

Semi-annual Report

March 2018

Bride Replacement for Improved Rural Access Sector Project

Prepared by Department of Works for the Asian Development Bank.

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BRIDGE REPLACEMENT FOR IMPROVED RURAL ACCESS SECTOR PROJECT

Package 1: Hiritano and Magi Highway

Package 2: New Britain Highway

ENVIRONMENTAL SAFEGUARDS MONITORING REPORT

(July to December 2017)

Project Implementation Unit

Department of Works

National Capital District

Papua New Guinea

March 2018

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Abbreviations

ADB	- Asian Development Bank
AP	- Affected People
BRIRAP	- Bridge Replacement for Improved Rural Access Sector Project
CEMP	- Construction Environment Management Plan
CEPA	- Conservation and Environment Protection Authority
CHEC	- China Harbour Engineering Company
CLO	- Community Liaison Officer
DBST	- Double Bitumen-layer Surface Treatment
DCSC	- Design and Construction Supervision 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	- Highland Region Core Road Network
HIV/STDs	- Human Immunodeficiency Virus / Sexually Transmitted Diseases
IA	- Implementation Agency
IEE	- Initial Environment Examination
LLG	- Local Level Government
MOA	- Memorandum of Agreement
NCD	- National Capital District
NEC	- National Environmental Consultant
PIU	- Project Implementation Unit
POM	- Port Moresby
PWM	- Provincial Works Manager
PNG	- Papua New Guinea
PPE	- Personal Protective Equipment
ROW	- Right of Way
RP	- Resettlement Plan
SPS	- Safeguard Policy Statement
TOR	- Terms of Reference
WGJV	- Wildcat and Golding Joint Venture Limited

1. Introduction

1.1 Background

01. The aim of Bridge Replacement Project is to replace aging and single-lane bailey bridges and other badly deteriorated bridges on the National Highways in Papua New Guinea (PNG) with double-lane permanent bridges. The Project is being implemented in the Central and West New Britain Provinces covering the replacement of 18 bridges that include: bailey bridges, steel truss bridges, and steel plate girder bridges, log bridges, coarse ways and River Bed Crossing. Twenty-two (22) of the existing bridges are reusable on the Provincial or district roads impacted by these National Highways.

02. The Government of Papua New Guinea (GoPNG) has negotiated a loan with the Asian Development Bank (ADB) to implement the Bridge Replacement for Improved Rural Access Sector Project (BRIRAP). Under the project, a total of 18 bridges are expected to be replaced. The Execution Agency (EA) for the project is Department of Works (DOW) whilst the Project Implementation Unit (PIU) is the Implementation Agency (IA).

03. The Project is implemented in Two packages. The Package 1 has a total of six (6) bridges, three (3) along the Hiritano Highway (Laloki Bridge, Brown River Bridge and Angabanga Bridge) while the other three are along the Magi Highway (Dogona, Kokebagu and Sivatatana). The Package two (2) project involves a total of twelve (12) Bridges (Korori, Ubai, Marapu, Ototabu, Aleeu, Kiava, Lobu, Koloi, Soi, Pika, Ibana and Ulamona) along the New Britain Highway in the East and West New Britain Provinces and the Contractor is a joint venture between Wildcat and Golding (WGJV).

04. The contract for replacement of bridges in Package 1 has been awarded to the China Harbour Engineering Company (CHEC). The construction period for Package 1 is 24 months which began on 24th February 2015 and was planned for completion on 23rd February 2017. A further extension to complete remaining work was granted that expires on 22nd August 2017. The overall construction progress for the Package 1 during the review period is 100 %. The design and construction supervision has been assigned to Chodai (PNG) Ltd for both packages.

05. The construction works under Package 2 began on 24th February 2015 which was originally planned for completion on 23rd February 2017. As the progress of work has been admirably low (overall 30 % completed as at 31 December 2017), the DOW is currently working on an extension arrangement. The contractor for package 2 is executed by WGJV which has been on full suspension since the first quarter (26th January) of this year.

1.2 Project Description

06. The Hiritano Highway that begins from Port Moresby has a total of 256 km. It is the main link road of Kerema in the Gulf Province with Port Moresby (POM) in the National Capital District (NCD). This highway has 29 bridges of which 3 are under the BRIRAP. The highway has been rehabilitated recently but the aging bridges were not replaced. All three bridges are a significant bottleneck for the fast movement of traffic in this recently rehabilitated highway.

07. The Magi Highway has a distance of 225 km that passes across 25 bridges. This highway too has been rehabilitated recently. As in the case of the Hiritano Highway, the bridges in this highway were not rehabilitated causing significant traffic delays and posing

safety risks to pedestrians and traffic. Some of the bridges pose a safety risk to moving traffic and pedestrians as they are over 25 years old.

08. The New Britain Highway covers a distance of 229 km. It is the main transport corridor that links West and East New Britain provinces. The highway is the main route to transport commodities such as palm oil, sea food, timber, etc. produced in the New Britain Island to the sea ports at Kimbe and Rabaul. The New Britain Highway has been rehabilitated in early 2000s but none of the bridges were included in the program due mainly to lack of funding at that time. The BRIRAP is replacing 12 out of a total of 39 bridges in this highway.

09. Table 1 provides information about the bridges that is the focus of this project.

Serial No.	Bridge Name	Starting Chainage	Span (M)	Construction Progress as at 31 December 2017 (% completed)
Package 1: Hiritano and Magi Highway				
1	Dogona	62.7	25	100
2	Kokebagu	77.6	25	100
3	Sivitatana	80.7	25	100
4	Laloki	0+0	80	100
5	Brown River	22.5	80	100
6	Angabanga	141.1	160	100
Package 2: New Britain Highway				
1	Ulamona	8.4	20	15.27
2	Ibana	20.0	40	27.36
3	Pika	30.7	40	31.91
4	Soi	35.3	30	24.77
5	Koloi	49.0	40	36.26
6	Lobu	52.5	40	62.36
7	Kiava	88.2	25	86.73
8	Aleeu	94.1	15.2	76.32
9	Obutabu	107.1	40	57.80
10	Marapu	135.1	30	58.23
11	Ubai	150.1	30	49.00
12	Korori	157.1	25	67.25

1.3 Environment impacts

10. The environmental impacts assessed at the time of preliminary design categorised bridge sites under Package 1 and 2 as Category B for environment. The same category was confirmed by the in-depth environmental analysis conducted at the time of detailed design. The Initial Environment Examination (IEE) for all two packages have already been disclosed in the ADB web site. The IEE confirmed that the corridor in which the bridges will be replaced is already highly disturbed primarily by extensive palm oil plantations in New Britain Island and mixed plantations and bushes in Hiritano and Magi Highway. There will be no significant loss of vegetation, primary forest and no conservation areas will be affected. No cultural or heritage site will be affected. Accordingly, environmental impacts of the rehabilitation of all bridge replacement works 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 (EMP). 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 and are confined to local area.

11. The key-issues of the IEEs for two packages are summarised in the following Table.

Table 2: Key-information on Initial Environment Examinations

Package	IEE Submission (Date)	CEMP Approval (Date)	CEMP Commenced Implementation (Date)
1 – Hiritano and Magi Highway	Sep 2013	13 th May 2015	May 2015
2- New Britain Highway	Nov 2013	24 th Oct 2015	Oct 2015

12. Based on the EMP presented in the IEE, a construction environment management plan (CEMP) was prepared by the contractor. The CEMP was reviewed by the National Environmental Consultant¹ (NEC). Prior to preparation of CEMP, training was provided to contractor staff. The unavailability of the EO of the contractor until recently created a problem with regard to the environment management of bridge sites under Package 1. The package 2 had similar problem when the EO for the contractor was finally recruited in June 2015. The environment management in BRIRAP saw a substantial improvement after the recruitment of EO.

13. The IEE consisted of the establishment of institutional arrangements for implementation of CEMP, grievance redress mechanism and consultations with the communities during the program of construction and environmental monitoring including the establishment of environmental baseline.

14. Internal monitoring has been conducted by EO of the contractor whose work has been overseen by the NEC of DCSC. Monitoring reports are prepared on a monthly basis by the contractor (Environmental Officer) which are reviewed by the environment consultant and feedback conveyed for improvement. The current document (EMR- July-December 2017) is the fourth semi-annual environmental monitoring report presented by the PIU and distributed to both EA and ADB for disclosure.

¹¹ The position has been changed to Environment Consultant of SC, Chodai Ltd

1.4 Purpose

15. This report presents the status of environment including the compliance with approved CEMP in respect of the two packages under BRIRAP covering July to December 2017. Semi-annual environment safeguards monitoring reports is a requirement under the SPS (2009). This report provides a clear picture with regard to the implementation of CEMP activities as well as the environmental outcome. The report serves the client, ADB and other organisations 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

16. The six-monthly report is written using data gathered from several sources. The primary data has been gathered from discussions with project staff including contractor staff and officials, meetings with the community and site inspections and observations, conducted by a team comprising of officers and the PIU's safeguards consultant. The secondary data sources utilized include review of monitoring reports produced by DCSC, extraction of data from contractor's reports and project files.

17. The list of reports reviewed is in Appendix 1. The names of people interviewed in Package 1 and 2 is presented in Appendix 2.

1.6 Report Organisation

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

- Introduction
- Monitoring results and findings
- Conclusions and recommendations
- Appendices

19. The above sequence is followed in respect of both packages and is presented in two separate sections of the report. The section 1 describes the management of the environment in Hiritano and Magi Highway bridge sites whilst section 2 discusses similar issues in respect of the New Britain Highway bridge sites.

Section 1: Package 1, Hiritano and Magi Highway

2. Monitoring results and findings

20. The main findings of monitoring including the assessment of environmental impacts and mitigation measures applied during the review period are presented in this section. The construction activities completed during the reporting period are given as a backdrop.

21. The activities implemented during the review period were installation of steel guardrail, DBST, barrier wall, payment for walkways and hot-mix asphalt surfacing, river training, building of stairs, deck slabs, road works, gabion basket making and road safety measures. The decommissioning of the project which commenced in August was completed in September. The project sites were handed over to the DOW whilst the camps were dismantled, and land handed over to the customary land owners in Angabanga. The Kwikila Camp site has been handed over to DOW whilst Laloki Camp site was taken over by its owner.

The Sabosa quarry continues to be used to extract gravel for other projects under separate arrangements with land owners.

22. The final inspections for all 6 bridges were completed and approved by the Engineer during the review period.

23. Out of the 17 CEMP monitoring parameters, 15 were applicable during the review period as listed below:

- Contractor's camp and yard (**relevant**)
- Erosion and sedimentation (**relevant**)
- Water quality (**relevant**)
- Air quality (**relevant**)
- Noise (**relevant**)
- Waste management (**relevant**)
- Hazardous material management (**relevant**)
- Aggregates extraction, haulage and storage (**relevant**)
- Vegetation management (**relevant**)
- Socio-economic issues (workers) (**relevant**)
- Socio-economic issues (community) (**relevant**)
- Public safety (**relevant**)
- Health and safety issues (**relevant**)
- Invasion of exotic weeds (not relevant)
- Chance discovery of archaeological find (not relevant)
- Traffic management (**relevant**)
- Prevention of HIV/AIDS and STDs (**relevant**)

24. In addition to above activities, the contractor conducted public consultations, managed grievances relating to environment and provided employment for people, employed both locally and from other provinces. In the meantime, CSDC and PIU conducted internal monitoring. The report presents progress of all above aspects and has also included a section of institutional arrangements for the review period.

25. Discussed below is the status of performance of the 15 parameters as well as community consultations and environmental grievances during the reporting period.

2.1 Contractor's camp and yard

26. The contractor in 2015 has built three new camps one at Kwikila, second one at Laloki and the third at Angabanga. The first camp occupied the land belonging to the Department of Works (DOW). The land in two other camps is under customary ownership. The contractor divided its employees into three teams and accommodated them in one of the three camps mentioned above. Each camp is secured by a wall and the contractor has employed a security company to provide control access to the camp. The only issue experienced with regard to Angabanga camp site was that the customary land owners are in dispute. The case is before PNG court. The payment for the use of land is deferred until the genuine land owner is determined by the courts.

27. The destruction caused to Angabanga camp by frequent river flooding continued during the review period. It is noted that river training at the commencement of the project would have minimized such damage.

28. The contractor removed its belongings and conducted site cleaning prior to hand over of the land to the customary land owner. It has been agreed between the contractor and the land owner to leave behind some structures such as tank and building work at the request of the latter. The monthly rent for all three land portions is Kina 8,000 payable to the registered land owner (payment not made to Angabanga site as explained). Land occupied by other two camps does not have disputes. All three camps are fully equipped with workers' accommodation, workshop, kitchen facilities, office complex, fuel storage and stock-pile area. The Angabanga and Laloki camps have a clinic each with a stock of medicines. There are some waste at Angabanga camp site that is yet to be removed by the contractor as well as waste soil dumped by contractor to be flattened to make the site useable for the local landowners.

2.2 Erosion and sedimentation control

29. The soil erosion from sites and its sedimentation in rivers reported in the previous EMR has been naturally stabilised. There was some minor soil erosion in Laloki site. Apart from this, there are no more critical issues with regard to soil erosion and sedimentation. Re-vegetation of slopes and cut surfaces has been undertaken but the growth of grass cover is poor. Although Doguna and Kokebagu Rivers have no water flow during most parts of the year, sedimentation brought about by adjacent cut and fill sites is found to be high. Performance of re-vegetation, soil erosion and sedimentation will be monitored by ESSU.



Photo 1: Rill Erosion On Fill Slope in Laloki

2.3 Water quality

30. The visual monitoring of water quality of Laloki river has been conducted and there has not been significant change. Laboratory analysis of river water has been found to be not important as the water quality deterioration is temporary and that there is no discharge of materials that will create permanent impact on river water. There were no complaints from the people living near rivers and other streams regarding the deterioration of water quality. The water quality in three rivers along Magi Highway is not an issue as water is available only during the rainy season. The Dogona river was completely dry whilst Kokebagu and Sivitatana only had stagnant water during the review period (Photos 2 and 3).



Photo 2: Kokebagu River Oct, 2017



Photo 3: Sivitatana River Oct, 2017

31. The natural river courses never changed its direction because of construction activities.

2.4 Air quality

32. There was no impact on air quality as the work undertaken did not produce any air-borne dust particles or emission from machinery. However, the movement of vehicles generated dust in all roads leading to sites during the dry season. The air quality did not have any impact on the community in all bridge sites.

2.5 Noise

33. The contractor monitored noise level using hand-held meter. There were no reports from the community around Laloki and Angabanga sites on high noise levels. The contractor managed this impact effectively through the adoption of measures such as frequently checking all machinery and vehicles for noise generation and the fixing of mufflers, etc. In a few instances, at the request of the community, construction works re-scheduled for day-time.

2.6 Waste management

34. The waste generated from work sites was of three main types namely, overburden from construction site and quarry sites, camp wastes and hazardous material including waste oil. The construction waste material and parts removed from old bridges were removed by the contractor and all sites cleaned up. What remains in work sites such as Angabanga and Kokebagu are parts of buildings which land owners requested to remain on site.

35. The iron works and timber off-cuts removed from bridges were removed from work sites and transported to DOW's yard. There are no complaints on the disposal of used bridge material. In some cases, such material was made available to the local community for free for their use. The used lubricants and oil were stored in the camp site has been removed by the relevant oil company.

36. The waste generated from camps has been disposed properly where there are no issues or complaints. Sewage drum was left underground by Contractor after decommissioning and that was instructed by DOW to be removed immediately by the contractor. The quarry waste also did not create any burden as the quarry itself is located

away from areas inhabited by people and away from agricultural lands. There are no streams, rivers or other water-bearing bodies near the quarry site.

2.7 Hazardous Waste Materials Management

37. The hazardous wastes generated from Laloki site were bitumen, paints and lubricants. All such materials were contained in contractor's yard with controlled entry to people. There was no report of any injury or life impairment to community members from hazardous waste disposal. There was evidence that minor leakage of fuel and lubricants reported earlier has been naturally stabilised. As such, there are no issues or concerns with regard to this matter. Contractor yet to confirm to DOW how the Hazardous waste will be disposed before decommissioning of Laloki base Camp.

2.8 Aggregate extraction

38. The material required for the construction of all six bridges was extracted from the quarry located at Sabosa. This is a new quarry opened up to supply material. It is expected that the volume of material to be extracted is well over 100,000 cubes as such a permit is already in possession. The material extracted was crushed at the quarry itself and transferred to batching and stockpile areas as required. This quarry already has a Quarry Management Plan approved by the DOW ESSU

39. The quarry is located away from the main road in the forest area where there are no residential houses nearby. There are no streams and other water-bearing bodies in close proximity to the site. Hence, environmental impacts on the community were not noted.

40. The material extracted is hauled away to all six work sites by dump-trucks. The trucks were loaded properly paying due care not to spill it whilst being transported. The air quality degraded due to truck movement that settled down after some time. There was no complaint from road users about any aspect of material transport.

41. The total volume of material removed during the review period was 6,150 cubic meters. The contractor has paid out to land owners a sum of Kina 15,375 as royalty fee for material removed. A Rate of K2.50 paid to per cubic meter of material extracted. Table 3 has details.

Table 3: Distribution of Material Volume Extracted and Royalty Paid by Month (Sabosa Quarry)

Month	Material Volume Loaded (M ³)	Royalty Payment (Kina)
July	5,400	13,500
August	750	1,875
September	0	0
Total	6,150	15,375

Note: Work on all 6 bridge sites completed in September

2.9 Tree removal and vegetation management

42. The trees removed in the past have not been followed up by a re-vegetation program. The contractor has completed turffing work on slopes where the progress is weak (Photo 4). This work will be monitored by ESSU.



Photo 4: Turfing Work at Laloki Site

2.10 Socio-economic issues (workers)

43. The CEMP contained socio-economic issues of three types. They are health and safety issues of workers, establishment of the Public Relations Department and HIV/ADS and STDs control program. The compliance of above three aspects with the CEMP are discussed below.

2.10.1 Workers health and safety

44. All construction workers are required to be present on their respective stations from 7.00 am until 6.00 pm. The employees have been advised not to engage with affairs of the community. They were also advised on work site rules including the prohibition of removal of fauna, flora and fuel wood from the local forest areas where there had not been any breaches. This issue has a little relevance to work sites as all workers came from the community itself. None of them lived in three camps. The camp and yards are controlled by a private security company called ESS where entry of any unauthorised person into these entities is not permitted. The clinic at Laloki and Angabanga camps were closed down as work has been completed during the review period.

45. Each employee was issued with personal protective equipment as appropriate. There was no report on accidents or other incidents during the reporting period.

2.10.2 Public Relations Department

46. The Public Relations Department established earlier was dismantled with the completion of work and sites handed over. All 6 CLOs (all men) at Angabanga, and other 2 at Magi Highway sites relinquished service at the completion of works. The CLO at Laloki in collaboration with H&SO conducted community meetings to explain about project closure and on HIV/STDs risk reduction.

2.10.3 HIV/AIDS and STDs

47. The HIV/AIDS and STDs control plan prepared by the contractor has been fully completed during the review period. The Plan is being executed by a private service provider called BAHA. The final HIV/AIDS training and awareness activity conducted on 26th September. The details of awareness and training provided are presented in Table 4.

Table 4: Public Consultations by Month

Month	Training events (number)	Participants (number)			APs Attended (number)	Subjects
		Male	Female	Total		
July	1	7	16	23	2	HIV/STDs
August	1	14	8	22 ¹	3	HIV/STDs risk minimization; where to seek additional information if at risk
September	1	13	10	23	1	HIV/STDs avoidance; where to seek further information; site cleaning
All	3	34	34	68	6	

Note: ¹Includes one councillor

48. On the job training for skilled workers has been delivered by the contractor during the last three months. This is conducted at the end of every month in preparation for the work in the proceeding month. The aim is to further strengthen workers possessing specialised skills such as gabion basket making, fixing steel bars and dump-truck mechanics. Table 5 has details relevant to the review period. A total of 22 community members have received the opportunity to be trained on skills by the contractor during the review period.

Table 6: Worker Skills Strengthening by Month

Month	Skills Area	Workers (number)		
		Men	Women	Total
July	Gabion basket fixing & line drain making	18		18 ¹
August	Fixing steel bars	1		1
September	Fixing dump-truck	3		3
All		22	0	22

Note: ¹ 2 are APs;

2.11 Socio-economic issues of community

49. The contractor provides employment for foreigners, people from other parts of the country and the local community. A total of 555 worker-months (95% men and 5 % women) have been employed by the contractor during the period under review. Table 7 has details.

Table 7: Distribution of Project Employment by Month

Month	Foreign Nationals	PNG Other Provinces	Local Community		APs	
			Men	Women	Men	Women
July	90	3	230	9	25	12

August	65	2	68	8	25	10
September	36	1	33	10	15	6
All	191	6	331	27	65	28

Note: All foreign nationals and PNG Workers. Other province workers are men only. Local Workers include APs.

50. Working on an average fortnight payment of Kina 320 per worker, the amount in wages disbursed by the contractor to the PNG economy during the review period has been Kina 232,960 exclusive of wages to foreign nationals.

51. The land lease paid out to land owners for the use of two land occupied by camps is Kina 5,700 per month. However, the lease payment for Angabanga land has been withheld during the review period. The Kwikila camp is sitting on DOW land where there is no rent payable.

2.12 Traffic management

52. The contractor had prepared and implemented a traffic management plan. The local community members (all men) were employed to hold “GO” and “STOP” signs. The traffic management was in order where there were no major issues or accidents reported during the review period. Moreover, sign posts towards approaching camps, work areas, quarry sites and other risk sites were established by the contractor.

2.13 Consultations

53. Three public consultations were conducted by CLOs together with other project staff as part of HIV/STDS awareness raising and camp clean up. The number of people attended during such consultations was 68. See Table 5.

2.14 Environment-related grievances

54. There were no grievances reported during the review period. There are no outstanding environment-related grievances during the reporting period.

55. As part of grievance redress process, awareness raising among community members has been undertaken during the review period. All 6 CLOs and 2 voluntary CLOs have been working on both awareness creation as well as to provide initial response to community with regard to their grievances. The community members were also explained about the process of handling environment-related grievances including the timeline to provide resolution to their grievances.

2.15 Chance Discovery Archaeological Items

56. There was no such discovery during the review period. The bridges are existing facilities that are being rehabilitated by the project. Accordingly, it is expected that such discovery is unlikely.

2.16 Introduction of Invasive Species

57. The risk of introduction of invasive species was carefully monitored by the contractor. All machinery and other equipment were thoroughly inspected prior to using on site.

3 Conclusions and Recommendations

3.1 Conclusions

58. The main conclusions arising from environmental monitoring activities during the review period are:

- There are no serious issues or impacts on the environment resulting from construction works which came to a close during the review period. Camps and other yards used by the contractor have been cleared and sites handed over to the owner. The site at Angabanga is not fully cleared;
- All staff and workers have received training on the use of PPE whilst on site. However, the wearing of PPE has not been practised which is an issue reported in many other projects in the country;
- The quarry operations have followed the approved quarry management plan where there are no issues or concerns. A total of Kina 15,375 has been paid to land owners as royalty fees;
- The short-term employment benefits created by the project are significant. A total of 364 work opportunities have been generated which is equivalent to an approximate disbursement of Kina 232,960 by way of wages to the community; and
- There were no environmental-related grievances during the review period.

59. Based on the above findings, it is to be concluded that construction activities of three bridge sites have come to a close that all complied with the CEMP. The only non-compliance activity is the removal of debris from the Old Bridge from Angabanga camp site which is not fully cleared to the satisfaction of the land owner.

3.2 Recommended actions

60. It is recommended that the building foundation of Angabanga camp is dismantled and site is cleared at the expense of the contractor. The site has already been handed over to the land owner. This will be monitored by ESSU.

61. The Contractor has been recommended by the ESSU upon request from the Angabanga Local Community to clear and flattened the waste soil dumped about few meters from the bridge site towards the Kerema Road.

Section 2: Package 2, New Britain Highway

62. Discussed in this section is the status of the Implementation of the CEMP in respect of bridge sites along the New Britain Highway.

4. Monitoring results and findings

63. The main findings of monitoring including the assessment of environmental impacts during the review period are presented in this section. The construction activities completed during the reporting period are given as a backdrop.

64. Work stoppage was reported during several times in the review period. The first one was in September and the second was in November. The work stoppages have had a significant impact on the progress of work where the overall progress as at 30 June 2017 stands at 58 %. The construction program was scheduled to be completed on 23rd February 2017.

65. The project was operational only up to 26th January 2017. A full suspension of work began after this date where all staff except a skeleton for security and other paper work, were withdrawn. The civil works undertaken during the review period were minimal.

66. The basis for environmental monitoring is the parameters listed in the CEMP of which there are 17 as follows:

- Contractor's camp and yard
- Erosion and sedimentation
- Water quality
- Air quality
- Noise
- Waste management
- Hazardous material management
- Aggregates extraction, haulage and to t storage
- Tree removal and vegetation management
- Socio-economic issues (workers)
- Socio-economic issues (community)
- Public safety
- Health and safety issues
- Invasion of exotic weeds
- Chance discovery of archaeological find
- Traffic management
- Prevention of HIV/AIDS and STDs

67. There was no work conducted during the review period as the full-stoppage commenced during the previous review period continued through to end December 2017.

4.1 Contractor's camp and yard

68. The two camps built by the contractor remained closed during the review period.

4.2 Erosion and sedimentation control

69. There was no new work that generated soil erosion and sedimentation in rivers due to work stoppage. However, soil erosion and sedimentation from the work undertaken in the previous reporting period persist.

4.3 Water quality

70. The only impact on water quality came from soil erosion produced from previous work where adequate control measures have not been executed. Water quality monitoring has not been undertaken due to work stoppage. The EO has already left the site in January.

4.4 Air quality

71. There was no further impact on air quality as construction works did not proceed in the review period. However, evidence gathered on air-borne dust generated from moving vehicles of the general public (Photo 10).



Photo 5: Dust Generation by Moving Vehicle Passing Bridge Site

4.5 Noise

72. There was no construction-related noise generated as there was no work during the review period.

4.6 Waste management

73. Waste not generated due to full suspension of work.

74. The iron parts, old timber and other debris stayed on site during the previous period continued (photo 11). It is possible that stream water quality may be affected by the rusted escaped from iron bars.



Photo 6: Work Site with Dismantled Iron Works on Site

4.7 Hazardous materials management

75. There was no hazardous waste generated as work did not continue.

4.8 Aggregate extraction

76. No aggregate extraction practised during the review period.

4.9 Trees removal and vegetation management

77. No impact on trees during the period under review.

4.10 Socio-economic issues (workers)

78. No issues to report as work stopped.

4.11 Socio-economic issues of community

79. No progress to report as there was complete work stoppage.

4.12 Traffic management

80. The traffic management plan has not been implemented as work did not take place.

4.13 Consultations

81. There were no public consultations conducted during the review period. The CLOs was off-site.

4.14 Environment-related grievances

82. No such grievances were reported due to work stoppage

4.15 Chance Discovery Archaeological Items

83. There was no such discovery during the review period.

4.16 Introduction of Invasive Species

84. Nothing to report due to work stoppage.

5. Conclusions and Recommendations

5.1 Conclusions

85. The main conclusions arising from environmental monitoring activities during the review period are:

- The construction works did not take place during the review period due to the full suspension of work. Only a few staff were on duty to secure the establishment whilst a handful was engaged in paper work; and
- The work sites were closed but there was evidence of minor environment impacts from dust generated by public vehicle movement. The sites were not clean too.

5.2 Recommended actions

86. The corrective actions are suggested to minimize environmental impacts from previously incomplete work. Table below presents some relevant information.

Table 9: Corrective Action Plan for Package 2

Serial No.	Item and Corrective Action	Responsibility	Completion Date (Planned)
1	Site clean-up is necessary	Contractor/CSDC/ /DOW/ESSU	After work is resumed
2	Minimize soil erosion hot spots site-wise	Contractor/CSDC	After work is resumed
3	Next Semi-annual environmental safeguards monitoring report (Jan-June 2018)	PIU/ESSU	30 th July 2018

Appendices

Appendix 1: List of References

1. Initial Environmental Examination for Magi and Hiritano Highway (2014).
2. Construction Environment Management Plan for Package 1 (March 2015)
3. Package 1, Monthly Environmental Monitoring Reports (January to June 2016)
4. Initial Environmental Examination for new Britain Highway (2014)
5. Construction Environmental Management Plan for Package 2
6. Package 2, Monthly Environmental Monitoring Reports (January -Dec 2016; Jan-June 2017)

Appendix 2: List of People Interviewed for Package 1 and 2

1. Barnabas Neausemale, BRIRAP Project Director
2. Paul Nindivi, Project Manager, BRIRAP,
3. Katsumi Sekii, Acting team leader, Chodai
4. Kila Mio, Customary Land Owner, Dogona
5. Vincent Liu, H&SO, Package 1
6. Adrian Mabai, CLO, Angabanga
7. Samson Gabriel, accountant, CHEC
8. Lucas Aloysius, CLO, Laloki Bridge