



Distillery Division
Date: 05.06.2020

GBL/SMR/MoEF&CC/2020-21/ 52

To,
The Additional Principal Chief Conservator Of Forests(C)
Ministry of Environment, Forests and Climate Change
4th Floor, E & F Wing, Kendriyasadan, Koramangala
Bengaluru - 560034

Respected Sir,

Sub: Half yearly compliance report for the period October 2019 to March 2020 –Reg
Ref: Environmental Clearance

- 1) F No. J-11011/272/2009-IA II(1) dated 7th July 2009
- 2) F No. J-11011/272/2009-IA II(1) dated 1st June 2011
- 3) F No. J-11011/272/2009-IA II(1) dated 3rd Feb 2015

With reference to the above subject herewith we are submitting the half yearly compliance report for the period October 2019 to March 2020. The details are as follows

SI No	Description	Details
1.	Name of the Industry	Godavari Biorefineries Limited (Distillery Division) Sameerwadi-587316 Tal: Mudhol, Dist : Bagalkot
2.	Person Responsible	Shri. Suhas. U. Godage General Manager
3.	Email.ID	suhas@somaiya.com
4.	Phone No/ Mobile	08350-260081 +917259009663
5.	Web site details	www.somaiya.com
6.	Environmental Clearance details	F No. J-11011/272/2009-IA II(1) dated 7 th July 2009 FNo. J-11011/272/2009-IA II(1) dated 1 st June 2011 F No. J-11011/272/2009-IA II(1) dated 3 rd Feb 2015
7.	Working days (Days)	137.8



Expansion of Distillery capacity from 200 KLPD to 320 KLPD based on grains/ Cassava/tapioca/Sugarcane juice/beet sugar juice/molasses as raw material and 40 KLPD ENA to 260 KLPD at Sameerwadi, Bagalkot district in Karnataka by M/s Godavari Biorefineries Limited – reg Environmental Clearance.

Pointwise Compliance for the Environment Clearance Conditions.

A. SPECIFIC CONDITIONS

Sl No	Conditions	Compliance
i	The industry shall ensure that the treated effluent and stack emissions from the unit are within the norms stipulated under the Environment (Protection) Act, 1986 rules or SPCB whichever is more stringent. In case of process disturbances/failure of pollution control equipment adopted by the unit, the respective unit shall be shut down and shall not be restarted until the control measures are rectified to achieve the desired efficiency	The Industry ensure the treated effluent and stack emissions from the unit conform to the norms stipulated. In case of failure of any Pollution Control Equipment or process disturbance the respective Unit would be shut down till the control measures are rectified to achieve the desired efficiency.
ii	The company shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on its website and shall update the same periodically. It shall simultaneously be sent to the Regional office of MOEF, the respective Zonal office of CPCB and the State Pollution Control Board. The levels of SPM, RSPM, SO ₂ , NO _x (ambient levels) and emissions from the stacks shall be monitored and displayed at a convenient location near the main gate of the company and at important public places	The compliance report and the monitored values are uploaded on the Company's website. It will be updated regularly and a copy sent to Regional office of MoEF&CC, Zonal office of CPCB and State Pollution Control Board. Industry has installed display board near the main gate displaying the levels of SPM, RSPM, SO ₂ , NO _x (ambient levels) and emissions from the stacks. Enclosed as Annexure No-1.
iii	The particulate emissions from the 64MW cogeneration unit shall be controlled by ESP and emissions from the boilers shall be controlled by wet scrubber and emission shall be dispersed through stack. The stack height shall be as per the CPCB standards/guidelines for dispersion of SPM emissions	The emissions from the 45.56MW cogeneration Unit are controlled by ESP to maintain emissions within the stipulated norms of CPCB /State Pollution Control Board. The emissions from boilers in Sugar complex are provided with wet scrubbers. Stack height of 70 mtr AGL is provided as per the CPCB standards/guidelines for dispersion of SPM emissions.
iv	The spent wash generated (800 m ³ /d) from molasses/ sugar cane juice/ Beet sugar juice based raw material after bio methanation shall be evaporated in the	Industry treats the spentwash generated from the plant through Biomethanation followed by evaporation and bio-composted.

	multiple effect evaporator and thereafter composted with press mud. The slopes from the grains, cassava/tapioca based process shall be concentrated in evaporator and converted into DWGS which will be used as animal feed. The condensate from the evaporator shall be recycled in the process	Industry is operating on molasses or Sugarcane syrup / B-heavy molasses as the raw material for the process. There is no generation of DWGS from the process due use of molasses as raw material.
v	The spent wash shall be stored in impervious pucca lagoons The spent wash lagoons shall have proper lining with HDPE and shall be kept in proper condition to prevent ground water pollution. The storage capacity of the lagoons for spent wash shall be as per CPCB guidelines and shall not exceed 30 days.	Industry has provided pucca lagoons for the storage of spentwash, Biomethanated Spentwash and concentrated spentwash. The lagoons are constructed as per the guidelines of CPCB to prevent ground water pollution. The storage capacity for Raw spent wash is 10833 m3 having retention period of 5.5 days, for Biomethanated spentwash the lagoon capacity is 22310 M3 having retention period of 11.5 days and concentrated spentwash lagoon capacity is 3468 M3 having retention period of 7.5 days. The storage capacity does not exceed 30 days.
vi	Adequate numbers of ground water quality monitoring stations by providing piezometers around the project area and compost yard shall be set up. Sampling and trend analysis monitoring must be made on a monthly basis and report submitted to SPCB and this Ministry	Industry has provided piezometers at five monitoring stations around the project area and compost yard. The data is monitored on monthly basis and reports are submitted to SPCB and RO of Ministry.
vii	Green belt in 33% of the plant area shall be provided to mitigate the impacts of fugitive emissions all around the plant and compost yard as per the CPCB guidelines in consultation with the local DFO	Industry has already developed the green belt area in consultation with local DFO in and around the premises.
viii	Company shall adopt rainwater harvesting measures to recharge the ground water.	Industry adopted rain harvesting system in the premises.

B. GENERAL CONDITIONS:

Sl No	Conditions	Compliance
i	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests,	Noted for compliance.
ii	Ambient Air Quality Monitoring Stations shall be set up in the down wind direction as well as where maximum ground level concentration of SPM. SO ₂ , NO _x , are	The Ambient Air Quality stations are set up in consultation with Regional Environmental Officer, KSPCB Bagalkot to capture data in downwind direction and at place where

	anticipated in consultation with the State Pollution Control Board	Max. GLC of SPM, SO ₂ , NO _x is anticipated
iii	Adequate number of influent and effluent quality monitoring stations shall be set up in consultation with the State Pollution Control Board. Regular monitoring should be carried out for relevant parameters	Industry has set up influent & effluent monitoring stations in consultation with the Regional Officer, Karnataka State Pollution control Board, Bagalkot and the monitoring will be carried for the relevant parameters.
iv	The industry shall ensure that the treated effluent and stack emissions from the unit are within the norms stipulated under the EPA rules or SPCB whichever is more stringent. In case of process disturbances/failure of pollution control equipment adopted by the unit, the respective unit shall be shut down and shall not be restarted until the control measures are rectified to achieve the desired efficiency	Noted for compliance
v	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz, 75 dBA (day time) and 70 dBA (night time).	Industry will ensure that the noise levels will be kept within the limits specified under EPA Rules 1985 by providing suitable control equipment and regularly monitored and reports will be submitted to State Pollution control Board.
vi	Occupational health surveillance programme shall be undertaken as regular exercise for all the employees. The first aid facilities in the occupational health center shall be strengthened and the medical records of each employee shall be maintained separately.	Industry is having full pledged occupational health center with First Aid facilities. The health surveillance of all the employees is regularly carried out and the data is maintained.
vii	A separate environmental management cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions	The Industry has set up Environmental Management Cell (EMC) with full-pledged laboratory facilities for environmental management and monitoring. The EMC reports to the Director (Works).
viii	The project authorities shall provide requisite funds for both recurring and non-recurring expenditure to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose	Industry has provided requisite funds for capital and operating expenditures to comply with the conditions stipulated by the MoEF&CC and KSPCB. 1.Capital cost of ETP & APC : Rs. 7935 Lakhs 2. Recurring cost : Rs. 482 Lakhs

ix	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent	Copy of the Environmental Clearance has been sent to the local Gram Panchayat. It is also displayed on Industry's official website. .
x	The Environmental Statement for each financial year ending 31 st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF by email.	The Environmental Statement for the financial year ending 31st March 2019 along with compliance to EC conditions is submitted to KSPCB, Regional office of MoEF&CC and is also displayed on Industry's official website.
xi	The implementation of the project vis-a-vis environmental action plans will be monitored by Ministry's Regional Office at Bangalore/State Pollution Control Board/Central Pollution Control Board.	Noted for compliance
xii	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated E C conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the State Pollution Control Board	Industry is submitting six monthly reports on the status of the compliance to EC conditions to the Regional office of MoEF&CC, zonal office of CPCB and the State Pollution Control Board.
xiii	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/ Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office	Industry circulated the Environmental Clearance in two local newspapers.

Godavari Biorefineries Limited, Distillery Division, Sameerwadi

xiv	The Project Authorities shall inform the Regional Office as well as the Ministry the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.	Noted for compliance
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Date: 05.06.2020
Place: Sameerwadi

For Godavari Biorefineries Limited
(Distillery Division)


S.U. Godage
General Manager



**Godavari Biorefineries Limited
(Distillery Division), Sameerwadi**

Annexure No-1

❖ **Boiler Stack monitoring results:-**

Month & Year	Stack No-3, 40 TPH Incineration boiler Stack ID- 1.7 mtr, Height – 81 mtr Fuel : Concentrated Spentwash & Coal, Fuel Ratio : 80 : 20				
	Flue gas velocity (m/Sec)	Flue gas Outlet temp deg C	Particulate matter(SPM) mg/Nm3	SO2 mg/nm3	NOX mg/Nm3
Dec.2019	12.1	137	57	42	30
Jan.2020	12.2	141	59	43	31
Feb.2020	12.3	144	62	45	32

❖ **ESP – Electrical meter reading:-**

Month & Year	Working days	ESP Electrical meter reading			
		Initial	Final	Total (MW)	In KWH units
Oct.2019	4.7	654.22	667.60	13.38	13380
Nov.2019	14.6	654.22	700.26	46.04	46040
Dec.2019	31.0	700.26	770.96	70.70	70700
Jan.2020	28.3	770.96	834.22	63.26	63260
Feb.2020	29.0	834.22	892.91	58.69	58690
March.2020	30.2	892.91	969.92	77.01	77010
	137.8				329080
Average unit consumption = $329080 / 137.8 = 2388$ KWH units per day					

Note: Two No's of additional fields are installed in the existing ESP to achieve more efficiency.

❖ **Ambient Air quality monitoring details:**

Month & Year	Location	Wind direction	Parameters			
			PM _{2.5} µg/m ³	PM ₁₀ µg/m ³	NO _x µg/m ³	SO ₂ µg/m ³
Oct.2019	Near distillery gate	Easterly	17	58	8	6.00
	Near BTP plant	Easterly	14	52	7.00	6.00
Dec.2019	Near distillery gate	Easterly	21	62	12.00	8.00
	Near BTP plant	Easterly	24	69	10.00	8.00
Jan.2020	Near distillery gate	Easterly	26	72	15.00	12.00
	Near BTP plant	Easterly	23	68	10.00	08.00
Feb.2020	Near distillery gate	Easterly	30	75	14.00	12.00
	Near BTP plant	Easterly	26	70	10.00	08.00

❖ **Effluent Sample Analysis report: Biomethanated Spentwash**

SI No	Parameter	Unit	Results		Test method
			1	2	
			12.12.2019	22.02.2020	
1	pH		7.91	7.62	IS: 3025(P-11)1983
2	Alkalinity	mg/lit	9710	7920	IS: 3025(P-23)1986
3	Volatile solids	mg/lit	3790	3570	APHA 22 nd edition2012,5056C
4	COD	mg/lit	40073	44844	IS: 3025(P-58) 2006
5	BOD	mg/lit	5120	5760	IS: 3025(P-44)1993
6	Total solids	mg/lit	73910	74210	APHA 22 nd edition2012,2540 B
7	Total Volatile solids	mg/lit	33450	38190	APHA 22 nd edition2012, 240- E,G
8.	Total Inorganic solids	mg/lit	40460	36020	APHA 22 nd edition2012, 2540 C
9.	Chlorides	mg/lit	6997	6495	IS: 3025(P-32)1988
10.	Sulphates	mg/lit	4892	5058	IS: 3025(P-24)1986
11.	Potash	mg/lit	14130	14300	IS: 3025(P-45)1993

❖ Trade sample Analysis report: Raw Spentwash sample

SI No	Parameter	Unit	Results			Test method
			1	2	3	
			12.12.2019	28.01.2020	22.02.2020	
1	pH		3.01	2.64	2.25	IS: 3025(P-11)1983
2	COD	mg/lit	87028	34816	136972	IS: 3025(P-58) 2006
3	BOD	mg/lit	45210	15260	57270	IS: 3025(P-44)1993
4	Total solids	mg/lit	130760	66120	169610	APHA 22 nd edition2012,2540 B
5	Total Volatile solids	mg/lit	55410	27610	71530	APHA 22 nd edition2012, 240- E,G
6.	Total Inorganic solids	mg/lit	75350	38510	98080	APHA 22 nd edition2012, 2540 C
7.	Chlorides	mg/lit	9854	2870	6998	IS: 3025(P-32)1988
8.	Sulphate	mg/lit	6711	4172	7326	IS: 3025(P-24)1986
9.	Potash	mg/lit	12900	12800	16100	IS: 3025(P-45)1993

❖ Trade sample Analysis report: Spentwash sample after 1st Stage Evaporation

SI No	Parameter	Unit	Results		Test method
			1	2	
			12.12.2019	28.01.2020	
1	pH		3.38	2.69	IS: 3025(P-11)1983
2	COD	mg/lit	162732	38046	IS: 3025(P-58) 2006
3	BOD	mg/lit	70340	17210	IS: 3025(P-44)1993
4	Total solids	mg/lit	193340	76820	APHA 22 nd edition2012,2540 B
5	Total Volatile solids	mg/lit	86080	29170	APHA 22 nd edition2012, 240- E,G
6.	Total Inorganic solids	mg/lit	107260	47650	APHA 22 nd edition2012, 2540 C
7.	Chlorides	mg/lit	12243	3828	IS: 3025(P-32)1988
8.	Sulphate	mg/lit	15519	5623	IS: 3025(P-24)1986
9.	Potash	mg/lit	19700	13900	IS: 3025(P-45)1993

❖ Noise Level Measurement Report:

Date of measurement: 28.01.2020

SI No	Location	Sampling time	dB(A) Leq
1	Distillery main gate	Day	56.9
		Night	51.2
2.	BTP Plant	Day	69.4
		Night	65.6
3.	Incineration Boiler	Day	71.8
		Night	68.3
4.	Compost yard	Day	65.1
		Night	53.3
5.	Distillery Time Office	Day	67.2
		Night	62.4

❖ **Borewell Analysis report:**

Date of Sampling: 19.10.2019

Sl No	Test parameter	Unit	Bharmappa H Sanadi Kappalguddi	Mahadev L Ajjapagoal Kappalguddi	Bhimappa R Udappgaol Kappalguddi	Test Method
			1	2	3	
1	Color	Hazen	<5	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		6.81	6.63	6.63	IS: 3025(P-11)1983
4	Turbidity	NTU	1.6	0.7	0.6	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	360	370	420	IS: 3025(P-23) 1986
6	COD	mg/lit	47	58	74	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	5	7	10	IS: 3025(P-44)1993
8	TDS	mg/lit	1090	1270	1590	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	312	410	390	IS: 3025(P-32)1988
10	Hardness	mg/lit	1210	1560	2050	IS: 3025(P-21)1983
11	Calcium	mg/lit	390	523	682	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	57	61	84	IS: 3025(P-46)1994
13	Sodium	mg/lit	85.4	85.9	116.1	IS: 3025(P-45) 1993
14	Potassium	mg/lit	6.3	6.4	6.2	IS: 3025(P-44)1993
15	%sodium	%	13.25	10.66	10.93	By calculation
16	SAR		1.06	0.94	1.11	By calculation
17	RSC	meq/l	-17.05	-23.83	-32.7	By calculation
18	EC	µmhos/cm	1750	1950	2750	IS: 3025(P-14)1984

❖ **Borewell Analysis report:**

Date of Sampling: 19.10.2019

Sl No	Test parameter	Unit	Mayappa Sanadi Kappalguddi	Parmahans G Bangi Kappalguddi	Test Method
			4	5	
1	Color	Hazen	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		7.37	7.34	IS: 3025(P-11)1983
4	Turbidity	NTU	0.7	0.2	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	310	280	IS: 3025(P-23) 1986
6	COD	mg/lit	40	21	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	<4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	1180	761	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	158	113	IS: 3025(P-32)1988
10	Hardness	mg/lit	1250	870	IS: 3025(P-21)1983
11	Calcium	mg/lit	603	283	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	63	40	IS: 3025(P-46)1994
13	Sodium	mg/lit	85.5	78.9	IS: 3025(P-45) 1993
14	Potassium	mg/lit	3.8	2.0	IS: 3025(P-44)1993
15	%sodium	%	8.8	16.41	By calculation
16	SAR		0.81	1.16	By calculation
17	RSC	meq/l	-29.2	-11.88	By calculation
18	EC	µmhos/cm	2070	1410	IS: 3025(P-14)1984

❖ **Borewell Analysis report:**

Date of Sampling: 12.12.2019

Sl No	Test parameter	Unit	CBSE School campus Saidapur	Ishwar R Terdal Bisnal	KIAAR Campus	Test Method
			1	2	3	
1	Color	Hazen	<5	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		7.37	7.52	7.33	IS: 3025(P-11)1983
4	Turbidity	NTU	0.1	0.1	0.1	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	190	230	184	IS: 3025(P-23) 1986
6	COD	mg/lit	17	15	12	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	< 4	< 4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	523	538	414	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	163	128	120	IS: 3025(P-32)1988
10	Hardness	mg/lit	270	315	381	IS: 3025(P-21)1983
11	Calcium	mg/lit	64	89	92	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	27	23	37	IS: 3025(P-46)1994
13	Sodium	mg/lit	82.1	90.7	78.1	IS: 3025(P-45) 1993
14	Potassium	mg/lit	2.3	2.5	1.2	IS: 3025(P-44)1993
15	%sodium	%	39.47	38.13	30.7	By calculation
16	SAR		2.16	2.21	1.73	By calculation
17	RSC	meq/l	-1.65	-1.76	-4.0	By calculation
18	EC	µmhos/cm	829	891	610	IS: 3025(P-14)1984

❖ **Borewell Analysis report:**

Date of Sampling: 12.12.2019

SI No	Test parameter	Unit	Basappa R Wali Bisnal	Hanumanth S Banaj Bisnal	Test Method
			4	5	
1	Color	Hazen	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		7.56	7.84	IS: 3025(P-11)1983
4	Turbidity	NTU	0.1	0.2	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	171	196	IS: 3025(P-23) 1986
6	COD	mg/lit	12	32	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	< 4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	624	570	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	138	165	IS: 3025(P-32)1988
10	Hardness	mg/lit	509	554	IS: 3025(P-21)1983
11	Calcium	mg/lit	143	129	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	37	56	IS: 3025(P-46)1994
13	Sodium	mg/lit	119.5	139.1	IS: 3025(P-45) 1993
14	Potassium	mg/lit	6.9	4.6	IS: 3025(P-44)1993
15	%sodium	%	33.41	35.14	By calculation
16	SAR		2.3	2.57	By calculation
17	RSC	meq/l	-6.81	-7.19	By calculation
18	EC	µmhos/cm	905	1080	IS: 3025(P-14)1984

❖ **Borewell Analysis report:**

Date of Sampling: 28.01.2020

Sl No	Test parameter	Unit	Borewell Near Haveli Saidapur	CBSE School Borewell Saidapur	Sidappa S Kuribagi, BorwellNo-1 Handigund	Test Method
			1	2	3	
1	Color	Hazen	<5	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		7.04	7.03	7.01	IS: 3025(P-11)1983
4	Turbidity	NTU	0.1	0.1	0.2	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	250	150	210	IS: 3025(P-23) 1986
6	COD	mg/lit	23	15	33	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	< 4	< 4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	710	510	930	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	199	100	310	IS: 3025(P-32)1988
10	Hadness	mg/lit	740	230	1220	IS: 3025(P-21)1983
11	Calcium	mg/lit	192	68	232	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	63	15	155	IS: 3025(P-46)1994
13	Sodium	mg/lit	68.4	84.4	69.9	IS: 3025(P-45) 1993
14	Potassium	mg/lit	3.5	5.4	3.1	IS: 3025(P-44)1993
15	%sodium	%	16.68	43.5	11.07	By calculation
16	SAR		1.09	2.41	0.87	By calculation
17	RSC	meq/l	- 9.85	-1.65	-20.31	By calculation
18	EC	µmhos/cm	1190	848	1830	IS: 3025(P-14)1984

❖ **Borewell Analysis report:****Date of Sampling: 28.01.2020**

Sl No	Test parameter	Unit	Sidappa S Kuribagi, BorwellNo-2 Handigund	Azadnagar Borewell Saidapur	Sujata Bhadrasheety Handigund	Test Method
			4	5	6	
1	Color	Hazen	<5	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		8.28	8.33	7.80	IS: 3025(P-11)1983
4	Turbidity	NTU	0.7	0.2	0.1	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	150	190	200	IS: 3025(P-23) 1986
6	COD	mg/lit	34	13	21	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	< 4	< 4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	940	610	631	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	342	119	89	IS: 3025(P-32)1988
10	Hardness	mg/lit	1060	510	570	IS: 3025(P-21)1983
11	Calcium	mg/lit	216	148	161	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	126	34	41	IS: 3025(P-46)1994
13	Sodium	mg/lit	69.2	62	73.2	IS: 3025(P-45) 1993
14	Potassium	mg/lit	2.9	2.6	3.0	IS: 3025(P-44)1993
15	%sodium	%	12.42	20.82	21.7	By calculation
16	SAR		0.92-	1.19	1.33	By calculation
17	RSC	meq/l	-18.3	-6.43	-7.46	By calculation
18	EC	µmhos/cm	1890	962	1131	IS: 3025(P-14)1984

❖ **Borewell Analysis report:**

Date of Sampling: 28.01.2020

Sl No	Test parameter	Unit	Girish R Kulkarni Handigund	Ulleppa Chanal Handigund	Test Method
			7	8	
1	Color	Hazen	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		8.17	8.20	IS: 3025(P-11)1983
4	Turbidity	NTU	0.2	0.1	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	220	220	IS: 3025(P-23) 1986
6	COD	mg/lit	35	31	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	< 4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	852	938	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	239	428	IS: 3025(P-32)1988
10	Hardness	mg/lit	920	1270	IS: 3025(P-21)1983
11	Calcium	mg/lit	248	325	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	73	230	IS: 3025(P-46)1994
13	Sodium	mg/lit	72.1	73.6	IS: 3025(P-45) 1993
14	Potassium	mg/lit	3.1	3.2	IS: 3025(P-44)1993
15	%sodium	%	14.5	8.33	By calculation
16	SAR		1.03	0.76	By calculation
17	RSC	meq/l	-14.08	-31.01	By calculation
18	EC	µmhos/cm	1960	2150	IS: 3025(P-14)1984

❖ **Borewell Analysis report:**

Date of Sampling: 22.02.2020

SI No	Test parameter	Unit	Sidappa K Biradi Bisnal	Ishwar R Terdal Bisnal	Test Borewell No-2	Test Method
			1	2	3	
1	Color	Hazen	<5	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		7.52	7.48	7.50	IS: 3025(P-11)1983
4	Turbidity	NTU	0.1	0.1	0.1	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	150	220	240	IS: 3025(P-23) 1986
6	COD	mg/lit	27	34	33	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	< 4	< 4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	390	460	690	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	84	80	115	IS: 3025(P-32)1988
10	Hardness	mg/lit	320	410	590	IS: 3025(P-21)1983
11	Calcium	mg/lit	112	144	200	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	10	24	28	IS: 3025(P-46)1994
13	Sodium	mg/lit	46	32.7	69.3	IS: 3025(P-45) 1993
14	Potassium	mg/lit	2.1	1.8	3.6	IS: 3025(P-44)1993
15	%sodium	%	23.62	13.37	19.35	By calculation
16	SAR		1.11	0.66	1.19	By calculation
17	RSC	meq/l	-3.43	- 4.8	- 7.53	By calculation
18	EC	µmhos/cm	745	657	1191	IS: 3025(P-14)1984

❖ **Borewell Analysis report:**

Date of Sampling: 22.02.2020

SI No	Test parameter	Unit	Test Borewell No-4 Saidapur	Shankar P Maygur Bisnal	KIAAR Premises Bisnal	Test Method
			4	5	6	
1	Color	Hazen	<5	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		6.77	7.21	7.42	IS: 3025(P-11)1983
4	Turbidity	NTU	0.1	0.1	0.1	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	120	90	250	IS: 3025(P-23) 1986
6	COD	mg/lit	29	17	30	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	< 4	< 4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	830	340	440	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	260	40	80	IS: 3025(P-32)1988
10	Hardness	mg/lit	800	320	470	IS: 3025(P-21)1983
11	Calcium	mg/lit	269	160	164	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	31	20	15	IS: 3025(P-46)1994
13	Sodium	mg/lit	91	97.8	39.5	IS: 3025(P-45) 1993
14	Potassium	mg/lit	3.2	3.3	4.6	IS: 3025(P-44)1993
15	%sodium	%	19.77	30.44	15.26	By calculation
16	SAR		1.4	1.93	0.79	By calculation
17	RSC	meq/l	-13.63	-7.86	-4.45	By calculation
18	EC	µmhos/cm	1436	2250	718	IS: 3025(P-14)1984

❖ **Borewell Analysis report:**

Date of Sampling: 22.02.2020

Sl No	Test parameter	Unit	Prakash D Naik Bisnal	Hanumanth S Naik Bisnal	Nagappa Satyappa Banaj Bisnal	Test Method
			7	8	9	
1	Color	Hazen	<5	<5	<5	IS: 3025(P-04)1983
2	Odor		Agreeable	Agreeable	Agreeable	IS: 3025(P-05) 1983
3	pH		7.09	7.09	7.22	IS: 3025(P-11)1983
4	Turbidity	NTU	0.1	0.1	0.1	IS: 3025(P-10)1984
5	Total Alkalinity	mg/lit	270	250	300	IS: 3025(P-23) 1986
6	COD	mg/lit	34	26	31	IS: 3025(P-58) 2006
7	BOD(3days @270 C	mg/lit	< 4	< 4	< 4	IS: 3025(P-44)1993
8	TDS	mg/lit	610	518	626	IS: 3025(P-16) 1984
9	Chlorides	mg/lit	149	106	134	IS: 3025(P-32)1988
10	Hardness	mg/lit	730	490	660	IS: 3025(P-21)1983
11	Calcium	mg/lit	212	119	205	IS: 3025(P-40) 1991
12	Magnesium	mg/lit	49	47	36	IS: 3025(P-46)1994
13	Sodium	mg/lit	56.9	90.8	71	IS: 3025(P-45) 1993
14	Potassium	mg/lit	1.8	4.1	1.8	IS: 3025(P-44)1993
15	%sodium	%	14.44	28.49	18.91	By calculation
16	SAR		0.91	1.78	1.2	By calculation
17	RSC	meq/l	-9.28	-4.86	-7.28	By calculation
18	EC	µmhos/cm	976	835	910	IS: 3025(P-14)1984

❖ **Soil Sample:- Sample collected on 19.10..2019**

Sl No	Test parameter	Unit	Bharmappa H Sanadi	Mahadev Ajjapagoal	Bhimappa Udappgaol	Mayappa Sanadi	Test Method
			1	2	3	4	
1	pH		7.79	6.86	6.88	7.23	PP-77-78
2	Conductivity	µmhos/cm	0.248	0.634	0.511	0.504	PP-81-82
3	Mineralizable Nitrogen	Kg/ha	0.0053	0.0041	0.0032	0.0067	PP-89-91
4	Available Phosphorus	Kg/ha	69	64	57	49	PP-96-98
5	Available Potassium	Kg/ha	630	790	880	370	PP -99-100
6	Organic Carbon	%	0.73	0.82	1.16	0.86	PP -84-85
7	Calcium	%	3.58	3.17	2.91	2.46	PP-103-104
8	Magnesium	%	0.42	0.29	0.48	0.34	PP-104-105

❖ **Soil Sample :-Sample collected on: 12.12.2019**

Sl No	Test parameter	Unit	Ishwar Terdal	KIAAR Campus	Basappa R Wali	Hanumanth S Banaj	Test Method
			1	2	3	4	
1	pH		8.37	8.19	7.82	7.76	PP-77-78
2	Conductivity	µmhos/cm	0.348	0.436	0.336	0.412	PP-81-82
3	Available Nitrogen	Kg/ha	0.0045	0.0033	0.0051	0.064	PP-89-91
4	Available Phosphorus	Kg/ha	25	43	47	51	PP-96-98
5	Available Potassium	Kg/ha	380	680	510	490	PP -99-100
6	Organic Carbon	%	0.59	0.74	0.83	0.69	PP -84-85
7	Calcium	%	2.23	2.05	1.56	2.82	PP-103-104
8	Magnesium	%	0.15	0.14	0.19	0.23	PP-104-105

❖ **Bio- organic Manure (Bhumilabh) Analysis Report:-**

SI No	Parameter	Unit	Result		
			12.12.2019	28.01.2020	22.02.2020
1	Moisture	%	36.20	34.26	33.15
2	pH(Saturated)		6.80	6.83	6.71
3	Total Volatile Solids	%	64.19	63.02	63.37
4	Residual ash	%	35.81	36.98	36.63
5	Nitrogen	%	1.68	1.65	1.68
6	Phosphorus	%	1.75	1.79	1.81
7	Potassium	%		3.23	3.29
8	Organic carbon	%	29.34	28.79	28.51
9	C/N ratio		17.46	17.44	16.97
	Leachate Water(Filtrate)				
10	pH		7.54	7.59	7.52
11	COD	mg/lit	236	231	229
12	BOD	mg/lit	28	27	26
13	Chlorides	mg/lit	146	142	145
14	EC	µmhos/cm	1530	1524	1540

❖ **Condensate polishing unit (BTP) Inlet & Outlet parameter details:**

Date: 12.12.2019

Sl No	Test Parameter	Unit	Inlet	Outlet	Test Method
1	pH	-	3.31	7.34	IS: 3025(P-11)1986
2	Chemical Oxygen demand	mg/lit	191	103	IS: 3025(P-58) 2006
3	BOD (3days @ 27 OC)	mg/lit	87	36	IS:3025(P-44)1993
4	Total dissolved solids	mg/lit	310	298	IS:3025(P-16)1984
5	Total suspended solids	mg/lit	68	37	IS:3025(P-17)1984
6	Chloride as Cl-	mg/lit	104	40	IS:3025(P-32)1988
7	Sulphate as SO4	mg/lit	83	51	IS:3025(P-24)1986
8	Oil & Grease	mg/lit	ND	ND	IS:3025(P-39)1993(RA 2003)

❖ **Boiler Ash analysis report:**

Sl No	Parameter	Unit	Result		
			ESP Ash	Bottom Ash	ESP Ash
			28.01.2020	28.01.2020	22.02.2020
1	Moisture	%	0.12	0.15	0.11
2	pH(Saturated)		12.87	11.84	12.85
3	Total Volatile Solids	%	1.43	1.69	1.44
4	Residual ash	%	98.57	98.31	98.56
5	Nitrogen	%	1.04	1.12	1.07
6	Phosphorus as P2O5	%	1.62	1.67	1.54
7	Potassium as K2O	%	22.32	5.07	22.91
8	Organic carbon	%	6.9	6.82	7.2

❖ **Press mud Analysis**

Sl No	Parameter	Unit	Result	
			28.01.2020	22.02.2020
1	Moisture	%	69.29	65.81
2	pH(Saturated)		4.36	4.39
3	Total Volatile Solids	%	90.56	90.68
4	Residual ash	%	9.44	9.32
5	Nitrogen	%	2.34	2.31
6	Phosphorus as P2O5	%	1.6	1.72
7	Potassium as K2O	%	0.41	0.45
8	Organic carbon	%	46.96	47.12

❖ **Yeast Sludge Analysis**

Sl No	Parameter	Unit	Result
			28.01.2020
1	Moisture	%	87.14
2	pH(Saturated)		4.31
3	Total Volatile Solids	%	88.16
4	Residual ash	%	11.84
5	Nitrogen	%	1.03
6	Phosphorus as P2O5	%	1.29
7	Potassium as K2O	%	1.37
8	Organic carbon	%	41