

Table-1 (a) Water Quality of Ponds with respect to Criteria parameters during 2012 (January-December)

Sl. No	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					BOD	TC	FC			
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)						
Bindusagar Pond (Bhubaneswar)													
1.	Lingaraj Temple side	12	7.7 (6.7-9.2)	11.6 (5.9-15.4)	12.3 (4.3-35.0)	23208 (5800-92000)	12608 (2300-35000)	12 (100)	12 (100)	12 (100)	Does not conform to Class B	BOD, TC,FC	Human activities
2.	Ananta vasudev	12	7.8 (6.8-9.3)	10.8 (3.8-14.3)	8.8 (4.3-15.7)	22458 (4700-54000)	12808 (2700-35000)	12 (100)	12 (100)	12 (100)	Does not conform to Class B	BOD, TC,FC	Human activities
3.	Near Kedarnath research Centre	12	7.8 (7.0-9.1)	13.0 (6.4-17.5)	9.8 (4.5-16.0)	23425 (5800-92000)	11742 (2300-24000)	12 (100)	12 (100)	12 (100)			
4.	Gyananagar	12	7.9 (6.9-8.6)	12.8 (5.2-19.9)	8.6 (2.3-15.6)	25808 (7900-54000)	15875 (4900-35000)	11 (92)	12 (100)	12 (100)			
Class 'B' water quality Criteria (IS-2296-1982)			6.5-8.5	5 and above	3 or less	500 or less					Outdoor bathing		
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	5 and above	3 or less		500 (Desirable) 2500 (Permissible)				Water use for organised outdoor bathing		

Table 1 (b) Water Quality of Ponds with respect to Criteria parameters during 2012 (January-December)

Sl. No	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					BOD	TC	FC			
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)						
Ponds (Puri)													
1.	Narendra	12	8.5 (8.0-8.8)	11.4 (3.-9-16.1)	7.0 (4.1-12.0)	11344 (930-54000)	5021 (450-17000)	12 (100)	12 (100)	11 (92)	Does not conform to Class B	BOD, TC,FC	Human activities
2.	Markanda	12	8.2 (7.5-9.2)	12.6 (7.3-18.9)	6.3 (2.0-13.0)	24975 (2200-92000)	6780 (2200-9200)	11 (92)	12 (100)	12 (100)			
3.	Indradyumna	12	8.3 (7.4-8.7)	8.8 (4.3-16.3)	5.0 (2.2-8.0)	19550 (400-92000)	10417 (200-35000)	11 (92)	11 (92)	11 (92)			
4.	Swetaganga	12	8.7 (7.7-9.6)	14.4 (6.5-22.9)	11.5 (2.3-31.5)	16500 (1300-54000)	6754 (450-24000)	11 (92)	12 (100)	11 (92)			
5.	Parvati sagar	12	8.0 (7.5-8.5)	10.0 (1.5-18.4)	8.0 (1.9-18.0)	30146 (450-160000)	10641 (200-54000)	11 (92)	11 (92)	11 (92)			
Class 'B' water quality Criteria (IS-2296-1982)			6.5-8.5	5 and above	3 or less	500 or less					Outdoor bathing		
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	5 and above	3 or less		500 (Desirable) 2500 (Permissible)				Water use for organised outdoor bathing		

Table 2 (a) Water quality of Ponds with respect to other parameters during 2012 (January-December)

Sl. No.	Sampling Location	Physical parameters (mg/l)		Organic pollution Indicators (mg/l)				Mineral constituents (mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	EC (μS/cm)	SAR	B	TDS	TH	Cl	SO ₄	F
Bindusagar Pond (Bhubaneswar)															
1.	Lingaraj Temple side	84 (26-210)	101 (68-126)	92.1 (14.2-196.5)	0.564 (0.168-1.600)	0.034 (BDL-0.126)	6.77 (1.96-14.28)	459 (404-549)	2.15 (1.59-2.66)	0.075 (0.030-0.219)	277 (240-319)	83 (76-92)	78.9 (60.5-98.8)	10.05 (3.66-20.19)	0.384 (0.231-0.532)
2.	Ananta Vasudev	90 (22-252)	104 (78-124)	67.8 (20.6-132.7)	0.673 (0.112-2.100)	0.023 (BDL-0.057)	6.90 (0.56-15.12)	452 (349-542)	2.14 (1.49-2.78)	0.066 (0.030-0.132)	234 (317-277)	86 (72-118)	80.5 (60.5-97.8)	11.0- (3.56-23.66)	0.373 (0.228-0.502)
3.	Near Kedarnath Research Centre	81 (18-160)	104 (72-132)	78.5 (36.4-170.0)	0.570 (0.112-1.568)	0.032 (BDL-0.152)	7.00 (0.28-21.84)	446 (407-538)	2.10 (1.49-2.66)	0.063 (0.019-0.163)	273 (225-318)	80 (72-84)	79.7 (61.5-98.9)	8.59 (4.16-16.44)	0.381 (0.267-0.534)
4.	Gyananagar	68 (24-148)	100 (66-132)	70.3 (12.8-113.1)	1.039 (0.168-1.6720)	0.040 (BDL-0.196)	6.51 (1.12-20.16)	430 (191-532)	2.18 (1.81-2.65)	0.058 (0.023-0.096)	273 (219-311)	85 (76-102)	79.4 (60.5-97.8)	8.93 (3.86-19.59)	0.375 (0.235-0.541)
Class 'C'		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

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Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr (VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Bindusagar Pond (Bhubaneswar)												
1.	Lingaraj Temple side	10.88 (2.19-26.95)	0.224 (0.056-0.792)	0.008 (0.003-0.012)	0.036 (0.008-0.060)	2.140 (0.250-5.000)	0.004 (0.002-0.010)	0.005 (0.001-0.008)	0.012 (0.004-0.017)	0.002 (0.001-0.003)	BDL	0.007 (0.004-0.015)
2.	Ananta vasudev	9.08 (1.10-15.08)	0.163 (0.031-0.647)	0.007 (0.002-0.010)	0.034 (0.014-0.056)	2.601 (1.100-8.184)	0.004 (0.001-0.008)	0.006 (0.002-0.008)	0.009 (0.004-0.016)	0.002 (0.001-0.003)	BDL	0.006 (0.003-0.012)
3.	Near Kedarnath Research Centre	8.77 (0.95-25.91)	0.248 (0.051-0.753)	0.008 (0.003-0.017)	0.044 (0.019-0.103)	1.370 (0.163-2.621)	0.004 (0.002-0.010)	0.005 (0.002-0.007)	0.010 (0.004-0.017)	0.002 (0.001-0.003)	BDL	0.004 (0.002-0.005)
4.	Gyananagar	10.74 (1.06-16.97)	0.221 (0.071-0.670)	0.008 (0.003-0.013)	0.036 (0.014-0.076)	1.612 (0.270-3.990)	0.003 (0.001-0.006)	0.005 (0.001-0.009)	0.010 (0.006-0.015)	0.002 (0.001-0.003)	BDL	0.005 (0.002-0.012)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10

BDL = Below Detection Limit

* Data for the period Jan-May, 2012

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Table 2 (b) Water quality of ponds with respect to other parameters during 2012 (January-December)

Sl. No.	Sampling Location	Physical parameters (mg/l)		Organic pollution Indicators (mg/l)				Mineral constituents (mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	EC (μS/cm)	SAR	B	TDS	TH	Cl	SO ₄	F
Ponds (Puri)															
1.	Narendra	61 (33-92)	209 (136-268)	59.9 (43.8-86.9)	0.423 (0.168-1.008)	0.071 (0.022-0.218)	5.18 (2.24-10.08)	998 (872-1218)	3.19 (1.86-3.81)	0.164 (0.015-0.889)	595 (487-746)	207 (160-258)	184.7 (120.0-253.8)	30.32 (17.82-41.08)	0.223 (0.140-0.234)
2.	Markanda	44 (14-90)	178 (98-224)	40.7 (22.2-94.1)	0.331 (0.112-0.840)	0.038 (0.004-0.130)	5.76 (1.68-9.52)	750 (588-838)	2.05 (1.34-2.81)	0.264 (0.007-1.419)	454 (328-345)	179 (88-230)	113.1 (80.0-150.0)	33.62 (75.04-63.06)	0.145 (0.054-0.246)
3.	Indradyumna	50 (13-184)	131 (82-164)	40.4 (28.0-54.1)	0.308 (0.112-0.784)	0.052 (0.007-0.353)	5.02 (1.68-10.64)	706 (596-924)	3.54 (2.00-5.07)	0.335 (0.018-3.073)	423 (360-544)	115 (62-184)	142.2 (116.0-178.4)	13.96 (3.56-31.88)	0.231 (0.082-0.456)
4.	Swetaganga	66 (36-108)	153 (140-308)	64.5 (19.2-129.9)	0.275 (0.112-0.560)	0.073 (0.003-0.196)	5.95 (2.24-10.64)	1254 (1066-1879)	4.00 (2.74-6.14)	0.190 (0.022-0.624)	766 (588-1193)	219 (152-264)	254.4 (157.3-384.4)	47.71 (6.68-82.37)	0.217 (0.056-0.718)
5.	Parvati sagar	59 (15-132)	126 (80-198)	57.6 (7.4-126.7)	0.280 (0.112-0.504)	0.022 (0.003-0.063)	5.02 (0.56-8.96)	688 (548-1079)	2.91 (2.00-5.63)	0.187 (0.016-0.832)	413 (348-631)	128 (94-164)	134.3 (106.1-220.2)	25.29 (7.96-41.87)	0.192 (0.117-0.340)
Class 'C'		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

BDL = Below Detection Limit

* Data for the period Jan-May, 2012

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Table contd..

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Ponds (Puri)												
1.	Narendra	16.89 (0.41-43.51)	0.888 (0.110-2.356)	BDL	0.024 (0.017-0.032)	0.930 (0.154-3.274)	0.005 (0.002-0.008)	0.003 (0.001-0.005)	0.007 (0.005-0.009)	0.002 (0.001-0.002)	BDL	0.008 (0.003-0.014)
2.	Markanda	8.41 (1.19-29.96)	1.429 (0.104-3.168)	BDL	0.030 (0.020-0.042)	0.614 (0.068-3.400)	0.006 (0.002-0.008)	0.004 (0.003-0.008)	0.008 (0.003-0.012)	0.003 (0.001-0.004)	BDL	0.009 (0.008-0.011)
3.	Indradyumna	24.43 (1.33-45.38)	0.122 (0.010-0.422)	BDL	0.032 (0.020-0.050)	0.648 (0.139-4.276)	0.006 (0.002-0.010)	0.003 (0.002-0.005)	0.012 (0.008-0.019)	0.002 (0.001-0.003)	BDL	0.007 (0.003-0.008)
4.	Swetaganga	40.34 (6.52-69.33)	0.817 (0.040-1.715)	BDL	0.036 (0.022-0.053)	1.036 (0.211-3.476)	0.007 (0.003-0.010)	0.004 (0.002-0.006)	0.011 (0.003-0.021)	0.002 (0.001-0.004)	BDL	0.008 (0.005-0.012)
5.	Parvati sagar	7.57 (2.52-12.79)	0.249 (0.002-0.634)	BDL	0.031 (0.015-0.048)	0.953 (0.350-2.210)	0.004 (0.001-0.010)	0.005 (0.003-0.011)	0.009 (0.007-0.013)	0.002 (0.001-0.003)	BDL	0.007 (0.006-0.009)
Class 'C'				0.05	-	50	-	1.5	15.0	0.01	-	0.10

BDL = Below Detection Limit

* Data for the period March-May, 2012

Class 'C' : Drinking water source with conventional treatment followed by disinfection