

**Third Annual Monitoring Report to the Board of Directors**  
**on the**  
**Implementation of Remedial Actions**  
**for the**  
**Mundra Ultra Mega Power Project**  
**in India**  
**(Asian Development Bank Loan 2419)**

**4 September 2018**

## **ACKNOWLEDGMENTS**

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## ABBREVIATIONS

ADB	–	Asian Development Bank
AMP	–	Accountability Mechanism Policy
CGPL	–	Coastal Gujarat Power Limited
LIP	–	Livelihood Improvement Plan
NIO	–	National Institute of Oceanography
RAP	–	remedial action plan

## WEIGHTS AND MEASURES

°C	–	degree Celsius
km	–	kilometer
MW	–	megawatt
PM <sub>10</sub>	–	(respirable) particulate matter less than or equal to 10 microns

## NOTE

Rs.	–	Indian rupee
\$	–	United States dollar

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

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## I. INTRODUCTION

1. A request for compliance review of Loan 2419-IND: Mundra Ultra Mega Power Project in India (Project) was filed by three individuals, one of whom was representing a group of fisherfolk affected by the Project on 17 October 2013. The ADB Board of Directors (Board) authorized the Compliance Review Panel (CRP) on 17 January 2014 to conduct a compliance review of the Project. The CRP submitted its Final Report on the compliance review to the Board in March 2015.<sup>1</sup> The compliance review was conducted in accordance with the 2012 Accountability Mechanism Policy (AMP).<sup>2</sup>

2. In response to the findings of noncompliance with the Safeguard Policy Statement (Environment) and Public Communications Policy (PCP), the Private Sector Operations Department (PSOD), the operations department responsible for the Project, prepared a set of remedial actions that was sent to the CRP on 27 May 2015. This Remedial Action Plan (RAP) provides for measures to bring the Project into compliance with ADB's operational policies and procedures. The RAP was approved by the Board on 24 June 2015.<sup>3</sup>

3. This is the third annual monitoring report of the CRP on the implementation of remedial actions for this Project. According to para. 192 of the AMP, the CRP will monitor the implementation by ADB Management of any Board-approved remedial actions relating to a complaint, to ensure that a project is brought into compliance with ADB's operational policies and procedures. Unless otherwise specified by the Board, the CRP will monitor the implementation of the remedial actions annually for up to 3 years from the Board decision on the RAP. The CRP monitors the actions of ADB Management. It does not monitor the actions of the borrower or implementing agency of the project.

## II. DESCRIPTION OF THE PROJECT

4. The Project is a coal-fired power plant which uses supercritical technology and has a total production capacity of 4,000 megawatts (MW). It was constructed on a build–own–operate basis near Tunda and Vandh villages in Mundra Taluka, Kutch district, Gujarat, India. The power plant has five 800 MW units. The total project cost amounts to about \$4.14 billion of which \$450 million was a loan by Coastal Gujarat Power Limited (CGPL) from ADB's ordinary capital resources without government guarantee.<sup>4</sup> Of that amount, \$200 million is a syndicated loan provided together with the Export–Import Bank of Korea (Korea Eximbank) under a risk participation agreement. The private sector loan was approved by the ADB Board on 17 April 2008. A total of \$351.18 million had been disbursed to CGPL under the amount committed for ADB Loan 2419. Additional financing for the Project has come from the International Finance Corporation (IFC), Korea Eximbank, and local banks.

5. The Project is 1.5 kilometers (km) away from the coast of the Gulf of Kutch, which has often been described as an “ecological miracle” because of its shallow waters, intertidal zones,

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<sup>1</sup> Compliance Review Panel (CRP). 2015. Final Report on Compliance Review Panel Request No. 2013/1 on the Mundra Ultra Mega Power Project in India (Asian Development Bank Loan 2419), 9 March 2015, available at [https://lnadbg4.adb.org/dir0035p.nsf/attachments/Mundra-CRPFinalReport-7Apr2015.pdf/\\$FILE/Mundra-CRPFinalReport-7Apr2015.pdf](https://lnadbg4.adb.org/dir0035p.nsf/attachments/Mundra-CRPFinalReport-7Apr2015.pdf/$FILE/Mundra-CRPFinalReport-7Apr2015.pdf).

<sup>2</sup> Asian Development Bank (ADB). 2012. *Accountability Mechanism Policy*. Manila

<sup>3</sup> ADB. Proposed Remedial Action Plan: India: Mundra Ultra Mega Power Project, also available at [https://lnadbg4.adb.org/dir0035p.nsf/attachments/R4415%20\(as%20posted%203%20July%202015\).pdf/\\$FILE/R44-15%20\(as%20posted%203%20July%202015\).pdf](https://lnadbg4.adb.org/dir0035p.nsf/attachments/R4415%20(as%20posted%203%20July%202015).pdf/$FILE/R44-15%20(as%20posted%203%20July%202015).pdf)

<sup>4</sup> ADB Private Sector (Nonsovereign) Loan No. 2419: Mundra Ultra Mega Power Project with approval number 7276. Details of this project are at [http://adb.org/projects/details?proj\\_id=41946-014&page=overview](http://adb.org/projects/details?proj_id=41946-014&page=overview).

stretch of mangrove forests, and corals.<sup>5</sup> More recently, the coastal zone along the Gulf has developed into an area of rapid industrialization. Between 2007 and 2012, the Ministry of Environment and Forests (MoEF) issued environmental clearances for 19,181 MW power plant capacity.<sup>6</sup> In addition, numerous clearances have been provided for the expansion of ports in Gujarat. It has been argued that these developments, taken together, could have “huge adverse impacts on the environment and also on the livelihood of fishing communities.”<sup>7</sup> The industrialization has received widespread international attention because of its perceived detrimental impact on the environment in the Gulf of Kutch.<sup>8</sup>

6. The CGPL plant was constructed near Tunda and Vandh villages, on land used for pasture of the villagers’ livestock and about 2 km away from the Adani coal power plant. Commencing operation from 2009 to 2012, the Adani plant has a full operational capacity of 4,620 MW and does not use supercritical technology. With the proximity of the CGPL plant to the Adani plant, attribution of environmental impacts to one of the two plants is sometimes difficult. The CGPL plant uses the West port of the Adani port to unload its coal and also uses the intake channel, which is owned and operated by the Adani coal power plant, for the intake of cooling water.

### III. COMPLIANCE REVIEW AND REMEDIAL ACTION PLAN

7. The request for compliance review was sent to the CRP by (i) Bharat Patel, representing at least 12 project affected persons;<sup>9</sup> (ii) Gajendrasinh Bhimaji Jadeja, a farmer; and (iii) Harun Salemamad Kara, a fish trader. The complaint listed the harm allegedly done by the Project to the affected persons’ livelihood, health, and environment, and attributed it to ADB’s failure to adhere to its environmental and social policies and procedures.

8. In its report on the compliance review,<sup>10</sup> the CRP detailed its findings on inadequate consultation; inadequate identification of project affected persons; negative impacts on the livelihood of foot fishers as a result of discharging water with elevated temperature through the outflow channel and due to alterations made to the Modhva creek where the outflow channel was constructed; restriction of access to fishing grounds; coal dust and fly ash pollution; and health impacts due to degradation of ambient air quality. Also, the CRP report noted that there was dilution taking place in order to meet the required water quality levels in the outflow channel. The CRP noted the absence of adequate baseline data which made it difficult to establish the extent of harm resulting from the Project as the pre-project situation had not been appropriately established. The CRP found noncompliance with the following ADB operational policies and procedures:

- (i) OM Section F1: Environmental Considerations in ADB Operations (issued on 25 September 2006);

<sup>5</sup> Asher, Manshi. 2008. *How Mundra Became India’s Rotterdam*. InfoChange, December; and Fishmarc and Kutch Nav Nirman Abhiyan (with support from the Foundation for Ecological Security); 2010. *Kutch Coast: People, Environment & Livelihoods*. Draft report for discussion at a workshop in Kutch on 7–8 January 2010. India.

<sup>6</sup> Ministry of Environment and Forests (MoEF). 2013. *Report of the Committee for Inspection of M/s Adani Port & SEZ Ltd. Mundra, Gujarat, April*. *Kutch Coast: People, Environment & Livelihoods*. pp. 73–74. New Delhi.

<sup>7</sup> Footnote 6, p. 74.

<sup>8</sup> Footnote 6.

<sup>9</sup> B. Patel submitted to the CRP on 20 January 2014 a list of affected persons whom he said he was representing. The letter contained references to MASS and B. Patel’s position as general secretary. The president and the vice-president of MASS subsequently informed the CRP that MASS did not wish B. Patel to represent the association in this complaint. Accordingly, on 23 June 2014, the CRP accepted B. Patel as personal representative for the project-affected people for whom he presented authorization on 20 January 2014.

<sup>10</sup> Footnote 1.

- (ii) OM Section F2: Involuntary Resettlement (issued on 25 September 2006);
- (iii) OM Section L3: Public Communications Policy (issued on 1 September 2005); and
- (iv) OM Section C3: Incorporation of Social Dimensions into ADB Operations (25 April 2007)

9. Following the CRP's findings, ADB Management presented a RAP which listed measures which would bring the Project into compliance with ADB's operational policies and procedures. (See Appendix 1.)

10. In its compliance review report, the CRP found harm resulting from fly ash and coal dust pollution in Vandh village, a community located immediately adjacent to the CGPL plant and also located near the Adani plant. But the CRP also found that ADB staff had paid careful attention to the implementation of mitigation measures to reduce coal dust and fly ash pollution in Vandh village. The CRP was thus of the view that ADB had exercised due diligence and acted in accordance with para. 67 of the ADB Environment Policy, which calls for the implementation of mitigation measures if unanticipated environmental impacts become apparent during project implementation.<sup>11</sup> As these mitigation measures were already underway and continue to be implemented, these measures are not part of the RAP. They are thus not monitored by the CRP but supervised by ADB staff under its regular supervision procedures.

11. As inadequate baseline data was collected during project preparation, the RAP provides for numerous studies to establish the impacts of the Project. The RAP provides that the CRP review these studies and provide comments. Based on the findings of the studies, agreements are then reached on what measures are to be taken to address the impacts. The very heavy emphasis on studies in the RAP was necessary as the absence of adequate baseline data made it impossible to specify the actions to address the impacts without further studies.

#### **IV. RESULTS OF THE PREVIOUS MONITORING OF THE REMEDIAL ACTION PLAN**

12. In its second monitoring report to the Board of 15 August 2017, the CRP noted that during the second year of implementation of the RAP, progress has been made in the implementation of several action items of the Board-approved RAP.<sup>12</sup> The CRP noted the active engagement of ADB staff in supporting CGPL in the implementation of these actions. The CRP was particularly pleased about the progress made in the preparation of the Livelihood Improvement Plan (LIP) for the 24 identified *pagadiyas* (foot fishers) and noted the thorough efforts made by ADB staff concerned in conducting the access survey. However, the CRP also noted important outstanding measures still to be completed. The second CRP annual monitoring report found RAP actions no. 1, 2, and 5 in partial compliance; RAP Action No. 3 was closed; and found full compliance with RAP action no. 4.

#### **V. RESULTS OF THE THIRD MONITORING OF THE REMEDIAL ACTION PLAN**

13. For this third annual monitoring report, the CRP conducted a mission from 4-5 July 2018 to India. It met with CGPL management and staff; with a group of *pagadiyas* included under the LIP; and with NGOs engaged in providing support to *pagadiyas* and fisherfolks fishing at the

<sup>11</sup> Footnote 10, para.103.

<sup>12</sup> CRP. 2nd Monitoring Report of the Compliance Review Panel on IND: Mundra Ultra Mega Power Project. August 2017 available at [https://lnadbg4.adb.org/dir0035p.nsf/attachments/Final-Mundra-2ndMonitoringReport-ForWeb.pdf/\\$FILE/Final-Mundra-2ndMonitoringReport-ForWeb.pdf](https://lnadbg4.adb.org/dir0035p.nsf/attachments/Final-Mundra-2ndMonitoringReport-ForWeb.pdf/$FILE/Final-Mundra-2ndMonitoringReport-ForWeb.pdf).

Tragadi *bander*.<sup>13</sup> The CRP also met with the Village Development Advisory Committees of Modva and Tragadi villages, which are charged with the implementation of the LIP for *pagadiyas*. A representative of the NGO, which provides support for the implementation of the LIP also attended the meeting with the *pagadiyas*. In preparation for the monitoring mission, the CRP reviewed quarterly progress reports submitted by ADB Management on the implementation of the RAP, supervision documents and all technical studies prepared under the RAP and conducted telephone consultations with the ADB staff and management engaged in the supervision of the RAP. During its monitoring mission, the CRP was not able to meet with the complainants. The CRP had arranged for a meeting with the complainants, but the complainants did not participate in the agreed meeting. The monitoring mission was led by Artraud Hartmann, CRP member and lead for this monitoring,<sup>14</sup> and Dingding Tang, CRP Chair. Josefina Miranda, Senior Compliance Review Officer from the Office of the Compliance Review Panel (OCR) provided logistical support. A list of persons met by the CRP during its mission is provided in Appendix 2.

14. The following describes the CRP's findings in its third year of monitoring of the implementation of the RAP and presents the CRP's comments, observations, and suggestions to ADB Management to bring the Project into compliance.

#### A. Disclosure of Information and Conduct of Consultations

**Status of Compliance:** At the time of this report, ADB is in partial compliance with this action.

**Management's Action Plan No. 1: Action to address ADB's noncompliance in relation to CRP's findings on disclosure of information and conduct of consultations<sup>1</sup>**

Inclusive and transparent stakeholder consultations will be carried out to establish and address the impacts of the Project in relation to (i) thermal discharge into the outfall channel; (ii) livelihood of foot fisherfolk; (iii) access restrictions; and (iv) ambient air quality, as detailed in this Action Plan. As part of this consultative process, the affected foot fisherfolk will be identified; information on their livelihoods will be collected and impacts will be assessed; and measures to address livelihood impacts will be established in a Livelihood Improvement Plan, as detailed in this Action Plan.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

15. **CRP findings regarding compliance with Action No. 1.** The CRP finds that since the last CRP annual monitoring report some progress has been made in the disclosure of reports. All studies except the Air Quality Study (Technical Study) have now been listed on the CGPL and the ADB websites. For the air quality study, a summary of the study has been disclosed on the ADB website in March 2018 but not yet on the CGPL website. The sharing of the findings of the air quality study in the local language with the relevant stakeholders has been delayed due to change in personnel at the CGPL management level. CGPL expressed the need to still clarify some of the findings and recommendations of the study with the author of the study. CGPL confirmed that the summary in local language will be prepared as soon as discussions on the draft report have been completed. The remedial action plan calls for disclosure and consultations

<sup>13</sup> The term *bander* is used locally to identify a port or haven along the seashore where fisherfolk establish temporary or permanent communities for the purpose of carrying on their occupation.

<sup>14</sup> While A. Hartmann finished drafting this report prior to completing her term as CRP part time member on 10 August 2018, due to internal review procedure, issuance of this report happened thereafter.



on the thermal discharge study conducted by the National Institute of Oceanography (NIO), the LIP and the air quality study. In April 2016, a presentation of findings in local language on the thermal discharge study conducted by NIO and the Access Study was given to local residents. Adequate consultations were conducted with *pagadiyas* and other stakeholder groups in the preparation of the LIP. No consultations have, as yet, been conducted on the findings of the air quality study. The CRP is of the view that CGPL should invite stakeholders to a presentation and discussion of the findings of the study. At this occasion, findings of the health study should also be presented.

16. **CRP conclusions regarding compliance with Action No. 1.** The CRP notes that in order to achieve full compliance, the following measures should be taken:

- (i) translate summary of technical air quality study in local language and upload on the CGPL and ADB websites;
- (ii) conduct consultations with stakeholders on findings of air quality study; and
- (iii) consultations on the findings of the health baseline study are recommended.

**B. Thermal Discharge from the Outflow Channel and Loss of Livelihood of Fisherfolk**

**Status of Compliance:** At the time of this report, ADB is in partial compliance with this action.

**Management's Action Plan No. 2: Action to address ADB's noncompliance in relation to CRP's findings on thermal discharge from the outflow channel and loss of livelihood of fisherfolk.**

- a) The National Institute of Oceanography ("NIO") has been engaged by CGPL and is carrying out field observations on the actual impacts of thermal discharge from the Project in Modhva Creek and adjoining coastal areas; this will involve validating the thermal modelling previously carried out by HR Wallingford during the environmental due diligence (prior to Project approval). NIO will complete this model conformity study.

Findings of the draft NIO report to be reviewed by ADB Management (engaging external specialist marine consultant). ADB Management will submit to the CRP, as soon as available, for review and comment the draft study prepared by NIO.

- b) Summary of the NIO report to be translated into the local language and shared with interested stakeholders (including fisherfolk) to obtain and record their views
- c) ADB will review the results of the study, including the advice of its specialist marine consultant and, in consultation with CGPL, will determine if any further action is appropriate. ADB shall consult with the CRP on any further action.
- d) The results of the automatic temperature monitoring device at the outflow channel to be made accessible to the public.

(continuation)

- e) ADB to advise CGPL appropriately on ongoing qualitative studies (i) to identify the fisherfolk who have practiced foot fishing on a regular basis in the creek and coastal area adjoining the outflow channel; and (ii) to assess any livelihood impacts on such identified foot fisherfolk for the purpose of preparing a Livelihood Improvement Plan in consultation with the identified foot fisherfolk (with disclosure of the plan in the local language). ADB shall provide the TOR for the qualitative studies and the results thereof to the CRP for its review and comment.
- f) ADB to provide the draft Livelihood Improvement Plan to the CRP for its review and comment prior to finalization and implementation.
- g) Review of the Livelihood Improvement Plan to be carried out by an independent expert for ADB.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

17. **CRP findings regarding compliance with Action No. 2.** The CRP finds that since its last annual monitoring report, no further progress has been made in the implementation of action item no. 2. Lack of progress is probably attributable to the fact, that important members of the CGPL senior management had been changed and the new senior management team had only been in place several weeks prior to arrival of this third CRP annual monitoring mission.

18. **Action items (a)-(c).** As already reported in the second monitoring report, NIO has completed a study with the objectives (i) to establish thermal dispersion from the discharge mouth; (ii) to establish temperature variations in and around the outfall channel due to the cooling water discharge by direct measurement; and (iii) to confirm model behavior through field monitoring. The study concludes that near ambient temperatures are attained at a distance of around 600 m from the mouth of the outfall channel during April 2015. The study also concludes that there are no impacts on the marine ecology. The CRP has serious reservations about the methodology and the results of this study and has presented a summary of its comments in para. 19 of the first CRP annual monitoring report. Study results build on an imprecise definition of the ambient temperature, and data of the study show that temperature variations over 1°C can be observed even 2 km from the channel mouth in the westward direction along the Modhva shoreline. Temperature impacts may thus be broader than the 600-meter distance from the mouth of the outfall channel concluded in the study. Most importantly, the mathematical modelling reported in the NIO report does not appropriately describe the dispersion of the thermal plume. Model results presented do not show temperature transport across the channel until the water with the elevated temperature reaches the channel mouth. Thus, the model fails to measure impacts on the nearshore areas of Tragadi bander and the Modhva shoreline to the west of the outfall channel. At the same time, there are insufficient measurement points available in these areas to establish the temperature impacts. The CRP also made observations on the methodology on the marine impact assessment.

19. Subsequent to the comments provided by the CRP, technical experts from the CRP and ADB designed a program for additional monitoring and measurement which would further define the (i) extent of zone of elevated temperature as a result of cooling water discharge, and (ii) ecological impacts on nearshore marine environment. To this effect a technical note was prepared

to lay out the extent and methodology for this additional monitoring. Detailed additional monitoring requirements are laid out in the Note titled: *Proposed Thermal and Ecological Monitoring in Coastal Waters fronting the CGPL plant* (November 2016). At the time of the second CRP annual monitoring mission, CGPL informed the CRP that they were not prepared to carry out this additional monitoring, as it considers the NIO study adequate and CGPL itself carries out regular monitoring. However, at the time of the second annual monitoring mission, the CRP was informed by ADB Management that CGPL was not prepared to share this said monitoring data with the CRP.

20. As a follow-up to the second CRP annual monitoring mission, ADB staff prepared, with the help of a specialized consultant, an Assessment of Impact of Thermal Discharge from Coastal Gujarat Thermal Power Plant Using Satellite Imagery. The objective of this study was to attempt to assess the impact of discharge of warm water from the CGPL plant using satellite imageries. It also attempted to compare findings with field surveys as well as modelling applications carried out by NIO. The satellite imageries showed significant temperature in excess of the ambient value during the three high tide cases observed. Derived temperature in the outfall channel, and the entire Modva shoreline and the Tragadi *bander* area show high elevated temperature, roughly about 6°C above ambient temperature. Moreover, the thermal plume across the outfall channel (e.g. into the Modhva creek) during high tides is much more pronounced than exhibited by the NIO modelling. The satellite imagery study thus gives some indications, that thermal impacts could be worse than the conclusions presented under the NIO study and that the Modhva shoreline does suffer from significant thermal impacts.

21. However, no firm conclusions can be drawn from these findings, as satellite data available is very limited. Data satellite imageries are only available for high tide situations and prevailing wind and wave conditions are not available for the satellite imageries. The absence of low tide satellite imageries seriously limits the findings. While Modhva creek and the Tragadi *bander* area experience higher temperatures during high tide, the Modhva shoreline will experience higher temperatures during low tide. The worst-case scenario for impacts along the Modhva shoreline could thus not be established under the satellite imagery study. To assess impacts on the Modhva shoreline, low tide imageries would be needed. Moreover, the actual position of waterline along the land at the instant of the satellite imaging was not available. The actual shoreline was only estimated through approximations. Given these important limitations, the satellite imagery study could not provide adequate reliable information. During its recent annual monitoring mission, CGPL management informed the CRP that it had not yet received this satellite study conducted through ADB and requested to receive a copy of the study with comments provided by the CRP. PSOD confirmed to CRP that the satellite study along with the comments provided by CRP was shared with CGPL in July 2018.

22. During its third annual monitoring mission, the CRP informed CGPL about the need to conduct additional thermal and ecological monitoring to assess the impacts of the CGPL power plant. CGPL management stated that it conducts thermal and ecological monitoring along the channel as well as at selected points along the Tragadi *bander* area and Modhva shoreline. The CRP requested again that this data be provided to the CRP through PSOD. As of completion of this third CRP annual monitoring report, this data has not yet been received. The CRP received through PSOD the thermal monitoring data which is presented in the Environmental Monitoring Report posted on the ADB project website.<sup>15</sup> However, this data only records temperature levels at the outfall weir of the cooling channel. It does not monitor thermal impacts beyond the weir and

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<sup>15</sup> [https://www.adb.org/sites/default/files/project-documents/41946/41946-014-esmr-en\\_3.pdf](https://www.adb.org/sites/default/files/project-documents/41946/41946-014-esmr-en_3.pdf).

along the shorelines (Tragadi *bander* area and Modhva shorelines). In the absence of CGPL monitoring data, the CRP is of the view, that additional temperature and ecological monitoring, as outlined in para. 22 of the second CRP annual monitoring report and referred to in para. 19 above, will need to be conducted.

23. **Automatic Temperature Monitoring Device – Action (d).** As already reported in the second CRP annual monitoring report, CGPL has installed an automatic temperature monitoring device at the weir of the outflow channel and is displaying measurement results at the public information board at the main entrance. **Livelihood Improvement Plan – Action Items (e)-(f).** CGPL has prepared a LIP for 24 *pagadiya* fishermen who have been identified under a survey process as regularly fishing in the area influenced by increased temperature resulting from water with higher temperature discharged through the outfall channel of CGPL. The objective of the LIP is to compensate fishermen for income foregone from reduced catch from *pagadiya* fishing and to support these fisherpeople in finding alternative income earning opportunities. ADB staff has very actively supported CGPL in the preparation of this LIP. As noted in the second annual monitoring report, the CRP has provided extensive comments on the draft livelihood improvement plan. The plan consists of three components; (i) monetary compensation in the amount of Rs.100,000 per *pagadiya* to compensate for income foregone from *pagadiya* fishing between 2012-2016; (ii) establishment of a medium-term support program for *pagadiyas* to derive additional income through alternative measures; (iii) additional support for *pagadiya* families in Tragadi village from an education fund (Rs.50,000), and for families in Modhva village from an education and health fund (Rs.100,000). The payment of Rs.100,000 has been completed (partly in cash and partly in fishing nets) to all 24 *pagadiyas* and families in Modhva and Tragadi villages have benefitted from the education funds. Only a small share of resources have been disbursed from the health fund.

**Figure 1:** CRP meeting with *pagadiyas* who are part of the Livelihood Improvement Plan



Source: OCRP

24. An integral part of the LIP are medium and long-term measures to support the income earning possibilities of *pagadiya* fishers affected by the Project. The LIP presents a planned investment into two shrimp farms, one in Modhva and one in Tragadi village. These investments

were presented as developmental support program for the 24 *pagadiyas*. While the two shrimp farm investments were not specifically targeted towards the 24 *pagadiyas*, the identified *pagadiyas* are expected to become members in the cooperatives which was to own the two-shrimp farm and thus – together with all other members – benefit from dividend pay-outs, once the shrimp farms became profitable. In its second annual monitoring report, the CRP explained that the shrimp farm investments would unlikely lead to sufficient income to compensate *pagadiyas* for income foregone, as the number of equity owners in each of the two villages would be large and it would take several years before the shrimp farm would become profitable. (See paras. 26 and 29 (ii) of second CRP annual monitoring report). Moreover, the shrimp farms would only provide employment to few laborers and direct employment was not expected to be provided to *pagadiya* fishermen. During this third annual monitoring mission, CGPL informed the CRP, that it will be unlikely that CGPL will invest in the two shrimp farms and that, in any case, there would be significant delays until the investments could be realized. The CRP thus notes, that at present, there is no medium-term development program in place which would support the 24 identified *pagadiyas* in obtaining additional income. However, such a medium-term income earning program is an integral part of the LIP. Without a viable medium-term program which would allow *pagadiyas* to earn the amount estimated as annual income loss from reduced fishing resulting from CGPL thermal discharge, the LIP is not fully implemented. It is thus important and urgent, that ADB supports CGPL in the definition and implementation of a development program which provides adequate support in income earning program for the 24 *pagadiyas* to earn an equivalent amount of income foregone from *pagadiya* fishing as a result of the establishment and operation of the CGPL plant and as determined under the survey for the LIP. The preparation and implementation of a medium-term livelihood support program is urgent, as compensation has only been paid for the period 2012-2016.

25. The CRP notes, that the LIP provides for a grievance redress mechanism which can be accessed by the *pagadiyas* participating under the program in case of grievances and by other stakeholders, including fishermen, who claim to be missed out of the *pagadiya* identification and selection process. The CRP was informed by CGPL and by the Village Development Advisory Committee implementing the LIP that no grievances have been filed and that any grievances are handled informally. The CRP was further informed that also no grievances have been filed either by other stakeholders challenging the selection of the *pagadiyas*. The CRP wishes to emphasize that it is essential that access to such a grievance redress mechanism is widely known among stakeholders so that affected persons can express their grievances and that trust and confidence is built in the viability of such a grievance redress mechanism. Moreover, it is important that the formal processes laid out in the LIP are adhered to and not be substituted by an informal process.

26. The CRP notes, that ADB staff has actively supported CGPL in the preparation of the LIP and in the implementation of its cash compensation component. A technical expert has been hired to support the Village Development Advisory Committee, which is charged with the implementation of the plan. In its supervision efforts, ADB staff has also emphasized the urgency and importance of a medium-term program for *pagadiyas* to earn additional income and provided assistance in further advancing the planning of the shrimp farm investments. ADB staff is also engaged in reviewing together with CGPL alternative options for a medium-term development program. ADB has not yet carried out an evaluation of the LIP as the program has not yet been fully implemented.

27. Furthermore, the CRP wishes to draw attention to the fact, that not all *pagadiyas* impacted by the Project might so far been identified as the area of impact could possibly be larger than assumed by the NIO study. There could possibly be impacts along the Modhva shoreline as the NIO study did not capture lateral impacts in its model. The results of the Satellite Study on Thermal

Impacts give some preliminary indications that this might be the case. (See para. 20.) Only additional monitoring and measurements would show whether there are temperature impacts along the Modhva shoreline. This issue has already been highlighted in para. 29 (ii) of the second CRP annual monitoring report and in paras. 20-21 above. If additional monitoring data of thermal impacts along the Modhva shoreline show that there are thermal impacts, a survey would need to be conducted to identify additional *pagadiyas* who fish along that area. If any additional *pagadiyas* are identified fishing in this impacted area, then they would need to be included under the current LIP.

**28. CRP conclusions regarding compliance with Action No. 2.** The CRP finds that Action No. 2 is partially complied with. The following measures need to be undertaken to reach full compliance:

- (i) additional thermal and ecological monitoring needs to be conducted as outlined in the technical Note: *“Proposed Thermal and Ecological Monitoring in Coastal Waters fronting the CGPL Plant” November 2016*;
- (ii) if there are additional areas of impacts, a survey needs to be undertaken to establish whether there are *pagadiyas* active in these additional areas of impacts and if *pagadiyas* are identified, they will need to be included under the current LIP; and
- (iii) full implementation of the LIP requires the definition and implementation of developmental components for the identified *pagadiyas*, which would allow them to earn the equivalent amount foregone from *pagadiya* fishing as determined under the survey for the LIP.

### C. Sludge Treatment and Disposal

**Status of Compliance:** The CRP has closed this action point.

**Management’s Action Plan No. 3: Action to address ADB’s noncompliance in relation to CRP’s findings on sludge treatment and disposal<sup>1</sup>**

- a) Since this issue was discovered (in December 2013), ADB has engaged with CGPL on environmentally sound ways in which to segregate the iron bearing sludge from the demineralization plant. The options for segregation of sludge and its disposal are currently under technical evaluation.

On completion of the technical evaluation of options, ADB will consult with the CRP on the preferred option prior to finalization of preferred option.

- b) Implement sludge treatment and disposal measures and discontinue discharging iron-bearing sludge into the sea water via outfall channel.

(See Appendix 1 for the full text of the Management’s Remedial Action Plan.)

**29. CRP findings regarding compliance with Action No. 3.** During its second annual monitoring mission, the CRP was informed by the Gujarat Pollution Control Board that disposal

of the iron bearing sludge through the discharge channel is consistent with national environmental legislation and regulation. The CRP has therefore closed this action item.

30. **CRP conclusions regarding compliance with Action No. 3.** Action item is closed.

#### D. Access Restrictions

**Status of Compliance:** Action item is presently in temporary noncompliance until adequate services to the *bander* is restored.

#### **Management's Action Plan No. 4: Action to address ADB's noncompliance in relation to CRP's findings on access restrictions<sup>1</sup>**

- a) Subsequent to the CRP findings, ADB investigations indicate that actions taken by CGPL (including identification of and consultations with affected persons and the measures taken to address the impacts of such access restrictions) adequately address the impacts of access restrictions to Tragadi *bander*. ADB will submit these findings to CRP for their review and comments.
- b) The ADB's findings in relation to access restriction issue will be translated into local language and consultations with the relevant stakeholders held.
- c) Based on the CRP's review of ADB's findings, if any further action is required, such action will be determined by ADB. ADB will ensure the implementation of such action.
- d) The surface quality of the access road to Tragadi *bander* for uninterrupted access during the monsoon to be maintained.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

31. **CRP findings regarding compliance with Action No. 4.** ADB conducted in 2015 a study to assess impacts on access restrictions on people residing at Tragadi *bander*.<sup>16</sup> The study found that impacts of the additional travel time and costs which are caused by the longer travel on the new road, are compensated through the services which at that time were provided by CGPL to residents of Tragadi *bander* (i.e., regular provision of drinking water, health and education services). The road which was used prior to the construction of the CGPL plant was no longer available as the old road is on the site of the CGPL plant. A new road was constructed for access to the *bander* which is 3.8 km longer than the previous road. Services, especially water and health services, were provided to Tragadi *bander* people by CGPL on a regular basis during the 9 months that these fisherfolk are fishing and residing at the *bander*. As these services compensated the costs of longer travel time, the CRP found this action item in full compliance in its first and second annual monitoring reports, "*assuming that services (i.e. drinking water, health and education services) are continued to be provided at adequate levels to the Tragadi bander people to compensate for increased costs resulting from longer access roads.*"<sup>17</sup>

<sup>16</sup> ADB Report on Access Restrictions to Fishing Grounds, August 2015, IND: Mundra Ultra Mega Power Project, available at <https://www.adb.org/sites/default/files/project-documents/41946/41946-014-escar-en.pdf>.

<sup>17</sup> Footnote 12. para. 48.



**Figure 2:** Tragadi bander without the transient fisherfolk and with water service temporarily suspended



Source: OCRP

32. ADB Management, in its Twelfth Quarterly Progress Report and CGPL during the annual monitoring mission, informed the CRP that CGPL has discontinued all services to Tragadi *bander* residents during the last season, with the exception of the micro-finance facility which is targeted to some selected families at the *bander*. The twelfth quarterly progress report prepared by ADB staff states: *“ADB was informed by CGPL during the March 2018 mission that the provision of services to the Tragadi bander including the supply of potable water, periodic health camps and other community services, as part of CGPL’s CSR program, have been suspended since August 2017. Site visits and consultations with Tragadi bander residents during the mission confirmed that the services were discontinued since the start of the current fishing season in August 2017.”* The CRP considers the resumption of services essential to remain in full compliance status. Services need to be provided at the level assumed in the 2015 access study, when compensation levels were calculated. The CRP was informed that since 2015 the population size of Tragadi *bander* has further increased and that this causes friction with the nearby Tragadi village which considers the area of Tragadi *bander* as an area where they fish and where the incremental population is threatening their access. Eighty six (86) families resided during the fishing season 2013-2014 at Tragadi *bander*. In the view of the CRP, CGPL only needs to provide services at the level of 2015 when the access study was conducted. Families which joined the Tragadi *bander* only after the construction of the CGPL plant, did not experience incremental costs for access, as they were not resident at the *bander* prior to the closing of the original access road. In terms of cost compensation, especially the provision of drinking water is important. The access study stated that provision of drinking water by CGPL resulted in a savings of Rs.800 per household per month.<sup>18</sup> This cost savings was considered important compensation for the longer and more costly road travel.

33. The CRP notes, that ADB staff has actively monitored the situation with CGPL and has informed CGPL that services need to be reinstated and that an interruption or even discontinuation of services at the 2015 level would constitute noncompliance with ADB operational policies and procedures. ADB Management, in its Twelfth Quarterly Progress Report of June 2018, states: *“ADB is currently pursuing with CGPL management on restoration of the services provided to Tragadi bander.”*

<sup>18</sup> Footnote 16, para. 20.



34. **CRP conclusion on compliance with Action No. 4.** There is temporary noncompliance with this action item until direct provision of services (i.e., water, health, education) to the Tragadi *bander* population is reinstated by CGPL at the level of 2015.

#### E. Ambient Air Quality

**Status of Compliance:** At the time of this report, ADB is in partial compliance with this action.

**Management's Action Plan No. 5: Action to address ADB's noncompliance in relation to CRP's findings on ambient air quality**

- a) Air quality monitoring (involving 10 monitoring stations at all villages within the Project's airshed) was established in April 2014 and will continue to be carried out for a two-year period.
- b) Undertake a study in the villages surrounding the Project to ascertain the extent of health impacts associated with air pollution (PM<sub>10</sub> and PM<sub>2.5</sub>).
- c) With respect to particulates, a technical study to be undertaken (to be carried out by an independent consultant engaged in consultation with ADB) to ascertain the contribution of the Project to ambient PM<sub>10</sub> levels within the Project's airshed.
- d) Findings of the technical study to be made accessible to interested stakeholders, and technical study to be finalized taking into account their views. A summary of the technical study will be translated into local language and shared with local communities and other stakeholders.
- e) Using the results of the ambient air quality monitoring and the technical study, ADB will undertake a correlation analysis of ambient air quality and stack emissions which will be used to determine, in consultation with CGPL, and relevant stakeholders, any further action in relation to ambient air quality monitoring and any control measures.

(See Appendix 1 for the full text of the Management's Remedial Action Plan.)

35. **CRP findings regarding compliance with Action No. 5.** ADB has carried out an *Analysis of Ambient Air Quality, Stack Emissions and Metrological Parameters within 10 km radius of the Tata Mundra Coal Power Plant*. The CRP has submitted its comments to ADB Management on 10 March 2017. The study also includes correlation analysis of ambient air quality and stack emissions. The study shows that there has been a significant increase of PM<sub>10</sub> levels in the surroundings of the CGPL plant. The PM<sub>10</sub> annual average increased by about 25% at the Tunda and Tragadi villages over the last 10 years (2006-2015). For Mota Kandagara, the percentage increment was even larger at 46%. Vandh village, located right next to the CGPL plant, is most immediately impacted by PM<sub>10</sub> emissions during all seasons and mainly from fugitive emission sources of CGPL plant and other adjacent industries located 1.5 km away from the CGPL plant. However, the report states that the primary source for PM<sub>10</sub> emissions are localized sources and not the CGPL plant. For the Vandh village, the CGPL coal yard is estimated to contribute between 8%-17% of measured PM<sub>10</sub> concentration for different seasons. As to stack emissions, the report notes that CGPL contributions are low across the airshed amounting to 0.4%-4.9%.

36. The CRP concurs with the methodology applied to assess the impacts. However, the CRP is concerned about the poor quality of the data on which the assessments are based. Given the incomplete data source, the results of the study may be unreliable. The report recognizes that very high instrument downtime was observed for the hourly data on suspended particulate matters, mostly due to poor support from the supplier. CGPL has one bi-flue and another tri-flue stacks and Adani Power Limited has 3 bi-flue and 1 tri-flue stacks. Stack kit calibration from CGPL had several downtime during operations which caused large gaps in hourly emissions for PM<sub>10</sub> data. Due to instrument downtime, very high percentage of hourly emission data for PM<sub>10</sub> was not available. Due to high fluctuations in the value of coefficient of variance in the stack emission data, average emission data should not be considered for the quantitative air impact assessment study. The CRP is of the view that such quantitative correlation impact assessment carried out with data where there are large data gaps, is unlikely to produce reliable results.

37. To improve the air quality measurements, the technical study report proposes a number of measures which should be implemented in order to provide more reliable and regular air quality data. CGPL informed the CRP, that it agrees with all but one of the recommendations. The recommendation on which there is disagreement refers to the changed location of one air quality monitoring station, which CGPL states cannot be changed, as the environmental authorization obtained by CGPL includes specific requirements for location of air quality monitoring stations. The CRP has requested from PSOD a set of air quality data for the last 12 months, to assess whether there is improvement in the air quality data collected. As of the date of completion of this monitoring report, the CRP has only received the air quality monitoring data presented in the Environmental Monitoring report, which is upload on the ADB website.<sup>19</sup> These air quality data are in graphical format to show trends of the ambient air quality data. This data cannot be evaluated to ascertain the compliance of the CRP's observations in the final investigation reports that are related to data quality, sampling duration, calibration of equipment, down time of instruments, among others. The CRP is of the view that in absence of field level observations and details of sampling of air quality data, such graphical data presented to indicate air quality trends is not sufficient to ascertain the compliance of RAP. The RAP states that based on the results of the technical study, further action in relation to ambient air quality monitoring and any control measures would be determined. The Air Quality Study specifies important measures for more reliable air quality monitoring, which includes, among other, less downtime in air quality monitoring equipment. ADB staff assured the CRP in its Twelfth Quarterly Progress Report, that it will continue to monitor the implementation of the study recommendations and control measures during supervision missions.

38. **CRP conclusion regarding compliance with Action No. 5.** The CRP finds that since the second annual monitoring mission no further progress has been made on this action item. The CRP finds, that action item 5 is partly complied with. In order to reach full compliance, the following measures need to be taken:

- (i) translation of a summary of the study in local language, distribution of summary and consultation with local population and relevant stakeholders with posting of summary of study on CGPL website; and
- (ii) implementation of agreed recommendations of Air Quality Study so improve CGPL air quality monitoring and reporting.

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<sup>19</sup> Footnote 15.

## VI. CONCLUSION

39. The CRP notes that since completion of the second annual monitoring report, very limited progress has been made in the implementation of the RAP. There has been even some backsliding in the implementation of RAP agreed actions (such as the absence of the medium-term development program of the LIP and the interruption of services to the Tragadi *bander*). The CRP attributes this limited progress in RAP implementation to the fact, that several members – including the CEO – of CGPL have changed during the last 12 months and that the new Senior Management team is only in place since a few weeks prior to arrival of the CRP’s third annual monitoring mission. The CRP notes that ADB staff has been very active and engaged in providing support in the implementation and monitoring of the LIP for the affected *pagadiyas* and in monitoring the need for CGPL services to households residing during the fishing season in Tragadi *bander* who are affected by the longer access road. ADB staff monitoring of other RAP measures, such as additional thermal and ecological monitoring along the Tragadi *bander* and Modhva shorelines and on follow-up measures of the air quality study were less pronounced largely due to the lack of counterpart environmental staff in CGPL to take forward the remedial actions. It is important that with the new CGPL management, all outstanding RAP measures be pursued.

40. According to para. 193 of the AMP, “the monitoring time frame will be project-specific depending on the implementation of the remedial actions, but will generally not exceed 3 years.” This is the third annual monitoring report. As remedial action measures 1, 2, and 5 are in partial compliance and action item 4 is temporarily in noncompliance, important efforts still need to be made in order to implement the RAP and to bring the Project into full compliance with ADB policies. The CRP is therefore of the view, that the Project would benefit from the CRP’s continued involvement in monitoring the actions which are not in full compliance status until these are brought into full compliance. The CRP monitoring will be done based on quarterly progress reports submitted by PSOD and staff interviews. ADB Management needs to continue its practice of submitting quarterly progress reports to the CRP and the Board Compliance Review Committee (BCRC) until the remedial action plan is fully implemented. The CRP would not conduct further site visits for monitoring purposes and does not consider it necessary to issue another annual monitoring report but will report to the BCRC its assessment on progress made towards full compliance of remedial action items 1, 2, 4, and 5.

<b>Management’s Action Plan Topic</b>	<b>Feedback to Management on Actions to Bring the Project into Full Compliance</b>
1) Disclosure of information and conduct of consultations	<p><b>Status of compliance: Partial Compliance</b></p> <p>The CRP suggests that the following actions be taken:</p> <ul style="list-style-type: none"> <li>(i) translate summary of technical air quality study in local language and upload on the CGPL and ADB websites;</li> <li>(ii) conduct consultations with stakeholders on findings of air quality study; and</li> <li>(iii) consultations on the findings of the health baseline study are recommended.</li> </ul>
2) Thermal Discharge from the Outflow Channel and	<p><b>Status of compliance: Partial Compliance</b></p> <p>The CRP suggests that the following actions be taken:</p>

<b>Management's Action Plan Topic</b>	<b>Feedback to Management on Actions to Bring the Project into Full Compliance</b>
Loss of Livelihood of Fisherfolk	<ul style="list-style-type: none"> <li>(i) additional thermal and ecological monitoring needs to be conducted as outlined in the technical Note: <i>"Proposed Thermal and Ecological Monitoring in Coastal Waters fronting the CGPL Plant" November 2016</i>;</li> <li>(ii) if there are additional areas of impacts, a survey needs to be undertaken to establish whether there are pagadiyas active in these additional areas of impacts and if pagadiyas are identified, they will need to be included under the current LIP; and</li> <li>(iii) full implementation of the LIP requires the definition and implementation of developmental components for the identified pagadiyas, which would allow them to earn the equivalent amount foregone from pagadiya fishing as determined under the survey for the LIP.</li> </ul>
3) Sludge Treatment and Disposal	<p><b>Status of compliance: Action item is closed by the CRP.</b></p> <p>The CRP considers this action item closed as Gujarat Pollution Control Board (GPCB) confirmed to CRP that disposal of iron-bearing sludge into the discharge channel is acceptable in accordance with national environmental legislation and regulations.</p>
4) Access restrictions	<p><b>Status of compliance: Temporarily in noncompliance</b></p> <p>Reinstatement of services of CGPL in the amounts calculated in the 2015 ADB access study.</p>
5) Ambient air quality	<p><b>Status of compliance: Partial compliance</b></p> <p>The CRP suggests that the following actions be taken:</p> <ul style="list-style-type: none"> <li>(i) translation of a summary of the study in local language, distribution of summary and consultation with local population and relevant stakeholders with posting of summary of study on CGPL website; and</li> <li>(ii) implementation of agreed recommendations of Air Quality Study so improve CGPL quality monitoring and reporting.</li> </ul>

**/S/ Dingding Tang**

Chair, Compliance Review Panel

**/S/Arntraud Hartmann**

Part-time Member, Compliance Review Panel

Manila, Philippines

21 August 2018

## MANAGEMENT'S REMEDIAL ACTION PLAN

### INDIA: MUNDRA ULTRA MEGA POWER PROJECT (LOAN 2419-IND)

#### Updated remedial action plan

On 3 June 2015, Management submitted its proposed remedial action plan to the Board pursuant to paragraph 191 of the Accountability Mechanism Policy (2012) ("**AM Policy**").

This document outlines ADB Management's proposed updated remedial action plan ("**Action Plan**") which takes into account the comments of the Compliance Review Panel ("**CRP**") received on 2 June 2015. This Action Plan supersedes the remedial action plan previously submitted by Management to the Board.

In accordance with paragraph 190 of the AM Policy, the borrower has agreed on 19 June 2015 to the remedial actions.

#### Introduction

On 9 March 2015, the CRP submitted its final report ("**CRP Report**") in relation to the above project ("**Project**") in which it found Asian Development Bank ("**ADB**") non-compliant with certain of its operational policies and procedures in four respects: (i) failure to adequately disclose information and conduct consultations; (ii) loss of livelihood of fisherfolk (due to thermal discharge from the outflow channel and impacts on Modhva Creek); (iii) access restrictions to fishing grounds; and (iv) ambient air quality.

This document outlines ADB Management's proposed remedial action plan ("**Action Plan**") which is submitted to ADB's Board for its consideration pursuant to paragraph 191 of the Accountability Mechanism Policy (2012) ("**AM Policy**")

Management acknowledges that, in a number of instances, the Action Plan requires further studies to be carried out, which will determine future actions that may be required to bring the Project back into compliance. Management will share these studies with the CRP and will seek the CRP's input prior to finalization of the studies and determination of the future actions.

The Action Plan is set out in Appendix 1 and includes the actions (including timelines) to bring the Project into compliance with ADB's relevant policies. Management accepts that responsibility to take all the required measures to bring the Project back into compliance with ADB's policies lies squarely with ADB's Management. The action to implement such measures 'on the ground' will be undertaken by Coastal Gujarat Power Limited ("**CGPL**"), ADB's borrower for the loan, unless otherwise indicated in the Action Plan. This action

will include the engagement of a qualified NGO with relevant experience to assist ADB to undertake consultations with the local community (as specifically outlined in Appendix 1).

ADB acknowledges the ongoing cooperation of CGPL in addressing the various issues which have arisen from ADB's noncompliance with its policies, which demonstrates CGPL's strong corporate responsibility ethos, which was also acknowledged by the CRP in the CRP Report. Management is positive that, with the support of CGPL, ADB can implement the Action Plan effectively and within the required timeline. A summary of cost estimates in relation to the actions is set out in Appendix 2.

Appendix 3 sets out the corrective actions that have been taken and are on-going in relation to coal dust. This appendix is included so that this document provides a complete picture of all on-going measures. Appendix 3 does not constitute a formal part of the Action Plan since the CRP found ADB in compliance with its policies in relation to coal dust.

### **Implementation Timelines**

The proposed Action Plan is to be implemented over a period of three (3) years up to September 2018 (whilst noting that certain actions have already commenced and are ongoing). During this period, ADB will provide the CRP with reports of further studies to be undertaken as stated in the Action Plan; will monitor the implementation of the actions on an on-going basis; and will submit quarterly progress reports during the first two years and then subsequently semi-annual progress reports to the CRP at the end of June and December of each year.

ADB's reports to the CRP will detail, for each item below, the latest status of the actions taken, in progress or to be taken, referencing the scheduled dates (including any updates) specified in the Action Plan. The objective of this quarterly / semi-annual reporting by ADB will be to assist the CRP in carrying out its monitoring and reporting to the ADB Board on the status of the implementation of the Action Plan pursuant to paragraphs 192 – 194 of the AM Policy.

ADB's progress reports will be publicly disclosed on ADB's website. The CRP's monitoring reports will be publicly disclosed on ADB's website pursuant to paragraph 3 (viii) of Appendix 9 of the AM Policy.

**APPENDIX 1**  
**PROPOSED ACTION PLAN**

**Note: All scheduled dates (unless otherwise stated) are for the completion of the relevant action by the end of the specified month.**

<b>1. Action to address ADB's noncompliance in relation to CRP's findings on disclosure of information and conduct of consultations<sup>1</sup></b>		<b>Scheduled date</b>
(a)	Inclusive and transparent stakeholder consultations will be carried out to establish and address the impacts of the Project in relation to (i) thermal discharge into the outfall channel; (ii) livelihood of foot fisherfolk; (iii) access restrictions <sup>2</sup> ; and (iv) ambient air quality, as detailed in this Action Plan. As part of this consultative process, the affected foot fisherfolk will be identified; information on their livelihoods will be collected and impacts will be assessed; and measures to address livelihood impacts will be established in a Livelihood Improvement Plan, as detailed in this Action Plan.	See relevant tables below.
<b>2. Action to address ADB's noncompliance in relation to CRP's findings on thermal discharge from the outflow channel and loss of livelihood of fisherfolk<sup>3</sup></b>		<b>Scheduled Date</b>
(a)	<p>The National Institute of Oceanography (“<b>NIO</b>”) has been engaged by CGPL<sup>4</sup> and is carrying out field observations on the actual impacts of thermal discharge from the Project in Modhva Creek and adjoining coastal areas; this will involve validating the thermal modelling previously carried out by HR Wallingford during the environmental due diligence (prior to Project approval). NIO will complete this model conformity study.<sup>5</sup></p> <p>Findings of the draft NIO report to be reviewed by ADB (engaging external specialist marine consultant). ADB will submit to the CRP, as soon as available, for review and comment the draft study prepared by NIO.</p>	October 2015

<sup>1</sup> This corresponds with Findings ‘A 1 and 2’ of the CRP’s Report (pages 10 – 20).

<sup>2</sup> Fisherfolk in the Modhva and Tragadi villages were recognized in 2009 as affected by access restrictions to Tragadi bander. The CRP notes (in paragraph 127 of its report) that a participatory, inclusive consultation process started and livelihood support measures were introduced for these particular villages, and that which ADB staff supported CGPL’s significant engagement in the consultations conducted in these villages.

<sup>3</sup> This corresponds with Findings ‘B 1 and B5’ of the CRP Report (pages 21 – 26 and 31 – 33).

<sup>4</sup> The NIO study is a requirement of the MOEF clearance dated April 2008.

<sup>5</sup> NIO was engaged in 2013, as an expert institute to undertake this study. The first set of field investigations under this study were completed in December 2013 and a report was submitted in September 2014. Another field investigation has been completed in April 2015 and a draft report is under preparation.

<b>1. Action to address ADB's noncompliance in relation to CRP's findings on disclosure of information and conduct of consultations<sup>1</sup></b>		<b>Scheduled date</b>
(b)	Summary of the NIO report to be translated into the local language and shared with interested stakeholders (including fisherfolk) to obtain and record their views.	February 2016
(c)	ADB will review the results of the study, including the advice of its specialist marine consultant and, in consultation with CGPL, will determine if any further action is appropriate. ADB shall consult with the CRP on any further action.	March 2016
(d)	The results of the automatic temperature monitoring device at the outflow channel to be made accessible to the public.	Ongoing
(e)	ADB to advise CGPL appropriately on ongoing qualitative studies (i) to identify the fisherfolk who have practiced foot fishing on a regular basis in the creek and coastal area adjoining the outflow channel; and (ii) to assess any livelihood impacts on such identified foot fisherfolk for the purpose of preparing a Livelihood Improvement Plan in consultation with the identified foot fisherfolk (with disclosure of the plan in the local language). ADB shall provide the TOR for the qualitative studies and the results thereof to the CRP for its review and comment.  ADB to provide the draft Livelihood Improvement Plan <sup>6</sup> to the CRP for its review and comment prior to finalization and implementation.	October 2015
(f)	Implementation of Livelihood Improvement Plan for the identified foot fisherfolk.	October 2015 - July 2018
(g)	Review of the Livelihood Improvement Plan to be carried out by an independent expert for ADB.	June 2018 (for production of independent expert report)

<sup>6</sup> The Livelihood Improvement Plan will consider short term and long term options to address past and future impacts. The final Livelihood Improvement Plan will be disclosed on ADB's website.



<b>3. Action to address ADB's noncompliance in relation to CRP's findings on sludge treatment and disposal<sup>7</sup></b>		<b>Scheduled Date</b>
(a)	Since this issue was discovered (in December 2013), ADB has engaged with CGPL on environmentally sound ways in which to segregate the iron bearing sludge from the demineralization plant. The options for segregation of sludge and its disposal are currently under technical evaluation.  On completion of the technical evaluation of options, ADB will consult with the CRP on the preferred option prior to finalization of preferred option.	October 2015  December 2015
(b)	Implement sludge treatment and disposal measures and discontinue discharging iron-bearing sludge into the sea water via outfall channel.	June 2016
<b>4. Action to address ADB's noncompliance in relation to CRP's findings on access restrictions<sup>8</sup></b>		<b>Scheduled Date</b>
(a)	Subsequent to the CRP findings, ADB investigations indicate that actions taken by CGPL (including identification of and consultations with affected persons and the measures taken to address the impacts of such access restrictions) adequately address the impacts of access restrictions to Tragadi bander. ADB will submit these findings to CRP for their review and comments.	Report August 2015
(b)	The ADB's findings in relation to access restriction issue will be translated into local language and consultations with the relevant stakeholders held.	October 2015
(c)	Based on the CRP's review of ADB's findings, if any further action is required, such action will be determined by ADB. ADB will ensure the implementation of such action.	December 2015
(d)	The surface quality of the access road to Tragadi bander for undisrupted access during the monsoon to be maintained.	Regular maintenance for the life of the Project
<b>5. Action to address ADB's noncompliance in relation to CRP's findings on ambient air quality<sup>9</sup></b>		<b>Scheduled Date</b>
(a)	Air quality monitoring (involving 10 monitoring stations at all villages within the Project's airshed) was established in April 2014 and will continue to be carried out for a two year period.	March 2016

<sup>7</sup> This corresponds with Finding 'B 2' of the CRP Report (pages 26 – 29).

<sup>8</sup> This corresponds with Finding 'C' of the CRP Report (pages 34 – 36).

<sup>9</sup> This corresponds with Finding 'E' of the CRP Report (pages 41 – 46).

(b)	Undertake a study in the villages surrounding the Project to ascertain the extent of health impacts associated with air pollution (PM <sub>10</sub> and PM <sub>2.5</sub> ).	December 2015 – July 2018
(c)	With respect to particulates, a technical study to be undertaken (to be carried out by an independent consultant engaged in consultation with ADB) to ascertain the contribution of the Project to ambient PM <sub>10</sub> levels within the Project's airshed. <sup>10</sup>	April 2016 (draft study)
(d)	<p>Findings of the technical study to be made accessible to interested stakeholders, and technical study to be finalized taking into account their views. A summary of the technical study will be translated into local language and shared with local communities and other stakeholders.</p> <p>ADB will provide the CRP with the terms of references for the study and draft study report for its review and comments.</p>	June 2016
(e)	<p>Using the results of the ambient air quality monitoring and the technical study, ADB will undertake a correlation analysis of ambient air quality and stack emissions which will be used to determine, in consultation with CGPL, and relevant stakeholders, any further action in relation to ambient air quality monitoring and any control measures.</p> <p>ADB will submit the correlation analysis to CRP for its review and comment. Any further action in relation to ambient air quality monitoring and any control measures may include additional monitoring, plantation of trees and paving of internal roads within the villages if considered appropriate.</p>	December 2016

<sup>10</sup> This study will ascertain at all monitoring stations the proportion of PM<sub>10</sub> contributed by the Project. For this purpose, the study will involve undertaking physical and chemical analysis of particulates and their correlation with the characteristics of fly ash emissions and coal dust from the Project. This study therefore should demonstrate the Project's contribution towards particulate air pollution. This study therefore has significantly higher scientific rigor than a 'dust analysis' which could only indicate what proportion of the total dust comprises the various components of dust (fly ash, unburnt coal, airborne salt and silica) without being able to indicate the source of such dust.

**APPENDIX 2**  
**SUMMARY OF COST ESTIMATES FOR ACTION PLAN**

<b>Action</b>	<b>Estimated Cost (in US Dollars equivalent)</b>
Costs in carrying out required studies to identify affected foot fisherfolk and continued consultation with fisherfolk by NGO.	\$100,000
Engagement by ADB of specialist marine consultant to assess the results of the NIO study.	\$40,000
Implementation of Livelihood Improvement Plan for foot fisherfolk.	\$300,000 (to be finalized in the Livelihood Improvement Plan)
Engagement by ADB of independent expert to assess the implementation of the Livelihood Improvement Plan.	\$25,000
Design and implementation of sludge treatment and disposal measures.	\$150,000
Contingency amount in relation to any access issues, as specified in Appendix 1, Section 4, item (c) on page 6.	\$50,000
Annual maintenance of access road.	No additional cost as CGPL will carry out in any event
Third party monitoring of ambient air quality.	Ongoing, so no additional cost
Air quality study to ascertain the Project's contribution to particulate pollution in the airshed.	\$200,000
Engagement by ADB of technical support as required.	\$300,000

### APPENDIX 3 – CORRECTIVE ACTION PLAN FOR COAL DUST ISSUES

**Note: Appendix 3 does not constitute a formal part of the Action Plan since the CRP found ADB in compliance with its policies in relation to coal dust.**

Corrective Action carried out to date includes:		
	(i)	A tube coal conveyor belt covering the elevated 1.3 km stretch along the Vandh village has been designed (estimated cost of \$18,500,000).
	(ii)	In the future, a 20-50m wide “green belt” comprising rows of fast growing trees to break the wind and intercept coal dust will develop (planted in 2012).
	(iii)	A 9 m tall wind barrier has been constructed along the Vandh village-ward plant boundary, adjoining the coal stockyard to arrest the movement of coal dust.
	(iv)	The height of coal piles over one-third of the Vandh village-ward length has been restricted to below 6 m.
		<b>Further Corrective Action<sup>1</sup></b>
	(a)	Construction of the covered tube conveyor belt.
	(b)	A water sprinkler system for the suppression of coal dust will be designed to throw a fine mist of water up to a height of 20 m along the width of the coal piles on the Vandh village-ward side to capture the coal dust that escapes over the 9 m tall wind barrier. Completed technical design of water sprinkler system to be submitted to ADB for review.
	(c)	Implementation of water sprinkling system.
	(d)	Until the above system has been implemented, during adverse wind condition periods (typically November – February), use (already installed) fire hydrants.=
	(e)	The area underneath the present coal conveyor to be paved for more efficient removal of coal dust that falls through the conveyors to prevent its getting air borne during gusts and windy conditions.
		<b>Scheduled Date</b>
		October 2016.
		September 2015.
		October 2016.
		October 2015.
		March 2016.

<sup>1</sup> This corresponds with Finding ‘C’ of the CRP Report (pages 36 - 40).

## **LIST OF PERSONS MET DURING THE MONITORING**

The Compliance Review Panel (CRP) met with the following persons within and outside the Asian Development Bank (ADB) in carrying out the monitoring of Management's remedial action for the Mundra Ultra Mega Power Project. This list is not exhaustive as it does not include names of affected persons who requested that their identities be kept confidential.

### **ADB Staff**

1. Mark Kunzer, Director, Private Sector Transaction Support Division (PSTS), PSOD
2. Samarendra Singh, Senior Investment Specialist, PSPM, PSOD
3. Viswanathan Ramasubramanian, Senior Safeguards Specialist, PSTS

### **Coastal Gujarat Power Limited**

1. Kumar V. Ghate, Chief Executive Officer
2. Dr. Ivaturi N. Rao, Chief, Environment and Sustainability
3. Pradeep Ghosal, Group Head, Community Relations
4. Saurabh Tripathi, Group Head, Environment
5. Pramod Singh, Head, Fire and Safety
6. LSVKS Murthy, Lead Engineer-Fire and Safety
7. Vidya Lakshmi, Lead Engineer-Environment
8. Tejas Khadse, Lead Associate, Environment
9. Asit Khan, Specialist, CSR
10. Saurabh Sharma, Lead Partner Management, Tata Power

### **Others**

1. Kalyan Dangar, SWADEEP
2. Head, Village Development Advisory Committee (Tragadi Village)
3. Head, Village Development Advisory Committee (Modwha Village)
4. Project affected persons (*pagadiyas*)