

Water Quality of Canals with respect to Criteria parameters during 2022 (January-December)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters					DO	BOD	TC	FC			
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/100 ml)	FC (MPN/100 ml)							
Taladanda canal														
1.	Jobra*	4	7.7 (7.5-8.2)	8.0 (7.6-8.5)	1.3 (1.1-1.4)	2850 (2200-3500)	905 (230-1300)	0	0	0 ^{\$} 4 ^{\$\$} (100)	0	Does not conform to Class B	TC	Human activities
2.	Ranihat*	4	7.6 (7.4-8.2)	7.8 (7.4-8.3)	1.3 (1.1-1.8)	27200 (4000-92000)	5575 (2700-13000)	0	0	2 ^{\$} 4 ^{\$\$} (100)	4 (100)	Does not conform to Class B & C	TC,FC	Human activities and waste water of Cuttack town
3.	Chatrabazar*	4	7.6 (7.3-8.1)	7.7 (7.4-7.9)	1.3 (1.1-1.5)	17133 (330-54000)	6633 (330-17000)	0	0	3 ^{\$} 3 ^{\$\$} (75)	3 (75)		TC,FC	
4.	Nuabazar*	4	7.5 (7.2-8.1)	7.5 (7.2-7.9)	1.3 (1.1-1.7)	107250 (17000-160000)	68400 (4600-160000)	0	0	4 ^{\$} 4 ^{\$\$} (100)	4 (100)	Does not conform to Class B & C	TC,FC	
5.	Biribati*	4	7.4 (7.1-8.0)	7.5 (7.0-7.8)	1.4 (1.1-1.6)	23053 (210-35000)	4395 (78-7900)	0	0	3 ^{\$} 3 ^{\$\$} (75)	2 (50)		TC,FC	
6.	Atharabanki	12	7.6 (6.9-8.5)	5.6 (2.2-10.0)	2.1 (1.2-3.7)	13383 (1400-54000)	5377 (220-24000)	2 (17)	1 (8)	5 ^{\$} (42) 12 ^{\$\$} (100)	4 (33)	Does not conform to Class B & C	DO, BOD, TC,FC	Human activities
**Class 'C'			6.5-8.5	4 and above	3 or less	5000 or less	-	Drinking water source with conventional treatment followed by disinfection						
**Class 'B'			6.5-8.5	5 and above	3 or less	500 or less	-	Outdoor bathing						
Water quality criteria for bathing water			6.5-8.5	5 and above	3 or less	-	2500 (Maximum Permissible)	Water use for organised outdoor bathing (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)						

* Data for the period August-November, 2022

** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

\$ for Class C and \$\$ for Class B

Contd..

Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values)				Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				EC	SAR	B			
			pH	EC (microSiemens /cm)	SAR	B (mg/L)						
(a) Taladanda canal												
1.	Jobra*	4	7.7 (7.5-8.2)	181 (154-201)	0.42 (0.34-0.51)	<0.5 (<0.5-<0.5)	0	0	0	Conform to Class E		
2.	Ranihat*	4	7.6 (7.4-8.2)	181 (150-193)	0.44 (0.33-0.5)	<0.5 (<0.5-<0.5)	0	0	0			
3.	Chatrabazar*	4	7.6 (7.3-8.1)	179 (148-194)	0.42 (0.34-0.47)	<0.5 (<0.5-<0.5)	0	0	0			
4.	Nuabazar*	4	7.5 (7.2-8.1)	175 (150-189)	0.44 (0.34-0.51)	<0.5 (<0.5-<0.5)	0	0	0			
5.	Biribati*	4	7.4 (7.1-8)	179 (155-196)	0.43 (0.33-0.51)	<0.5 (<0.5-<0.5)	0	0	0			
6.	Atharabanki	12	7.6 (6.9-8.5)	241 (166-447)	0.77 (0.4-1.31)	<0.5 (<0.5-<0.5)	0	0	0			
**Class 'E'			6.0-8.5	2250 or less	26 or less	2.0 or less	Irrigation, industrial cooling, controlled waste disposal					

* Data for the period excluding August-November, 2022

** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

Water Quality of Taladanda Canal with respect to other parameters during 2022 (January-December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents					
		Annual average values (Range of values)											
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	% Na	TDS	TH	Cl	SO ₄	F
		(mg/L)		(mg/L)				(mg/L)					
1.	Jobra*	31 (<10-55)	72 (52-92)	9.1 (6.7-11)	0.56 (0.56-0.56)	0.007 (0-0.045)	2.66 (1.12-5.04)	18.94 (14.9-22.69)	NA	75 (64-88)	12 (10-14)	11.1 (6-22.1)	0.52 (0.35-0.73)
2.	Ranihat*	31 (<10-64)	75 (56-88)	9.8 (7.3-13)	0.7 (0.56-1.12)	0.010 (0-0.090)	4.06 (2.24-7.84)	19.32 (15.99-21.79)	NA	76 (68-80)	10 (8-12)	13.7 (7.7-22.6)	0.46 (0.39-0.54)
3.	Chhatrabazar*	43 (16-65)	77 (68-88)	8.2 (6.7-11)	0.56 (0.56-0.56)	0.005 (0-0.036)	3.5 (2.8-4.48)	18.2 (15.84-20.52)	NA	83 (76-92)	11 (8-14)	13.2 (6.2-22.1)	0.42 (0.33-0.47)
4.	Nuabazar*	19 (<10-36)	76 (56-92)	8.2 (6.7-11)	0.56 (0.56-0.56)	0.005 (0-0.036)	4.2 (2.8-5.6)	19.68 (16.65-22.11)	NA	75 (68-84)	11 (8-12)	10.8 (<5-21.8)	0.44 (0.42-0.47)
5.	Biribati*	67 (16-126)	79 (60-92)	9.1 (6.7-11)	0.56 (0.56-0.56)	0.004 (0-0.028)	4.06 (2.8-5.6)	18.66 (15.3-22.13)	NA	80 (76-84)	12 (10-14)	11.7 (<5-22.8)	0.63 (0.36-0.82)
6.	Atharabanki	30 (11-72)	88 (60-116)	15.8 (8-26)	0.79 (<0.4-1.68)	0.029 (0-0.174)	3.97 (1.68-8.4)	27.41 (18.43-36.17)	NA	94 (68-188)	26 (14-80)	19.3 (<5-74.9)	0.55 (0.32-0.81)
**Class 'C'		-	-	-	-	-	-	-	1500	-	600	400	1.5
**Class 'E'		-	-	-	-	-	-	60	2100	-	600	1000	-

* Data for the period excluding August-November, 2022

** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI) ##	T. Cr ##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)								
1.	Jobra*	2.053 (0.837-2.755)	<0.05 (<0.05-<0.05)	NA	NA	NA	NA	NA	NA	NA	NA	NA
2.	Ranihat*	2.083 (1.452-2.688)	0.115 (<0.05-0.178)	NA	NA	NA	NA	NA	NA	NA	NA	NA
3.	Chhatrabazar*	2.329 (0.709-3.186)	<0.05 (<0.05-0.056)	NA	NA	NA	NA	NA	NA	NA	NA	NA
4.	Nuabazar*	2.629 (1.906-3.205)	0.098 (0.05-0.16)	NA	NA	NA	NA	NA	NA	NA	NA	NA
5.	Biribati*	2.263 (0.806-3.218)	0.106 (<0.05-0.162)	NA	NA	NA	NA	NA	NA	NA	NA	NA
6.	Atharabanki	2.288 (0.929-6.298)	0.079 (<0.05-0.232)	<0.002	0.011	0.631	0.014	0.019	0.191	0.0053	NA	0.006
	**Class 'C'	50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
	**Class 'E'	-	-	-	-	-	-	-	-	-	-	-

* Data for the period excluding August-November, 2022

Data for the period April, 2022 , NA : Not Analysed

** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

Water Quality of Puri Canal with respect to Criteria parameters during 2022 (January-December)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason	
			Parameters					DO	BOD	TC	FC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)								
1.	Hansapal	12	7.6 (7.1-8.5)	7.9 (6.3-10.9)	1.4 (1.1-2.3)	6774 (490-28000)	2762 (220-13000)	0	0	4 ^{\$} (33) 11 ^{\$\$} (92)	2 (16)	Does not conform to Class B, C	TC, FC	Human activities	
2.	Jagannathpur	10	7.2 (6.6-7.6)	7.7 (6.1-10.3)	1.4 (1.1-2.8)	4650 (1300-22000)	1915 (130-7000)	0	0	1 ^{\$} (10) 10 ^{\$\$} (100)	1 (10)	Does not conform to Class B, C	TC, FC	Human activities	
3.	Chandanpur***	7	7.5 (7.2-8.5)	6.3 (5.4-7.1)	1.9 (1.1-2.4)	2986 (1100-7900)	1000 (330-2400)	0	0	1 ^{\$} (14) 7 ^{\$\$} (100)	0	Does not conform to Class B, C	TC		
*Class 'C'			6.5-8.5	4 and above	3 or less	5000 or less	Drinking water source with conventional treatment followed by disinfection								
*Class 'B'			6.5-8.5	5 and above	3 or less	500 or less	Outdoor bathing								
Water quality criteria for bathing water			6.5-8.5	5 and above	3 or less		2500 (Maximum Permissible)	Water use for organised outdoor bathing (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)							

^{\$} for Class C and ^{\$\$} for Class B

*** Data for the period March, April, May, August, September, October, November, 2022

* Tolerance limits for Inland Surface water bodies (IS-2296-1982)

NB :The criteria of non-compliance with respect to TC has been calculated on the following basis:(Ref : IS 2296-1982 foot note)

For Class B : TC values with more than 5% of samples show more than 2000 MPN/100 ml and more than 20% of the samples show more than 500 MPN/ 100 ml.

For Class C : TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	EC (microSiemens /cm)	SAR	B (mg/l)	EC	SAR	B			
			1.	Hansapal	12	7.6 (7.1-8.5)	209 (165-250)	0.58 (0.4-0.74)	<0.5 (<0.5-<0.5)			
2.	Jagannathpur	10	7.2 (6.6-7.6)	213 (161-244)	0.54 (0.38-0.65)	<0.5 (<0.5-<0.5)	0	0	0			
3.	Chandanpur***	7	7.5 (7.2-8.5)	193 (162-238)	0.49 (0.34-0.74)	<0.5 (<0.5-1.464)	0	0	0			
* Class 'E'			6.5-8.5	2250 or less	26 or less	2 or less				Irrigation, Industrial Cooling or controlled waste disposal		

*** Data for the period March, April, May, August, September, October, November, 2022

DO : Dissolved Oxygen, BOD : Biochemical Oxygen Demand, TC : Total Coliform, TSS : Total Suspended Solids; COD : Chemical Oxygen Demand, NH₄-N : Ammonical nitrogen, TKN : Total Kjeldahl Nitrogen; FC : Fecal Coliform, EC : Electrical Conductivity, TDS : Total Dissolved Solids, B : Boron ; SAR : Sodium Absorption Ratio, TH : Total hardness; Cl : chloride, SO₄²⁻ : sulphate; F : Fluoride; PO₄³⁻ : phosphate, : Cr(VI) : Hexavalent Chromium; Fe : Iron, Ni : Nickel, Cu : Copper, Zn : Zinc; Cd : cadmium; Hg : Mercury; Pb : Lead

Water Quality of Puri Canal with respect to other parameters during 2022 (January-December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents					
		Annual average values (Range of values)											
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	% Na	TDS	TH	Cl	SO ₄	F
		(mg/L)		(mg/L)				(mg/L)					
1.	Hansapal	30 (<10-90)	78 (64-92)	9.6 (7-16)	0.65 (<0.4-1.68)	0.029 (0-0.140)	3.55 (1.68-5.6)	23.38 (18.39-31.35)	NA	81 (56-100)	18 (12-31)	16.5 (<5-30.3)	0.43 (0.24-0.59)
2.	Jagannathpur	29 (<10-92)	83 (64-108)	10.1 (6.7-22)	0.62 (0.56-1.12)	0.006 (0-0.025)	3.86 (1.68-6.72)	22 (18.14-24.96)	NA	83 (64-96)	18 (10-36)	15.6 (<5-26.3)	0.44 (0.28-0.528)
3.	Chandanpur***	44 (10-167)	86 (72-116)	13.3 (7.2-19.8)	0.8 (0.56-1.12)	0.014 (0-0.087)	4.32 (1.68-7.84)	20.48 (13.53-28.47)	NA	83 (72-112)	13 (10-16)	12.6 (6.9-19.7)	0.54 (0.42-0.67)
*Class 'C'		-	-	-	-	-	-	-	1500	-	600	400	1.5
*Class 'E'		-	-	-	-	-	-	60	2100	-	600	1000	-

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)##	T Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)								
1.	Hansapal	1.437 (0.265-2.804)	0.076 (<0.05-0.252)	<0.002	0.018	0.265	0.009	0.002	0.006	0.0007	NA	0.007
2.	Jagannathpur	1.794 (0.726-3.194)	0.11 (<0.05-0.415)	<0.002	0.011	0.003	0.009	0.004	0.019	0.0013	NA	0.008
3.	Chandanpur***	1.195 (0.485-1.609)	<0.05 (<0.05-0.089)	0.004	0.009	0.256	0.008	0.005	0.014	0.0093	NA	0.005
*Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
*Class 'E'		-	-	-	-	-	-	-	-	-	-	-

*** Data for the period March, April, May, August, September, October and November 2022

Data for the period April, 2022 NA : Not Analysed