

Semi-annual Report

July 2018

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

Henganofi-Nupuru Road Sub-Project

Prepared by Department of Works for the Asian Development Bank

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HIGHLAND REGION ROAD IMPROVEMENT INVESTMENT PROGRAM – PROJECT 3

Henganofi-Nupuru Sub-Road Project

ENVIRONMENTAL SAFEGUARDS MONITORING REPORT

(January - June 2018)

**Project Implementation Unit
Department of Works National
Capital District Papua New
Guinea**

August 2018

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ABBREVIATIONS

ADB	- Asian Development Bank
AP	- Affected People
BOQ	- Bill of Quantities
CEMP	- Construction Environment Management Plan
CEPA	- Conservation and Environment Protection Authority
CRO	- Community Relations Officer
CSC	- Construction Supervision Consultant
DBST	- Double Bitumen-layer Surface Treatment
DC	- Design Consultant.
DOW	- Department of Works
EA	- Executing Agency
EMP	- Environmental Management Plan
EO	- Environmental Officer
EPAR	- Environmental (Prescribed Activities) Regulation
ESSU	- Environment and Social Safeguards Unit
GOPNG	- Government of Papua New Guinea
GRC	- Grievance Redress Committee
GRM	- Grievance Redress Mechanism
HCRN	- Highland Region Core Road Network
HIV	- Human immunodeficiency Virus
HRMG	- Highlands Region Road Improvement Investment Program
IA	- Implementation Agency
IEE	- Initial Environmental Examination
ISS	- International Safeguards Specialist
LLG	- Local Level Government
MFF	- Multi-tranche Financing Facility
MOA	- Memorandum of Understanding
NRA	- National Roads Authority
PNG	- Papua New Guinea
PRO	- Public Relations Officer
PSC	- Project Supervision Consultant
PWM	- Provincial Works Manager
ROW	- Right of Way
RP	- Resettlement Plan
SHP	- Southern Highlands Province
SIS	- Socio-economic Impact Study
SPS	- Safeguards Policy Statement
STD	- Sexual Transmitted Diseases
TOR	- Terms of Reference

FACT SHEET:

Loan	ADB Loan: 3404/3408 and Grant 0485 PNG
Project Number	CSTB 3533
Subproject	Henganofi – Nupuru Road Subproject
Executing Agency	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 environmental management and environmental compliance monitoring
Implementing Agency/Unit	<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 environmental management and environmental compliance monitoring, land acquisition and/or resettlement activities, as required. The more relevant delegated responsibilities include the following;</p> <p>Prior to the commencement of civil works:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Submit and indorse environmental assessments required for regulatory approval of the CEPA and require the contractor to obtain approval, e.g., environmental clearance, environmental permit or permits from other statutory authorities as required by the Government. <input type="checkbox"/> Ensure that all regulatory clearances for the subproject are obtained from the relevant government authorities and are submitted promptly to ADB. <input type="checkbox"/> Ensure that the EMP is updated based on detailed design and included in the bidding document of the subproject and that all bidding contractors have access to the environmental assessments and EMP. <input type="checkbox"/> Ensure that the EMP and all required mitigation measures during construction, including conditions stipulated in the CEPA's clearance or environmental permit, are included in BCD with requirements to update the EMP in response to any unexpected impacts and <input type="checkbox"/> That all selected contractors have agreed to implement in full the requirements of environmental mitigation measures prescribed in the EMP <input type="checkbox"/> Provide training as required to HRMG in Mt Hagen and contractor; <input type="checkbox"/> Receive environmental safeguard clearance on subproject(s). <input type="checkbox"/> Provide training to contractor prior to preparation of CEMP, safeguards requirements of ADB and regulatory requirements of CEPA.

	<input type="checkbox"/> Approve CEMP for the subproject, after being cleared by PSC. During the implementation of civil works: <input type="checkbox"/> Ensure that the CEMP including all proposed mitigation measures and monitoring and relevant provisions of the environmental assessments is updated as required, <input type="checkbox"/> Conduct environmental management and compliance monitoring on a monthly basis in cooperation with the PSC. <input type="checkbox"/> Review and assess the contractor's monthly environmental monitoring report and compliances as contained in the CEMP. <input type="checkbox"/> Assist the Engineer in the compliance of the submitted CEMP. <input type="checkbox"/> Prepare the quarterly and semi-annual reports in cooperation with the PSC for submission to DOW and ADB.
Coverage of the Environmental Monitoring Report	January to June 2018

EXECUTIVE SUMMARY

- I. This first Semi-Annual environmental monitoring report for 2018 covers the period from January to June 2018. This report was carried out by the DOW through the Highlands Road Management Group (HRMG) and the monitoring results will be communicated to ADB through this report.
- II. Henganofi-Nupuru sub-project road is one of the 4 sub-projects of Tranche 3 of the Highlands Region Roads Improvement Investment Program, an ADB assisted road program. The sub-project is covered by CSTB contract # 3533 entered into by the Independent State of Papua New Guinea represented by the Department of Works and China Wu Yi LTD (CWY China).
- III. The contract was awarded March 4, 2017 and mobilization started in October 2017. The construction period of the project is 24 months. The Long Term Performance Based Maintenance Services is 60 months from the issuance of the Performance Certificate for the Improvement Work.
- IV. An induction meeting was conducted for all the contractors in July 12, 2017 by the Engineer and HRMG with the PSC to provide a background of the environmental management plans and compliance monitoring requirements. The meeting covered best practices for environmental management and mitigation, including sewage treatment, solid and hazardous waste management; and soil erosion control and management. A presentation on environmental laws including a summary presentation on the legal framework of PNG, CEPA Act, Environment Act of 2000, list of suggested environmental monitoring equipment, and PNG Water Quality Standards. Also provided were sample forms and requirements for monthly monitoring report, Notice of Violation Form, and Logbook.
- V. An induction training was also conducted on October 31 to November 1, 2017 to address Construction Environmental Management Plans formulation, Environmental Management, Environmental Monitoring and Best Practices for Environmental Mitigation at Kuri Lodge, Mt. Hagen. The training was attended by the contractor and environmental officers, HRMG, PSC and NRA.
- VI. Several seminars and trainings are proposed to provide capacity and capability building activities to the contractor's environmental officers and HRMG staff to ensure that the environmental management and compliance monitoring requirements are done in an efficient and timely manner.
- VII. Monthly reports from the PSC, HRMG and the Contractor indicate that in terms of environmental performance some mitigation and corrective actions were needed for solid waste management, sewage management, elevated noise and dust particularly at Habanofi Primary School and, wages and compensation issues, and negligence in PPEs use.
- VIII. The monthly assessment of air, water and noise needs to be conducted. For this purpose, the contractor needs to purchase the necessary equipment as indicated in the BOQ.
- IX. The Upegu Quarry has obtained a permit from CEPA last March 23, 2018 which is valid for a ten year period. Monitoring of this quarry needs to be done regularly as it is also used for domestic purposes.

1.0 INTRODUCTION

1.1 Background

1. The Highlands Region of Papua New Guinea (PNG), comprising the Provinces of Western Highlands, Jiwaka, Southern Highlands, Hela, Eastern Highlands, Enga and Chimbu, is a major contributor to the PNG economy through its agricultural production and mineral resources. A well-maintained road network is essential to facilitate the movement of goods and people. The Government of PNG (GoPNG) has made significant investments in improving the road network but a lack of maintenance has resulted in the deterioration of the roads such that the Highlands Core Road Network (HCRN) is now in poor condition.
2. In order to address the deterioration of the HCRN, there is a clear need to: (i) implement a program of regular maintenance on all HCRN roads that are in good condition; and (ii) improve those roads that are in poor condition and (iii) ensure that maintenance begins on those roads as soon the improvement works are completed.
3. The GoPNG has negotiated a Multi-tranche Financing Facility (MFF) loan with the Asian Development Bank (ADB) to implement the Highlands Region Road Improvement Investment Program (HRRIP) in tranches. The HRRIP includes projects to improve the HCRN, the preparation of long-term maintenance contracts for the HCRN, and the capacity development of road agencies. In total, 13 road sections are expected to be funded under the program.
4. Project 1 has included the improvement to two road sections and Project 2 is currently being implemented to upgrade three road sections while Project 3 proposes to rehabilitate four road sections comprising 113.3 km of the HCRN.
5. The Execution Agency (EA) for the program is the Department of Works (DOW) whilst the Highland Region Management Group (HRMG) is the Implementation Agency (IA).
6. Tranche 3 (ADB 3043/3408 and EU Grant 0485) include the upgrading, rehabilitation and maintenance of four road sections namely, Henganofi-Nupuru, Gewa-Gembogi, Pangia-Wiru Loop, and Nipa-Munihi in the Eastern Highlands Province (EHP), Chimbu Province and Southern Highlands Province (SHP).
7. The rehabilitation of the Henganofi to Nupuru road in the Eastern Highlands province has a length of 33.96 km. The works proposed for the upgrading and rehabilitation of the Henganofi to Nupuru Road such as earthworks, establishment and operation of quarry sites and extraction of materials, minor civil works and discharge of wastewater are Level 1/Level 2 activities under the EPAR and may require an Environmental Permit depending on the duration and scale of those activities.
8. The contract was awarded in March 4, 2017 and civil works started in October 2017 following the contractor's mobilization. The construction period of the project is 24 months. The Long Term Performance Based Maintenance Services is 60 months from the issuance of the Performance Certificate for the Improvement Work.
9. The Henganofi-Nupuru Road Section is covered by CSTB contract # 3533 entered into by the Independent State of Papua New Guinea represented by the Department of Works and China Wu Yi LTD (CWYC China).

1.2 Sub-Project Description

10. The road from Henganofi to Nupuru, passing through Fayantina, is approximately 34 km in length. The road commences at the junction with the main Highlands Highway, approximately one kilometer from Henganofi station and ends at the junction with the Okapa road in Nupuru. The road serves the Henganofi and Okapa Districts of Eastern Highlands Province which together have an average population of 40,000. The road is the only link from the two districts to Goroka and Kainantu townships and hence improvement is vital to the economic development of the area and the delivery of fundamental services to the population (Figure 1: Location of the Henganofi - Nupuru Road).

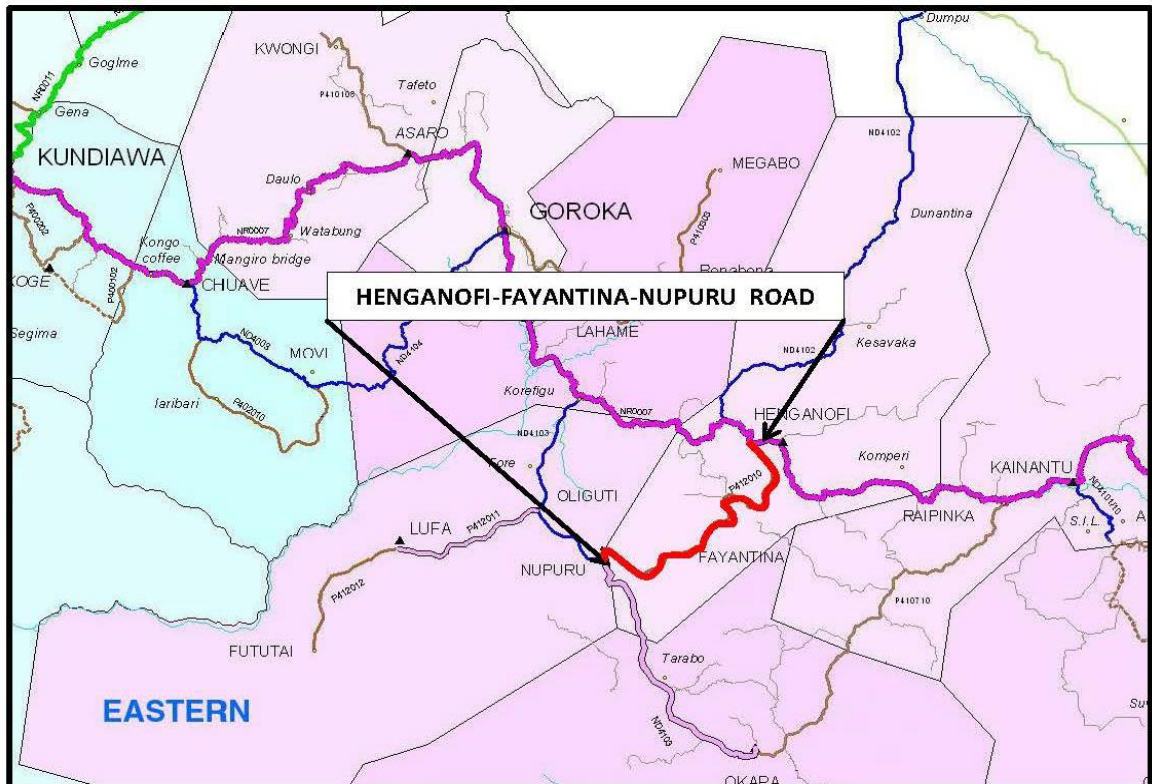


Figure 1: Location of the Henganofi - Nupuru Road

11. The Henganofi – Nupuru road was initially, a walking trail used by local since the late 1960s or early 1970s. It has gradually been opened to provide the current road excess. The route traverses' mountainous terrain and extensive sections of the alignment follow ridges. Elsewhere, the route is benched into sidelong ground and comprises a twisting alignment with steep gradients at the approaches to river and creek crossings. The route crosses a total of 4 rivers and 3 major creeks on existing bridges. Two of these bridges are of comparatively recent construction and will require only minor maintenance whereas the remaining structures will require rehabilitation of the superstructure, the provision of steel decking to replace the existing timber and the provision of pedestrian facilities across the bridges. One new bridge is required.
12. The route passes through 11 villages/tribal settlements, the largest of which is Pore that acts as a local centre for the population living within the middle third of the road length and the immediate surrounding area. There are also numerous junctions along the road with local roads connecting to the interior.

13. The first 20 kilometers of the road primarily follows a ridge top alignment and the landscape is dominated by swathes of grassland with occasional secondary growth of trees, generally around settlement areas and individual homes. In the section of the road from km 20 to the end at Nupuru, the local tribes have made extensive plantings of pine trees.
14. The entire length of the road corridor has been extensively disturbed by human habitation and the activities of clearance for cultivation, the gathering of wood for fuel and hunting for food, hides and feathers for ceremonial purposes. As a consequence, there are no natural habitats of significance immediately adjacent to the road corridor and within the areas which will be affected by the proposed improvement works.
15. The Eastern Highlands province plays host to the Crater Mountain WMA and is located southwest of the Henganofi Nupuru road.
16. The environmental impacts assessed at the time of preliminary design categorized the subproject as Category B for environment. The same category was confirmed by the in- depth environmental analysis conducted at the time of project preparation. The Initial Environment Examination (IEE) dated April 2016 has already been disclosed on the ADB web site. The IEE confirmed that environmental impacts of the rehabilitation of the Henganofi-Nupuru subproject road are limited to the road corridor, are of minor scale and can be mitigated through the thorough implementation of the measures contained in the environment management plan. The impacts such as dust, noise, materials sourcing, storage, haulage, soil erosion, sedimentation and run-off are likely to occur mainly during the construction phase.
17. Based on the EMP presented in the IEE, a construction environment management plan (CEMP) was prepared by the contractor and submitted to ADB through DOW. ADB issued a no objection letter in January 23, 2018.
18. An Induction Meeting was conducted for all the contractors in July 12, 2017 by the Engineer and HRMG with the PSC to provide a background of the environmental management plans and compliance monitoring requirements. A reference compact disc (CD) was also provided to the contractors during this meeting containing best practices for environmental management and mitigation, including sewage treatment, solid and hazardous waste management; and soil erosion control and management. Based on the experiences with Tranche 1 and Tranche 2, environmental laws including a summary presentation on the legal framework of PNG, CEPA Act, Environment Act of 2000, list of suggested environmental monitoring equipment, and PNG Water Quality Standards, was also provided in the CD. Further, also provided were sample forms and requirements on sample monthly monitoring report, Notice of Violation Form, and Logbook Sample Content.
19. Internal monitoring will be conducted by the environmental specialist of the Project Supervision Consultant (PSC) whereas independent monitoring will be conducted by the Environmental Officer (EO) of HRMG.

1.3 Proposed Scope of Works

20. The project intends to improve the existing Henganofi – Nupuru road through the provision of a 5.5 meter wide pavement, sealed with DBST and 0.25 meter wide shoulders. Earthworks will be required to provide an adequate bench for construction of the pavement. Associated drainage will also be required where improvements are necessary in the vertical alignment to ensure adequate stopping sight distance. An

average additional width of 1.0 m on each side of the existing cleared width will be required to accommodate the improvement works. The estimated volume of excavation is 95,000m³ of which 60,000m³ will be reused for embankments and the remainder is expected to be unsuitable and therefore to be disposed of. Approximately 40,000 m³ of borrow area will be required for the balance of embankment construction.

21. The proposed drainage system for the road will entail the installation of 80 new culverts, primarily to provide relief to road side drains, the removal and replacement of 50 existing culverts which are either badly damaged or undersized and the maintenance of 9 large diameter existing culverts i.e. dia >1,200 mm. Most of the culverts to be maintained will require extensions on each side to accommodate the carriageway above. Approximately 21,000 linear meters of lined roadside drains will be constructed to cater for run-off from the carriageway and the adjacent slopes.
22. There are 7 existing bridges within the road length, the details of which are presented in Figure 1: Location of the Henganofi - Nupuru Road. Five of the bridges require major rehabilitation and the provision of steel decks. The Pore bridge is relatively new and require only minor maintenance while the bridge at the Imayata River has been washed out and requires replacement. This will necessitate the construction of bank seat abutments with gabion protection to prevent scour of the foundations and the installation of Barley bridge superstructure (Table 1 - Bridges Along the Henganofi - Nupuru Road)

Table 1: Bridges Along the Henganofi - Nupuru Road

NAME	CHAINAGE	TYPE	PROPOSED WORKS
Konamebi River	00 + 365	Steel Girder	Rehabilitation of Girders and provision of Steel Deck.
Menipi Creek	00 + 925	Steel Truss	Rehabilitation of Truss and Provision of Steel Deck.
Pore River	20 + 520	9 Bay Bailey	Good Condition – No Works Required
Okoteri Creek1	23 + 815	10 Bay Bailey	Minor Rehabilitation and Provision of Steel Deck
Okoteri Creek2	24 + 240	4 Bay Bailey	Rehabilitation and Provision of Steel Deck
Imayata River	28 + 030	6 Bay Bailey	Construction of a new Bailey bridge includes provision
Iyapa Creek	29 + 722	2 Bay Bailey	Rehabilitation and Provision of Steel Deck

23. The rehabilitation and upgrading would approximately take 36 months and involve the following:

- (i) Transport, handling and storage of construction materials, fuel and lubricants and, machinery to site;
- (ii) Preparation of contractor's camp and work sites;
- (iii) Establishment of ancillary facilities, i.e. identification and establishment of suitable material sources/quarries, batching, crushing and asphalt plants;
- (iv) Clearing and grubbing (shoulders and drainage);
- (v) Excavate defective sections and improve side drains as required;
- (vi) Excavation and/or filling to widen the existing road bench;
- (vii) Culvert removal, installation, extension and/ or replacement;
- (viii) Construct masonry retaining walls;
- (ix) Construction of gabion protection works;
- (x) Rehabilitate bridges which may include installation of new steel decks if necessary, removing rust and repainting and, construct a new bridge;
- (xi) Backfill and compact as required;

- (xii) Layout sub-base and base materials and compaction;
 - (xiii) Install road furniture required (guardrails, pavement markings, etc.); and
 - (xiv) Pave roadway with DBST.
24. The upgrading and rehabilitation works for the Henganofi to Nupuru Road would require approximately 231 people of which 120 unskilled workers will be sourced from the local communities in the area. Various machinery and heavy equipment will be required in the rehabilitation and upgrading works. This would range from 4WD vehicles to bulldozers. The human-power complement, machinery and equipment required for the works rehabilitation and upgrading would approximately take 24 months and would involve the following:
25. The works require materials including fuel, lubricants, paint, bitumen, cement, aggregates, sand, timber, geotextile, drainage pipes and culverts. All materials will be sourced from approved suppliers. Workers, including local women, will make gabion baskets for embankment and bridge pier protection.

1.4 Purpose

26. This report is written to present the status of the environment including compliance with the approved CEMP in respect of the Henganofi – Nupuru road section covering January to June 2018. Semi-annual environment safeguards monitoring reports is a requirement under the SPS. In addition, the report provides a clear picture with regard to the future implementation of CEMP activities as well as the environmental outcome.
27. Furthermore, the report serves the client, ADB and other organizations to understand the environmental management process, its outcome, the corrective actions that are required and the impact of such actions on the environment.

1.5 Methodology

28. This six-month consolidated report is written using data gathered from several sources. These include (i) Contractor's interviews and monthly reports; PSC monthly reports and; (iii) HRMG-PIU verification of site and field observations.
29. This report is reviewed by the Supervision Consultant and HRMG-PIU prior to its submission to ADB. It also follows the format prescribed by ADB and a checklist for monitoring environmental compliance.
30. The list of reports reviewed is in Appendix 1 whilst names of people interviewed are in Appendix 2.

1.6 Institutional Arrangements

31. The Department of Works, as the executing agency, has the overall responsibility to manage the planning, implementation and monitoring related to acquiring use rights for additional land to implement HRRIP subprojects, as well as compensation for damages on project-affected land.
32. DOW established a Project Management Office (PMO) headed by a Project Director which manages the day to day activities of the program. Within the PMO, there are two units, the Project Management Unit (PMU) which is based in Port Moresby. The other is the Highlands Road Management Group (HRMG), the DOW's Project

Implementation Unit (PIU) for HRRIP subprojects to carry out the planning, implementation and monitoring for land activities, as required and is based in Mt. Hagen.

33. In the revitalized organizational chart (as of February 2017), the HRMG is headed by the Field Project Manager (FPM). Under the FPM are two sub-units, the construction unit headed by the “Engineer” and the social and environmental safeguards unit headed by the Senior Field Project Coordinator (SFPC).

1.7 Report Organization

34. The report consists of the foregoing introduction and 2 other sections as follows:

- i) Section 1 – Executive Summary
- ii) Section 2 - Introduction,
- iii) Section 3 – Monitoring results and finding
- iv) Section 4 – Conclusions and recommendations and appendices

2.0 MONITORING RESULTS AND FINDINGS

35. The main findings of monitoring shall include the assessment of environmental impacts during the review period and proscriptive requirements are presented in this section.

36. The basis for monitoring are the parameters that would be considered in the CEMP of which there are 15 as follows:

- Contractor's camp and yard
- Erosion and sedimentation
- Water quality
- Air quality
- Noise
- Waste management
- Hazardous material management
- Aggregates extraction
- Tree removal and vegetation management
- Socio-economic issues (workers)
- Socio-economic issues (community)
- Public safety
- Health and safety issues
- Traffic management
- Prevention of HIV/AIDS and STDs
- Existing Infrastructure Issues
- Environment Related Grievances
- Training and Mentoring

37. The summary of non-compliance from the monthly reports prepared jointly by HRMG and PSC is provided in Table 2. Environment Officers from HRMG with PSC should prepare the Notices of Violation if warranted based on the standards set during a meeting for this purpose.

38. Table 2: Summary of Non-Compliance Notices for January to June 2018.

NON-COMPLIANCE	MONTHS					
	J	F	M	A	M	J
Workers are paid below the set minimum wage requirement.	X	X	X	X	X	X
Monitoring was done without in-situ equipment.	X	X	X	X	X	X
Untreated waste water is discharged into Konanempi River.	X	X	X	X	✓	✓
Workers are not issued with PPEs since the start of the project and local workers are not housed on site.	X	X	X	X	X	X
Local workers are not paid minimum wage and contractor has not formally addressed the issue despite a letter from provincial labour office to rectify this issue.	X	X	X	X	X	X
Wastes are not segregated and does not follow the Solid Waste Management Plan including an open landfill at CH 2+1000.	X	X	X	✓	✓	✓
Failure to comply with the 30% female employment requirement.	X	X	X	X	X	X

2.1 Contractor's Camp and Yard

39. The contractor has established its camp site at Konanempi at Ch 00+300. The camp consists of offices and quarters for employees (Photo 1).
40. The main issues that were identified are the disposal grey water, leaking pipe from the septic tank and the disposal of waste water into a main drainage. An attempt was made by the contractor to provide a leach field which needs improvement to prevent contamination of surface and groundwater (Photo 2).
41. Close monitoring need to be conducted for solid waste, liquid waste and hazardous waste management plan compliance. The contractor has to provide the site development plan to determine sewage treatment facility for improvement and closure mitigation in the future.



Photo 1: Newly built contractor's campsite at Konanempi village.



Photo 2: Sewerage pipe discharging to a leaching field.

2.2 Erosion and Sedimentation Control

42. The contractor has shown responsible soil erosion control through the hauling of soil spoils to approved dumpsites (Photo 3) and working when there is no rain is also practiced.
43. Monitoring should be done in the clearing and grubbing area at Km 10+700, excavation and earthworks at Km. 7 and culverts installation at Km 0 – 10+700. An important resource is the Erosion and Sediment Control Best Management Practices Manual which was provided during the Induction Meeting.



Photo 3: Hauling spoil to the approved dumping sites.

2.3 Water Quality

44. Baseline data has been collected for water quality and should be used to compare sediments as turbidity in water bodies during earthworks activities and bridges construction or repair.
45. In the case of waste water from the camps, it is important to gather water samples to determine if it is positive for E. coli considering that Tranche 2 projects show positive occurrences
46. The contractor has been advised to purchase their own in-situ environmental equipment to conduct monthly monitoring for areas that are undergoing works for water parameters including pH, Dissolved Oxygen and Turbidity
47. The PNG Environmental Water Quality Regulations of 2002 will be used as basis for baseline establishment and monthly compliance monitoring.
48. The contractor has created an access road from the quarry to the project site. This was done by re-channeling the river creating problems for the community downstream. The diversion of a river requires environmental permits from CEPA. This activity has also resulted in an accident when the contractor's truck fell into the river with slight injuries to the driver who was treated at Goroka Hospital (Photo 4).



Photo 4: Overturned contractor's dump truck.

2.4 Air Quality

49. The baseline data for air quality should be used for comparison with the monthly monitoring schedule. This should be done as a result of the concerns of a nearby school the Habanofi Primary School. Following the difficulty of procuring sampling equipment for SOX and NOX, particulate pollution sampling for PM10 and PM 2.5. is recommended using in-situ equipment.

2.5 Noise

50. The impact of excessive noise levels need to follow best management practices including use of mufflers and engine conditioning. A noise level meter has to be

procured for this purpose. Noise pollution has been reported as a concern by the Habanofi Primary School.

2.6 Waste Management

51. Clearing and grubbing spoils are deposited in agreed upon disposal sites with stable slopes and with the permission of the landowners. The monthly reports covering the period indicate that spoils are disposed of properly.
52. The contractor disposes its unsegregated solid wastes into open dump areas. . A daily cover of soil will reduce pests and prevent any residual smell. It is recommended that the contractor segregate its waste and follow best practices for solid waste management including composting and the principles of reduce, reuse and recycle.



Photo 5: Open dumpsite in the contractor's camp.

2.7 Hazardous Materials Management

53. The hazardous wastes from the camp consist mostly of leaking lubricant drums which has seeped into the soil (Photo 6). The hazardous waste management strategy is to ensure that the soil is not contaminated by cementing the storage area and providing bunds to prevent leakage into other parts of the workshop area.
54. The management of hazardous wastes include their storage and ultimately disposal including fluorescent bulbs, computers and peripherals, printers and other equipment. This will also include used batteries, battery fluids, oils, lubricants, and asphalt products. There is a need to regularly monitor the implementation of the Hazardous Waste Management Plan.



Photograph 6: Leaking lubricant drums seeping into the soil and storm drain.

2.8 Aggregates Extraction

55. There are two quarries in the project. Upengu quarry is riverine while Minive is land based. The former is used for embankment works while the riverine quarry materials are used for base and sub-base works. The contractor has negotiated with the local landowners to extract materials from the quarry.
56. The Upegu Quarry has an approved QMP and Quarry Permit from CEPA, consisting of Permit No: EP-L2 (612) issued on 23/3/18 with a term of 10 years. Presently, the extraction volumes were estimated at 20,070 m³.
57. The Upegu Quarry is monitored to ensure erosion and sediment impacts mitigation measures are in place to reduce its impact to the communities who use it for domestic purposes (Photo 7).



Photo 7: A resident and her son doing laundry at Upegu River.

2.9 Trees Removal and Vegetation Management

58. The contract document stipulates that the contractor shall ensure that no trees or shrubs are felled or harmed except those required to be cleared for the execution of the works.
59. For the monitoring period the trees that have been removed or destroyed during the construction works are duly logged in and reported in a grievance logbook which would be resolved by the Grievance and Redress Mechanism. All trees earmarked for removal should be marked together with the Environmental Officer of HRMG and only the marked trees are allowed to be removed. No tree shall be removed without the prior approval of the Engineer and any competent authority.

2.10 Socio-economic Issues of Workers

60. The socio-economic issues of workers were assessed based on compliance with labor laws of PNG and the social safeguards recommendations from ADB particularly the inclusion of 30% women workers (Table 3). The total number of workers employed for the period was 595 consisting of 509 males and 86 females or 86% and 14% respectively. This is less than half of the recommended 30% hiring of women.
61. In January 2018, the employees went on strike to protest low wages, absence of accommodation of staff and worker's and deficiency of PPEs. CWYC has responded to a query from the Provincial Labor office with a letter on March 20, 2018 to resolve the issues.

62. Table 3: Employed workers disaggregated by gender and affected persons.

Month	Male	Female	Total	Affected Persons Employed	Estimated Wages (K)
January	23	15	38	7	K3000.00
February	32	20	52	9	K3 500.00
March	37	29	66	12	K 5800.00
April	121	6	127	23	K2 800.00
May	144	8	152	30	K8 900.00
June	152	8	160	25	K8 900.00
Total	509	86	595	106	K32 900.00
Average	85	14	99	18	K5483.33
Percentage	85.6%	14.5%	100%	17.8%	

2.11 Socio-Economic Issues of Community

63. The Contractor has initiated community meetings and consult the communities to discuss the project and its impacts it would have on the community (Photo 8). The issues raised include compensation payments which was addressed and resolve by the Member for Henganofi District Hon Robert Atiyafa.

64. The documentation of these meetings has been undertaken by the PRO.



Photo 8: Consultation meeting with stakeholders of the project.

65. The benefits from the quarry activities are provided in Table 4 for Upegu Quarry and Hapanofi Quarry. A total of PGK 63,220 was paid for both quarries with 98% going to the quarry owners of Upegu.

66. The benefits to the community in terms of local food purchases, local construction materials and local purchases totaling PGK 41,300 are provided in Table 5.

67. The summary of lease rentals paid to the customary landowner totaling PGK 14,800 are for Upegu and Konamempi camps, and stockpile sites Table 6.

68. Local purchases of vegetables from the community are the most common expense in (Photo 9).

Table 4: Royalty payments for quarry activities covering the quarter.

Month	Konamempi Quarry	Hapanofi Quarry	Mehenave Quarry	Upegu Quarry	Total (m ³)	Estimated Value (Kina)
January						
February						
March						
April	-	-	-	5000	5000	K15 750.00
May	-	370	-	6200	6570	K20 695.50
June	-	-	-	8500	8500	K26 775.00
Total		370		19 700	20070	K63 220.50
Percentage	0%	1.84%	0%	98.16%	100%	

Table 5: Community benefits in terms of local purchases in the community.

Month	Local Purchases of Food	Local Construction Materials	Local Purchase of Other Items	Other Local Expenditures	Total
January	4,700.00	5,000.00	300.00	N/A	10,000.00
February	4,800.00	2,500.00	300.00	N/A	7,600.00
March	4,800.00	1,500.00	300.00	N/A	6,600.00
April	1,200.00	2 300.00	1 000.00	N/A	4,500.00
May	1,800.00	4 300.00	N/A	N/A	6,100.00
June	700.00	1 400.00	4 400.00	N/A	6,500.00
Total	K18,000.00	K17,000.00	K6,300.00		41,300.00
Percentage	43.6%	41.2%	15.3%		100%

Table 6: Summary of Lease Rental Paid to Customary Land Owners.

Month	Upegu Camp	Konamempi Camp	Stockpile Sites	Disposal Sites	Total
January	K1,200.00	K1,100.00	N/A	N/A	K2,300.00
February	K1,200.00	K1,100.00	N/A	N/A	K2,300.00
March	K1,200.00	K1,100.00	N/A	N/A	K2,300.00
April	K1,200.00	K1,100.00	N/A	K0.00	K2300.00
May	K1,200.00	K1,100.00	K500.00	K0.00	K2800.00
June	K1,200.00	K1,100.00	K500.00	K0.00	K2800.00
Total	K7,200.00	K6,600.00	K1 000.00	K0.00	K14,800.00
Percentage	45.57%	41.77%	6.8%	0%	100%

2.12 Public Safety

69. The accident where a contractor's truck overturned while transporting quarry materials from Upegu quarry is the latest accident reported. The other risks to public safety in terms of erosion and sedimentation of water bodies and home gardens need to be assessed for future road work activities.
70. A Contingency Emergency Response Plan has been prepared by the contractor which will mainly focus on the construction works that they will undertake in their specific areas of concern and the attendant potential risks and hazards.



Photo 9: Local produce purchased by the contractor from vegetable vendors.

2.13 Workers Health and Safety

71. The contractor has to provide PPEs for its employees to prevent untoward accidents. Due to the non-compliance of this requirement, a Notice of Violation has been issued after many broken promises. The contractor has to follow its own Health and Safety Plan to address the safety and protection of all staff and the community traveling within the works. The contractor has provided a water filtration system for the convenience of the workers upon their request (Photo 10).

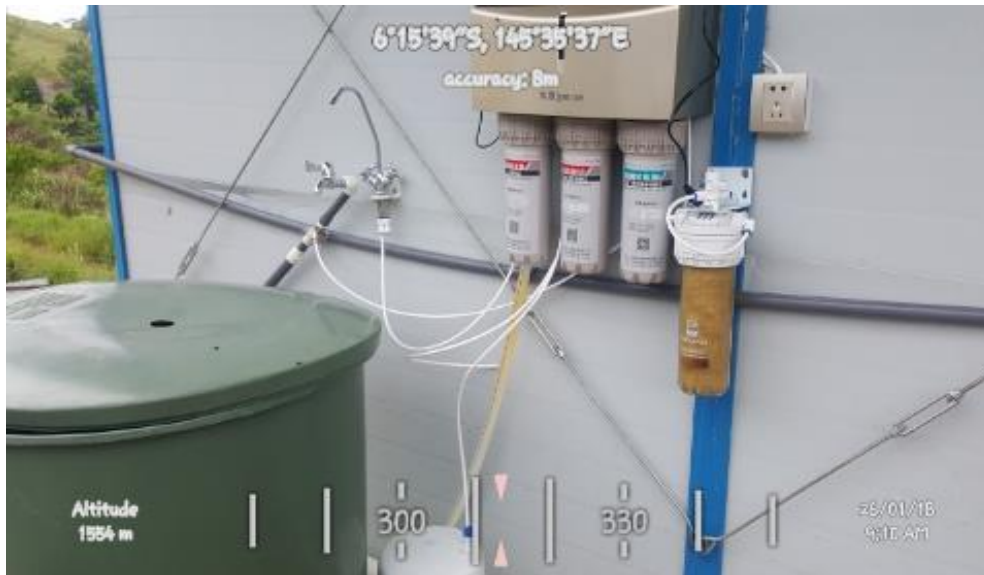


Photo 10: Water filtration system for the workers at the camp.

2.14 Traffic Management

72. The contractor has prepared a Traffic Management Plan. However, improvement is required with the traffic signage and warning placards as they do not follow the traffic requirements and standards (Photo 11).
73. The contractor also has to provide signage; to warn motorists and the public of potentially hazardous situations including eroding areas and landslips.

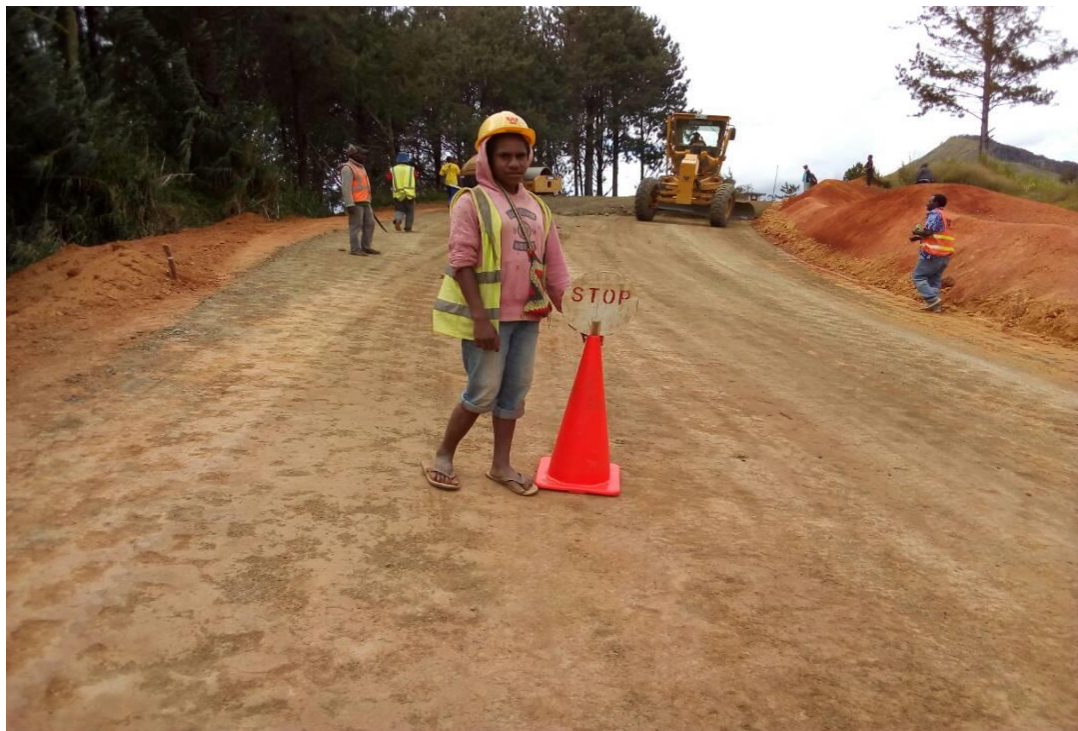


Photo 11: A female traffic aider provides traffic assistance to motorists.

2.15 Prevention of HIV/AIDS and STDs

74. The statistics on the prevalence of HIV-AIDS in the area showing a peak of 249 infected people in 2015 (Table 10). This number could increase due to the added economic activities from the road construction
75. The contractor has engaged the services of an HIV/AIDS and STDs the FORE Health Centre and is assisted by the Salvation Army in Goroka.
76. The Centre has provided their activity plan and scope of work to the contractor with an awareness schedule for the full length of the project. The initial activities include HIV-AIDS awareness, condom distribution, family planning, use of audio-visual aids during the campaign.

Table 7: HIV/AIDS and STDs statistics from 2013-2017.

Months	2013	2014	2015	2016	2017
January	17	25	8	19	0
February	12	9	24	14	1
March	15	9	22	26	7
April	21	18	25	18	4
May	17	17	21	8	17
June	13	19	36	10	30
July	14	30	14	0	18
August	13	10	30	19	19
September	9	15	22	9	12
October	18	17	12	6	16
November	18	13	18	5	7
December	12	17	17	0	8
Total	179	199	249	134	139



Photo 12: Service provider FORE providing HIV/AIDS awareness seminar.

2.16 Existing Infrastructure Issues

77. Monitoring needs to be done to ensure that no public or private services, utilities or similar facilities are damaged or interrupted by the Works.

2.17 Environment Related Grievances

78. There were no environment related grievances for the reporting period. It is important however, for the Contractor to facilitate the formation of the Environment Grievance Redress Committee (GRC) and also to ensure proper following the procedure specified in Grievance Redress Mechanism (GRM).

2.18 Training and Mentoring

79. A seminar workshop on Solid, Liquid and Hazardous Waste Management was conducted by the International Environment Specialist on February 20, 2018 at the Kuri Lodge, Mt. Hagen City. The seminar was attended by participants from the contractors of Tranche 2 and 3 and Environmental Officers from HRMG (Photo 13).
80. The International Environment Specialist spearheaded a Seminar Workshop on Tree Planting and Management and Quarry Management Plan on March 8, 2018 at the Kuri Lodge, Mt. Hagen City. The seminar was attended by participants from the contractors of Tranche 2 and 3 and Environmental Officers from HRMG (Photo 14).
81. A meeting was also conducted by the IES on the issues of Notice of Violations and Corrective Actions and the problems of quarry management last May 31, 2018 at Kimininga Hotel. The meeting was attended by all the Resident Engineers, Team Leader, Contractor's Representative, CSC Environment Specialist, HRMG Environment Officers, Contractor's Environment Officers and other participants (Photo 15).



Photo 13: Seminar-Workshop on Solid, Liquid and Hazardous Waste Management.



Photo 14: Seminar-Workshop on Tree Planting and Quarry Management.



Photo 15: Meeting on Notice of Violation for Tranche 2 and 3 projects.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusion

82. This semi-annual report for 2018 indicates that the CEMP is being implemented substantially and the contractor provides remedies and mitigation for environmental notices of violation.
83. The main drainage of the contractor's camp needs to be further assessed to determine compliance with proper septic tank construction standards including the provision of efficient leaching fields.
84. The issue of providing mitigation for the high levels of noise and dust pollution needs to be mitigated to reduce impacts on the nearby school.
85. The provision of PPEs to all workers is a concern that the contractor should take note and redress. It is considered an issue given the work area has hazardous conditions including steep slopes, high rainfall events and difficult physical labor.
86. The contractor has to conduct monthly monitoring of environmental parameters identified in the CEMP and IEE.
87. The contractor needs to procure its own in-situ equipment for environmental monitoring.
88. There is a need to improve wages to conform with PNG labor laws and increase women employment to the 3-% level.

3.2 Recommendations for Implementation and Corrective Actions

89. It is important to enhance further the capabilities of the contractor's environmental officers together with those of HRMG. For this purpose, the following trainings are proposed. These trainings, seminars and workshops need to be done as soon as possible to ensure that the contractor with the assistance of DOW-HRMG together with the PSC would benefit from these capacity and capability building activities (Table 8).
90. The importance of identifying environmental harm and mitigating or remediating these harmful activities need corrective action. The procedure followed by the project is the identification of environmental non-compliance by PSC and HRMG. The repeated infractions or severity of the environmental harm will be the basis for the issuance of a Notice of Violation of PSC and or HRMG. This NOV becomes the basis for the preparation by the contractor of a Corrective Action Plan to address the violations.
91. In this case, corrective action could be categorized into two; corrections mean that there is immediate relief or action to an environmental problem. Corrective action refers to actions that would ensure that these environmental problems are not repeated either through policy or application of environmental management best practices (Table 9).

92. Table 8: Recommended Seminars and Trainings for Capacity Building

Activity Number	Item and Recommended Action	Responsibility	Completion Date
1	Training on the use of environmental In-situ equipment for monitoring.	HRMG-PSC-CWYC	August 2018
2	Seminar-Workshop on Traffic Safety.	DOW-HRMG-PSC-CWYC	August 2018
3	Seminar-Workshop on Environment Health and Safety Best Practices.	HRMG-PSC-CWYC	August 2018
4	Seminar-Workshop on Compliance Monitoring Reports, Documentation and Technical Writing.	HRMG-PSC-CWYC	September 2018
5	Seminar Workshop on Status, Issues and Concerns in the Implementation of the CEMP and other plans.	HRMG-PSC-CWYC	September 2018

Table 9: Recommendations for Implementation and Corrective Action.

Non Compliance	Recommendations for Implementation	Corrective Actions Plan	In-Charge	Date of Implementation
Absence of monthly monitoring for identified environmental parameters.	Advise the contractor to conduct environmental monitoring using in-situ equipment.	Assist the contractor's Environmental Officer in the use of these equipment.	PSC HRMG	July-August 2018
Absence of in-situ environmental monitoring equipment.	Review the BOQ in terms of the equipment requirements with the RE and PSC-HRMG.	Assist the contractor in sourcing out this equipment from reputable suppliers	PSC HRMG CWYC	July-August 2018
Non-implementation of solid waste management including waste segregation and open dumps.	Review with the contractor the provisions of the submitted Solid Waste Management Plan.	Assist the contractor in the implementation of SWMP.	CWYC	July-August 2018
Absence of PPEs for majority of the workers.	Review with the contractor the need for PPEs.	For contractor to prioritize PPEs in project .	CWYC	July-August 2018
Local workers are not paid minimum wage and contractor has not formally addressed the issue despite a letter from provincial labour office to rectify this issue.	HRMG with PSC to initiate meetings with the Contractor to immediately resolve this concern.	Contractor to provide senior personnel who will be in charge of addressing the wage issue.	PSC HRMG CWYC	August – September 2018
Failure to comply with the 30% female employment requirement.	Advise the contractor on the need to hire more women to reach or exceed the employment of 30% women.	Review with the contractor the requirements of the contract.	CSC-RE CWYC	August – September 2018

4.0 APPENDICES

Appendix 1: List of References

1. Initial Environmental Examination for Henganofi – Nupuru Road section (2016).
2. Contractor's Environment Management Plan for Henganofi – Nupuru (January 2018)
3. Department of Works Specification for Road and Bridge Works 1995.
4. Department of Works Specification for Road and Bridge Works 2015 Edition.
5. Back to Office Report of HRMG Environmental Officer and Quarterly Report.
6. Conformed Documents for the Improvement Works and Long Term Performance Based Maintenance Service (LTPBM) for Henganofi Nupuru Road. Contract Number CSTB 3533.
7. Scherer, Thomas F. 2016. North Dakota State University Extension Service. Reviewed and Reprinted October 2016.
8. DOWL. 2015. Erosion and Sediment Control Best Management Practices Manual. Montana Department of Transportation. HIV Semi Annual Report
9. General Construction Waste Management and Hazardous Materials Handling and Waste Disposal DEC 1997.
10. Sample Environmental Baseline Procedure for Tranche 3 Projects.

Appendix 2: List of People Interviewed

1. Mr. Alberto Fieramosca – Resident Engineer PSC.
2. Mr. Johnny Buduhan – Resident Engineer PSC
3. Alphonse Niggins, Senior Field Coordinator, HRMG
4. Stephen Sukot -National Environmental Specialist, PSC
5. Paul Nombri, Manager, Technical Services, HRMG
6. Paraka Newman, Environmental Officer, HRMG
7. Imbi Tapame – COVEC Environmental Officer
8. Nazmie Ruape, Social Safeguards Officer, HRMG
9. Graham Tofagau, Public Relations Officer, China Wu Yi Co., Ltd
10. Anita Uvovo, Environmental Officer, HRMG
11. John Upave, Community Relations Officer, HRMG
12. Terrix Lanefae, Public Relations Officer, China Wu Yi Co., Ltd
13. James Gurinoware, Health and Safety Officer, China Wu Yi Co., Ltd
14. Abel Kapari, Environmental Officer, China Wu Yi Co., Ltd