Ambient Air Quality Data of Delhi Stations

For the Month of May, 2018

केन्द्रीय प्रदूषण नियंत्रण बोर्ड

पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,

भारत सरकार

CENTRAL POLLUTION CONTROL BOARD

Website: http://www.cpcb.nic.in

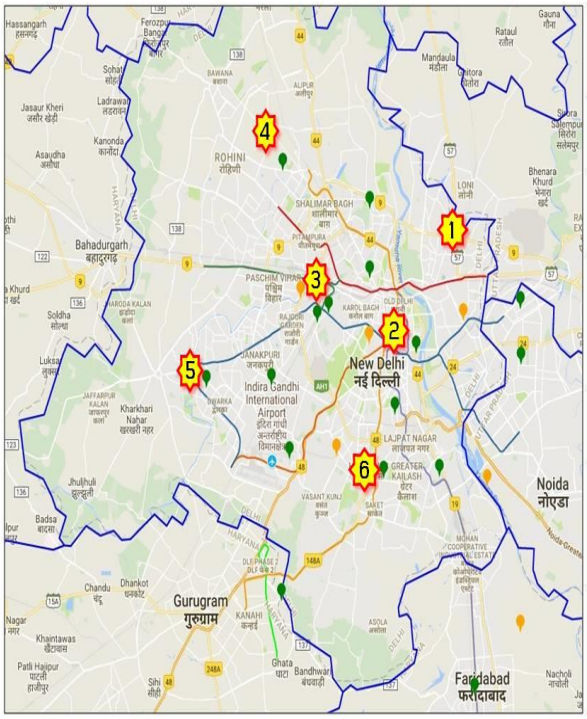
Index

Background: Ambient Air Quality of Delhi

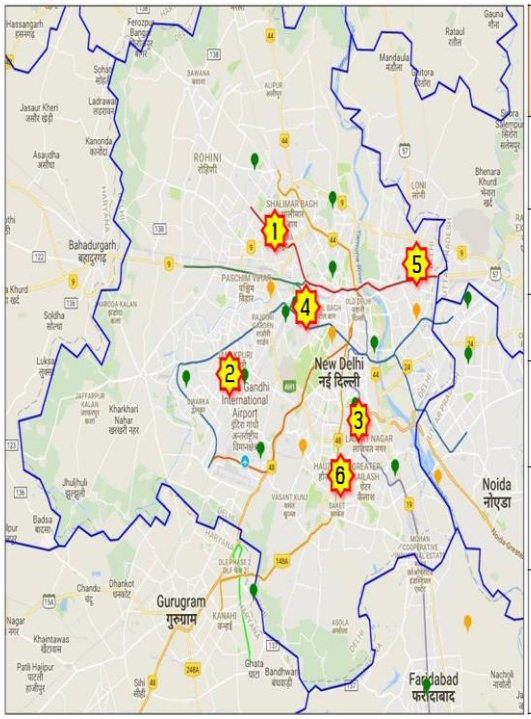
In compliance to the direction of Hon'ble National Green Tribunal, Principal Bench, New Delhi Dated: November 17, 2017 (in the matter of Vardhman Kaushik Vs. Union of India & Others vide **OA No. 44/2018** (Earlier OA No. 21/2014), the ambient air quality data of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and Manual Stations under NAMP in Delhi (operated by CPCB) for the period May 01, 2018 to May 31, 2018 are compiled and presented in this report.

Site Map of CAAQM & NAMP Stations operated by CPCB in Delhi

1. **CAAQM Stations:** IHBAS ,Income Tax Office, DMS Shadipur, D.T.U., NSIT Dwarka, Sirifort
2. **NAMP Stations:** Pitampura, Janakpuri , Nizamuddin, Shahzada Bagh, Shahdara, Sirifort



CPCB CAAQM Stations	
1	IHBAS
2	I.T.O.
3	DMS Shadipur
4	D.T.U.
5	NSIT Dwarka
6	Sirifort



CPCB NAMP Stations	
1	Pitampura
2	Janakpuri
3	Nizamuddin
4	Shahzada bagh
5	Shahdara
6	Sirifort

Parameter-wise data tables of CAAQM Stations

1. Particulate Matter (in µg/m^3):

i) PM_{10} (100 µg/m^3- 24 Hourly average limit prescribed as per NAAQS 2009)

Date/Stations	ITO	DTU	Sirifort
1-May-18	125	179	181
2-May-18	139	160	164
3-May-18	118	172	155
4-May-18	120	154	170
5-May-18	203	294	306
6-May-18	161	284	227
7-May-18	229	326	355
8-May-18	109	125	127
9-May-18	190	209	181
10-May-18	209	348	287
11-May-18	219	324	366
12-May-18	235	361	347
13-May-18	137	235	166
14-May-18	105	192	167
15-May-18	163	239	246
16-May-18	130	223	284
17-May-18	205	300	304
18-May-18	213	311	290
19-May-18	188	341	266
20-May-18	160	206	284
21-May-18	137	218	256
22-May-18	NA	330	343
23-May-18	NA	325	407
24-May-18	205	237	351
25-May-18	155	267	362
26-May-18	201	233	339
27-May-18	224	NA	372
28-May-18	248	424	342
29-May-18	224	355	357
30-May-18	268	310	314
31-May-18	NA	257	280
Maximum	**268**	**424**	**407**
Minimum	**105**	**125**	**127**
Average	**179**	**265**	**277**

Maximum values are reported in RED for all respective stations & Minimum values are reported in GREEN for all respective stations

Note: NA denotes Data is not available for the day

ii) $PM_{2.5}$ (60 µg/m^3- 24 hourly average limit prescribed as per NAAQS 2009)

Date/Stations	IHBAS	ITO	DMS	DTU	Sirifort	NSIT
1-May-18	100	47	38	46	NA	62
2-May-18	146	50	66	49	41	77
3-May-18	127	45	46	39	36	49
4-May-18	151	52	53	51	46	49
5-May-18	166	112	100	109	80	93
6-May-18	140	77	81	103	63	79
7-May-18	151	96	137	138	92	122
8-May-18	126	37	42	53	33	52
9-May-18	102	101	66	93	45	89
10-May-18	74	135	94	158	105	100
11-May-18	112	141	119	NA	122	130
12-May-18	157	152	109	NA	119	131
13-May-18	135	84	68	NA	56	238
14-May-18	144	65	51	NA	50	71
15-May-18	133	93	72	NA	50	82
16-May-18	124	65	69	NA	87	93
17-May-18	95	88	109	95	86	123
18-May-18	101	103	100	117	87	98
19-May-18	144	90	98	132	69	100
20-May-18	161	83	92	74	71	80
21-May-18	116	65	73	66	56	92
22-May-18	63	NA	147	115	93	133
23-May-18	83	NA	139	106	109	138
24-May-18	97	123	111	77	99	107
25-May-18	111	79	88	96	75	107
26-May-18	95	111	88	85	95	113
27-May-18	68	93	107	NA	76	138
28-May-18	62	126	112	148	111	105
29-May-18	61	129	101	79	76	105
30-May-18	83	136	63	63	60	87
31-May-18	84	NA	56	63	62	90
Maximum	**166**	**152**	**147**	**158**	**122**	**238**
Minimum	**61**	**37**	**38**	**39**	**33**	**49**
Average	**113**	**92**	**87**	**90**	**75**	**101**

Maximum values are reported in RED for all respective stations & Minimum values are reported in GREEN for all respective stations

Note: NA denotes Data is not available for the day

2. SO_2 (80 µg/m^3- 24 hourly average limit prescribed as per NAAQS 2009)

Date/Stations	IHBAS	DMS	NSIT
1-May-18	17	7	8
2-May-18	23	8	8
3-May-18	15	8	6
4-May-18	15	8	6
5-May-18	22	12	10
6-May-18	20	9	5
7-May-18	16	10	8
8-May-18	NA	7	7
9-May-18	NA	10	10
10-May-18	29	14	9
11-May-18	30	11	12
12-May-18	NA	8	11
13-May-18	22	11	29
14-May-18	26	12	6
15-May-18	20	12	8
16-May-18	28	12	7
17-May-18	21	18	9
18-May-18	19	15	10
19-May-18	17	13	10
20-May-18	20	18	10
21-May-18	17	20	14
22-May-18	16	25	19
23-May-18	16	17	22
24-May-18	20	21	17
25-May-18	28	19	14
26-May-18	18	19	16
27-May-18	22	15	14
28-May-18	19	14	15
29-May-18	13	10	15
30-May-18	8	8	5
31-May-18	8	6	7
Maximum	30	25	29
Minimum	8	6	5
Average	19	13	11

Maximum values are reported in RED for all respective stations & Minimum values are reported in GREEN for all respective stations

Note: NA denotes Data is not available for the day

3. NO_2 (80 µg/m^3- 24 hourly average limit prescribed as per NAAQS 2009)

Date/Stations	DMS	NSIT	ITO	IHBAS
1-May-18	26	25	177	52
2-May-18	27	23	158	105
3-May-18	28	22	92	77
4-May-18	36	22	84	45
5-May-18	59	36	111	62
6-May-18	50	34	72	82
7-May-18	45	31	81	80
8-May-18	34	28	67	70
9-May-18	72	31	101	29
10-May-18	76	43	81	27
11-May-18	80	50	130	48
12-May-18	51	34	155	54
13-May-18	31	35	100	61
14-May-18	44	31	60	54
15-May-18	47	32	81	46
16-May-18	49	29	107	25
17-May-18	60	34	118	57
18-May-18	59	38	134	64
19-May-18	59	36	115	59
20-May-18	55	27	118	62
21-May-18	55	30	107	48
22-May-18	64	41	142	68
23-May-18	68	40	140	63
24-May-18	62	33	153	55
25-May-18	65	34	119	68
26-May-18	65	37	111	42
27-May-18	57	30	114	27
28-May-18	75	36	143	31
29-May-18	39	36	102	32
30-May-18	40	33	123	16
31-May-18	41	34	120	25
Maximum	80	50	177	105
Minimum	26	22	60	16
Average	52	33	113	53

Maximum values are reported in RED for all respective stations & Minimum values are reported in GREEN for all respective stations

Note: NA denotes Data is not available for the day

3. Benzene (05 µg/m^3- Annual Mean limit prescribed as per NAAQS 2009)

Date/Stations	DMS	NSIT
1-May-18	1.8	1.3
2-May-18	1.0	1.1
3-May-18	2.1	1.1
4-May-18	2.4	1.1
5-May-18	5.8	3.7
6-May-18	3.0	2.8
7-May-18	3.3	2.7
8-May-18	1.3	0.8
9-May-18	4.6	2.1
10-May-18	5.8	4.0
11-May-18	7.4	3.8
12-May-18	6.6	3.3
13-May-18	2.5	3.1
14-May-18	2.3	1.2
15-May-18	4.0	3.3
16-May-18	2.5	2.0
17-May-18	3.7	4.0
18-May-18	6.1	4.4
19-May-18	7.4	4.1
20-May-18	3.8	4.6
21-May-18	2.2	4.2
22-May-18	13.3	5.9
23-May-18	8.6	4.8
24-May-18	5.7	2.6
25-May-18	8.6	2.7
26-May-18	8.6	3.6
27-May-18	4.9	2.3
28-May-18	5.5	4.7
29-May-18	1.9	4.7
30-May-18	1.0	0.8
31-May-18	1.1	1.6
Maximum	13.3	5.9
Minimum	1.0	0.8
Average	4.5	3.0

Maximum values are reported in RED for all respective stations & Minimum values are reported in GREEN for all respective stations

Note: NA denotes Data is not available for the day

4. Ozone (100 µg/m^3- 8 hourly average limit prescribed as per NAAQS 2009)

Date/Stations	DMS			NSIT		
Time Interval	06-14 hr	14-22 hr	22-06 hr	06-14 hr	14-22 hr	22-06 hr
1-May-18	26	58	33	47	62	38
2-May-18	35	51	8	39	53	18
3-May-18	15	42	26	23	52	42
4-May-18	28	70	12	23	52	42
5-May-18	44	78	2	51	70	17
6-May-18	17	45	1	26	52	9
7-May-18	35	62	25	42	53	31
8-May-18	32	55	22	40	54	29
9-May-18	26	50	1	50	62	7
10-May-18	35	88	2	29	72	11
11-May-18	47	69	4	48	70	12
12-May-18	51	86	24	57	99	35
13-May-18	28	61	28	38	67	36
14-May-18	23	63	19	40	79	32
15-May-18	30	69	9	46	87	21
16-May-18	25	61	19	34	59	35
17-May-18	43	80	3	59	73	14
18-May-18	23	60	2	49	73	14
19-May-18	23	61	4	37	57	15
20-May-18	35	58	15	45	60	36
21-May-18	49	61	23	60	53	32
22-May-18	62	71	1	65	75	9
23-May-18	46	65	2	71	79	15
24-May-18	26	57	1	60	55	12
25-May-18	50	63	1	47	49	5
26-May-18	50	63	1	54	55	5
27-May-18	47	55	8	41	50	30
28-May-18	37	68	1	93	87	6
29-May-18	25	65	40	93	87	6
30-May-18	27	62	8	51	27	6
31-May-18	30	79	32	31	69	20
Maximum	62	88	40	93	99	42
Minimum	15	42	1	23	27	5
Average	34	64	12	48	64	21

Maximum values are reported in RED for all respective stations & Minimum values are reported in GREEN for all respective stations

Note: NA denotes Data is not available for the day

5. CO (02 mg/m^3- 8 hourly average limit prescribed as per NAAQS 2009)

Date/Stations	IHBAS			NSIT			DMS		
Time Interval	06-14 hr	14-22 hr	22-06 hr	06-14 hr	14-22 hr	22-06 hr	06-14 hr	14-22 hr	22-06 hr
1-May-18	0.4	0.6	1.1	0.4	0.4	0.4	0.3	0.3	0.3
2-May-18	0.8	0.8	1.3	0.3	0.3	0.3	0.3	0.3	0.2
3-May-18	1.1	0.7	0.6	0.4	0.3	0.3	0.3	0.4	0.3
4-May-18	0.5	0.3	0.6	0.4	0.3	0.3	0.3	0.4	0.3
5-May-18	0.7	0.7	1.5	0.4	0.4	0.7	0.3	0.4	0.5
6-May-18	1.0	1.3	1.4	0.5	0.3	0.4	0.2	0.3	0.5
7-May-18	1.0	1.4	0.9	0.4	0.4	0.4	0.3	0.3	0.4
8-May-18	0.6	1.3	1.3	0.3	0.3	0.3	0.3	0.4	0.3
9-May-18	0.8	0.9	0.3	0.3	0.5	0.4	0.8	0.8	1.2
10-May-18	0.7	1.6	0.7	0.4	0.4	0.7	0.7	0.9	1.7
11-May-18	0.6	1.5	1.0	0.5	0.4	0.6	0.9	1.1	1.5
12-May-18	0.5	1.6	1.5	0.5	0.5	0.5	1.1	1.1	0.7
13-May-18	1.0	0.9	0.9	0.5	0.4	0.2	0.7	0.4	0.3
14-May-18	0.9	1.4	1.2	0.3	0.4	0.4	0.6	0.7	0.6
15-May-18	1.2	1.7	1.0	0.4	0.4	0.4	0.5	0.9	0.9
16-May-18	0.3	0.9	0.2	0.3	0.4	0.4	0.5	0.6	0.6
17-May-18	0.2	0.5	0.9	0.4	0.4	0.3	0.7	0.5	0.9
18-May-18	0.8	0.9	1.2	0.3	0.4	0.5	0.7	0.7	1.6
19-May-18	1.1	0.5	0.7	0.4	0.3	0.3	0.8	0.5	0.7
20-May-18	0.7	0.7	2.0	0.4	0.3	0.4	0.5	1.0	0.7
21-May-18	1.0	1.0	1.3	0.3	0.4	0.4	0.5	0.5	0.4
22-May-18	0.7	0.9	1.3	0.4	0.4	0.9	0.7	1.9	2.5
23-May-18	0.6	0.9	1.7	0.5	0.4	0.4	1.3	1.2	1.5
24-May-18	0.8	1.0	1.2	0.4	0.3	0.4	0.7	1.3	0.9
25-May-18	1.1	0.6	1.5	0.4	0.4	0.5	0.8	0.6	1.1
26-May-18	1.1	1.0	1.0	0.4	0.4	0.6	0.8	0.6	1.1
27-May-18	0.9	0.5	1.3	0.4	0.3	0.4	0.4	0.7	1.0
28-May-18	1.2	0.6	0.6	0.4	0.3	0.7	0.7	1.5	2.0
29-May-18	1.1	0.9	1.3	0.4	0.3	0.7	0.6	0.8	0.7
30-May-18	0.4	0.5	0.9	0.4	0.4	0.6	0.6	0.7	0.9
31-May-18	0.7	0.6	0.8	0.3	0.4	0.5	0.7	0.9	0.7
Maximum	1.2	1.7	2.0	0.5	0.5	0.9	1.3	1.9	2.5
Minimum	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.2
Average	0.8	0.9	1.1	0.4	0.4	0.5	0.6	0.7	0.9

Maximum values are reported in RED for all respective stations & Minimum values are reported in GREEN for all respective stations

Note: NA denotes Data is not available for the day

6. NH_3 (400 µg/m^3- 24 hourly average limit prescribed as per NAAQS 2009)

Date/Stations	IHBAS	ITO
1-May-18	23	35
2-May-18	15	32
3-May-18	14	91
4-May-18	22	137
5-May-18	19	195
6-May-18	20	183
7-May-18	26	145
8-May-18	19	95
9-May-18	27	210
10-May-18	30	120
11-May-18	23	180
12-May-18	22	207
13-May-18	21	149
14-May-18	21	115
15-May-18	21	183
16-May-18	27	142
17-May-18	21	192
18-May-18	25	270
19-May-18	25	219
20-May-18	20	175
21-May-18	27	140
22-May-18	19	212
23-May-18	54	235
24-May-18	43	195
25-May-18	35	249
26-May-18	41	178
27-May-18	43	231
28-May-18	42	216
29-May-18	38	184
30-May-18	17	232
31-May-18	37	219
Maximum	54	270
Minimum	14	32
Average	27	173

Maximum values are reported in RED for all respective stations & Minimum values are reported in GREEN for all respective stations

Note: NA denotes Data is not available for the day

Parameter-wise data tables of Manual Stations under NAMP

May 2018	Pitampura				Sirifort			Shahdara		
	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
02.05.2018	12	54	376	70	4	27	442	9	41	411
04.05.2018	5	91	242	93	4	46	220	4	55	287
08.05.2018	5	27	395	99	4	34	228	9	44	224
10.05.2018	7	102	402	136	4	67	194	15	77	217
14.05.2018	12	65	192	74	5	53	185	12	54	146
16.05.2018	4	43	212	78	5	47	187	6	57	343
18.05.2018	5	45	226	110	4	58	211	4	47	187
22.05.2018	5	54	315	150	4	72	253	5	47	246
24.05.2018	10	60	221	121	10	68	268	4	53	325
28.05.2018	15	85	445	121	5	47	218	10	60	378
30.05.2018	4	63	376	46	4	25	393	5	51	267

May 2018	Janakpuri				Nizamuddin			Shahzada Bagh		
	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
01.05.2018	4	47	204	33	4	63	165	4	58	164
03.05.2018	5	36	178	30	6	55	116	4	49	208
07.05.2018	10	44	212	70	NA	NA	NA	9	66	331
09.05.2018	4	54	136	51	9	86	164	6	79	184
11.05.2018	7	51	219	93	5	74	245	5	91	246
15.05.2018	7	65	208	53	5	78	119	4	65	212
17.05.2018	6	39	276	NA	8	58	318	5	70	257
21.05.2018	8	29	214	46	5	65	184	6	78	184
23.05.2018	8	55	221	83	9	54	230	11	90	258
25.05.2018	7	50	266	78	4	68	214	5	68	235
29.05.2018	4	51	187	42	4	50	64	4	43	235

Note: NA denotes Data is not available for the day

Daily Meteorological Data - May 2018

Meteorological parameters	(01-02) May 2018	(02-03) May 2018	(03-04) May 2018	(04-05) May 2018	(05-06) May 2018	(06-07) May 2018	(07-08) May 2018	(08-09) May 2018	(09-10) May 2018	(10-11) May 2018
Mixing Height (m)	802	827 ↑	*	768 ↓	669 ↓	742 ↑	806 ↑	*	584 ↓	634 ↑
Wind Speed (m/s)	3.7	4.4 ↑	4.0 ↓	2.3 ↓	3.0 ↑	2.4 ↓	3.6 ↑	2.3 ↓	1.9 ↓	2.0 ↑
Temperature (^{O}C)	31.1	27.9 ↓	29.4 ↑	31.9 ↑	34.0 ↑	32.7 ↓	31.9 ↓	29.1 ↓	29.9 ↑	34.0 ↑
Relative Humidity(%)	51.2	49.7 ↓	52.7 ↑	45.7 ↓	36.0 ↓	33.1 ↓	35.5 ↑	43.1 ↑	44.1 ↑	34.3 ↓
Wind Direction	E, SE	SE, NE	SE, E	Varies	NE, N	N, NE, NW	NW	NE, N	SW, S, W	SW, NW, W

Meteorological parameters	(11-12) May 2018	(12-13) May 2018	(13-14) May 2018	(14-15) May 2018	(15-16) May 2018	(16-17) May 2018	(17-18) May 2018	(18-19) May 2018	(19-20) May 2018	(20-21) May 2018
Mixing Height (m)	673	721 ↑	877 ↑	860 ↓	699 ↓	661 ↓	732 ↑	736 ↑	710 ↓	709 ↓
Wind Speed (m/s)	2.2	3.4 ↑	4.3 ↑	2.7 ↓	2.6 ↓	2.9 ↑	2.8 ↓	1.8 ↓	2.8 ↑	3.6 ↑
Temperature (^{O}C)	35.7	34.0 ↓	28.5 ↓	31.0 ↑	33.1 ↑	35.2 ↑	34.7 ↓	35.1 ↑	34.1 ↓	35.7 ↑
Relative Humidity(%)	34.2	48.8 ↑	48.5 ↓	48.7 ↑	41.6 ↓	30.6 ↓	29.0 ↓	34.3 ↑	31.7 ↓	19.6 ↓
Wind Direction	E, SE	E	S, SE	E, SE	N,E,NE	N,NW	N,NE	NE,W	N,NW	N

Meteorological parameters	(21-22) May 2018	(22-23) May 2018	(23-24) May 2018	(24-25) May 2018	(25-26) May 2018	(26-27) May 2018	(27-28) May 2018	(27-28) May 2018	(28-29) May 2018	(29-30) May 2018	(30-31) May 2018
Mixing Height (m)	731	649 ↓	655 ↑	693 ↑	579 ↓	666 ↑	701 ↑	701 ↑	655 ↓	836 ↑	758 ↓
Wind Speed (m/s)	3.4	2.0 ↓	2.7 ↑	2.1 ↓	2.6 ↑	2.2 ↓	2.5 ↑	2.5 ↑	2.3 ↓	4.4 ↑	2.6 ↓
Temperature (^{O}C)	36.9	37.8 ↑	36.5 ↓	36.9 ↑	38.2 ↑	38.0 ↓	36.8 ↓	36.8 ↓	37.0 ↑	34.7 ↓	34.7
Relative Humidity(%)	17.2	22.5 ↑	28.9 ↑	19.7 ↓	16.5 ↓	18.2 ↑	24.5 ↑	24.5 ↑	30.3 ↑	42.0 ↑	43.3 ↑
Wind Direction	N,NW	NE,N	NE,N	NE, NW, W	NW	Varies	NE, E	NE, E	S, SE, NE	SE, E	SE, S

*Inadequate data/Data not available

Daily mean values are compared with the previous value

Daily AQI values of Delhi-NCR (May, 2018)

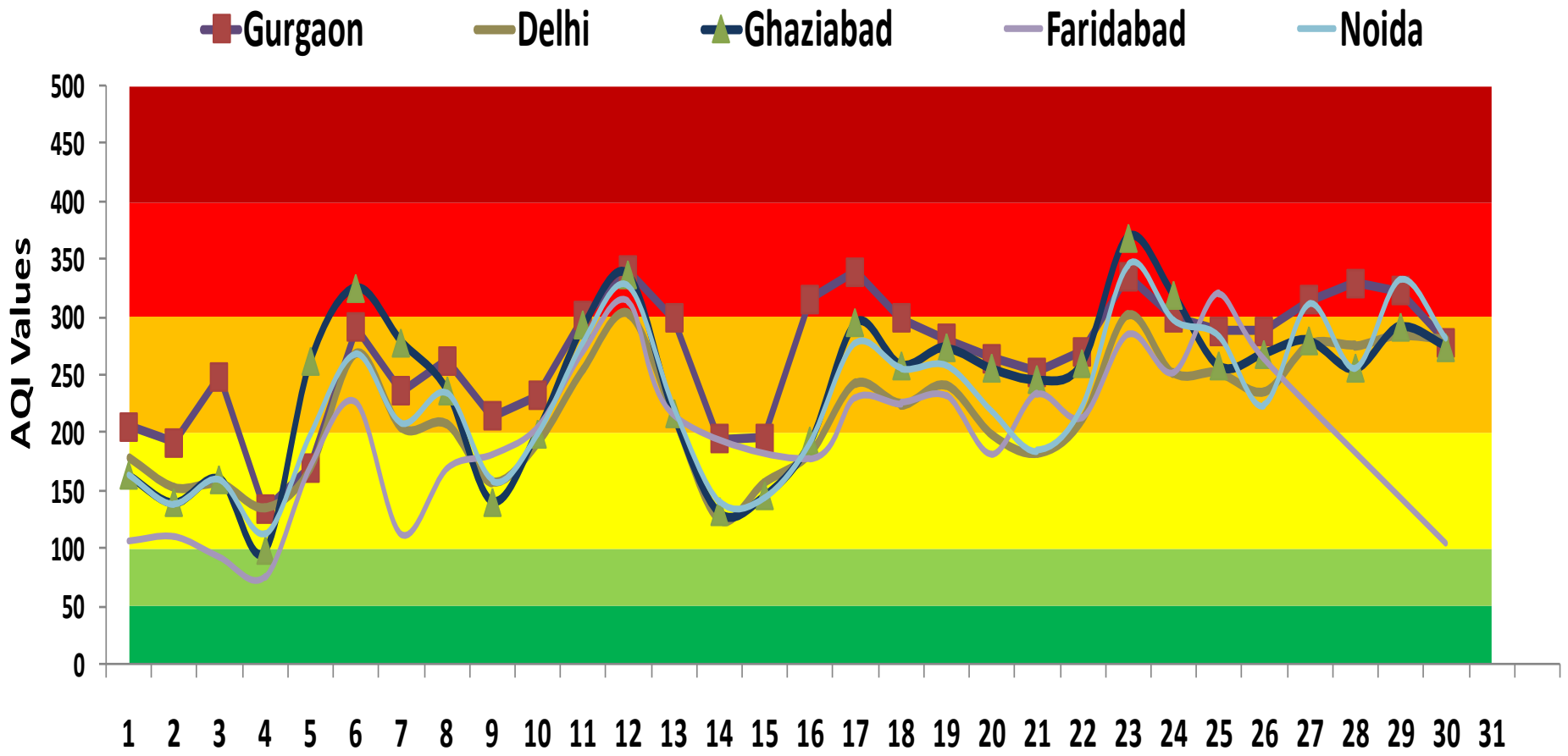
Dates/ Cities	Delhi	Gurgaon	Ghaziabad	Faridabad	Noida	Bhiwadi	Alwar
1-May-18	178	206	163	106	164	294	87
2-May-18	153	192	140	110	138	271	76
3-May-18	156	249	160	93	160	216	NA
4-May-18	135	134	98	76	113	128	NA
5-May-18	169	170	262	172	200	239	NA
6-May-18	269	291	326	227	268	398	NA
7-May-18	205	236	279	113	209	253	NA
8-May-18	208	263	237	169	235	272	NA
9-May-18	157	215	141	181	159	NA	104
10-May-18	190	232	200	205	199	291	92
11-May-18	256	301	293	270	278	348	84
12-May-18	303	341	337	314	327	NA	82
13-May-18	215	299	217	216	222	NA	114
14-May-18	125	195	132	NA	141	NA	139
15-May-18	157	196	146	NA	144	NA	96
16-May-18	183	316	193	178	192	NA	NA
17-May-18	243	340	295	231	278	NA	121
18-May-18	225	299	259	226	256	NA	85
19-May-18	242	282	274	232	259	NA	159
20-May-18	199	265	256	182	220	NA	55
21-May-18	183	253	246	234	185	NA	64
22-May-18	212	271	261	214	223	369	NA
23-May-18	302	336	369	286	346	NA	NA
24-May-18	252	300	320	253	298	374	162
25-May-18	252	289	258	321	285	345	129
26-May-18	236	289	269	264	224	348	128
27-May-18	277	315	280	NA	312	388	127
28-May-18	276	330	256	NA	257	412	185
29-May-18	285	323	292	NA	333	359	124
30-May-18	281	279	275	105	283	367	NA
31-May-18	203	246	216	162	212	253	78
Max	303	341	369	321	346	412	185
Min	125	134	98	76	113	128	55
Average	217	266	240	198	230	312	109

Good	Satisfactory	Moderate	Poor	Very Poor	Severe
(0–50)	(51–100)	(101–200)	(201–300)	(301–400)	(>401)

Note: Prominent Pollutant is Particulate Matter in Delhi-NCR

AQI Trend Delhi-NCR, May 2018

Good	Satisfactory	Moderate	Poor	Very Poor	Severe
(0–50)	(51–100)	(101–200)	(201–300)	(301–400)	(>401)



Data Analysis of Ambient Air Quality:

- **Particulate Matter ($PM_{2.5}$ and PM_{10}):** The values of Particulate Matter exceeded the permissible limits as per NAAQS 2009 in all stations across Delhi. Exceedence in PM10 24 hourly average values are more prominent than PM2.5 across Delhi. The stations are categorized based on the maximum daily average value observed in the month and tabulated as under:

PM_{10} (Maximum 24 hours average permissible limit as per NAAQS 2009 is 100 µg/m^3)		
Maximum 24 hr Concentration in µg/m^3 (Category)	**Stations**	
	CAAQM	**Manual (under NAMP)**
Below 101 (Moderate)	None	None
Between 101-350(Moderate to poor)	ITO	Shahzada Bagh, Janakpuri & Nizamuddin
Between 351-430 (Very poor)	DTU, Sirifort	Shahdara
Above 430 (Severe)	None	Pitampura, Sirifort

$PM_{2.5}$ (Maximum 24 hours average permissible limit as per NAAQS 2009 is 60 µg/m^3)		
Maximum 24 hr Concentration in µg/m^3 (Category)	**Stations**	
	CAAQM	**Manual (under NAMP)**
Below 61(Moderate)	None	None
Between 61-120(Moderate to poor)	None	Jankpuri
Between 121-250 (Very poor)	IHBAS,DMS,NSIT,ITO, DTU &, Sirifort	Pitampura
Above 250 (Severe)	None	None

- **Nitrogen Dioxide (NO_2):** Exceeded the permissible limits at 06 Stations in Delhi. Maximum exceedence recorded at ITO (28 days) and exceedence recorded at IHBAS only once. The exceedence in 06 Stations (CAAQM and Manual) is as tabulated below if their concentration reached above 80 µg/m^3any day in a month:

NO_2 (Maximum 24 hours average permissible limit as per NAAQS 2009 is 80 µg/m^3)		
Maximum 24 hr Concentration in µg/m^3	**Stations**	
	CAAQM	**Manual (under NAMP)**
Below 80	NSIT,DMS	Shahdara, Sirifort & Janakpuri
Above 80	IHBAS,ITO	Pitampura, Shahzada Bagh & Nizamuddin

- Benzene: Standard for this parameter is defined annually in NAAQS 2009, therefore it's exceedence cannot be determined based on 24 hr or monthly data, but slightly high values were recorded at DMS and NSIT for twelve and one day respectively.
- Sulphur Dioxide (SO_2): Recorded within permissible limit in all stations across Delhi as per NAAQS 2009 standards.
- Ammonia: Observed within the permissible limits in all stations across Delhi as per NAAQS 2009 Standard.
- Carbon Monoxide (CO): Observed 8-hourly concentration values within the permissible limits in all stations across Delhi as per NAAQS 2009 Standard except at DMS Shadipur at time interval 22-06 hr only once in this month .
- Ozone (O_3): As per NAAQS 2009 Standard, Ozone 8-hourly concentration values within the permissible limits in all stations across Delhi.

Concentration range of Ambient Air Quality Parameters of Delhi Stations

The concentration ranges for pollutants of CAAQM and Manual stations having 24 hourly standard limits are presented in Table-1 and Table-2, respectively based on detailed tabulated data at Page 02—10.

Table-1 Range of 24-hourly Averages for Notified Parameters monitored in May 2018 Delhi

Parameters	IHBAS		ITO		DMS		DTU		SIRIFORT		NSIT	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
$PM_{2.5}$ (µg/m³)	61	166	37	152	38	147	39	158	33	122	49	238
PM_{10} (µg/m³)	*	*	105	268	*	*	125	424	127	407	*	*
SO_2 (µg/m³)	8	30	*	*	6	25	*	*	*	*	5	29
NO_2 (µg/m³)	16	105	60	177	26	80	*	*	*	*	22	50
NH_3 (µg/m³)	14	54	32	270	*	*	*	*	*	*	*	*
Note: '*'indicate Insufficient data or parameter not measured												
CO, Ozone and Benzene not included as there is no 24 hourly permissible limits in NAAQS												

Table-2 Range of 24-hourly Averages for Notified Parameters monitored in May 2018 Delhi

Parameters	Pitampura		Sirifort		Shahdara		Janakpuri		Nizammudin		Shahzada Bagh	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
$PM_{2.5}$ (µg/m³)	46	150	*	*	*	*	30	93	*	*	*	*
PM_{10} (µg/m³)	192	445	185	442	146	411	136	276	64	318	164	331
SO_2 (µg/m³)	4	15	4	10	4	15	4	10	4	9	4	11
NO_2 (µg/m³)	27	102	25	72	41	77	29	65	50	86	43	91
Note: '*'indicate Insufficient data or parameter not measured												

Air Quality Index

AQI of Delhi was found largely lying between moderate to poor category. However, Faridabad Ghaziabad Gurgaon & Noida has recorded 12, 19, 17 & 17 poor days respectively. Whereas Bhiwadi station in NCR region once falls in severe category in this month. In other areas, majority of the days were in moderate to poor category. Distribution of Air Quality Categories according to the prevailing AQI for Delhi and adjacent NCR cities is presented in Table-3, based on detailed tabulated data and graphical variation at Page 12-13.

Table-3 AQI Values of Delhi-NCR for the month of May 2018

AQI Categories	Range	Delhi	Faridabad	Ghaziabad	Gurgaon	Noida	Bhiwadi	Alwar
Good	(0–50)	*	*	*	*	*	*	*
Satisfactory	(51–100)	*	02	01	*	*	*	11
Moderate	(101–200)	12	10	07	05	10	01	10
Poor	(201–300)	17	12	19	17	17	08	*
Very Poor	(301–400)	02	02	04	09	04	09	*
Severe	(>401)	*	*	*	*	*	01	*

Meteorological Parameters

Monthly average mixing height was 718 meters. The range for daily average mixing height was observed from 579 meters to 877 meters. Daily average wind speed was observed in the range 1.8 m/s – 4.4 m/s. Monthly average temperature was 34.0 ˚C with minimum daily average as 27.9˚C and maximum as 38.2˚C recorded. Monthly average relative humidity was 34.8% with maximum daily average as 52.7 % and minimum as 16.5 % recorded. Prominent wind direction in May 2018 was from North- west followed by East.

Table-4 Range of Monthly Average for Metrological Parameters in Delhi, May 2018

Parameters(Unit)	MAX	MIN
Mixing Height (m)	877	579
Wind Speed(m/s)	4.4	1.8
Temperature(°C)	38.2	27.9
Relative Humidity (%)	52.7	16.5

Critical Observations:

- Delhi Air Quality as a whole has recorded slight betterment in May 2018 compared to the month of April 2018. Only twice this month, the AQI reached to very poor category and 12 days recorded to moderate category compared to only 7 days in the month of April 2018.
- $PM_{2.5}$ and PM_{10} are the main pollutants for exceedence and elevated AQI in Delhi and NCR.
- Although higher mixing Height and higher wind speed has helped in better dispersion of $PM_{2.5}$. However, the re-suspension of dust due to local turbulence and few episodes of dust storms have also elevated the PM_{10} level during the month.
- The rise of Benzene at DMS, Shadipur may be due to more evaporation loss of fuel in vehicle, in and around area of Shadipur Bus Depot.

Recommendations:

- Water Sprinkling of barren lands, open areas (Roadside shoulders), wet sweeping/mechanical sweeping may be ensured by municipalities.
- More stringent implementation of construction and demolition, waste handling rule is necessary.
- Ensure Strict action against visibly polluting vehicles
- Introduce wet/mechanized vacuum sweeping of roads
- Undertake greening of open areas, gardens, community places, schools and housing societies
- Take stringent action against open burning of bio-mass/leaves/tyres etc. to control such activities
- Take necessary steps to divert non-destined vehicles towards Eastern Peripheral Expressway.
- Fire at MSW dump site may be controlled by continuous vigil and dousing activities by municipalities and operators.
- Installation of vapors recovery system in fuel dispensing outlets (Petrol Pumps) should be taken up in priority to control volatile emission.

ANNEXURE - I

NATIONAL AMBIENT AIR QUALITY STANDARD (2009)

Pollutant	Time Weighted Average	Concentration in Ambient Air		
		Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
SO_2, µg/m^3	Annual*	50	20	• Improved West and Gaeke • Ultraviolet fluorescence
	24 hours**	80	80	
NO_2, µg/m^3	Annual*	40	30	• Modified Jacob &Hochheiser (Na-Arsenite) • Chemiluminescence
	24 hours**	80	80	
PM_{10}, µg/m^3	Annual*	60	60	• Gravimetric • TOEM • Beta attenuation
	24 hours**	100	100	
$PM_{2.5}$, µg/m^3	Annual*	40	40	• Gravimetric • TOEM -------- • Beta attenuation
	24 hours**	60	60	
O_3, µg/m^3	8 hours**	100	100	• UV photometric • Chemiluminescence • Chemical Method
	1 hour**	180	180	
Lead (Pb), µg/m^3	Annual*	0.50	0.50	• AAS/ICP method after sampling on EMP 2000 or equivalent filter paper • ED-XRF using Teflon filter
	24 hours**	1	1	
CO, mg/m^3	8 hours**	2	2	• Non Dispersive Infra Red (NDIR) spectrosopy
	1 hour**	4	4	
Ammonia (NH_3) µg/m^3	Annual*	100	100	• Chemiluminescence • Indophenol blue method
	24 hours**	400	400	
Benzene	Annual*	5	5	• Gas chromatography based on continuous analyzer • Adsorption and Desorption followed by GC analysis
Benzopyrene (BaP) - particulate phase only, ng/m^3	Annual*	1	1	• Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m^3	Annual*	6	6	• AAS/ICP method after sampling on EMP 2000 or equivalent filter paper
Nickel (Ni), ng/m^3	Annual*	20	20	• AAS/ICP method after sampling on EMP 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, theymay exceed the limits but not on two consecutive days of monitoring.
Note - Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

ANNEXURE -II

CAAQM STATIONS

Sr. No.	Stations	Types of activities around location (Residential/ Commercial/Traffic/ Industrial)	Parameters Monitored
1.	Income Tax Office	Traffic Intersection /Kerb site	NO_2, $PM_{2.5}$, NH_3, PM_{10}
2.	DCE	Residential	NO_2, $PM_{2.5}$, NH_3, PM_{10}
3.	Shadipur	Commercial	SO_2, NO_2, $PM_{2.5}$, CO, O_3, Benzene
4.	IHBAS	Residential	SO_2, NO_2, $PM_{2.5}$, CO, NH_3
5.	NSIT Dwarka	Residential	SO_2, NO_2, $PM_{2.5}$, CO, O_3 , Benzene
6.	Sirifort	Residential cum Commercial	NO_2, $PM_{2.5}$, NH_3, PM_{10}

DETAILS OF MANUAL STATIONS IN DELHI UNDER NAMP

Sr. No.	Monitoring station	Types of activities around location (Residential/ Commercial/Traffic/ Industrial)	Parameters Monitored
01.	Pitampura	Residential	SO_2, NO_2, PM_{10}, $PM_{2.5}$
02.	Sirifort	Residential	SO_2, NO_2, PM_{10}, $PM_{2.5}$
03.	Janakpuri	Residential	SO_2, NO_2, PM_{10}, $PM_{2.5}$
04.	Nizamuddin	Residential	SO_2, NO_2, PM_{10}, $PM_{2.5}$
05.	Shahzada Bagh	Industrial	SO_2, NO_2, PM_{10}, $PM_{2.5}$
06.	Shahdara	Industrial	SO_2, NO_2, PM_{10}, $PM_{2.5}$