

# Environmental Monitoring Report

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Annual Report  
September 2010

## IND: Northeastern Region Capital Cities Development Investment Program-Construction of Water Storage Tanks in Greater Aizawl

Prepared by State Investment Program Management and Implementation Unit (SIPMIU) of Aizawl, Mizoram for the Government of India and the Asian Development Bank.

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# **Environmental Monitoring Report**

**Month Year: September 2010**

Subproject Name : - Construction of Water Storage Tanks in Greater Aizawl  
Planing Area

Project No. : 35290-01

Subproject Town : Aizawl

Tranche : 1

Sector : Water Supply

## **India: Northeastern Region Capital Cities Development Investment Program**

**Prepared by**

**State Investment Programme Management & Implementation Unit (SIPMIU)-  
Aizawl**

**This report has been submitted to ADB by SIPMIU of the Government of Mizoram and is made publicly available in accordance with ADB's public communications policy (2005), it does not necessarily reflect the views of ADB**

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## I. INTRODUCTION

### A. Background

State Investment Programme Management & Implementation Unit (SIPMIU) Aizawl, Mizoram is intended to optimize social and economic development in Aizawl towns in the State. This will be achieved through investments in urban infrastructure i.e water supply; sewerage and sanitation; and solid waste management. SIPMIU will also provide policy reforms to strengthen urban governance, management, and support for urban infrastructure and services. The assistance will be based on the State-level framework for urban reforms, and institutional and governance reforms recommended by the Government of India (GoI) through the Northeastern Region Capital Cities Development Investment Program (NRCCDIP)

1. SIPMIU Tranche-1 to be implemented over a seven year period beginning in 2010, and will be funded by a loan via the Multitranche Financing Facility (MFF) of the ADB. The Executing Agency (EA) is the State Investment Programme Management & Implementation Unit (SIPMIU) which is currently in the construction stage Tranche-I and Preparation of DPR Tranche-II.

### B. Project Purpose

2. State Investment Programme Management & Implementation Unit (SIPMIU) will improve infrastructure through the development, design and implementation of a series of subprojects, each providing improvements in a particular sector (water supply, sewerage, solid waste etc) in one town. These Sub-project have been classified by ADB as environmental assessment category B (some negative impacts but less significant than category A) and the impacts of subprojects were assessed through Initial Environmental Examination (IEE) reports prepared according to ADB Environment Policy (2002, 2009) and Environmental Assessment Guidelines (2003).

3. However, as per EIA notification 2006 of Ministry of Environment and Forest (MoEF) Government of India the sub-project Solid Waste Management Facility" is classified as category "B" and Require Environmental Clearance.

4. The nature of the sub-projects may change during their subsequent development, particularly during detailed design. This report is the Environmental Monitoring Report (EMR) to describe the implementation of the mitigation measures and monitoring recommended in the IEE and summary Initial Environmental Examination (SIEE).

### C. Project Profile

#### Scope of work in tranche-1

1. Construction of 7 numbers of RCC Tanks (Namely Mission Vengthlang Tank, Bawgawn Tank, 7 day Tlang Tank, Armed Veng Tank, Luangmual Complex Tank, Zemabawk TB Tlang Tank, and Tlangnuam Tank)
2. Installation of two chlorinators with chlorinator rooms at inlet of storage reservoir at Tuikutlang and booster pump house Chandmari.
3. Installation of 130000 numbers of consumer water meters.

5. Construction of 7 (replacement) ground level of RCC Zonal Tank, 3 Staff/Chowkidar Quarters, 1 site office and 2 chlorinators has been awarded to m/s S.S Construction vide contract No. OHT/WS/AIZ/TI/NCB-3 dated 19.04.2010. **Table 1** shows the project components, starting date of implementation, schedule date of completion etc. along with physical progress for Tranche 1.

6. On date project works started in Aizawl towns under Tranche 1 for water supply. Significant physical progress will be expected during next quarter. **Table 1** shows summary of the scope of works along with present work status. Also expected changes from the approved objectives, remedial measures for fulfillment of objective and key risks/ assumption for attainment of objectives are mentioned in the table.

|                              |   |   |
|------------------------------|---|---|
| <b>Name of Work</b>          | <b>Construction of 7 (Replacement) Ground level of R.C.C Zonal Tank, 3 Staff / Chowkidar Quarters, 1 Site Office and 2 Chlorinators</b> | <b>Vide Contract No. OHT/WS/AIZ/TI/NCB-3 dated 19.04.2010</b> |
| Name of Contractor           | S.S. Construction, Chaltlang, Aizawl  |   |
| Duration of work             | 18 months   |   |
| Commencement Date            | 25.04.2010  |   |
| Scheduled Date of Completion | 20.10.2011  |   |

Table 1: Sub-project status - Tranche 1 (Upto 30.09.2010)

| Sl. No   | Name of Work   | Activities  | Progress of Work (%)<br>Till End of Sept.2010 |                          | Expected changes from approved scope | Fulfillment of objectives-Type of remedial measures needed | Key assumptions and risks that affect attainment of the objectives | Remarks                        |
|----------|--|---|---|--------------------------|--------------------------------------|--|--|--------------------------------|
|          |  |   | During the month                              | Cumulative               |                                      |  |  |                                |
| (1)<br>a | <b><u>Construction of R.C.C Tank</u></b><br>Mission Vengthlang | Construction of RCC tank  | 16  | 60                       | No Further change                    | Effective monitoring and application of EMP                | No risk  | Dome cast done                 |
| b        | <b><u>Construction of R.C.C Tank</u></b><br>7Day Tlang         | 1. Dismantling of P.S. Tank<br>2. Dismantling of foundation<br>3. Retaining Wall – Stone masonry<br>4. Retaining Wall - RCC<br>5. Road Work | -<br><br>60<br>80<br>0                        | 100<br><br>60<br>80<br>0 | No Further change                    | Effective monitoring and application of EMP                | No risk  | Completed<br><br><br>Completed |
| c        | <b><u>Construction of R.C.C</u></b>                            | 1. Dismantling of P.S Tank  | 20  | 100                      | No Further change                    | Effective monitoring                                       | No risk  | Completed                      |

|          |   |  |                   |                    |                   |   |         |              |
|----------|---|--|-------------------|--------------------|-------------------|---|---------|--------------|
|          | <b><u>Tank</u></b><br>Zemabawk  | 2. Compacting of foundation<br>3. Retaining Wall – RCC   | 80<br>15          | 80<br>15           |                   | and application of EMP                      |         |              |
| d        | <b><u>Construction of R.C.C Tank</u></b><br>Bawngkawn                         | 1. Dismantling of P.S Tank<br>2. Dismantling of foundation<br>3. Retaining Wall – RCC<br>4. Road Work                  | 0<br>0<br>0<br>25 | 0<br>0<br>0<br>100 | No Further change | Effective monitoring and application of EMP | No risk | Completed    |
| e        | <b><u>Construction of R.C.C Tank</u></b><br>Armed Veng                        | 1. Dismantling of P.S Tank<br>2. Retaining Wall  | 0<br>0            | 0<br>0             | --                | ---   | ----    |              |
| f        | <b><u>Construction of R.C.C Tank</u></b><br>Tlangnuam                         | 1. Dismantling of P.S Tank<br>2. Dismantling of foundation<br>3. Retaining Wall – RCC<br>4. Road Work (Retaining Wall) | 0<br>0<br>0<br>25 | 0<br>0<br>0<br>25  | No Further change | Effective monitoring and application of EMP | No risk |              |
| g        | <b><u>Construction of R.C.C Tank</u></b><br>Luangmual                         | 1. Dismantling of P.S Tank<br>2. Dismantling of foundation<br>3. Retaining Wall – Stone Masonry                        | 80<br>0<br>0      | 80<br>0<br>0       | No Further change | Effective monitoring and application of EMP | No risk | Just started |
| (2)<br>a | <b><u>Construction of Staff Quarters</u></b><br>7 Day Tlang                   |  | 20                | 65                 | No Further change | Effective monitoring and application of EMP | No risk |              |
| b        | Tlangnuam   |  | -                 | -                  | --                | ---   | --      |              |
| c        | Bawngkawn   |  | -                 | -                  | --                | --  | --      |              |
| (3)<br>a | <b><u>Construction of Site Office</u></b><br>Armed Veng                       |  | -                 | -                  | --                | ---   | ---     |              |
| b        | Extra Works of Temporary Site Office at 7Day Tlang                            |  |                   | 100                | No Further change | Effective monitoring and application of EMP | No risk | Completed    |
| (4)<br>a | <b><u>Chlorinator Room Construction</u></b><br>Main Reservoir (Tuikhuahtlang) |  | -                 | 95                 | No Further change | Effective monitoring and application of EMP | No risk |              |
| b        | Chanmari  |  | -                 | 95                 | No Further        | Effective                                   | No risk |              |



|  |              |  |  |  |        |                                   |  |  |
|--|--------------|--|--|--|--------|-----------------------------------|--|--|
|  | Booster Pump |  |  |  | change | monitoring and application of EMP |  |  |
|--|--------------|--|--|--|--------|-----------------------------------|--|--|

7. Monitoring and reporting on Environmental and Social safeguard have been started. At present no as such adverse effect of project activities on social and environmental components

### III. ENVIRONMENTAL PROCEDURE REVIEW

#### A. Environmental Legal Requirements

8. **Annexure 1** lists those Acts; Rules, Policies and Regulations currently in force in India and deal with environmental issues that could apply to infrastructure development. However, because of the relatively minor negative impacts of most of the types of the subproject likely to be developed under NERCCDIP, it is expected that most subproject should not fall within the scope of these legal instruments (Except Solid Waste Management Facility Project). Subprojects and activities that will need to comply with certain laws are:

- Any components that require the acquisition of forest land;
- Any construction activities located in areas covered by any special Notification;
- Water Treatment Plants (WTP) and Sewage Treatment Plants (STP);
- Composting and landfill facilities;
- Common waste management facilities, including composting, landfills, transfer stations;
- Common waste management facilities within 10 km of the boundary of protected areas (such as National Parks, Sanctuaries, Notified areas and Biosphere Reserves);
- Mobile diesel generators

9. The specific requirements to ensure compliance by these components and subprojects are shown in **Table 2**.

Table 2: Action Required Ensuring Subprojects Comply with National Environmental Laws

| Component   | Applicable Legislation   | Compliance  | Action Required   |
|---|--|---|---|
| 1. All components that require acquisition of forest land       | Forest (Conservation) Act 1980; Wildlife (protection) Act 1972 | Approval from Ministry of Environment and Forests (MoEF)                  | Identify non- forest land and formulate an afforestation program  |
| 2. Water Treatment Plant (WTP) and Sewage Treatment Plant (STP) | Water (Prevention and Control of Pollution) Act 1974           | Consent for Establishment (CFE) and Consent for Operation (CFO) from MPCB | Based on project review and site inspection MPCB provides CFE before construction, and stipulate the disposal standards to be met during operation. After completion of construction, CFO is issued confirming compliance with the CFE conditions, if any |
|   |  | Renewal of CFO during operation (STP)                                     | Based on the performance of the STP and its compliance with the disposal standards CFO is renewed every year  |
| 3. All composting and landfill facilities                       | Municipal Solid Wastes (Management and handing) Rules 2000     | Authorization of proposed site by MPCB                                    | Authorization is issued based on land use in and around the site and  |

| Component   | Applicable Legislation   | Compliance   | Action Required   |
|---|--|--|---|
|   |  |  | groundwater condition   |
|   | Water (Prevention and Control of Pollution ) Act 1974; Air(Prevention and Control of Pollution ) Act 1981        | CFE and CFO from Mizoram State Pollution Control Board( MPCB )   | Same as for STPs (above)  |
| 4. Common waste management facilities including composting, landfills and transfer stations   | Environment (Protection) Act 1986: Environmental Impact Assessment Notification 2006, amended in 2009 Category B | Requires environmental clearance from State Environment impact Assessment Authority (SEIAA). In state where State Environmental Impact Assessment Authority is not constituted, Environmental Clearance will be required from MoEF, Gol. | Based on preliminary information and site visits, if required, project will be categorized as B1 or B2. B1 projects require EIA study for approval. |
| 5. Common waste management facilities within or 10 km outside the boundary of protected areas such as National Parks, Sanctuaries, Notified Areas and Biosphere Reserve | Environmental Impact Assessment Notification, 2006 Category A  | Requires environmental clearance from Ministry of Environment and Forests (MoEF) Government of India.  | Conduct EIA study Category A and B1 projects require public consultation as part of EIA   |
| 6. Mobile diesel generators   | Air (Prevention and Control of Pollution ) Act 1981  | CFE and CFO from Mizoram State Pollution Control Board( MPCB )   | CFO renewal every year based on performance   |

## B. Compliance with Environmental Regulations

10. **Table 3** below shows present clearance status for different sub-projects under **Tranche -1**. As per the present status consent to establish obtained for all the running sub-projects under Tranche-1

**Table 3: Present Status of Environment & Forest and Other Clearances (upto 30<sup>th</sup> September, 2010) - Project 1**

| Town          | Work (Package No.)  | Applicable Legislation/ Type of clearance  | Clearance given by and date | Subject / Issue | Remarks/ Action needed |
|---------------|---|--|-----------------------------|-----------------|------------------------|
| Aizawl (Tr-1) | Construction of 7 (Replacement) Ground level of RCC Zonal Tank, 3 staff/Chowkidar Quarters, 1 Site Office and 2 Chlorinators. (Contract No. OHT/WS/AIZ/NCB-3) | <b>Water (Prevention and Control of Pollution) Act. 1974/</b><br><b>Proposed works do not required consent to establish and consent to operate.</b><br>Consent to establish and Consent to operate is required for WTP from Pollution Control Board but in this case of Subproject of Tranche-1. WTP is not proposed. WTP is already in operation since long time and its operation & maintenance is in hand of PHE Department | <b>Not required</b>         | NA              | <b>Not required</b>    |

## C. Compliance of Environmental Loan Covenants

11. The status of compliance of ADB's major Environmental Loan Covenants shown below:

| Project Specific Covenants  | Status / Issues   |
|---|---|
| <b>Environmental</b>  |   |
| 1. The EA shall ensure that: (LA Sched 5 Para 13)<br>(a) the project is carried out and all subproject facilities designed, constructed, operated, maintained, and monitored in compliances with the environmental law and regulations of the Borrower, the state, ADB's Environmental Policy (2002, 2009), and the EARF;   | Under compliance in accordance with ADB Environmental Policy and Environmental Assessment Guidelines  |
| 2. (b) Subproject encroaching any National Park or its buffer zone shall not be included in the Project; however, Subproject in or close to the wildlife sanctuary or any other environmentally sensitive area may be allowed subject to the EA obtaining all statutory clearances;   | No as such encroachment recorded till date.<br>If it happens in future, environmental clearance will be taken up as per Govt. procedure   |
| 3 (c) an IEE as required, including an EMP with budget identifying the cost of its implementation as incorporated in the related bid document if any, when adequate public consultation for each sub-project, in accordance with the EARF shall be submitted to ADB for review and approval before award of related contract. In case of any EIA or SIEE for sub-project classified as A or B sensitive, this shall be subject to the 120 day public disclosure requirement under ADB's Environmental Policy (2002, 2009) | IEE report has been prepared by PPTA consultant for sub-project where EMP, budget for application of EMP and issues of public consultation are incorporated.<br>Review and updation of IEE report is being carried out for Tranche-2 Subprojects.<br>Budget and EMP components will be incorporated in the bid document<br>All the reports approved by ADB.<br>At present all the sub-projects are classified as non-sensitive class B (only IEE will be required except Solid Waste Management facility and for which EIA study is in progress)<br><br>As per National rules EIA will be required for landfill site handling more than 50 MT/day municipal solid waste |
| 4 (d) all mitigation measures identified in the IEE, SIEE, EIA or SEIA and the related EMP, as applicable, for each sub-project, shall be incorporated in sub-project design, and carried out during construction, and O & M, and disclosed to the stakeholders;  | Under compliance: IEE screening of potential environmental impact and mitigation measures applied according to project location, specific sector development and associated design requirements.<br><br>EMP's prepared and regularly monitored for compliance of stated mitigation measures.<br><br>During construction process within the town consultation with local communities on environmental issues are considered  |
| 5 (e) if there are any changes in specific locations or alignments of any sub-project facilities after completion of the process of IEE (or EIA) or due to detailed design or implementation that has an impact on the environmental assessment carried out thus far, then additional environmental assessment shall be carried out in accordance with ADB's Environmental Policy (2002, 2009) and the EARF, and prior approval of ADB obtained before further physical implementation of the sub-project;                | In case of any major change of locations, EMP will be revised for Tranche-1 sub-projects. Till date no change is expected in tranche-1sub-project.<br><br>For minor change in location of project facilities EMP will be revised for monitoring purpose   |
| 6 (f) all environmental clearances required by applicable laws, and regulations at Borrower, State, or local levels shall be obtained in a timely manner, prior to commencement of civil works for the relevant subproject  | In tranche -1 sub-project no clearance is required.   |

| Project Specific Covenants  | Status / Issues  |
|---|--|
| 7 (g) semi-annual progress reports on the implementation of the EMPs, measures under the IEE/EIA, and the environmental monitoring shall be carried out as a part of the project. Implementation for review and disclosure in accordance with ADB's Public Communications Policy (2005) | Quarterly progress report on application of EMP is being prepared regularly<br>Field monitoring continued as per monitoring plan<br>During construction process within the town consultation with local communities on environmental issues has already initiated and continued in most of the locations |

#### **D. Environmental Organization and Management**

12. Environmental issues of the project coordinated by an Environmental Specialist within the SIPMIU/DSMC, who ensures that all subprojects, comply with environmental safeguards. An Environmental Monitoring Specialist (EMS) who is part of the DSMC team implement the Environmental Monitoring Plan from each IEE to ensure that mitigation measures are provided and protect the environment as intended. **Figure 1** shows institutional responsibility for implementation of environmental safeguard monitoring at different level.

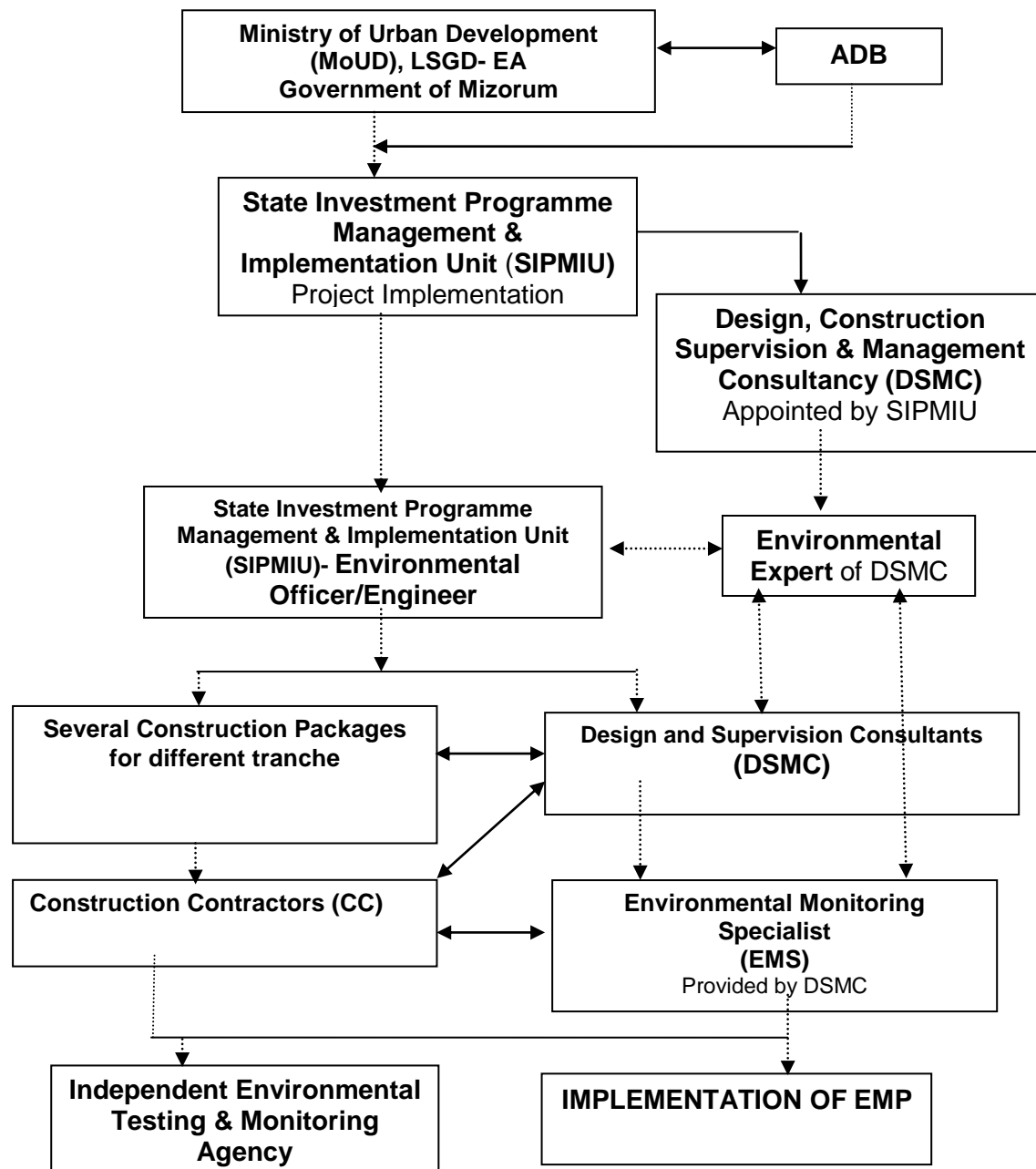
13. EMP shows that most of the mitigation activities are the responsibility of the Construction Contractors (CC) employed to build the infrastructure during the construction stage or the O&M Contractors employed to conduct maintenance or repair work when the system is operating. Responsibility for the relevant measures assigned to the Contractors via the contracts through which they are appointed, so they legally required taking the necessary action. There are also some actions that need to be taken by SIPMIU in their role as project proponent, and some actions related to the design that would be implemented by the DSMC.

14. A program of monitoring would be conducted to ensure that all parties take the specified action to provide the required mitigation, to assess whether the action has adequately protected the environment, and to determine whether any additional measures may be necessary. This would be conducted by a qualified Environmental Monitoring Specialist (EMS) from the DSMC. The EMS responsible for all monitoring activities and reporting the results and conclusions to the SIPMIU, and recommend remedial action if measures are not being provided or are not protecting the environment effectively. The EMS may be assisted by environmental specialist in particular technical fields, and junior or medium-level engineers who can make many of the routine observations on site. Post-construction monitoring will be conducted by the relevant Government Agency (GA) to whom responsibility for the infrastructure will pass once it begins to operate<sup>1</sup>.

15. EMP shows that most of the mitigation measures are fairly standard methods of minimizing disturbance from building in urban areas (maintaining access, planning work to avoid sensitive times, finding uses for waste material, etc), and experienced Contractors should be familiar with most of the requirements. Monitoring of such measures normally involves making observations in the course of site visits, although some require more formal checking of records and other aspects. There are also be some surveys of residents, as most of the measures are aimed at preventing impacts on people and the human environment.

<sup>1</sup> In the operational period some infrastructure will be the responsibility of the Municipal Boards/Councils, whilst others will be the responsibility of the appropriate branch of the State government (such as PWD, PHED, etc)

**Figure 1: Institutional Responsibility- Environmental  
Organisation SIPMIU**



#### IV. IMPLEMENTATION STATUS OF MITIGATION MEASURES

16. At present there are **1 sub-project having 3 components in Tranche-1** i.e Construction of 7 numbers of RCC Tanks, Installation of 2 Numbers of chlorinators with chlorinators room and installation of 13000 numbers of water meter and work is already awarded to the contractors. Field activities are ongoing for sub-project of tranche-1 as per EMP. The detail mitigation measures against impacts on air, water, soil environment and safety aspects are shown in **Annexure 2**. Overall compliance status of EMP application and actions needed are discussed below and shown in **Table 4**.

17. For implementation of EMP, arrangement of human safety, provision of PPE for workers engaged in construction is being implemented. Training is being provided to the contractor; DSMC's monitoring specialist and SIPMIU representative on environmental safeguard requirement. Moreover instruction is given to contractors to follow the specified clause of BID document to mitigate environmental and social impacts.

18. **Annexure 3** shows the instruction sheet for the contractor on application of EMP.

19. "Pollution under Control certificate" (PUC) for the vehicles engaged in construction work has not been obtained.

Table 4 : Compliance Status with Environmental Management and Monitoring Plans as stipulated in the Environmental Documentation – Tranche 1

| Sites  | Name of Sub Project   | EMP being Implemented<br>(Yes / No) | Overall Status of EMP Implementation<br>(Excellent/Satisfactory/Partially Satisfactory/Below Satisfaction/Poor/Very Poor) | Actions Proposed or continued/Additional Corrective Measures Required  |
|--------|---|-------------------------------------|---|--|
| Aizawl | Construction of 7 (Replacement) Ground level of RCC Zonal Tank, 3 staff/Chowkidar Quarters, 1 Site Office and 2 Chlorinators. (Contract No. OHT/WS/AIZ/NCB-3) | Yes                                 | Below Satisfactory  | <ul style="list-style-type: none"> <li>Continue Implementation of EMP through awareness and monitoring</li> <li>Complete utilisation of PPE</li> <li>Continue barricading, use of safety tape</li> <li>Complete Implementation of EMP through awareness and monitoring</li> <li>Continual awareness programs are required in order to implement better EMP</li> <li>Regular monitoring of the EMP should be done in order to analyze it's implementation</li> <li>Barricades should be used in order to prevent any mishap.</li> </ul> |

## V. ENVIRONMENTAL MONITORING AND EVALUATION

20. For effective monitoring, selected environmental parameters have been identified as indicators which may be qualitatively and quantitatively measured and compared over a period of time in order to assess/ensure the compliance of EMP. The environmental performance indicators are physical, biological and social characteristics identified as most important in affecting the environment at critical locations all along the sub-project corridors. The parameters identified as performance indicators are:

- Air, noise and water quality
- Compliance to EMP
- Compliance to local/state/national environmental regulations

21. Till date Air, Noise and Water quality test has not been carried out as construction work is started in Monsoon Season. Now it will be carried out as monsoon season is over.



## VI. MAJOR PROJECT ISSUES AND PROBLEMS

22. Field activity of the sub-project under Tranche-1 is under progress. Till date there are no major issues and problems arise at the project locations. But it is observed that workers engaged in construction work are not bearing proper PPE.

## VII. CONSULTATIONS AND RECOMMENDATIONS

23. For protection of local environment and health and safety of workers engaged during construction phase, application of mitigation measures started as per specified EMP. Public consultation during construction/implementation phase is being carried out. The general recommendations as per present observations are given in **Table 5**.

24. As per ADB's new safeguard policy the project authority will establish a mechanism to receive and facilitate resolution of affected persons' concerns, complaints and grievances about the project's environmental performance. **The grievances mechanism** should be scaled to the risks and adverse impacts of the project. It will be addressed affected peoples' concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all the affected people at no cost and without retribution. The affected people will be informed by appropriate mechanism.

25. During implementation process performance monitoring fact sheet will be prepared against each possible environmental impacts and which will be attached with the monitoring report.

Table 5: Recommendations and Suggestions

| S. No. | Issues                                  | Recommendations & Suggestions   |
|--------|---|---|
| 1      | Execution of works non-compliant to EMP | Effective implementation of Environmental Management Plan has to be ensured by Contractors where the present status is partial satisfactory<br>Environmental Safety Officers to be mobilized by Contractors for the sub-project tranche-1 to carry out the environmental monitoring, reporting and other related jobs which need an expert                            |
| 2      | Health and safety                       | It has been observed during site visit that workers engaged in construction works are not bearing proper PPE. It is suggested that implementing agency and contractor should insist workers to bear proper PPE.<br>It is also observed that most of the construction area is not demarcated. The construction area should be access controlled to avoid any accident. |
| 3      | Debris disposal                         | In some cases the proper debris disposal need to be carried out on designated location.   |

26. The action plan considered for satisfactory environmental compliance as per the present sub-project activities are given in **Table 6**.

Table 6: Action plan consider for Satisfactory Environmental Compliance

| Action   | To be taken by                | Time frame |
|--|-------------------------------|------------|
| Instruction to contractors and monitoring for <ul style="list-style-type: none"> <li>Proper disposal of debris and quick disposal of excavated/dismantling surplus earth/iron material</li> <li>Complete use of PPE</li> <li>Restoration/construction of approach road at</li> </ul> | SIPMIU, DSMC, and Contractors | Continuous |

| Action  | To be taken by                             | Time frame   |
|---|--|--|
| earliest<br>○ Camp site management<br>○ Water sprinkling at dry period<br>○ Collection of PUC certificate<br>○ Use of safety tape/ barricade/ caution board |  |  |
| Proper disinfection of water tank.  | Contractor,<br>SIPMIU, DSMC                | Before commissioning   |
| Public consultation during construction   | SIPMIU DSMC,s<br>Capacity building<br>team | Before start of construction<br>work and during construction at<br>regular interval. |
| Follow up action for departmental clearances/<br>consent  | SIPMIU                                     | At earliest  |

## ANNEXURE 1

The Government of India has formulated various policy guidelines; acts and regulations aimed at the sustenance of environment in general, which are briefly summarized and applicable acts with the projects, are described in the following sub-sections.

### Environmental Legislation and Pollution Control Acts

| Sl. No. | Sources                         | Legislation   |
|---------|---------------------------------|---|
| 1       | Water Pollution                 | The Water (Prevention and Control of Pollution) Act, 1974, as amended in 1988   |
| 2       | Air Pollution                   | The Air (Prevention and Control of Pollution) Act, 1981, as amended by Amendment Act, 1987  |
| 3       | Noise Pollution                 | The Noise Pollution (Regulation and Control) Rules, 2000  |
| 4       | Environment                     | The Environment (Protection) Act, 1986  |
| 5       | Public Liability                | The Public Liability Insurance Act, 1991<br>The Public Liability Insurance Rules, 1991  |
| 6       | Hazardous Waste                 | <ul style="list-style-type: none"> <li>➤ Hazardous Waste (Management and Handling) Rules, 1989</li> <li>➤ Batteries (Management and Handling) Rules, 2001</li> <li>➤ Manufacture, Storage and Import of Hazardous Chemical Rules, 1989</li> <li>➤ Emergency Planning Preparedness and Response for Chemical Disasters Rules, 1995</li> <li>➤ Manufacturing, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Modified Engineered Organisms or Cell Rules, 1993</li> <li>➤ Hazardous Microorganisms and Genetically Modified Organisms (Manufacture, Use Import Export and Storage) Rules, 1999</li> <li>➤ Bio- Medical Waste (Management and Handling) Rules, 2000</li> </ul> |
| 7       | Municipal Solid Waste           | Municipal Solid Waste (Management and Handling) Rules, 2000<br>Recycled Plastics Manufacturing and Usage Rules, 1999  |
| 8       | EIA Notification                | The Ministry of Environment and Forests has revised the EIA notification, 1994, and issues the revised EIA notification on 14th September 2006  |
| 9       | Use and Management of Explosive | The Explosives Act, 1884 and The Explosives Rules, 1983   |

#### ○ **The Environment Protection act, 1986 and the EIA Notification, 1994**

The Environmental (Protection) Act, 1986 is the umbrella legislation providing for the protection of environment in the country. This Act provided for the Environment (Protection) Rules, which have been formulated under the act “The Environmental Impact Assessment Notification, 1994 and the Amendments / Revised EIA notification on 14<sup>th</sup> September 2006”.and Year 2009.

#### ○ **The Forest (Conservation) Act, 1980**

The Forest (Conservation) Act, 1980 pertains to the cases of diversion of forest area and felling of roadside plantation. Depending on the size of the tract to be cleared, clearances are applied for at the following levels in the governments:

- If the area of forests to be cleared or diverted exceeds 20 ha (or, 10ha in hilly area), the prior permission of the Central Government is required;

- If the area of forest to be cleared or diverted is between 5 to 20 ha, the Regional Office of Chief Conservator of Forests is empowered to approve;
  - If the area of forest to be cleared or diverted is below or equal to 5 ha, the State Government can give permission; and
  - If the area to be clear-felled has a forest density of more than 40%, permission to undertake any work is needed from the Central Government, irrespective of the area to be cleared.
- **The Wildlife (Protection) Act, 1972**

The Wildlife Protection Act has allowed the government to establish a number of National Parks and Sanctuaries over the past 25 years, to protect and conserve the flora and fauna of the state.

- **The Water and Air (Prevention and Control of Pollution) Acts 1974**

The water (Prevention and Control of Pollution) Act, 1974 resulted in the establishment of the Central and State level Pollution Control Boards whose responsibilities include managing water quality and effluent standards, as well as monitoring water quality, prosecuting offenders and issuing licenses for construction and operation of certain facilities. The SPCB is also empowered to set air quality standards and monitor and prosecute offenders under the air (Prevention and Control of Pollution) Act, 1981.

## ANNEXURE - 2

### Application of EMP (June to September 2010)

#### Aizwal Water Supply- Aizwal

|  |
|--|
| <b>Project:</b> Construction of 7 (Replacement) Ground level of RCC Zonal Tank, 3 staff/Chowkidar Quarters, 1 Site Office and 2 Chlorinators. (Contract No. OHT/WS/AIZ/NCB-3)<br><br><b>Contract No:</b> OHT/WS/AIZ/NCB-3<br><b>Tranche-</b> 1<br><b>Physical progress:</b> Overall physical progress of the package: --30 % upto 30.09.2010 |
|--|

| Sr. No.               | Environmental components related to project activities   | Compliance |    | Explanation (in case of done or not done justification necessary)  |
|-----------------------|--|------------|----|--|
| PRECONSTRUCTION STAGE |  |            |    |  |
|                       |  | YES        | NO |  |
| 1                     | Site preparation work completed by IPIU including necessary clearance  | NR         | -  | It is an up-gradation of existing system clearance is not required from the State Pollution Control board as the project does not fall under the EIA notification, 2006.   |
| CONSTRUCTION STAGE    |  |            |    |  |
| 2                     | Establishment of temporary camps with sanitary and solid waste management arrangement  | -          | NA | Preference has been given to local labor and Predominantly local labors are engaged in construction work so there is no need to construct big worker camp. Small site camp has been established mainly to keep construction equipments.  |
| 3                     | Removal of overburden and excavated/dismantling material from working site and use / preservation of the same – as per mitigation measures | YES        |    | The excavated soil (which is in very small quantity) and the overburden/dismantling material has been stock-piled on the nearby designated grounds which will then be used to refill the low lying areas in the proximity of the site.   |
| 4                     | Water sprinkling at construction site for arresting dust   | YES        |    | Manual watering is being carried out on regular basis to arrest the dust arisen from construction and excavation activities.   |
| 5                     | Materials carrying vehicle are covered   | YES        |    | Material carrying activities started and vehicles are covered.   |
| 6                     | All vehicles and equipments mobilized to construction site and producing emission, have Pollution Control Board certification              | Yes        |    | Large number of vehicles are not engaged few vehicles which are used in the mobilization activities to and fro from the construction site are PUC certified. Strict instructions have been given to the contractor to use only PUC certified vehicles. Instructions are given to the contractor for submission of PUC certificate as soon as possible. |
| 7                     | At sensitive locations enclosures provided around generator set and concrete mixture or other noise producing machinery                    | YES        |    | The noise producing machinery is provided with enclosures to reduce the intensity of noise affecting the environment and local people residing in nearby areas.  |
| 8                     | Regular maintenance of noise   | YES        |    | Regular maintenance of the equipments is   |

| Sr. No. | Environmental components related to project activities  | Compliance |    | Explanation (in case of done or not done justification necessary)   |
|---------|---|------------|----|---|
|         | producing equipment done  |            |    | being done. Oiling of the equipments is being done as per the requirement.  |
| 9       | Arrangement of drainage of waste water and arresting solid waste from waste water generated at construction site            |            | NA | Generation waste water at construction site is very less however, Instruction has been given to the contractor and contractor is ready to make the arrangement soon.  |
| 10      | Felling of trees done (if necessary) with mitigation measures i.e. planting of three trees for each tree fell.              | -          | NA | No trees have been removed from construction site and the same is not required also as no tree is coming in the construction line.  |
| 11      | Chances of water bodies pollution from construction   |            | NA | No such condition exist at site   |
| 12      | Drainage crossing National Highways and railways - done without any disturbance through construction of culvert etc.        |            | NA | Such item is not applicable as all the construction work is within the urban periphery of Aizwal Town.  |
| 13      | Disposal of construction debris if any as per mitigation measures done  | YES        |    | No debris produced at site. The overburdens and excavated earths are being utilized for backfilling and leveling of undulated grounds nearby the construction site.   |
| 14      | Local flooding from watering of excavation, flushing pipes etc.   |            | NA | Local flooding from watering of excavation, flushing pipes etc. will not take place. Water logging is also not expected due to its natural topography during heavy rains.   |
| 15      | Ensure use of Personal Protective Equipment like helmet, gumboot, gloves, safety tape, nose musk and earplugs at work place | YES        |    | The Contractor has ensured usage of protective equipments like helmet, gloves gumboots etc by labors at the site.   |
| 16      | Provide Health and Safety training to all personnel and implement H & S plan  | YES        |    | The Health and safety training has been imparted to the Contractor who in turn has provided the same to the local labors also. It is instructed to the contractor to ensure the implementation of the H&S plan strictly.                          |
| 17      | Plan truck routes to avoid Town, narrow or congested roads, important or fragile buildings, religious and tourist sites     | YES        |    | The transportation activities are carried out during lean hours. The routes are selected in such a way that their movement does not hamper the daily traffic.   |
| 18      | Plan transport of waste to avoid peak traffic and tourist season  | YES        |    | Transportation of waste material is being done during lean hours.   |
| 19      | Suitable short term traffic diversion and implementation of traffic management plan at construction site                    |            | NA | The work is being carried out at existing Water Tank after dismantling the old one in such a way that the daily traffic routes are not affected. Any diversion of traffic is required.  |
| 20      | Consideration of public safety - as per prescribed mitigation measures  | YES        |    | Necessary safety measures are being adopted. Barricading & safety tapes are being used. Boards are placed at appropriate location indicating "Work at progress". Strict instructions have been given to the contractor to maintain public safety. |
| 21      | Employ at least 50% of workforce from communities near sites  | YES        |    | Most of the labors engaged in construction work/ other related work has been hired from the nearby areas.   |

| Sr. No. | Environmental components related to project activities          | Compliance | Explanation (in case of done or not done justification necessary)          |
|---------|---|------------|--|
| 22      | Continuous monitoring on implementation of mitigation measures. | YES        | Regular monitoring on implementation of mitigation measures is being done. |

NA- Not applicable, NR- Not required

## ANNEXURE 3

### Instructions for Contractor- Environmental Safeguard

- Setting up camp office with proper sanitation condition, solid waste management facility and sufficient drinking water supply. Non cutting of trees during setting up camp
- Removal / disposal of overburden earth/ stone materials at earliest without any accumulation at working sites
- Proper disposal of other construction waste
- Proper storage of construction materials
- Requirement of blasting permission with specification of blasting time as if required
- Filling up trenches and open excavated part before monsoon
- Felling of trees if done to be compensated by plantation
- Scheduling of work without any social impact – movement of pedestrian (particularly during tourist/ festive seasons) or other disturbances etc.
- Regular water sprinkling at construction site (when it required)
- Covering of materials carrying vehicles
- Personnel safety of workforce – use of ear plugs, nose musk, safety belt, helmet, gloves, gumboots etc at working sites
- Instruction to material supplier/ contractor to arrange pollution under control certificate for material carrying vehicles
- Regular maintenance of noise producing machinery
- Providing enclosure for noise producing equipment like generator, concrete mixture etc
- Implementation of traffic diversion measures including use of safety tape/ barricade/ caution board at working sites
- Proper drainage of waste water/ rain water from working sites
- Arrangement of common medicine and First Aid box at camp site
- Awareness program on HIV/AIDS



## ANNEXURE 4

### Testing parameters

#### Air Quality

- Air pollution monitoring – for STP- 2 locations nearby STP site for 4 days 24 hrs. for SPM, RSPM, SO<sub>2</sub>, NO<sub>x</sub> and CO
- Air pollution monitoring – for Bridge - 2 locations nearby bridge site for 3 days 24 hrs. for SPM, RSPM, SO<sub>2</sub>, NO<sub>x</sub> and CO
- Air pollution monitoring – for Landfill - 4 locations (one at center and rest at 3 locations 120 degree apart) for 3 days 24 hrs. for SPM, RSPM, SO<sub>2</sub>, NO<sub>x</sub> and CO

#### Noise Level

- Noise level monitoring at 3 nearby locations for one time in six months- in case of STP
- Noise level monitoring at 5 nearby locations for one time in six months- in case of Bridge
- Noise level monitoring at 4 nearby locations (preferably near air quality measuring sites) for one time in six months- in case of Landfill site

#### Water Quality

- Surface water quality- Atleast 2 surface water quality (pond, river, *nala*) samples in and around STP (if location exist)

| Parameter                                |
|--|
| Turbidity NTU                            |
| pH                                       |
| Total Suspended Solid mg/l               |
| Total Dissolved Solid mg/l               |
| Total Hardness as CaCO <sub>3</sub> mg/l |
| Dissolved Oxygen mg/l                    |
| Biological Oxygen Demand mg/l            |
| Chemical Oxygen Demand mg/l              |
| Chloride mg/l                            |
| Sulphate mg/l                            |
| Nitrate mg/l                             |
| Sodium mg/l                              |
| Potassium mg/l                           |
| Calcium mg/l                             |
| Magnesium mg/l                           |
| Iron mg/l                                |
| Manganese mg/l                           |
| Cadmium mg/l                             |
| Arsenic mg/l                             |
| Chromium mg/l                            |
| Copper mg/l                              |
| Mercury mg/l                             |
| Lead mg/l                                |
| Selenium mg/l                            |
| Aluminium mg/l                           |
| Zinc mg/l                                |
| Boron mg/l                               |
| Fluorine mg/l                            |

| Parameter                     |
|-------------------------------|
| Chlorine (residual free) mg/l |
| Phenolic Compound mg/l        |
| Cyanide mg/l                  |
| Phosphate mg/l                |

- Surface water quality- Atleast 2 surface water quality (upstream and down stream) for each river bridge
- Surface water quality- Atleast 2 surface water quality (pond, river, *nala*) samples in and around Landfill site (if location exist)
- Ground water quality – Atleast 3 ground water samples near landfill for the following parameters,

| Parameters                               |
|--|
| pH                                       |
| Total Dissolved Solid mg/l               |
| Total Hardness as CaCO <sub>3</sub> mg/l |
| Alkalinity as mg/l                       |
| Dissolved Oxygen mg/l                    |
| Chloride mg/l                            |
| Sulphate mg/l                            |
| Nitrate mg/l                             |
| Iron mg/l                                |
| Manganese mg/l                           |
| Cadmium mg/l                             |
| Arsenic mg/l                             |
| Chromium mg/l                            |
| Copper mg/l                              |
| Mercury mg/l                             |
| Lead mg/l                                |
| Zinc mg/l                                |
| Fluoride mg/l                            |
| Phenolic Compound mg/l                   |
| Phosphate mg/l                           |