00
August	92	369	278	398	1,137	14,781.00
September	nil	nil	77	308	385	5,005.00
October	nil	4,920	290	3,870	9,080	11,804.00
November	nil	4,920	290	3,870	9,080	11,804.00
December	nil	4,920	290	3,870	9,080	11,804.00
<b>Total</b>	<b>184</b>	<b>15,498</b>	<b>1,974</b>	<b>12,718</b>	<b>29,899</b>	<b>69,979.00</b>
<b>Average</b>	<b>30.67</b>	<b>2,583</b>	<b>329</b>	<b>2,119.67</b>	<b>4,983.17</b>	<b>11,663.16</b>

69 The quarry owners have been benefiting from the company since the inception of the project and continuously benefitting from the spinoffs. The quarry owners worked as spotters, security guards, crews and machine operators apart from the direct benefit from quarry royalties. Geotagged photographs 23 and 24 show Tomiare Quarry at CH. 22+300 and Kabulbul Quarry at CH.13+600



**Photograph A: Tomiare Quarry**



**Photograph B: Kabulbul Quarry**

**Picture 13: Tomiare and Kabulbul Quarry Plant site**

## **2.12 Ancillary Facilities Management**

70 Pre-coated sealing chips are covered with canvas to prevent rain from washing away the bitumen

71 Batching plant was constructed in a way where it does not produce much fumes while burning the bitumen

72 Sealing truck is fully and properly equipped with sealing equipment to load bitumen and to spray on the road surface.

73 Constructed concrete bund around the batching plant area to prevent any leakages going into water ways

### 2.13 Tree Removal and Vegetation Management

74 This environmental monitoring parameter is not applicable during the monitoring period since all clearing and grabbing has already been done during the first semester of 2019.

### 2.14 Socio-Economic Issues of Workers

75 For the covered period from July to December 2019, the contractor has hired a total of 965 workers and personnel or an average of 160.8 persons per month. There were 870 males (90.16%) while there were 95 females (9.84%) during the covered period employed in the sub-project. There were 630 APs that were employed in the sub-project. This represents 65.3% of total persons hired. The breakdown is shown in the following:

**Table 7: Summary of monthly employment and estimate wages by gender**

Months	Male	Female	Total	DPS Employed	Estimated Female Wages	Estimated Total Wages
July	170	30	200	120	15,000.00	100,000.00
August	170	30	200	120	15,000.00	100,000.00
September	160	10	170	120	5,000.00	85,000.00
October	160	10	170	120	5,000.00	85,000.00
November	160	10	170	120	5,000.00	85,000.00
December	50	5	55	30	15,000.00	27,500.00
<b>Total</b>	<b>870</b>	<b>95</b>	<b>965</b>	<b>630</b>	<b>60,000.00</b>	<b>482,500.00</b>
<b>Average</b>	<b>145</b>	<b>15</b>	<b>160.8</b>	<b>105</b>	<b>10,000.00</b>	<b>80,416.70</b>
<b>Percentage</b>	<b>90.16%</b>	<b>9.8%</b>	<b>100%</b>	<b>65.3%</b>	<b>12.43%</b>	<b>100%</b>

76 For the covered period, it is estimated that the contractor paid the 965 workers and paid a total of Kina 482,500.00 or an average of Kina 80,416.70 per month. Out of this total, Kina 60, 000.00 was paid to female workers from July to December 2019.

77 In addition, the contractor also farmed out certain construction activities that were not captured by the employment data because these deliverables are paid per task or per piece.

78 Hence, there were women documented working in the quarry, segregating flat stones to be used in the line drains and culverts but were not reflected in the data presented by the contractor.

79 There are four construction activities where both males and females have participated but were not reflected in the employment data provided by the contractor because their mode of payment is not daily but based upon completion of a certain piece or task. These are construction of gabion baskets, line drains, ripraps, head walls and stone sorting. However, according to the data provided by Contractor in its monthly reports, there were unskilled works from the affected communities employed by contractor to work in various construction activities. The breakdown is shown in the following Table 7: Summary of monthly employment by gender for unskilled workers.



80 There are four construction activities where both males and females have participated but were not reflected in the employment data provided by the contractor because their mode of payment is not daily but based upon completion of a certain piece or task. These are construction of gabion baskets, line drains, ripraps, head walls and stone sorting. However, according to the data provided by Contractor in its monthly reports, there were unskilled works from the affected communities employed by contractor to work in various construction activities. The breakdown is shown in the following

**Table 8: Summary of monthly employment by gender for unskilled workers**

Month	Unskilled Men	Unskilled Women	Total	DPs Employed	Estimated Total Amount Paid
July	20	5	25	12	12,500.00
August	15	5	20	15	10,000.00
September	20	6	26	20	13,000.00
October	10	4	14	10	7,000.00
November	12	5	17	10	8,500.00
December	9	6	15	15	7,500.00
<b>Total</b>	<b>86</b>	<b>31</b>	<b>117</b>	<b>82</b>	<b>58,500.00</b>
<b>Average</b>	<b>14</b>	<b>5</b>	<b>19</b>	<b>13</b>	<b>9,750.00</b>
<b>Percentage</b>	<b>73.50%</b>	<b>26.49%</b>	<b>100%</b>	<b>70.08%</b>	<b>100.00%</b>

81 For the covered period, there were 117 unskilled locals along the affected communities employed by contractor to work in non-payroll various construction activities. The total wages paid to these 117 unskilled employees was Kina 58,500.00 or an average total wage of Kina 9,750.00. The wages paid to them depends upon the completion of a certain given tasks. Hence it was not commutated using the estimated wage rate of Kina 500.00. Such assigned tasks are on a casual basis and both male and female were engaged to carry out the tasks.

82 The contractor in its monthly reports did not specify the number of personnel and casual workers employed by their origin or per LLGs. Also, the number of women who have participated in non-payroll activities has not been provided by the contractor hence it is not captured in this report.



**Picture 14: Day Casual labourers at work; local participation**



## 2.15 Socio-Economic Impacts to the Community

- 83 The locals from the vicinity of the road project have benefited a lot from construction activities since the inception of the road project. The contractor was fair by engaging individuals as casuals and skilful labours from the road impacted wards from the start of the project (0+000 KM) to the end of the project at Williame Village (31+460 KM) at South Wiru sub-district.
- 84 The owners of the lands where the quarries are located are usually the tribes and clans who own the customary lands. However, there are tribe members who are assigned the portions of customary lands where the quarries are located. These tribal occupants suffer direct disturbances and are entitled to a bigger share than ordinary tribal members. The royalties received each month are divided based on internal agreements within the tribes.
- 85 For the month of July to December 2019, there were three (3) operating quarry sites and this is known as the Elu Quarry, Kabulbul Quarry, Tomiare Quarry, and Kumarini Quarry.
- 86 The materials are extracted from the quarries at an agreed cost of K1.30per bucket or K13.00 per/cubic meter. The total volume of materials extracted for the month of July to December 2019 was approximately 66,157 tonnes. The total royalties' payment received by customary landowners for the above tonnage produced by 3 operating quarry sites was around Kina 86,004.10. The details are shown in the following Gender equality has been emphasised by ADB to engage about 30% of women to participate the total workforce but the average is 13.80% which is below the set benchmark. The disintegrated employment by gender from July to December 2019 is tabulated below.
- 87 The contractor for the subproject road has made use of customary land where its campsite was established and disposal of spoils at selected stable areas. All such cases have been agreed with the customary landowner for the payment of the agreed fees or in-kind assistance. The total amount received by customary landowners on this account is Kina 2,500 as per the signed Lease agreements signed for the usage of Langane Campsite.
- 88 For the covered period, the contractor has paid an aggregate amount of Kina 15,000.00 to the customary landowners or on average spent around Kina 2,500.00/month. The details are shown in the following Table 9: Summary of lease rental payments to customary landowners.

**Table 9: Summary of rental payments to customary landowners**

Month	Lagani Campsite Rentals	Total
July	2,500.00	2,500.00
August	2,500.00	2,500.00
September	2,500.00	2,500.00
October	2,500.00	2,500.00
November	2,500.00	2,500.00
December	2,500.00	2,500.00
<b>Total</b>	<b>15,000.00</b>	<b>15,000.00</b>
<b>Average</b>	<b>2,500.00</b>	<b>2,500.00</b>

- 89 The contractor has also paid a monthly rental for the Bitumen Yard at Kina 900.00. for the covered period (July to December 2019) the contractor has paid a total of Kina 5,400.00 as the rental payment for the bitumen yard.
- 90 For the covered period (July to December 2019) the contractor has spent a total of Kina 3,295,629.60 for purchasing and hiring of local construction materials and equipment's. This includes dump trucks and excavators totalling up to Kina 2,275,431.20 and also hired fire sand with sealing chips at Kina 1,018,748.00. For the locally produced food items the contractor has spent a total of Kina 1,450.00. The details are shown in the following Table 10: Local hires by subcontractors.

**Table 10: Hire of subcontractor and local food purchase**

Month	Excavators & Dump Trucks	Fine Sand & Sealing Chips	Local Purchase of Food Items	Total
July	156,695.20	185,250.00		338,945.20
August	156,695.20	185,250.00		338,945.20
September	23,900.00	299,900.00	550.00	324,300.00
October	23,900.00	299,900.00	550.00	324,300.00
November	23,900.00	299,900.00	550.00	324,300.00
December	23,900.00	299,900.00	550.00	324,300.00
<b>Total</b>	<b>408,990.40</b>	<b>1,570,100.00</b>	<b>2,200.00</b>	<b>1,975,090.40</b>
<b>Average</b>	<b>68,165.07</b>	<b>448,600.00</b>	<b>366.67</b>	<b>329,181.66</b>

- 91 As part of sharing project benefits to the affected communities, the contractor has always sub-contracted other necessary maintenance work within the campsites to the locals who have sufficient skills and capacity to carry out construction work.
- 92 In addition, the Contractor is very reliable in providing the following in-kind assistance and donations to the wards, villages, schools and churches along the subproject.
- ✓ Provide other assistance and support to social obligations for roadside communities.
  - ✓ Provide and assist locals by transporting sick people to nearby health centres.
  - ✓ Provide fuel to police and security personnel.
  - ✓ Provide crushed materials (gravel) to schools and churches as requested.
  - ✓ Provide coffins and other materials to close relatives of the deceased.
- 93 During project commencement the contractor has constructed a Field Office with Laboratory and a Living Quarters for the Project Supervision Consultant personnel at Pangia Admin Primary School ground. A Memorandum of Agreement was signed between the contractor and Pangia Admin Primary School Board of Management specifying that instead of monthly rental payments, all facilities constructed by the contractor should be ended over to the school upon completion of the sub-project road.
- 94 On 3<sup>rd</sup> December 2019, HRMG being the Project Implementation Unit successfully ended over the facilities to Pangia Admin Primary School when the sub-project road reached its final completion stage thus there was no further need for Project Supervision Consultant team to use the facilities.

- 95 The end-over take-over program was facilitated by HRMG and PSC, thus witnessed by Pangia Admin Teachers, Students, and the surrounding communities.
- 96 The Headmaster of the school gave his words of appreciation to HRMG/DoW and the contractor for giving facilities of certain value to the school in exchange of land rentals. Further comments were made that since their staff have housing woes, they will use the buildings to accommodate teachers. Below are some photographs of road improvement benefits it brings to the community.



**Photograph 18**  
**Women Participation at project site**



**Photograph 19**  
**Locally produced timbers for work**



**Photograph 20**  
**New house built along the roadside**



**Photograph 21**  
**Bus service at the project site**



**Photograph 22**  
**Women selling food at project site**



**Photograph 23**  
**New fence built along the roadside.**

**Picture 15: Spin of benefits activities resulted from new road been constructed**



97 The project has added more value to the locals in terms of purchases of local foods and timbers by the company. The company has hired dump trucks and heavy machines for the civil works from July to December 2019.

98 The local purchases and hires by the contractor are tabulated in table (8) below from July to December 2019 for a total of Kina 1, 994, 919.00.

## **2.16 Public Safety**

99 The contractor constructed a temporary bypass access road at Poleo creek and Wanduwe bridge sites for public to use while constructing the permanent bridge. The new bridges have been constructed without delays.

100 The public road users especially drivers were advised to drive slowly on the project site while the construction is still in progress by our security personal onsite. A field worker is placed there to monitor and inform the drivers to reduce their speed before crossing.

101 Several guard rails were erected on slopes and clips to prevent accidents from moving vehicles from going overboard the roadside.

102 Speed limits and traffic controls signs were placed at all workstations and road construction sites.



**Picture 16: Temporary access road built by contractor at Wanduwe river**

## **2.17 Traffic Management**

103 The contractor has submitted the Traffic Management Plan (TMP) and was elevated and approved by the Department of Works and Implementation through the Executing Agency, Environmental and Social Safeguards Unit (ESSU).

- 104 Traffic is managed very well at the construction site. Now that most of the road section is sealed, the number of vehicles travelling the road has increased. Contractor has
- 105 put the necessary traffic control warning sign to ensure vehicles are travelling the road safely.



Picture 17: Signage informing traffic on work man ahead



Picture 18: A spotter displaying traffic control sign at Ch 29+200

## 2.18 Prevention of HIV/AIDS and STIs

- 106 The contractor has submitted the HIV/Aids Management Plan and approved by the Department of Works through the Executing Agency, Environment and Social Safeguards Unit (ESSU) in April 2018 for the Pangia-Wiru Loop road sub-project.
- 107 The contractor was compliant by engaging a service provider, Pangia Health Centre, Department of Health for its HIV/AIDS programs. The volunteer counselling and public



awareness was progressing well at identified villages per the monitoring month. The geotagged photographs (27) and (28) show the health officials and volunteers at certain locations along the road corridor.



Photograph 19



Photograph 20

**Picture 19: Safeguards officers doing HIV/AIDS awareness**

**Picture 20: CHW counselling a female while conducting HIV rapid testing.**



**Picture 21: HIV/AIDS awareness conducted school and at contractor's camp**

- 108 That the contractors have conducted the awareness programme via Approved Service Providers as required.
- 109 That information, Education and Communication (IEC) campaigns have fully been complied with and implemented at all the T3 road project sites by the contractors and their respective service providers
- 110 That both the male and female condoms have been made available at the sites and have also been distributed to the attendants (male & female) at all awareness sites. That the IEC materials like pamphlets have been distributed to attendants at all the awareness sites by the service providers.
- 111 That STI and HIV/AIDS screening, diagnosis, counselling and referrals have been carried out at every awareness sites at all the road project sites.

112 This HIV / AIDS outreach activity report is for the month of July to October conducted by the contractor in different locations.

**Table 11: Number of participants and awareness materials distributed**

	Company Employees		General Population		Total
JULY	Male	Female	Male	Female	
Number of Person in Awareness	40	6	10	4	60
Number of Condoms Distributed	120	Nil stock	80	Nil stock	200
AUGUST	Male	Female	Male	Female	
Number of Person in Awareness	10	4	110	70	194
Number of Condoms Distributed	30	Nil stock	70	Nil stock	100
SEPTEMBER	Male	Female	Male	Female	
Number of Person in Awareness	10	2	32	34	78
Number of Condoms Distributed	20	4	180	36	240
OCTOBER	Male	Female	Male	Female	
Number of Person in Awareness	12	2	38	15	67
Number of Condoms Distributed	20	1	180	5	206

## 2.19 Existing Infrastructure Issues

113 The Paiyama ceremonial ground has been an issue for the contractor as locals stopped work. After several public consultations with the locals, the contractor was allowed to

proceed with civil works. The issue has been resolved amicably with the locals by HRMG and the supervision consultant for the project.



Picture 22: Public consultation exercise at Paiyama village

## 2.20 Environmental Related Grievances

114 For the period covering July to December 2019, compensation payments for meritorious grievances including assets (trade, houses and fence, etc) and improvements (food crops like banana, coffee and trees, etc) recommended by GRC have been successfully paid.

115 However, emerging grievances including environmental matters to be continuously enlisted by HRMG CRO for further deliberation by GRC. All environmental related claims to be resolved by contractor.

Table 12: Type of grievances redressed by GRC

Types of Grievances Deliberated by GRCs							
Missed Out Payments for Assets within 810 Meters road section		Assets within ceremonial Area		Other Missed Out Payments		Assets Affected within School Areas	
Total Grievances:545		Total Grievances:150		Total Grievances		Total grievances	
Genuine	Non-Genuine	Genuine	Non-Genuine	Genuine	Non-Genuine	Genuine	Non-Genuine
340	205	150	0	35	0	2 Schools	0





## **APPENDICES**

### **Appendix 1 List of References (source)**

1. Brief Back to Office Reports – July to December 2019
2. Contractor's Monthly Reports – July to December 2019
3. Initial Environment Examination for Pangia-Wiru Loop – 2015 publication
4. Internal Monitoring Reports by HRMG – July to December 2019

### **Appendix 2 List people interviewed**

1. Mr. Joven Du - Administration Manager – COVEC
2. Mr. Rodney Karu - Contractor Environmental Officer – COVEC
3. Mr. Steven Sukot - CSC Environmental Specialist
4. Mr. Paul Nombri - Manager Technical Services
5. Mr. Mathias Konga - Re-settlement and Social Safeguards Specialist
6. Mr. Carlton Kunupo - Community Relations Officer – PWL
7. Mr. Samson Wereh - GRC Chairman – District Administrator