

Information on the Consultant(s):

Project Management Consultancy (PMC) of Rengali Irrigation Project Phase-2 is in position from September 2016 and is on process. The Consultant is a Consortium of Nippon Koei Co., Ltd. (NK), Nippon Koei India Pvt. Ltd.(NKI) and WAPCOS Limited (WAPCOS).

Concurrence from JICA has been received vide their letter no. JICA (ID) 28-635 (a) Date.31 August 2016.

Evaluation:

1. Reports and Review Note submitted by PMC during this Reporting Period
2. Timely submission of Bi-Monthly Invoice Claim of Consortium.
3. Field Visit Notes submitted by PMC for each visit.

2-5 Precautions (Measures to be adopted/points which require special attention)

| Original issues and Countermeasure(s) <i>(P/M)</i> | Actual issues and Countermeasure(s) <i>(P/R)</i> |
|--|--|
| <p><u>Institution Setting-up</u></p> <ul style="list-style-type: none"> - Final Structure of PMU needs to be approved by GoO. - Operation Manual should be prepared and approved by GoO after confirmation by JICA India Office. | <ul style="list-style-type: none"> - Final structure of PMU is already approved by GoO. - The Operation Manual is prepared & approved by GoO vide WR Irr-II-RL-01/15 – 15888 dtd 05.07.2016. |
| <p><u>Land Acquisition</u></p> <ul style="list-style-type: none"> - 89 % of land acquisition has not been completed. - Preliminary Notification for Package A, B, C, D, E should be immediately announced after the approval of the State Rules under LARR 2013 and by signing of Loan Agreement. - Progress of land acquisition should be submitted by updating <u>Attachment 27</u> with expected dates of completion. - 80% of private land possession is pre-condition for award of contract for each package | <ul style="list-style-type: none"> - Against stipulation of having 80% of land acquired before issue of work order, by the end of Sept. 2020, 100% acquisition has been done for Packages-A(I), A(II), A(III)A, B(I), B(II), C(I), C(II), C(III) and C(IV) where as 82% land acquisition is done for Package E1, and 63% is done in case of package D1, 61% for package G2 & 36 % for package G3. Overall progress of land acquisition is at 67%. by end of Sept. - 2020 |
| <p><u>Approval of Design</u></p> <p>Approval of design drawings need to be obtained before commencement of tender process. DoWR should report the progress to JICA with updating <u>Attachment 11</u></p> | <p>The LS & DS of canal of Rengali Irrigation Project. Phase-2 has been already finalized. Out of total 4682 of structures, design and drawing of 4676 nos. of structures have already been designed and approved for 4670 nos. of structures. Balance 6 nos. of structures is under progress.</p> <p>Current status of the progress of designs of these Packages is attached in Attachment 11.</p> |
| <p><u>Railway Crossing and Highway Crossing</u></p> <p>These structures are constructed by other agencies (NHAI and ECoR). PMU should have regular meeting with the concerned agencies to monitor the progress and problems.</p> | <p>PMU is conducting regular meeting with NHAI and ECoR agencies to monitor the progress and problems.</p> <p>PMU has informed on new railway and highway crossing over canal system to NHAI and ECoR and requested for cost estimate</p> <p>In this quarter, the number of National Highway and Railway crossing structures to be newly constructed has been reviewed and revised as follows:</p> <ol style="list-style-type: none"> 1. National Highway :16 nos. 2. State Highway & PWD Road : 18 nos. 3. Railways :6 nos |
| <p><u>Forest Clearance</u></p> <p>Stage II Forest Clearance (Stage II) (1,295 ha) is expected before March 2015. The progress should be reported from DoWR to JICA</p> | <p>Stage – 2 forest clearances is obtained from MoEF, GoI on date 17.05.2019 for 874.5957 Ha. Fresh diversion proposal for both Stage - I & Stage – 2 is applied through online and submitted to GoO. Pending for verification and recounting of trees at DFO level till now.</p> |

| Original issues and Countermeasure(s) | Actual issues and Countermeasure(s) |
|--|--|
| <p><u>Safety Measure of Tunnel Construction</u></p> <p>In order to prevent accidents, DoWR should particularly undertake safety management measures for the construction of tunnel including establishment of safety control organization, holding regular safety meetings, and ensuring safety program to be executed by the contractor as per <u>Attachment 31 and 32.</u></p> | <ul style="list-style-type: none"> - DoWR had constituted committee to inspect canal alignment RD 100.49 km to 103.46 km and elevated portion, to study feasibility of proposed tunnel in the area. The committee submitted the report and recommending open excavation instead of tunnel. The revised proposal has been submitted to JICA for approval. - JICA has approved for open cut & cover for Rs 304.89 Cr.. Revised RAP scheme is approved by RDC & submitted to DoWR for sanction. |
| <p><u>Timely Implementation of On-farm Development</u></p> <ul style="list-style-type: none"> - On-Farm Development (OFD) will be taken up by Command Area Development Agency (CADA). CADA is executing the OFD works in Phase-I command area until FY2016. Completion of the work in Phase-I area and deployment of additional division for the work is imperative in order to start OFD in Phase-II command area. <p>The Progress of OFD in Phase-I should be reported by updating <u>Attachment 4.</u></p> | <ul style="list-style-type: none"> - OFD works will be initiated after construction of distribution system in package A(I), A(II), A(III), B(I), B(II), C(I), C(II), C(III) and C(IV). |
| <p><u>Environment and Social Consideration</u></p> <ul style="list-style-type: none"> - DoWR should revise the RAP based on the finalized scope and the Odisha Rules under the LARR 2013 and submit the same to JICA for disclosure. - DoWR should quarterly/biannually / annually report the progress of the Project by submitting the Form for Environmental and Social Management System to JICA along with PSR, in order for JICA to monitor its performance. | <ul style="list-style-type: none"> - RAP Report for package D(I) is approved by RDC, Central Division, Cuttack & submitted to DoWR for sanction of the cost estimate for Rs 2.49 Cr. - These reports are submitted with Quarterly PSR. |

Attachment 4: Remaining Activities of phase-I

Attachment 6: Progress of State-financed portion Phase-II

Attachment 11: Progress of Design Approval of Structures

Attachment 27: Status of Land Acquisition

Attachment 31: Safety and Quality Control Check

Attachment 32: Safety Management for Construction of Tunnel (not applicable now)

Attachment III-3: Environmental Check List

Attachment III-10: Environmental Monitoring Form (quarterly),

Attachment III-14: RAP Internal Monitoring Form (biannually)

Attachment III-15: RAP External Monitoring Form (annually in principle) (not applicable now as RAP is in process)

| | |
|---|--|
| | |
| <p><u>Institutionalization of O&M System</u></p> <p>- O&M system by sharing DoWR and WUAs is proposed as per <u>Attachment 28</u> and will be established during the construction of the works for smooth hand-over and realization of O&M.</p> | <p>The RIP-2 is in the process of developing Operation and Maintenance Procedures for the distribution systems. A draft O&M Manual has been prepared by the PMC and handed over to the CE. During December 2019, based on the application results of the draft Manual in Bhuban Branch Canal (BBC) and LBC up to BBC, the First Milestone Area, a Manual for Bhuban Branch Canal System has been handed over to the PMU by the PMC. In due course, as soon as rest systems start delivering water to the command area, the procedures will be developed for the remaining systems.</p> <p>The Project engineers have been exposed to the O&M Manual through a training course during December 2019, on O&M of Canal Systems, by the PMC. In due course the CAD officials and WALMI Field Teams will be trained on the Manuals. With formation of WUA, Executive Committees and related Sub Committee of WUAs would be training on operation and maintainance of irrigation system in WUA area.</p> |

Attachment 28: Proposed O&M Structure

3-3 Environmental and Social Impacts

- Major environmental and social impacts have occurred during project implementation (e.g. involuntary resettlement, poverty reduction, natural environment)

| Issue(s) | Action or countermeasure(s) taken and remaining problem(s) |
|--|--|
| <p><i>(PCR)</i> Displacement of 33 families in Block-D</p> | <p><i>(PCR)</i> <i>The RRS, approved by the RDC, Central Division, Cuttack is with Government. The RRS has been prepared after discussing with PAF for rehabilitation in an area agreed by the PAF</i></p> |

3-4 Qualitative and Quantitative Data of Monitoring Indicators

- Operation and Effect Indicator, EIRR and/or FIRR
- Supporting data for computing EIRR and/or FIRR

3-4-1 EIRR/FIRR*

| | | |
|-------------|---|---|
| EIRR | <p>Original: <u>15.20%</u></p> <p>Cost: - Construction Cost including Rengali Multipurpose Project, World Bank Portion in RIP, LBC II Phase-I and Phase-II, operation and maintenance cost</p> <p>Benefit: - Increase in agriculture production Project Life: 50 years</p> | <p>Actual: (PCR) _____% Cost: Benefit: Project Life: Attachment(s): Supporting data for computing EIRR</p> |
|-------------|---|---|

*FIRR = Financial Internal Rate of Return EIRR = Economic Internal Rate of Return

Attachment 29: Calculation of EIRR

Status of Land Acquisition under Old & New Act

Under Old Act, ending September 2020

STATUS OF LAND ACQUISITION OF LEFT BANK CANAL-II OF RENGALI IRRIGATION PROJECT FOR THE MONTH ENDING SEPTEMBER- 2020 FROM R.D.71.313KM TO R.D.123.50 KM.

Attachment - 1(b)

| Name of the Package | Total land Acquisition Involved | | Status under Old Act | | | | Status under New Act (RFCTLAR&R Act, 2013) | | | | Total Possession Received | | Probable date of 80% Possession | Remarks | | | | | |
|---------------------|---------------------------------|----------------|----------------------|----------------|-------------------------------|--------------|--|----------------|--------------------|----------------|-------------------------------|---------------|---------------------------------|---------------|--------------|----------------|--------------|----------------|-----------|
| | No. of cases | Area | payment in process | | Possession made under old act | | Total No. of cases and area under New Act | | Payment in process | | Possession made under New act | | | | No. of Cases | Area | | | |
| | | | No. of cases | Area | No. of cases | Area | No. of Cases | Area | No. of cases | Area | No. of cases | Area | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| A-1 | 1 | 1.62 | 1 | 1.62 | 0 | 0 | 1 | 1.62 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | 1 | 1.62 | 100 | | |
| A-2 | 1 | 93.91 | 1 | 93.91 | 0 | 0.00 | 1 | 93.91 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | 1 | 93.91 | 100 | | |
| A-3(A) | 11 | 62.32 | 11 | 62.32 | 0 | 0 | 11 | 62.32 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | 11 | 62.32 | 100 | | |
| A-3(B) | | 229.05 | | | | | | | | | | | | | | | | | |
| A-3(B) D.P. | 22 | 9.30 | 10 | 65.17 | 1 | 2.58 | 9 | 62.59 | 12 | 163.88 | 1 | 2.27 | 11 | 161.61 | 20 | 224.20 | 97.97 | | |
| B-1 | 1 | 1.80 | 1 | 1.80 | 0 | 0 | 1 | 1.80 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | 1 | 1.80 | 100 | | |
| B-2 | 51 | 369.06 | 32 | 159.18 | 2 | 21.93 | 30 | 137.25 | 19 | 209.88 | 2 | 20.76 | 17 | 189.12 | 47 | 326.37 | 88.43 | | |
| C-1 | 9 | 91.55 | 5 | 53.32 | 0 | 0 | 5 | 53.32 | 4 | 38.23 | 1 | 17.82 | 3 | 20.41 | 8 | 73.73 | 80.54 | | |
| C-2 | 9 | 156.99 | 7 | 116.20 | 0 | 0 | 7 | 116.2 | 2 | 40.79 | 0 | 0.00 | 2 | 40.79 | 9 | 156.99 | 100.00 | | |
| C-3 | 22 | 293.05 | 12 | 177.02 | 0 | 0 | 12 | 177.02 | 10 | 116.03 | 1 | 4.96 | 9 | 111.07 | 21 | 288.09 | 98.31 | | |
| C-4 | 14 | 151.65 | 8 | 53.77 | 1 | 0.21 | 7 | 53.56 | 6 | 97.88 | 0 | 0.00 | 6 | 97.88 | 13 | 151.44 | 99.86 | | |
| D | 7 | 135.07 | 3 | 82.23 | 0 | 0 | 3 | 82.23 | 4 | 52.84 | 2 | 49.59 | 2 | 3.25 | 5 | 85.48 | 63.29 | Apr.2020 | |
| E | 12 | 297.22 | 7 | 167.13 | 2 | 60.44 | 6 | 134.47 | 5 | 130.09 | 2 | 31.85 | 4 | 109.95 | 10 | 244.42 | 82.48 | Oct.19 | |
| J-1 | 9 | 136.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | 9 | 136.00 | 5 | 62.14 | 1 | 2.26 | 1 | 2.26 | 1.66 | Apr-20 | |
| J-2 | 21 | 187.01 | 0 | 0.00 | 0 | 0 | 0 | 0 | 21 | 187.01 | 0 | 0 | 0 | 0.00 | 0 | 0.00 | - | R.O. to comply | |
| G-1 | 12 | 189.77 | 1 | 1.68 | 0 | 0 | 1 | 1.68 | 12 | 188.09 | 8 | 119.78 | 0 | 0.00 | 1 | 1.68 | 0.89 | Apr-20 | |
| G-2 | 28 | 244.68 | 17 | 119.98 | 0 | 0 | 17 | 119.98 | 11 | 124.70 | 1 | 8.08 | 5 | 30.82 | 22 | 150.80 | 61.63 | Apr-20 | |
| G-3 | 24 | 282.34 | 3 | 13.31 | 0 | 0 | 3 | 13.31 | 21 | 269.03 | 12 | 179.88 | 9 | 89.15 | 12 | 102.46 | 36.29 | May-20 | |
| Total | 255 | 2932.39 | 119 | 1168.64 | 6 | 85.16 | 114 | 1111.26 | 136 | 1763.75 | 35 | 497.13 | 69 | 865.61 | 183 | 1976.87 | 67.41 | | |

N.B:- Total possession in this month
 Nos. Area
 Old 0 0
 New 4 40.43
 Total 4 40.43

Spl.LAR&RO
RIP, Sukinda

Under New Act ending September 2020

STATUS OF LAND ACQUISITION UNDER NEW ACT ENDING SEPTEMBER- 2020

Attachment 1 (c)

| PKG | No. of cases | Area (Ac) | 11(1) To be submitted by RO | | 11(1) Zone officer | | 11(1) LAO collector | | 11(1) DoWR | | 11(1) Rev. Notification made | | Status 19(1) | | | | | | Yaddast/ Payment in process | | Possession received | | |
|--------------|--------------|-----------|-----------------------------|------------|--------------------|----------|---------------------|----------|--------------|----------|------------------------------|----------|--------------|----------|------------|----------|----------------|----------------|-----------------------------|--------------|---------------------|--------------|------------|
| | | | No. of Cases | Area (Ac.) | No. of Cases | Area Ac. | No. of Cases | Area Ac. | No. of Cases | Area Ac. | No. of Cases | Area Ac. | No. of Cases | Area Ac. | With RO/ZO | With LAO | With Collector | with Govt DoWR | With R & DM | No. of Cases | Area (Ac.) | No. of Cases | Area (Ac.) |
| A-1 | 0 | 0.00 | | | | | | | | | | 0 | 0.00 | | | | | | 0 | 0 | 0 | 0.00 | |
| A-2 | 0 | 0.00 | | | | | | | | | | 0 | 0.00 | | | | | | 0 | 0.00 | 0 | 0.00 | |
| A-3(A) | 0 | 0.00 | | | | | | | | | | 0 | 0.00 | | | | | | 0 | 0.00 | 0 | 0.00 | |
| A3(B) | 12 | 163.88 | | | | | | | | | | 12 | 163.88 | | | | | | 1 | 2.27 | 11 | 161.61 | |
| A3(B) D.P. | | 9.30 | | | | | | | | | | 9.30 | | | | | | | | | | 9.30 | |
| B-1 | 0 | 0.00 | | | | | | | | | | 0 | 0.00 | | | | | | 0 | 0.00 | 0 | 0.00 | |
| B-2 | 19 | 209.88 | | | | | | | | | | 19 | 209.88 | | | | | | 2 | 20.76 | 17 | 189.12 | |
| C-1 | 4 | 38.23 | | | | | | | | | | 4 | 38.23 | | | | | | 1 | 17.82 | 3 | 20.41 | |
| C-2 | 2 | 40.79 | | | | | | | | | | 2 | 40.79 | | | | | | 0 | 0.00 | 2 | 40.79 | |
| C-3 | 10 | 116.03 | | | | | | | | | | 10 | 116.03 | | | | | | 1 | 4.96 | 9 | 111.07 | |
| C-4 | 6 | 97.88 | | | | | | | | | | 6 | 97.88 | | | | | | 0 | 0.00 | 6 | 97.88 | |
| D | 4 | 52.84 | | | | | | | | | | 4 | 52.84 | | | | | | 2 | 49.59 | 2 | 3.25 | |
| E | 5 | 130.09 | | | | | | | | | | 5 | 130.09 | | | | | | 2 | 31.85 | 4 | 109.95 | |
| J-1 | 9 | 136.00 | 1 | 7.93 | | | | | | | | 8 | 128.07 | 1 | 54.50 | 0 | 0.00 | 0 | 0.00 | 1 | 9.17 | 1 | 2.26 |
| J-2 | 21 | 187.01 | 21 | 187.01 | | | | | | | | 0 | 0 | | | | | | 0 | 0.00 | 0 | 0.00 | |
| G-1 | 12 | 188.09 | 3 | 51.01 | | | | | | | | 9 | 137.08 | 0 | 0 | 0 | 0.00 | 1 | 17.30 | 0 | 0.00 | 0 | 0.00 |
| G-2 | 11 | 124.70 | 0 | 0.00 | | | | | | | | 11 | 124.70 | 3 | 44.71 | 0 | 0.00 | 2 | 41.09 | 0.00 | 0.00 | 1 | 8.08 |
| G-3 | 21 | 269.03 | 0 | 0.00 | | | | | | | | 21 | 269.03 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | 12 | 179.88 |
| Total | 136 | 1763.75 | 25 | 245.95 | 0 | 0.00 | 0 | 0 | 0 | 0 | 0 | 111 | 1517.80 | 4 | 99.21 | 0 | 0.00 | 3 | 58.39 | 1 | 9.17 | 69 | 865.61 |

* Possession received for Direct Purchase of village Damodarapur, Bambilo & Gandhapal-Ac. 9.30.

N.B: Reduction of area under Pkg G1, G2,G3,J1 & J2 is due to introduction of under ground pipeline system for Korei Branch Canal & Barpada Branch canal and the distributaries.

N.B Partly Payment made for Ac. 1.75 dec.of land of village -Nizigarh and payment in process for the rest area. Besides above, civil suits have been filed by the awardees in Addl. Civil Judge,

Spl.LAR&R.O.
R.I.P.,Sukinda.

MONITORING FORMAT (Ending September 2020)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews, JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent when necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered.

1. Responses/Actions to Comments and Guidance from Government Authorities and the Public

| Monitoring Item | Monitoring Result of Reporting Period |
|---|--|
| <p>To be filled with Conditions of Forest Clearance Stage I, Stage II and Environmental Clearance</p> <p>Stage-I conditions Dt.21.11.1996</p> <ol style="list-style-type: none"> 1. Immediate action should be taken for transfer and mutation of equivalent non-forest land in favor of the state forest Department. 2. The user Agency will transfer the cost of Compensatory Afforestation revised as on date to incorporate existing wage structure in favour of the forest Department. 3. Funds for compensatory afforestation will be provided for afforestation /rehabilitation of an area equivalent to forest area proposed to be the land offered for compensatory afforestation .this area will be utilized for the purposed irrigated plantation for which free water will such a programme at present. Certain areas will be identified for eco-tourism and will be developed as such. 4. The Advisory committee recommended the proposal for approval for diversion of (2159.43-52.03 ha) forest land. | <ol style="list-style-type: none"> 1. Already done. 2. Already deposited. 3. Already provided 4. Diversion of forest land has been done. |

1. Result of Monitoring

2.1 Construction Phase

2.1.1 Pollution

Air Environment (Arrangement for air pollution testing is being arranged by the Chief Engineer, JICA Project. Orbital Infrastructure Consultancy & Research Pvt. Ltd., approved laboratory Govt. of Odisha has been engaged for studying Air Environment, Sampling & Analysis of air quality and suitability of drinking water near the construction packages already started for A1, A2, A3(A) & B1 for the previous period in PSR 4 & PSR 7. During this reporting period from 1st April. 2020 to 30th Sept. 2020 although the new packages A3(B), B2, C1, C2, C3 & C4 are started, but at the specified points of package D, E, G1, G2, G3, J1, J2 & J3 no work is started for which air pollution test & water tests are not being carried out. Once started the test will be conducted on the identified sites.

| Item | Unit | Measured Value (Mean) | Measured Value (Max) | Indian Standard (NAAQS 2009) | Referred International Standard (WHO) | Remarks | | | |
|-----------------|--------------------|-----------------------|----------------------|------------------------------|---------------------------------------|-------------------|---------------------------|--|--|
| | | | | | | Measurement Point | Frequency | | |
| PM 10 | µg/ m ³ | | | 100 | 150 | Chandipal | As per CPCB / SPCB norms. | IS - 5182 Part - 23 | |
| PM 2.5 | | | | 60 | 75 | | ditto | NAQS Monitoring & Analysis guidelines Vol.-I | |
| SO ₂ | | | | 80 | 20 (24 Hours) 500 (Minute) | | ditto | IS - 5182 Part - 2 | |
| NOx | | | | 80 | 40 | | ditto | IS - 5182 Part - 6 | |
| PM 10 | µg/ m ³ | | | 100 | 150 | Kansargoda | As per CPCB / SPCB norms. | IS - 5182 Part - 23 | |
| PM 2.5 | | | | 60 | 75 | | ditto | NAQS Monitoring & Analysis guidelines Vol. - I | |
| SO ₂ | | | | 80 | 20 (24 Hours) | | ditto | IS - 5182 Part - 2 | |

| Item | Unit | Measured Value (Mean) | Measured Value (Max) | Indian Standard (NAAQS 2009) | Referred International Standard (WHO) | Remarks | | |
|-----------------|--------------------------|-----------------------|----------------------|--------------------------------|---------------------------------------|-------------------|---------------------------|--|
| | | | | | | Measurement Point | Frequency | Method |
| NOx | | | | 80 | 500 (Minute) | | | |
| | | | | | 40 | | | |
| PM 10 | $\mu\text{g}/\text{m}^3$ | | | 100 | 150 | Damdarpur | As per CPCB / SPCB norms. | IS - 5182 Part - 23 |
| | | | | | | | | |
| PM 2.5 | | | 60 | 75 | | | ditto | NAQS Monitoring & Analysis guidelines Vol.-I |
| | | | | | | | | |
| SO ₂ | | | 80 | 20 (24 Hours) 500 (Minute) | | | ditto | IS – 5182 Part - 2 |
| | | | | | | | | |
| NOx | | | 80 | 40 | | | ditto | IS – 5182 Part – 6 |

Water Environment (Arrangements for testing of water is being done by Orbital Infrastructure Consultancy & Research Pvt. Ltd.)in the reporting period from 1st April 2020 to 30th September 2020.

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Measurement Point | Remarks | |
|----------------------|---------|----------------------|---------------------|---|---------------------------------|-------------------|---------------------------|--------------------|
| | | | | | | | Frequency | Method |
| Surface Water | | | | | | | | |
| Color | Hazen | | | 5 | 5 | Chandipal | As per CPCB / SPCB norms. | IS – 3025 Part - 4 |
| Odour | mg/L | | | UO | UO (Un Objectionable) | | | IS – 3025 Part-5 |
| Taste | | | | Agbl | 0 | | | IS – 3025 Part-8 |
| Conductivity | µmho/cm | | | 0 | - | | | IS – 3025 Part-14 |
| Turbidly | NTU | | | 5 | 5 | | | IS – 3025 Part-10 |
| pH | | | | 6.5-8.5 | 7-8.5 | | | IS – 3025 Part-11 |
| COD | Mg/L | | | 0 | - | | | IS – 3025 Part-58 |
| BOD | Mg/L | | | 3 | 0-8 | | | IS – 3025 Part-44 |
| Total Hardness | Mg/L | | | 300 | - | | | IS – 3025 Part-21 |
| Iron | Mg/L | | | 0.3 | .3 | | | IS – 3025 Part-53 |
| Chloride | Mg/L | | | 250 | - | | | IS – 3025 Part-32 |
| Residual Chlorine | Mg/L | | | 0.2 | 0.1 | | | IS – 3025 Part-26 |
| Total SS | Mg/L | | | 0 | - | | | IS – 3025 Part-17 |
| Total DS | Mg/L | | | 500 | 500 | | | IS – 3025 Part-16 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-----------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|-------------------|
| | | | | | | Measurement Point | Frequency | Method |
| DO | Mg/L | | | 4 | - | | | IS – 3025 Part-38 |
| Calcium | Mg/L | | | 75 | 75 | | | IS – 3025 Part-40 |
| Magnesium | Mg/L | | | 30 | 50 | | | IS – 3025 Part-46 |
| Sulphate | Mg/L | | | 200 | 200 | | | IS – 3025 Part-24 |
| Nitrate | Mg/L | | | 45 | 50 - 100 | | | IS – 3025 Part-34 |
| Fluoride | Mg/L | | | 0.6-1.2 | 0.5 - 1.5 | | | IS – 3025 Part-23 |
| Phosphate | Mg/L | | | 0 | 5 | | | APHA 4500 (D) |
| Sodium | Mg/L | | | 6 | - | | | IS – 3025 Part-45 |
| Potassium | Mg/L | | | 0 | To be filled | | | IS – 3025 Part-45 |
| Cyanide | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-27 |
| Chromium | Mg/L | | | 0.05 | 0.05 | | | IS – 3025 Part-52 |
| Boron | Mg/L | | | 1 | 0.024 | | | IS – 3025 Part-29 |
| SAR | Mg/L | | | 26 | - | | | By Calculation |
| Lead | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-47 |
| Cadmium | Mg/L | | | 0.01 | - | | | IS – 3025 Part-41 |
| Mercury | Mg/L | | | 0.001 | - | | | IS – 3025 Part-48 |
| Copper | Mg/L | | | 0.05 | 1 | | | IS – 3025 Part-36 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-------------------|---------|----------------------|---------------------|---|---------------------------------|--|---------------------------|--------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Color | Hazen | | | 5 | 5 | Damdarpur, Panaspal, Laxminagar, Badapatulu, Belabahali, Ghasipura, Ragadi | As per CPCB / SPCB norms. | IS – 3025 Part – 4 |
| Odour | mg/L | | | UO | UO (Un Objectionable | | | IS – 3025 Part-5 |
| Taste | | | | Agbl | 0 | | | IS – 3025 Part-8 |
| Conductivity | µmho/cm | | | 0 | - | | | IS – 3025 Part-14 |
| Turbidity | NTU | | | 5 | 5 | | | IS – 3025 Part-10 |
| pH | | | | 6.5-8.5 | 7-8.5 | | | IS – 3025 Part-11 |
| COD | Mg/L | | | 0 | - | | | IS – 3025 Part-58 |
| BOD | Mg/L | | | 0 | 0-8 | | | IS – 3025 Part-44 |
| Total Hardness | Mg/L | | | 300 | - | | | IS – 3025 Part-21 |
| Iron | Mg/L | | | 0.3 | .3 | | | IS – 3025 Part-53 |
| Chloride | Mg/L | | | 250 | - | | | IS – 3025 Part-32 |
| Residual Chloride | Mg/L | | | 0.2 | 0.1 | | | IS – 3025 Part-26 |
| Total SS | Mg/L | | | 0 | - | | | IS – 3025 Part-17 |
| Total DS | Mg/L | | | 0 | 500 | | | IS – 3025 Part-16 |
| DO | Mg/L | | | 0 | - | | | IS – 3025 Part-38 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-----------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|-------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Calcium | Mg/L | | | 75 | 75 | | | IS – 3025 Part-40 |
| Magnesium | Mg/L | | | 30 | 50 | | | IS – 3025 Part-46 |
| Sulphate | Mg/L | | | 200 | 200 | | | IS – 3025 Part-24 |
| Nitrate | Mg/L | | | 45 | 50 - 100 | | | IS – 3025 Part-34 |
| Fluoride | Mg/L | | | 0.6-1.2 | 0.5 - 1.5 | | | IS – 3025 Part-23 |
| Phosphate | Mg/L | | | 0 | 5 | | | APHA 4500 (D) |
| Sodium | Mg/L | | | 0 | - | | | IS – 3025 Part-45 |
| Potassium | Mg/L | | | 0 | To be filled | | | IS – 3025 Part-45 |
| Cyanide | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-27 |
| Chromium | Mg/L | | | 0.05 | 0.05 | | | IS – 3025 Part-52 |
| Boron | Mg/L | | | 0 | 0.024 | | | IS – 3025 Part-29 |
| SAR | Mg/L | | | 0 | - | | | By Calculation |
| Lead | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-47 |
| Cadmium | Mg/L | | | 0.01 | - | | | IS – 3025 Part-41 |
| Mercury | Mg/L | | | 0.001 | - | | | IS – 3025 Part-48 |
| Copper | Mg/L | | | 0.05 | 1 | | | IS – 3025 Part-36 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|----------------------|---------|----------------------|---------------------|---|---------------------------------|-------------------|---------------------------|------------------|
| | | | | | | Measurement Point | Frequency | |
| Surface Water | | | | | | | | |
| Color | Hazen | | | 5 | 5 | Kansargoda | IS – 3025 Part - 4 | |
| Odour | mg/L | | | UO | UO (Un Objectionable) | | As per CPCB / SPCB norms. | IS – 3025 Part-5 |
| Taste | | | | Agbl | 0 | | IS – 3025 Part-8 | |
| Conductivity | µmho/cm | | | 0 | - | | IS – 3025 Part-14 | |
| Turbidity | NTU | | | 5 | 5 | | IS – 3025 Part-10 | |
| pH | | | | 6.5-8.5 | 7-8.5 | | IS – 3025 Part-11 | |
| COD | Mg/L | | | 0 | - | | IS – 3025 Part-58 | |
| BOD | Mg/L | | | 3 | 0-8 | | IS – 3025 Part-44 | |
| Total Hardness | Mg/L | | | 300 | - | | IS – 3025 Part-21 | |
| Iron | Mg/L | | | 0.3 | .3 | | IS – 3025 Part-53 | |
| Chloride | Mg/L | | | 250 | - | | IS – 3025 Part-32 | |
| Residual Chlorine | Mg/L | | | 0.2 | 0.1 | | IS – 3025 Part-26 | |
| Total SS | Mg/L | | | 0 | - | | IS – 3025 Part-17 | |
| Total DS | Mg/L | | | 500 | 500 | | IS – 3025 Part-16 | |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-----------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|-------------------|
| | | | | | | Measurement Point | Frequency | Method |
| DO | Mg/L | | | 4 | - | | | IS – 3025 Part-38 |
| Calcium | Mg/L | | | 75 | 75 | | | IS – 3025 Part-40 |
| Magnesium | Mg/L | | | 30 | 50 | | | IS – 3025 Part-46 |
| Sulphate | Mg/L | | | 200 | 200 | | | IS – 3025 Part-24 |
| Nitrate | Mg/L | | | 45 | 50 - 100 | | | IS – 3025 Part-34 |
| Fluoride | Mg/L | | | 0.6-1.2 | 0.5 - 1.5 | | | IS – 3025 Part-23 |
| Phosphate | Mg/L | | | 0 | 5 | | | APHA 4500 (D) |
| Sodium | Mg/L | | | 6 | - | | | IS – 3025 Part-45 |
| Potassium | Mg/L | | | 0 | To be filled | | | IS – 3025 Part-45 |
| Cyanide | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-27 |
| Chromium | Mg/L | | | 0.05 | 0.05 | | | IS – 3025 Part-52 |
| Boron | Mg/L | | | 1 | 0.024 | | | IS – 3025 Part-29 |
| SAR | Mg/L | | | 26 | - | | | By Calculation |
| Lead | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-47 |
| Cadmium | Mg/L | | | 0.01 | - | | | IS – 3025 Part-41 |
| Mercury | Mg/L | | | 0.001 | - | | | IS – 3025 Part-48 |
| Copper | Mg/L | | | 0.05 | 1 | | | IS – 3025 Part-36 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|---------------------|---------|----------------------|---------------------|---|---------------------------------|-------------------------------|----------------------------------|--------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Ground Water | | | | | | | | |
| Color | Hazen | | | 5 | 5 | Kansargoda (Under Pkg.B-1) | As per CPCB SPCB norms. | IS – 3025 Part – 4 |
| Odour | mg/L | | | UO | UO (Un Objectionable | | | IS – 3025 Part-5 |
| Taste | | | | Agbl | 0 | | | IS – 3025 Part-8 |
| Conductivity | µmho/cm | | | 0 | - | | | IS – 3025 Part-14 |
| Turbidly | NTU | | | 5 | 5 | | | IS – 3025 Part-10 |
| pH | | | | 6.5-8.5 | 7-8.5 | | | IS – 3025 Part-11 |
| COD | Mg/L | | | 0 | - | | | IS – 3025 Part-58 |
| BOD | Mg/L | | | 0 | 0-8 | | | IS – 3025 Part-44 |
| Total Hardness | Mg/L | | | 300 | - | | | IS – 3025 Part-21 |
| Iron | Mg/L | | | 0.3 | .3 | | | IS – 3025 Part-53 |
| Chloride | Mg/L | | | 250 | - | | | IS – 3025 Part-32 |
| Residual Chloride | Mg/L | | | 0.2 | 0.1 | | | IS – 3025 Part-26 |
| Total SS | Mg/L | | | 0 | - | | | IS – 3025 Part-17 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-----------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|-------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Total DS | Mg/L | | | 0 | 500 | | | IS – 3025 Part-16 |
| DO | Mg/L | | | 0 | - | | | IS – 3025 Part-38 |
| Calcium | Mg/L | | | 75 | 75 | | | IS – 3025 Part-40 |
| Magnesium | Mg/L | | | 30 | 50 | | | IS – 3025 Part-46 |
| Sulphate | Mg/L | | | 200 | 200 | | | IS – 3025 Part-24 |
| Nitrate | Mg/L | | | 45 | 50 - 100 | | | IS – 3025 Part-34 |
| Fluoride | Mg/L | | | 0.6-1.2 | 0.5 - 1.5 | | | IS – 3025 Part-23 |
| Phosphate | Mg/L | | | 0 | 5 | | | APHA 4500 (D) |
| Sodium | Mg/L | | | 0 | - | | | IS – 3025 Part-45 |
| Potassium | Mg/L | | | 0 | To be filled | | | IS – 3025 Part-45 |
| Cyanide | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-27 |
| Chromium | Mg/L | | | 0.05 | 0.05 | | | IS – 3025 Part-52 |
| Boron | Mg/L | | | 0 | 0.024 | | | IS – 3025 Part-29 |
| SAR | Mg/L | | | 0 | - | | | By Calculation |
| Lead | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-47 |
| Cadmium | Mg/L | | | 0.01 | - | | | IS – 3025 Part-41 |
| Mercury | Mg/L | | | 0.001 | - | | | IS – 3025 Part-48 |
| Copper | Mg/L | | | 0.05 | 1 | | | IS – 3025 Part-36 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|----------------------|---------|----------------------|---------------------|---|---------------------------------|------------------------------|---------------------------|-------------------|
| | | | | | | Measurement Point | Frequency | |
| Surface Water | | | | | | | | |
| Color | Hazen | | | 5 | 5 | Damdarpur (Under Pkg.A3B) | As per CPCB / SPCB norms. | |
| Odour | mg/L | | | UO | UO (Un Objectionable) | | | IS – 3025 Part-4 |
| Taste | | | | Agbl | 0 | | | IS – 3025 Part-5 |
| Conductivity | µmho/cm | | | 0 | - | | | IS – 3025 Part-8 |
| Turbidity | NTU | | | 5 | 5 | | | IS – 3025 Part-14 |
| pH | | | | 6.5-8.5 | 7-8.5 | | | IS – 3025 Part-10 |
| COD | Mg/L | | | 0 | - | | | IS – 3025 Part-11 |
| BOD | Mg/L | | | 3 | 0-8 | | | IS – 3025 Part-58 |
| Total Hardness | Mg/L | | | 300 | - | | | IS – 3025 Part-44 |
| Iron | Mg/L | | | 0.3 | .3 | | | IS – 3025 Part-21 |
| Chloride | Mg/L | | | 250 | - | | | IS – 3025 Part-53 |
| | | | | | | | | IS – 3025 Part-32 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-------------------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|-------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Residual Chlorine | Mg/L | | | 0.2 | 0.1 | | | IS – 3025 Part-26 |
| Total SS | Mg/L | | | 0 | - | | | IS – 3025 Part-17 |
| Total DS | Mg/L | | | 500 | 500 | | | IS – 3025 Part-16 |
| DO | Mg/L | | | 4 | - | | | IS – 3025 Part-38 |
| Calcium | Mg/L | | | 75 | 75 | | | IS – 3025 Part-40 |
| Magnesium | Mg/L | | | 30 | 50 | | | IS – 3025 Part-46 |
| Sulphate | Mg/L | | | 200 | 200 | | | IS – 3025 Part-24 |
| Nitrate | Mg/L | | | 45 | 50 - 100 | | | IS – 3025 Part-34 |
| Fluoride | Mg/L | | | 0.6-1.2 | 0.5 - 1.5 | | | IS – 3025 Part-23 |
| Phosphate | Mg/L | | | 0 | 5 | | | APHA 4500 (D) |
| Sodium | Mg/L | | | 6 | - | | | IS – 3025 Part-45 |
| Potassium | Mg/L | | | 0 | To be filled | | | IS – 3025 Part-45 |
| Cyanide | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-27 |
| Chromium | Mg/L | | | 0.05 | 0.05 | | | IS – 3025 Part-52 |
| Boron | Mg/L | | | 1 | 0.024 | | | IS – 3025 Part-29 |
| SAR | Mg/L | | | 26 | - | | | By Calculation |
| Lead | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-47 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | |
|-------------------|---------|----------------------|---------------------|---|---------------------------------|---------------------------|--------------------|
| | | | | | | Measurement Point | Frequency |
| Cadmium | Mg/L | | | 0.01 | - | | IS – 3025 Part-41 |
| Mercury | Mg/L | | | 0.001 | - | | IS – 3025 Part-48 |
| Copper | Mg/L | | | 0.05 | 1 | | IS – 3025 Part-36 |
| Color | Hazen | | | 5 | 5 | Damdarpur (Under Pkg.A3B) | IS – 3025 Part – 4 |
| Odour | mg/L | | | UO | UO (Un Objectionable | | IS – 3025 Part-5 |
| Taste | | | | Agbl | 0 | | IS – 3025 Part-8 |
| Conductivity | µmho/cm | | | 0 | - | | IS – 3025 Part-14 |
| Turbidity | NTU | | | 5 | 5 | | IS – 3025 Part-10 |
| pH | | | | 6.5-8.5 | 7-8.5 | | IS – 3025 Part-11 |
| COD | Mg/L | | | 0 | - | | IS – 3025 Part-58 |
| BOD | Mg/L | | | 0 | 0-8 | | IS – 3025 Part-44 |
| Total Hardness | Mg/L | | | 300 | - | | IS – 3025 Part-21 |
| Iron | Mg/L | | | 0.3 | .3 | | IS – 3025 Part-53 |
| Chloride | Mg/L | | | 250 | - | | IS – 3025 Part-32 |
| Residual Chloride | Mg/L | | | 0.2 | 0.1 | | IS – 3025 Part-26 |
| Total SS | Mg/L | | | 0 | - | | IS – 3025 Part-17 |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-----------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|-------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Total DS | Mg/L | | | 0 | 500 | | | IS – 3025 Part-16 |
| DO | Mg/L | | | 0 | - | | | IS – 3025 Part-38 |
| Calcium | Mg/L | | | 75 | 75 | | | IS – 3025 Part-40 |
| Magnesium | Mg/L | | | 30 | 50 | | | IS – 3025 Part-46 |
| Sulphate | Mg/L | | | 200 | 200 | | | IS – 3025 Part-24 |
| Nitrate | Mg/L | | | 45 | 50 - 100 | | | IS – 3025 Part-34 |
| Fluoride | Mg/L | | | 0.6-1.2 | 0.5 - 1.5 | | | IS – 3025 Part-23 |
| Phosphate | Mg/L | | | 0 | 5 | | | APHA 4500 (D) |
| Sodium | Mg/L | | | 0 | - | | | IS – 3025 Part-45 |
| Potassium | Mg/L | | | 0 | To be filled | | | IS – 3025 Part-45 |
| Cyanide | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-27 |
| Chromium | Mg/L | | | 0.05 | 0.05 | | | IS – 3025 Part-52 |
| Boron | Mg/L | | | 0 | 0.024 | | | IS – 3025 Part-29 |
| SAR | Mg/L | | | 0 | - | | | By Calculation |
| Lead | Mg/L | | | 0.05 | 0.01 | | | IS – 3025 Part-47 |
| Cadmium | Mg/L | | | 0.01 | - | | | IS – 3025 Part-41 |
| Mercury | Mg/L | | | 0.001 | - | | | IS – 3025 Part-48 |
| Copper | Mg/L | | | 0.05 | 1 | | | IS – 3025 Part-36 |

Noise and Vibration (Arrangements for testing of noise & vibration is being done by the Agencies.)

| Item | Unit | Measured Value (Mean) | Measured Value (Max) | Indian Standard (NAAQS, 2009) | | | | Referred International Standard | Remarks Measurement | Frequency | Method |
|-----------------|-----------|-----------------------|----------------------|-------------------------------|-------|-----|--------------|---|--|-----------|--------|
| | | | | day | night | day | night | | | | |
| Noise Level | dB(A) | | | Industrial | 75 | 70 | To be filled | Chandipal | Periodically as per CPCB / SPCB norms. | IS9876 | |
| | | | | Commercial | 65 | 55 | | | | | |
| | | | | Residential | 55 | 45 | | | | | |
| | | | | Silence Zone | 50 | 40 | | | | | |
| Vibration Level | mm/second | | | | | | To be filled | At sensitive receptors & settlements in the adjoining area of tunnel site | | | |
| Noise Level | dB(A) | | | Industrial | 75 | 70 | | Kansargoda | Periodically as per CPCB / SPCB norms. | IS9876 | |
| | | | | Commercial | 65 | 55 | | | | | |
| | | | | Residential | 55 | 45 | | | | | |
| | | | | Silence Zone | 50 | 40 | | | | | |
| Noise Level | dB(A) | | | Industrial | 75 | 70 | | Damadarpur | Periodically as per CPCB / SPCB norms. | IS9876 | |
| | | | | Commercial | 65 | 55 | | | | | |
| | | | | Residential | 55 | 45 | | | | | |
| | | | | Silence Zone | 50 | 40 | | | | | |

2.1.1.2 Land Environment

| Item | Monitoring Result of Reporting Period (1 st April 2020 to 30 th September 2020.) | Remarks Measurement Point | Frequency | Method |
|---------------------------|--|---|-----------|--|
| Degradation of land cover | Not affected | 1. Construction areas 2. Borrow areas 3. Labour camps | Quarterly | Visual observation |
| Soil Erosion | Not affected | At high banking zone of Canal sections | Quarterly | Site observation, review of records and public discussions |

2.1.1.3 Soil Environment

| Item | Monitoring Result of Reporting Period (1 st April 2020 to 30 th September 2020.) | Remarks Measurement Point | Frequency | Method |
|---------------------------|--|---------------------------------|-----------|--------------------|
| Degradation of land cover | Not affected | To be filled based on Annex XII | Quarterly | Observation |
| Soil Erosion | Not affected | To be filled based on Annex XII | Quarterly | Visual observation |

2.1.1.4 Occupational Health of Workers

| Item | Monitoring Result of Reporting Period (1 st April 2020 to 30 th September 2020.) | Remarks Measurement Point | Frequency | Method |
|--|---|----------------------------------|-----------|--|
| Health of workers may be affected due to unhealthy working conditions. | The contractor has made all arrangements for the workers for Health Environment working condition 1. Arrangement has been made for conducting health camp. 2. Regularly public interruption made during construction. | Construction Site / labour camps | Quarterly | 1. Health camp by Health Dept. 2. Public discussion |

2.1.5 Biodiversity

| Item | Monitoring Result of Reporting Period (1 st April 2020 to 30 th September 2020.) | Remarks Measurement Point | Frequency | Method |
|--|--|---------------------------|---------------------|--------|
| Related environmental issues including elephant passages | 1. No environmental issues encountered during canal construction work. 2. There are no elephant passages as information collected from forest activities. 3. No flora & fauna has been affected. | Command Area | Bi-annually | |
| | | elephant passages | Regular observation | |

2.1.1.6 Hydrology

| Item | Monitoring Result of Reporting Period (1 st April 2020 to 30 th September 2020.) | Remarks Measurement Point | Frequency | Method |
|--|---|---------------------------------|---|-------------------------------|
| Adequacy of irrigation water supply | Not yet started | Command area | During cropping season | Observe of the concerned area |
| Depletion of water level due to use of surface water | Not affected as system is not completed. | Barrage pond | Post Kharif supply and Post Rabi supply | Observe of the concerned area |
| Ground water fluctuation | Observation will be made prior to & after monsoon. | Villages in the Project area | Twice a year | Depth of water level |
| Change in course of natural drains | Not observed. Programme to supply irrigation water in command area after completion of the distribution system during khariff season. | In the Project area | Once Post monsoon | Course of natural drain. |

2.1.1.7 Solid Waste

| Item | Monitoring Result of Reporting Period (1 st April 2020 to 30 th September 2020.) | Remarks Measurement Point | Frequency | Method |
|--------------------|--|---|------------|--------------------|
| Construction waste | Contractor managing the construction works such as excavated earth using in fillinf section of canal & laterite rock is being disposed off for utilization of buling materials | At construction site and at Spoil banks | Periodical | Routine site visit |

2.1.8 Risk and Hazard

| Item | Monitoring Result of Reporting Period (1 st April 2020 to 30 th September 2020.) | Remarks Measurement Point | Frequency | Method |
|---|--|---|------------|---|
| Accidents in construction sites | No accident occurred during a period of construction works in working sites. | At the work side of Package A1, A2 & B1 | Periodical | Measures as suggested are taken |
| Hazards due to storage spillage of oil & lubricants | Diesel & Lubricants are stocked away from the Fire place and also above the ground level on Pan / Tray such that it is not contaminated with the soil. | At the work side of Package A1, A2 & B1 | Periodical | As per SPCB. Measures as suggested are taken. |

2.2 Operation and Decommission Stages (Not Applicable Now)

2.2.1 Pollution (Arrangement for the testing is being carried out by the contractor)

Water Environment

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Measurement Point | Remarks | |
|----------------------|---------|-----------------------------|---------------------|---|---------------------------------|--------------------------------|-------------|--------------------------|
| | | | | | | | Frequency | Method |
| Surface Water | | | | | | | | |
| Color | Hazen | The system is not completed | | 5 | To be filled | Panaspal Chadipal Gohira | At interval | regular APHA 2120 (B) |
| Odour | | | | UO | To be filled | Belabahali | | APHA 2150 (B) |
| Taste | | | | Agbl | To be filled | Korda | | 2160 Taste-B,C |
| Conductivity | µmho/cm | | | 0 | To be filled | Laxminagar | | APHA 2510 (B) |
| Turbidity | NTU | | | 5 | To be filled | | | APHA 2130 B |
| pH | | | | 6.5-8.5 | To be filled | | | APHA 4500 (B) |
| COD | Mg/L | | | 0 | To be filled | | | APHA 5220(B) |
| BOD | Mg/L | | | 0 | To be filled | | | APHA 5210(B) |
| Total Hardness | Mg/L | | | 300 | To be filled | | | APHA 2340 (C) |
| Iron | Mg/L | | | 0.3 | To be filled | | | APHA 3500 (B) |
| Chloride | Mg/L | | | 250 | To be filled | | | APHA 4500 Cl (B) |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-------------------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|-------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Residual Chloride | Mg/L | | | 0.2 | To be filled | | | APHA 4500 Cl-B,C |
| Total SS | Mg/L | | | 0 | To be filled | | | APHA 2540 (D) |
| Total DS | Mg/L | | | 0 | To be filled | | | APHA 2540 (C) |
| DO | Mg/L | | | 0 | To be filled | | | APHA 4500(B) |
| Calcium | Mg/L | | | 75 | To be filled | | | APHA 3500 Ca (B) |
| Magnesium | Mg/L | | | 30 | To be filled | | | APHA 3500 Mg (B) |
| Sulphate | Mg/L | | | 200 | To be filled | | | APHA 4500 So4 (E) |
| Nitrate | Mg/L | | | 45 | To be filled | | | APHA 4500 NO3(B) |
| Fluoride | Mg/L | | | 0.6-1.2 | To be filled | | | APHA 4500 F-(D) |
| Phosphate | Mg/L | | | 0 | To be filled | | | APHA 4500 (D) |
| Sodium | Mg/L | | | 0 | To be filled | | | APHA 3500 Na (B) |
| Potassium | Mg/L | | | 0 | To be filled | | | APHA 3500 K (B) |
| Cyanide | Mg/L | | | 0.05 | To be filled | | | APHA |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | |
|---------------------|---------|----------------------|---------------------|---|---------------------------------|-------------------|---------------------|
| | | | | | | Measurement Point | Frequency |
| | | | | | | | 4500Cn-(D) |
| Chromium | Mg/L | | | 0.05 | To be filled | | APHA 3500 Cr (B) |
| Boron | Mg/L | | | 0 | To be filled | | APHA 3500 (B) |
| SAR | Mg/L | | | 0 | To be filled | | By Calculation |
| Lead | Mg/L | | | 0.05 | To be filled | | APHA 3500 Pb |
| Cadmium | Mg/L | | | 0.01 | To be filled | | APHA 3500 Cd |
| Mercury | Mg/L | | | 0.001 | To be filled | | APHA 3500-Hg |
| Copper | Mg/L | | | 0.05 | To be filled | | APHA 3500-Cu |
| Ground Water | | | | | | | |
| Color | Hazen | | | 5 | To be filled | Marthapur | APHA 2120 (B) |
| Odour | | | | UO | To be filled | Gohira | APHA 2150 (B) |
| Taste | | | | Agbl | To be filled | Belabahali | 2160 Taste-B,C |
| Conductivity | µmho/cm | | | 0 | To be filled | Korda | APHA 2510 (B) |
| Turbidity | NTU | | | 5 | To be filled | | APHA 2130 B |
| pH | | | | 6.5-8.5 | To be filled | | APHA 4500 (B) |
| COD | Mg/L | | | 0 | To be filled | | APHA 5220(B) |
| BOD | Mg/L | | | 0 | To be filled | | APHA 5210(B) |
| Total Hardness | Mg/L | | | 300 | To be filled | | APHA 2340 (C) |
| | | | | | | | At regular interval |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-------------------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|-------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Iron | Mg/L | | | 0.3 | To be filled | | | APHA 3500 (B) |
| Chloride | Mg/L | | | 250 | To be filled | | | APHA 4500 Cl (B) |
| Residual Chloride | Mg/L | | | 0.2 | To be filled | | | APHA 4500 Cl-B,C |
| Total SS | Mg/L | | | 0 | To be filled | | | APHA 2540 (D) |
| Total DS | Mg/L | | | 0 | To be filled | | | APHA 2540 (C) |
| DO | Mg/L | | | 0 | To be filled | | | APHA 4500(B) |
| Calcium | Mg/L | | | 75 | To be filled | | | APHA 3500 Ca (B) |
| Magnesium | Mg/L | | | 30 | To be filled | | | APHA 3500 Mg (B) |
| Sulphate | Mg/L | | | 200 | To be filled | | | APHA 4500 So4 (E) |
| Nitrate | Mg/L | | | 45 | To be filled | | | APHA 4500 NO3(B) |
| Fluoride | Mg/L | | | 0.6-1.2 | To be filled | | | APHA 4500 F-(D) |
| Phosphate | Mg/L | | | 0 | To be filled | | | APHA 4500 (D) |
| Sodium | Mg/L | | | 0 | To be filled | | | APHA 3500 Na |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard (IS:10500 Drinking Water) | Referred International Standard | Remarks | | |
|-----------|------|----------------------|---------------------|---|---------------------------------|-------------------|-----------|------------------------|
| | | | | | | Measurement Point | Frequency | Method |
| Potassium | Mg/L | | | 0 | To be filled | | | (B) APHA 3500 K (B) |
| Cyanide | Mg/L | | | 0.05 | To be filled | | | APHA 4500Cn-(D) |
| Chromium | Mg/L | | | 0.05 | To be filled | | | APHA 3500 Cr (B) |
| Boron | Mg/L | | | 0 | To be filled | | | APHA 3500 (B) |
| SAR | Mg/L | | | 0 | To be filled | | | By Calculation |
| Lead | Mg/L | | | 0.05 | To be filled | | | APHA 3500 Pb |
| Cadmium | Mg/L | | | 0.01 | To be filled | | | APHA 3500 Cd |
| Mercury | Mg/L | | | 0.001 | To be filled | | | APHA 3500-Hg |
| Copper | Mg/L | | | 0.05 | To be filled | | | APHA 3500-Cu |

| Ground Water Level | | | | | | |
|------------------------------|------|---------------------------------|--------------|--------------|--|--|
| Change in ground water level | mbgl | To be carried out as suggested. | To be filled | To be filled | Chandipal Damadarpur Panasapal (Hudisahi Village) Laxminagar Belbahali Ragadi Barundeji Ranapur Chandali Bamphidi Suano Barakhai Dhuligarh Ramachandrapur (Manoharpur) Ankurapal Sukinda Haripur Nua- Nilakanthapur Gadagaunpur Kansargada Bambilo | Once in Post Monsoon & Once in Pre Monsoon |
| | | | | | | |

| Water logging & drainage | | | | | | |
|---|--------------|--------------|--------------|--------------|---------------------------------------|--|
| Water logging & drainage water level | Sq. km | Not observed | To be filled | To be filled | Low lying areas of command area | In the peak monsoon season & at the time of full flow in the canal |
| Weed infestation in the water body | | | | | | |
| Water logging & drainage water level | To be filled | Not Observed | To be filled | To be filled | Stagnant areas of surface water body. | Post-monsoon period |
| Wastage of water | | | | | | |
| Wastage of water | To be filled | Not Observed | To be filled | To be filled | Command area | During Rabi & Khariff |

2.2.2 Soil Environment (Testing report to be submitted after monsoon period) (Not Applicable Now)

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard | Referred International Standard | Remarks Measurement Point | Frequency | Method |
|---------------------------------------|--------------|----------------------|---------------------|-----------------|---------------------------------|---------------------------|---------------------------------------|------------------------|
| Soil fertility may be affected | | | | | | | | |
| EC | Micro mho/cm | | | To be filled | To be filled | Ghasipura Laxminagar | At regular intervals to be decided by | EC metr (hesse, 1972) |
| OM | % | | | To be filled | To be filled | Garudabandi | by | Walkely & Black method |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard | Referred International Standard | Remarks Measurement Point | Frequency | Method |
|---|--------------|----------------------|---------------------|-----------------|---------------------------------|--|---|----------------------|
| Total Nitrogen- by Mico-kjeldahl method | mg/100g | | | To be filled | To be filled | Damdarpur Korda Gohira Panaspal Kansargoda Belabahali | PMU | Mico-kjeldahl method |
| Available Phosphorous – by Olsen's method | mg/100g | | | To be filled | To be filled | | | Olsen's method |
| Calcium & Magnesium – by Versene method | Meq/100 g | | | To be filled | To be filled | | | Versene method |
| Sodium & Potassium – by Flame photometer | mg/100g | | | To be filled | To be filled | | | Flame photometer |
| Use of agrochemicals | | | | | | | | |
| Dosage of fertilizers, pesticides, insecticides | To be filled | | | To be filled | To be filled | Command Area | At regular intervals to be decided by PMU | |

| Item | Unit | Measured Value(Mean) | Measured Value(Max) | Indian Standard | Referred International Standard | Remarks Measurement Point | Frequency | Method |
|---|------|----------------------|---------------------|-----------------|---------------------------------|---------------------------|-----------|--------|
| etc. specified by Dept. of Agriculture, Govt. of Odisha | | | | | | | | |

2.2.3 Biodiversity (Not Applicable Now)

| Item | Monitoring Result of Reporting Period 1 st April 2020 to 30 th September 2020. | Remarks Measurement Point | Frequency | Method |
|--|--|---------------------------|---------------------|---|
| Related environmental issues including elephant passages | <p>1. No environmental issues encountered during canal construction.</p> <p>2. There are no elephant passages as information collated from forest activities.</p> <p>3. No flora & fauna has been affected</p> | Command Area | Bi-annually | <p>Flora- Quadrant plot Analysis</p> <p>Fauna- Direct method</p> <ul style="list-style-type: none"> • Sighting • Transit line <p>Indirect Method</p> <ul style="list-style-type: none"> • Feeding Sign • Scat / dung / pellet identification • Hoof / pug marks <p>Information collection from villagers and forest officers to ensure that passage is followed or detoured.</p> |
| | | elephant passages | Regular observation | |

2.2.4 Public Health (Not Applicable Now)

| Item | Monitoring Result of Reporting Period 1 st April 2020 to 30 th September 2020. | Remarks Measurement Point | Frequency | Method |
|---|---|--|---------------------|-------------|
| Early diagnosis of malaria | Project area not malaria affected prone area | Stagnant water is not allowed near Camp / Work side of Pkg. A1, A2 & B1. Malaria control medicine are stocked at the camp. | Regular observation | Health camp |
| Implementation of malaria mitigation measures | Health Dept. has been requested to conduct health camp at different locations for health check up & prevention of malaria & water born disease. | | Regular observation | |

2.2.5 Climate change (Not Applicable Now)

| Item | Monitoring Result of Reporting Period 1 st April 2020 to 30 th September 2020. | Remarks Measurement Point | Frequency | Method |
|--|---|---------------------------|---------------------|--------|
| Development of large scale green body. | After completion of project open land will be covered by agriculture & the agriculture land will be increased | | Regular observation | |