

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
(PRINCIPAL BENCH), NEW DELHI
ORIGINAL APPLICATION NO. 300 of 2013

IN THE MATTER OF

MANOJ MISHRA

PETITIONER(S)

Versus

UNION OF INDIA & ORS.

RESPONDENT(S)

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(A B AKOLKAR)

MEMBER SECRETARY

DELHI

DATED: 8th September, 2016

Water Quality of River Yamuna in Delhi

**SUBMITTED TO HON'BLE NATIONAL GREEN TRIBUNAL
IN COMPLIANCE WITH THE DIRECTIONS GIVEN IN A CHAMBER MEETING
HELD ON 6.9.16
IN THE MATTER OF
MANOJ MISHRA VS UNION OF INDIA & ORS
(CWP 300 OF 2013)**



(8th SEPTEMBER 2016)

Central Pollution Control Board

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Water Quality of River Yamuna in Delhi

- Water quality of River Yamuna is carried out on monthly basis in Delhi at 5 locations viz Palla, Nizamuddin Bridge, Downstream of Okhla Barrage (After confluence with Shahdara Drain), Agra Canal (Kalindi Kunj) and Agra Canal at Madanpur Khadar.
- The year wise observed water quality for criteria pollutants viz. Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD) and Total Coliform for 2014, 2015 and 2016 (upto July) is presented in the form of range Table 1 and Figure 1-10. The month wise water quality data in respect of Dissolved Oxygen (DO), Biochemical Oxygen Demand and Total Coliform is presented in Table 2.
- Location wise status of water quality

1. Water Quality of river Yamuna at Palla.

Dissolved Oxygen (Criteria for 'C' class - 4 mg/l)

Year	Dissolved oxygen range
2014	6.4-12.8 mg/l
2015	5.54-15.5 mg/l
2016	5.1-10.81 mg/l

BOD (Criteria limit-3 mg/l)

Year	BOD range
2014	1-51 mg/l
2015	1-8 mg/l
2016	2-9 mg/l

Total Coliform (Criteria limit-5000 MPN/100ml)

Year	Total Coliform range
2014	450-43000 MPN/100ml
2015	780-35000 MPN/100ml
2016	1400-54000 MPN/100ml

➤ **Observation: Increasing trend of BOD and Total Coliform**

2. Water Quality of river Yamuna at Nizamuddin Bridge.

Dissolved Oxygen (Criteria for 'C' class - 4 mg/l)

Year	Dissolved oxygen range
2014	0.3-2.8 mg/l
2015	0.1-2.4 mg/l
2016	0.4-1.8 mg/l

BOD (Criteria limit-3 mg/l)

Year	BOD range
2014	4-36 mg/l
2015	4-40 mg/l
2016	19-45 mg/l

Total Coliform (Criteria limit-5000 MPN/100ml)

Year	Total Coliform range
2014	330000-54000000 MPN/100ml
2015	68000-17000000 MPN/100ml
2016	2100000-9200000MPN/100ml

➤ **Observation: Increasing trend of BOD and Total Coliform**

3. Water Quality of river Yamuna at Okhla after confluence with Shahdara drain.

Dissolved Oxygen (Criteria for 'C' class - 4 mg/l)

Year	Dissolved oxygen range
2014	0.8-2.9 mg/l
2015	0.0-2.4 mg/l
2016	0.1-1.1 mg/l

BOD (Criteria limit-3 mg/l)

Year	BOD range
2014	9-79 mg/l
2015	13-97 mg/l
2016	29-67 mg/l

Total Coliform (Criteria limit-5000 MPN/100ml)

Year	Total Coliform range
2014	330000-160000000 MPN/100ml
2015	940000-16000000 MPN/100ml
2016	230000-160000000 MPN/100ml

➤ **Observation: Increasing trend of BOD and Total Coliform**

4. Water Quality of river Yamuna a Agra Canal (Kalindi Kunj).

Dissolved Oxygen (Criteria for 'C' class - 4 mg/l)

Year	Dissolved oxygen range
2014	0.4-3.0 mg/l
2015	0.3-2.6 mg/l
2016	0.4-1.8 mg/l

BOD (Criteria limit-3 mg/l)

Year	BOD range
2014	5.0-37.0 mg/l
2015	7.0-28.0 mg/l
2016	6.0-29.0 mg/l

Total Coliform (Criteria limit-5000 MPN/100ml)

Year	Total Coliform range
2014	450000-160000000 MPN/100ml
2015	150000-5400000 MPN/100ml
2016	330000-9200000 MPN/100ml

- **Observation: Fluctuating trend of BOD and Total Coliform. DO depletion trend**

5. Water Quality of Agra Canal at Madanpur khadar.

Dissolved Oxygen (Criteria for 'C' class - 4 mg/l)

Year	Dissolved oxygen range
2014	0.4-3.0 mg/l
2015	0.6-2.0 mg/l
2016	0.4-1.4 mg/l

BOD (Criteria limit-3 mg/l)

Year	BOD range
2014	8.0-54.0 mg/l
2015	4.0-49.0 mg/l
2016	17.0-44.0mg/l

Total Coliform (Criteria limit-5000 MPN/100ml)

Year	Total Coliform range
2014	330000-160000000 MPN/100ml
2015	210000-16000000 MPN/100ml
2016	630000-16000000 MPN/100ml

- **Observation: Fluctuating trend of BOD and Total Coliform. DO depletion trend**

Table – 1: Overall Status of River Yamuna (yearly)

S. No.	Location	Year	DO		BOD		TC	
			min	max	min	max	min	max
1	YAMUNA RIVER AT PALLA	2012	6.1	11.4	BDL/1	3	2200	3500000
		2013	6.1	13.1	BDL/1	6	1100	110000
		2014	6.4	12.8	1	5	450	43000
		2015	5.5	15.5	1	8	780	35000
		2016	5.1	10.8	2	9	1400	54000
2	YAMUNA RIVER AT NIZAMUDDIN	2012	0	5.4	4	56	280000	17000000000
		2013	0.3	3.5	5	31	920000	9200000
		2014	0.3	2.8	4	36	330000	54000000
		2015	0.1	2.4	4	40	68000	17000000
		2016	0.4	1.8	19	45	2100000	9200000
3	YAMUNA RIVER AT AGRA CANAL (KALINDI KUNJ)	2012	0	3.9	4	60	170000	17000000000
		2013	0.6	3.3	5	26	110000	920000
		2014	0.4	3	5	37	450000	160000000
		2015	0.3	2.6	7	28	150000	5400000
		2016	0.4	1.8	6	29	330000	9200000
4	YAMUNA RIVER AT OKHLA AFTER MEETING SHAHDARA DRAIN	2012	0	5.1	6	113	130000	17000000000
		2013	0.3	6.1	4	43	220000	9200000
		2014	0.8	2.9	9	79	330000	160000000
		2015	0	2.4	13	97	940000	16000000
		2016	0.1	1.1	29	67	230000	160000000
5	AGRA CANAL AT MADANPUR KHADAR	2012	0	2.7	5	62	140000	17000000000
		2013	0.6	2.8	5	28	170000	16000000
		2014	0.4	3	8	54	330000	160000000
		2015	0.6	2	4	49	210000	16000000
		2016	0.4	1.4	17	44	630000	16000000

Table 2: Water Quality of river Yamuna and Agra canal in Delhi stretch

Locations	Monitoring Date	pH	Dissolved Oxygen (mg/l)	Chemical Oxygen Demand (mg/l)	Bio-chemical Oxygen Demand (mg/l)	Total coliform (MPN/100 ml)
Primary water quality criteria for river (Class 'C')*		6 to 9	4.0(MIN)	-	3 (Max)	5000 (Max)
1. YAMUNA RIVER AT PALLA	07.01.2014	7.8	9.8	10	2	43000
	11.02.2014	7.9	9.1	10	1	1300
	05.03.2014	7.8	11.0	8	2	450
	01.04.2014	7.5	8.8	5	1	2500
	01.05.2014	7.2	10.6	13	3	1100
	03.06.2014	7.4	9.4	10	4	9400
	08.07.2014	7.4	8.5	15	3	11000
	06.08.2014	7.4	6.4	18	2	24000
	08.09.2014	7.6	9.1	14	5	1700
	08.10.2014	8.3	7.2	9	3	17000
	13.11.2014	7.7	8.9	BDL	2	7900
	04.12.2014	7.5	12.8	8	1	680
	14.01.2015	7.8	12.1	10	2	2200
	03.02.2015	8.6	15.5	BDL	1	2300
	04.03.2015	7.4	5.5	35	3	17000
	Apr, 2015	7.9	12.2	BDL	1	-
	May, 2015	7.8	13.4	21	5	-
	June, 2015	8.3	5.6	16	4	1300
	July, 2015	8.8	9.0	32	8	4600
	Aug, 2015	7.7	6.9	9	1	4900
	Sep, 2015	8.6	9.4	22	5	780
	Oct, 2015	7.8	8.5	16	3	
	Oct, 2015	7.8	8.5	16	3	2200
	Nov, 2015	7.6	6.8	10	2	35000
	Dec, 2015	7.9	9.0	6	2	2300
	Jan, 2016	7.7	10.6	37	9	3300
	Feb, 2016	8.0	10.8	20	6	3300
	Mar, 2016	7.8	9.2	9	2	1400
	Apr, 2016	7.2	8.8	6	4	4000
	May, 2016	No Water				
June, 2016	7.9	7.6	9	4	35000	
July, 2016	7.5	5.1	21	3	54000	

Locations	Monitoring Date	pH	Dissolved Oxygen (mg/l)	Chemical Oxygen Demand (mg/l)	Bio-chemical Oxygen Demand (mg/l)	Ammonia (mg/l)	Total coliform (MPN/100 ml)
Primary water quality criteria for river (Class 'D')**		6.5 to 8.5	4.0(MIN)	-	-	1.2 (Max)	-
2. YAMUNA RIVER AT NIZAMMUDIN	07.01.2014	7.5	1.0	69	32	17.5	5400000
	11.02.2014	7.6	0.3	31	4	8.6	9400000
	05.03.2014	7.5	1.2	42	13	6.8	3500000
	01.04.2014	7.5	1.2	36	16	12.3	1300000
	01.05.2014	7.4	2.0	36	19	10.3	5400000
	03.06.2014	7.1	1.3	42	18	12.1	5400000
	08.07.2014	7.6	1.1	50	15	9.1	1100000
	06.08.2014	7.4	2.8	19	6	1.1	330000
	08.09.2014	7.6	1.9	34	15	1.7	3500000
	08.10.2014	7.6	0.8	59	14	12.7	3500000
	13.11.2014	7.6	0.3	42	18	11.9	9200000
	04.12.2014	7.5	0.4	79	36	3.4	16000000
	14.01.2015	7.8	1.5	65	21	15.5	16000000
	03.02.2015	7.8	0.9	90	40	17.2	2400000
	04.03.2015	7.8		83	29	12.3	3500000
	Apr, 2015	7.6	1.0	15	5	0.4	-
	May, 2015	7.7	0.7	34	12	9.1	-
	June, 2015	8.1	0.2	83	21	16.5	2800000
	July, 2015	8.1	0.1	55	16	11.6	9200000
	Aug, 2015	7.4	2.4	15	4	1.7	68000
	Sep, 2015	7.8	1.6	37	15	1.2	3500000
	Oct, 2015	7.9	1.2	56	16	12.9	16000000
	Nov, 2015	7.1	1.2	67	19	11.4	17000000
	Dec, 2015	8.0	1.5	67	28	18.4	3500000
	Jan, 2016	7.1	1.8	86	37	8.2	3500000
	Feb, 2016	7.2	0.6	100	38	19.3	9200000
	Mar, 2016	7.1	0.9	92	45	16.4	3500000
	Apr, 2016	7.3	0.4	106	29	27.1	3500000
	May, 2016	7.3	0.9	78	19	23.6	2800000
	June, 2016	7.3	0.5	78	33	23.9	2100000
	July, 2016	7.4	0.4	81	19	18.4	2800000
	07.01.2014	7.4	0.9	95	37	15.2	16000000
11.02.2014	7.5	0.8	85	11	15.9	9200000	
05.03.2014	7.7	0.9	117	29	12.5	4600000	
01.04.2014	7.6	1.4	21	8	7.1	450000	

3.YAMUNA RIVER AT AGRA CANAL (KALINDI KUNJ)	01.05.2014	7.4	1.5	60	18	10.2	920000
	03.06.2014	7.1	2.4	69	17	11.6	450000
	08.07.2014	7.6	1.3	66	16	12.0	2400000
	06.08.2014	7.5	3.0	12	5	2.2	2200000
	08.09.2014	7.5	1.7	41	20	4.2	5400000
	08.10.2014	8.1	1.0	47	18	10.7	2400000
	13.11.2014	7.6	1.4	47	17	7.6	5400000
	04.12.2014	7.7	0.4	42	12	1.1	1300000
	14.01.2015	7.4	2.6	82	22	11.6	3500000
	03.02.2015	7.8	0.8	100	28	24.7	1700000
	04.03.2015	7.8		75	27	14.1	5400000
	Apr, 2015	7.7	1.4	71	21	17.9	-
	May, 2015	7.7	1.7	38	10	6.8	-
	June, 2015	8.0	1.2	59	17	11.2	230000
	July, 2015	8.1	1.1	54	16	10.3	1300000
	Aug, 2015	7.6	1.6	17	7	0.5	460000
	Sep, 2015	7.6	0.9	50	15	4.6	790000
	Oct, 2015	7.8	0.3	56	13	11.3	150000
	Nov, 2015	7.2	1.4	72	16	14.4	2400000
	Dec, 2015	8.0	2.0	57	18	10.6	3500000
	Jan, 2016	7.1	1.8	81	29	16.5	330000
	Feb, 2016	7.3	0.4	82	16	13.1	9200000
	Mar, 2016	7.1	0.6	82	21	11.8	9200000
	Apr, 2016	7.5	0.4	83	23	29.5	1100000
	May, 2016	7.4	0.9	80	16	18.1	9200000
	June, 2016	7.3	0.6	57	25	16.7	1700000
	July, 2016	7.4	0.5	92	6	17.3	3500000

Locations	Monitoring Date	pH	Dissolved Oxygen (mg/l)	Chemical Oxygen Demand (mg/l)	Bio-chemical Oxygen Demand (mg/l)	Total coliform (MPN/100 ml)
Primary water quality criteria for river (Class 'B')#		6.5 to 8.5	5.0(MIN)	-	3 (Max)	500 (Max)
	07.01.2014	7.6	1.0	104	44	>16000000
	11.02.2014	-	0.9	131	-	17000000
	05.03.2014	7.7	1.5	100	26	2300000
	01.04.2014	7.4	0.8	173	67	17000000
	01.05.2014	7.4	1.7	107	34	17000000
	03.06.2014	7.0	1.1	169	79	450000
	08.07.2014	7.6	1.4	101	36	2400000

4. YAMUNA RIVER AT OKHLA AFTER MEETING SHAHDARA DRAIN	06.08.2014	7.5	2.9	27	9	490000
	08.09.2014	7.4	1.5	49	24	1700000
	08.10.2014	7.7	1.4	94	42	790000
	13.11.2014	7.6	1.1	94	35	3500000
	04.12.2014	7.9	1.16	78	24	330000
	14.01.2015	8	2.4	284	93	5400000
	03.02.2015	7.9	1	190	64	9200000
	04.03.2015	7.8		240	97	2400000
	Apr, 2015	7.5	1.1	76	27	-
	May, 2015	7.9	1.7	105	33	-
	June, 2015	8.0	0.9	148	38	4000000
	July, 2015	8.1	1.2	72	19	3500000
	Aug, 2015	7.7	1.7	56	13	3500000
	Sep, 2015	7.6	0.1	109	52	3500000
	Oct, 2015	7.9	0	119	35	940000
	Nov, 2015	7.2	0.1	78	23	2800000
	Dec, 2015	7.9	1.2	156	62	16000000
	Jan, 2016	7.0	1.1	172	54	16000000
	Feb, 2016	7.3	1.0	160	47	16000000
	Mar, 2016	7.1	0.7	165	67	9200000
Apr, 2016	7.5	0.1	119	29	9200000	
May, 2016	7.5	-	144	35	230000	
June, 2016	7.4	0.6	134	43	5400000	
July, 2016	7.4	0.5	147	31	16000000	

Locations	Monitoring Date	pH	Dissolved Oxygen (mg/l)	Chemical Oxygen Demand (mg/l)	Bio-chemical Oxygen Demand (mg/l)	Electrical conductivity (micro mhos/cm)	Total coliform (MPN/ 100 ml)	SAR	Boron (mg/l)
Primary water quality criteria for river (Class 'E')##		6.0 to 8.5	-	-	-	2250 (Max)	-	26 (Max)	2 (Max)
	07.01.2014	7.5	0.9	94	31	1100	160000000	-	0.9
	11.02.2014	7.6	0.5	68	8	1261	7900000	-	0.8
	05.03.2014	7.5	1.1	108	54	956	6300000	-	0.9
	01.04.2014	7.5	1.2	36	11	870	35000000	-	-
	01.05.2014	7.5	2.0	68	22	986	35000000	-	BDL
	03.06.2014	7.1	1.4	56	19	1190	1100000	2.61	BDL
	08.07.2014	7.6	1.5	75	21	1460	330000	3.04	BDL
	06.08.2014	7.4	3.0	23	9	340	460000	0.92	BDL

5. AGRA CANAL AT MADANPUR KHADAR	08.09.2014	7.5	1.9	53	26	1210	9200000	2.46	BDL
	08.10.2014	7.8	0.4	61	27	1586	3500000	3.92	BDL
	13.11.2014	7.6	0.4	58	19	960	5400000	2.15	BDL
	04.12.2014	7.8	0.8	69	24	958	1700000		BDL
	14.01.2015	7.5	1.3	81	23	1102	1700000		BDL
	03.02.2015	7.9	0.8	96	49	1860	16000000		BDL
	04.03.2015	7.7		93	29	1140	16000000		BDL
	Apr, 2015	7.6	1.5	38	13	890	-		BDL
	May, 2015	7.7	1.9	34	10	743	-		-
	June, 2015	8.1	0.9	64	17	1450	1100000		BDL
	July, 2015	8.1	1.2	51	15	1120	1100000		BDL
	Aug, 2015	7.4	1.5	15	4	495	210000		-
	Sep, 2015	7.6	1.3	48	15	1017	790000		BDL
	Oct, 2015	7.9	1.4	60	15	1424	490000		0.5
	Nov, 2015	7.2	0.6	66	16	1590	3500000		BDL
	Dec, 2015	8.0	2.0	60	19	1560	3500000		BDL
	Jan, 2016	7.1	1.4	80	29	1050	630000		
	Feb, 2016	7.3	0.5	116	33	1020	5400000		
	Mar, 2016	7.1	0.7	102	44	1235	5400000		
	Apr, 2016	7.4	0.4	106	21	1822	13000000	2.9	1.0
May, 2016	7.4	0.8	68	17	1563	9200000	2.57	0.9	
June, 2016	7.4	0.7	67	29	1395	16000000	2.80	BDL	
July, 2016	7.3	0.5	132	24	1142	9200000	2.22	BDL	

* Drinking water source with conventional treatment followed by disinfection.

**Propagation of wild life, fisheries

#Outdoor bathing -
organized

##Irrigation, industrial cooling, controlled waste disposal.

Source (Primary water quality criteria for river): ADSORBS/3/1978-79 (CPCB Publication)

BDL = below detection limit

Fig – 1: Schematic flow diagram of river Yamuna in Delhi depicting water quality monitoring locations

