

# Environment Due Diligence Report

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September 2017

## IND: Railway Sector Investment Program –Tranche 3

Prepared by the Ministry of Railways for the Government of India and the Asian Development Bank

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## CURRENCY EQUIVALENTS

(as of 31 August 2017)

Currency unit	–	Indian Rupee (INR)
INR1.00	=	\$.01564
\$1.00	=	INR 63.96

## ABBREVIATIONS

ADB	-	Asian Development Bank
EARF	-	Environmental Assessment and Review Framework
EDD	-	Environmental Due Diligence
EIA	-	Environmental impact assessment
EMP	-	Environmental management plan
EMoP	-	Environmental monitoring plan
GOI	-	Government of India
IEE	-	Initial Environmental Examination
MoEF	-	Ministry of Environment and Forests
MOR	-	Ministry of Railways
NAAQS	-	National Ambient Air Quality Standard
NGO	-	non-government organization
PF	-	protected forest
PFR	-	periodic financing request
PIU	-	project implementation unit
PPE	-	personal protective equipment
PMC	-	Project Management Consultant
PWD	-	Public Works Department
RDSO	-	Research Design and Standards Organization
RF	-	reserved forest
RoW	-	right of way
RSIP	-	Railway Sector Investment Program
RVNL	-	Rail Vikas Nigam Ltd.
SPCB	-	State Pollution Control Board

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## I. INTRODUCTION

### A. Report Purpose and Rationale

1. The Department of Economic Affairs of the Ministry of Finance, Government of India (Government) requested ADB for Periodic Financing Request (PFR) for Tranche 3 under the Railway Sector Investment Program (RSIP) on 31 May 2017. The proposed third tranche, amounting to \$120 million, includes the balance to complete all work contracts, rail supply, and the contract with the General Consultant to complete the doubling of 840 km of railway and electrification of 641 km.

2. Para 56 of Safeguards Policy Statement 2009 states that for projects proposed for financing, ADB will conduct safeguard reviews, including the borrower's safeguard documents. Due diligence and review will also comprise field visits as well as desk reviews. This Environmental Due Diligence (EDD) is one of the requirements for the processing of tranche 3. By conducting EDD, ADB helps borrowers manage environmental impacts and risks and promotes long-term sustainability of investments.<sup>1</sup>

3. This EDD reviews the compliance of RSIP with the environment safeguard requirements of ADB (Environmental Assessment and Review Framework, Initial Environmental Examinations and Environmental Management Plans) and the safeguard policies of the Government of India.

### B. Railway Sector Investment Program

4. The Framework Financing Agreement of the Multitranche Financing Facility (MFF) was signed between the Government of India and the Asian Development Bank on July 8, 2011, with a total cost of \$1.145 billion. ADB will finance \$500 million, while the rest will be shouldered by the Government. The Facility is intended to finance individual projects of RSIP and will be subject to the criteria indicated in Schedule 4 of the FFA, satisfactory due diligence (including environmental due diligence), preparation of relevant safeguards and fiduciary frameworks, including performance assessment of previous loans (Tranches 1 and 2), and incorporation of lessons into the requested loan.

### C. Project Location and Scope

5. The subprojects under RSIP include the doubling of about 840 km of Daund – Bulbarga section (224 km), Sambhalpur – Titlagardh section (182 km), Raipur – Titlagarh section (203 km), and Hospet – Tinaighat section (229 km); and electrification of the Pune – Guntakhal section (641 km). The subprojects are in Maharashtra, Karnataka, Andhra Pradesh, Chhattisgarh and Odisha states.

6. Tranche 1 covers financing of slices long term works, goods and services for doubling of about 840 km of railway lines and electrification of about 640 km of railway lines, while Tranche 2 covers financing of procurement of track components. Tranche 3 will cover the financing for the completion of investment subprojects and procurement of track components that was started under tranches 1 and 2.

### D. Implementation Progress as of June 2017

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<sup>1</sup> Operations Manual Section F1 / Bank Policies. October 2013.

7. As of the last environmental monitoring report (June 2017), no significant non-compliance has been observed during implementation of environmental safeguards. Pollution control measures being implemented by the contractors at different locations are found to be satisfactory, although there are several lapses in different projects with respect to safety of workers, labour camp facilities, borrow area management, debris management and inadequate monitoring of Project Management Consultants' environmental officers. Most of the required permits and clearances from regulatory agencies have been obtained by the contractors. Contractors also need to continuously improve the living conditions of workers in labor camps. There are several lapses in environment, health and safety (EHS) implementation procedures in several packages. Contractors' vigilance in properly implementing EHS best practices, specifically on the wearing of personal protective equipment (PPEs) among workers, should be encouraged. One of the reasons for the lax implementation of EHS in contract packages is the absence of PMC's Environmental Officers in some construction packages and the insufficient time spent by these officers monitoring the EMP implementation.

8. Periodic health check-ups, including HIV / AIDS awareness camps have been done in most construction packages, but some contractors were not implementing the HIV / AIDS awareness on a regular basis. Monitoring of air, water and noise quality was conducted from November 2016 to March 2017 for most packages. Overall, test results showed that most of the environmental parameters were within permissible limits except for some packages, which can be attributed to project construction activities. Construction materials such as stone aggregates, sand and ballast used in construction of doubling projects are procured from licensed borrow areas and quarries in all packages. Debris generated during construction are disposed in designated waste disposal sites.

9. As of June 2017, work contracts have been awarded for 15 out of 17 packages. For each construction package, a Project Management Consultant (PMC) has been engaged for monitoring of contractors' activities.

## **E. Environmental Categorization, Assessment and Reporting**

10. Tranches 1 and 2 of the Facility, which only cover the financing of doubling and electrification of railway lines have been classified as "B" based on ADB's Environmental Assessment Guidelines and Safeguards Policy Statement 2009. Tranche 1 covers financing of slices long term works, goods and services for doubling of about 840 km of railway lines and electrification of about 640 km of railway lines, while Tranche 2 covers financing of procurement of track components. Tranche 3 will cover the financing for the completion of investment subprojects and procurement of track components that was started under tranches 1 and 2. It is expected that the categorization of the third tranche, which will only cover the financing for the completion of investment subprojects and procurement of track components that were started under Tranches 1 and 2, will be retained as "B".

11. An environmental assessment and review framework (EARF) has been prepared for the Facility on March 2011. Four initial environmental examinations (IEEs) were prepared: Hospet-Tinaighat Doubling; Pune-Guntakal Electrification and Daund – Gaulbarga Doubling; Raipur-Titlagarh; and Sambalpur – Titlagarh Doubling subprojects.

12. A total of eight semi-annual environmental monitoring reports from September 2013 to June 2017 have been prepared for Tranches 1 and 2 of the Facility, and disclosed on the ADB website in compliance to the EARF and the loan agreement.

## **F. Institutional Setup and Responsibilities**

13. Monitoring of environmental safeguards for Tranche 3 will be similar with the two tranches. The contractors will be directly responsible for implementation of environmental safeguard measures at site during construction on a day-to-day basis based on the contract's environmental safeguard measures specifications.

14. The environment, health and safety (EHS) expert of each contractor will ensure the implementation of environmental safeguard measures as stipulated in the EMP and contract documents.

15. For each construction package, Rail Vikas Nigam Limited (RVNL) has appointed Project Management Consultant (PMC). The PMC, which includes an Environmental Officer, has supervisory role that includes monitoring of compliance of environmental safeguard measures implemented by the contractor, based on the conditions of Contract Agreement, IEE and EMP, and the national and states' environmental statutes and regulations.

16. The General Consultant, through the Environment Expert, has been appointed by RVNL to monitor the overall progress of projects including compliance with environmental safeguard measures. The Environment Expert is expected, just like what he is doing for the two tranches, to continue doing periodic site inspection, review of environmental progress for each package and prepare environmental monitoring reports for RVNL and ADB. He is also expected to conduct training on safeguards implementation for PMC and contractors.

## **II. COMPLIANCE WITH ENVIRONMENTAL SAFEGUARDS REQUIREMENTS AND IMPLEMENTATION**

17. The due diligence for the environment comprised review of available documents and the compliance of the project with respect to the Loan Agreement, the EARF, the environmental management plan indicated in the IEEs of the 5 subprojects, EMP implementation, institutional arrangement, national and local regulatory permits and clearances, and Safeguard Policy Statement 2009. The compliance review was based on the review of safeguard documents, the environmental monitoring reports submitted by the General Consultant,<sup>2</sup> site visits and consultation with project management and contractors, to further understand the project implementation mechanism.

### **A. Compliance with National Environmental Laws**

18. The permits and licenses required for different packages are summarized in Table 1. None of the projects were covered under the purview of EIA Notification 2006. Hence an environmental clearance was not required for any of the subprojects.

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<sup>2</sup> <https://www.adb.org/projects/documents/ind-36330-023-emr>

**Table 1: Compliance with National Regulations**

Project	Sub-project	Package	Permits and Clearances <sup>3</sup>						
			1	2	3	4	5	6	7
Hospet - Tinaighat	HT-1	Hospet-Harlapur	NA	Obtained	Obtained and renewed	Obtained	Obtained	Obtained. Plant yet to be commissioned	Obtained
	HT-2	Contract terminated in June 2016							
	HT-3	Kambargana vi-Tinaighat	NA	Obtained	Obtained and renewed	Obtained	Obtained	Applied for renewal to Pollution Control Board, renewal awaited. Plant is not operational	Obtained
Sambalpur - Titlagarh	ST-1	Major bridges	NA	Obtained	Obtained and renewed	NA	NA	NA	Obtained <sup>4</sup>
	ST-2	Sambalpur-Barapali	On going <sup>5</sup>	Obtained	Obtained and renewed	NA	NA	Pending <sup>6</sup>	Obtained
	ST-3	Barapali-Bolangir	NA	Obtained	Obtained	NA	NA	NA	Obtained
	ST-4	Bolangir-Titlagarh	On going <sup>7</sup>	Obtained	Obtained and renewed	NA	NA	NA	CFO expired, renewal in process
Raipur-Titlagarh	RT-1	Contract terminated in June 2016							
	RT-2	Lakhana-Arand	NA	Obtained	Obtained	NA <sup>8</sup>	NA	NA	Obtained
	RT-3	Contract terminated in June 2016							
Daund-Gulbarga	DG-1	Bhigwan - Mohol	NA	Obtained	Obtained and renewed	Obtained	Not obtained <sup>9</sup>	Awaiting NOC <sup>10</sup>	NA

<sup>3</sup> 1- Clearance for Diversion of Forestland under Forest Conservation Act, 1980;

2-Permission for Tree Felling under Forest Conservation Act, 1980;

3-Labour License under Labour Rules;

4-Quarry License from the Department of Mines and Geology;

5-Environmental Clearance for Quarry under Environmental Protection Act;

6-NOC for Stone Crusher Plant from PCB under Air (Prevention and Control of Pollution) Act, 1981 and Water (Prevention and Control of Pollution) Act, 1974;

7- NOC for Batching Plant from PCB under Air (Prevention and Control of Pollution) Act, 1981 and Water (Prevention and Control of Pollution) Act, 1974

<sup>4</sup> Obtained for concrete mix plant established at Hirapur camp site, Mahanadi bridge site and Sonagarh bridge.

<sup>5</sup> Forest Clearance for temporary diversion of 0.044 ha area is in process.

<sup>6</sup> The plant is temporarily handed over to Contractor's own Highway Division and the crushed ballast from this plant is not in use for this package.

<sup>7</sup> Forest Clearance for temporary diversion of 5.768 ha area is in process.

<sup>8</sup> Boulders are being procured from licensed third party.

<sup>9</sup> Currently procuring ballast from third party licensed quarry.

<sup>10</sup> Stone crusher plant was shifted to another location at Kem Village, hence new NOC is required.

Project	Sub-project	Package	Permits and Clearances <sup>3</sup>						
			1	2	3	4	5	6	7
	DG-2	Hotgi - Gulbarga	NA	NA	Obtained	NA	NA	NA	Obtained
Pune-Guntakal	PG-1	Pune - Bhigwan - Gulbarga - Wadi	NA	NA	Obtained and renewed	NA	NA	NA	NA
	PG-2	Wadi - Raichur	NA	NA	Obtained	NA	NA	NA	NA
	PG-3	Raichur - Guntakal	NA	NA	Obtained and renewed	NA	NA	NA	NA

## B. Compliance with Environmental Assessment and Review Framework and Safeguard Policy Statement 2009 and Environmental Management Plan

19. The Environmental Assessment and Review Framework (EARF) was prepared and disclosed in the ADB website on March 2011 to ensure that all environmental safeguard requirements of ADB and India are met during MFF implementation. No category A subprojects has been considered under the program. RVNL complied with the EARF in terms of project categorization, safeguard screening and assessment, institutional arrangements and grievance redress mechanism.

20. The Environmental Management Plan (EMP) is incorporated in all contract documents of all construction packages. The PMC and PIU monitor implementation of EMP by the contractor on site on a regular basis. The General Consultant (GC) conducts site inspections on a quarterly basis. Based on the General Consultant's assessment of the EMP performance on site and feedback from each PMC, it was found that overall the status of EMP implementation was satisfactory. A number of issues were identified and several remedial measures were taken to address the issues in June and July 2017. Details of issues identified, remedial measures taken and status of compliance of each environmental parameter is provided in chapter III, table 4.

## C. Compliance with Framework Financing Agreement

21. The Framework Financing Agreement (FFA) of RSIP was signed between the Government of India and ADB on July 8, 2011. The Loan Agreement for Tranche 1 was signed between the two parties on July 9, 2012. The Loan Agreement for Tranche 2 was signed on February 17, 2014. The project's compliance to environmental safeguards requirements based on Schedule 4 of the FFA is indicated in Table 2.

**Table 2. Compliance to Framework Financing Agreement**

Agreement Clause	Compliance Status
<b>Schedule 4</b>	
<p><b>Schedule 4 A. 1(iv):</b></p> <p>The project will also be environmentally and socially sound and include measures to mitigate any possible environment and social impacts in accordance with the safeguard framework-1 prepared (Schedule 5) and Safeguard Policy Statement (SPS) 2009. For each project, a poverty and social analysis will be conducted in accordance with ADB's guidelines on poverty and social assessment. Similarly, an environmental assessment will be carried out for each project in accordance with the SPS 2009.</p> <p>All measures and requirements set forth in the respective initial environmental examination (IEE), environmental impact assessment (EIA), and environmental management plan (EMP), and any corrective or preventative actions set forth in a safeguards monitoring report, MOR and RVNL shall ensure that all bidding documents and contracts for works contain provisions that require contractors to comply with the measures and requirements relevant to the contractor set forth in the IEE/EIA, the EMP, the RP and the IPP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set out in the safeguards monitoring report.</p>	<p>Complied.</p> <p>Initial Environmental Examination (IEE) report has been prepared for each project under RSIP, incorporating detailed screening, environmental assessment and stakeholder consultations to satisfy the requirements of ADB's Safeguard Framework and ADB's SPS 2009. The Environmental Management and Monitoring Plan has been incorporated in bidding documents of all the projects.</p> <p>All the necessary permits / approvals / licenses were obtained during construction. Environmental safeguards have been implemented during construction as required in the EMP.</p>

Agreement Clause	Compliance Status
<p><b>Schedule 4 A. 1(iv):</b> For each project, all necessary Government approvals will be obtained, including MOR, Ministry of Environment and Forest, Pollution Control Boards, and other relevant agencies, as applicable.</p>	<p>Complied. The necessary approvals and licenses in each project including their renewals have been ensured.</p>
<b>Schedule 5 – Social Dimension and Safeguard Requirements</b>	
<p><b>Para 47</b> India will ensure, and cause the Ministry of Railways and RVNL to ensure, that all the requirements prescribed in this Schedule, and the following social and safeguard frameworks and plans that have been prepared with respect to the Facility and the first tranche and of which ADB has been provided full copies, and which are deemed incorporated herein by reference, are complied with during the processing and implementation of the components/projects under the Facility.</p>	<p>Complied. The EARF has been prepared and IEEs and EMPs were prepared for the first tranche, copies of which were submitted to ADB.</p>
<p><b>Para 48</b> The frameworks cover the Facility-specific information and requirements in accordance with ADB's safeguard policies: (i) the general anticipated impacts of the components or projects likely to be financed under the MFF on the environment, involuntary resettlement, and indigenous peoples; (ii) the safeguard criteria that are to be used in selecting components, projects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure (including the 120-day disclosure rule, if required), and monitoring and reporting; and (iv) the institutional arrangements (including budget and capacity building requirements), grievance redress mechanisms and the client's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents.</p>	<p>Complied. The EARF contains all the Facility-specific information and requirements in accordance with ADB's safeguard policies.</p>
<p><b>Para 50</b> In all cases, for each new PFR preparation, India will cause MOR and RVNL to review ongoing projects to check on the status of compliance with the social and all safeguard plans and frameworks, and submit due diligence reports of the earlier PFR to ADB, together with other required safeguard documents and semiannual monitoring reports relevant to the components/projects included in the tranche being processed. In any case if significant involuntary resettlement issues are identified in the implementation and review of ongoing projects, a corrective action plan will be prepared to address such issues and submitted to ADB.</p>	<p>Complied. RVNL, through the General Consultant, submits environmental monitoring reports, which contain due diligence report for environmental safeguards. The report contains status of compliance with IEEs, EMPs and EARF.  This report is the Environment Due Diligence Report for environment safeguards compliance under PFR 1 and 2.</p>

**Table 3. Compliance to Loan Agreement (Ordinary Operations)**

Agreement Clause	Compliance Status
<p><b>Conditions for Award of Contract</b> <b>Para 6.</b> The Borrower shall cause MOR and RVNL to ensure that no Works contract for any part of the Project is awarded which involves environmental impacts until RVNL has: (a) obtained the final approval of the IEE from the relevant environment authority of the Borrower; and</p>	<p>Complied The approved EMP has been incorporated into work contract of all the construction packages under RSIP.</p>

Agreement Clause	Compliance Status
(b) incorporated the relevant provisions from the EMP into the Works contract.	
<p><b>Schedule 5. Execution of Project Safeguards Environment</b>  <b>Para 3</b></p> <p>(a) The Borrower shall cause MOR and RVNL to ensure, that the preparation, design, construction, implementation, operation and decommissioning of the Project, and all Project facilities comply with (a) all applicable laws and regulations of the Borrower relating to environment, health, and safety; (b) the Environmental Safeguards; (c) the EARF; and (d) all measures and requirements set forth in the respective IEE and EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.</p> <p>(b) The Borrower shall cause MOR and RVNL to ensure that Works under a contract shall not be commenced in the relevant section, until the forestry clearance and permits from the State pollution control boards for operation of hot mix plants are obtained;</p>	<p>Complied.  All the applicable laws and regulations related EHS, the environmental safeguards, the EARF, and the IEE and requirements are being implemented.</p> <p>Complied  No Hot Mix Plant has been installed in any of the contract packages.</p>
<p><b>Human and Financial Resources to Implement Safeguards Requirements</b>  <b>Para 7</b></p> <p>The Borrower shall cause MOR and RVNL to ensure that all necessary budgetary and human resources to fully implement the EMPs, the RPs and the IPPs as required, are made available.</p>	<p>Being complied.  Enough budget and human resources are being allocated to implement the EMPs.</p>
<p><b>Safeguards – Related Provisions in Bidding Documents and Works Contracts</b>  <b>Para 8</b></p> <p>The Borrower shall cause MOR and RVNL to ensure that all bidding documents and contracts for Works contain provisions that require contractors to:</p> <ul style="list-style-type: none"> <li>(a) comply with the measures and requirements relevant to the contractor set forth in the IEE, the EMP, the RP and the IPP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set out in a Safeguards Monitoring Report;</li> <li>(b) make available a budget for all such environmental and social measures;</li> <li>(c) provide RVNL with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the respective IEE, the EMP, the RP or the IPP</li> </ul>	<p>Complied</p> <p>Being complied.  The compliance with the mitigation measures stipulated in the EMP is constantly monitored in each construction package and necessary corrective actions are being taken at site.</p> <p>Environmental monitoring and mitigation costs allocated/incorporated in contract agreement</p> <p>No unanticipated environmental risks or impacts are generated yet.</p>
<p><b>Safeguards Monitoring and Reporting</b>  <b>Para 9</b></p> <p>The Borrower shall cause MOR and RVNL to ensure the following:</p> <ul style="list-style-type: none"> <li>(a) submit semi-annual Safeguards Monitoring Reports to ADB and disclose relevant information</li> </ul>	<p>Complied.</p> <p>The semi-annual report has been prepared as per the guidelines and submitted.</p>

Agreement Clause	Compliance Status
<p>from such reports to affected persons promptly upon submission;</p> <p>(b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in any IEE, the EMP, the RP or the IPP (as applicable), promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan;</p> <p>(c) report any breach of compliance with the measures and requirements set forth in any EMP, RP or IPP promptly after becoming aware of the breach.</p>	<p>No such unanticipated environmental risks or impacts occurred during the reporting period</p> <p>No breach of compliance recorded in any of the projects till date.</p>
<p><b>Prohibited List of Investments</b></p> <p>10. The Borrower shall cause MOR and RVNL to ensure that no proceeds of the Loan are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of the SPS.</p>	<p>Complied.</p> <p>No proceeds of the loan are used for activities under the prohibited investment activities indicated in SPS 2009.</p>
<p><b>Labor Standards</b></p> <p>11. The Borrower shall cause MOR and RVNL to ensure that Works contracts under the Project follow all applicable labor laws of the Borrower and that these further include provisions to the effect that contractors (a) carry out HIV/AIDS awareness programs for labor and disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction; and (b) follow and implement all statutory provisions on labor (including not employing or using children as labor, equal pay for equal work), health, safety, welfare, sanitation, and working conditions. Such contracts shall also include clauses for termination in case of any breach of the stated provisions by the contractors.</p>	<p>Being complied.</p> <p>Work contracts follow the EHS and labor laws and conditions. HIV and AIDS awareness programs are regularly conducted.</p>

### III. STATUS OF EMP IMPLEMENTATION AND MONITORING

#### A. Environmental Management Plan

22. EMP is an integral part of all the contract documents and the EMP provisions have been included under conditions of the contract of all the construction packages. The contractor must follow the stipulated environmental safeguards as per EMP during construction activities. The compliance with the safeguards requirements is being constantly monitored by PMC and PIU at site. The performance of implementation of EMP is assessed by the General Consultant based on actual observations made at site and feedback received from the respective PMC.

**Table 4: Status of Implementation of Mitigation Measures**

Environmental Parameters	Status of Implementation as of 30 March 2017	Status of Compliance as of 31 July 2017
1. Public/Traffic safety measures	Requirements for improvement in DG-1 and RT-2 identified in March 2017. Specific improvements required were: Caution/Warning Signboards and	Being complied. Required improvements have been made in DG-1 and RT-2.

Environmental Parameters	Status of Implementation as of 30 March 2017	Status of Compliance as of 31 July 2017
	<p>barricading required near cross roads and on temporary access constructed for movement of machineries and construction vehicles. Public movement on such tracks may create hazardous situation.</p> <p>Satisfactory in rest of the packages</p>	
2. Housekeeping and hygiene at construction sites	<p>Requirement for improvement in DG-1, ST-3, ST-4 observed in March 2017. Specific observations were: Garbage collection and disposal as well as debris removal from site required in these packages.</p> <p>Satisfactory in all other packages</p>	<p>Being complied.</p> <p>Some improvements have been made in DG-1, ST-3 and ST-4. Close follow up monitoring will be conducted by the PIU and PMC.</p>
3. Labour /construction camps and facilities	<p>General hygienic condition was found to be satisfactory in DG-2 and ST-1 in March 2017.</p> <p>Improvement is needed in all other labour camps: DG-1, ST-2, ST-3, ST-4 and RT-2. Specific improvements required are: provision of proper toilet facilities with running water; waste disposal facilities and collection system to established; proper drinking water to be provided to workers.</p>	<p>Being complied.</p> <p>PIU has issued a warning letter and remedial measures are being taken by the contractors for DG-1, ST-2, ST-3, ST-4 and RT-2.</p>
4. Medical facilities and health checkups of workers	Satisfactory in all the packages	Being complied.
5. Dust Control: (A) At plant site (B) At construction sites	<p>Satisfactory in all the packages except Package ST-3 and ST-4</p> <p>Frequent water sprinkling over the earthen bed is required in construction package ST-3 and ST-4 to control dust due to movement of dumpers and machineries.</p>	<p>Being complied.</p> <p>Due to the rainy season currently less water sprinkling is required.</p>
6. Stockpiling of topsoil	Satisfactory in DG-1, HT-1, HT-3, RT-2 and ST-2. Require improvement in rest of the packages.	<p>Being complied.</p> <p>Improvements have been made in rest of the packages.</p>
7. Slope protection of high embankment and bridge approaches from soil erosion	Good in all packages	Complied.
8. First aid facilities	Satisfactory in all the construction packages	Complied.

Environmental Parameters	Status of Implementation as of 30 March 2017	Status of Compliance as of 31 July 2017
9. Personal Protective Equipment (PPE)	<p>Satisfactory in ST-1, DG-1, DG-2 PG-1, PG-2 and PG-3. Requires improvement in remaining construction packages.</p> <p>Improvement required in supply of adequate PPEs by the main contractor and their use during works. Attention required for the workers of subcontractors where use of PPE is almost neglected in most of the packages.</p>	<p>Being complied.</p> <p>Usage of PPE has improved.</p>
10. Proper storage and handling of chemicals and waste oils	Satisfactory	Complied.
11. Sanitation and waste management	<p>Requires improvement in all construction packages</p> <p>Debris removal from site in substantially completed sections especially in DG-1, HT-1, HT-3, PG-1, PG-2 and PG-3 is required before commissioning. The contractor should submit his disposal plan along with identification of disposal sites.</p>	<p>Being complied.</p> <p>Debris disposal plan has been submitted and approved. Debris disposal is going on in accordance with the approved plan.</p>
12. Employment for local villagers / residents	Good.	<p>Complied.</p> <p>Mostly local labourers are engaged in the project except for the labourers requiring special skills.</p>
13. Safety measures during execution of works	<p>Satisfactory in PG-1, PG-2 and PG-3. Needs improvement in remaining packages</p> <p>It is required to provide safe access as well as safe working platform in all the project packages</p>	<p>Being complied.</p> <p>Required improvements have been made in remaining packages.</p>
14. Emergency response system	<p>Requires improvement in ST-3, ST- 4 and RT-2. Satisfactory in remaining packages</p> <p>Display of Emergency contact numbers, training of staff to deal with emergency, and emergency vehicles required to be deployed in all the major bridge construction site and construction camp. All the sub-contractors must be trained properly for responding to emergency.</p>	<p>Being complied.</p> <p>Emergency contact numbers have been displayed on sign boards at major bridge construction sites and construction camps. Subcontractors have been trained on emergency response system.</p>
15. Borrow area and operation and rehabilitation	Satisfactory in DG-1, RT-2, ST-2, HT-1 and HT-3. Requires improvement in ST-3, ST-4, RT-1 and RT-3. In ST-1 and PG project packages no borrow areas are	<p>Being complied.</p> <p>Information verification is under process.</p>

Environmental Parameters	Status of Implementation as of 30 March 2017	Status of Compliance as of 31 July 2017
	<p>required.</p> <p>PMC should verify the correctness of information submitted by the contractor especially in RT- 1, RT-3, ST-3, ST-4 and HT- 2.</p>	
16. Debris clearance from site	<p>Require improvement in DG-1, ST-2, ST-3, ST-4, HT-2 and RT-3 Satisfactory in remaining packages</p> <p>All the debris must be removed and disposed in designated area and a record of debris removal and disposal to be maintained by respective PMC</p>	<p>Being complied.</p> <p>Debris disposal plan has been approved. Disposal is taking place in accordance with disposal plan.</p>
17. Awareness programme on HIV/AIDS and other STD for workers	<p>Good in DG-1, ST-1, ST-2 and HT- 1, In remaining packages the awareness camps are required to be organized bimonthly as per the contract conditions</p>	<p>Being complied.</p> <p>Awareness campaigns are being conducted as required.</p>
18. Tree plantation	<p>Progress in tree plantation is poor in all contract packages except package ST-2. There is a need to immediately conduct tree plantation.</p>	<p>Being complied.</p> <p>RVNL has instructed the contractor to immediately conduct tree plantation during the ongoing monsoon season and achieve a target of 30% in addition to the trees planted so far.</p>
19. Monitoring of environmental attributes	<p>Satisfactory in HT-1, DG-1, DG-2 and RT-2. Require improvement in packages ST-1, ST-2 and ST-3, ST-4, PG-1, PG-2 and PG-3</p> <p>Periodicity of environmental monitoring is required to be ensured by the PMC. The monitoring schedule should be consistent with the specified environmental monitoring plan specified in the contract.</p>	<p>Being complied.</p> <p>A letter has been issued by RVNL instructing the PMC firms that each Environment Specialist should provide an input of at least 1 week per month per contract package.</p>
20. Mobilization status of Environmental Officer of PMC	<p>The Environmental Officer of PMC is available in all the packages except in RT-1, ST-4, PG-2 and PG-3. The duration and frequency of site visits by PMC's Environmental officer is good in DG-2, PG-1, HT-1, HT-2, HT-3 and ST-2. However, in remaining packages this requires improvement</p>	<p>Being complied.</p> <p>A letter has been issued by RVNL instructing the PMC firms that each Environment Specialist should provide an input of at least 1 week per month per contract package.</p> <p>Works in PG-2 and PG-3 have been completed. If the need for remedial measures is observed by the GC in these packages, the respective PIU will implement them.</p>

Environmental Parameters	Status of Implementation as of 30 March 2017	Status of Compliance as of 31 July 2017
21. Appointment of focal environmental officer at corporate level and PIU level	Good	Complied.
22. Record Keeping and Reporting of PMC	Satisfactory in RT-2, DG-1, DG-2, and ST-1. Require improvement in remaining packages  Proper record keeping and reporting require improvement in Packages RT-1, RT-3, ST-3 and ST-4.	Being complied.  Record keeping is expected to be improved after the issuance of instructions by RVNL to the PMC on required time inputs of each Environment Specialist.

## B. Environmental Monitoring Plan

23. Air Quality Monitoring<sup>11</sup>. The monitoring conducted between November 2016 and March 2017 showed that all the air quality parameters (suspended particulate matters (SPM), PM10, PM2.5, SO<sub>2</sub>, NO<sub>x</sub>, and CO) were all within the permissible limits of GOI, except for the SPM concentration in ST-1 (in bridge no. 438 at Saintala), where the concentration ranged from 440.3 – 462 µg/m<sup>3</sup>, which is considered high.

24. Water Quality Monitoring<sup>12</sup>. For the period November 2016 to March 2017, the samples of water from different sources were collected and tested for physico-chemical characteristics in different construction packages as per environmental monitoring plan. The test results showed that all the measured parameters were within the permissible limit as per IS 10500-2012. However, the total dissolved solids exceeded the desirable limit but within permissible limit in the bore well water samples of construction packages DG-1 in the sample of Kalindi Camp borewell and in water sample of DG-2 at Savalgi camp, HT-1, HT- 3, PG-1, PG-2 and PG-3. The total hardness was also observed exceeding the desirable limit of 200 mg/l in the bore well samples taken from Savalgi Camp of DG-2 but was found within the permissible level as per IS 10500:2012. Similarly, the concentration of Ca and Mg was also exceeded the desirable limit in the water sample of DG-2, but within maximum permissible limit. The Contractor has established RO system for using the water from this source for drinking to bring down the TDS and hardness within the range of desirable limit.

25. Noise Level Monitoring<sup>13</sup>. The noise pollution level has been recorded at different locations in construction packages DG-1, HT- 1, HT-3, RT-2 and ST-1, ST-2, ST-4, PG-1, PG-2 and PG-3 during November 2016 to March 2017 period. The results reflect that during the monitoring period the daytime noise levels varied between minimum 51.1 dBALeq at Kurdwadi Railway Station in DG-1 to maximum 74.8 dB Leq at Bridge Construction site in ST-1. At all the measured locations, the noise levels were recorded within the prescribed limit (75 dBALeq) for industrial/commercial areas. The night time noise levels were recorded in construction packages DG-1, HT-1, ST-1, ST-2, St-3 and ST-4. No nighttime noise levels were recorded in construction package DG-2, HT-3, RT-2 and RT-3. The nighttime noise levels were recorded in the range from minimum 44.7 dBALeq to maximum 63.2 dBALeq which are lower than the prescribed limit of 70 dBALeq. There are no sensitive receptors at the project locations. And exceedances of noise levels

<sup>11</sup> Page 43 – 45 of Semi-annual Environmental Monitoring Report (October 2016 – March 2017) (<https://www.adb.org/sites/default/files/project-documents/36330/36330-023-emr-en.pdf>)

<sup>12</sup> Page 47 – 60 of Semi-annual Environmental Monitoring Report, Oct 2016 – March 2017

<sup>13</sup> Page 61 – 63 of Semi-annual Environmental Monitoring Report, Oct 2016 – March 2017

### **C. Public consultation and Grievances**

26. Resettlement has been the main safeguards issue under the program particularly in terms of impacts on local communities near the project construction sites. Hence, consultations have been held but mainly in the context of resettlement issues. Similarly, grievances submitted have been mainly for social and resettlement reasons. Further details on this is provided in the Resettlement Due Diligence report.

### **D. Non-compliance Notices**

27. There were no major non-compliances except for the absence of PMC's Environmental Officers in packages RT-1 and ST-4. Inadequate person-day inputs by the PMC Environmental officers were also found to be provided in package ST-1 and ST-3. Immediate actions have been taken by RVNL to address this issue wherein RVNL has issued instructions to the PMC firms that Environmental Officers should provide an input of at least 1 week per month per contract package.

28. There is also a need to improve the general housekeeping in labour camps (package DG-1 in Malikpet camp, package ST-2, ST-3, ST-4 and RT-2) specifically on improvement of toilet facilities and provision of solid waste management system. For the compensatory plantation requirements, most contractors are behind their plantation targets. There is also inadequate monitoring of environmental compliance during construction by PMCs. Necessary remedial measures have been taken and are being taken to address these issues.

## **IV. FINDINGS AND RECOMMENDATIONS**

29. **Compliance to Environmental Safeguard Requirements and EMP.** Most of the stipulated environmental safeguards measures have been implemented satisfactorily in all construction packages. Few lapses have also been recorded though, which require proper attention and improvement. Appropriate actions have been taken by RVNL and the contractors have improved implementation of environmental safeguards as of July 2017. The environmental safeguards of the projects are being implemented in compliance with the loan covenants, project agreement and contractors are complying with the mitigation measures described in the Environmental Management Plan (EMP). The statutory/regulatory requirements are being strictly monitored for their compliance by the contractors. Efforts are being made to ensure that the contractor obtains all necessary licenses and permits from concerned agencies, including renewal when required. No major complaints or grievances related to environment safeguards have been received so far in the project.

30. The contractors have shown improvement in borrow area operation and management. The team of Contractor and PMC are putting their efforts for resolving the discrepancies in borrow area detailing in construction package ST-3. The contractors of construction packages DG-1, DG-2 and HT-1 have obtained environmental clearance for borrow areas.

31. **Compliance to Environmental Monitoring Plan.** The compliance of contractor with environmental mitigation and monitoring program indicated in EMP is satisfactory. The monitoring conducted between November 2016 and March 2017 showed that all the air quality parameters (suspended particulate matters (SPM), PM10, PM2.5, SO2, NOx, and CO) were all within the permissible limits, except for the SPM concentration in ST-1 (in bridge no. 438 at Saintala), where the concentration ranged from 440.3 – 462 µg/m<sup>3</sup>, which is considered high. The test results for water quality showed that all the measured parameters were within the permissible limit, except in package DG-1 and DG-2, where the total hardness exceeds the desirable limit of 200 mg/l in

bore well samples. The Contractor has established RO system for using the water from this source for drinking to bring down the TDS and hardness within the range of desirable limit. For noise levels, the noise levels were recorded within the prescribed limit (75 dBA<sub>Leq</sub>) for industrial/commercial areas.

32. **Recommendations.** It is important that the Borrower continue complying with relevant environmental policies as well as ADB's environmental safeguard requirements. The contractor needs to further undertake the following: (i) continue with the improvement of living conditions at labour camps; (ii) ensure adequate supervision in all packages to improve EHS practices; (iii) provide proper toilets with running water in all construction camps; (iv) deploy PMC's Environmental Officer to monitor the implementation of environmental safeguard measures; (v) improve the management of air pollution in packages ST-3 and ST-4 and continue improving the implementation of measures to prevent water contamination and siltation of water bodies; (vi) remove the debris in construction sites in most packages and submit action plan for site restoration; (vii) immediately start tree plantation during the current monsoon season; (viii) conduct regular HIV / AIDS awareness program for workers.