

Semi-annual Report

August 2018

**PNG: HIGHLANDS REGION ROAD IMPROVEMENT
INVESTMENT PROGRAM (TRANCHE 3)
Pangia-Wiru Loop 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

Pangia-Wiru Loop 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 |
| AIDS | - | Acquired Immune Deficiency Syndrome |
| AP | - | Affected People |
| CEMP | - | Construction Environment Management Plan |
| CRO | - | Community Relations Officer |
| PSC | - | Project Supervision Consultant |
| DBST | - | Double Bitumen-layer Surface Treatment |
| DC | - | Design Consultant |
| DOW | - | Department of Work |
| EA | - | Executive Agency |
| EMP | - | Environmental Management Plan |
| 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 Road Management Group |
| HRRIIP | - | Highlands Region Road Improvement Investment Program |
| IA | - | Implementation Agency |
| IEE | - | Initial Environment Examination |
| ISS | - | International Safeguards Specialist |
| LLG | - | Local Level Government |
| MFF | - | Multi-tranche Financial Facility |
| MOA | - | Memorandum of Agreement |
| NRA | - | National Road Authority |
| PNG | - | Papua New Guinea |
| PRO | - | Public Relations Officer |
| PWM | - | Provincial Works Manager |
| ROW | - | Right of Way |
| RP | - | Resettlement Plan |
| SHP | - | Southern Highland Province |
| SIS | - | Socio-economic Impact Study |
| SPS | - | Safeguard Policy Statement |
| STDs | - | Sexual Transmitted Diseases |
| TOR | - | Terms of Reference |

FACT SHEET

| | |
|--------------------------|--|
| Loan | ADB Loan: 3404/3408 and Grant 0485 PNG |
| Project Number | CSTB 3532 |
| Subproject | Pangia-Wiru 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. |

| | |
|---|--|
| | <p>During the implementation of civil works:</p> <ul style="list-style-type: none"> <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 Semi-Annual and quarterly reports in cooperation with the PSC for submission to DOW and ADB. |
| Coverage of the Semi-Annual Environmental Monitoring Report # 1 | January to June 2018 |

EXECUTIVE SUMMARY

- I. This first semi-annual environmental monitoring report covered the period from January to June 2018. This report was prepared by the DOW through the Highlands Road Management Group (HRMG) and the monitoring results is communicated to ADB through this report.
- II. The Pangia-Wiru Loop 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 # 3532 entered into by the Independent State of Papua New Guinea represented by the Department of Works and China Overseas Engineering Company LTD (COVEC China).
- III. The project commencement date was in October 16, 2017 while the civil works construction commenced in February 26, 2018. 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. The CEMP, QMP, HIV/AIDS Plan, Hazardous Waste Management and Occupational Health and Safety Plans were submitted and approved by DOW-ESSU. In April, the unaccomplished plans were submitted to DOW-ESSU for approval, these are the Sewerage Waste Management, Solid Waste Management and Traffic Management Plans.
- V. The contractor should also provide the necessary in-situ environmental monitoring equipment as required.
- VI. The PSC and HRMG has provided close monitoring however, and issues on unwarranted disposition of spoils, leaking sewages, employment of women and worker's privileges and worker's rights were raised with the contractors.
- VII. The contractor has to conduct monthly monitoring using in-situ equipment for the identified environment parameters. However, the contractor has to purchase the required equipment.
- VIII. The implementation of the CEMP and the associated plans should be done, and a checklist of the monthly monitoring requirements need to be revised to accommodate the revisions made on these plans.
- IX. The application of Notices of Violation should be an option that needs PSC and HRMG vigilance to implement best practices in environmental management.
- X. The review by PSC and HRMG of the Quarry Management Plans should be prioritized considering the environmental impact of these activities. The use of maps to ensure that environmental best practices in soil erosion and sedimentation management are recommended.
- XI. There is a need for the contractor to provide HRMG and PSC National Specialist with the monthly environment reports for monitoring and environmental site audits.

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 (HRRRIIP) in tranches. The HRRRIIP 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 of 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-Napuru, Gewa-Gembogl, Nipa-Munihu, and Pangia-Wiru in the Eastern Highlands Province (EHP), Chimbu Province and Southern Highlands Province (SHP).
7. The rehabilitation of the Pangia to Wiru road in the Southern Highlands province has a length of 31.40 km. The works proposed for the upgrading and rehabilitation of the Pangia to Wiru Road such as earthworks, establishment and operation of quarry sites and extraction of materials, minor civil works and discharge of wastewater are Level 2 activities under the EPAR and requires an EP depending on the duration and scale of those activities.
8. . The civil works is expected to commence in July 2017 with the mobilization of the Contractor. Actual commencement of operations began in October 16, 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.
9. The Pangia-Wiru Road Section is covered by CSTB contract # 3532 entered into by the Independent State of Papua New Guinea represented by the Department of Works and China Overseas Engineering Group Co. Ltd (COVEC LTD).

1.2 Sub-Project Description

10. The Pangia-Wiru Loop road commences in the township of Pangia and extends to the Williame village, a distance of 31.40 Km. shows the location of the Pangia-Wiru Loop Road. See Figure1.
11. The route traverses rolling to occasionally mountainous terrain characterized by numerous incised gullies and outcropping spurs. As a result, sections of the horizontal alignment wind with numerous tight radii curves and the road benched into the existing sidelong ground. Elsewhere, the route follows a ridge top alignment. The vertical alignment is reasonable with only isolated short sections having gradients in excess of 10%. The existing road surface is a gravel layer consisting of fair to good graded limestone material with a width of 7 to 12 meter wide up to Km 24 but thereafter the road narrows to little more than a walking track with clay type of road surface. There are occurrences of soil erosion observed in the proposed project intermittent along Km 11+000 to Km 23+700.
12. The route passes through eight villages of which Maupini (km18) and Williame (km 31) are the largest. There are also several smaller settlements that typically consist of clusters of up to six or so houses.

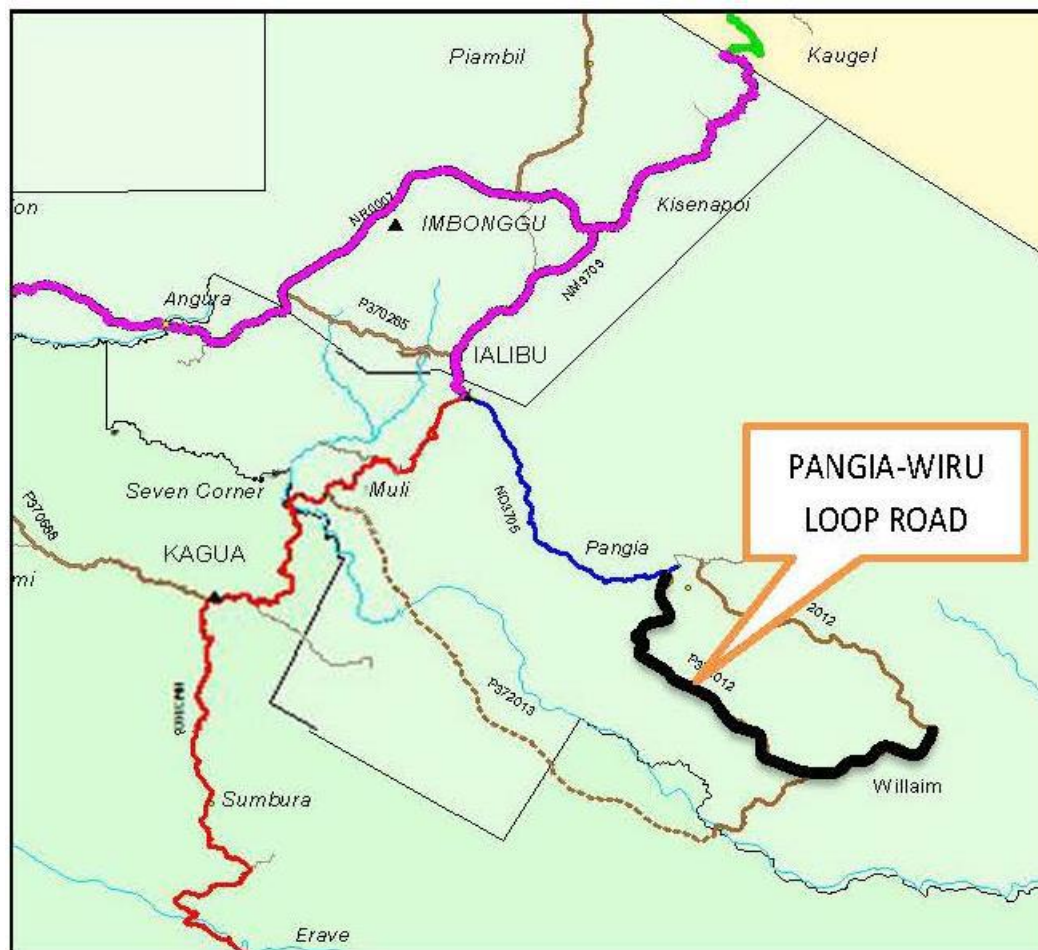


Figure 1: Location Map of Pangia-Wiru Loop Road

13. The existing road drainage is generally in very poor condition or completely lacking. The route crosses three major creeks on log bridges, all of which will need to be replaced with Bailey bridges. There are two minor creek crossings and several localized watercourses where natural gullies provide channels for the discharge of surface water run-off from the adjacent slopes or from spring/underground sources.
14. 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 in the ADB web site. The IEE confirmed that environmental impacts of the rehabilitation of the Pangia-Wiru 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.
15. Based on the EMP presented in the IEE, a construction environment management plan (CEMP) was submitted and approved last April 4, 2018 by the DOW-ESSU.
16. 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.
17. Electronic references were 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. Other information including environmental laws, 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 on sample monthly monitoring report, Notice of Violation Form, and Logbook Sample Content.
18. 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. However, the monthly environment reports submitted to DOW are joint PSC and HRMG reports.

1.3 Proposed Scope of Works

19. The proposed project is to upgrade the existing road to a 8.0 meter wide carriageway width sealed with DBST and 0.25 m wide gravel shoulders. Earthworks will be required to widen with an average of 2m on each side of the existing road bench from Km 24+000 until end of the project to accommodate the final formation width and roadside drains. The total volume of excavation is estimated at 121,000 cu.m. of which 50,000 cu.m. will be reused in embankments with the remainder being surplus material and can be provided to interested local people for levelling their land. The raw materials will come from local quarries to be identified by the contractor and approved by the Project supervision consultant (PSC). No material will be extracted from rivers. The improvements will likewise include the provision of road safety features comprising road signs, pavement markings and guardrails
20. A total of 92 additional culverts to discharge roadside drains are proposed in addition to the replacement of 29 existing culverts which are of inadequate capacity (typically 450mm diameter) while seven existing culverts are to be retained and rehabilitated with the capacity of 750 to 900 mm diameter to cope with the flows from roadside

drains. Approximately 28,000 meters of lined roadside drain will be provided to cater for surface works run off from the road and adjacent slopes.

21. There are three existing log bridges within the road section, (Ippei Creek with chainage 27+880, Polea Creek with chainage 29+430 and Wanduve Creek with Chainage 30+085). all of which will require replacement with Bailey Bridges. Two of the bridges have spans of approximately 9m while the third bridge has a span of 6 metres. All of these bridges will be constructed using bank seat abutments constructed on concrete pads at the top of bank level. The bailey decks will be assembled in the roadway and then launched across the channels. Some protection work in the form of gabions will be required to protect the abutments from possible scour.

22. The rehabilitation and upgrading would involve the following activities:

- (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.

23. The upgrading and rehabilitation works for the Pangia - Wiru Loop Road would require a workforce of 216 people of which 105 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 and presents the manpower complement and machinery and equipment required for the works.

24. The works require materials including fuel, lubricants, paint, bitumen, cement, aggregates, cement, sand, timber, geotextile, drainage pipes and culverts. All materials will be sourced from approved suppliers. Workers, including local women, will make gabion baskets using local materials for embankment and bridge pier protection

1.4 Purpose

25. This report is written to present the status of the environment including compliance with the CEMP in respect of the Pangia - Wiru 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.

26. Considering that the project has only commenced late last year, the compliance monitoring requirements enumerated in the monitoring findings are just initial and will be compared with the CEMP.
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 three-month consolidated report is written using data gathered from several sources. These include (i) Contractor's interviews and Environment Officer monthly report; (ii) Monthly report of the PSC, and; (iii). HRMG-PIU verification of site and BTOR.
29. This report is also 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 City.
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 18 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 1. 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 1: Summary of Non-Compliance for January to June 2018 for Pangia - Wiru.

| NON-COMPLIANCE | MONTHS | | | | | |
|--|--------|---|---|---|---|---|
| | J | F | M | A | M | J |
| Conduct monthly environmental monitoring and compare it with previously conducted environmental baselines. | X | X | X | X | X | X |
| Leaking sewage treatment facility in the camp. | X | X | X | ✓ | ✓ | ✓ |
| Burning of camp wastes including plastic. | X | X | X | X | X | X |
| Proper disposal of wastes from clearing and grubbing in the designated dumping areas. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Construction of soil erosion management and sediment traps to prevent sediment transport during rains | X | X | X | X | X | X |
| Absence of environmental in-situ equipment to conduct field measurements. | X | X | X | X | X | X |
| Absence of appropriate PPEs for most of the workers. | X | X | X | X | X | X |
| Proper maintenance of vehicles and equipment to prevent excessive generation of smoke. | X | X | X | X | X | X |
| Cutting of trees and vegetation need to be properly marked and inventoried for replacement | X | X | X | ✓ | ✓ | ✓ |
| Absence of camp clinic with nurse or appropriate health personnel to provide first aid assistance. | X | X | X | X | X | X |
| Submit or revise the Sewerage Waste Management, Solid Waste Management and Traffic Management Plans. | - | X | X | ✓ | ✓ | ✓ |

2.1 Contractor's Camp and Yard

39. The Contractor has almost completed its camp facilities (Photograph 1). The environmental issue observed by the environmental officers is the leaking sewage facility (Photograph 1). The contractor needs to present the design of the septic tank to determine whether a problem exists.

40. The Sewerage Management Plan and Solid Waste Management Plan have not been submitted to DOW-ESSU.

2.2 Erosion and Sedimentation Control

41. The contractor has carried out clearing and grubbing for approximately 22 kilometers and in some areas, it was observed that the contractor has deposited its wastes in the designated sites. However, some wastes need further soil conservation measures (Photograph 3).

42. As previously suggested, a helpful manual to address the issue was provided during the induction meeting entitled Erosion and Sediment Control Best Management Practices Manual.



Photograph 1: The contractor's base camp and offices in Pangia.



Photograph 2: Leaking sewage at the Langane camp site.



Photograph 3: Eroded spoils spilling into food gardens.

2.3 Water Quality

43. A baseline survey was conducted in January 2018 which assessed surface water environmental parameters for pH, dissolved oxygen and turbidity. However, due to the absence of environmental monitoring equipment, the monthly monitoring activities could not be conducted.
44. A list of recommended in-situ equipment, supplier sources and costs for water, air and noise has previously been provided for the monthly monitoring activities. Monitoring for water could be done for the three identified rivers/creeks including the Iperei, Polea and Wanduve.
45. The PNG Environmental Water Quality Regulations of 2002 will be used as basis for baseline establishment and monthly compliance monitoring.

2.4 Air Quality

46. The baseline and monthly monitoring for air quality has only been obtained for particulate pollution sampling for PM₁₀ and PM_{2.5}. It is recommended that the contractor procure its own in-situ equipment. Observation of dusts from vehicles was mitigated by watering trucks.

2.5 Noise

47. The noise level monitoring was done for the month of June, however, the results indicated that the levels were below 75dB. Despite this, it was recommended that the use of PPEs for ear protection would be encouraged considering the noise generated by heavy equipment. A noise level meter has to be procured for this purpose.

2.6 Waste Management

48. The proper disposal of construction wastes would also constitute this section. An agreement form with owners of disposal sites has been obtained for this purpose.
49. A separate memorandum of agreement with the owners of disposal sites with regards their liability for environmental damages is also being prepared.
50. The Contractor is required to prepare a Solid Waste Management Plan with operational details. However, the SWMP submitted to DOW-ESSU has not been approved.

2.7 Hazardous Materials Management

51. The management of hazardous wastes include their storage and ultimately disposal for fluorescent bulbs, computers and peripherals, printers and other equipment will be monitored. The other monitored waste includes used batteries, battery fluids, oils, lubricants, and asphalt products were collected properly. The Hazardous Waste Management Plan (HWMP) has been approved by DOW-ESSU.
52. The Materials Safety Data Sheet (MSDS) for these wastes will also be part of the HWMP to ensure the proper handling of these materials.

2.8 Aggregate Extraction

53. The materials from the Kablublu Quarry at Ch. 13+600 has been tested and approved and are currently being used for backfilling culverts and masonry work for the line drains. The other quarry is the Elu Quarry while another has been identified in June located at Chainage 22 at Tomiare Village. The Contractor is required to provide a Quarry Management Plan for each and every quarry.
54. The Kablublu Quarry Management Plan that was submitted to DOW-ESSU has been approved. Quarry sites must not be occupied, prepared or operated before the necessary land occupation permit and Environmental Permits have been obtained from the CEPA.

2.9 Tree Removal and Vegetation Management

55. The project has started the clearing and grubbing activities for at least 22km. 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.
56. All the affected trees were identified and marked for removal by the Environmental Officer of HRMG and PSC and were removed (Photograph 4). No tree shall be removed without the prior approval of the Engineer and any competent authority.
57. A seminar workshop on Tree Planting and Management has been conducted last March 8, 2018 to implement this activity.



Photograph 4: Trees were marked and inventoried prior to cutting.

2.10 Socio-economic Issues of Workers

58. The socio-economic issues of workers need to be assessed based on compliance with the labor laws of PNG. The provision of the contract recommending 30% women workers also needs to be addressed with gender requirements in the contract which should be at least 30% women.

59. A summary of the disaggregated workers employed for the months of January to June 2018 are contained in Table 2. A total of 945 workers were employed wherein 759 are men and 186 were women or 80% and 20% respectively. Of these, were 690 affected persons or 73%.

60. A summary of women involvement in non-payroll activities are contained in Table 3. If this transient work lasting for a few days, would be factored in, the total women employment would total 402 or approximately 35% of total labor.

Table 2: Summary of monthly employment by Gender for the Month of January – June 2018

| Month | Employed by Gender (number) | | | Affected Persons Employed | Total Wages (Kina) |
|-------------------|-----------------------------|------------|-------------|---------------------------|--------------------|
| | Men | Women | Total | | |
| January | 87 | 13 | 100 | 65 | 80,000.00 |
| February | 100 | 23 | 123 | 86 | 95,000.00 |
| March | 120 | 32 | 152 | 112 | 100,000.00 |
| April | 133 | 33 | 166 | 123 | 150,000.00 |
| May | 154 | 40 | 194 | 149 | 180,000.00 |
| June | 165 | 45 | 210 | 155 | 194,670.00 |
| Total | 759 | 186 | 945 | 690 | 799,760 |
| Average | 127 | 31 | 158 | 115 | 133,278.00 |
| Percentage | 80% | 20% | 100% | 73% | |

Table 3: Women involvement in Non-Payroll activities from January – June 2018

| Month | Gabions | Line Drains | Rip Raps | Headwalls | Total |
|----------------|---------|-------------|----------|-------------|------------|
| January | √ | | √ | | |
| February | √ | | √ | | |
| March | √ | 20 | √ | 17 | 37 |
| April | √ | 26 | √ | 23 | 49 |
| May | √ | 32 | √ | 28 | 60 |
| June | √ | 40 | √ | 30 | 70 |
| Total | | 118 | | 98 | 216 |
| Average | | 29.5 | | 24.5 | 54 |

√ Women were involved but not quantified.

2.11 Socio-Economic Issues of Community

61. The Contractor is solely responsible for any compensation due or reinstatement necessary with respect to any damage caused by him to areas outside the site. The contractor is also required to organize and support an Environmental Grievance and Redress Committee and conduct regular meetings and consultations.

62. The conduct of meetings and consultations are important aspects of the project to voice out social issues and concerns. For the six month period, a total of nine meetings were conducted with a total of 119 male and 26 female participants whereby a total of 100 participants are considered displaced persons.

63. Documentation is also required for these meetings identifying important issues and concerns of the community.

64. Measurement of the socio-economic benefits of the community from the project's operation include the contractor's monthly expenditures for purchases of food, construction materials, and other expenses. Table 5 provides a summary of these expenditure items.

65. The socio-economic issues also provide information on the quarry activities including the volume of quarry extraction and the royalties paid to each person, clan or family. These are summarized in Table 6 which show a total of PGK 843,750 payments. Payments for land rental of Langane camp is PGK 2,500 per month or a total of PGK 12,500.

66. Table 4: Number of meeting and consultations for the Month of January to June 2018

| MONTH | Number of consultations | Male Participants | Female Participants | Total Participants | Affected Persons who participated |
|--------------|-------------------------|-------------------|---------------------|--------------------|-----------------------------------|
| January | 1 | 6 | 0 | 6 | 6 |
| February | | | | | |
| March | 1 | 8 | 1 | 10 | 7 |
| April | 3 | 25 | 5 | 30 | 27 |
| May | 2 | 40 | 10 | 50 | 30 |
| June | 2 | 40 | 10 | 50 | 30 |
| Total | 9 | 119 | 26 | 146 | 100 |

Table 5: Expenditures or Community Payments from January to June 2018

| Month | Food Purchase (K) | Construction Materials Purchase (Kina) | Other Expenses | Other Local Expenses | Total (Kina) |
|-------------------|-------------------|--|------------------|----------------------|------------------|
| January | 1,200.00 | 2,000.00 | 2,000.00 | 3,000.00 | 8,200.00 |
| February | 1,250.00 | 2,300.00 | 1,800.00 | | 5,350.00 |
| March | 1,300.00 | 2,500.00 | 2,100.00 | | 5,900.00 |
| April | 1,560.00 | 3,000.00 | 1,820.00 | | 6,380.00 |
| May | 1,800.00 | 3,200.00 | 2,500.00 | | 7,500.00 |
| June | 2,000.00 | 3,500.00 | | | 5,500.00 |
| Total | 9,110.00 | 16,500.00 | 10,220.00 | 3,000.00 | 38,830.00 |
| Average | 1,518.00 | 2,750.00 | 2,044.00 | 500.00 | 6,000.00 |
| Percentage | 23% | 42% | 26% | 8% | 100 |

Table 6: Quarry extraction in tonnes and estimated kina paid from January to June 2018

| Month | Volume by Quarry (Tonnes) | | Total (cubic meters) | Estimated value (K) |
|--------------|---------------------------|---------------|----------------------|---------------------|
| | Kablublu | Elu | | |
| January | 2,000 | nil | 1250 | 31,250 |
| February | 2,000 | nil | 1250 | 31,250 |
| March | 3,000 | nil | 1875 | 46,875 |
| April | 10,000 | 4,000 | 8750 | 218,750 |
| May | 9,000 | 6,000 | 9375 | 234,375 |
| June | 11,000 | 7000 | 11250 | 281,250 |
| TOTAL | 37,000 | 17,000 | 33,750 | 843,750 |

* Based on Kina 2.50 per bucket or Kina 25 per cubic meters. 1 ton = 1.6 cubic meters.

2.12 Public Safety

67. Observations have been made with regards poor traffic management safety. A review of the Traffic Management Plan needs to be done to identify best practices for the safety of the riding public.

68. Construction activities near school sites or community areas need more visible precautionary signs or traffic safety including traffic aides and humps. The 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. The use of Geographic Information Systems could serve as a tool for this activity.

69. A Contingency Emergency Response Plan needs to be formulated and submitted by the contractor for review and approval.

2.13 Workers Health and Safety

70. The contractor has to ensure the safety and protection against accidents of all staff and labor engaged in the works, local residents in the vicinity of the Works and the public travelling through the Works.

71. The Contractor has not fully implemented the Health and Safety Plan (HSP). Provision of first aid, medical supplies and trained medical personnel need to be provided.

72. The Contractor has to provide protective clothing and safety equipment or Personnel Protective Equipment (PPE) to all staff and labor engaged in the works to the satisfaction of the Engineer as contained in the prepared SHP. Photograph 5 show that the contractor has not complied with this requirement for its non-payroll workers who are mostly women.

2.14 Traffic Management

73. The Contractor has not submitted a Traffic Management Plan for their respective work areas with the necessary materials, equipment and human power.
74. The monitoring activities shall be based on the Contractor's adherence to the stated TMP. A traffic aider is shown with a reflective vest (Photograph 6).



Photograph 5: Women workers without any PPE doing line drain works.



Photograph 6: Female traffic aider worker with reflective vest.

2.15 Prevention of HIV/AIDS and STDs

75. The Contractor has engaged the Department of Health, Pangia Health Centre in Ialibu to implement the recently approved HIV/AIDS and STDs Management Plan.
76. The service provider has started its information and education campaign and individual counselling (Photograph 7).



Photograph 7: Information and awareness meeting on HIV-AIDS and STDs.

2.16 Existing Infrastructure Issues

77. There were no existing infrastructure issues. Monitoring shall 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 quarter. However, the Contractor has to form its Environmental Grievance and Redress Committee and need to be monitored by HRMG and PSC.

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 contractors of Tranche 2 and 3 and Environmental Officers from HRMG (Photograph 8).
80. The International Environment Specialist likewise conducted 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 contractors of Tranche 2 and 3 and Environmental Officers from HRMG (Photograph 9).



Photograph 8: Seminar-Workshop on Tree Planting and Quarry Management.



Photograph 9: Seminar-Workshop on Tree Planting and Quarry Management.



Photograph 10: Meeting on Notice of Violation for Tranche 2 and 3 projects.

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 (Photograph 10).

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusion

82. The contractor has an obligation to provide the necessary in-situ environmental monitoring equipment following the contract.
83. The PSC and HRMG has provided close monitoring and non-compliance advice on unwarranted disposition of spoils, leaking sewages, employment of women and worker's privileges and worker's rights that were raised with the contractor.
84. The contractor has to conduct monthly monitoring using in-situ equipment for the identified environment parameters.
85. The implementation of the CEMP and the associated plans should be done, and a checklist of the monthly monitoring requirements need to be revised to accommodate the revisions made on these plans.
86. The application of Notices of Violation should be an option that needs PSC and HRMG vigilance to implement best practices in environmental management.
87. The review by PSC and HRMG of the Quarry Management Plans should be prioritized considering the environmental impact of these activities. The use of maps to ensure that environmental best practices in soil erosion and sedimentation management are recommended.
88. There is a need for the contractor to provide HRMG and PSC National Specialist with the monthly environment reports for monitoring and environmental site audits.

3.2 Recommended Actions

89. The experience from Tranche 1 and Tranche 2 indicate that the personnel recruited by the Contractor need capacity building. It is therefore important that these trainings, seminars and workshops need to be done as soon as possible to ensure that the Contractor's staff with the assistance of DOW-HRMG together with the PSC would benefit from these capacity and capability building activities (Table 7).

90. Table 7: 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-COVEC | August 2018 |
| 2 | Seminar-Workshop on Traffic Safety. | DOW-HRMG-PSC-COVEC | August 2018 |
| 3 | Seminar-Workshop on Environment Health and Safety Best Practices. | HRMG-PSC-COVEC | August 2018 |
| 4 | Seminar-Workshop on Compliance Monitoring Reports, Documentation and Technical Writing. | HRMG-PSC-COVEC | September 2018 |
| 5 | Seminar Workshop on Status, Issues and Concerns in the Implementation of the CEMP and other plans. | HRMG-PSC-COVEC | September 2018 |

- 91.

92. Table 8: Recommendations for Implementation and Corrective Action

| Non Compliance | Recommendations for Implementation | Corrective Actions Plan | In-Charge | Date of Implementation |
|--|---|--|------------------|-------------------------------|
| Absence of monthly monitoring and in-situ equipment for identified environmental parameters. | Advise the contractor to conduct environmental monitoring and procure in-situ equipment. | Assist the contractor's Environmental Officer in the use and acquisition of these equipment. | PSC HRMG | July-August 2018 |
| Non-implementation of solid and hazardous waste management including waste segregation, open dumps and smoke belching. . | Review with the contractor the provisions of the submitted Solid Waste Management Plan. | Assist the contractor in the implementation of SWMP. | COVEC | 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. | COVEC | July-August 2018 |
| Absence of soil erosion management and sediment traps to contain spoils being transported to water bodies. | Contractor to implement immediate establishment of sediment traps and tree and grass seeding or planting. | Contractor to provide action plan with detailed activities. | COVEC | August – September 2018 |
| Absence of camp clinic with nurse or appropriate health personnel to provide first aid assistance. | Advise the contractor to provide the required appropriate health personnel and provide first aid medicines. | Review with the contractor the submitted Health and Safety Plan | COVEC | August – September 2018 |
| No inventory of trees to be cut. | Discuss with the RE inventory requirement. | Provide notices to contractor. | COVEC | August – September 2018 |
| Submit or revise the Sewerage Waste Management, Solid Waste Management and Traffic Management Plans. | Review with the contractor the pending plans and assist in their accomplishment. | Provide a written notification to the contractor to submit and revise these plans. | COVEC | August – September 2018 |

APPENDICES

Appendix 1: List of References

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

Appendix 2: List of People Interviewed

1. Mr. Ben Mirang - Resident Engineer PSC
2. Alphonse Niggins, Senior Field Project Coordinator and Acting FPM, HRMG-DOW.
3. Steven Sukot – National Environment Specialist PSC
4. Paul Nombri, Manager, Technical Services, HRMG
5. P a r a k a N e w m a n , Environmental Officer, HRMG
6. Garry Dum – Environmental Officer, HRMG