BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

Original application No. 125 of 2017

And

Original Application No. 217 of 2017

IN THE MATTER OF:

Court on its own motion

Versus

State of Karnataka ..Respondent

AND

Dr. Kupendra Reddy ..Applicant

Versus

State of Karnataka ..Respondent

INDEX

(BALAJI SRINIVASAN)
Advocate for Petitioner
24 Lawyers Chamber
Supreme Court of India
New Delhi.-1
C.C. 1546
E-mail I.D.: balaji@24lc.in

FILED ON:-

1876

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 125 of 2017
And
Original Application No. 217 of 2017

IN THE MATTER OF:
Court on its own motion

Versus

State of Karnataka ..Respondent

AND

Dr. Kupendra Reddy ..Applicant

Versus

State of Karnataka ..Respondent

AFFIDAVIT ON BEHALF OF THE BANGALORE WATER SUPPLY AND SEWERAGE BOARD

I, E.Nithyananda Kumar, son of Eraiah aged 59 years working as Chief Engineer, Wastewater Management, BWSSB, am authorized signatory of the Respondent Bengaluru Water Supply and Sewerage Board ("**BWSSB**") and as such I am well acquainted with the facts and circumstances of the case. I do hereby solemnly affirm and state on oath as follows.

1. The instant affidavit is being filed as an explanation to the compliances made by BWSSB. The compliances made by BWSSB have been in respect to the following in brief:
   I. Mobilization of available resources to ensure that the STPs are commissioned as expeditiously as possible
   II. Upgradation of all existing STPs with facilities to removal of Biological Nutrient Removal
   III. Ensure that all the sewage generated in the catchment area is channelized and linked to the Rajakaluves
   IV. Identify blockages in the existing UGDs
   V. Treated water to not mix with the sewage and then to flow into the STP to get recycled for the second time

2. The compliances have been elaborated below:

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10678/14 upto 27/06/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

I. Mobilization of available resources to ensure that the STPs are commissioned as expeditiously as possible

i. Direction/Order dated 06.12.2018, of this Hon'ble Tribunal

In para No.19 of the aforesaid order, it is observed that "*The crux of the present environmental disaster is indiscriminate discharge of untreated sewage into the lakes. Admittedly, currently approximately 183 MLD, if not more, of untreated sewage is being discharged into the lake. This is nothing short of a state of environmental emergency. Consequently, it is of utmost importance that the under construction and planned STPs are commissioned on a war footing. The Commission is of the view that there is no proper justification on the part of the authorities not to expedite the completion of the STPs as indicated particularly in respect of the 150 MLD K & C Valley STP. The authorities (BWSSB, BDA and KSPCB) must mobilize all available resources to ensure that the STPs are commissioned as expeditiously as possible preferably by March 2019 or within such time as this Hon'ble Tribunal may deem fit*".

ii. Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report dated 20.09.2019

Koramangala Challaghatta lake series (KC Valley) located in the east of Bengaluru urban district encompassing nearly 35.7% of BBMP spatial extent and constitutes largest among the three major lakes series in Bengaluru. KC Valley catchment extends between 12.8365°N to 13.0153°N and 77.5651°E to 77.7873°E with a spatial extent of 292.38 sq.km. The catchment has nearly 82 lakes, some of which dates back to over 1400 years, such as the Agara lake, Bellandur lake built during the Western Ganga Dynasty in the early 5th century. The K&C Valley catchment nalhas/tributary streams further moves and merges with the Dakshin Pinakini, a seasonal river. The Hebbal and Yelahanka tributary streams converge with the Varthur lake series at Nagondanahalli village (BBMP Ward 94-Hagadur). It is to state that there are 82 lakes in this catchment area. Most of these lakes are silted (or being filled with C&D debris). Some of the lakes (not the part of 82 tanks) have been made disused and converted them into layouts and presently water bodies do not exist. This is one of the main reasons for flooding of the eastern part

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10678/14 upto 27/06/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

of the Bengaluru during rains. The BWSSB has about 6 STPs in place for a capacity of 453.5 MLD in this catchment area. Further, the BWSSB has also taken up construction of other 6 STPs for the capacity of 205 MLD. Hence, 658.5 MLD of sewage would be treated by 2020 in this catchment area. The BWSSB submits that presently about 583 MLD outflows from Varthur lake (this includes the treated water from K&C Valley STPs). By taking this into consideration the total sewage generated and its treatment, there shall not be any untreated sewage left to flow in the lakes. But the situation is otherwise. The BWSSB should take note of it and workout a proper planning/reorient to treat the entire sewage to make it zero flow into the lakes. The BWSSB shall have to properly designed UGD network so as to feed the existing STPs to their full capacity and also to the STPs under construction. In addition, it should also ensure that the treated water shall be reused after meeting the requirement of all the tanks in the catchment area. It is noted that most of the STPs are not running to their full capacity. The BWSSB may be directed to make proper arrangements to feed the required quantity of sewage by strengthening the UGD networking to supply to the existing and to be constructed STPs. The present status of polluted water in the lakes in Bengaluru is mainly due to the sustained inflow of partially treated or untreated sewage and untreated industrial effluents. It is recommended here that the first priority of use of treated water from all the STPs shall be to feed and maintain the full water level of the lakes and remaining surplus water should only be used for other purposes. The dates given at column 4 for completion of STPs and other works may be accepted.

iii. <u>BWSSB Compliance:</u>

a. 150 MLD Capacity new Sewage Treatment Plant based on activated sludge process with BNR with Power generation Date of completion 30.07.2020.

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

The construction of this 150 MLD STP is taken up at the cost of Rs.297.37 Crore Date of Completion is 30.07.2020.

1. The overall progress as on 15-11-2019 is 66.53% against the Planned target of 70.60%.

   i. Designs are completed upto 99.48%.
   ii. Orders for equipments have been placed to 100%.
   iii. The progress of works on civil structures is 57.64% against the target of 60.62%
   iv. 92.97% against 100% of the equipments have been supplied to the site.
   v. A progress of 9.65% is achieved in installation of the procured equipments against target of 13.51%.

The slippage of around 4% is due to the incessant rains from 2nd week of August to 1st week of November 2019. The above slippage of progress will be covered in the available time and the trial run of the above plant will be taken up during May-2020 and the treatment to the required level will be attained within the scheduled date of 30.07.2020.

Enclosures:

1. Annexure-1
2. Copy of the Progress report of the work as Annexure-A2 (Page No.1 to 3).
3. Photographs showing the status of the works as Annexure-A3 (Page No.1 to 16).

b. Construction of 210 MLD capacity ISPS at Koramangala Sports Complex – including O&M for 7 years: Date of completion 29.01.2020.

The construction of this 210 MLD ISPS is taken up at the cost of Rs.38.61 Crore Date of Completion is 29.01.2020.

1. The overall progress as on 15-11-2019 is 82.99% against the planned target of 85.30%

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10618 Upto 27/05/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

i. Designs are completed upto 99.80%.
ii. Orders for equipment's have been placed to 100%.
iii. The progress of works on civil structures is 95.00% against the target of 100%,
iv. 100.00% of the equipment's have been supplied to the site.
v. Installation of plants, testing and commissioning is to be taken up

The slippage of around 2.31% is due to the incessant rains from 2nd week of August to 1st week of November 2019. The above slippage of progress will be covered in the available time and the work will be completed as per schedule.

The work will be completed within 29.01.2020. However, the actual pumping of sewage to the 150 MLD STP at K&C Valley can only be taken up when the STP is ready for operation i.e. 30.07.2020 as mentioned in (a) above.

Enclosures:

1. Annexure-1
2. Copy of the Progress report of the work as Annexure-A2 (Page No.4 to 6).
3. Photographs showing the status of the works as Annexure-A3 (Page No.7 to 14).

c. Laying of 1800 mm dia raising main from 210 MLD ISPS to 150 MLD STP – S2D(a) of length 5.315 Km Date of completion 07.01.2020

The work of providing and laying 1800 mm dia raising main from 210 MLD ISPS at NGV to K&C Valley STP is taken up at the cost of Rs.65.64 Crore Date of Completion is 07.01.2020. In the scope of the work, it is required to lay 1800mm dia PCC pipe for length of 5315 RMT (5.315 KM).

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10678/14 upto 27/12/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

1. As on 15.11.2019 the overall progress is 50.23% against the Planned target of 75.74%,

I. 75% of the pipeline procurement along with the specials is completed, i.e. 4000 RMT of pipeline has been procured.

II. Against 3015 RMT of pipeline is identified to be laid in the roads out of which 2600 RMT of pipeline is already laid.

III. 2300 RMT of pipeline is identified to be laid in the storm water drain (SWD) out of which 80 RMT of pipeline is laid. The targeted quantity of pipeline to be laid in SWD as on 15-11-2019 is 100 RMT.

Pipeline to be laid in the SWD is 2300 RMT and 3015 RMT of pipeline is to be laid in the roads of thickly populated residential/ commercial areas. Normally the procured pipes will be stacked/stored all along the alignment to facilitate easy handling. However, as the pipeline is to be laid in the thickly populated residential/commercial areas, procurement of entire quantity of pipes is not feasible due to lack of space for storage of the pipes.

The lagging in laying of pipeline is mainly due to ROW issues in respect of residential layouts, in defense land etc. Out of 3015 Rmt, a stretch of 715 RMT of pipeline is to be laid along the road by the side of the existing storm water drain (SWD). This portion of SWD is presently taken up for remodeling of SWD by BBMP authorities. In view of the requirement of working space and to provide access to the commuters the pipeline has to be laid only after completion of remodeling of SWD. Tentatively, the pipe laying work in this stretch may start from 1st Dec-2019 and will require one month time for completion.

Laying of pipelines in the storm water drain (SWD) is very difficult as the location of work in this drain is at the end of the valley carrying

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10678/14 upto 27/06/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

huge quantity of storm water. As and when it rains anywhere in the catchment area, it ultimately reaches to this location and floods. Due to incessant rains from 2nd week of August 2019 to 1st week of November 2019, the progress in the above work could not be achieved.

Sufficient mobilization of materials, men and machinery has been made and the laying of pipeline is commenced from 2nd week of November 2019. Work is taken up at 3 fronts. The work will be completed by 31.03.2020 and will be ready much in advance before STP is ready to take sewage i.e. 30.07.2020. It is requested that the timeline of this work be extended upto 31-03-2020 as the delay is due to heavy rains and this works will be completed before 30-07-2020 when the STP is to be commissioned. Hence the last date of sewage conveyance to STP will not changed.

Enclosures:

1. Annexure-1
2. Copy of the Progress report of the work as Annexure-A2 (Page No.7 to 9).
3. Photographs showing the status of the works as Annexure-A3 (Page No.25 to 38).

d. Sarakki – 5.0 MLD STP at Sarakki lake Date of completion August-2019

The plant is operational.

Enclosures:

1. Annexure-1
2. Photographs of the plant is shown in Annexure-A3 (Page No.39 to 42).

e. Chikkabeguru – 5.0 MLD STP Date of completion March-2020

NOTARY PUBLIC R. P. BANSAL Advocate Regn. No. 10578/14 upto 27/05/2024 GOVT. OF INDIA

Chief Engineer
BWSSB
Cauvery Bhavan,
Bangalore.

The work of construction of 5 MLD STP at Chikkabegur is taken up at the cost of Rs.13.89 Crore Date of Completion is 31-03-2020

1. The overall progress as on 15.11.2019is 45.92% against the planned target of 55.50%,

   a. Designs are completed upto 78.00%.
   b. Orders for equipment's have been placed to 100%.
   c. The progress of works on civil structures is 58.00% against the target of 70.00%, 40.00% of the equipment's have been supplied to the site against 50.00%.

Due to non-availability of enough land, the location of the plant was shifted from the original place proposed. Also due to poor soil conditions in the newly located place it was required to use piles for the foundation. As on date there is slippage of around 9.58% in progress which is mainly due to the continuous rains from 2nd week of August 2019 to 1st week of November 2019. However, this slippage will be covered in the available time and work will be completed as per schedule i.e. within Mar-2020

Enclosures:

1. Annexure-1
2. Copy of the Progress report of the work as Annexure-A2 (Page No.13 to 15).
3. Photographs showing the status of the works as Annexure-A3 (Page No.43 to 50).

f. Hulimavu – 10 MLD STP Date of completion March-2020

The work of construction of 5 MLD STP at Hulimavu is taken up at the cost of Rs.20.23 Crore. Date of Completion is 31-03-2020.

1. The overall progress as on 15.11.2019 is 62.01% against the planned target of 79.17%,

   i. Designs are completed upto 99.00% against 100.00%

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10575/ upto 2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore

ii. Orders for equipments have been placed to 97.83% against 100.00%

iii. The progress of works on civil structures is 74.76% against the target of 85.42%, 61.26% of the equipments have been supplied to the site against 80.00%.

Due to non-availability of enough land, the location of the plant was shifted from the original place proposed. Also due to poor soil conditions in the newly located place it was required to use piles for the foundation. As on date there is slippage of around 17.16% in progress which is mainly due to the continuous rains from 2nd week of August 2019 to 1st week of November 2019. However, this slippage will be covered in the available time and work will be completed as per schedule i.e. within Mar-2020

Enclosures:

1. Annexure-1
2. Copy of the Progress report of the work as Annexure-A2 (Page No.16 to 18).
3. Photographs showing the status of the works as Annexure-A3 (Page No.51 to 60).

g. Agaram – 35 MLD STP Date of completion Dec-2019

The work of construction of 35 MLD STP at Agara is taken up at the cost of Rs.53.63 Crore. Date of Completion is 31-12-2019.

1. The overall progress as on 15.11.2019 is 72.90% against the planned target of 91.06%,

   a. Designs are completed upto 98.00% against 100.00%.

   b. Orders for equipments have been placed to 100%.

   c. The progress of works on civil structures is 95.00% against the target of 99.00%,

   d. 68.00% of the equipments have been supplied to the site against 94.00%.

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10975/14 upto 27/06/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

The slippage of around 18.16% is due to the consistent intermittent rains during the months of August, September and October-2019. However, this slippage will be covered in the available time and work will be completed as per schedule i.e. within Dec-2019

Enclosures:

1. Annexure-1
2. Copy of the Progress report of the work as Annexure-A2 (Page No.19 to 21).
3. Photographs showing the status of the works as Annexure-A3 (Page No.65 to 77).

Device to connect Agaram STP to Agaram lake for impounding treated water it has been suggested to use 900 mm/600 mm across the ring road (the BWSSB shall ensure to feed the required treated water to Agara lake. The available existing 900mm dia RCC pipeline laid across the ring road is connected to Agaram Lake, same will be utilized to provide treated effluent from 35 MLD Agaram STP to Agaram lake.

h. **Waste water wet well – 32.5 MLD Capacity near the premises of 90MLD Bellandur Amanikhane STP to augment sewage from the adjoining areas of Bellandur Amanikhane STP - Date of completion 31.12.2020**

This is the most difficult work involving excavation upto a depth of 14 mtrs. 1st call tender for this work were floated during Nov-2017, since then 5 times the tenders have been recalled due to nonparticipation. However, the scope of work has been split into 2 separate works involving a) civil works and b) electro mechanical works. The tenders have been refloated and on the on the 9th call of electro mechanical tender there are bidders and the tender is being evaluated for awarding. In the civil works tender has been refloated for the 10th time and will be finalized with the evaluation of participated bidders. The works will be completed within the scheduled time i.e., 31-12-2020.

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10075/19 Delhi 27/05/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

i. **Augmenting sewage from Iblur side and conveying to Bellandur Amanikere STP (Laying of sewer sub main) - Date of completion 30.12.2020**

As per the commitment given to the Committee, this work is to be completed by Dec-2020, with regards to present status it is to submit that, an estimate for Rs 435 lakhs for laying RCC NP3 pipe line ranging from 450mm dia to 900mm dia is approved and tenders are to be finalized before 30-12-2019. The work will be completed as specified. i.e. 30.12.2020.

II. <u>Upgradation of all existing STPs with facilities to removal of Biological Nutrient Removal</u>

i. Direction/Order of this Hon'ble Tribunal

This Hon'ble Tribunal records that The STPs that are being set up and those which have already been set up must provide for treating/removing phosphorous and Nitrogen/nutrients. Proposal for upgradation of all existing STPs with facilities to removal of Biological Nutrient Removal at 248 MLD STP at K&C Valley.

ii. Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report dated 20-09-2019

It is suggested that BWSB may take interim measures to reduce the Phosphorous and Nitrogen/nutrients by integrating constructed wet lands with the STPs in consultation with BDA and Forest Department if found feasible.

iii. <u>BWSSB Compliance:</u>

In this regard it is to submit that the under construction STPs have been included with Biological Nutrient Removal facility.

BWSSB has proposed to upgrade the existing STPs at K & C Valley which are not having BNR facility i.e.(108+55+55+30)=248 MLD.

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10573/ Delhi 27/06/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

248 MLD STP at K & C Valley to reduce the Phosphorous and Nitrogen/nutrients in line with the Hon'ble NGT Committee recommendations at a cost of Rs.280 Crore which also includes Power Generation in the upgraded STP along with handling of Biosolids for further utilization. To meet cost of the above project BWSSB vide its letter No. BWSSB/CE(WWM)/ACE(WWM)-1/TA-1/620/2019-20 Dt: 15-6-2019 out of the Rs.500 crore deposited in the Escrow account by Government of Karnataka as per the directions of the Hon'ble NGT. In this regard Government of Karnataka in its G.O. UDD 91 MNJ 2017 (Part-4), Bangalore, Dated 20.07.2019 has allocated an amount of Rs.200 Crores to take up the upgradation of 248 MLD STP at K&C Valley. The remaining amount will be borne by BWSSB.

The work involves concepts like Biological Nutrient Removal, power generation, Biosolids handling system etc., along with rehabilitation of the various existing STPs having a total capacity of 248 MLD, it is necessary to appoint a consultant. BWSSB has already floated the necessary tenders for appointing a Project Management Consultancy which will be finalized by 30-12-2019.

In this valley following STP's which are working or under construction are inclusive of Biological Nutrient and Phosphorous treatment capabilities.

1. 90 MLD STP at Bellandur Amanikere (in operation)
2. 60 MLD STP at K&C Valley (in operation)
3. 5 MLD STP at Sarakki (in operation)
4. 150 MLD STP at K&C Valley (under construction)
5. 5 MLD STP at Chikkabegur (under construction)
6. 10 MLD STP at Hulimavu (under construction)
7. 35 MLD STP at Agaram (under construction)

III. <u>Ensure that all the sewage generated in the catchment area is channelized and linked to the Rajakaluves</u>

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10573/14 Delhi 27/06/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

i. Order of this Hon'ble Tribunal

In para No.9 (3) of the order dated 21.10.2019, this Hon'ble Tribunal observed that, "*As per the reports submitted before the Hon'ble Tribunal, the authorities have already identified all the sewage and effluent entry points into the lake. Therefore it is imperative that the authorities must simultaneously ensure that all the sewage generated in the catchment area is channelized and linked to the Rajakaluves for appropriate treatment by the STPs*".

ii. Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019

Pertaining to this para, in the final report of the Committee headed by Sri N. Santhosh Hegde, in Annexure-3, have already recorded the observations in Sl. No.1 against para 19(1), same is herewith reproduced "The BWSSB has about 6 STPs in place for a capacity of 453.5 MLD in this catchment area. Further, the BWSSB has also taken up construction of other 6 STPs for the capacity of 205 MLD. Hence, 658.5 MLD of sewage would be treated by 2020 in this catchment area. The BWSSB submits that presently about 583 MLD outflows from Varthur lake (this includes the treated water from K&C Valley STPs). By taking this into consideration the total sewage generated and its treatment, there shall not be any untreated sewage left to flow in the lakes. But the situation is otherwise. The BWSSB should take note of it and workout a proper planning/reorient to treat the entire sewage to make it zero flow into the lakes. The BWSSB shall have to properly designed UGD network so as to feed the existing STPs to their full capacity and also to the STPs under construction. In addition, it should also ensure that the treated water shall be reused after meeting the requirement of all the tanks in the catchment area".

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10678/14 upto 27/06/2024 GOVT. OF INDIA

iii. BWSSB Compliance

In this regard, as per directions of the Committee headed by Sri N. Santhosh Hegde the measurement of the actual flow in each of the

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

Nallahs/Drains leading to Bellandur lake were measured and a report was submitted during May 2019. As per the report, the following quantity of sewage was measured which was in addition to the sewage that was being treated in STPs as on the date of report,

1. HAL SWD (Challaghatta Valley) - 48.22 MLD (average)
2. Koramangala and Agaram Valley-179.50 MLD (average)
3. Iblur SWD-5.6 MLD (average)
4. Kempapura SWD-3.4 MLD (average)

The total sewage generated in the catchment area of Bellandur other than Kempapura valley and Iblur side is 583 MLD. The total inflow into Bellandur lake as on the date of measurement was 583 MLD, to treat this sewage BWSSB has the following treatment plants :

i) Existing 248 MLD capacity at K&C Valley
ii) Existing 60 MLD capacity at K&C Valley
iii) Existing 90 MLD capacity at Bellandur Amanikhane
iv) Existing 50 MLD capacity at Kadabeesanahalli
v) Existing 1.5 MLD capacity at Lal Bagh

vi) Existing 4 MLD capacity at Cubbon Park
vii) Existing 5 MLD STP at Sarakki.
viii) 150 MLD STP at K&C Valley under construction (**Work-a** as listed in NGT Committee recomendations in annexure-3).
ix) 35 MLD STP at Agaram under construction (**Work-g** as listed in NGT Committee recomendations in annexure-3).
x) 5 MLD STP at Chikkabegur under construction (**Work-e** as listed in NGT Committee recomendations in annexure-3).
xi) 10 MLD STP at Hulimavu under construction (**Work-f** as listed in NGT Committeerecomendations in annexure-3).

The combined treatment capacity of the above plants will be 658.5 MLD against a measured flow of 583 MLD. The BWSSB has planned to link the sewage lines to the STP to increase the flow to STP and to utilize the capacity to the full.

NOTARY PUBLIC

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

1. HAL SWD 48.22 MLD

- An average of 170 MLD of sewage generated in Challaghatta Valley was treated at the time of reporting of flow in the valley and in addition a flow of 48.22 MLD was reported to the committee.

- After completion of the 2 of the works in this valley, the flow of sewage in to 218 MLD STP has increased by 10 MLD and presently 180 MLD of sewage is being conveyed by gravity line to the existing 218 MLD STP at K&C Valley. Further, linking of laterals in Ambedkar Nagar (HAL) valley would augment additional sewage of 38 MLD and thereby the 218 MLD STP will be operated to its designed capacity of 218 MLD.

STP	Treatment at the time of measurement in MLD	No of works	Capturable flow in MLD	Treatment after completion of works taken up in MLD
K&C (218 MLD by gravity)	170	6 works completed, balance 17 works in progress	10	180
		After completion of balance 17 works by December 2020	38	218

2. Koramangala and Agaram SWD-179.50 MLD

STP	Treatment at the time of measurement in MLD	No of works	Capturable flow in MLD	Treatment after completion of works taken up in MLD
K&C (30 MLD by Agaram pumping)	30	-	-	30

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,

K&C (60 MLD by Agaram pumping)	30	Linking near Mahindra show room under KMRP and 6 linking works completed, out of 20 works	25	55
5 MLD Sarakki	0		5	5
Bellandur Amanikere (90 MLD) (60 MLD Agram pumping+5.6 MLD Iblur+3.4 MLD Kempapura+21 MLD local by wet well)	30		15	57
		After completion of balance 14 works by December 2020	12	
10 MLD Hulimavu	0		10	10
5 MLD Chikkabegur	0		5	5
35 MLD Agaram	0		10	10
150 MLD K&C	0	After completion of 28 works by December 2020	98	98
	90		**180**	**270**

- An average of 90 MLD of sewage generated in Koramangala and Agaram Valley was treated at the time of reporting of flow in the valley and in addition a flow of 179.50 MLD was reported to the committee during May 2019.

<u>As on 15/11/2019 (Present Status)</u>

- As undertaken during the committee meetings, the linking works at Mahindra Showroom under KMRP has been completed. After completion of 6 works of linking an average of 40 MLD flow has increased to the Agaram ISPS which in turn has been treated in respective STP's.

- Thus as on date 30 MLD sewage is being treated at 30 MLD STP at K&C valley (OLD) (no increase), in 60 MLD STP at K&C valley an average flow of 55 MLD (an increase of 25 MLD) is being treated, 5 MLD is treated in newly commissioned Sarakki STP and at 90 MLD STP of Bellandur Amanikere an average flow of 45 MLD (an increase of

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10673/14 upto 27/06/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

15 MLD) is being treated - 45 MLD (25 MLD at K&C, 5 MLD at Sarakki, 15 MLD at Bellandur Ammanikere.

- Further, after completion of balance 14 works in Phased manner by December 2020 in this valley, total 37 MLD of sewage will be captured. Out of this 37 MLD 12 MLD will be treated at Bellandur Ammanikere there by a total of 57 MLD (45+12) will be treated. Out of balance 25 MLD (37-12) 10 MLD will be treated in Agaram STP to be commissioned during December 2019, out of balance 15 MLD (25-10) 10 MLD will be treated at Hulimavu STP which is to be commissioned during March 2020 and balance 5 MLD (15-10) - 37 MLD (12 MLD at Bellandur Ammanikere, 10 MLD at Agaram, 10 MLD at Hulimavu, 5 MLD at Chikkabegur)

- After completion of balance 28 works an average 98 MLD of sewage will be augmented to the ISPS under construction in Koramangala Valley (Work-b as listed in NGT Committee recomendations in annexure-3) – 98 MLD

- The remaining 25 MLD sewage can be augmented to 35 MLD Agaram STP (work-g in committee report after completing the works under 110 villages in Koodlu area and works under CWSS-V stage with the assistance of JICA by 2023-24 in Bommanahalli area.

3. **Iblur Catchment area**

<u>The flow measured in this SWD is 5.6MLD (Avg)</u>

BWSSB has proposed to lay sewer submain to convey the sewage generated in this area to Bellandur Amanikere STP

Proposed Date of completion: 30.12.2020

Tenders have been floated (**Work-**as listed in NGT Committee recomendations in annexure-3).

4. **Kempapura Catchment area**

NOTARY PUBLIC R. P. BANSAL Advocate Reg. No. 10479/14 Valid 27/04/2024 GOVT. OF INDIA

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

The flow measured in this SWD is 3.4MLD (Avg)

BWSSB has proposed to lay sewer network including sub main to convey the sewage generated in this area to Bellandur Amanikere STP. The existing pipeline was damaged. Hence, it is proposed to lay a new pipeline and the tendering is under process.

IV. Identify blockages in the existing UGDs

i. Pertaining to the para, in the final report of the Committee headed by Sri N. Santhosh Hegde, in Annexure-3, have already recorded the observations in Sl. No.1 against para 19(1), same is herewith reproduced "A proper mechanism should be developed/placed to identify the blockages in the existing UGDs and to attend them mechanically".

ii. BWSSB Compliance:

At present BWSSB has 145 No of Jetting cum Suction machines and 40 No's of De-silting machines. 30 Jetting cum Suction machines are under procurement and by January-2020 BWSSB will have 175 Jetting cum Suction machines. These machines are used for cleaning laterals and BWSSB has planned to clean 1,93,845 out of 2,33,000 No. of manholes in the sewer-lateral network of 6,994 KM's once in a year. This step is taken towards the preventive maintenance of the lateral network. The plan is put on the BWSSB website. On the sub mains and trunk sewers, the length of this network is of 559 KM's with 17,877 No of manholes. It is also planned for de-silting of these lines and 10,857 manholes in a year. There are 6 high pressure de-silting machines and 1 recycler machine to de-silt these sub mains and mains. With these machines it is difficult to meet the target. Hence, a tender has been floated for hiring 4 more recycling machines. The old sub mains and mains which are completely blocked are being replaced with higher capacity sewer lines. This rehabilitation/replacement works are being taken up as and when there is a requirement.

NOTARY PUBLIC R. P. BANSAL ADVOCATE GOVT. OF INDIA

Chief Engineer (...)
BWSSB,
Cauvery Bhavan,
Bangalore.

V. Treated water to not mix with the sewage and then to flow into the STP to get recycled for the second time

i. Order of this Hon'ble Tribunal

In the order dated 21.10.2019 of Hon'ble NGT based on the Committee recommendations of KSPCB states, "*Be that as it may, from the analysis presented by learned Amicus and perusal of report of the Committee there is patent non-compliance in critical areas by the State and its Authorities beyond saying that the work was in progress, there is no specific information of the status of the STPs to be constructed with learned counsel for the state. The committee has noticed from the submissions made by the State Pollution Control Board that treated water was being allowed to flow into the UGD network to mix with the sewage and then to flow into the STP to get recycled for the second time without any purpose*".

ii. Compliance of BWSSB:

In this regard BWSSB submits that as per KSPCB guidelines Private STPs in the city are not allowed to let out the treated effluent out of the their premises. As per norms usually 60-70% of the treated effluent can be reused for all non-potable purposes like car washing, floor washing, maintenance of gardens etc,. But the balance quantity has to be let out of the premises, in all the private properties where BWSSB has sanctioned the connection the balance quantity is let into the BWSSB sewers. This invariably gets mixed with the sewage generated in the network and the same is conveyed to BWSSB STPs along with the untreated sewage. This creates a duplication of treatment of the earlier treated effluent, leading to wastage and also reducing the capacity of sewage system to carry and treat the sewage.

To avoid this, unused treated effluent, upto the specified standards, from private STPs shall be allowed to let into SWDs which will recharge the lakes and better quality of water can be ensured at lakes.

In this regard discussions have been done in the Co-ordination Committee meeting headed by Hon'ble Chief Secretary, Govt. of Karnataka dated: 29.07.2019. BWSSB has requested KSPCB to give permission for letting

NOTARY PUBLIC R. P. BANSAL Advocate

Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

the treated water from STPs in residential apartments directly into Storm Water Drains instead of letting such water into UGD lines.

KSPCB was asked to take a stand and issue a direction. The issue was also discussed in the subsequent Co-ordination Committee meetings of Hon'ble Chief Secretary dt: 13.08.2019, 28.08.2019, 13.09.2019, 25.09.2019 and 14.10.2019.

As per the directions of Hon'ble Chief Secretary, Govt. of Karnataka, a meeting was held on 06.09.2019 under the Chairman, BWSSB with Member Secretary, KSPCB along BWSSB and KSPCB officials, to discuss the issue. During the meeting, it was requested to KSPCB to have an audit of the buildings which are reusing the treated water generated from private STPs. Further it was also requested to KSPCB to issue guidelines as per 'Surface Discharge Standards' to permit excess treated water from private STPs into Storm Water Drains after utilizing treated water for urban re-use. Since the surface discharge standards are less stringent than the STP effluent standards there is no problem in giving such permission to let out excess treated water in the side drains and storm water drains.

A meeting was conducted at the KSPCB on 07.11.2019 by the KSPCB authorities to finalize its stand on the issue, the final decision from KSPCB is awaited. BWSSB will abide by the decision and will act accordingly.

It is respectfully submitted that the above are the steps taken by BWSSB and it is respectfully submitted that the BWSSB will be obliged to provide any additional information or details are required by this Hon'ble Tribunal.

DEPONENT
Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

Verification

Verified at Delhi on this 25 day of November, 2019, that the contents of the above Affidavit are true and correct to my personal knowledge and on the information received and delivered, are believed to be true and nothing material has been concealed.

IDENTIFIED BY

NOTARY PUBLIC
R. P. BANSAL
Advocate
Reg. No. 10678/14
upto 27/06/2024
GOVT. OF INDIA

ATTESTED
Notary Public, Delhi
(As Presented)
25/11/19

DEPONENT
Chief Engineer (WWM)
BWSSB,
Cauvery Bhavan,
Bangalore.

1896

Compliance for the orders of the Hon'ble NGT during its hearing on 21.10.2019 in respect of OA No.125/2017 in line with the report of NGT Committee constituted by the Hon'ble National Green Tribunal headed by Sri N. Santhosh Hegde, former Judge, Hon'ble Supreme Court of India Dated 20.09.2019

1897

INDEX

Sl. No	Particulars	Page Number
1	Affidavit	
2	Annexure-I Compliances in line with the recommendations of the Hon'ble NGT Committee under Chairmanship of Sri N. Santhosh Hegde	
3	Annexure-II	
4	Annexure-III	
5	Annexure-IV	

List Abbreviations

Short form	Word
GoK	Government of Karnataka
BWSSB	Bangalore Water Supply and Sewerage Board
STP	Sewage Treatment Plant
ISPS	Intermediate Sewage Pumping Station
SWD	Storm Water Drain
KSPCB	Karnataka State Pollution Control Board
BBMP	Bruhat Bengaluru Mahanagara Palike

1899

ANNEXURE – 1

Compliance report for the orders of the Hon'ble NGT during its hearing on 21.10.2019 in respect of OA No.125/2017 in line with the report of NGT committee headed by Hon'ble Justice Sri N. Santhosh Hegde Dated 20.09.2019

The Bangalore Water Supply and Sewerage Board submits its compliance to the order of the Hon'ble National Green Tribunal (NGT) in its order dated 21-10-2019 with the status of works **as on 15-11-2019** and also, compliances in respect of the Annexure III of the final report submitted by the Committee headed by Hon'ble Justice Sri N. Santhosh Hegde on 20-09-2019 as report.

Based on the above recommendations and inline with the Action Plan submitted to the committee on 30.07.2019, BWSSB has taken steps to comply with the requirements as detailed below:

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
1	In para No.19 (1) of the NGT order, it is observed that "The crux of the present environmental disaster is indiscriminate discharge of untreated sewage into the lakes.	Koramangala Challaghatta lake series (KC Valley) located in the east of Bengaluru urban district encompassing nearly 35.7% of BBMP spatial extent and constitutes		The works mentioned at (a), (b) and (c) in the committee report pertains to pumping, conveying and treatment of sewage at new STP at K & C Valley which is under construction. The 3 works together make the full system functional. Hence the last of the	

1900

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 18-11-2019	Remarks of BWSS
	Admittedly, currently approximately 183 MLD, if not more, of untreated sewage is being discharged into the lake. This is nothing short of a state of environmental emergency. Consequently, it is of utmost importance that the under construction and planned STPs are commissioned on a war footing. The Commission is of the view that there is no proper justification on the part of the authorities not to expedite the completion of the STPs as	largest among the three major lakes series in Bengaluru. KC Valley catchment extends between 12.8365°N to 13.0153°N and 77.5651°E to 77.7873°E with a spatial extent of 292.38 sq.km. The catchment has nearly 82 lakes, some of which dates back to over 1400 years, such as the Agara lake, Bellandur lake built during the Western Ganga Dynasty in the early 5th century. The K&C Valley catchment nalhas/tributary streams further moves and merges with the	a. **150 MLD Capacity new Sewage Treatment Plant** based on activated sludge process with BNR with Power generation **Date of completion 30.07.2020**	completion date is the date on which the operation of STP starts i.e,30-07-2020. The construction of this 150 MLD STP is taken up at the cost of Rs.297.37 Crore **Date of Completion is 30.07.2020** 1. The overall progress as on 15-11-2019 is 66.33% against the Planned target of 70.68%. i. Designs are completed upto 99.48%. ii. Orders for equipments have been placed to 100%. iii. The progress of works on civil structures is 57.64% against the	The slippage of aro 4% is due to incessant rains from week of August to week of Noven 2019. The a slippage of progress be covered in available time and trial run of the ab plant will be taken during May-2020 the treatment to

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
	indicated particularly in respect of the 150 MLD K & C Valley STP. The authorities (BWSSB, BDA and KSPCB) must mobilize all available resources to ensure that the STPs are commissioned as expeditiously as possible preferably by March 2019 or within such time as this Hon'ble Tribunal may deem fit".	DakshinPinakini, a seasonal river. The Hebbal and Yelahanka tributary streams converge with the Varthur lake series at Nagondanahalli village (BBMP Ward 94-Hagadur). It is to state that there are 82 lakes in this catchment area. Most of these lakes are silted (or being filled with C&D debris). Some of the lakes (not the part of 82 tanks) have been made disused and converted them into layouts and presently		target of 60.62% iv. 92.97% against 100% of the equipments have been supplied to the site. v. A progress of 9.65% is achieved in installation of the procured equipments against target of 13.51%.	required level will be attained within the scheduled date of 30.07.2020. **Enclosures:** **1. Copy of the Progress report of the work as Annexure-A2 (Page No.1 to 3).** **2. Photographs showing the status of the works as Annexure-A3 (Page No.1 to 16).**

1902

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
		water bodies do not exist. This is one of the main reasons for flooding of the eastern part of the Bengaluru during rains. The BWSSB has about 6 STPs in place for a capacity of 453.5 MLD in this catchment area. Further, the BWSSB has also taken up construction of other 6 STPs for the capacity of 205 MLD. Hence, 658.5 MLD of sewage would be treated by 2020 in this catchment area. The BWSSB submits	b. **Construction of 210 MLD capacity ISPS at Koramangala Sports Complex – including O&M for 7 years:** **Date of completion 29.01.2020**	The construction of this 210 MLD ISPS is taken up at the cost of Rs.38.61 Crore **Date of Completion is29.01.2020** 1. The overall progress as on 15-11-2019 is 82.99% against the Planned target of 85.20% i. Designs are completed upto 99.80% ii. Orders for equipment's have been placed to 100%. iii. The progress of works on civil structures is 95.00% against the target of 100%,	The slippage of aro 2.21% is due to incessant rains from week of August to week of Noven 2019. The ab slippage of prog will be covered in available time and work will be compl as per schedule.

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
		that presently about 583 MLD outflows from Varthur lake (this includes the treated water from K&C Valley STPs). By taking this into consideration the total sewage generated and its treatment, there shall not be any untreated sewage left to flow in the lakes. But the situation is otherwise. The BWSSB should take note of it and workout a proper planning/reorient to treat the entire sewage to make it zero flow into the lakes. The BWSSB shall have to		iv. 100.00% of the equipment's have been supplied to the site. v. Installation of plants, testing and commissioning is to be taken up	The work will be completed within 29.01.2020. However, the actual pumping of sewage to the 150 MLD STP at K&C Valley can only be taken up when the STP is ready for operation i.e. 30.07.2020 as mentioned in (a) above. **Enclosures:** **1. Copy of the Progress report of the work as Annexure-A2 (Page No.4 to 6).**

1904

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
		properly designed UGD network so as to feed the existing STPs to their full capacity and also to the STPs under construction. In addition, it should also ensure that the treated water shall be reused after meeting the requirement of all the tanks in the catchment area. It is noted that most of the STPs are not running to their full capacity. The BWSSB may be directed to make proper arrangements to feed the required quantity of			2. Photographs showing the st of the works Annexure-A3 (Page No.7 to 1
			c. **Laying of 1800 mm dia raising main from 210 MLD ISPS to 150 MLD STP – S2D(a)** of length 5.315 Km **Date of completion 07.01.2020**	The work of providing and laying 1800 mm dia raising main from 210 MLD ISPS at NGV to K&C Valley STP is taken up at the cost of Rs.65.64 Crore **Date of Completion is 07.01.2020** In the scope of the work, it is required to lay 1800mm dia PCC pipe for length of 5315 RMT (5.315 KM). 1. As on 15.11.2019 the overall	

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
		sewage by strengthening the UGD networking to supply to the existing and to be constructed STPs. The present status of polluted water in the lakes in Bengaluru is mainly due to the sustained inflow of partially treated or untreated sewage and untreated industrial		progress is 50.23% against the Planned target of 75.74%, I. 75% of the pipeline procurement along with the specials is completed, i.e. 4000 RMT of pipeline has been procured. II. Against 3015 RMT of pipeline is identified to be laid in the roads out of which 2600 RMT of pipeline is already laid. III. 2300 RMT of pipeline is identified to be laid in the storm water drain (SWD) out of which 80 RMT of pipeline is laid. The targeted quantity of pipeline to	Pipeline to be laid in the SWD is 2300 RMT and 3015 RMT of pipeline is to be laid in the roads of thickly populated residential/ commercial areas. Normally the procured pipes will be stacked/stored all along the alignment to facilitate easy handling.

1906

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
		effluents. It is recommended here that the first priority of use of treated water from all the STPs shall be to feed and maintain the full water level of the lakes and remaining surplus water should only be used for other purposes. The dates given at column 4 for completion of STPs and other works may be accepted.		be laid in SWD as on 15-11-2019 is 100 RMT.	However, as the pipe is to be laid in thickly popula residential/commerci areas, procurement entire quantity of pi is not feasible due lack of space for stor of the pipes. The lagging in laying pipeline is mainly du ROW issues in resp of residential layouts defense land etc. Ou 3015 Rmt, a stretch 715 RMT of pipelin

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
					to be laid along the road by the side of the existing storm water drain (SWD). This portion of SWD is presently taken up for remodeling of SWD by BBMP authorities. In view of the requirement of working space and to provide access to the commuters the pipeline has to be laid only after completion of remodeling of SWD. Tentatively, the pipe laying work in this stretch may start from 1st Dec-2019 and will

1908

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
					require one month t for completion. Laying of pipelines the storm water dr (SWD) is very diffi as the location of w in this drain is at end of the va carrying huge quar of storm water. As when it rains anywh in the catchment are ultimately reaches this location and flo Due to incessant r from 2nd week August 2019 to week of Noven

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
					2019, the progress in the above work could not be achieved. Sufficient mobilization of materials, men and machinery has been made and the laying of pipeline is commenced from 2nd week of November 2019. Work is taken up at 3 fronts. The work will be completed by 31.03.2020 and will be ready much in advance before STP is ready to take sewage i.e. 30.07.2020. It is

1910

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
					requested that t timeline of this work extended upto 31-0 2020 as the delay is d to heavy rains and t works will completed before 07-2020 when the S is to be commission Hence the last date sewage conveyance STP will not change **Enclosures:** 1. **Copy of Progress report the work Annexure-A2 (P No.7 to 9).**

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
					2. Photographs showing the status of the works as Annexure-A3 (Page No.25 to 38).
			d. **Sarakki – 5.0 MLD STP at Sarakki lake Date of completion August-2019**	The plant is operational.	**Enclosures:** 1. **Photographs of the plant is shown in Annexure-A3 (Page No.39 to 42).**
			e. **Chikkabeguru – 5.0 MLD STP Date of completion March-2020**	The work of construction of 5 MLD STP at Chikkabegur is taken up at the cost of Rs.13.89 Crore **Date of Completion is 31-03-2020** 1. The overall progress as on 15.11.2019is 45.92% against the Planned target of 55.50%,	Due to non-availability of enough land, the location of the plant was shifted from the

1912

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
				a. Designs are completed upto 78.00%. b. Orders for equipment's have been placed to 100%. c. The progress of works on civil structures is 58.00% against the target of 70.00%, d. 40.00% of the equipment's have been supplied to the site against 50.00%.	original place propos Also due to poor conditions in the ne located place it required to use piles the foundation. As date there is slippage around 9.58% progress which mainly due to continuous rains fr 2nd week of Aug 2019 to 1st week November 20 However, this slipp will be covered in available time and w will be completed per schedule i.e. wit

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
					Mar-2020 **Enclosures:** **1. Copy of the Progress report of the work as Annexure-A2 (Page No.13 to 15).** **2. Photographs showing the status of the works as Annexure-A3 (Page No.43 to 50).**
			f. **Hulimavu – 10 MLD STP** **Date of completion March-2020**	The work of construction of 5 MLD STP at Hulimavu is taken up at the cost of Rs.20.23 Crore **Date of Completion is 31-03-2020** 1. The overall progress as on 15.11.2019 is 62.01% against the	Due to non-availability of enough land, the

1914

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
				Planned target of 79.17%, i. Designs are completed upto 99.00% against 100.00% ii. Orders for equipments have been placed to 97.83% against 100.00% iii. The progress of works on civil structures is 74.76% against the target of 85.42%, iv. 61.26% of the equipments have been supplied to the site against 80.00%.	location of the p was shifted from original place propos Also due to poor conditions in the ne located place it required to use piles the foundation. As date there is slippage around 17.16% progress which mainly due to continuous rains fi 2nd week of Aug 2019 to 1st week November 20 However, this slipp will be covered in available time and w

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
					will be completed as per schedule i.e. within Mar-2020 **Enclosures:** **1. Copy of the Progress report of the work as Annexure-A2 (Page No.16 to 18).** **2. Photographs showing the status of the works as Annexure-A3 (Page No.51 to 60).**

1916

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
			g. **Agaram -- 35 MLD STP Date of completion Dec-2019**	The work of construction of 35 MLD STP at Agara is taken up at the cost of Rs.53.63 Crore **Date of Completion is 31-12-2019** 1. The overall progress as on 15.11.2019 is 72.90% against the Planned target of 91.06%. a. Designs are completed upto 98.00% against 100.00%. b. Orders for equipments have been placed to 100%. c. The progress of works on civil structures is 95.00% against the target of 99.00%. d. 68.00% of the equipments have been supplied to the site against 94.00%.	The slippage of arou 18.16% is due to consistent intermitt rains during the mon of August, Septem and October-20 However,. this slipp will be covered in available time and w will be completed as schedule i.e. within 2019 **Enclosures:** 1. Copy of Progress repor

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
					the work as Annexure-A2 (Page No.19 to 21). 2. Photographs showing the status of the works as Annexure-A3 (Page No.65 to 77).
			Device to connect Agaram STP to Agaram lake for impounding treated water it has been suggested to use 900 mm/600 mm across the ring road (the BWSSB shall ensure to feed the required treated	The available existing 900mm dia RCC pipeline laid across the ring road is connected to Agaram Lake, same will be utilized to provide treated effluent from 35 MLD Agaram STP to Agaram lake.	

1918

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
			water to Agara lake.		
			h. **Waste water wet well – 32.5 MLD Capacity near the premises of 90MLD Bellandur Amanikhane STP to augment sewage from the adjoining areas of Bellandur Amanikhane**	This is the most difficult work involving excavation upto a depth of 14 mtrs. 1st call tender for this work were floated during Nov-2017, since then 5 times the tenders have been recalled due to nonparticipation. However, the scope of work has been split into 2 separate works involving a) civil works and b) electro mechanical works. The tenders have been refloated and on the on the 9th call of electro mechanical tender there are bidders and the tender is	The works will completed within scheduled time 31-12-2020.

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
			STP Date of completion 31.12.2020	being evaluated for awarding. In the civil works tender has been refloated for the 10th time and will be finalized with the evaluation of participated bidders.	
			i. Augmenting sewage from Ibblur side and conveying to Bellandur Amanikere STP (Laying of sewer sub main) Date of completion 30.12.2020	As per the commitment given to the Committee, this work is to be completed by Dec-2020, with regards to present status it is to submit that, an estimate for Rs 435 lakhs for laying RCC NP3 pipe line ranging from 450mm dia to 900mm dia is approved and tenders are to be finalized before 30-12-2019.	The work will be completed as specified. i.e. 30.12.2020
2	19(2) The STPs that are being set up and those which have already been	Proposal for upgradation of all existing STPs with facilities to removal of	Upgradation of 248 MLD STP at K&C Valley	In this regard it is to submit that the under construction STPs have been included with Biological Nutrient	In this valley following STP's which are working or under

1920

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
	set up must provide for treating/removing phosphorous and Nitrogen/nutrients	Biological Nutrient Removal at 248 MLD STP at K&C Valley. **Remarks of Committee** It is suggested that BWSB may take interim measures to reduce the Phosphorous and Nitrogen/nutrients by integrating constructed wet lands with the STPs in consultation with BDA and Forest Department if found feasible.		Removal facility. BWSSB has proposed to upgrade the existing 248 MLD STP at K & C Valley to reduce the Phosphorous and Nitrogen/nutrients in line with the Hon'ble NGT Committee recommendations at a cost of Rs.280 Crore which also includes Power Generation in the upgraded STP along with handling of Biosolids for further utilization. To meet cost of the above project BWSSB vide its letter No. BWSSB/CE(WWM)/ACE(WWM)-1/TA-1/620/2019-20 Dt: 15-6-2019 out of the Rs.500 crore deposited in the Escrow account by Government of Karnataka as per the directions of the Hon'ble NGT. In this regard	construction inclusive of Biologi Nutrient a Phosphorous treatm capabilities. 1. 90 MLD STP Bellandur Amanik (in operation) 2. 60 MLD STP at K Valley (in operatio 3. 5 MLD STP Sarakki operation) 4. 150 MLD STP K&C Valley (ur construction) 5. 5 MLD STP Chikkabegur (under constructio

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
				Government of Karnataka in its G.O. UDD 91 MNJ 2017 (Part-4), Bangalore, Dated 20.07.2019 has allocated an amount of Rs.200 Crores to take up the upgradation of 248 MLD STP at K&C Valley. The remaining amount will be borne by BWSSB. The work involves concepts like Biological Nutrient Removal, power generation, Biosolids handling system etc., along with rehabilitation of the various existing STPs having a total capacity of 248 MLD, it is necessary to appoint a consultant. BWSSB has already floated the necessary tenders for appointing a Project Management Consultancy which will be finalized by 30-12-2019.	6. 10 MLD STP at Hulimavu (under construction) 7. 35 MLD STP at Agaram (under construction) The following STPs at K & C Valley are not having BNR.- (108+55+55+30)=248 MLD

1922

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
3	In para No.9 (3) of the NGT order dated 21.10.2019, it is observed that "As per the reports submitted before the Hon'ble Tribunal, the authorities have already identified all the sewage and effluent entry points into the lake. Therefore it is imperative that the authorities must simultaneously ensure that all the sewage generated in the catchment area is channelized and linked to the Rajakaluves for appropriate treatment by the STPs".	Pertaining to this para, in the final report of the Committee headed by Sri N. Santhosh Hegde, in Annexure-3, have already recorded the observations in Sl. No.1 against para 19(1), same is herewith reproduced "The BWSSB has about 6 STPs in place for a capacity of 453.5 MLD in this catchment area. Further, the BWSSB has also taken up construction of other 6 STPs for the capacity of 205 MLD. Hence, 658.5 MLD of sewage would be treated by 2020 in this	In this regard, as per directions of the Committee headed by Sri N. Santhosh Hegde the measurement of the actual flow in each of the Nallahs/Drains leading to Bellandur lake were measured and a report was submitted during May 2019. As per the report, the following quantity of sewage was measured which was in addition to the sewage that was being treated in STPs as on the date of report, 1. HAL SWD (Challaghatta Valley) - 48.22 MLD (average) 2. Koramangala and Agaram Valley-179.50 MLD (average) 3. Iblur SWD-5.6 MLD (average) 4. Kempapura SWD-3.4 MLD (average) The total sewage generated in the catchment area of Bellandur other than Kempapura valley and Iblur side is 583 MLD. The total inflow into Bellandur lake as on the date of measurement was 583 MLD, to treat this sewage BWSSB has the following treatment plants,		

1923

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
		catchment area. The BWSSB submits that presently about 583 MLD outflows from Varthur lake (this includes the treated water from K&C Valley STPs). By taking this into consideration the total sewage generated and its treatment, there shall not be any untreated sewage left to flow in the lakes. But the situation is otherwise. The BWSSB should take note of it and workout a proper planning/reorient to treat the entire sewage to make it zero flow into the lakes.	i) Existing 248 MLD capacity at K&C Valley ii) Existing 60 MLD capacity at K&C Valley iii) Existing 90 MLD capacity at Bellandur Amanikhane iv) Existing 50 MLD capacity at Kadabeesanahalli v) Existing 1.5 MLD capacity at Lal Bagh vi) Existing 4 MLD capacity at Cubbon Park vii) Existing 5 MLD STP at Sarakki. viii) 150 MLD STP at K&C Valley under construction (**Work-a** as listed in NGT Committee recomendations in annexure-3). ix) 35 MLD STP at Agaram under construction (**Work-g** as listed in NGT Committee recomendations in annexure-3). x) 5 MLD STP at Chikkabegur under construction (**Work-e** as listed in NGT Committee recomendations in annexure-3).		

1924

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
		The BWSSB shall have to properly designed UGD network so as to feed the existing STPs to their full capacity and also to the STPs under construction. In addition, it should also ensure that the treated water shall be reused after meeting the requirement of all the tanks in the catchment area".	xi) 10 MLD STP at Hulimavu under construction (**Work-f** as listed in NGT Committeerecomendations in annexure-3). The combined treatment capacity of the above plants will be 658.5 MLD against a measured flow of 583 MLD. The BWSSB has planned to link the sewage lines to the STP to increase the flow to STP and to utilize the capacity to the full. 1. **HAL SWD 48.22 MLD** • An average of 170 MLD of sewage generated in Challaghatta Valley was treated at the time of reporting of flow in the valley and in addition a flow of 48.22 MLD was reported to the committee. • After completion of the 2 of the works in this valley, the flow of sewage in to 218 MLD STP has increased by 10 MLD and presently 180 MLD of sewage is being conveyed by gravity line to the existing 218 MLD STP		

<table>
<tr><th>Sl. No.</th><th>Direction/Order No.19 (1) and 19 (2) of NGT</th><th>Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019</th><th>Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019</th><th>Status of the works/ actions as on 15-11-2019</th><th>Remarks of BWSSB</th></tr>
<tr><td></td><td></td><td></td><td colspan="2">at K&C Valley. Further, linking of laterals in Ambedkar Nagar (HAL) valley would augment additional sewage of 38 MLD and thereby the 218 MLD STP will be operated to its designed capacity of 218 MLD.

<table>
<tr><th>STP</th><th>Treatment at the time of measurement in MLD</th><th>No of works</th><th>Capturable flow in MLD</th><th>Treatment after completion of works taken up in MLD</th></tr>
<tr><td rowspan="2">K&C (218 MLD by gravity)</td><td rowspan="2">170</td><td>6 works completed, balance 17 works in progress</td><td>10</td><td>180</td></tr>
<tr><td>After completion of balance 17 works by December 2020</td><td>38</td><td>218</td></tr>
</table>
</td><td></td></tr>
</table>

1926

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS

Koramangala and Agaram SWD-179.50 MLD

STP	Treatment at the time of measurement in MLD	No of works	Capturable flow in MLD	Treatment after completion of works taken up in MLD
K&C (30 MLD by Agaram pumping)	30	-	-	30
K&C (60 MLD by Agaram pumping)	30	Linking near Mahindra show room under KMRP and 6 linking works completed, out of 20 works	25	55
5 MLD Sarakki	0		5	5
Bellandur Amanikere (90 MLD) (60 MLD Agram pumping+5.6 MLD Iblur+3.4 MLD Kempapura+21 MLD local by wet well)	30		15	57
		After completion of balance 14 works by December 2020	12	
10 MLD Hulimavu	0		10	10
5 MLD Chikkabegur	0		5	5
35 MLD Agaram	0		10	10
150 MLD K&C	0	After completion of 28 works by December 2020	98	98
	90		**180**	270

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
			• An average of 90 MLD of sewage generated in Koramangala and Agaram Valley was treated at the time of reporting of flow in the valley and in addition a flow of 179.50 MLD was reported to the committee during May 2019. **As on 15/11/2019 (Present Status)** • As undertaken during the committee meetings, the linking works at Mahindra Showroom under KMRP has been completed. After completion of 6 works of linking an average of **40 MLD** flow has increased to the Agaram ISPS which in turn has been treated in respective STP's. • Thus as on date 30 MLD sewage is being treated at 30 MLD STP at K&C valley (OLD) (no increase), in 60 MLD STP at K&C valley an average flow of 55 MLD (an increase of 25 MLD) is being treated, 5 MLD is treated in newly commissioned Sarakki STP and at 90 MLD STP of Bellandur Amanikere an average flow of 45 MLD (an		

1928

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
			increase of 15 MLD) is being treated - **45 MLD** (25 MLD at K&C, 5 MLD at Sarakki, 15 MLD at Bellandur Amanikere. • Further, after completion of balance 14 works in Phased manner by December 2020 in this valley, total 37 MLD of sewage will be captured. Out of this 37 MLD 12 MLD will be treated at Bellandur Amanikere there by a total of 57 MLD (45+12) will be treated. Out of balance 25 MLD (37-12) 10 MLD will be treated in Agaram STP to be commissioned during December 2019, out of balance 15 MLD (25-10) 10 MLD will be treated at Hulimavu STP which is to be commissioned during March 2020 and balance 5 MLD (15-10) - **37 MLD** (12 MLD at Bellandur Ammanikere, 10 MLD at Agaram, 10 MLD at Hulimavu, 5 MLD at Chikkabegur) • After completion of balance 28 works an average **98 MLD** of sewage will be augmented to the ISPS under construction in Koramangala Valley (**Work-b** as listed in NGT Committee recomendations in annexure-3) – 98		

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
			MLD • The remaining 25 MLD sewage can be augmented to 35 MLD Agaram STP (work-g in committee report after completing the works under 110 villages in Koodlu area and works under CWSS-V stage with the assistance of JICA by 2023-24 in Bommanahalli area. **4. Iblur Catchment area** ***The flow measured in this SWD is 5.6MLD (Avg)*** BWSSB has proposed to lay sewer sub main to convey the sewage generated in this area to Bellandur Amanikere STP Proposed Date of completion: 30.12.2020 Tenders have been floated (**Work**-as listed in NGT Committee recomendations in annexure-3). **5. Kempapura Catchment area** ***The flow measured in this SWD is 3.4MLD (Avg)***		

1930

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSS
			BWSSB has proposed to lay sewer network including sub main to convey the sewage generated in this area to Bellandur Amanikere STP. The existing pipeline was damaged. Hence, it is proposed to lay a new pipeline and the tendering is under process.		
		Pertaining to this para, in the final report of the Committee headed by Sri N. Santhosh Hegde, in Annexure-3, have already recorded the observations in Sl. No.1 against para 19(1), same is herewith reproduced "A proper mechanism should be developed/placed to identify the blockages in the existing UGDs and to attend them	At present BWSSB has 145 No of Jetting cum Suction machines and 40 No's of De-silting machines. 30 Jetting cum Suction machines are under procurement and by January-2020 BWSSB will have 175 Jetting cum Suction machines. These machines are used for cleaning laterals and BWSSB has planned to clean 1,93 845 out of 2,33,000 No. of manholes in the sewer-lateral network of 6,994 KM's once in a year. The plan is put on the BWSSB website. This step is taken towards the preventive maintenance of the lateral network. On the sub mains and trunk sewers, the length of this network is of 559 KM's with 17,877 No of manholes. It is also planned for de-silting of these lines and 10,857 manholes in a year. There are 6 high pressure de-silting	

Sl. No.	Direction/Order No.19 (1) and 19 (2) of NGT	Recommendations/suggestions/views of the Committee headed by Hon'ble Justice N. Santhosh Hegde in its report Dtd:20-09-2019	Particulars of the works with completion dates as per the Committee report Dtd:20-09-2019	Status of the works/ actions as on 15-11-2019	Remarks of BWSSB
		mechanically.	machines and 1 recycler machine to de-silt these sub mains and mains. With these machines it is difficult to meet the target. Hence, a tender has been floated for hiring 4 more recycling machines. The old sub mains and mains which are completely blocked are being replaced with higher capacity sewer lines. This rehabilitation/replacement works are being taken up as and when there is a requirement.		

1932

4	In the order dated 21.10.2019 of Hon'ble NGT based on the Committee recommendations of KSPCB states "Be that as it may, from the analysis presented by learned Amicus and perusal of report of the Committee there is patent non-compliance in critical areas by the State and its Authorities beyond saying that the work was in progress, there is no specific information of the status of the STPs to be constructed with learned counsel for the state. The committee has noticed from the submissions made by the State Pollution Control Board that treated water was being allowed to flow into the UGD network to mix with the sewage and then to flow into the STP to get recycled for the second time without any purpose".	In this regard BWSSB submits that as per KSPCB guidelines Private STPs in the c are not allowed to let out the treated effluent out of the their premises. As per nor usually 60-70% of the treated effluent can be reused for all non-potable purposes l car washing, floor washing, maintenance of gardens etc,. But the balance quantity ha be let out of the premises, in all the private properties where BWSSB has sanctioned connection the balance quantity is let into the BWSSB sewers. This invariably g mixed with the sewage generated in the network and the same is conveyed to BWS STPs along with the untreated sewage. This creates a duplication of treatment of earlier treated effluent, leading to wastage and also reducing the capacity of sew system to carry and treat the sewage. To avoid this, unused treated effluent, upto the specified standards, from private S shall be allowed to let into SWDs which will recharge the lakes and better quality water can be ensured at lakes. In this regard discussions have been done in the Co-ordination Committee mee headed by Hon'ble Chief Secretary, Govt. of Karnataka dated: 29.07.2019. BWSSB requested KSPCB to give permission for letting the treated water from STPs residential apartments directly into Storm Water Drains instead of letting such w into UGD lines. KSPCB was asked to take a stand and issue a direction. The issue was also discusse the subsequent Co-ordination Committee meetings of Hon'ble Chief Secretary

		13.08.2019, 28.08.2019, 13.09.2019, 25.09.2019 and 14.10.2019. As per the directions of Hon'ble Chief Secretary, Govt. of Karnataka, a meeting was held on 06.09.2019 under the Chairman, BWSSB with Member Secretary, KSPCB along BWSSB and KSPCB officials, to discuss the issue. During the meeting, it was requested to KSPCB to have an audit of the buildings which are reusing the treated water generated from private STPs. Further it was also requested to KSPCB to issue guidelines as per 'Surface Discharge Standards' to permit excess treated water from private STPs into Storm Water Drains after utilizing treated water for urban re-use. Since the surface discharge standards are less stringent than the STP effluent standards there is no problem in giving such permission to let out excess treated water in the side drains and storm water drains. A meeting was conducted at the KSPCB on 07.11.2019 by the KSPCB authorities to finalize its stand on the issue, the final decision from KSPCB is awaited. BWSSB will abide by the decision and will act accordingly.

CE(WWM)
BWSSB

CE(M)
BWSSB

CE(P)
BWSSB

EIC
BWSSB

ANNEXURE – II

Progress Report

INDEX

1935

150 MLD AT K&C Valley

Design and Construction of 150 MLD Sewage Treatment Plant at K&C Valley, Bengaluru

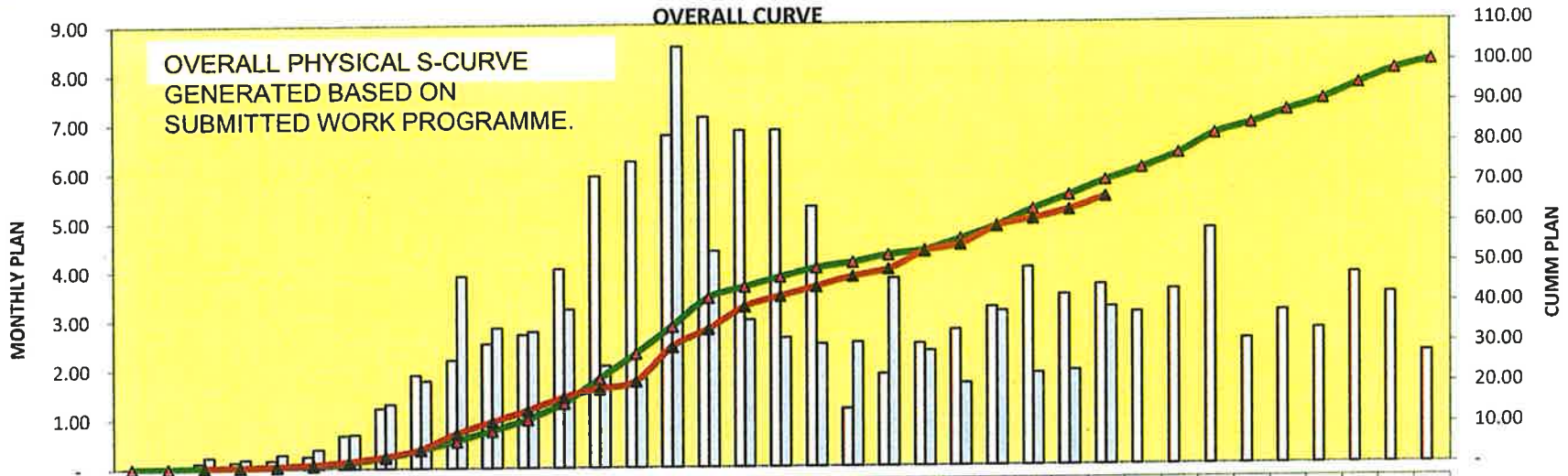
Date of Commencement:31st July 2017 Project Completion Date:30th July 2020.

Overall Progress as per Construction Programme as on 15.11.2019.

Sl. No.	Description of works	Weightage	Progress upto 15.11.2019			
			Target upto 15.11.2019		Achieved upto 15.11.2019	
			Plan against 100%	Plan % w.r.t. weightage	Actual against 100%	Actual % w.r.t. weightage
1	Engineering (Design, Drawings & Documentation)	5%	100	5	99.48	4.97
2	Place orders for plant and equipments	5%	100	5	100	5
3	Construction of Civil Structures	40%	60.62	24.24	57.64	23.05
4	Manufacturing & Delivery	35%	100	35	92.97	32.53
5	Installation of Plant & Machineries	10%	13.51	1.35	9.65	0.96
6	Testing & Commissioning	5%	-	-	-	-
	Overall weightage Progress	**100%**	70.60		66.53	

Design and Construction of 150 MLD Sewage Treatment Plant at K&C Valley, Bengaluru including Operation & Maintenance of Constructed Facilities for Ten (10) Years

Overall Progress Curve as on 15.11.2019.



	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Month Plan	-	0.	0.	0.	0.	0.	0.	1.	1.	2.	2.	2.	4.	5.	6.	6.	7.	6.	6.	5.	1.	1.	2.	2.	3.	4.	3.	3.	3.	3.	4.	2.	3.	2.	3.	3.	2.
Month Act	-	-	0.	0.	0.	0.	0.	1.	1.	3.	2.	2.	3.	2.	1.	8.	4.	2.	2.	2.	2.	3.	2.	1.	3.	1.	1.	3.	-	-	-	-	-	-	-	-	-
Cumm Plan	-	0.	0.	0.	0.	0.	1.	2.	4.	6.	9.	11	15	21	28	34	41	44	47	49	50	52	53	56	59	63	66	70	73	77	82	84	87	90	94	97	10
Cumm Act			0.	0.	0.	0.	1.	2.	4.	8.	11	14	17	19	21	29	34	39	42	44	47	48	53	54	59	61	63	66									

1938

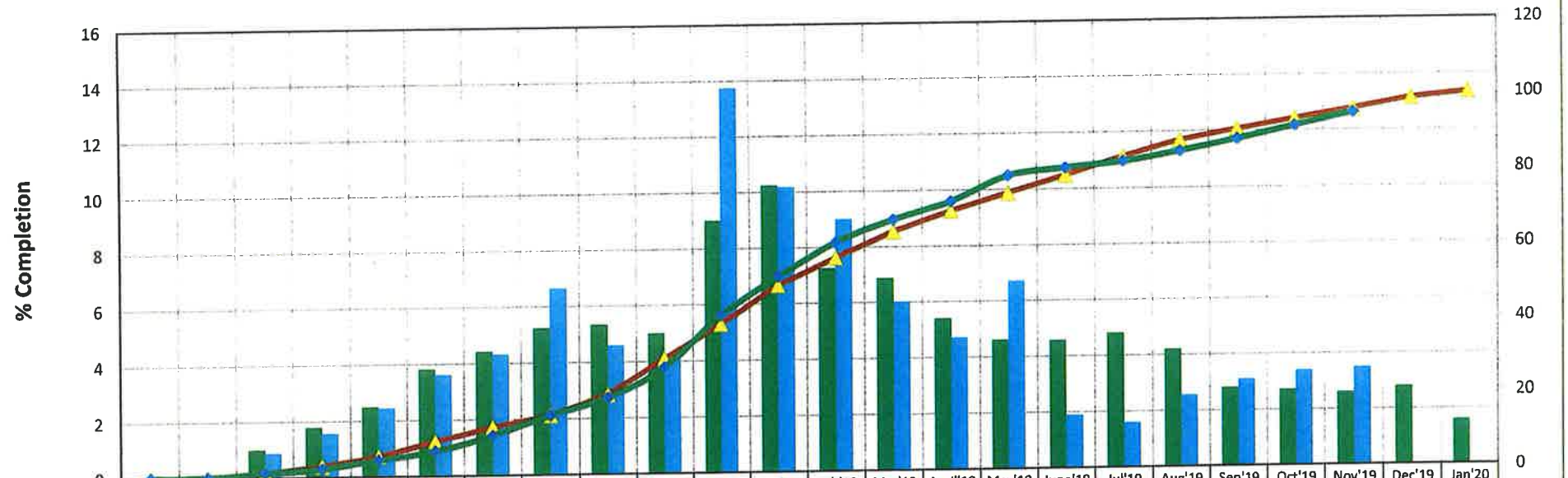
210 MLD ISPS at NGV

1939

Pumping Main

210 MLD ISPS at NGV

Physical progress curve



	Feb'18	Mar'18	April'18	May'18	Jun'18	Jul'18	Aug'18	Sep'18	Oct'18	Nov'18	Dec'18	Jan'19	Feb'19	Mar'19	April'19	May'19	June'19	Jul'19	Aug'19	Sep'19	Oct'19	Nov'19	Dec'19	Jan'20
SCH MON.	0.05	0.05	1.00	1.78	2.50	3.82	4.42	5.23	5.34	4.99	9.00	10.25	7.25	6.87	5.40	4.60	4.56	4.80	4.20	2.80	2.7	2.6	2.8	1.6
ACT. MON.	0.03	0.04	0.89	1.56	2.45	3.62	4.32	6.65	4.59	4.12	13.74	10.18	9.00	6.00	4.70	6.72	1.89	1.60	2.56	3.1	3.4	3.5		
SCH.CUM.	0.05	0.1	1.10	2.88	5.38	9.2	12.84	15.88	21.22	30.62	39.62	49.87	57.12	63.99	69.39	73.99	78.55	83.35	87.55	90.35	93.05	95.65	98.45	100.00
ACT. CUM.	0.05	0.13	1.11	2.11	4.41	6.61	10.61	15.83	20.42	28.27	42.01	52.19	61.19	67.19	71.89	78.61	80.50	82.10	84.66	87.76	91.16	94.66		

ISPS at NGV

Name of Project	:	**DESIGN AND CONSTRUCTION OF 210 MLD INTERMEDIATE SEWAGE PUMPING STATION (ISPS) AT KORAMANGALA SPORTS COMPLEX, BANGALORE INCLUDING OPERATION AND MAINTENANCE OF CONSTRUCTED FACILITIES FOR SEVEN (7) YEARS (TURNKEY CONTRACT).**
Cost of Project	:	**38.61 Crore**
Date of Commencement	:	30th January , 2018 **Date of Completion** :29th January 2020

S.No	Description of works	Weightage	Progress as on 15.11.2019			
			Target		Achieved	
			Progress%	% w.r.t. weightage	Progress %	% w.r.t. weightage
1	Engineering (Design, Drawings & Documentation)	5%	100.00%	5.00%	99.80%	4.99%
2	Place orders for plant and equipments	5%	100.00%	5.00%	100.00%	5.00%
3	Construction of Civil Structures	40%	100.00%	40.00%	95.00%	38.00%
4	Supply & Delivery to site Plant & Machineries	35%	100.00%	35.00%	100.00%	35.00%
5	Installation of Plant & Machineries	10%	3.00%	0.30%	0.00%	0.00%
6	Testing & Commissioning	5%	0.00%	0.00%	0.00%	0.00%
	Overall weightage Progress	**100%**		**85.30%**		**82.99%**

Pumping Main

Name of Work : Work of pumping main from Koramangala sports complex ISPS to K&C valley – S2D (a)

Cost of Project : **65.64 Crore**

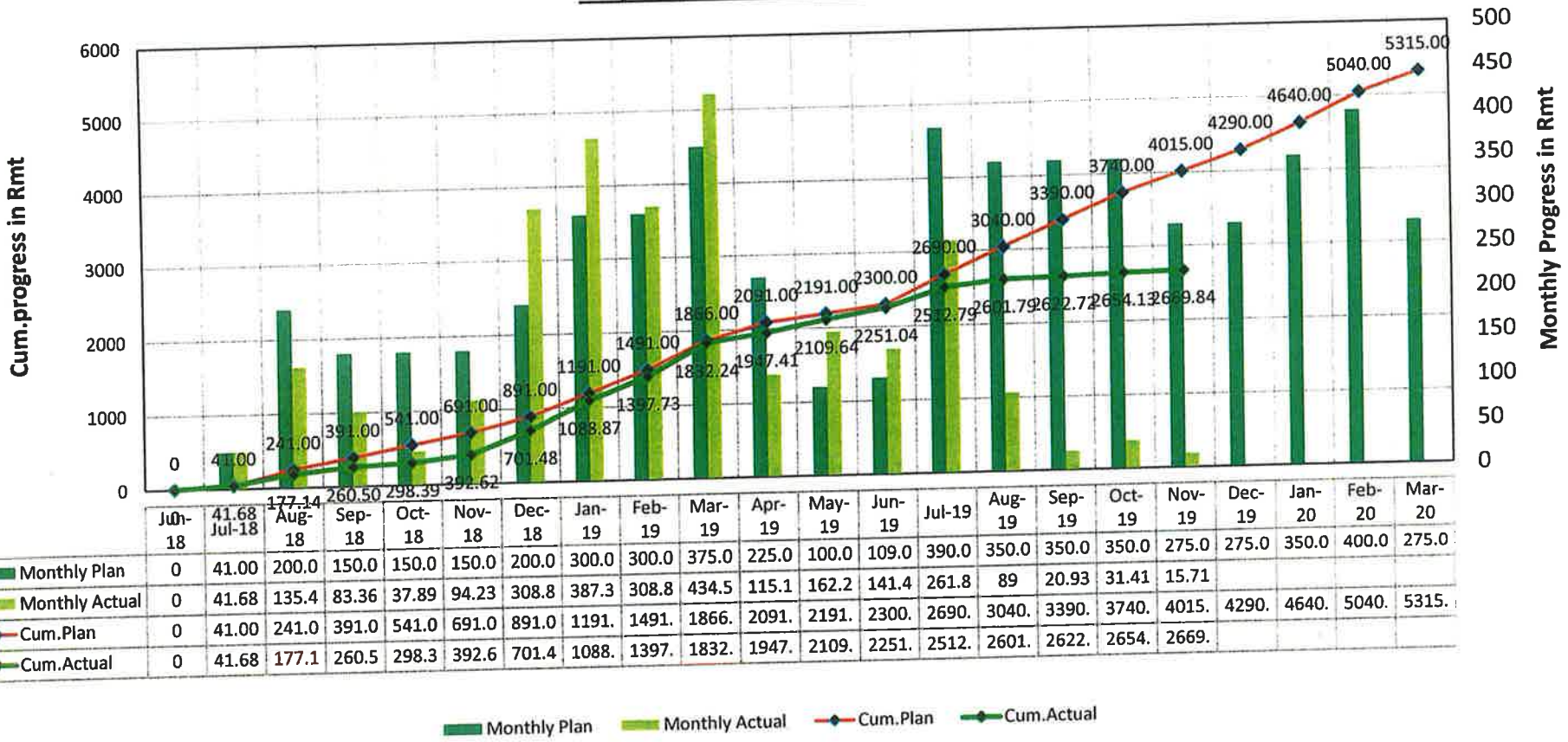
Date of Commencement : 08.01.2018 **Date of completion** : 31.03.2020

Overall Physical Progress

Sl.No	Description of works	Weightage	Target		Achieved	
			Progress %	% W.r.t weightage	Progress %	% W.r.t weightage
1	Laying of Pipe line	75%	75.74%	56.81%	50.23%	37.67%
2	Fixing of Sluice & Air valve	15%	0.00%	0.00%	0.00%	0.00%
3	Testing & Commissioning	10%	75.74%	7.57%	27.09%	2.71%
	Over all Weightage Progress	**100%**		**64.38%**		**40.38%**

Pumping Main

Physical Progress Curve



	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
Monthly Plan	0	41.00	200.0	150.0	150.0	150.0	200.0	300.0	300.0	375.0	225.0	100.0	109.0	390.0	350.0	350.0	350.0	275.0	275.0	350.0	400.0	275.0
Monthly Actual	0	41.68	135.4	83.36	37.89	94.23	308.8	387.3	308.8	434.5	115.1	162.2	141.4	261.8	89	20.93	31.41	15.71				
Cum.Plan	0	41.00	241.0	391.0	541.0	691.0	891.0	1191.	1491.	1866.	2091.	2191.	2300.	2690.	3040.	3390.	3740.	4015.	4290.	4640.	5040.	5315.
Cum.Actual	0	41.68	177.1	260.5	298.3	392.6	701.4	1088.	1397.	1832.	1947.	2109.	2251.	2512.	2601.	2622.	2654.	2669.				

1944

5 MLD STP AT SARAKKI

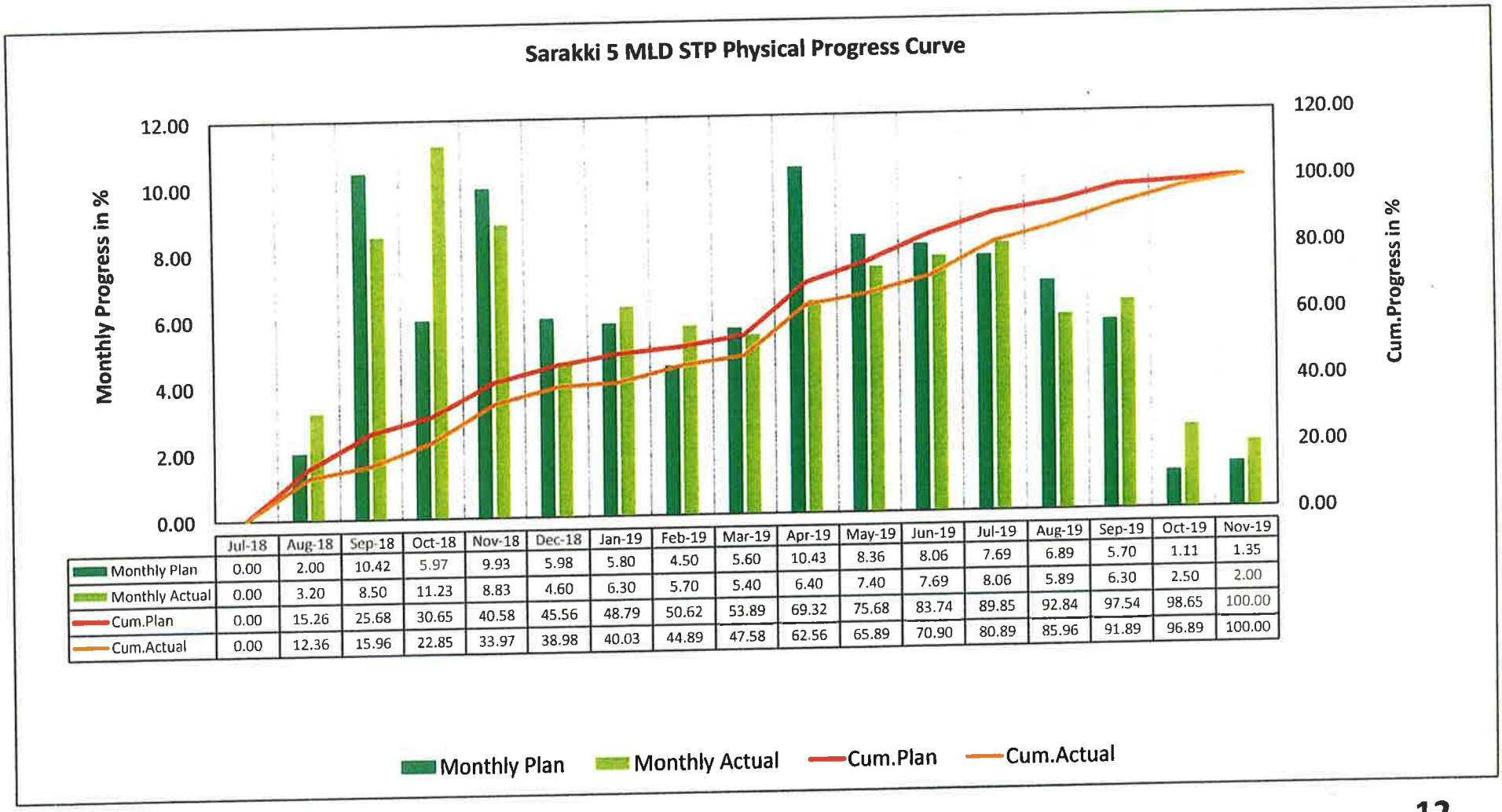
5 MLD STP AT SARAKKI

Name of the Project : Design and construction of 5 MLD Sewage Treatment Plant at Sarakki, Bengaluru including O&M of constructed facilities for 10 years.

Cost of Project	:	**14.49 Crores**
Project Status	:	**Plant is Commissioned on 08.11.2019**

1946

5 MLD STP AT SARAKKI



	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19
Monthly Plan	0.00	2.00	10.42	5.97	9.93	5.98	5.80	4.50	5.60	10.43	8.36	8.06	7.69	6.89	5.70	1.11	1.35
Monthly Actual	0.00	3.20	8.50	11.23	8.83	4.60	6.30	5.70	5.40	6.40	7.40	7.69	8.06	5.89	6.30	2.50	2.00
Cum.Plan	0.00	15.26	25.68	30.65	40.58	45.56	48.79	50.62	53.89	69.32	75.68	83.74	89.85	92.84	97.54	98.65	100.00
Cum.Actual	0.00	12.36	15.96	22.85	33.97	38.98	40.03	44.89	47.58	62.56	65.89	70.90	80.89	85.96	91.89	96.89	100.00

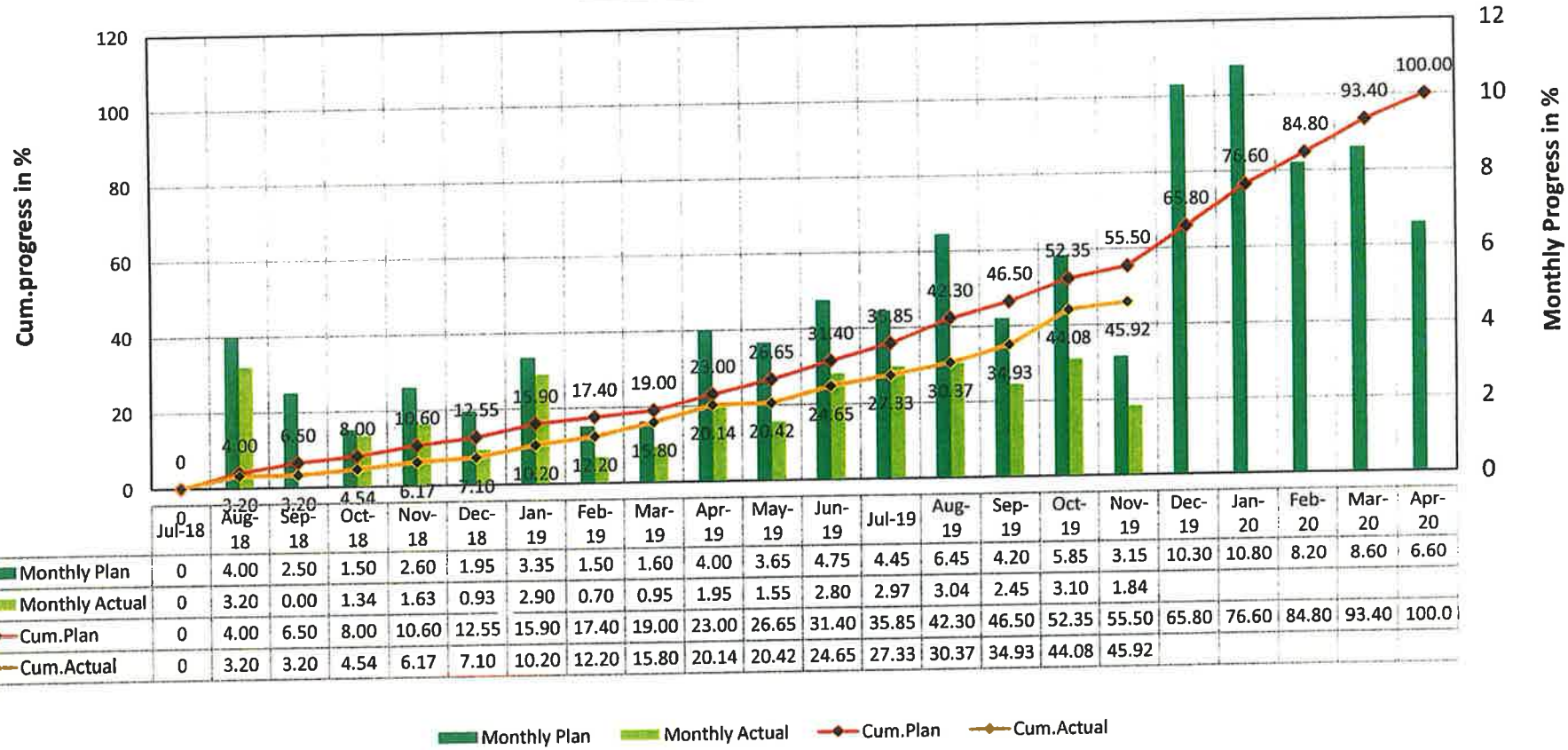
1947

5 MLD STP AT CHIKKA BEGUR

1948

5MLD STP AT CHIKKABEGUR

Physical Progress Curve



	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20
Monthly Plan	0	4.00	2.50	1.50	2.60	1.95	3.35	1.50	1.60	4.00	3.65	4.75	4.45	6.45	4.20	5.85	3.15	10.30	10.80	8.20	8.60	6.60
Monthly Actual	0	3.20	0.00	1.34	1.63	0.93	2.90	0.70	0.95	1.95	1.55	2.80	2.97	3.04	2.45	3.10	1.84					
Cum.Plan	0	4.00	6.50	8.00	10.60	12.55	15.90	17.40	19.00	23.00	26.65	31.40	35.85	42.30	46.50	52.35	55.50	65.80	76.60	84.80	93.40	100.0
Cum.Actual	0	3.20	3.20	4.54	6.17	7.10	10.20	12.20	15.80	20.14	20.42	24.65	27.33	30.37	34.93	44.08	45.92					

5MLD STP AT CHIKKABEGUR

Name of the Project : Design and construction of 5 MLD Sewage Treatment Plant at Chikka begur, Bengaluru including O&M of constructed facilities for 10 years.

Cost of Project : **13.89 Crores**

Date of Commencement : 17.10.2018 **Date of Completion** : 31.03.2020)

Sl.No	Description of works 4th Mile stone (17.07.2019 - 30.11.2019) (4 Months)	Weightage	Progress as 15.11.2019			
			Target		Achieved	
			Programme %	% W.r.t weightage	Progress %	% W.r.t weightage
1	Engineering (Design, Drawings & Documentation)	5%	100%	5.00%	78%	3.90%
2	Place orders for plant and equipments	5%	100%	5.00%	100%	5.00%
3	Construction of Civil Structures	40%	70%	28.00%	58%	23.02%
4	Supply & Delivery to site plant & Machineries	35%	50%	17.50%	40%	14.00%
5	Installation of Plant & Machineries	10%	0%	0.00%	0%	0.00%
6	Testing & Commissioning	5%	0%	0.00%	0%	0.00%
	Overall Weightage Progress	**100%**		**55.50%**		**45.92%**

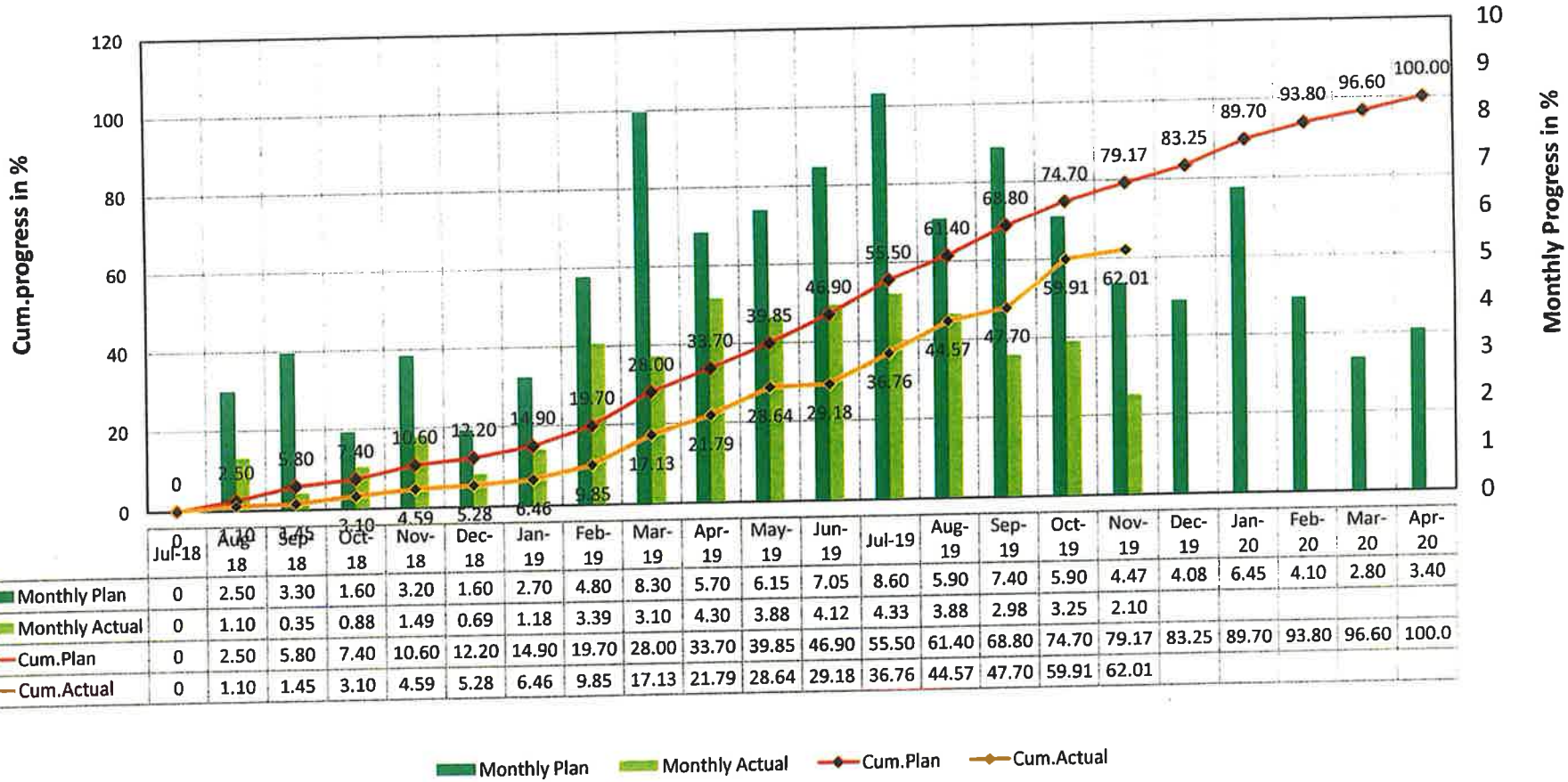
1950

10 MLD STP AT HULIMAVU

1951

10MLD STP HULIMAVU

Physical Progress Curve



	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20
Monthly Plan	0	2.50	3.30	1.60	3.20	1.60	2.70	4.80	8.30	5.70	6.15	7.05	8.60	5.90	7.40	5.90	4.47	4.08	6.45	4.10	2.80	3.40
Monthly Actual	0	1.10	0.35	0.88	1.49	0.69	1.18	3.39	3.10	4.30	3.88	4.12	4.33	3.88	2.98	3.25	2.10					
Cum.Plan	0	2.50	5.80	7.40	10.60	12.20	14.90	19.70	28.00	33.70	39.85	46.90	55.50	61.40	68.80	74.70	79.17	83.25	89.70	93.80	96.60	100.0
Cum.Actual	0	1.10	1.45	3.10	4.59	5.28	6.46	9.85	17.13	21.79	28.64	29.18	36.76	44.57	47.70	59.91	62.01					

18

10MLD STP HULIMAVU

Name of the Project : Design and construction of 10 MLD Sewage Treatment Plant at Hulimavu, Bengaluru including O&M of constructed facilities for 10 years.

Cost of Project : 20.23 Crores

Date of Commencement : 23.02.2018 **Project Completion Date** : 31.03.2020)

Sl.No	Description of works (7^{th} Mile stone 23.08.2019- 22.11.2019) (3 Months) EOT period	Weightage	Progress as on 15.11.2019			
			Target		Achieved	
			Progress %	% W.r.t weightage	Progress %	% W.r.t weightage
1	Engineering (Design, Drawings & Documentation)	5%	100.00%	5.00%	99.00%	4.95%
2	Place orders for plant and equipments	5%	100.00%	5.00%	97.73%	4.89%
3	Construction of Civil Structures	40%	85.42%	34.17%	74.46%	29.79%
4	Supply & Delivery to site plant & Machineries	35%	80.00%	28.00%	61.36%	21.48%
5	Installation of Plant & Machineries	10%	70.00%	7.00%	9.09%	0.91%
6	Testing & Commissioning	5%	0.00%	0.00%	0.00%	0.00%
	Overall Weightage Progress	**100%**		**79.17%**		**62.01%**

1953

35 MLD STP AT AGARA

35 MLD STP AT AGARA

Name of the Project : Design and construction of 35 MLD Sewage Treatment Plant at Agara, Bengaluru including O&M of constructed facilities for 10 years.

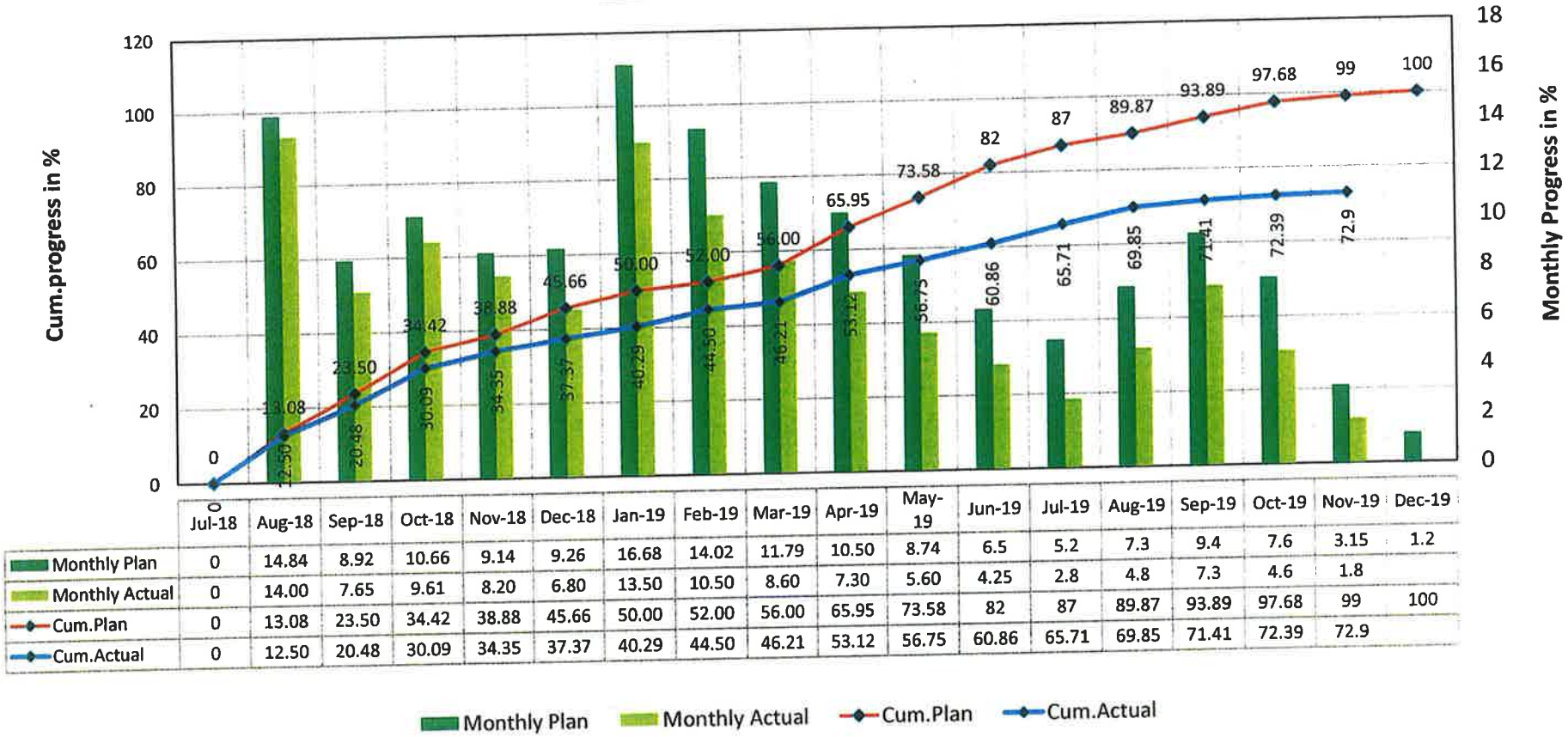
Cost of Project : 53.63 Crores

Date of Commencement : 24.07.2017 **Date of Completion** : 31.12.2019

Sl.No	Description of works 7th & last Mile stone (24.04.2019-23.07.2019) (3 Months) EOT proposed-31.12.2019	Weightage	Progress as on 15.11.2019			
			Target		Achieved	
			Programme %	% W.r.t weightage	Progress %	% W.r.t weightage
1	Engineering (Design, Drawings & Documentation)	5%	100%	5.00%	98%	4.90%
2	Place orders for plant and equipments	5%	100%	5.00%	100%	5.00%
3	Construction of Civil Structures	40%	99%	39.66%	95%	38.00%
4	Supply & Delivery to site plant & Machineries	35%	94%	32.90%	68%	23.80%
5	Installation of Plant & Machineries	10%	75%	7.50%	12%	1.20%
6	Testing & Commissioning	5%	20%	1.00%	0	0.00%
	Overall Weightage Progress	**100%**		**91.06%**		**72.90%**

35 MLD STP AT AGARA

Physical Progress Curve



	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Monthly Plan	0	14.84	8.92	10.66	9.14	9.26	16.68	14.02	11.79	10.50	8.74	6.5	5.2	7.3	9.4	7.6	3.15	1.2
Monthly Actual	0	14.00	7.65	9.61	8.20	6.80	13.50	10.50	8.60	7.30	5.60	4.25	2.8	4.8	7.3	4.6	1.8	
Cum.Plan	0	13.08	23.50	34.42	38.88	45.66	50.00	52.00	56.00	65.95	73.58	82	87	89.87	93.89	97.68	99	100
Cum.Actual	0	12.50	20.48	30.09	34.35	37.37	40.29	44.50	46.21	53.12	56.75	60.86	65.71	69.85	71.41	72.39	72.9	

1956

WORK OF PROVIDING OPERATION MAINTANANCE OF SEWERAGE SYSTEM AND DESILTING OF 1800MM DIA USING RECYCLER AT AGARAM LAKE FOR A PERIOD OF 6 MONTHS

1957

WORK OF PROVIDING OPERATION MAINTANANCE OF SEWERAGE SYSTEM AND DESILTING OF 1800MM DIA USING RECYCLER AT AGARAM LAKE FOR A PERIOD OF 6 MONTHS			
Cost of Project :	**50.59 Lakhs**		
Date of Commencement	: 28.08.2019	**Project Completion Date**	: 27.02.2020)
Progress Achieved 500m/2100m			

1958

ANNEXURE – III PHOTOS

INDEX

1959

150 MLD STP at K&C Valley

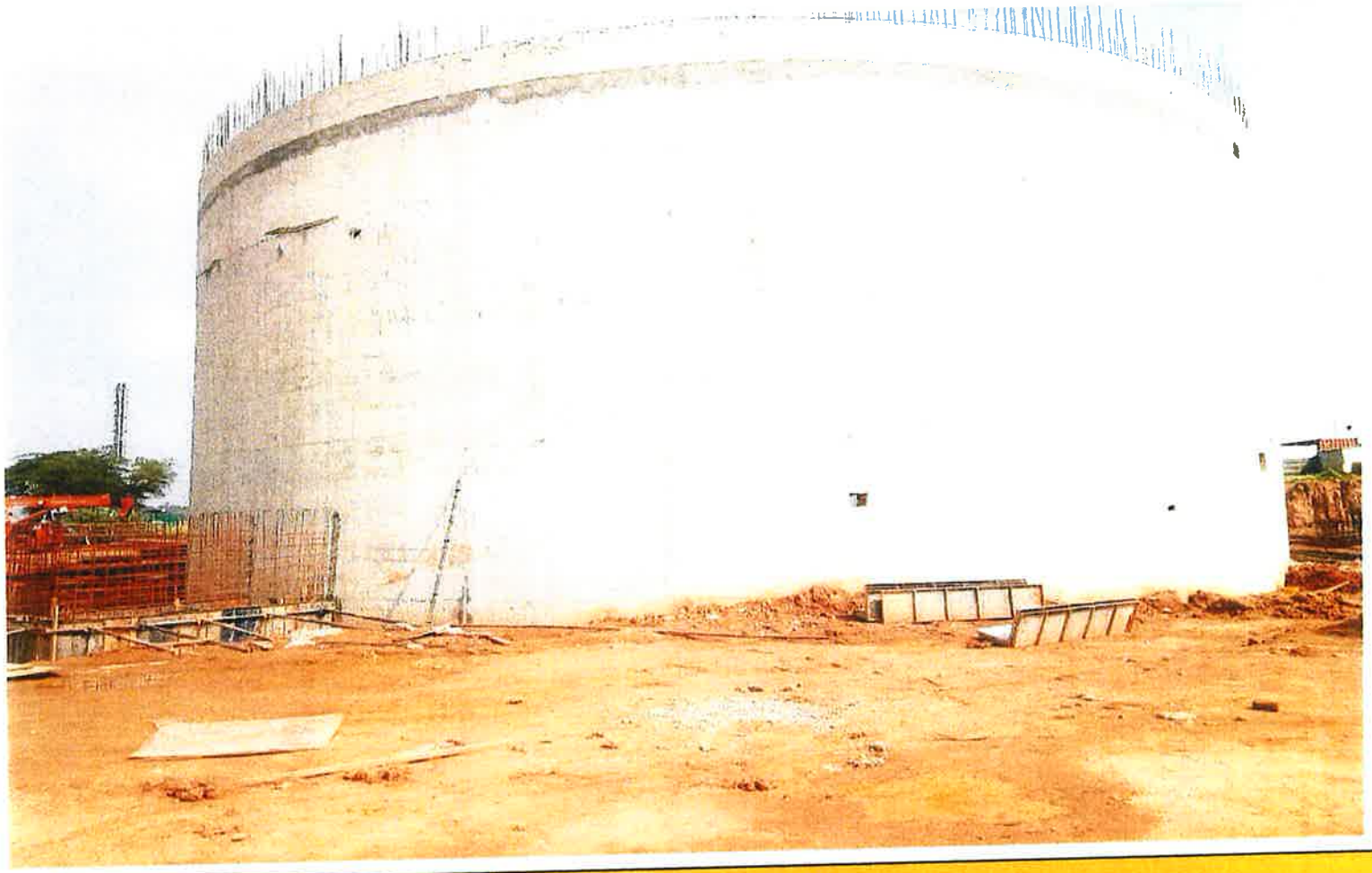
1960

150 MLD Sewage Treatment Plat At K&C Valley

PLANT LAYOUT

1961

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019



Digestor –C

1962

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Mechanical Equipment Erection at Primary Clarifiers

1963

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Concrete Pouring At Aeration tank

1964

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Mechanical Equipment Erection at Primary Clarifiers

1965

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Concrete Pouring At Aeration tank

1966

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Centring and Rebar work at Head works

1967

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Centring and Rebar work at Head works

1968

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Primary Clarifier and Aeration Tank

1969

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Primary Clarifier

1970

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Parshall Flume

1971

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Gravity Sludge Thikener

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Aeration Tank

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Aenarobic Digester D

On Going 150MLD STP Work At K&C Valley Status As on 15.11.2019

Overall View

1975

210 MLD ISPS at NGV

1976

ISPS at NGV

Pump house & Substation.

1977

ISPS at NGV

Wet well- Inside beam shuttering

1978

ISPS at NGV

Wet well- Inside beam bottom shuttering

1979

ISPS at NGV

Substation

1980

ISPS at NGV

HT Panel & DG Room

1981

ISPS at NGV

S2D(b) Administrative Building

1982

ISPS at NGV

Safety Training

1983

Pumping Main

1984

Pumping Main

Pipe Stocking at Yard

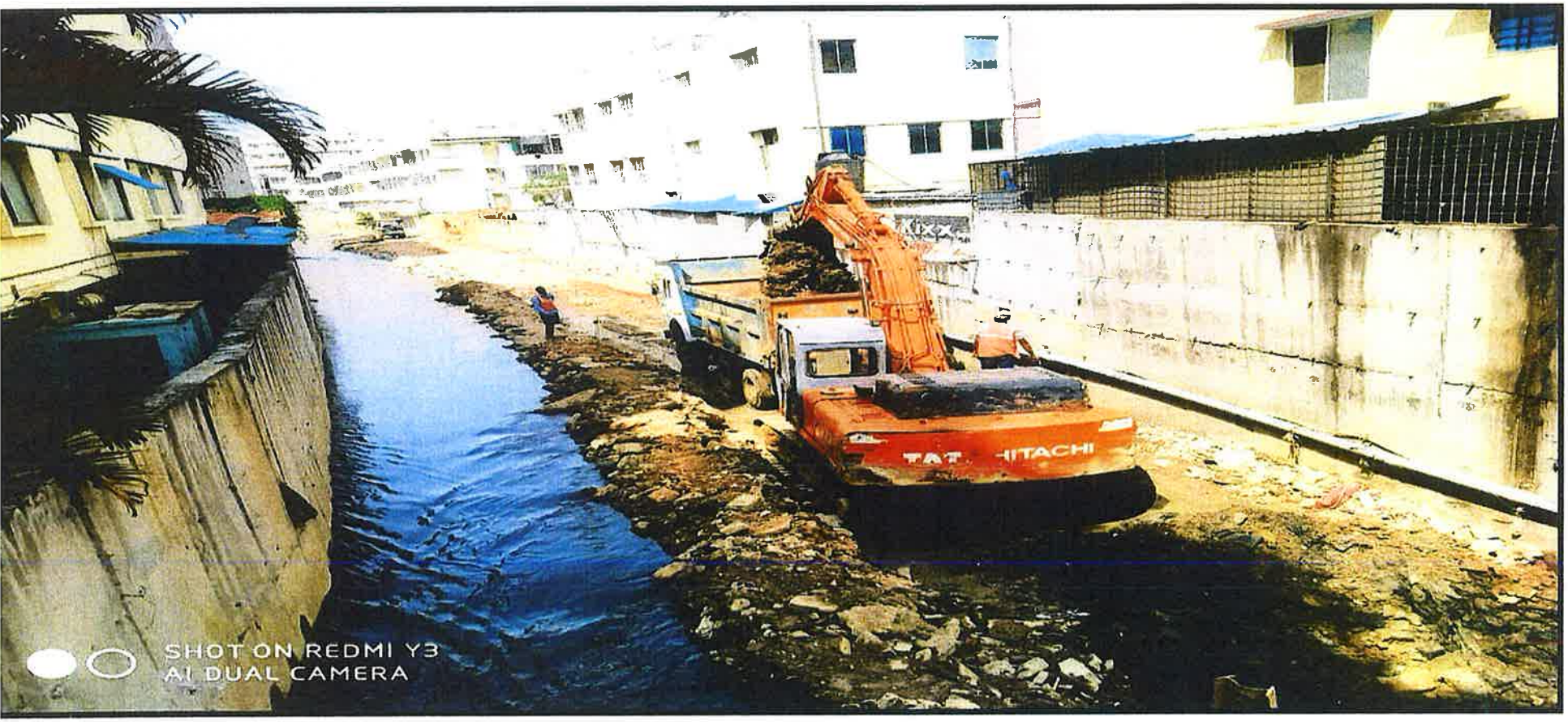
1985

Pumping Main

Pipe Stocking at site

1986

Pumping Main



Earth work excavation in Storm water drain near Maharaja Signal.

1987

Pumping Main

Flooded after formation of Bund in Storm water drain near Maharaja Signal.

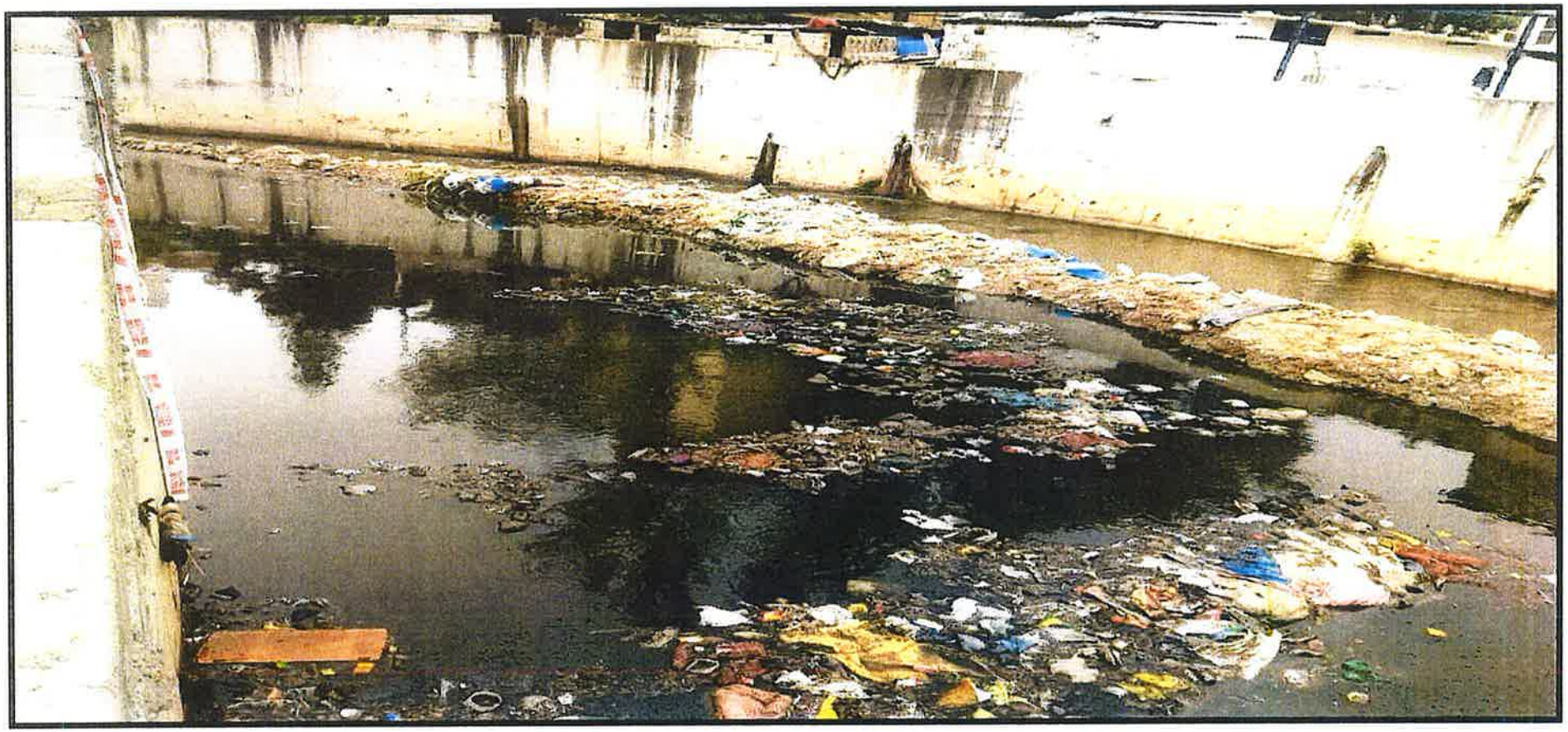
1988

Pumping Main

Dewatering and Earthwork excavation in Storm water drain near Sony Signal.

1989

Pumping Main



Flooded after formation of Bund in Storm water drain near Sony Signal.

1990

Pumping Main

Bund formation and Dewatering work in Storm water drain near Sony Signal.

1991

Pumping Main

Bund formation and Dewatering work in Storm water drain near Sony Signal.

1992

Pumping Main

Bund formation and Dewatering work in Storm water drain near Sony Signal.

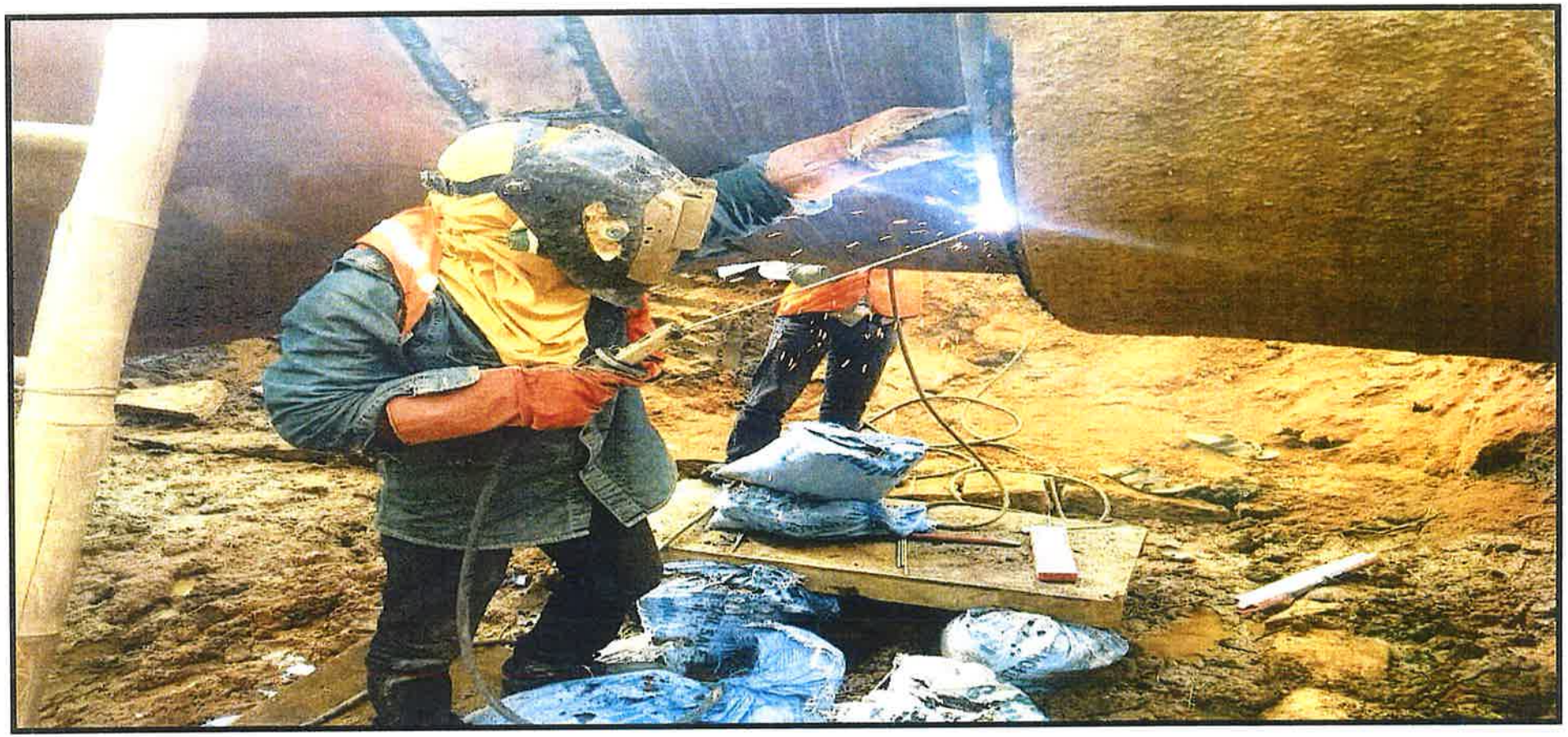
1993

Pumping Main

Bund formation and Dewatering work in Storm water drain near Sony Signal.

1994

Pumping Main



Pipe laying & jointing

1995

Pumping Main

Pipe laying & jointing at Lake bed area

1996

Pumping Main

Safety Training

1997

5 MLD STP AT SARAKKI

1998

5 MLD STP SARAKKI

INAUGURATION FUNCTION

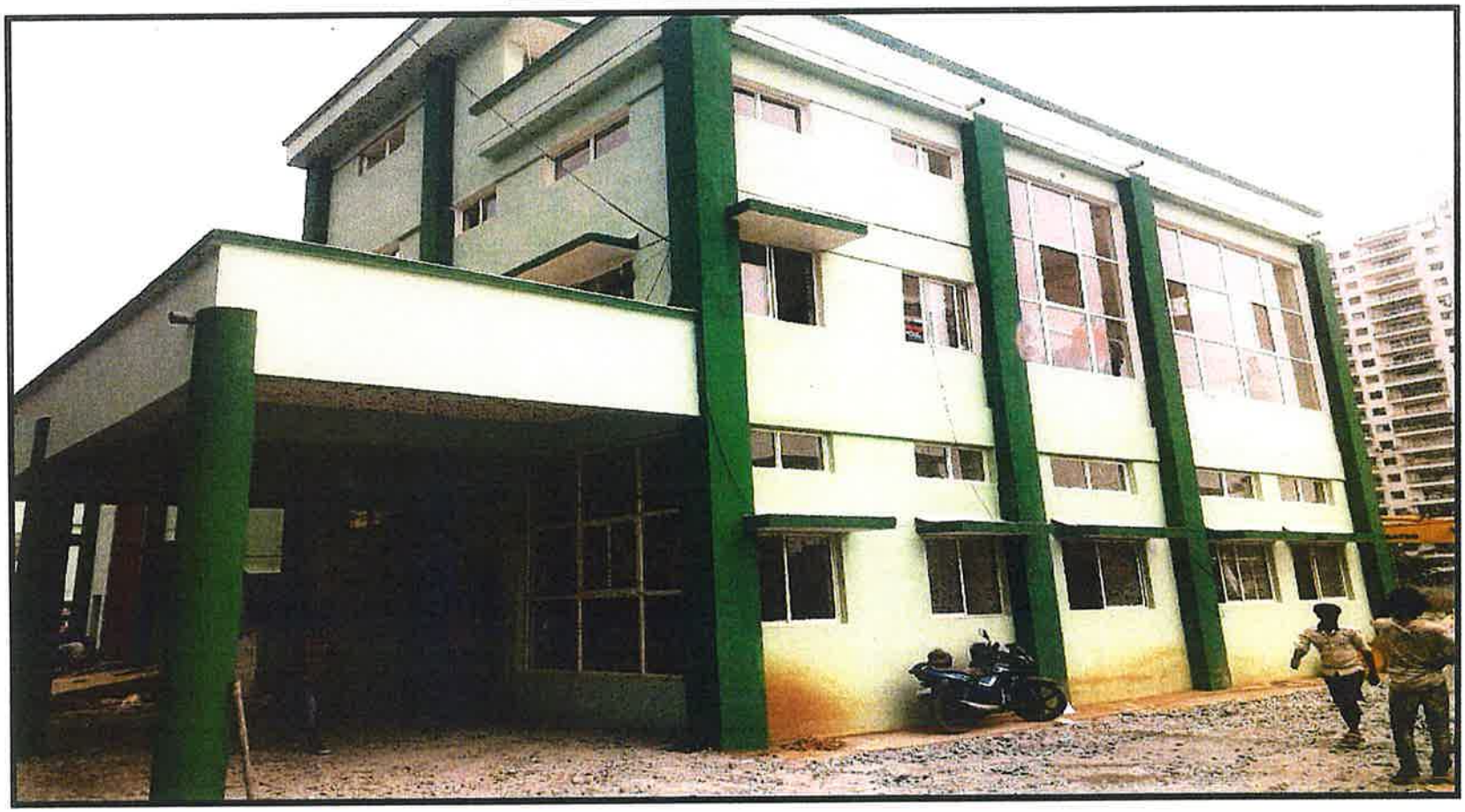
1999

5 MLD STP SARAKKI

ARIAL VIEW

2000

5 MLD STP SARAKKI



Admin.building

2001

5 MLD STP AT CHIKKA BEGUR

2002

5MLD STP CHIKKABEGUR

AERIAL VIEW

2003

5MLD STP CHIKKABEGUR

Blower Building

2004

5MLD STP CHIKKABEGUR

Admin. Building

2005

5MLD STP CHIKKABEGUR

Receiving chamber & Wet well

2006

5MLD STP CHIKKABEGUR

Chlorine Contact Tank de shuttering

2007

5MLD STP CHIKKABEGUR

SBR –wall 6th lift & walkway

2008

5MLD STP CHIKKABEGUR

Safety Training

2009

10 MLD STP AT HULIMAVU

2010

10MLD STP HULIMAVU

AERIAL VIEW

2011

10MLD STP HULIMAVU

SBR BASIN-1

2012

10MLD STP HULIMAVU

SBR BASIN-2 Hydro Testing

2013

10MLD STP HULIMAVU

Receiving Chamber Shuttering

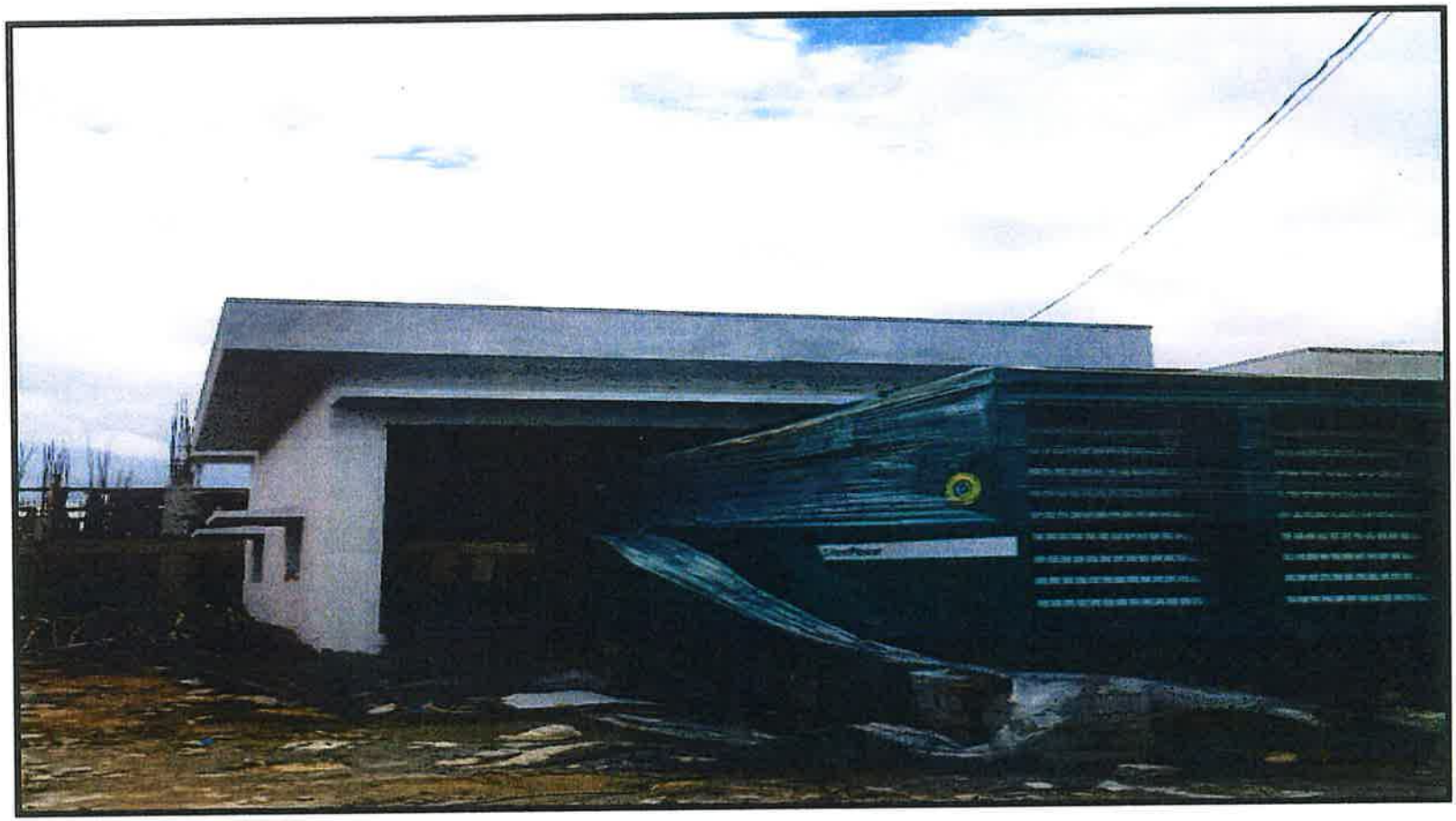
2014

10MLD STP HULIMAVU

Motor Control Centre

2015

10MLD STP HULIMAVU



DG Room

2016

ANNEXURE – F2

10MLD STP HULIMAVU

Wet well

2017

10MLD STP HULIMAVU

Motor Control Centre

2018

10MLD STP HULIMAVU

DG room

2019

10MLD STP HULIMAVU

Chlorine Contact tank

2020

10MLD STP HULIMAVU

SBR walk way tiling work

2021

10MLD STP HULIMAVU

PTU Reinforcement work

2022

10MLD STP HULIMAVU

Safety Training

2023

35 MLD STP AT AGARA

2024

35 MLD STP AGARA

ARIAL VIEW

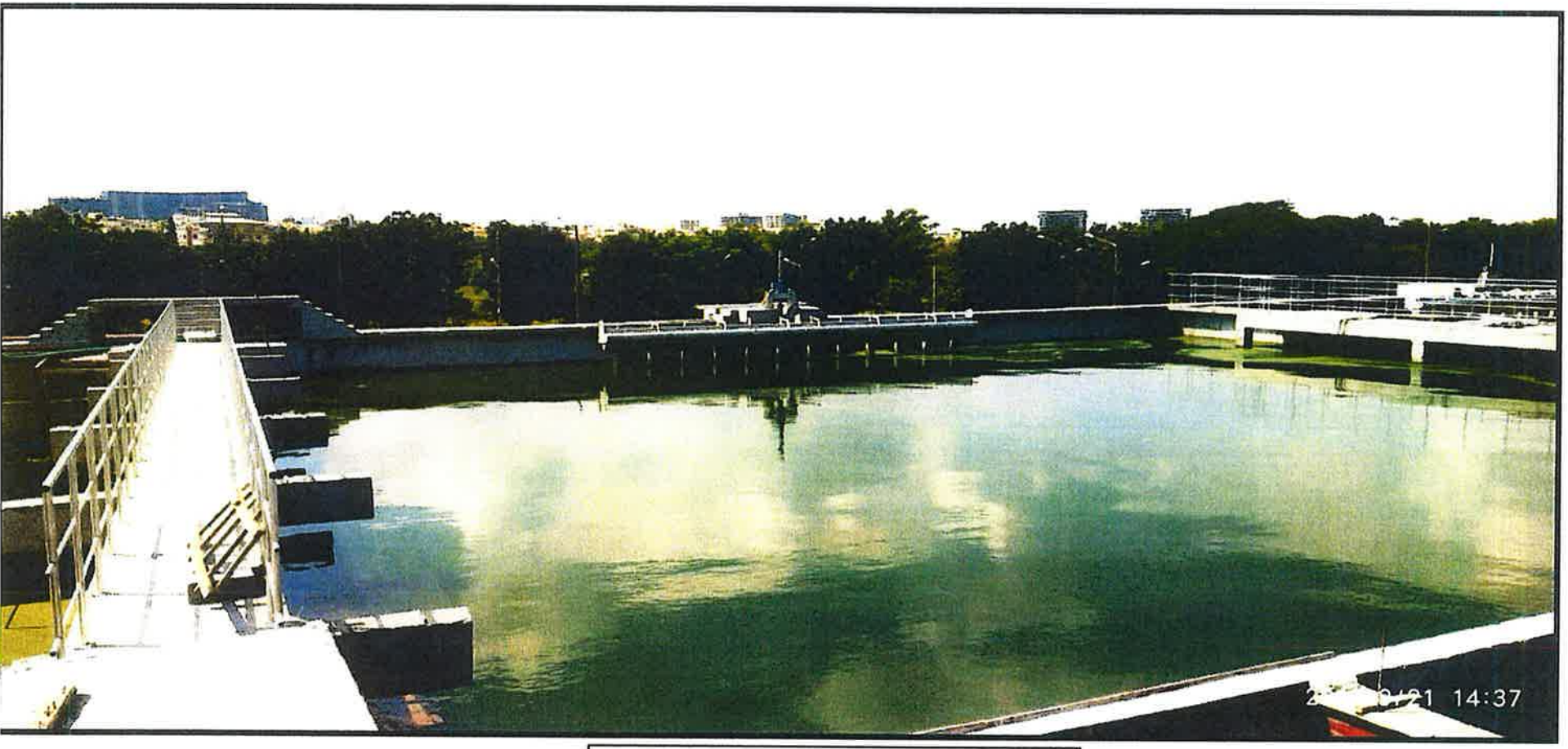
2025

35 MLD STP AGARA

SBR basin- 1&2

2026

35 MLD STP AGARA



SBR basin- 3 Hydro testing

2027

35 MLD STP AGARA

SBR basin-4

2028

35 MLD STP AGARA

Admin. Building

2029

35 MLD STP AGARA

Chlorine Contact Tank

2030

35 MLD STP AGARA

CC Tank-Leak absorption unit

2031

35 MLD STP AGARA

CCT- Chlorinators erection

2032

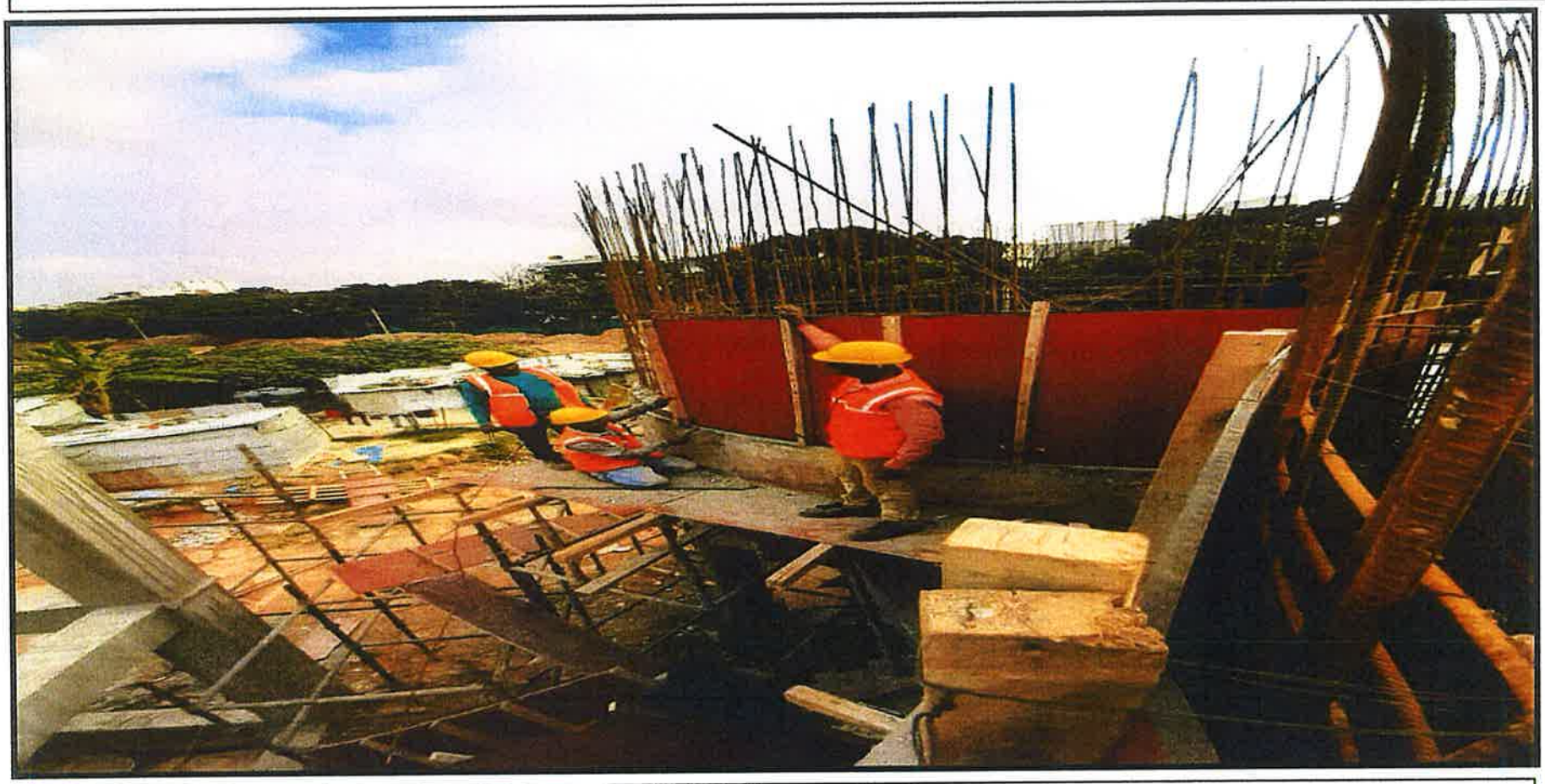
ANNEXURE – G2

35 MLD STP AGARA

Fixing of Blowers

2033

35 MLD STP AGARA



PTU Wall Shuttering

2034

35 MLD STP AGARA

Welding of Pipes

2035

35 MLD STP AGARA

Safety Training

2036

WORK OF PROVIDING OPERATION MAINTANANCE OF SEWERAGE SYSTEM AND DESILTING OF 1800MM DIA USING RECYCLER AT AGARAM LAKE FOR A PERIOD OF 6 MONTHS

2037

Desilting of Sewer line

Deployed Recycler Machine for Desilting

2038

Desilting of Sewer line

Debris Removed from Manhole

Desilting of Sewer line

Deployed Recycler Machine for Desilting

2040

Desilting of Sewer line

Desilting of Manhole

2041

Desilting of Sewer line

Inspection of Blocked Manhole

Desilting of Sewer line

Desilting of Pipeline using Recycler Machine