

AIR QUALITY STATUS OF MAHARASHTRA 2016-17



Maharashtra Pollution Control Board
महाराष्ट्र प्रदूषण नियंत्रण मंडळ



The Energy & Resources Institute

Air Quality Status of Maharashtra 2016-17

Prepared for



Maharashtra Pollution Control Board
महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Prepared by



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PREFACE

Maharashtra Pollution Control Board has established Ambient Air Quality Network in Maharashtra covering major cities to comply with the mandate of Air (prevention & Control) Act 1981 and disseminate information regarding status of air quality prevailing in the State of Maharashtra.

Ambient Air Quality is monitored under National Air Quality Monitoring Programme (NAMP), State Air Quality Monitoring Programme (SAMP) and Continuous Ambient Air Quality Monitoring stations (CAAQMS). In the year 2016-17 there were around 74 active AAQMS (Ambient Air Quality Monitoring Stations) spread across 25 cities in Maharashtra which recorded more than 10 thousand observation days collectively taken together. The Board has also expanded monitoring activity by commissioning five CAAQMS one each at Dombivali, Chandrapur, Nashik, Nagpur and Aurangabad cities this year.

This report highlights the status of air quality, through graphical illustrations, reported and recorded across the active AAQMS in Maharashtra for the year 2016-17. It presents the parametric information, monthly averages, annual average observations and air quality index for all the observation days for the criteria pollutants SO₂, NO_x and RSPM (Respirable Suspended Particulate Matter). Additionally the CO (Carbon Monoxide) and ozone pollution recorded at the 8 CAAQMS is also presented in the report.

In 2016-17 about 60% of the observations were recorded to have non polluted days as against the share of 55% last year while the polluted days categorised as 'Moderate' and 'Poor' have decreased during the same time. Similarly, this year only 31 AAQMS violated the NO_x standards and only 1 AAQMS at Nanded city (Industrial Area CIDCO) violated the SO₂ annual standards. The overall air quality is reported exceedance with respect to mainly due to RSPM and the Board is committed to take the necessary efforts, and actionable measures to reduce the same.

The report is prepared by The Energy and Resources Institute's (TERI's), Western Regional Centre, Mumbai and I appreciate the efforts of Dr Anjali Parasnis, Associate Director TERI, and Shri Prathmesh Chourey, Fellow, TERI WRC, Mumbai and their team in preparing the report for the board. The contribution of Dr. V. M Motghare, Joint Director-APC, MPCB and Shri S. C Kollur, Scientific Officer-APC, MPCB is highly appreciated.

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Table of Contents

EXECUTIVE SUMMARY.....	1
INTRODUCTION	5
NAMP (National Air Quality Monitoring Programme).....	7
NAMP Network - Maharashtra.....	8
Active monitoring sites in Maharashtra (2016-17).....	9
STATUS OF AIR QUALITY.....	11
Sulphur dioxide	11
Oxides of Nitrogen.....	14
Particulate Matter.....	17
Ozone	20
Carbon Monoxide.....	23
Air Quality Index.....	26
Calculation of AQI.....	27
Conclusion.....	31
ANNEX – 1: LIST OF ACTIVE AAQMS IN 2016-17	33
ANNEX – 2: RO WISE DATA RECORDED BY AAQMS IN MAHARASHTRA 2016-17	37
RO – Amravati	37
Akola – LRT Commerce College.....	40
Akola -MIDC Water Works.....	42
Akola - College of Engg & Technology.....	44
Amravati - Raj Kamal Chowk	46
Amravati - Govt. college of Engineering.....	48
Amravati - Godhadiwala Private Limited.....	50
RO – Aurangabad.....	53
Aurangabad - SBES College	56
Aurangabad - Collector Office	58
Aurangabad - C.A.D.A. Office	60
Jalna - Bachat Bhavan	62
Jalna - Krishnadhan Seeds Ltd.	64
Latur - MIDC Water Works.....	66
Latur - Shyam Nagar - Kshewraj Vidyalaya	68
Latur - Ganj Golai - Sidhheshwar Bank.....	70
Nanded - Ganeshnagar	72
Nanded - Mutha Chowk.....	74
Nanded - Industrial Area CIDCO	76
Aurangabad - Aurangabad CAAQMS.....	78
RO – Chandrapur	81
Chandrapur - Ghuggus.....	84

Chandrapur - Chandrapur - MIDC	86
Chandrapur - Chandrapur- SRO MPCB.....	88
Chandrapur - Tadali MIDC	90
Chandrapur - Ballarshah.....	92
Chandrapur - Rajura.....	94
Chandrapur - Chandrapur CAAQMS	96
RO - Kalyan	99
Ambernath	102
Badlapur - Badlapur - BIWA House.....	104
Bhiwandi - IGM Hospital.....	106
Bhiwandi - Prematai Hall	108
Dombivali.....	110
Dombivali - MIDC Office Dombivali.....	112
Dombivali - Dombivali CAAQMS.....	114
Kalyan - MPCB RO Kalyan Office	116
Ulhasnagar - Smt. CHM College Campus.....	118
Ulhasnagar - Powai Chowk.....	120
Ro - Kolhapur.....	123
Kolhapur - Shivaji University Campus.....	126
Kolhapur - Ruikar Trust.....	128
Kolhapur - Mahadwar Road	130
Sangli - Terrace of SRO – Sangli, Udyog Bhavan	132
Sangli - Sangli - Miraj Primary Municipal School	134
Sangli - Krishna Valley School	136
RO - Mumbai.....	139
Mumbai - Bandra	142
Mumbai - Sion	144
RO - Nagpur.....	147
Nagpur - IOE North Ambazari road.....	150
Nagpur - MIDC Office, Hingna Road.....	152
Nagpur - Govt. Polytechnic Col, Sadar.....	154
Nagpur - Nagpur Civil Lines	156
Nagpur - Nagpur CAAQMS	158
RO - Nashik	161
Jalgaon - Old B. J. Market.....	164
Jalgaon - Girna Water Tank	166
Jalgaon - MIDC Jalgaon.....	168
Nashik - RTO Colony	170
Nashik - MIDC Satpur - VIP.....	172
Nashik - NMC Nashik.....	174
Nashik - SRO Office Nashik	176

Nashik - Nashik CAAQMS.....	178
RO – Navi Mumbai	181
Navi Mumbai - Rabale	184
Navi Mumbai - Nerul – DY Patil	186
Navi Mumbai - Mahape, MPCB Nirmal Bhavan	188
Navi Mumbai - Airoli.....	190
Taloja - Kharghar-CIDCO Nodel Office	192
Taloja - MIDC Building	194
RO – Pune	197
Pune - Bhosari.....	200
Pune - Nal Stop.....	202
Pune - Swargate, Pune.....	204
Pune - Pimpri - Chinchwad-BOB Building	206
Pune - Karve Road - CAAQMS.....	208
Solapur - WIT Campus.....	210
Solapur - Saat Rasta - Chithale Clinic.....	212
Solapur - Solapur	214
RO - Raigad	217
Panvel - Panvel – Water Supply Plant	220
RO - Thane.....	223
Thane - Kopri.....	226
Thane - Naupada.....	228
Thane - Balkum Glaxo.....	230
ANNEX – 3: PARAMETRIC VALUES OF POLLUTANTS RECORDED BY AAQMS 2016-17	233
Sulphur -dioxide.....	233
Oxides of Nitrogen.....	237
Particulate Matter (PM ₁₀).....	241
Air Quality Index Category wise count	245
APPENDIX – A: REVISED NAAQS 2009.....	249

List of Figures

Figure No. 1: Annual Average trend of SO ₂ , NO _x and RSPM at Industrial Area CIDCO ,Nanded city	2
Figure No. 2: Annual trend in share of classes of AQI across Maharashtra for past seven years	3
Figure No. 3: State wise number of AAQMS under NAMP	8
Figure No. 4: Number of active AAQMS in Maharashtra in respective financial year	10
Figure No. 5: Parametric values of SO ₂ concentrations recorded by AAQMS across Maharashtra (2016-17)	12
Figure No. 6: Parametric values of NO _x concentrations recorded by AAQMS across Maharashtra (2016-17)	15
Figure No. 7: Parametric values of RSPM (PM ₁₀) concentrations recorded by AAQMS across Maharashtra (2016-17)	18
Figure No. 8: 8- hourly average O ₃ concentrations recorded by CAAQMS in Maharashtra ..	21
Figure No. 9: 8- hourly average CO concentrations recorded by CAAQMS in Maharashtra.	24
Figure No. 10: Percentage occurrence for the classes of AQI across AAQMS in Maharashtra – 2016-17	28
Figure No. 11: Share of AQI category for air quality for monitored observations across all AAQMS in Maharashtra (2016-17).....	29
Figure No. 12: Monthly average reading recorded at LRT Commerce College. – Akola	40
Figure No. 13: Annual average trend of SO ₂ , NO _x , and RSPM at LRT Commerce College. – Akola	41
Figure No. 14: Monthly average reading recorded at MIDC Water works.-Akola	42
Figure No. 15: Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Water works.-Akola	43
Figure No. 16: Monthly average reading recorded at College of Engg & Technology Akola (Architecture Branch)-Akola.....	44
Figure No. 17: Annual average trend of SO ₂ , NO _x , and RSPM at College of Engg & Technology Akola (Architecture Branch)-Akola	45
Figure No. 18: Monthly average reading recorded at Raj Kamal Chowk. -Amravati.....	46
Figure No. 19: Annual average trend of SO ₂ , NO _x , and RSPM at Raj Kamal Chowk. - Amravati.....	47
Figure No. 20: Monthly average reading recorded at Govt. college of Engineering - Amravati	48
Figure No. 21: Annual average trend of SO ₂ , NO _x , and RSPM at Govt. college of Engineering - Amravati.....	49
Figure No. 22: Monthly average reading recorded at Godhadiwala Private Limited - Amravati.....	50
Figure No. 23: Annual average trend of SO ₂ , NO _x , and RSPM at Godhadiwala Private Limited - Amravati.....	51

Figure No. 24: Monthly average reading recorded at SBES College - Aurangabad.....	56
Figure No. 25: Annual average trend of SO ₂ , NO _x , and RSPM at SBES College - Aurangabad	57
Figure No. 26: Monthly average reading recorded at Collector Office, Aurangabad.....	58
Figure No. 27: Annual average trend of SO ₂ , NO _x , and RSPM at Collector Office, Aurangabad.....	59
Figure No. 28: Monthly average reading recorded at C.A.D.A. Office - Aurangabad	60
Figure No. 29: Annual average trend of SO ₂ , NO _x , and RSPM at C.A.D.A. Office - Aurangabad.....	61
Figure No. 30: Monthly average reading recorded at Jalna-Bachat Bhavan.....	62
Figure No. 31: Annual average trend of SO ₂ , NO _x , and RSPM at Jalna-Bachat Bhavan	63
Figure No. 32: Monthly average reading recorded at Jalna-Krishnadhan Seeds Ltd.	64
Figure No. 33: Annual average trend of SO ₂ , NO _x , and RSPM at Jalna-Krishnadhan Seeds Ltd.....	65
Figure No. 34: Monthly average reading recorded at MIDC Water Works – Latur.....	66
Figure No. 35: Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Water Works - Latur	67
Figure No. 36: Monthly average reading recorded at Shyam Nagar-Kshewraj Vidyalaya.....	68
Figure No. 37: Annual average trend of SO ₂ , NO _x , and RSPM at Shyam Nagar-Kshewraj Vidyalaya.....	69
Figure No. 38: Monthly average reading recorded at Ganj Golai- Sidhheshwar Bank.....	70
Figure No. 39: Annual average trend of SO ₂ , NO _x , and RSPM at Ganj Golai- Sidhheshwar Bank.....	71
Figure No. 40: Monthly average reading recorded at Ganeshnagar	72
Figure No. 41: Annual average trend of SO ₂ , NO _x , and RSPM at Ganeshnagar	73
Figure No. 42: Monthly average reading recorded at Mutha Chowk	74
Figure No. 43: Annual average trend of SO ₂ , NO _x , and RSPM at Mutha Chowk.....	75
Figure No. 44: Monthly average reading recorded at Industrial Area CIDCO.....	76
Figure No. 45: Annual average trend of SO ₂ , NO _x , and RSPM at Industrial Area CIDCO	77
Figure No. 46: Monthly average reading recorded at Aurangabad CAAQMS.....	78
Figure No. 47: Annual average trend of SO ₂ , NO _x , and RSPM at Aurangabad CAAQMS	79
Figure No. 48: Monthly average reading recorded at Ghuggus - Chandrapur	84
Figure No. 49: Annual average trend of SO ₂ , NO _x , and RSPM at Ghuggus - Chandrapur	85
Figure No. 50: Monthly average reading recorded at Chandrapur – MIDC.....	86
Figure No. 51: Annual average trend of SO ₂ , NO _x , and RSPM at Chandrapur – MIDC.....	87
Figure No. 52: Monthly average reading recorded at Chandrapur- SRO MPCB	88
Figure No. 53: Annual average trend of SO ₂ , NO _x , and RSPM at Chandrapur - SRO MPCB	89
Figure No. 54: Monthly average reading recorded at Tadali MIDC.....	90
Figure No. 55: Annual average trend of SO ₂ , NO _x , and RSPM at Tadali MIDC	91
Figure No. 56: Monthly average reading recorded at Ballarshah	92
Figure No. 57: Annual average trend of SO ₂ , NO _x , and RSPM at Ballarshah.....	93

Figure No. 58: Monthly average reading recorded at Rajura	94
Figure No. 59: Annual average trend of SO ₂ , NO _x , and RSPM at Rajura.....	95
Figure No. 60: Monthly average reading recorded at Chandrapur CAAQMS.....	96
Figure No. 61: Annual average trend of SO ₂ , NO _x , and RSPM at Chandrapur CAAQMS.....	97
Figure No. 62: Monthly average reading recorded at Ambernath.....	102
Figure No. 63: Annual average trend of SO ₂ , NO _x , and RSPM at Ambernath	103
Figure No. 64: Monthly average reading recorded at Badlapur - BIWA House.....	104
Figure No. 65: Annual average trend of SO ₂ , NO _x , and RSPM at Badlapur - BIWA House	105
Figure No. 66: Monthly average reading recorded at IGM Hospital - Bhiwandi.....	106
Figure No. 67: Annual average trend of SO ₂ , NO _x , and RSPM at IGM Hospital - Bhiwandi	107
Figure No. 68: Monthly average reading recorded at Prematai Hall - Bhiwandi.....	108
Figure No. 69: Annual average trend of SO ₂ , NO _x , and RSPM at Prematai Hall - Bhiwandi	109
Figure No. 70: Monthly average reading recorded at Dombivali.....	110
Figure No. 71: Annual average trend of SO ₂ , NO _x , and RSPM at Dombivali.....	111
Figure No. 72: Monthly average reading recorded at MIDC Office - Dombivali.....	112
Figure No. 73: Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Office - Dombivali	113
Figure No. 74: Monthly average reading recorded at Dombivali CAAQMS.....	114
Figure No. 75: Annual average trend of SO ₂ , NO _x , and RSPM at Dombivali CAAQMS.....	115
Figure No. 76: Monthly average reading recorded at MPCB RO Kalyan Office	116
Figure No. 77: Annual average trend of SO ₂ , NO _x , and RSPM at MPCB RO Kalyan Office	117
Figure No. 78: Monthly average reading recorded at Smt. CHM College Campus, Ulhasnagar	118
Figure No. 79: Annual average trend of SO ₂ , NO _x , and RSPM at Smt. CHM College Campus, Ulhasnagar	119
Figure No. 80: Monthly average reading recorded at Powai Chowk - Ulhasnagar	120
Figure No. 81: Annual average trend of SO ₂ , NO _x , and RSPM at Powai Chowk - Ulhasnagar	121
Figure No. 82: Monthly average reading recorded at Shivaji University Campus	126
Figure No. 83: Annual average trend of SO ₂ , NO _x , and RSPM at Shivaji University Campus	127
Figure No. 84: Monthly average reading recorded at Ruikar Trust - Kolhapur	128
Figure No. 85: Annual average trend of SO ₂ , NO _x , and RSPM at Ruikar Trust - Kolhapur.	129
Figure No. 86: Monthly average reading recorded at Mahadwar Road	130
Figure No. 87: Annual average trend of SO ₂ , NO _x , and RSPM at Mahadwar Road.....	131
Figure No. 88: Monthly average reading recorded at Terrace of SRO – Sangli, Udyog Bhavan	132
Figure No. 89: Annual average trend of SO ₂ , NO _x , and RSPM at Terrace of SRO – Sangli, Udyog Bhavan	133

Figure No. 90: Monthly average reading recorded at Sangli - Miraj Primary Municipal School.....	134
Figure No. 91: Annual average trend of SO ₂ , NO _x , and RSPM at Sangli - Miraj Primary Municipal School.....	135
Figure No. 92: Monthly average reading recorded at Krishna Valley School.....	136
Figure No. 93: Annual average trend of SO ₂ , NO _x , and RSPM at Krishna Valley School.....	137
Figure No. 94: Monthly average reading recorded at Bandra.....	142
Figure No. 95: Annual average trend of SO ₂ , NO _x , and RSPM at Bandra.....	143
Figure No. 96: Monthly average reading recorded at Sion.....	144
Figure No. 97: Annual average trend of SO ₂ , NO _x , and RSPM at Sion.....	145
Figure No. 98: Monthly average reading recorded at IOE North Ambazari road	150
Figure No. 99: Annual average trend of SO ₂ , NO _x , and RSPM at IOE North Ambazari road	151
Figure No. 100: Monthly average reading recorded at MIDC Office, Hingna Road	152
Figure No. 101: Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Office, Hingna Road	153
Figure No. 102: Monthly average reading recorded at Govt. Polytechnic Col, Sadar	154
Figure No. 103: Annual average trend of SO ₂ , NO _x , and RSPM at Govt. Polytechnic Col, Sadar.....	155
Figure No. 104: Monthly average reading recorded at Civil Lines Nagpur.....	156
Figure No. 105: Annual average trend of SO ₂ , NO _x , and RSPM at Civil Lines Nagpur.....	157
Figure No. 106: Monthly average reading recorded at Nagpur CAAQMS.....	158
Figure No. 107: Annual average trend of SO ₂ , NO _x , and RSPM at Nagpur CAAQMS.....	159
Figure No. 108: Monthly average reading recorded at Old B. J. Market.....	164
Figure No. 109: Annual average trend of SO ₂ , NO _x , and RSPM at Old B. J. Market	165
Figure No. 110: Monthly average reading recorded at Girna Water Tank.....	166
Figure No. 111: Annual average trend of SO ₂ , NO _x , and RSPM at Girna Water Tank.....	167
Figure No. 112: Monthly average reading recorded at MIDC Jalgaon.....	168
Figure No. 113: Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Jalgaon	169
Figure No. 114: Monthly average reading recorded at RTO Colony.....	170
Figure No. 115: Annual average trend of SO ₂ , NO _x , and RSPM at RTO Colony	171
Figure No. 116: Monthly average reading recorded at MIDC Satpur - VIP	172
Figure No. 117: Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Satpur - VIP.....	173
Figure No. 118: Monthly average reading recorded at NMC Nashik	174
Figure No. 119: Annual average trend of SO ₂ , NO _x , and RSPM at NMC Nashik.....	175
Figure No. 120: Monthly average reading recorded at SRO Office Nashik.....	176
Figure No. 121: Annual average trend of SO ₂ , NO _x , and RSPM at SRO Office Nashik	177
Figure No. 122: Monthly average reading recorded at Nashik CAAQMS	178
Figure No. 123: Annual average trend of SO ₂ , NO _x , and RSPM at Nashik CAAQMS.....	179
Figure No. 124: Monthly average reading recorded at Rabale.....	184
Figure No. 125: Annual average trend of SO ₂ , NO _x , and RSPM at Rabale.....	185

Figure No. 126: Monthly average reading recorded at Nerul – DY Patil.....	186
Figure No. 127: Annual average trend of SO ₂ , NO _x , and RSPM at Nerul – DY Patil	187
Figure No. 128: Monthly average reading recorded at Mahape, MPCB Nirmal Bhavan.....	188
Figure No. 129: Annual average trend of SO ₂ , NO _x , and RSPM at Mahape, MPCB Nirmal Bhavan	189
Figure No. 130: Monthly average reading recorded at Airoli	190
Figure No. 131: Annual average trend of SO ₂ , NO _x , and RSPM at Airoli	191
Figure No. 132: Monthly average reading recorded at Kharghar-CIDCO Nodel Office.....	192
Figure No. 133: Annual average trend of SO ₂ , NO _x , and RSPM at Kharghar-CIDCO Nodel Office	193
Figure No. 134: Monthly average reading recorded at Talaja -MIDC Building	194
Figure No. 135: Annual average trend of SO ₂ , NO _x , and RSPM at Talaja -MIDC Building .	195
Figure No. 136: Monthly average reading recorded at Bhosari	200
Figure No. 137: Annual average trend of SO ₂ , NO _x , and RSPM at Bhosari	201
Figure No. 138: Monthly average reading recorded at Nal Stop	202
Figure No. 139: Annual average trend of SO ₂ , NO _x , and RSPM at Nal Stop	203
Figure No. 140: Monthly average reading recorded at Swargate, Pune	204
Figure No. 141: Annual average trend of SO ₂ , NO _x , and RSPM at Swargate, Pune	205
Figure No. 142: Monthly average reading recorded at Pimpri - Chinchwad-BOB Building	206
Figure No. 143: Annual average trend of SO ₂ , NO _x , and RSPM at Pimpri - Chinchwad-BOB Building	207
Figure No. 144: Monthly average reading recorded at Karve Road – CAAQMS.....	208
Figure No. 145: Annual average trend of SO ₂ , NO _x , and RSPM at Karve Road - CAAQMS	209
Figure No. 146: Monthly average reading recorded at WIT Campus	210
Figure No. 147: Annual average trend of SO ₂ , NO _x , and RSPM at WIT Campus.....	211
Figure No. 148: Monthly average reading recorded at Saat Rasta - Chithale Clinic.....	212
Figure No. 149: Annual average trend of SO ₂ , NO _x , and RSPM at Saat Rasta - Chithale Clinic	213
Figure No. 150: Monthly average reading recorded at Solapur	214
Figure No. 151: Annual average trend of SO ₂ , NO _x , and RSPM at Solapur.....	215
Figure No. 152: Monthly average reading recorded at Panvel – Water Supply Plant	220
Figure No. 153: Annual average trend of SO ₂ , NO _x , and RSPM at Panvel – Water Supply Plant.....	221
Figure No. 154: Monthly average reading recorded at Kopri.....	226
Figure No. 155: Annual average trend of SO ₂ , NO _x , and RSPM at Kopri	227
Figure No. 156: Monthly average reading recorded at Naupada	228
Figure No. 157: Annual average trend of SO ₂ , NO _x , and RSPM at Naupada.....	229
Figure No. 158: Monthly average reading recorded at Balkum Glaxo.....	230
Figure No. 159: Annual average trend of SO ₂ , NO _x , and RSPM at Balkum Glaxo	231

List of Tables

Table No. 1: List of parameters monitored by various AAQMS across Maharashtra.....	1
Table No. 2: Major air pollutants, their sources and their effects on humans.....	6
Table No. 3: City and Program type wise number of AAQMS in Maharashtra	10
Table No. 4: Molecular formula, sources and harmful impacts of Sulphur dioxide	11
Table No. 5: Trend of Annual Average SO ₂ concentrations recorded at Industrial Area CIDCO.....	13
Table No. 6: Molecular formula, sources and harmful impacts of oxides of nitrogen.....	14
Table No. 7: Top ten stations which violated NO _x annual standard (40µg/m ³) in 2016-17	16
Table No. 8: Relative size sources and harmful impacts of PM _{2.5} and PM ₁₀	17
Table No. 9: Worst ten AAQMS which recorded highest minimum daily RSPM concentrations	19
Table No. 10: Molecular formula, sources and harmful impacts of Ozone	20
Table No. 11: Percentage exceedance of Ozone concentrations recorded by CAAQMS (2016- 17)	22
Table No. 12: Molecular formula, sources and harmful impacts of Carbon Monoxide.....	23
Table No. 13: Percentage exceedance of CO concentrations recorded by CAAQMS (2016-17)	25
Table No. 14: Health advisories for various range of Air Quality Indices and respective colour codes.....	26
Table No. 15: Sub-index and breakpoint pollutant concentration for Indian Air Quality Index	27
Table No. 16: Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Amravati RO (2016-17)...	39
Table No. 17: Data for Monthly average reading recorded at LRT Commerce College. - Akola	40
Table No. 18: Data for Annual average trend of SO ₂ , NO _x , and RSPM at LRT Commerce College. – Akola.....	41
Table No. 19: Data for Monthly average reading recorded at MIDC Water works.-Akola	42
Table No. 20: Data for Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Water works.-Akola.....	43
Table No. 21: Data for Monthly average reading recorded at College of Engg & Technology Akola (Architecture Branch)-Akola	44
Table No. 22: Data for Annual average trend of SO ₂ , NO _x , and RSPM at College of Engg & Technology Akola (Architecture Branch)-Akola	45
Table No. 23: Data for Monthly average reading recorded at Raj Kamal Chowk. -Amravati 46	
Table No. 24: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Raj Kamal Chowk. - Amravati.....	47
Table No. 25: Data for Monthly average reading recorded at Govt. college of Engineering - Amravati.....	48

Table No. 26: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Govt. college of Engineering - Amravati.....	49
Table No. 27: Data for Monthly average reading recorded at Godhadiwala Private Limited - Amravati.....	50
Table No. 28: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Godhadiwala Private Limited - Amravati.....	51
Table No. 29: Percentage exceedance of pollutants at Amravati RO.....	52
Table No. 30: Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Aurangabad RO (2016-17).....	55
Table No. 31: Data for Monthly average reading recorded at SBES College - Aurangabad... 56	
Table No. 32: Data for Annual average trend of SO ₂ , NO _x , and RSPM at SBES College - Aurangabad.....	57
Table No. 33: Data for Monthly average reading recorded at Collector Office, Aurangabad 58	
Table No. 34: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Collector Office, Aurangabad.....	59
Table No. 35: Data for Monthly average reading recorded at C.A.D.A. Office - Aurangabad.....	60
Table No. 36: Data for Annual average trend of SO ₂ , NO _x , and RSPM at C.A.D.A. Office - Aurangabad.....	61
Table No. 37: Data for Monthly average reading recorded at Jalna - Bachat Bhavan.....	62
Table No. 38: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Jalna-Bachat Bhavan.....	63
Table No. 39: Data for Monthly average reading recorded at Jalna-Krishnadhan Seeds Ltd. 64	
Table No. 40: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Jalna - Krishnadhan Seeds Ltd.....	65
Table No. 41: Data for Monthly average reading recorded at MIDC Water Works - Latur.... 66	
Table No. 42: Data for Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Water Works - Latur.....	67
Table No. 43: Data for Monthly average reading recorded at Shyam Nagar-Kshewraj Vidyalaya.....	68
Table No. 44: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Shyam Nagar-Kshewraj Vidyalaya.....	69
Table No. 45: Data for Monthly average reading recorded at Ganj Golai- Sidhleshwar Bank.....	70
Table No. 46: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Ganj Golai-Sidhleshwar Bank.....	71
Table No. 47: Data for Monthly average reading recorded at Ganeshnagar.....	72
Table No. 48: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Ganeshnagar.....	73
Table No. 49: Data for Monthly average reading recorded at Mutha Chowk.....	74
Table No. 50: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Mutha Chowk.....	75
Table No. 51: Data for Monthly average reading recorded at Industrial Area CIDCO.....	76

Table No. 52: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Industrial Area CIDCO.....	77
Table No. 53: Data for Monthly average reading recorded at Aurangabad CAAQMS.....	78
Table No. 54: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Aurangabad CAAQMS.....	79
Table No. 55: Percentage exceedance of pollutants at Aurangabad RO	80
Table No. 56 : Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Chandrapur RO (2016-17)	83
Table No. 57: Data for Monthly average reading recorded at Ghuggus - Chandrapur.....	84
Table No. 58: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Ghuggus - Chandrapur	85
Table No. 59: Data for Monthly average reading recorded at Chandrapur - MIDC.....	86
Table No. 60: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Chandrapur - MIDC	87
Table No. 61: Data for Monthly average reading recorded at Chandrapur- SRO MPCB.....	88
Table No. 62: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Chandrapur - SRO MPCB	89
Table No. 63: Data for Monthly average reading recorded at Tadali MIDC.....	90
Table No. 64: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Tadali MIDC.....	91
Table No. 65: Data for Monthly average reading recorded at Ballarshah	92
Table No. 66: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Ballarshah	93
Table No. 67: Data for Monthly average reading recorded at Rajura	94
Table No. 68: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Rajura	95
Table No. 69: Data for Monthly average reading recorded at Chandrapur CAAQMS	96
Table No. 70: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Chandrapur CAAQMS.....	97
Table No. 71: Percentage exceedance of pollutants at Chandrapur RO.....	98
Table No. 72:Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Chandrapur RO (2016-17)	101
Table No. 73: Data for Monthly average reading recorded at Ambernath.....	102
Table No. 74: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Ambernath.....	103
Table No. 75: Data for Monthly average reading recorded at Badlapur - BIWA House	104
Table No. 76: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Badlapur - BIWA House	105
Table No. 77: Data for Monthly average reading recorded at IGM Hospital - Bhiwandi	106
Table No. 78: Data for Annual average trend of SO ₂ , NO _x , and RSPM at IGM Hospital - Bhiwandi.....	107
Table No. 79: Data for Monthly average reading recorded at Prematai Hall - Bhiwandi	108
Table No. 80: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Prematai Hall - Bhiwandi.....	109
Table No. 81: Data for Monthly average reading recorded at Dombivali	110

Table No. 82: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Dombivali	111
Table No. 83: Data for Monthly average reading recorded at MIDC Office - Dombivali	112
Table No. 84: Data for Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Office - Dombivali	113
Table No. 85: Data for Monthly average reading recorded at Dombivali CAAQMS	114
Table No. 86: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Dombivali CAAQMS.....	115
Table No. 87: Data for Monthly average reading recorded at MPCB RO Kalyan Office.....	116
Table No. 88: Data for Annual average trend of SO ₂ , NO _x , and RSPM at MPCB RO Kalyan Office	117
Table No. 89: Data for Monthly average reading recorded at Smt. CHM College Campus, Ulhasnagar	118
Table No. 90: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Smt. CHM College Campus, Ulhasnagar.....	119
Table No. 91: Data for Monthly average reading recorded at Powai Chowk - Ulhasnagar .	120
Table No. 92: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Powai Chowk - Ulhasnagar	121
Table No. 93: Percentage exceedance of pollutants at Kalyan RO	122
Table No. 94: Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Kolhapur RO (2016-17).	125
Table No. 95: Data for Monthly average reading recorded at Shivaji University Campus...	126
Table No. 96: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Shivaji University Campus.....	127
Table No. 97: Data for Monthly average reading recorded at Ruikar Trust - Kolhapur	128
Table No. 98: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Ruikar Trust - Kolhapur.....	129
Table No. 99: Data for Monthly average reading recorded at Mahadwar Road	130
Table No. 100: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Mahadwar Road	131
Table No. 101: Data for Monthly average reading recorded at Terrace of SRO – Sangli, Udyog Bhavan	132
Table No. 102: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Terrace of SRO – Sangli, Udyog Bhavan	133
Table No. 103: Data for Monthly average reading recorded at Sangli - Miraj Primary Municipal School.....	134
Table No. 104: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Sangli - Miraj Primary Municipal School	135
Table No. 105: Data for Monthly average reading recorded at Krishna Valley School	136
Table No. 106: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Krishna Valley School.....	137
Table No. 107: Percentage exceedance of pollutants at Kolhapur RO.....	138
Table No. 108: Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Mumbai RO (2016-17)	141

Table No. 109: Data for Monthly average reading recorded at Bandra	142
Table No. 110: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Bandra	143
Table No. 111: Data for Monthly average reading recorded at Sion	144
Table No. 112: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Sion	145
Table No. 113: Percentage exceedance of pollutants at Mumbai RO	146
Table No. 114: Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Nagpur RO (2016-17)	149
Table No. 115: Data for Monthly average reading recorded at IOE North Ambazari road..	150
Table No. 116: Data for Annual average trend of SO ₂ , NO _x , and RSPM at IOE North Ambazari road	151
Table No. 117: Data for Monthly average reading recorded at MIDC Office, Hingna Road	152
Table No. 118: Data for Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Office, Hingna Road	153
Table No. 119: Data for Monthly average reading recorded at Govt. Polytechnic Col, Sadar	154
Table No. 120: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Govt. Polytechnic Col, Sadar	155
Table No. 121: Data for Monthly average reading recorded at Civil Lines Nagpur	156
Table No. 122: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Civil Lines Nagpur	157
Table No. 123: Data for Monthly average reading recorded at Nagpur CAAQMS	158
Table No. 124: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Nagpur CAAQMS	159
Table No. 125: Percentage exceedance of pollutants at Nagpur RO.....	160
Table No. 126: Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Nashik RO (2016-17).	163
Table No. 127: Data for Monthly average reading recorded at Old B. J. Market.....	164
Table No. 128: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Old B. J. Market	165
Table No. 129: Data for Monthly average reading recorded at Girna Water Tank	166
Table No. 130: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Girna Water Tank	167
Table No. 131: Data for Monthly average reading recorded at MIDC Jalgaon.....	168
Table No. 132: Data for Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Jalgaon...	169
Table No. 133: Data for Monthly average reading recorded at RTO Colony	170
Table No. 134: Data for Annual average trend of SO ₂ , NO _x , and RSPM at RTO Colony.....	171
Table No. 135: Data for Monthly average reading recorded at MIDC Satpur - VIP	172
Table No. 136: Data for Annual average trend of SO ₂ , NO _x , and RSPM at MIDC Satpur - VIP	173
Table No. 137: Data for Monthly average reading recorded at NMC Nashik	174
Table No. 138: Data for Annual average trend of SO ₂ , NO _x , and RSPM at NMC Nashik	175
Table No. 139: Data for Monthly average reading recorded a SRO Office Nashik	176
Table No. 140: Data for Annual average trend of SO ₂ , NO _x , and RSPM at SRO Office Nashik	177

Table No. 141: Data for Monthly average reading recorded at Nashik CAAQMS	178
Table No. 142: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Nashik CAAQMS	179
Table No. 143: Percentage exceedance of pollutants at Nashik RO	180
Table No. 144 : Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Navi Mumbai RO (2016-17)	183
Table No. 145: Data for Monthly average reading recorded at Rabale	184
Table No. 146: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Rabale	185
Table No. 147: Data for Monthly average reading recorded at Nerul – DY Patil	186
Table No. 148: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Nerul – DY Patil	187
Table No. 149: Data for Monthly average reading recorded at Mahape, MPCB Nirmal Bhavan	188
Table No. 150: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Mahape, MPCB Nirmal Bhavan.....	189
Table No. 151: Data for Monthly average reading recorded at Airoli.....	190
Table No. 152: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Airoli	191
Table No. 153: Data for Monthly average reading recorded at Kharghar-CIDCO Nodel Office	192
Table No. 154: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Kharghar-CIDCO Nodel Office	193
Table No. 155: Data for Monthly average reading recorded at Taloja - MIDC Building	194
Table No. 156: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Taloja -MIDC Building	195
Table No. 157: Percentage exceedance of pollutants at Navi Mumbai RO.....	196
Table No. 158 : Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Pune RO (2016-17)	199
Table No. 159: Data for Monthly average reading recorded at Bhosari.....	200
Table No. 160: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Bhosari	201
Table No. 161: Data for Monthly average reading recorded at Nal Stop.....	202
Table No. 162: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Nal Stop	203
Table No. 163: Data for Monthly average reading recorded at Swargate, Pune.....	204
Table No. 164: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Swargate, Pune	205
Table No. 165: Data for Monthly average reading recorded at Pimpri - Chinchwad-BOB Building	206
Table No. 166: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Pimpri - Chinchwad-BOB Building.....	207
Table No. 167: Data for Monthly average reading recorded at Karve Road - CAAQMS.....	208
Table No. 168: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Karve Road - CAAQMS.....	209
Table No. 169: Data for Monthly average reading recorded at WIT Campus	210
Table No. 170: Data for Annual average trend of SO ₂ , NO _x , and RSPM at WIT Campus	211

Table No. 171: Data for Monthly average reading recorded at Saat Rasta - Chithale Clinic	212
Table No. 172: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Saat Rasta - Chithale Clinic	213
Table No. 173: Data for Monthly average reading recorded at Solapur	214
Table No. 174: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Solapur	215
Table No. 175: Percentage exceedance of pollutants at Pune RO	216
Table No. 176: Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Raigad RO (2016-17) ...	219
Table No. 177: Data for Monthly average reading recorded at Panvel – Water Supply Plant	220
Table No. 178: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Panvel – Water Supply Plant.....	221
Table No. 179: Percentage exceedance of pollutants at Raigad RO	222
Table No. 180 : Data for SO ₂ , NO _x & RSPM recorded at AAQMS in Thane RO (2016-17) ...	225
Table No. 181: Data for Monthly average reading recorded at Kopri.....	226
Table No. 182: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Kopri.....	227
Table No. 183: Data for Monthly average reading recorded at Naupada.....	228
Table No. 184: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Naupada	229
Table No. 185: Data for Monthly average reading recorded at Balkum Glaxo	230
Table No. 186: Data for Annual average trend of SO ₂ , NO _x , and RSPM at Balkum Glaxo...	231
Table No. 187: Percentage exceedance of pollutants at Thane RO.....	232

Abbreviations

MPCB	Maharashtra Pollution Control Board
AAQMS	Ambient Air Quality Monitoring Stations
NAMP	National Air Monitoring Program
SAMP	State Air Monitoring Program
CAAQMS	Continuous Ambient Air Quality Monitoring
SO ₂	Sulphur Dioxide
NO _x	Oxides of Nitrogen
PM	Particulate Matter
RSPM	Respirable Suspended Particulate Matter
O ₃	Ozone
CO	Carbon Monoxide
CIDCO	City and Industrial Development Corporation
NAAQS	National Ambient Air Quality Standards
CPCB	Central Pollution Control Board
µg	Micrograms
m ³	Meter cube
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NH ₃	Ammonia
CO	Carbon Monoxide
BTX	Benzene-Toluene-Xylene
WHO	World Health Organization
GBD	Global Burden of Disease
LRIs	Lower respiratory infections
COPD	Chronic Obstructive Pulmonary Disease
USEPA	United States Environmental Protection Agency
Pb	Lead
NAAQM	National Ambient Air Quality Monitoring
RO	Regional Offices
N ₂ O	Nitrous Oxide
VOC	Volatile Organic Compounds
COHb	Carboxyhaemoglobin
ppm	parts per million
AQI	Air Quality Index
US-EPA	United States Environmental Protection Agency
IIT	Indian Institute of Technology
INAQS	Indian National Air Quality Standards
PM ₁₀	Particulate Matter ₁₀
PM _{2.5}	Particulate Matter _{2.5}
MIDC	Maharashtra Industrial Development Corporation
NAAQS	National Ambient Air Quality Standards

Executive Summary

MPCB (Maharashtra Pollution Control Board) established in the year 1981 has 12 regional offices across the state to check and regulate the pollution level with necessary control measures. The Board has installed various AAQMS (Ambient Air Quality Monitoring Stations) across the state under the NAMP (National Air Monitoring Program) and SAMP (State Air Monitoring Program). In the year 2016-17, there were 74 active AAQMS in Maharashtra under NAMP (60), SAMP (4) and Continuous AAQMS (CAAQMS) (10). Out of the total CAAQMS, 5 new CAAQMS have been commissioned this year at Aurangabad, Nashik, Nagpur, Chandrapur and Dombivali cities in current year 2016-17.

The criteria air pollutants like SO₂ (Sulphur Dioxide), NO_x (Oxides of Nitrogen) and PM (Particulate Matter) _{2.5&10} also commonly known as RSPM (Respirable Suspended Particulate Matter) are monitored across all the AAQMS in Maharashtra, while the CAAQMS also monitors other air pollutants like O₃ (ozone), benzene, CO (Carbon Monoxide) and so on as presented below in Table No. 1. The observations recorded across the AAQMS for the SO₂, NO_x and RSPM levels in the year 2016-17 is presented through illustrations to depict the daily, monthly and annual data sets. The secondary pollutants like ozone and carbon Monoxide have been analysed for their eight hourly concentrations as against the respective standards.

Considering the 3 primary air pollutants- SO₂, NO_x and RSPM, the AAQMS representing areas around Industrial Area-CIDCO near Nanded city in Aurangabad region exceed the NAAQS (National Ambient Air Quality Standards) for all 3 criteria pollutants as prescribed by CPCB (Central Pollution Control Board). This AAQMS recorded the highest annual average concentrations for SO₂, NO_x and RSPM consistently for last three years as shown in Figure No. 1. In 2016-17, the Industrial Area CIDCO was the only station in Maharashtra which violated the annual standards for SO₂ (78µg/m³), NO_x (81µg/m³) and RSPM (156µg/m³) by almost 1.5 to 2.5 times.

Table No. 1: List of parameters monitored by various AAQMS across Maharashtra

Program	Frequency	Station name	SO ₂	Oxides of Nitrogen			PM		NH ₃	CO	O ₃	BTX
				NO	NO ₂	NO _x	2.5	10				
NAMP & SAMP	Twice a week	64 AAQMS (Annex-1)	✓	--	--	✓	--	✓	--	--	--	--
CAAQMS	Daily	Aurangabad	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Chandrapur	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Nagpur	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Nashik	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Dombivali	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Bandra	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Sion	✓	--	--	✓	✓	✓	--	--	--	--
		Airoli	✓	--	--	✓	✓	✓	--	--	--	--
		Karve Road	✓	✓	✓	✓	✓	✓	--	✓	✓	--
		Solapur	✓	✓	✓	✓	✓	✓	--	✓	✓	--

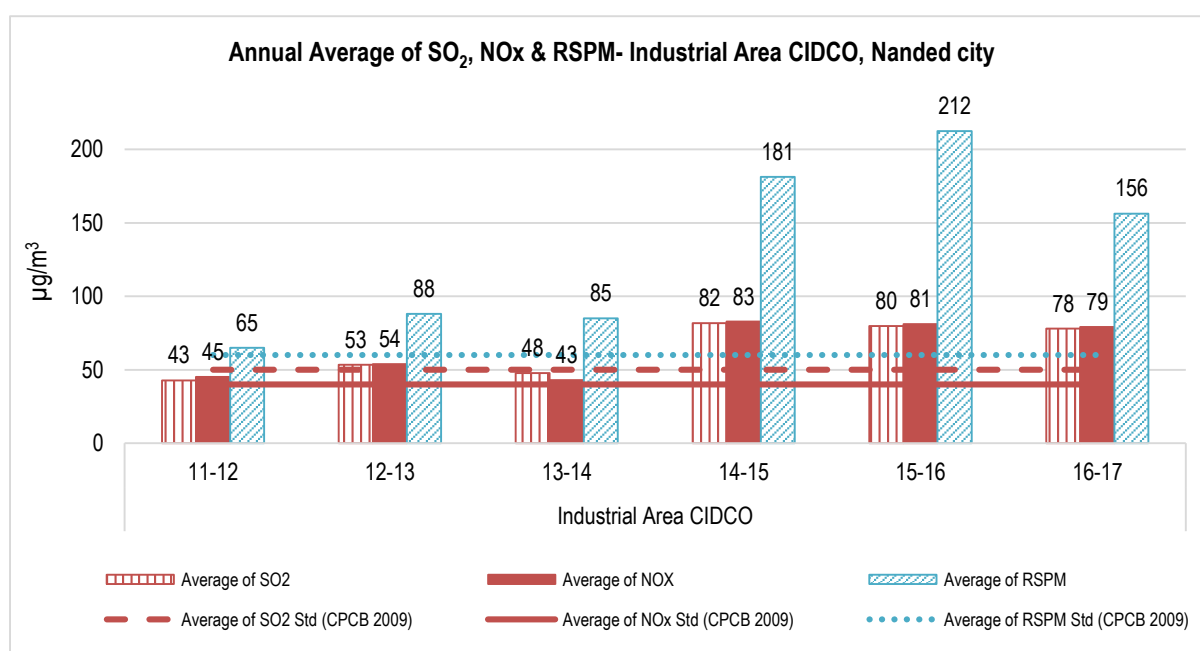


Figure No. 1: Annual Average trend of SO₂, NO_x and RSPM at Industrial Area CIDCO, Nanded city

In the year 2016-17 out of 74 AAQMS across Maharashtra, 31 AAQMS recorded annual NO_x concentrations above the annual standard of 40 µg/m³. All AAQMS in and around Pune city exceeded the annual average standard and the AAQMS at Swargate recorded highest annual average NO_x concentrations of about 82 µg/m³. Similarly AAQMS at Sion in Mumbai Region has recorded about 78 µg/m³ in the current year. This station has been consistently recording annual concentrations more than twice the annual NO_x standard for the past 7 years. The cities of Amravati, Latur, Chandrapur, Nagpur and Nashik have reported annual NO_x concentrations less than 40 µg/m³.

Practice and implementation of appropriate vehicular norms and ease of traffic congestion is highly desired in these cities. Appropriate traffic management and strict adherence to traffic rules may also help in reducing the traffic congestion, idling time and NO_x concentrations in those areas.

Higher RSPM concentrations have always been a concern for the state of Maharashtra and this year (2016-17) too, all AAQMS exceeded the annual RSPM standard (60 µg/m³), except for the CAAQMS at Airoli in Navi Mumbai which recorded annual RSPM concentrations of 42 µg/m³. The highest RSPM concentration was recorded at Ghuggus in Chandrapur region with 242 µg/m³ which is more than 4 times the standard and it was followed by the AAQMS at Rajura, (in the same region) which recorded annual average concentrations of 156 µg/m³ as compared to previous year which recorded 127 µg/m³. Similarly the AAQMS at Sion, Mumbai recorded RSPM levels (150 µg/m³) comparable to previous year (148 µg/m³). Also the AAQMS in Amravati Region (College of Engg & Technology & Raj Kamal Chowk) recorded even the minimum daily RSPM concentrations at 83 and 81 µg/m³ which violates the annual standard (60 µg/m³) thus indicating that the region is severely affected with RSPM pollution.

The high concentration of RSPM may be attributed to emissions from industries, construction sector, road dust re-suspension due to vehicular movement, vehicular emissions, quarrying and mining activities in the region. Appropriate operation and

maintenance practices at mines and quarry sites like use of water mists, wind screens, low dump sites, Construction of even and smooth roads, appropriate sweeping of roads and strict norms for construction sector should be regulated to minimize the dispersion of RSPM in the air.

Out of the 8 CAAQMS which monitor the ozone, CAAQMS at Nashik and Nagpur recorded exceedance for about 16% of the observations against the 8 hourly standards ($100 \mu\text{g}/\text{m}^3$). Similarly the CAAQMS of Chandrapur and Aurangabad recorded more than 14% of the observations exceeding the standard. While the CO concentrations were observed to increase in Solapur and Pune city which recorded more than 79% and 56% of the observations which violated the eight hourly ($2\text{mg}/\text{m}^3$) standards. The regions of Chandrapur and Aurangabad recorded clean in terms for CO pollution.

In the year 2016-17, 10,051 observations were recorded across 74 active AAQMS in Maharashtra representing 25 cities as compared to last year which recorded total of 8,631 observations. As seen in Figure No. 2, it is interesting to note that around 60% (6074) daily observations were in 'Good' and 'Satisfactory' category as against the share of 55% in the last year. Thus recording an improvement in terms of non-polluted days in Maharashtra. The share of 'Moderate' (35%) and 'Poor' (4%) air quality days also recorded a decrease as compared to last year share of 44% and 5% respectively. In terms of polluted categories less than 2% of the observations days were categorised as 'Very Poor' and 'Severe' air quality days.

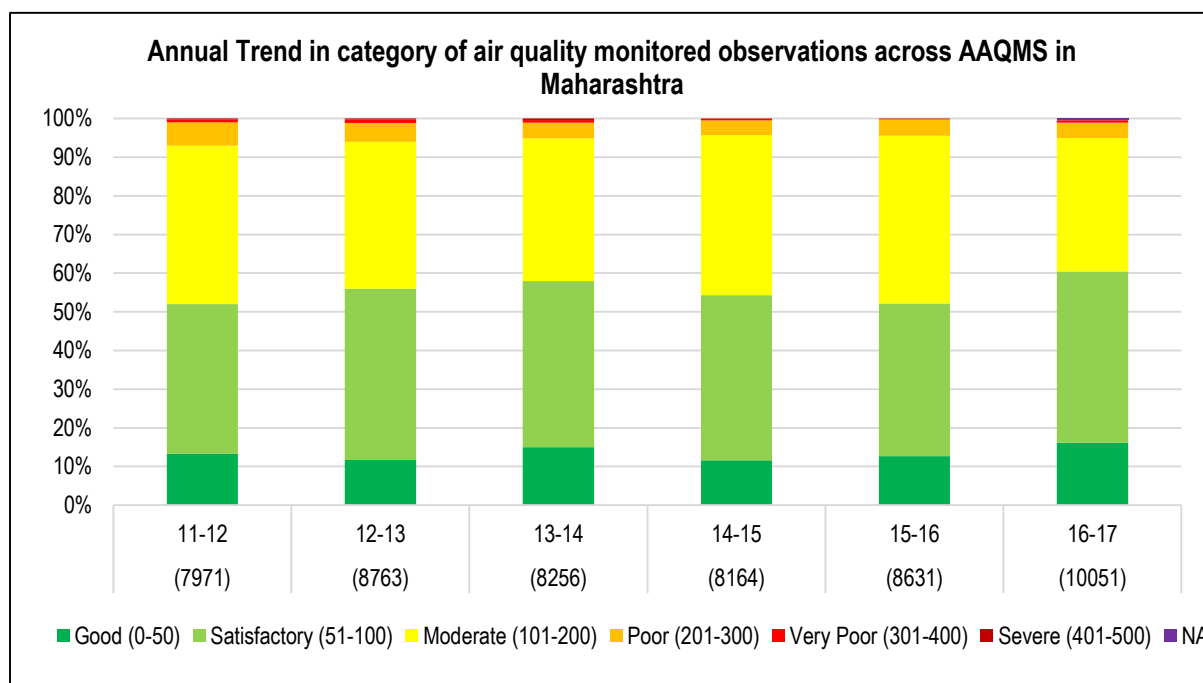


Figure No. 2: Annual trend in share of classes of AQI across Maharashtra for past seven years

Introduction

Air is the mixture of invisible, odorless, tasteless gases with varying percentages that surrounds the earth.¹ The Nitrogen and Oxygen forms a major chunk of air with 78% and 21% concentration respectively along with 0.9% of Argon and several others including water vapor, carbon dioxide and other gases. Any change in this normal composition of air due to addition of undesired elements from anthropogenic activities like combustion of fossil fuels, power plants, industries, automobiles, construction activities and so on can deteriorate the air quality and expose citizens to great health risks.

The presence of any air pollutant (means any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment) is termed as Air pollution². As per the World Health Organization (WHO) in 2016, India ranks 33 out of 100 most polluted cities in world contributing 22 cities to the top of 50 most polluted ones³. It is also estimated by Global Burden of Disease (GBD) that about 4.2 million deaths due to exposure of PM 2.5 have occurred thus ranking fifth as risk factor for total deaths worldwide⁴. Also, as per the study carried out by GBD in 2015, about 17.1% of deaths are occurred from ischemic heart disease, 14.2% from stroke, 16.5% from lung cancer, 24.7% from LRIs, and 27.1% from Chronic Obstructive Pulmonary Disease (COPD) due to long exposure of Particulate Matter Similarly, ambient ozone contributed to 254,000 deaths, ranking 33rd highest risk factor globally for deaths⁵.

Sources of air pollution are natural as well as manmade. Natural sources are majorly the volcanoes, forest fires and dust storm while the manmade sources are emission from industrial units like power-plants, refineries, sponge iron manufacturing, and combustion of fuel in vehicles as well as households and road dust suspension. Pollutants can originate from point, non-point and mobile sources. Stationary objects which release pollutants are classified as point sources (eg: factories, smoke stacks), non-point sources include residential, hospitals, waste disposal and agriculture operations while the mobile sources include transportation vehicles-cars, trucks, tractors, boats. Air pollutants are classified as:

1) Primary pollutants:

Primary air pollutants are the ones that are emitted directly into the atmosphere by the sources (power-generating plants).

2) Secondary pollutants:

Secondary air pollutants are the ones that are formed as a result of reactions between primary pollutants and other elements in the atmosphere

¹ <https://www.merriam-webster.com/dictionary/air>

² [The Air \(prevention and control of pollution\) act, 1981](#)

³ <http://www.autocarpro.in/news-national/india-polluted-cities-world-100-19805>

⁴ [State of Global Air/2017](#), Institute for Health Metrics and Evaluation's Global Burden of Disease Project and the Health Effects Institute

⁵ [State of Global Air/2017](#), Institute for Health Metrics and Evaluation's Global Burden of Disease Project and the Health Effects Institute

The National Ambient Air Quality Standards for six principal pollutants set by USEPA (United States Environmental Protection Agency) include –Sulphur dioxide, lead, nitrogen dioxide, carbon Monoxide, Ozone, Particulate matter⁶. The effects of these criteria pollutants have been drafted in Table No. 2. Air pollution is global issue contributing many diseases such as ischemia, myocardial infarction, stroke, chronic obstructive pulmonary disease and cancers.

Table No. 2: Major air pollutants, their sources and their effects on humans

Pollutants	Sources	Effects
Nitrogen dioxide (NO _x)	Combustion processes (heating, power generation, and vehicles)	<ul style="list-style-type: none"> • Bronchitis in asthmatic children. • Reduced lung function
Particulate Matter (PM _{2.5} , PM ₁₀)	Vehicles, industrial sources, domestic fuel burning, road dust re-suspension,	<ul style="list-style-type: none"> • Cardiovascular and respiratory diseases, • Lung cancer, • ALRI (Acute Lower Respiratory Infections)
Carbon Monoxide (CO)	Incomplete fuel combustion (as in motor vehicles)	<ul style="list-style-type: none"> • Reduces the oxygen carrying capacity of blood, • Causes headaches, nausea, and dizziness • Can lead to death at high levels
Sulphur dioxide (RSPM)	Burning of sulphur-containing fuels for heating, power & vehicles.	<ul style="list-style-type: none"> • Affects respiratory system and lung function. Coughing, mucus secretion, asthma and chronic bronchitis. • Causes acid rain.
Lead (Pb)	Petrol and industry (such as smelting, and paint works).	<ul style="list-style-type: none"> • Affects brain development in children, • At very high doses leads to poisoning, • May lead to brain and organ damage.
Ozone (O ₃) Tropospheric	Formed by the reaction of NO _x and (VOCs) in sunlight	<ul style="list-style-type: none"> • Breathing problems, asthma, reduced lung function.

⁶<http://www.epa.gov/air/criteria.html>

Increase in technological, industrial and agricultural advancement, along with the growing population, has exacerbated the deterioration of air quality, which is now a serious problem throughout the world. In India, rapidly growing cities, increasing traffic, growing energy consumption, waste production, fuel adulteration, and combustion of fire wood and traffic congestion are often attributed as the key reasons for deteriorating air quality. Rapidly growing Indian cities are suffering from some of the worst air quality problems in the world. To counter the problems associated with air pollution, the Government of India enacted the Air (prevention and control pollution) Act 1981. The act prescribes to combat air pollution by prohibiting the use of polluting fuels and substances as well as appliances that give rise to air pollution. Under this Act, the central government is empowered to take measures necessary to protect and improve the quality of the environment by setting standards for emissions and discharges; regulating the location of industries; management of hazardous wastes, and protection of public health and welfare.

NAMP (National Air Quality Monitoring Programme)

The CPCB (Central Pollution Control Board), a statutory organisation, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981. The principal function of the CPCB, under the Air (Prevention and Control of Pollution) Act, 1981, is to improve the quality of air and to prevent, control or abate air pollution in the country.

CPCB initiated NAAQM (National Ambient Air Quality Monitoring) programme in the year 1984 to get spatial and temporal variation of ambient air concentrations for a wide range of pollutants that are considered relevant for evolving a strategic management plan. Monitoring locations are selected to represent different land use categories like kerbside, residential, industrial, and commercial, to capture air quality levels under different activity profiles. Subsequently, expanding the network to have representation of various regions in the country, various stations under the programme were established nationwide.

The program was subsequently renamed as NAMP (National Air Quality Monitoring Programme). Under NAMP, three air pollutants viz., Sulphur Dioxide (SO₂), Nitrogen dioxides (NO₂) and Respirable Suspended Particulate Matter (RSPM/PM₁₀) have been identified for regular monitoring at all the locations. The monitoring of pollutants is carried out for 24 hours (4-hourly sampling for gaseous pollutants and 8-hourly sampling for particulate matter) with a frequency of twice a week, to have 104 observations in a year. In the year 2016-17, under NAMP, there were around 629 AAQMS for generating air quality database covering 264 cities in 29 States and 5 union territories⁷.

Further, CPCB under the Air (Prevention and Control) Act has set the NAAQS (National Ambient Air Quality Standards), revised on 18 November 2009 ([Appendix A](#)), with objectives of (1) To indicate the levels of air quality necessary with an adequate margin of safety to protect public health, vegetation and property, (2) To assist in establishing priorities for abatement and control of pollutant level, (3) To provide a uniform yardstick for assessing air quality at national level and (4) To indicate the need and extent of the monitoring programme.

⁷ <http://www.cpcb.nic.in/Network.php>

NAMP Network - Maharashtra

The Maharashtra State government in 1981 adopted the Water (Prevention and Control of Pollution) Act 1974 and under this MPCB (Maharashtra Pollution Control Board) was established in the year 1981. MPCB implements a range of environmental legislation, via its 12 RO's (Regional Offices), in the state and functions under the administrative control of Environment Department, Government of Maharashtra. The Air (Prevention and Control of Pollution) Act 1981 was adopted by the state of Maharashtra in 1983 and the MPCB is functioning as the state board under section 5 of this Act. Following which MPCB has taken many initiatives to control, prevent and monitor air quality in the state of Maharashtra.

Being a highly industrialised, populated and urbanized state, Maharashtra has numerous air pollution sources, which has resulted in the deterioration of air quality in many cities. The state has a wide range of major industries involved in polluting activities like power plants, pharmaceuticals, petroleum, and manufacturing of fertilizers. Vehicular growth, construction activities, quarry sites and so on have augmented the deterioration of the air quality. Hence, to keep a constant vigilance on the status of the air quality, MPCB has installed around 80 air quality monitoring stations under NAMP, highest as compared to any other state in India (Figure No. 3).

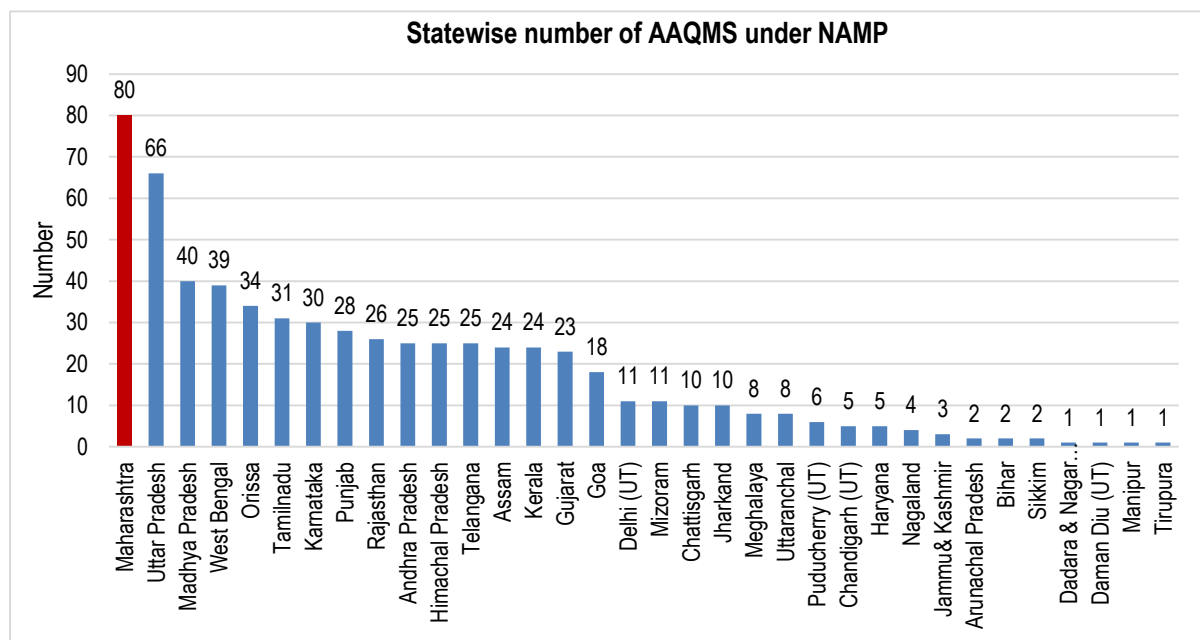


Figure No. 3: State wise number of AAQMS under NAMP

Data source: <http://www.cpcb.nic.in/Network.php>

Active monitoring sites in Maharashtra (2016-17)

AAQMS are added periodically to expand the network of monitoring stations and the corresponding tally of active AAQMS over the past ten years has been presented in Figure No. 4. The total number of AAQMS installed are around 80 under NAMP, however all may not be active due to operating challenges like maintenance issues, shortage of manpower and change of location and so on. While some monitoring stations are closed temporarily or are managed by other agencies and the hence data may be unavailable for a particular station for that spell of time.

As seen in Figure No. 4, there were 74 active AAQMS ([Annex-1](#)), 60 under NAMP (National Ambient Monitoring Program), 4 under SAMP (State Ambient Monitoring Program) and 10 under CAAQMS⁸ (Continuous Ambient Air Quality Monitoring) which recorded air quality of 25 cities in Maharashtra. The details of the cities and the number of AAQMS sites is presented below in Figure No. 4: Number of active AAQMS in Maharashtra in respective financial year

Table No. 3 while the data recorded across all the AAQMS in 2016-17 and has been compiled and presented graphically for seasonal and annual trend in [Annex-2](#).

Around 10 CAAQMS (Continuous Ambient Air Quality Monitoring Stations) are installed across Maharashtra out of which 5 CAAQMS were installed in the reporting year 2016-17. The monitoring at the CAAQMS is carried out for 24 hours to help monitor real time concentrations for pollutants like- SO₂, NO, N₂O, NO_x, Butene-Toluene-Xylene, CO, O₃, Particulate Matter and so on. The CAAQMS also records meteorological parameters like Wind speed and direction, relative humidity, solar radiation, rainfall and barometric pressure. CAAQMS uses data logging system to store the data by using various environmental softwares like Envidas, Comply and so on.

Parameters like SO₂ (Sulphur dioxide), NO₂ (Oxides of Nitrogen) and RSPM (Respirable Suspended Particulate Matter) were monitored by all AAQMS with a minimum frequency of two observations per week. Along with these parameters CO (Carbon Monoxide), Ozone, Benzene are also monitored by CAAQMS sites at Aurangabad, Chandrapur, Dombivali, Nagpur, Nashik, Pune, Bandra, and Solapur.

⁸ The AAQMS at Sion is a manually operated station but data is monitored daily and hence has been categorised as CAAQMS

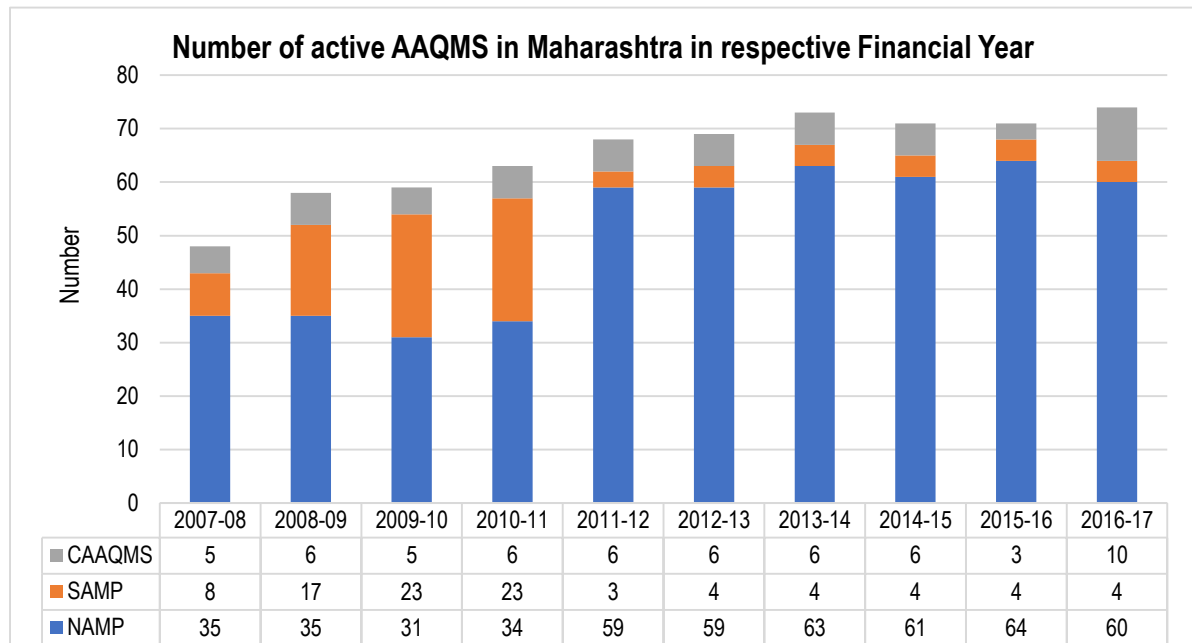


Figure No. 4: Number of active AAQMS in Maharashtra in respective financial year

Table No. 3: City and Program type wise number of AAQMS in Maharashtra

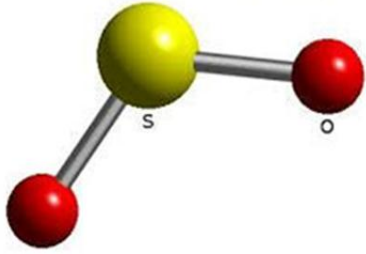
Sr No	Regional office	City	Program Type			Total
			CAAQMS	NAMP	SAMP	
1.	Amravati	Akola	--	3	--	3
2.		Amravati	--	3	--	3
3.	Aurangabad	Aurangabad	1	3	--	4
4.		Jalna	--	2	--	2
5.		Latur	--	3	--	3
6.		Nanded	--	3	--	3
7.	Chandrapur	Chandrapur	1	6	--	7
8.	Kalyan	Ambernath	--	1	--	1
9.		Badlapur	--	1	--	1
10.		Bhiwandi	--	--	2	2
11.		Dombivali	1	1	1	3
12.		Kalyan	--	--	1	1
13.		Ulhasnagar	--	2	--	2
14.	Kolhapur	Kolhapur	--	3	--	3
15.		Sangli	--	3	--	3
16.	Mumbai	Mumbai	2	--	--	2
17.	Nagpur	Nagpur	1	4	--	5
18.	Nashik	Jalgaon	--	3	--	3
19.		Nashik	1	4	--	5
20.	Navi Mumbai	Navi Mumbai	1	3	--	4
21.		Taloja	--	2	--	2
22.	Pune	Pune	1	4	--	5
23.		Solapur	1	2	--	3
24.	Raigad	Panvel	--	1	--	1
25.	Thane	Thane	--	3	--	3
	Total		10	60	4	74

Status of Air Quality

Sulphur dioxide

Sulphur Dioxide (SO₂), a colourless gas with a pungent, irritating odour and taste belongs to the family of reactive oxides of sulphur. Sulphur dioxide is formed by two molecules of oxygen and one molecule of sulphur having a covalent bond with angle of 119°⁹. The natural source for SO₂ emissions are volcanoes while the manmade emission sources include industrial and vehicular emissions. It is also a precursor to particulate matter. Being polar in nature, it readily dissolves in water to give acidic solution which oxidizes to sulphuric acid and is transported by wind currents over hundreds of miles, and gets deposited as acid rain. Acid rain causes acidification of water bodies, corrosion to metal structures, skin diseases and so on. In an incident in 2014, the Dombivali area witnessed acid rain in the form of 'green rain' where the rainwater collected was green in colour¹⁰. The molecular structure of SO₂ along with sources and effects are tabulated in Table No. 4.

Table No. 4: Molecular formula, sources and harmful impacts of Sulphur dioxide

	Common name	Molecular formula	Life span in air	Nature
	Sulphur dioxide	SO ₂	4-10 days	Polar (soluble in water)
Molecular structure				
Sources	<ul style="list-style-type: none"> • Natural: Volcanoes, biological decay and forest fires • Anthropogenic: Fossil fuel combustion from industries and power plants, Smelting of metals, manufacture of sulphuric acid, incineration of refuse and production of elemental sulfur. 			
Effects	<ul style="list-style-type: none"> • Human Health: Respiratory illness, asthma, chronic bronchitis, affects lung function, coughing, irritation to skin and eyes. • Environment: Acid rain 			

⁹ AK Srivastava and PC Jain, *Chemistry*, Published by V.K Enterprises, 7.8 Oxides of sulphur, Pg 581

¹⁰ <http://www.niohensis.nic.in/newsbulletin/Jan2014/Green%20rain%20in%20Dombivli.pdf>

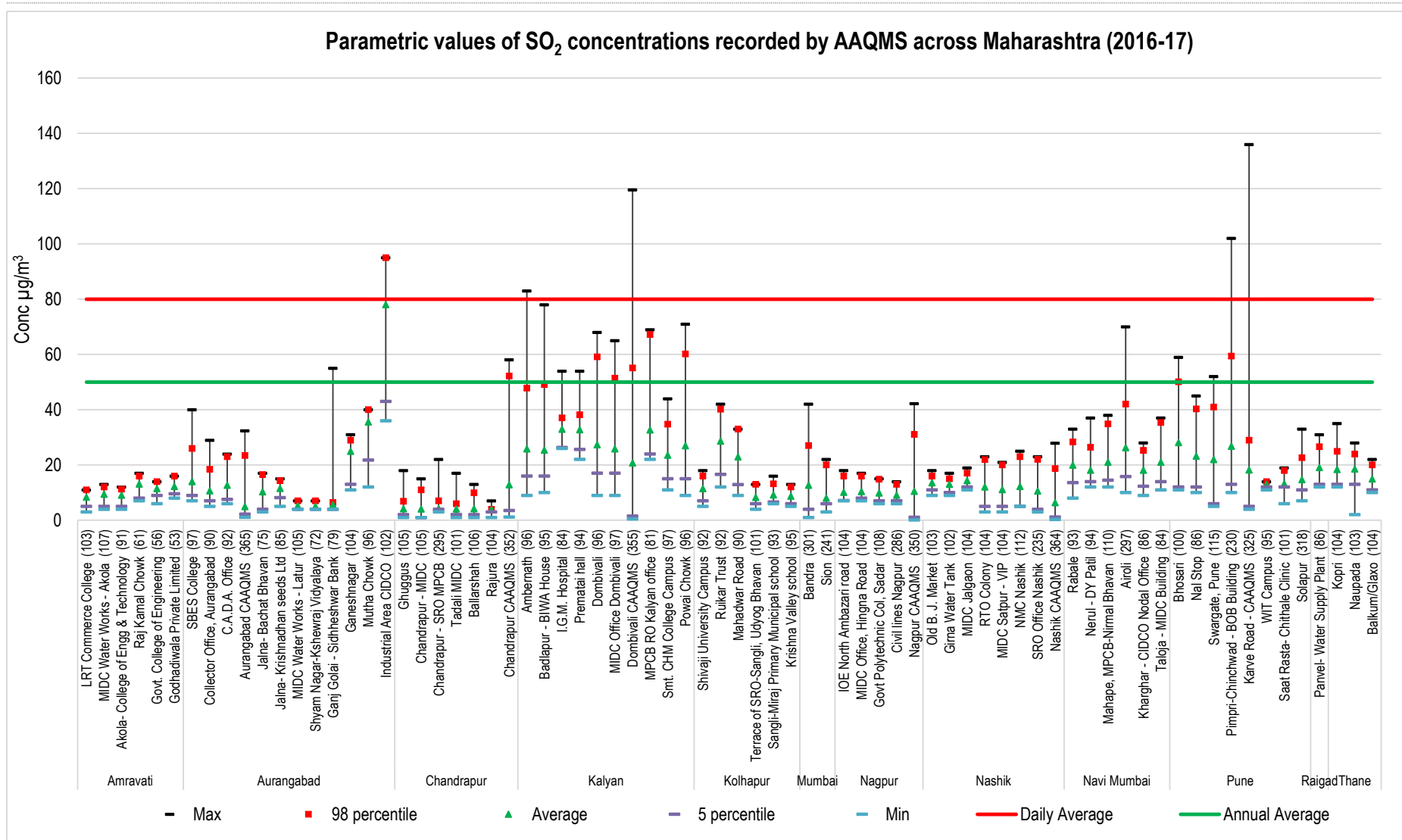


Figure No. 5: Parametric values of SO₂ concentrations recorded by AAQMS across Maharashtra (2016-17)

As seen in Figure No. 5, ([refer Annex-3 for datasets](#)) all the AAQMS recorded SO₂ concentrations well under the standards for daily as well as annual standards except for the AAQMS at Nanded (Industrial Area CIDCO). This station reported annual average SO₂ levels of 78 µg/m³ as against the annual standards of 50 µg/m³ indicating a violation of more than 1.5 times. The maximum daily average concentration as well as the 98th percentile concentrations of SO₂ recorded at this location was about 95 µg/m³ which exceeded the 24 hours standard (80 µg/m³). As seen in Table No. 5 this station has been violating the annual standard (50 µg/m³) for the past two years (between 2014 and 2016) and in the years 2012 to 2014 the annual SO₂ concentrations have been in the border line category. The second highest annual SO₂ concentrations of 36 µg/m³ were also recorded in Nanded city at the AAQMS installed at Mutha chowk, which is one of the busiest and congested traffic junction of Nanded city. This indicates that the region has been recording an increasing trend in the SO₂ concentrations and there is an immediate need to investigate this further

Table No. 5: Trend of Annual Average SO₂ concentrations recorded at Industrial Area CIDCO

Financial Year	Annual Average of SO ₂ (50µg/m ³)
11-12	43
12-13	53
13-14	48
14-15	82
15-16	80

Data source: Air Quality Status of Maharashtra 2015 – 16, MPCB

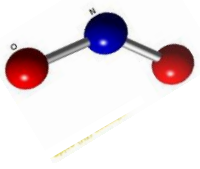
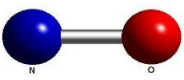
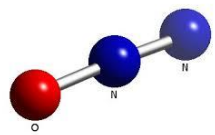
This is followed by the Kalyan region which recorded annual SO₂ concentrations between 20-40 µg/m³ across all the 10 AAQMS in this region. This region comprises of the industrial areas of Dombivali and Ambernath which have many chemical industries in that belt. However, the SO₂ concentrations were well within the annual standards. Similar to the last year, the AAQMS at Bhiwandi (Prematai hall and IGM hospital) and Kalyan (MPCB RO Kalyan office) recorded annual SO₂ concentrations of about 33 µg/m³.

The cities of Pune and Kolhapur also recorded annual SO₂ concentrations in the range of 20 to 30 µg/m³ in the year 2016-17. Whereas, the cities of Nagpur, Aurangabad, Amravati and Chandrapur recorded annual SO₂ concentrations less than 20 µg/m³ and were relatively clean from SO₂ pollution.

Oxides of Nitrogen

Nitrogen oxides (NO_x) are a mixture of gases that are composed of nitrogen and oxygen. Two of the most toxicologically significant nitrogen oxides are nitric oxide (NO) and nitrogen dioxide (NO₂). The other component of the family includes nitrous oxide (N₂O) which is also known as laughing gas. Nitric oxide has no colour, odour, or taste and is non-toxic. In the air it gets rapidly oxidized to nitrogen dioxide. Nitrogen dioxide is a reddish-brown gas with a pungent, irritating odour. In the presence of sunlight the oxides of nitrogen react with the unburned hydrocarbons to form photochemical smog which causes damage to plants and is also detrimental to human health. These compounds play an important role in the atmospheric reactions that create ozone (O₃) and acid rain¹¹. Nitrogen dioxide is known to irritate the lungs and increase susceptibility to respiratory infections. Direct acute effects of Nitrogen dioxide include damage of the cell membranes in the lung tissues and causes constriction of the Lung way passages. Eye and nasal irritation along with pulmonary discomfort is commonly observed between concentrations of 15 to 25 ppm¹². Table No. 6 summarises the highlights of the sources and effects of the oxides of nitrogen.

Table No. 6: Molecular formula, sources and harmful impacts of oxides of nitrogen

Common name	Nitrogen dioxide	Nitric oxide	Nitrous oxide
Molecular formula	NO ₂	NO	N ₂ O
Life span in air *	1-7 days	1-7 days	170 years
Nature	Polar	Polar	Polar
Molecular structure			
Sources	<ul style="list-style-type: none"> • Natural: Lightning, Forest fires and Bacterial activity • Anthropogenic: High temperature combustion (internal combustion engines, fossil fuel-fired power stations, industrial), Burning of Bio-mass and Fossil Fuels 		
Effects	<ul style="list-style-type: none"> • Human Health: Irritation of nose and throat, reduced lung function, Bronchitis in asthmatic children, visibility impairment, swelling of tissues in the throat and upper respiratory tract, reduced oxygenation of body tissues. • Environment: Acid rain, precursor for photochemical smog 		

¹¹ Agency for Toxic Substances and Disease Registry, U.S. Department of health and human services, Public Health Service, (April 2002)

¹²R.Khan, *Review on effects of Particulates; Sulfur Dioxide and Nitrogen Dioxide on Human Health*, April (2014),Pg.71

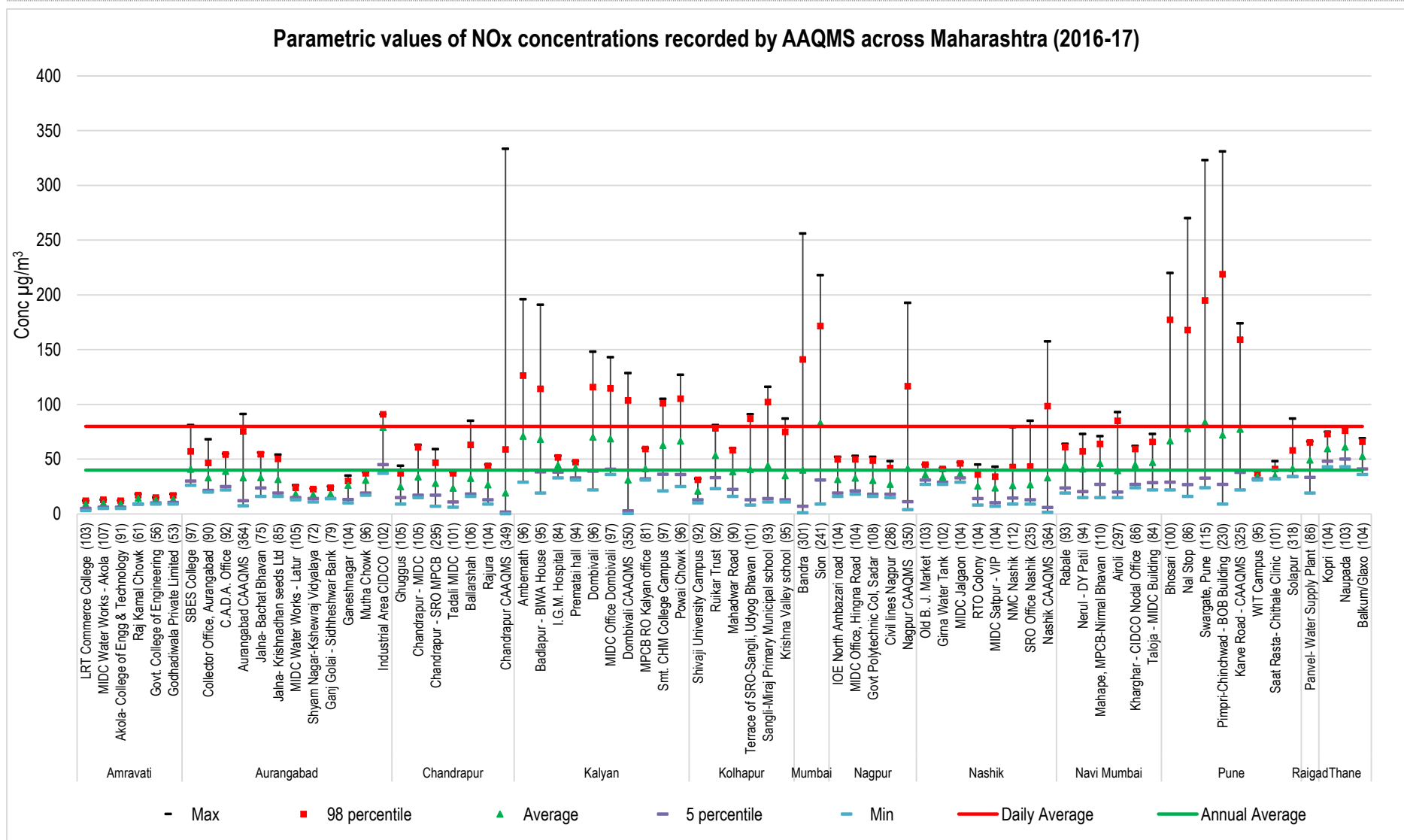


Figure No. 6: Parametric values of NOx concentrations recorded by AAQMS across Maharashtra (2016-17)

Various AAQMS across Maharashtra have been recording NO_x concentrations higher than the standards over the past few years. In the year 2016-17, 31 AAQMS across Maharashtra, as seen in Figure No. 6, ([refer Annex-3 for datasets](#)) were recorded annual NO_x concentrations of 40µg/m³ or higher.

All the 5 AAQMS in and near Pune city (Table No. 7) violated the annual NO_x standard (40µg/m³) and the AAQMS at Swargate, Pune recorded the highest annual average NO_x concentrations of about 82µg/m³ which is more than double the annual standard. The same station had recorded annual average NO_x levels of 66 and 51µg/m³ in the year 2015-16 and 2014-15 indicating a steady increase in the annual NO_x levels in that location. Similarly the Nal stop AAQMS and the Karve road, CAAQMS of Pune recorded similar concentrations of about 79µg/m³ and 80µg/m³ of annual NO_x levels this year as against 64 and 57µg/m³ last year respectively.

The AAQMS at Nanded (Industrial Area CIDCO), recorded the second highest annual average NO_x concentrations of about 81 µg/m³ which is about the same NO_x levels this station has been recording for the past two years, about 81 and 83 µg/m³ in the year 2015-16 and 2014-15. This station has also recorded the highest SO₂ concentrations for this year. The AAQMS at Sion, Mumbai too has been consistently recording more than double the annual NO_x concentrations for the past 7 years and violating the annual NO_x standards of 40 µg/m³. This year too, this AAQMS recorded about 78 µg/m³.

The industrial areas of Ambernath, Badlapur and Dombivali of Kalyan RO recorded annual NO_x concentrations in the range of 69-73 µg/m³ violating the annual standards by more than 1.8 times the standard this year. Similarly, the reported annual NO_x concentrations are between 50 -60µg/m³ in Thane city. While the city of Solapur is at a border line category with an annual average of NO_x between 35-40 µg/m³ across all three stations. The cities of Amravati, Latur, Chandrapur, Nagpur and Nashik have reported annual NO_x concentrations less than 40 µg/m³.

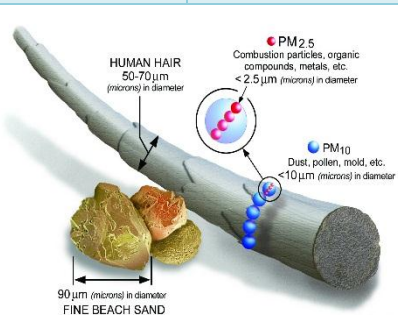
Table No. 7: Top ten stations which violated NO_x annual standard (40µg/m³) in 2016-17

Sr No	MPCB RO	City	Station Name	Number of days of observations	Average (µg/m ³)
1	Pune	Pune	Swargate, Pune	115	82
2	Aurangabad	Nanded	Industrial Area CIDCO	102	81
3	Pune	Pune	Karve Road - CAAQMS	325	80
4			Nal Stop	86	79
5	Mumbai	Mumbai	Sion	241	78
6	Kalyan	Dombivali	Dombivali	96	73
7	Pune	Pimpri	Pimpri-Chinchwad - BOB Building	230	73
8	Kalyan	Badlapur	Badlapur - BIWA House	95	71
9		Ambernath	Ambernath	96	69
10	Pune	Pimpri	Bhosari	100	69

Particulate Matter

Particulate matter (PM) is a complex mixture of extremely small particles and liquid droplets made up of a number of components, including acids (nitrates and sulphates), organic chemicals, metals, and soil or dust particles¹³. PM generally includes a fine fraction of particles ranging between 10-2.5 μm 10 times finer than the hair follicle (Table No. 8). PM is described using terms based on the complexity and the importance of particle size in determining exposure and human dose. PM can be directly emitted into the atmosphere because some natural and anthropogenic processes or formed secondarily from precursor gases. Today, PM emissions are highly regulated in most countries due to the environmental concerns. PM's are also responsible in affecting the climate of the earth by changing the amount of radiation retained in the earth's system.

Table No. 8: Relative size sources and harmful impacts of PM_{2.5} and PM₁₀

Common name	Respirable Suspended Particulate Matter (RSPM)		
Size in microns	PM _{2.5} &PM ₁₀	Nature	Non Polar ¹⁴
Relative Comparison	 <p>The diagram illustrates the relative sizes of various particles. A human hair is shown with a diameter of 50-70 microns. Fine beach sand has a diameter of 90 microns. PM_{2.5} particles are shown as small red dots with a diameter less than 2.5 microns. PM₁₀ particles are shown as small blue dots with a diameter less than 10 microns. The diagram also notes that PM_{2.5} includes combustion particles, organic compounds, and metals, while PM₁₀ includes dust, pollen, and mold.</p> <p>Source:¹⁵</p>		
Major sources	<ul style="list-style-type: none"> • Natural: Volcanoes, Dust storms, Forest and grassland fires, Living vegetation, and Sea spray • Anthropogenic: Power plants and industrial processes, Vehicular traffic, Domestic coal burning, Industrial and Municipal waste incinerators 		
Effects	<ul style="list-style-type: none"> • Human Health: premature death, aggravated asthma, acute respiratory symptoms including aggravated coughing and difficult or painful breathing, chronic bronchitis and decreased lung function. • Vegetation: Can clog stomatal openings of plants and interfere with photosynthesis functions. 		

¹³US Environmental Protection Agency: <http://www.epa.gov/pm/>

¹⁴Dasgupta et al. *Fine Particulates in Ambient Air And Its Organic Component*

¹⁵US Environmental Protection Agency: <http://www.epa.gov/nheerl/humanstudies/images/PM2.5%20scale-large.jpg>

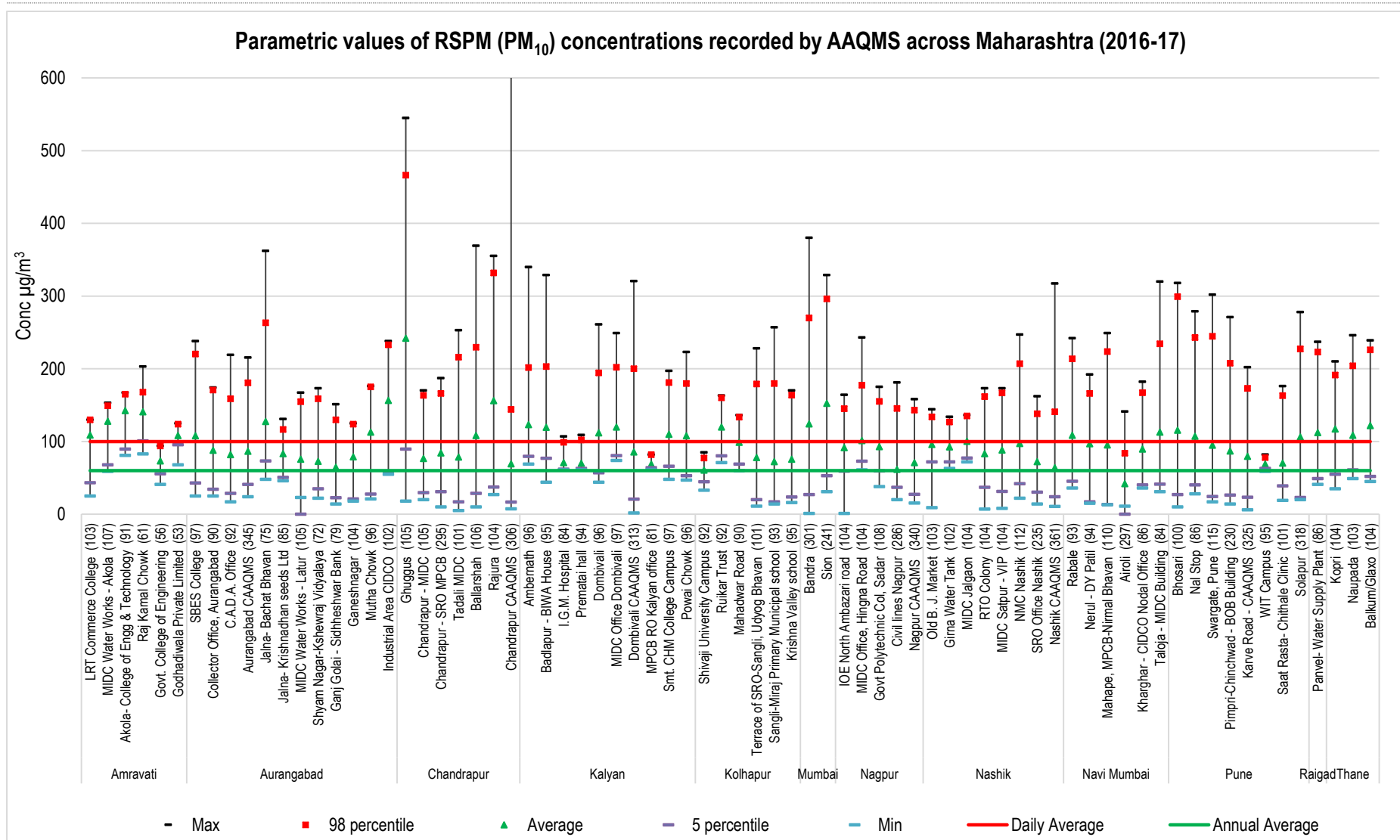


Figure No. 7: Parametric values of RSPM (PM₁₀) concentrations recorded by AAQMS across Maharashtra (2016-17)

The annual RSPM levels have been exceeding the standard for all the AAQMS across Maharashtra from the past few years. As seen in Figure No. 7, ([refer Annex-3 for datasets](#)) this year 73 out of 74 active AAQMS, violated the annual standards of 60µg/m³ indicating that this year also the RSPM concentrations have been high across all the cities monitored for air quality. The only station which recorded annual RSPM concentrations below the standard was Airoli in Navi Mumbai with 42 µg/m³. This is a CAAQMS and the annual RSPM concentrations at this site has been 53, 38 and 36 µg/m³ for the years 2013-14, 2014-15 and 2015-16 respectively.

The AAQMS at Ghuggus in Chandrapur, recorded the highest annual average RSPM concentrations of 242µg/m³ which is more than 4 times the standard. Leaving apart the 2% observations, the highest 24 concentration of RSPM recorded (98 percentile reading) was recorded to be 466 µg/m³, more than 4.5 times the daily standard set by CPCB. This indicates that out of the 105 observation days at Ghuggus, the air quality was 3-4 times polluted than the acceptable standards for more than 50 days.

Although the AAQMS in Nanded (industrial area CIDCO) recorded RSPM concentrations of about 156 µg/m³, which is more than 2.5 times the standard, it recorded an improvement as compared 212 and 186µg/m³ recorded in the last two years. The stations of Chandrapur (Rajura) recorded annual average of 156 µg/m³, more than 2.5 times the standard and considerably higher than the average recorded last year (127 µg/m³) at the same site. This is followed by the AAQMS site at Mumbai (Sion) which recorded 150µg/m³ annual average RSPM concentration as against 148 µg/m³ and 117 µg/m³ in the years 2015-16 and 2014-15.

Two out three AAQMS (College of Engg & Technology & MIDC water works) in Akola city recorded RSPM concentrations between 120-140 µg/m³ while the third AAQMS installed at LRT College of commerce recorded RSPM concentrations over 100 µg/m³. It is striking to note that the minimum daily concentrations, 83 and 81 µg/m³ recorded at Akola (College of Engg & Technology) and Amravati (Raj Kamal Chowk) also violated the annual standard (60 µg/m³), indicating that on all the given observation days the site and its nearby location was severely affected by RSPM concentrations. The minimum concentrations recorded at 26 locations violated the annual standards and a list of the worst ten sites of these has been enlisted in Table No. 9.

Table No. 9: Worst ten AAQMS which recorded highest minimum daily RSPM concentrations

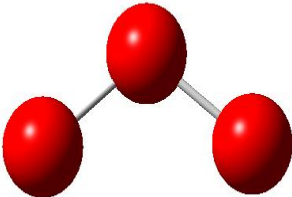
Sr No	Station Name	Region	Minimum daily concentrations (µg/m ³)	Annual Average concentrations (µg/m ³)
1	Raj Kamal Chowk	Amravati	83	141
2	Akola- College of Engg & Technology	Akola	81	142
3	MIDC Office Dombivali	Dombivali	74	120
4	MIDC Jalgaon	Jalgaon	72	100
5	Ruikar Trust	Kolhapur	71	120
6	Ambernath	Ambernath	69	123
7	Godhadiwala Private Limited	Amravati	68	108
8	Girna Water Tank	Jalgaon	63	92
9	MIDC Office, Hingna Road	Nagpur	61	101
10	I.G.M. Hospital	Bhiwandi	61	71

Ozone

Ozone (O₃), a pale blue gas molecule, is composed of three oxygen atoms and has a pungent smell. The ozone layer found high in the upper atmosphere (stratosphere) shields us from much of the sun's ultraviolet radiation. However, ozone found at the ground level (troposphere), breathable packet, is an air pollutant and causes serious health problems. Ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapours, and chemical solvents are some of the major sources of NO_x and VOC.

Breathing ozone can trigger a variety of health problems. Ozone penetrates deeper into the parts of the lungs that are more vulnerable to injury. Ozone makes people more sensitive to allergens, which are the most common triggers for asthma attacks.¹⁶ Ground level ozone can also have harmful effects on sensitive vegetation and ecosystems. The sources and effects of ozone are drafted below in Table No. 10.

Table No. 10: Molecular formula, sources and harmful impacts of Ozone

	Common name	Molecular formula	Life span in air	Nature
	Ozone	O ₃	22 +/- 2days ¹⁷	Polar
Molecular structure				
Sources	Ozone precursors come from fuel combustion from automobiles; oil based and paint industries, power plant, oil refineries, and electronic equipment such as photocopiers.			
Effects	<ul style="list-style-type: none"> • Human Health: Reduce lung function, respiratory illness, premature death, asthma, bronchitis, heart attack, and other cardiopulmonary problems. • Environment: Photochemical Smog 			

¹⁶United States Air and Radiation EPA-452/K-99-001&Environmental Protection Washington, DC 20460 July 1999 Agency [Smog-Who does it hurt](#), Page2.

¹⁷ O. Cooper, ESRL, [Tropospheric Ozone Global distribution and Radiative Forcing](#) (2007), Slide 5

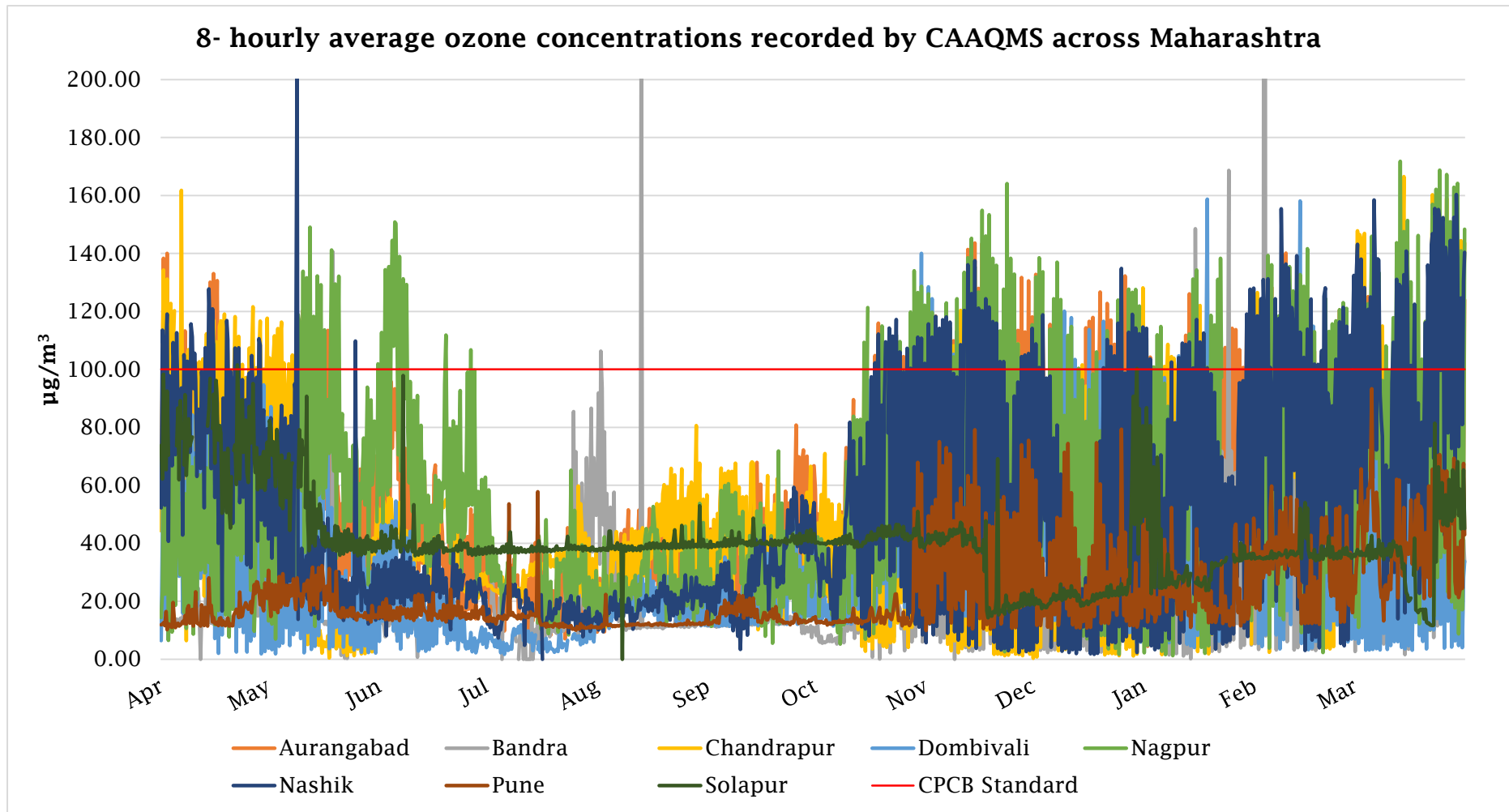


Figure No. 8: 8- hourly average O_3 concentrations recorded by CAAQMS in Maharashtra

Table No. 11: Percentage exceedance of Ozone concentrations recorded by CAAQMS (2016-17)

	Aurangabad	Bandra	Chandrapur	Dombivali	Nagpur	Nashik	Pune	Solapur
Total Number of 8 hourly observations	1095	1048	1035	1058	1041	1082	1095	1063
Number of observations exceeding 8 hourly standards	158	7	150	59	166	173	0	2
Percentage Exceedance 2016-17 (%)	14.43	0.67	14.49	5.58	15.95	15.99	0.00	0.19
Percentage Exceedance 2015-16 (%)		0.09					0.00	5.74

Ozone concentrations were monitored at the 8 CAAQMS in Maharashtra and more than one thousand reading (Table No. 11) have been recorded across all the stations. As seen in Figure No. 8, the ozone concentrations have been relatively higher in the winter months as compared to summer months.

The CAAQMS at Nashik and Nagpur recorded exceedance for about 16% of the observations followed by regions of Chandrapur and Aurangabad which recorded more than 14% of the observations exceeding the 8 hourly standards ($100\mu\text{g}/\text{m}^3$).

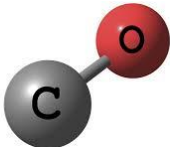
The CAAQMS at Bandra, Solapur and Pune recorded negligible days with ozone pollution with mere 0.6% of the readings exceeding the standards while the CAAQMS at Dombivali recorded around 5.5% of the observation which exceeded the standards. The exceedance at Solapur has significantly decreased from over 5% to less than 1% as compared to the last fiscal year. Some peaks were recorded in Nashik ($208\mu\text{g}/\text{m}^3$) and Bandra (234 and $734\mu\text{g}/\text{m}^3$) were recorded but those are outliers.

Thus in terms of ozone pollution the cities of Nashik, Nagpur, Chandrapur and Aurangabad need to implement strategies to reduce the ozone pollution.

Carbon Monoxide

most important health effects associated with exposure to CO is due to its strong bond with Carbon Monoxide (CO) is a colourless, odourless, tasteless, non-irritating, and poisonous gas consisting of one carbon and one oxygen atom, connected by a triple bond (Table No. 12). CO is produced when carbon-based fuels undergo incomplete combustion. The largest proportion of these emissions are produced as exhausts of internal combustion engines, especially by motor vehicles with petrol engines. Carbon Monoxide a shelf life of about 2 months and eventually, carbon Monoxide reacts with other compounds in the atmosphere thus converting to carbon dioxide¹⁸. Human activities are attributed to the release of about 60% of the carbon Monoxide whereas natural processes account for the remaining 40%¹⁹. The the haemoglobin molecule, forming carboxy haemoglobin (COHb) which is then incapable of releasing oxygen to the tissue such as the heart and the brain.²⁰ At low concentrations (10 ppm) CO pollutant affects cardiovascular activities, nervous system and respiration, which may lead to unconsciousness and also death after prolonged exposures. Studies have recorded death due to acute exposure to high concentration of CO (>500ppm)²¹.

Table No. 12: Molecular formula, sources and harmful impacts of Carbon Monoxide

	Common name	Molecular formula	Life span in air	Nature
	Carbon Monoxide	CO	2 months	Polar
Molecular structure				
Sources	<ul style="list-style-type: none"> • Natural: Volcanoes and forest fires • Anthropogenic :Emissions from automobiles, coal- gas- or oil-fired heating or power generating plants, combustion of waste in municipal and other incinerators, burning of forest and agricultural materials, smoldering coal refuse material 			
Effects	<ul style="list-style-type: none"> • Human Health: dizziness, nausea (feeling sick) and vomiting, tiredness and confusion, stomach pain, shortness of breath and difficulty in breathing, Blue baby syndrome. 			

¹⁸ U.S. Department of Health And Human Services Public Health Service Agency for Toxic Substances and Disease Registry, [Toxicological Profile For Carbon Monoxide](#) ,Page 2

¹⁹ WHO [Environmental Health Criteria 213: Carbon Monoxide \(second edition\)](#),Sources of carbon monoxide.Page38

²⁰ T. Greiner, Department of Agricultural and Biosystems Engineering, Iowa State University, [Carbon Monoxide Poisoning: Dangers, Detection, Response, and Poisoning \(AEN-193\)](#)

²¹ M. Fierro, The University of Arizona, College of Public Health, [Adverse Health Effects Of Exposure To Ambient Carbon Monoxide](#) (September 2001),Page 4

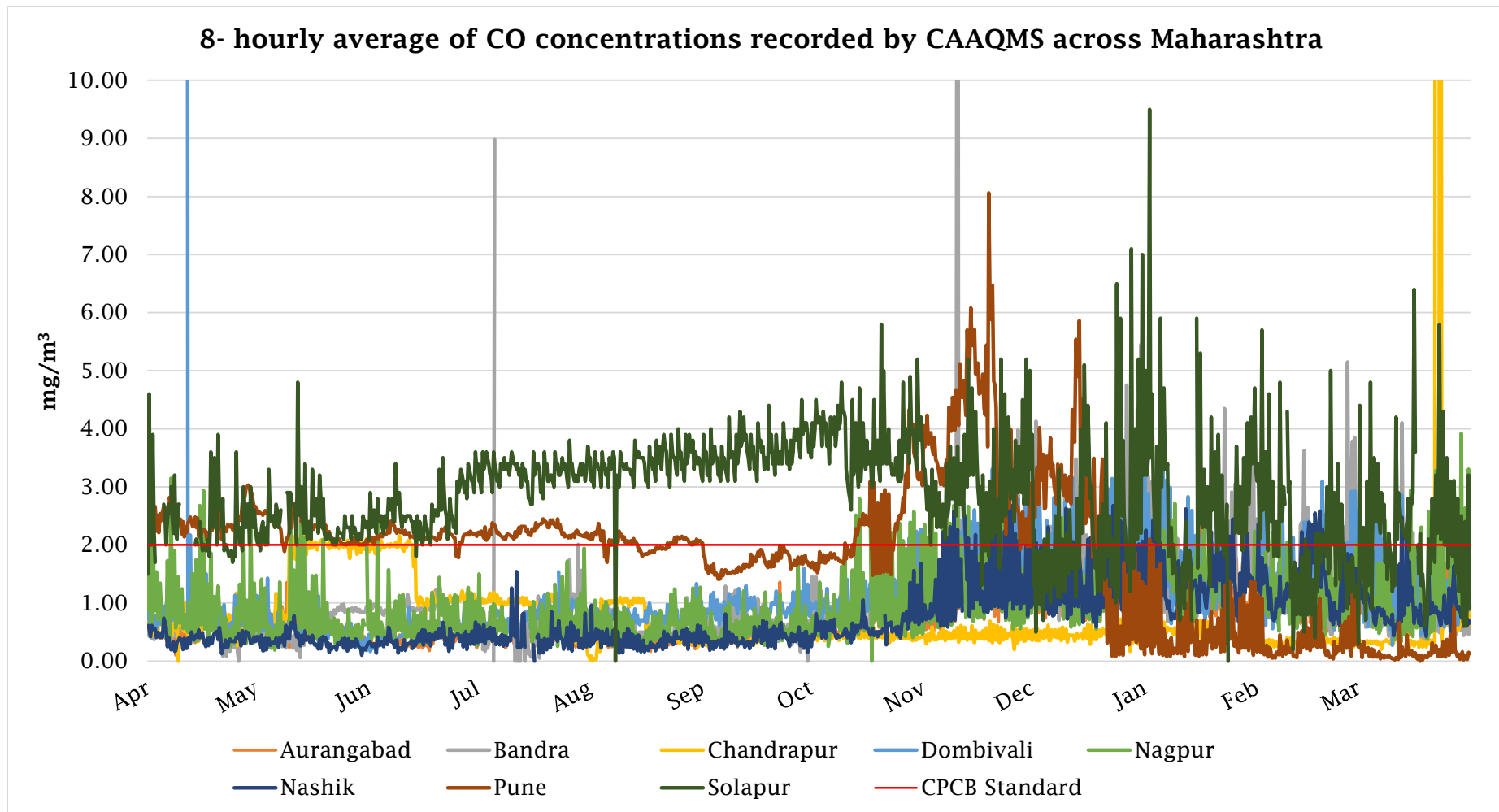


Figure No. 9: 8- hourly average CO concentrations recorded by CAAQMS in Maharashtra

Table No. 13: Percentage exceedance of CO concentrations recorded by CAAQMS (2016-17)

	Aurangabad	Bandra	Chandrapur	Dombivali	Nagpur	Nashik	Pune	Solapur
Total Number of 8 hourly observations	1094	1048	1035	1051	1042	1084	1095	1063
Number of observations exceeding 8 hourly standards	19	99	58	100	82	61	615	848
Percentage Exceedance 2016-17 (%)	1.74	9.45	5.60	9.51	7.87	5.63	56.16	79.77
Percentage Exceedance 2015-16 (%)	--	7.38	--	--	--	--	16.67	42.26

Carbon Monoxide concentrations were recorded at 8 CAAQMS as enlisted in Table No. 13 and graphically depicted in Figure No. 9. More than 1000 observations for 8 hourly averages have been recorded across all the stations.

As seen in Figure No. 9, Solapur and Pune cities have recorded more than 79% and 56% of the observations which violated the eight hourly ($2\text{mg}/\text{m}^3$) standards. Both these cities have recorded an increase in CO concentrations as well as the exceedance violations as compared to 2015-16 where Solapur and Pune recorded 42.26% and 16.67% exceedance. The highest 8 hourly concentration of CO recorded at Solapur and Pune were $9.5\text{ mg}/\text{m}^3$ and $8.6\text{ mg}/\text{m}^3$ in the winter months of February and November respectively.

This is followed by the regions of Dombivali, Bandra and Nagpur which have recorded around 8-10% of the observations which exceeded the 8 hourly standards. The exceedance has been majorly in the winter season.

The CAAQMS at Chandrapur and Aurangabad reported percentage exceedance for less than 6% and 2% of the observations for CO concentrations for the year 2016-17. These two regions were amongst the cleanest for CO pollution. While the regions of Solapur and Pune need further investigation and strategic planning to help curb the CO levels.

Air Quality Index

Air Quality Index (AQI) is a tool for effective communication on the status of the air quality to people. AQI transforms complex air quality data of various pollutants into a single index value, which are easy to understand. The categories of the AQI usually are expressed in terms of the air quality being Good, Bad, Poor or Very Poor based on the concentrations of various pollutants and their health impacts at various concentrations. The AQI is useful for reporting daily air quality and to gauge the pollution load. Most of the AQI developed by various agencies are within a range of 0 to 500 and higher value of AQI indicates high level of pollution. Depending upon 'doses of exposure' AQI is further divided into different classes of AQI, which present different health concerns. To make it easy to understand, the categories of AQI are assigned color codes. Various international environmental agencies such as US-EPA have developed their own set of mathematical algorithms to determine AQI, which are based on human exposure dose of air pollutants.

In order to develop a calculation of AQI specific to India, CPCB in consultation with IIT (Indian Institute of Technology) Kanpur, devised an AQI system after conducting a literature review, understanding the air quality monitoring procedures and protocols, INAQS (Indian National Air Quality Standards), and dose-response relationships of pollutants. In October 2014 CPCB published the report titled National Air Quality Index²² and has elaborated the procedure of calculation and the subsequent categories of the AQI. There are six AQI categories, namely 'Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe' associated to various health adversaries (Table No. 14).

Table No. 14: Health advisories for various range of Air Quality Indices and respective colour

AQI	AQI Associated Health Impacts
Good (0–50)	Minimal Impact.
Satisfactory (51–100)	Minor breathing discomfort to sensitive people.
Moderate (101–200)	Breathing discomfort to the people with lung disease such as asthma and discomfort to people with heart disease, children and older adults.
Poor (201–300)	Breathing discomfort to people on prolonged exposure and discomfort to people with heart disease.
Very Poor (301–400)	Respiratory illness to the people on prolonged exposure specially in people with lung and heart diseases.
Severe (401-500)	Respiratory effects even on healthy people and serious health impacts on people with lung/heart diseases. The health impacts may be experienced even during light physical activity.

codes

²² CPCB 2014, [National Air Quality Index](#), Central Pollution Control Board, Ministry of Environment & Climate Change, Government of India

Calculation of AQI

Each of these categories is decided based on ambient concentration values of air pollutants and their likely health impacts (known as health breakpoints). AQ sub-index and health breakpoints are evolved for eight pollutants (PM₁₀, PM_{2.5}, NO₂, SO₂, CO, O₃, NH₃, and Pb) for which short-term (upto 24-hours) NAAQS are prescribed. Based on the measured ambient concentrations of a pollutant, sub-index is calculated, which is a linear function of concentration (e.g. the sub-index for PM_{2.5} will be 51 at concentration 31µg/m³, 100 at concentration 60µg/m³, and 75 at concentration of 45µg/m³). The worst sub-index determines the overall AQI. The sub-indices for individual pollutants at a monitoring location are calculated using its 24-hourly average concentration value (8-hourly in case of CO and O₃) and health breakpoint concentration range (Table No. 15).

The worst sub-index is the AQI for that location. All the eight pollutants may not be monitored at all the locations. Overall AQI is calculated only if data are available for minimum three pollutants out of which one should necessarily be either PM_{2.5} or PM₁₀. Else, data are considered insufficient for calculating AQI. Similarly, a minimum of 16 hours' data is considered necessary for calculating sub index. The sub-indices for monitored pollutants are calculated and disseminated, even if data are inadequate for determining AQI. The Individual pollutant-wise sub-index will provide air quality status for that pollutant.

Table No. 15: Sub-index and breakpoint pollutant concentration for Indian Air Quality Index

AQI Category (Range)	PM10 24-hr	PM2.5 24-hr	NO2 24-hr	O3 8-hr	CO 8-hr (mg/m ³)	SO2 24-hr	NH3 24-hr	Pb 24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5 – 1.0
Moderate (101-200)	101-250	61-90	81-180	101-168	2.1- 10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800	3.1-3.5
Severe (401-500)	430 +	250+	400+	748+*	34+	1600+	1800+	3.5+

$$I = \frac{(I_{High} - I_{low})}{(C_{high} - C_{low})} * (C - C_{low}) + I_{low}$$

where: I = the (Air Quality) index
 C = the pollutant concentration
 C_{low} = the concentration breakpoint that is $\leq C$
 C_{high} = the concentration breakpoint that is $\geq C$
 I_{low} = the index breakpoint corresponding to C_{low}
 I_{high} = the index breakpoint corresponding to C_{high}

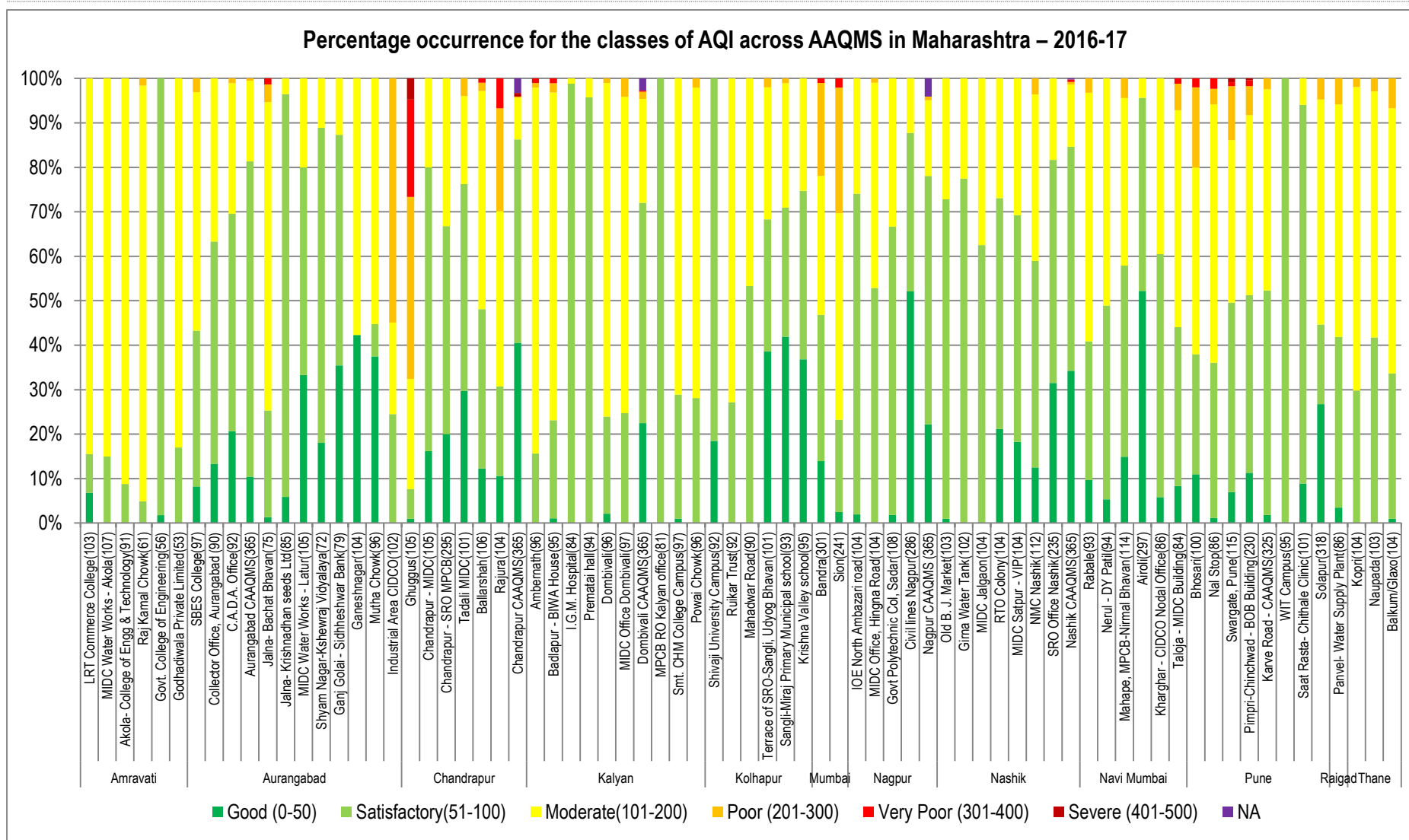


Figure No. 10: Percentage occurrence for the classes of AQI across AAQMS in Maharashtra – 2016-17

An overview of the AQI for the reading recorded by the AAQMS in Maharashtra has been calculated using three parameters viz, SO₂, NO_x and RSPM as per the calculation and AQI categories released by CPCB and IIT Kanpur in October 2014. After determining the sub-indices for a region the highest sub-index from that AAQMS has been considered as the AQI for the area represented by that AAQMS. [Annex-3](#) presents the occurrence of a respective category of AQI out of the total observations recorded at that AAQMS in 2016-17.

In the year 2016-17, 10,051 observations were recorded across 74 active AAQMS in Maharashtra representing 25 cities. As shown in Figure No. 11, it is interesting to note that around 60% (6074) daily observations were in 'Good' and 'Satisfactory' category as against the share of 55% in the last year. Thus recording an improvement in terms of non-polluted days in Maharashtra. The share of 'Moderate' (35%) and 'Poor' (4%) air quality days also recorded a decrease as compared to last year share of 44% and 5% respectively. In terms of polluted categories less than 2% of the observations days were categorised as 'Very Poor' and 'Severe' air quality days.

In the Amravati region, the AAQMS at Govt College of Engineering in Amravati city recorded more than 96% of the observations in 'Good' & 'Satisfactory' category, while the Raj kamal chowk AAQMS in the same city recorded the minimum observation days in these categories. The latter recorded more than 90% of the observations in 'Moderate' air quality.

In Aurangabad city, atleast 40% of the observation days were categorized in 'Good' & 'Satisfactory' across all the 4 stations representing different types of areas (industrial and residential). With more than 80% of the observation days categorised either 'Good' or 'Satisfactory', the CAAQMS installed at Waluj MIDC recorded the best AQI in and around Aurangabad city. Similarly, in Jalna city in Aurangabad RO, the industrial area AAQMS at Krishidhan seeds, recorded more than 90% of the observation days with 'Good' and 'Satisfactory' AQI, while the one at Bachat Bhavan representing residential area recorded less than 30% in the same category and majorly reported AQI in 'Moderate' category.

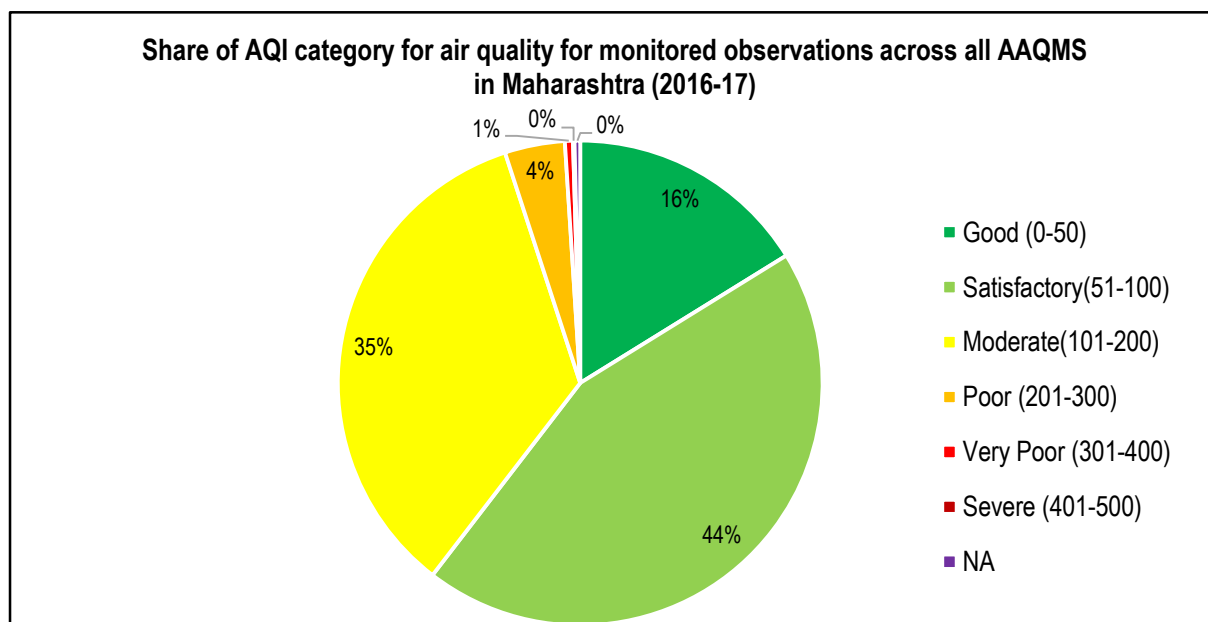


Figure No. 11: Share of AQI category for air quality for monitored observations across all AAQMS in Maharashtra (2016-17)

Note: Since the values have been rounded up some values may appear as zero.

Latur city registered more than 80% of the observation days as non-polluted while in Nanded city more than 50% of the observation days were in 'Moderate' category of AQI as per readings recorded at Ganeshnagar and Mutha Chowk AAQMS. The AAQMS at Industrial area CIDCO recorded around 102 observations out of which more than 55% of the observations days recorded air quality with 'Poor' air quality index.

In Chandrapur area, 3 out of 7 AAQMS, namely Chandrapur MIDC, Tadali MIDC and Chandrapur CAAQMS reported more than 70% of the observations in either 'Good' or 'Satisfactory' category. The sites at Rajura and Ballarshah recorded less than 50% of the observations days as non-polluted with the AAQMS at Rajura recording more than 25% observations in 'Poor' category. The AAQMS of Major concern in Chandrapur area is the site at Ghuggus which reported mere 5% of the observations as non-polluted while around 25% of the days were in 'Very Poor' and 'Severe' category. The majority of the days around this site had an AQI of 'Moderate' air quality.

In the Kalyan region, Ambernath, Badlapur, Dombivali and Ulhasnagar areas recorded more than 80% of the observation days in 'Moderate', 'Poor' and 'Very Poor' category. Only Bhiwandi and Kalyan areas recorded more than 95% of the observation days in either 'Good' or 'Satisfactory' category.

Sangli town of Kolhapur RO, recorded atleast 70% of the observation days as 'Good' and 'Satisfactory' while the AQI of Kolhapur city at Ruikar trust and Mahadwar road AAQMS was recorded to be 'Moderate' for majority, >70% & >45% of the observation days. The only site, which recorded all the observation days in 'Good' and 'Satisfactory' category was the AAQMS at Shivaji University, which is also regarded as a control site for the region.

In the Nagpur and Nashik regions the AQI recorded was fairly in the 'Good and 'Satisfactory' category and all the stations recorded atleast 60% of the observations days in either of these categories. The only exception being MIDC Hingna AAQMS which reported 55% of the observations in the above category. The Nashik CAAQMS reported about 5 days of Air quality in 'Poor' and 'Very poor' categories.

The Bandra and Sion AAQMS also reported 20 and 30% of the observation days in 'Poor' category while around 30% and 45% of the days were in 'Moderate' category respectively. As against this the city of Navi Mumbai recorded AQI in 'Good and 'Satisfactory' in the range of 40% to 60% of the observation days across all the AAQMS. More than 95% of the observations from the Airoli AAQMS of Navi Mumbai region registered under the 'Good' and 'Satisfactory' category.

The Pune regional office comprises of the cities of Pune, Pimpri-Chinchwad and Solapur. Out of the 8 AAQMS in these cities. The city of Pimpri (Pimpri-Chinchwad BOB & Bhosari) registered less than 50% of the observation days in 'Good and 'Satisfactory' and the AAQMS at Bhosari recorded around 20% of observation days in 'Poor' and 'Very Poor' category. Similarly in Pune city mere 50% of the observation days were recorded as non-polluted ('Good & 'Satisfactory'). Two sites in Solapur city recorded more than 95% in 'Good and 'Satisfactory' category except for the CAAQMS at Solapur which reported only around 45% of the observation days as 'Good and 'Satisfactory'.

Thane and Panvel city too reported less than 40% of the observation days with 'Good and 'Satisfactory' AQI and majorly the quality of air was in 'Moderate' category.

Conclusion

RSPM (PM₁₀) pollution has always been a concern for Maharashtra state out of the 3 criteria pollutants. This year all the AAQMS, except for the AAQMS at Airoli-Navi Mumbai, violated the annual NAAQS (60µg/m³). RSPM is recorded high at AAQMS of Ghuggus .Out of total observations (105), 41% recorded under Poor category, 22% under Very Poor and 5 % of total observations under Severe category. This is followed by AAQMS at Rajura (23%:Poor category, 7% :Very Poor out of total 104 observations), Sion(26% in Poor category, 2% under Very Poor out of total 241 observations).

The high concentration of RSPM maybe be attributed to emission from industries, construction sector, road dust re-suspension due to vehicular movement, vehicular emissions, quarrying and mining activities in the region. Appropriate operation and maintenance practices at mines and quarry sites like use of water mists, wind screens, low dump sites, Construction of even and smooth roads, appropriate sweeping of roads and strict norms for construction sector should be regulated to minimize the dispersion of RSPM in the air. As per WHO (World Health Organization²³) in estimated 3% of cardiopulmonary and 5% of lung cancer death, globally, are attributed to PM pollution. Hence the population residing at the above regions are highly prone to lung and respiratory disorders. Susceptible groups with pre-existing lung or heart disease, as well as elderly people and children, are particularly vulnerable.

The NO_x concentration was observed to exceed at around 31 out of 74 AAQMS, primarily in the areas of Kalyan, Pune, Mumbai and Thane as majority of the AAQMS in these cities violated the annual NO_x standards (40 µg/m³). While the cities of Akola, Kolhapur, Jalgaon and Solapur were in the border line category. Practicing and implementation of appropriate vehicular norms and ease of traffic congestion is highly desired in the cities which exceeded the NO_x standards. Appropriate traffic management and strict adherence to traffic rules may also help in reducing the traffic congestion, idling time and help in reducing NO_x concentrations in those areas.

The state of Maharashtra was recorded to be relatively clean for SO₂ pollution. However the AAQMS at Nanded (Industrial Area CIDCO) may need further investigation to identify the source of SO₂ pollution. This area was recorded to be the most polluted area across Maharashtra for all the three criteria pollutants and recorded annual average of SO₂ (78µg/m³), NO_x (79µg/m³) and RSPM (156µg/m³) almost twice the respective standards.

²³ http://www.euro.who.int/__data/assets/pdf_file/0006/189051/Health-effects-of-particulate-matter-final-Eng.pdf

Annex – 1: List of Active AAQMS in 2016-17

MPCB RO	Region/City/Area	Station code	Station name	Type	Program
Amravati	Akola	700	LRT Commerce College	Residential	NAMP
		701	MIDC Water Works - Akola	Industrial	NAMP
		702	Akola- College of Engg & Technology	Commercial	NAMP
	Amravati	547	Raj Kamal Chowk	Rural and other areas	NAMP
		548	Govt. College of Engineering	Residential	NAMP
		549	Godhadiwala Private Limited	Industrial	NAMP
Aurangabad	Aurangabad	511	SBES College	Residential	NAMP
		512	Collector Office, Aurangabad	Residential	NAMP
		513	C.A.D.A. Office	Residential	NAMP
			Aurangabad CAAQMS		CAAQMS
	Jalna	706	Jalna- Bachat Bhavan	Residential	NAMP
		707	Jalna- Krishnadhan seeds Ltd	Industrial	NAMP
	Latur	641	MIDC Water Works - Latur	Industrial	NAMP
		642	Shyam Nagar-Kshewraj Vidyalaya	Residential	NAMP
		643	Ganj Golai - Sidhshwar Bank	Rural and other areas	NAMP
	Nanded	703	Ganeshnagar	Residential	NAMP
		704	Mutha Chowk	Commercial	NAMP
		705	Industrial Area CIDCO	Industrial	NAMP

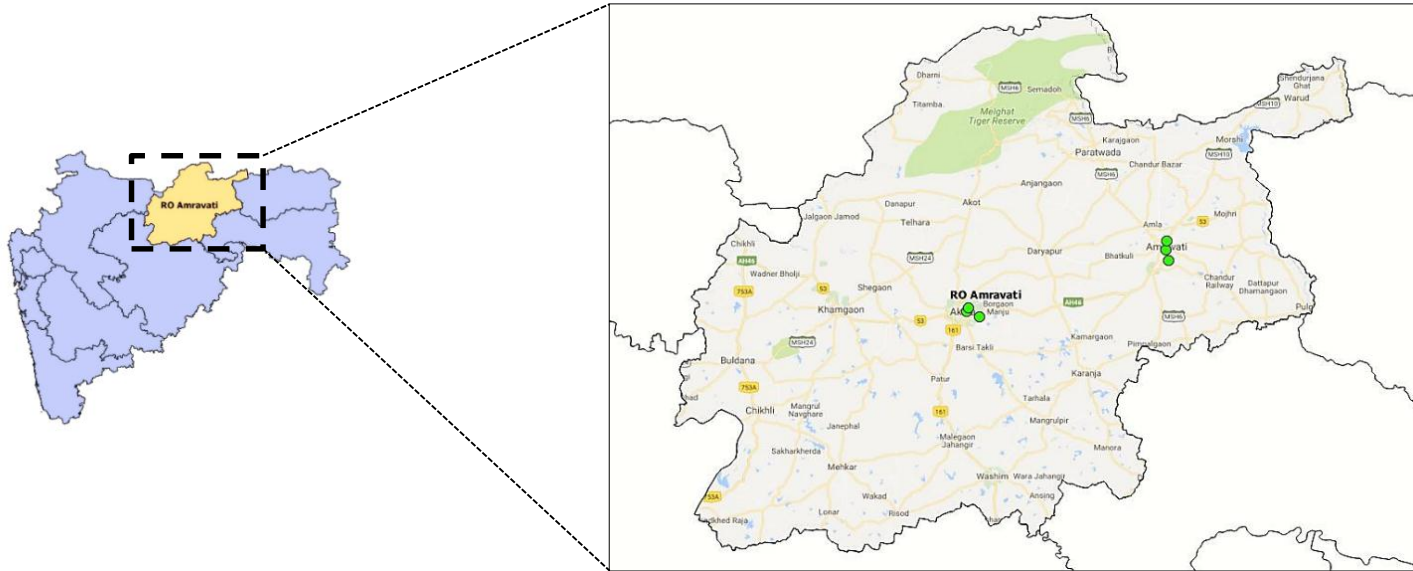
MPCB RO	Region/City/Area	Station code	Station name	Type	Program
Chandrapur	Chandrapur	267	Ghuggus	Residential	NAMP
		281	Chandrapur - MIDC	Industrial	NAMP
		396	Chandrapur - SRO MPCB	Residential	NAMP
		638	Tadali MIDC	Industrial	NAMP
		639	Ballarshah	Residential	NAMP
		640	Rajura	Industrial	NAMP
			Chandrapur CAAQMS		CAAQMS
Kalyan	Ambernath	445	Ambernath	Rural and other areas	NAMP
	Badlapur	649	Badlapur - BIWA House	Rural and other areas	NAMP
	Bhiwandi	-	I.G.M. Hospital	Rural and other areas	SAMP
		-	Prematai hall	Rural and other areas	SAMP
	Dombivali	265	Dombivali	Industrial	NAMP
		-	MIDC Office Dombivali	Rural and other areas	SAMP
			Dombivali CAAQMS		CAAQMS
	Kalyan	-	MPCB RO Kalyan office	Rural and other areas	SAMP
	Ulhasnagar	647	Smt. CHM College Campus	Rural and other areas	NAMP
		648	Powai Chowk	Rural and other areas	NAMP
Kolhapur	Kolhapur	508	Shivaji University Campus	Residential	NAMP
		509	Ruikar Trust	Rural and other areas	NAMP
		510	Mahadwar Road	Residential	NAMP

MPCB RO	Region/City/Area	Station code	Station name	Type	Program
	Sangli	574	Terrace of SRO-Sangli, Udyog Bhavan	Residential	NAMP
		575	Sangli-Miraj Primary Municipal school	Rural and other areas	NAMP
		576	Krishna Valley school	Industrial	NAMP
Mumbai	Mumbai	-	Bandra	Residential	CAAQMS
		-	Sion	Residential	CAAQMS
Nagpur	Nagpur	287	IOE North Ambazari road	Residential	NAMP
		288	MIDC Office, Hingna Road	Industrial	NAMP
		314	Govt Polytechnic Col, Sadar	Rural and other areas	NAMP
		711	Civil lines Nagpur	Residential	NAMP
			Nagpur CAAQMS		CAAQMS
Nashik	Jalgaon	644	Old B. J. Market	Residential	NAMP
		645	Girna Water Tank	Residential	NAMP
		646	MIDC Jalgaon	Industrial	NAMP
	Nashik	259	RTO Colony	Residential	NAMP
		269	MIDC Satpur - VIP	Industrial	NAMP
		280	NMC Nashik	Residential	NAMP
		710	SRO Office Nashik	Residential	NAMP
			Nashik CAAQMS		CAAQMS
Navi Mumbai	Navi Mumbai	491	Rabale	Industrial	NAMP
		492	Nerul - DY Patil	Residential	NAMP

MPCB RO	Region/City/Area	Station code	Station name	Type	Program
		493	Mahape, MPCB-Nirmal Bhavan	Industrial	NAMP
		-	Airoli	Rural and other areas	CAAQMS
	Taloja	494	Kharghar - CIDCO Nodal Office	Residential	NAMP
		496	Taloja - MIDC Building	Industrial	NAMP
Pune	Pune	312	Bhosari	Industrial	NAMP
		379	Nal Stop	Rural and other areas	NAMP
		381	Swargate, Pune	Residential	NAMP
		708	Pimpri-Chinchwad - BOB Building	Residential	NAMP
		-	Karve Road - CAAQMS	Residential	CAAQMS
	Solapur	299	WIT Campus	Residential	NAMP
		300	Saat Rasta- Chithale Clinic	Residential	NAMP
		0	Solapur	Residential	CAAQMS
Raigad	Panvel	495	Panvel- Water Supply Plant	Residential	NAMP
Thane	Thane	303	Kopri	Residential	NAMP
		304	Naupada	Rural and other areas	NAMP
		305	Balkum/Glaxo	Industrial	NAMP

Annex – 2: RO wise data recorded by AAQMS in Maharashtra 2016-17

RO – Amravati



Region	Station code	Station name	Program	Latitude	Longitude
Akola	700	LRT Commerce College	NAMP	20° 42' 26.06"N	77° 0' 38.07"E
	701	MIDC Water Works - Akola	NAMP	20° 41' 17.50"N	77° 3'31.06"E
	702	Akola- College of Engg & Technology	NAMP	20° 43' 11.34"N	77° 01' 4.16"E
Amravati	547	Raj Kamal Chowk	NAMP	20° 55' 44.94"N	77° 45' 8.71"E
	548	Govt. College of Engineering	NAMP	20° 57' 32.73"N	77° 45' 18.52"E
	549	Godhadiwala Private Limited	NAMP	20° 53' 24.51"N	77° 45' 48.37"E

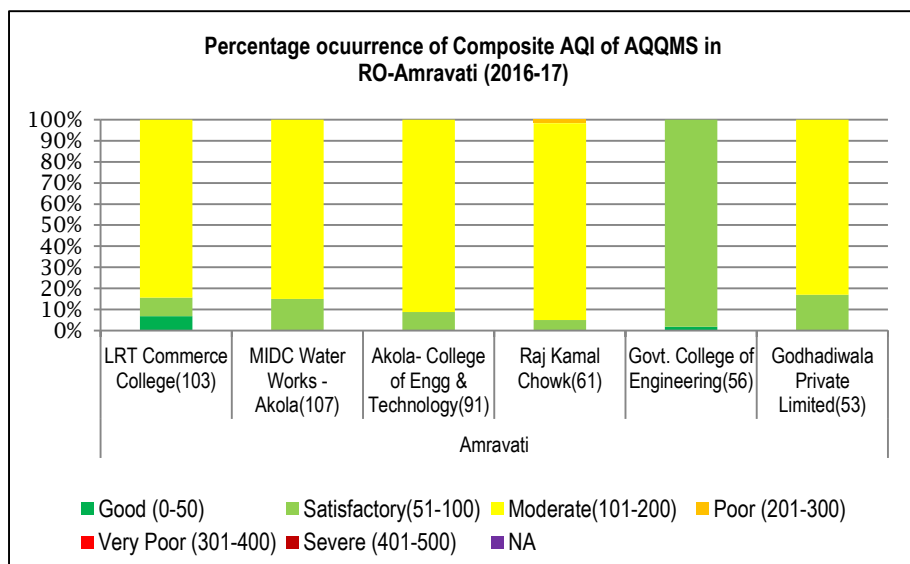
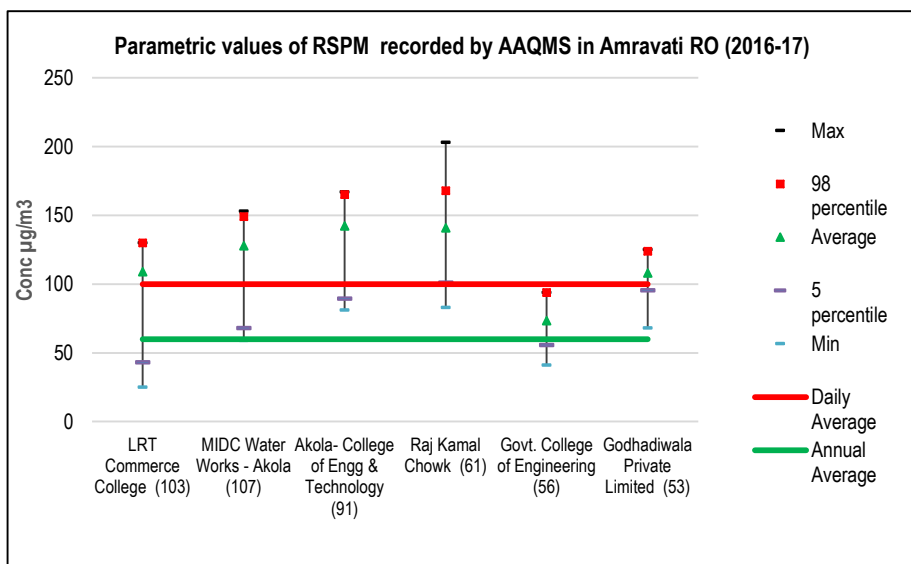
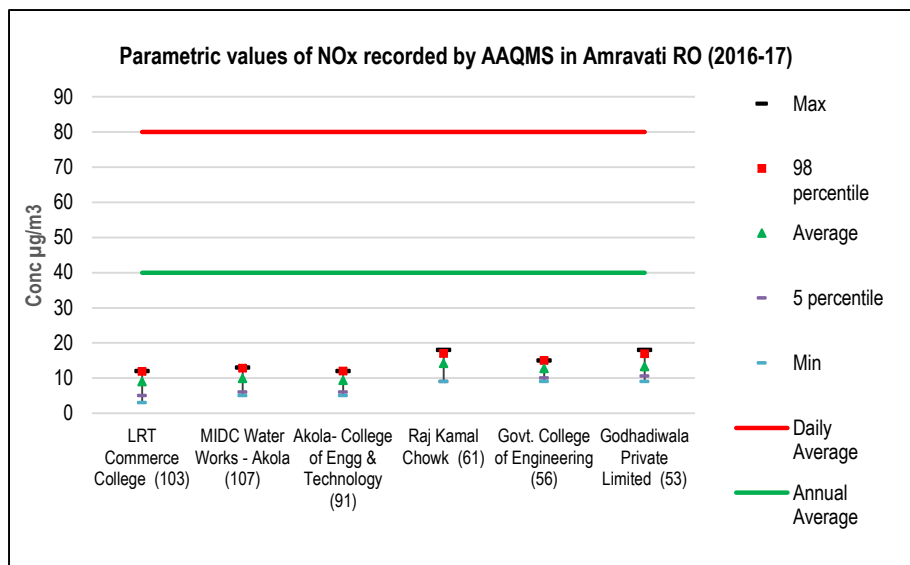
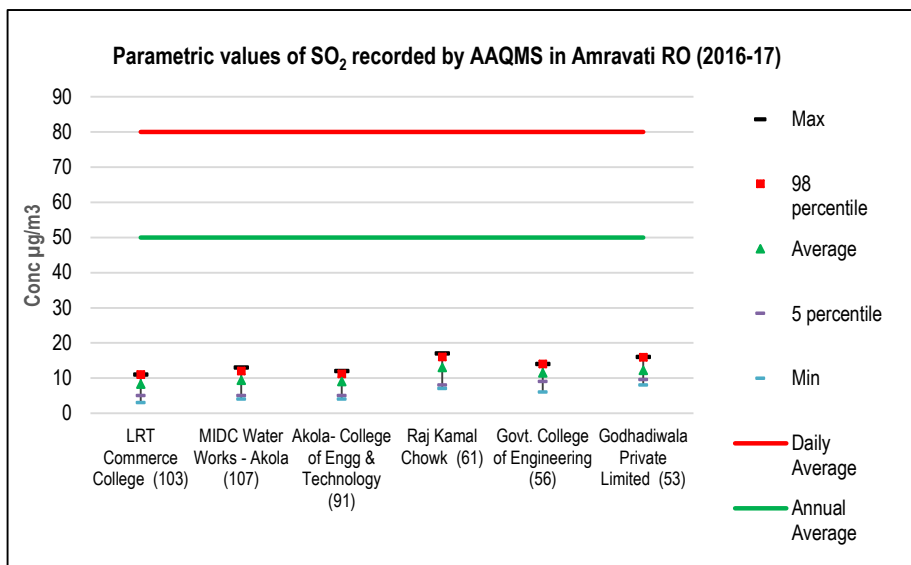


Table No. 16: Data for SO₂, NO_x & RSPM recorded at AAQMS in Amravati RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	80		50	80	
	LRT Commerce College (103)	11	11	8	5	3
	MIDC Water Works - Akola (107)	13	12	9	5	4
	Akola- College of Engg & Technology (91)	12	11	9	5	4
	Raj Kamal Chowk (61)	17	16	13	8	7
	Govt. College of Engineering (56)	14	14	11	9	6
	Godhadiwala Private Limited (53)	16	16	12	10	8
NO _x	<i>CPCB Standard</i>	80		40	80	
	LRT Commerce College (103)	12	12	9	5	3
	MIDC Water Works - Akola (107)	13	13	10	6	5
	Akola- College of Engg & Technology (91)	12	12	9	6	5
	Raj Kamal Chowk (61)	18	17	14	9	9
	Govt. College of Engineering (56)	15	15	13	10	9
	Godhadiwala Private Limited (53)	18	17	13	11	9
RSPM (PM ₁₀)	<i>CPCB Standard</i>	100		60	100	
	LRT Commerce College (103)	130	130	109	43	25
	MIDC Water Works - Akola (107)	153	149	128	68	59
	Akola- College of Engg & Technology (91)	167	165	142	90	81
	Raj Kamal Chowk (61)	203	168	141	101	83
	Govt. College of Engineering (56)	94	94	73	56	41
	Godhadiwala Private Limited (53)	125	124	108	96	68

Akola – LRT Commerce College

Table No. 17: Data for Monthly average reading recorded at LRT Commerce College. - Akola

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
LRT Commerce College	2016	Apr	8	9	121
		May	10	11	123
		Jun	10	11	121
		Jul	5	6	45
		Aug	6	6	50
		Sep	7	8	109
		Oct	7	8	110
		Nov	9	10	120
		Dec	10	10	127
	2017	Jan	10	11	126
		Feb	9	10	123
		Mar	9	9	122

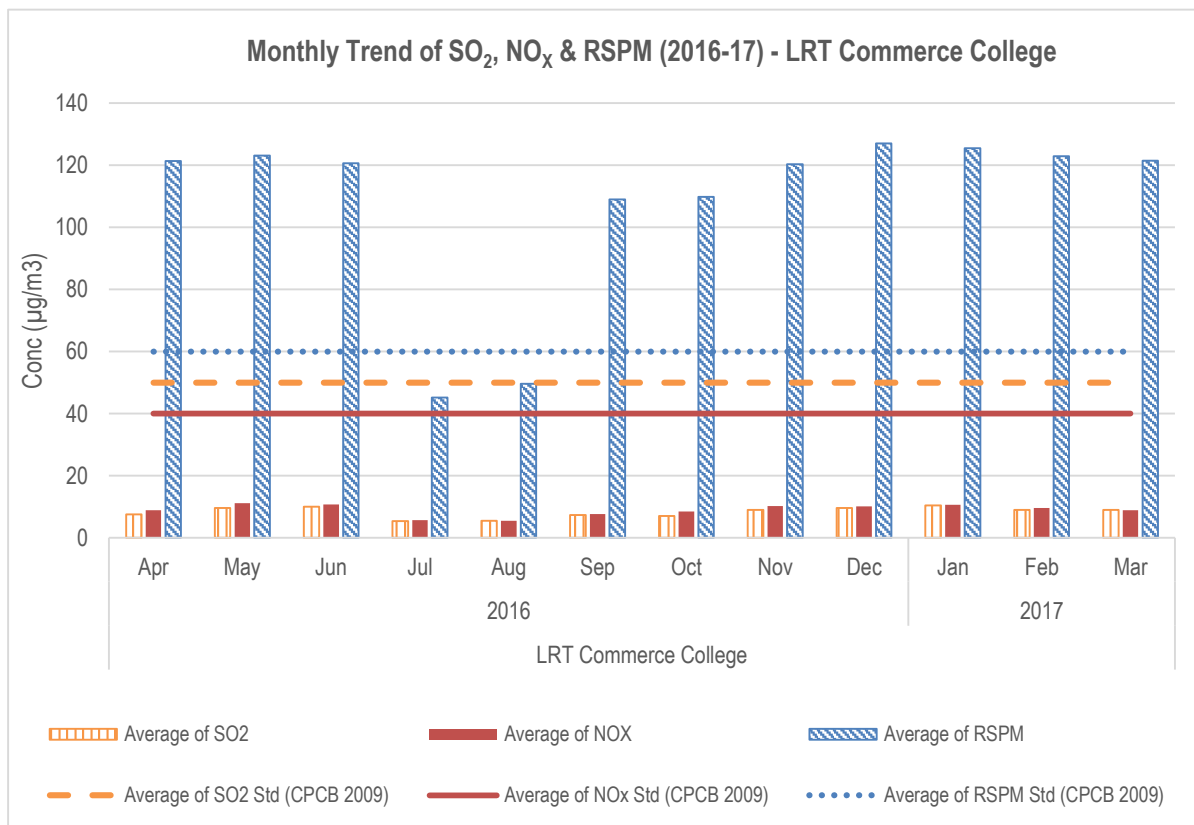


Figure No. 12: Monthly average reading recorded at LRT Commerce College. – Akola

Table No. 18: Data for Annual average trend of SO₂, NO_x, and RSPM at LRT Commerce College. – Akola

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
LRT Commerce College	09-10	6	2	87
	10-11	6	3	107
	11-12	7	7	125
	12-13	8	8	126
	13-14	7	3	122
	14-15	7	3	117
	15-16	7	7	115
	16-17	8	9	109

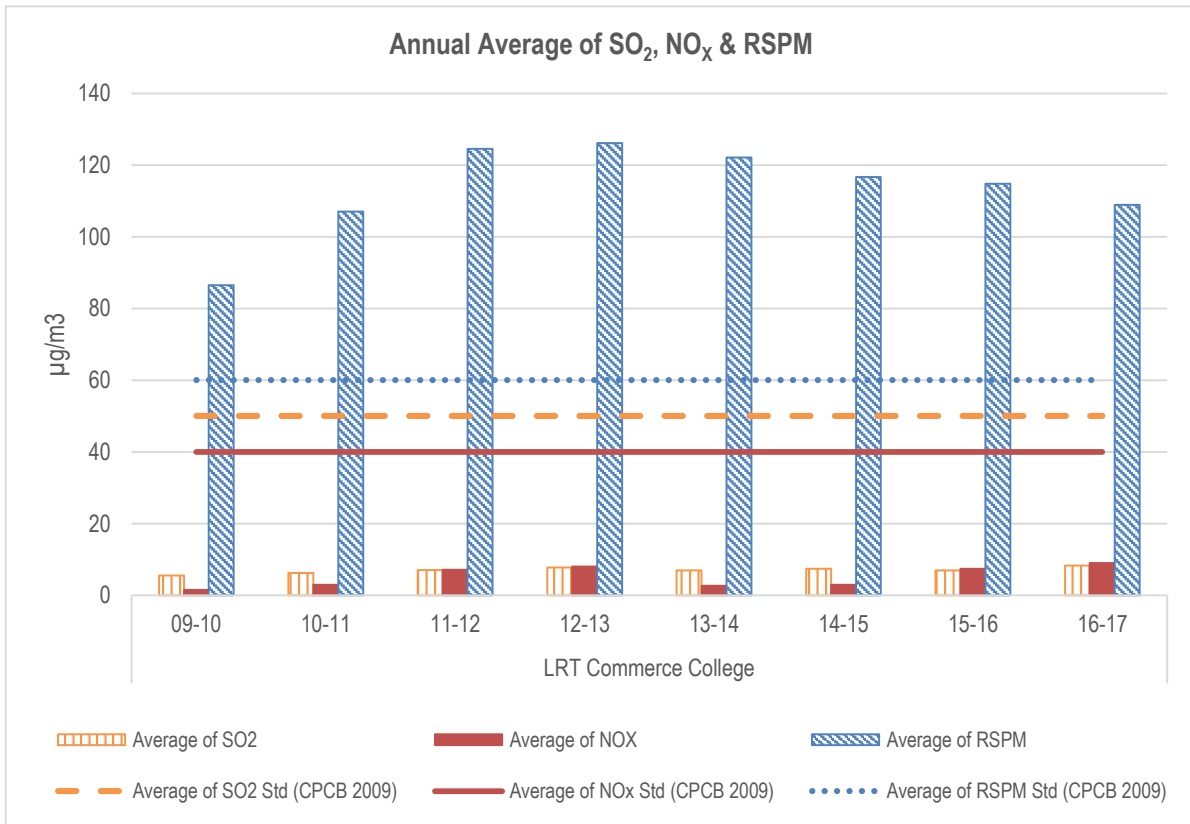


Figure No. 13: Annual average trend of SO₂, NO_x, and RSPM at LRT Commerce College. – Akola

Akola -MIDC Water Works

Table No. 19: Data for Monthly average reading recorded at MIDC Water works.-Akola

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
MIDC Water Works - Akola	2016	Apr	10	12	135
		May	11	12	137
		Jun	11	11	138
		Jul	5	6	70
		Aug	6	7	83
		Sep	7	7	116
		Oct	9	11	135
		Nov	10	11	141
		Dec	11	11	146
	2017	Jan	11	11	143
		Feb	11	10	139
		Mar	10	10	134

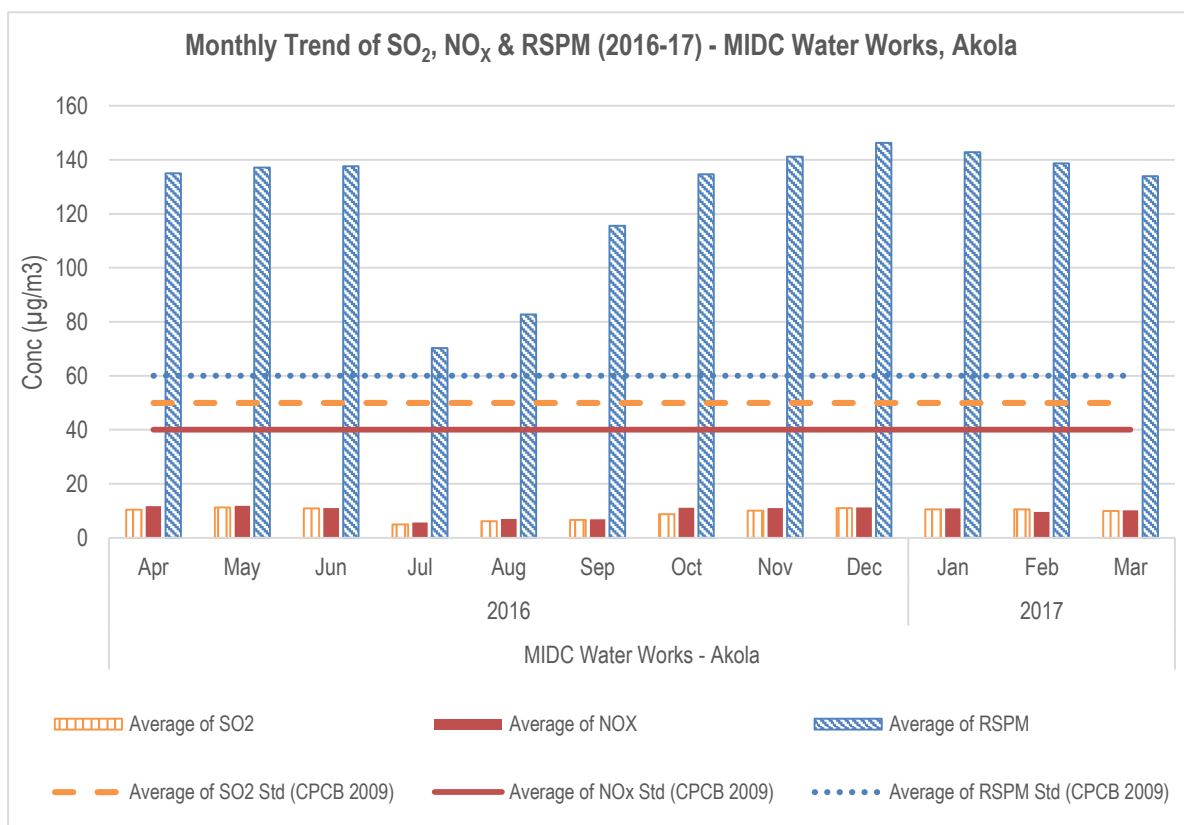


Figure No. 14: Monthly average reading recorded at MIDC Water works.-Akola

Table No. 20: Data for Annual average trend of SO₂, NO_x, and RSPM at MIDC Water works.-Akola

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
MIDC Water Works - Akola	09-10	8	10	88
	10-11	9	7	131
	11-12	10	11	141
	12-13	10	11	142
	13-14	9	7	136
	14-15	9	9	129
	15-16	7	12	106
	16-17	9	10	128

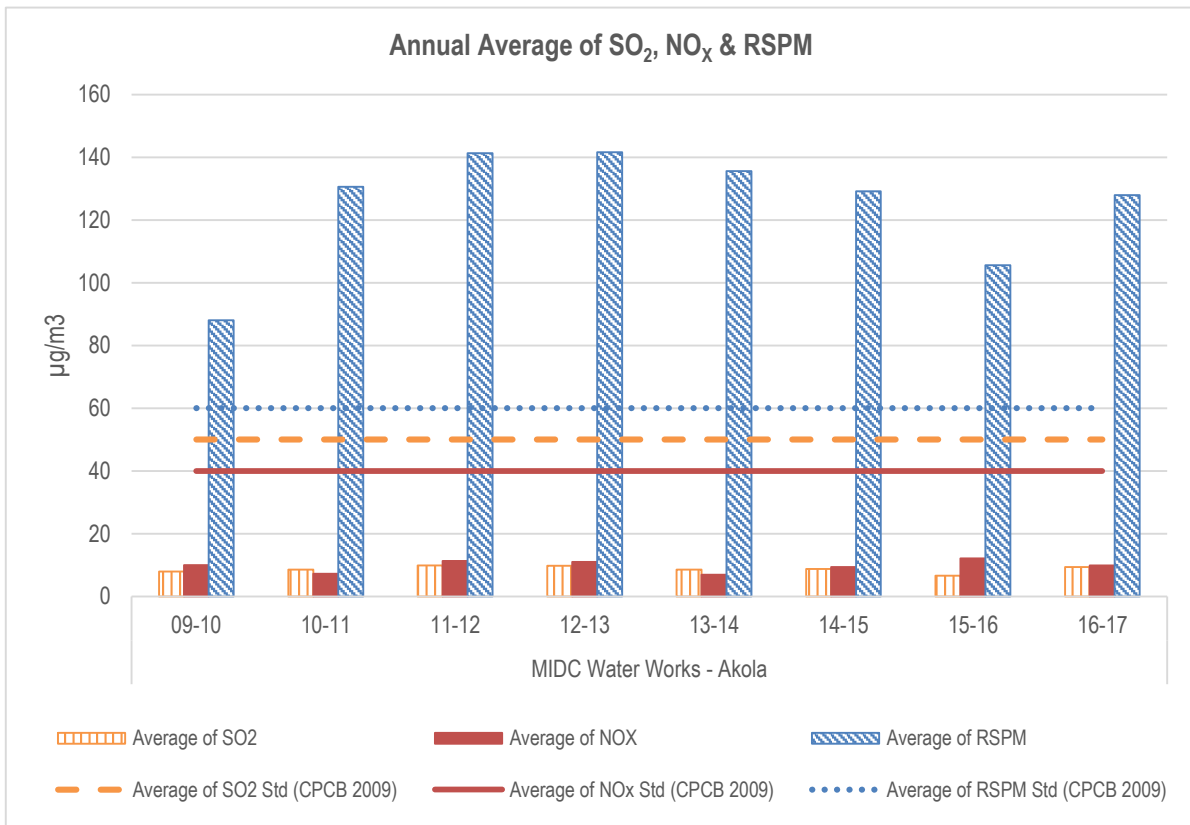


Figure No. 15: Annual average trend of SO₂, NO_x, and RSPM at MIDC Water works.-Akola

Akola - College of Engg & Technology

Table No. 21: Data for Monthly average reading recorded at College of Engg & Technology Akola (Architecture Branch)-Akola

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Akola- College of Engg & Technology	2016	Apr	9	10	149
		May	10	11	151
		Jun	10	11	148
		Jul	5	6	101
		Aug	5	7	89
		Sep	7	7	122
		Oct	7	8	143
		Nov	10	10	161
		Dec	11	11	162
	2017	Jan	11	11	156
		Feb	10	10	145
		Mar	9	10	140

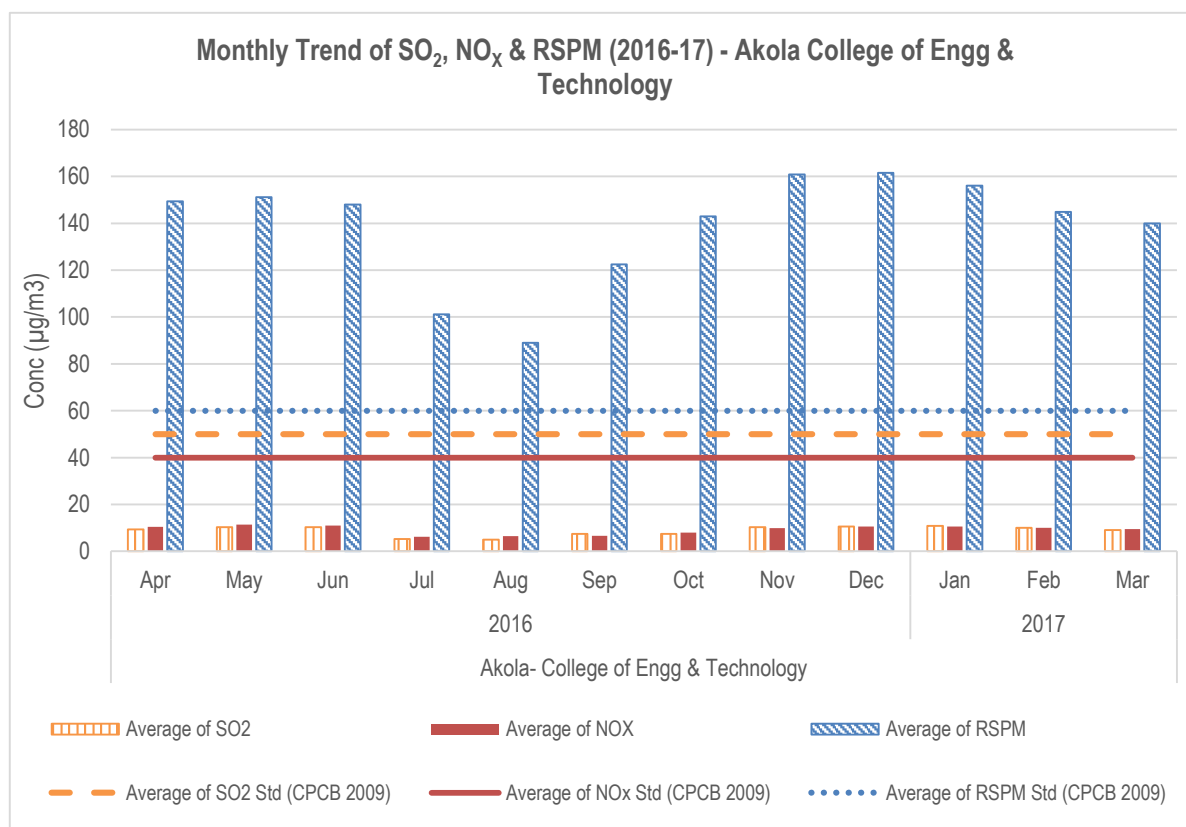


Figure No. 16: Monthly average reading recorded at College of Engg & Technology Akola (Architecture Branch)-Akola

Table No. 22: Data for Annual average trend of SO₂, NO_x, and RSPM at College of Engg & Technology Akola (Architecture Branch)-Akola

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Akola- College of Engg & Technology	09-10	6	2	117
	10-11	7	5	142
	11-12	9	9	150
	12-13	9	8	151
	13-14	8	6	149
	14-15	8	8	146
	15-16	8	9	139
	16-17	9	9	142

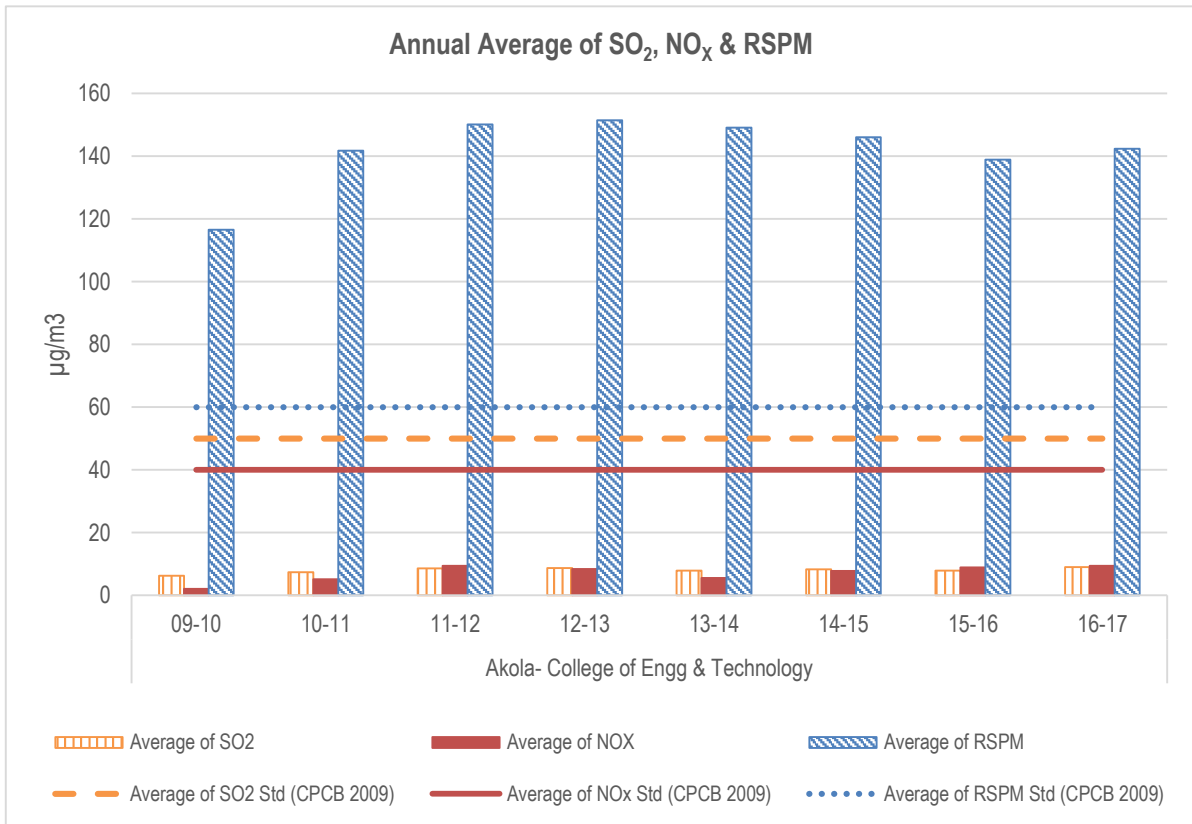


Figure No. 17: Annual average trend of SO₂, NO_x, and RSPM at College of Engg & Technology Akola (Architecture Branch)-Akola

Amravati - Raj Kamal Chowk

Table No. 23: Data for Monthly average reading recorded at Raj Kamal Chowk. -Amravati

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Raj Kamal Chowk	2016	Aug	12	13	127
		Oct	14	15	149
		Nov	13	15	143
		Dec	14	15	142
	2017	Jan	14	15	145
		Feb	13	14	136
		Mar	13	14	145

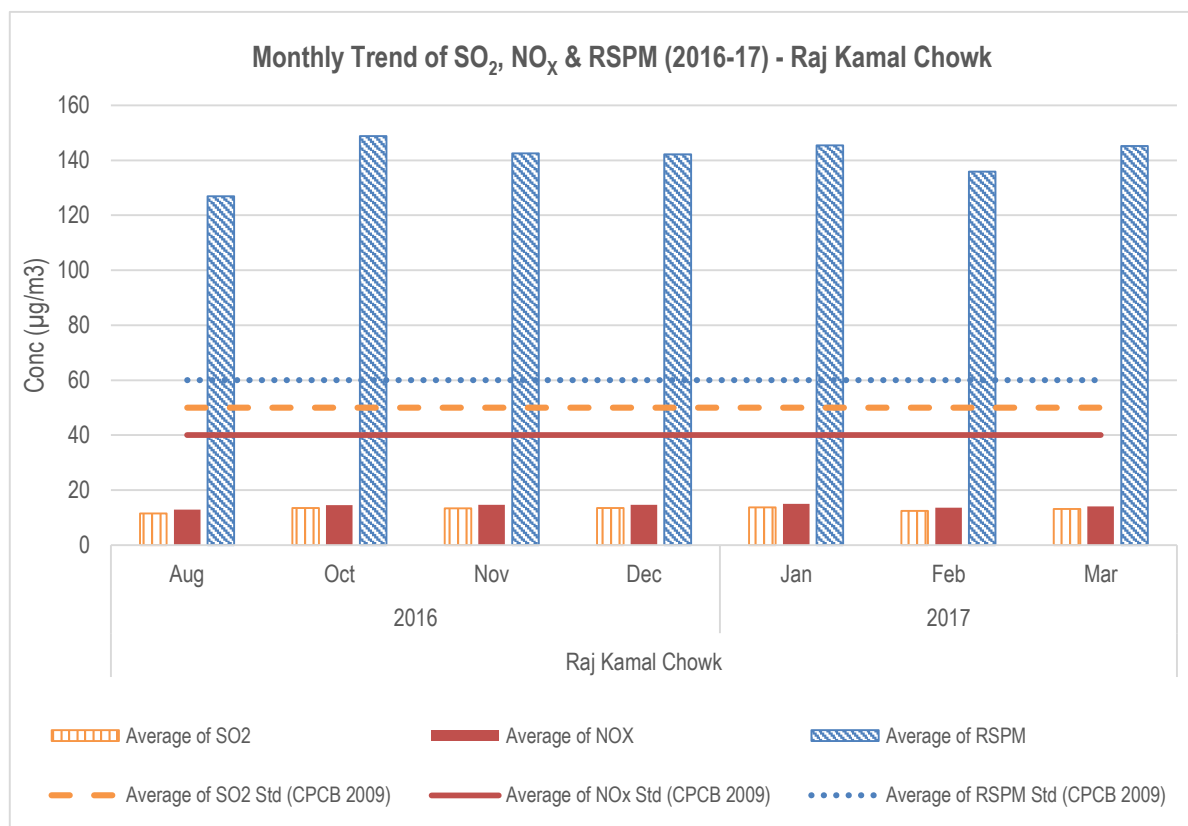


Figure No. 18: Monthly average reading recorded at Raj Kamal Chowk. -Amravati

Table No. 24: Data for Annual average trend of SO₂, NO_x, and RSPM at Raj Kamal Chowk. - Amravati

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Raj Kamal Chowk	06-07	13	19	79
	07-08	11	16	78
	08-09	12	15	100
	09-10	14	16	125
	10-11	13	15	146
	11-12	15	18	108
	12-13	12	13	109
	13-14	12	13	128
	14-15	12	14	133
	15-16	12	14	135
	16-17	13	14	141

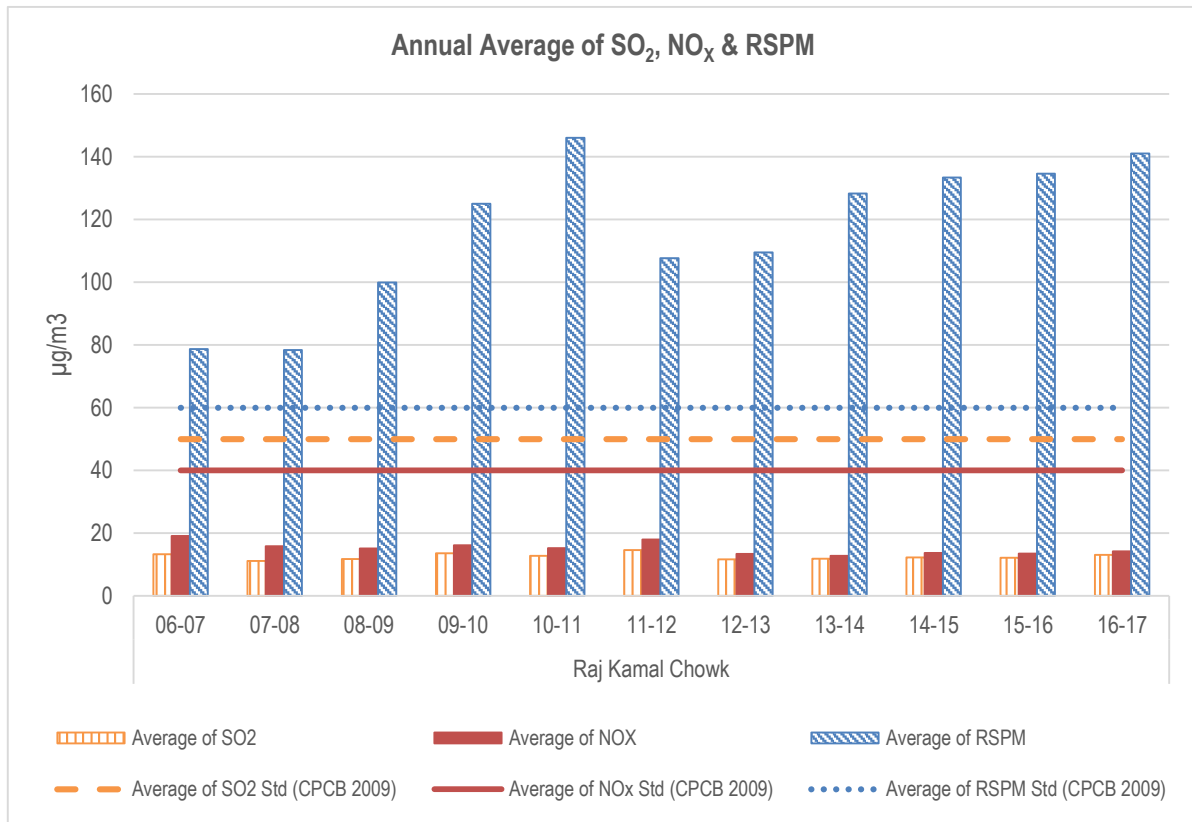


Figure No. 19: Annual average trend of SO₂, NO_x, and RSPM at Raj Kamal Chowk. -Amravati

Amravati - Govt. college of Engineering

Table No. 25: Data for Monthly average reading recorded at Govt. college of Engineering - Amravati

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Govt. College of Engineering	2016	Aug	11	13	65
		Oct	11	13	77
		Nov	12	13	71
		Dec	11	12	75
	2017	Jan	10	12	73
		Feb	12	13	77
		Mar	12	14	72

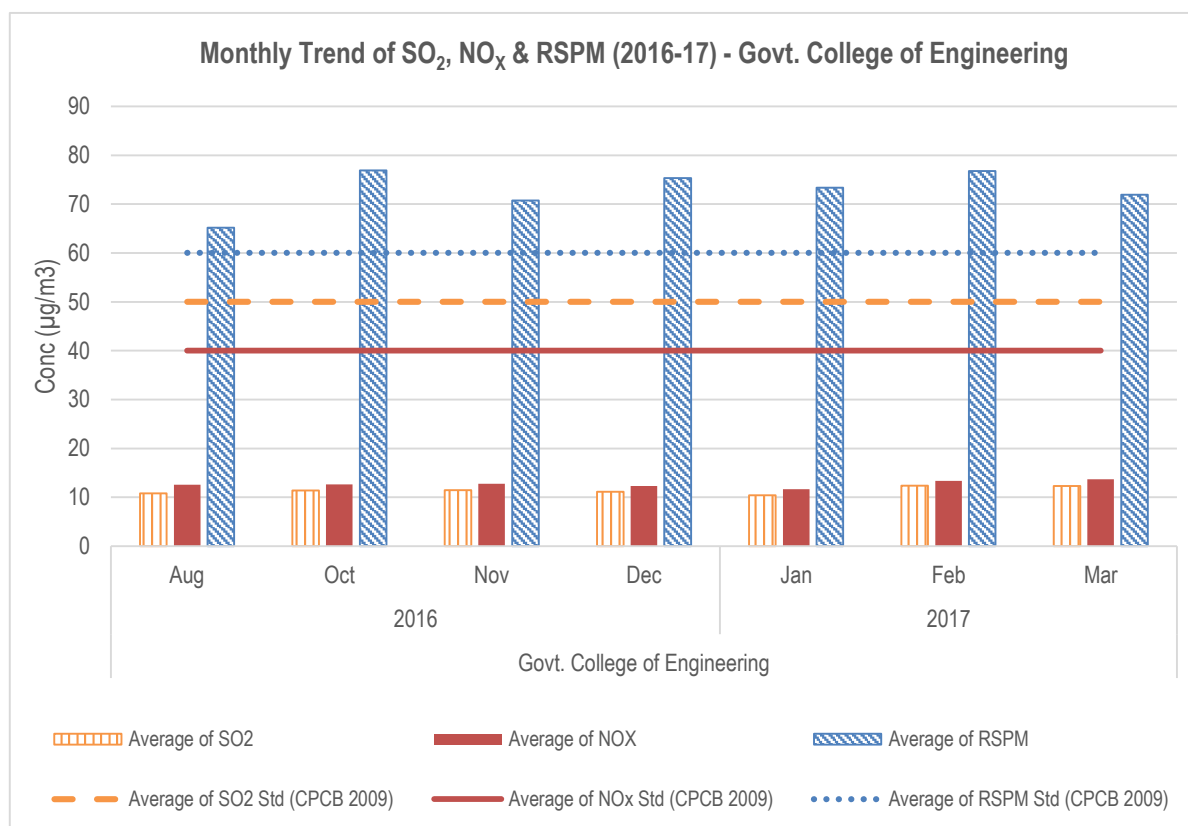


Figure No. 20: Monthly average reading recorded at Govt. college of Engineering - Amravati

Table No. 26: Data for Annual average trend of SO₂, NO_x, and RSPM at Govt. college of Engineering - Amravati

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Govt. College of Engineering	06-07	10	12	50
	07-08	8	8	40
	08-09	8	10	47
	09-10	10	12	78
	10-11	10	13	79
	11-12	10	12	79
	12-13	11	12	80
	13-14	10	12	80
	14-15	11	12	75
	15-16	11	12	73
	16-17	11	13	73

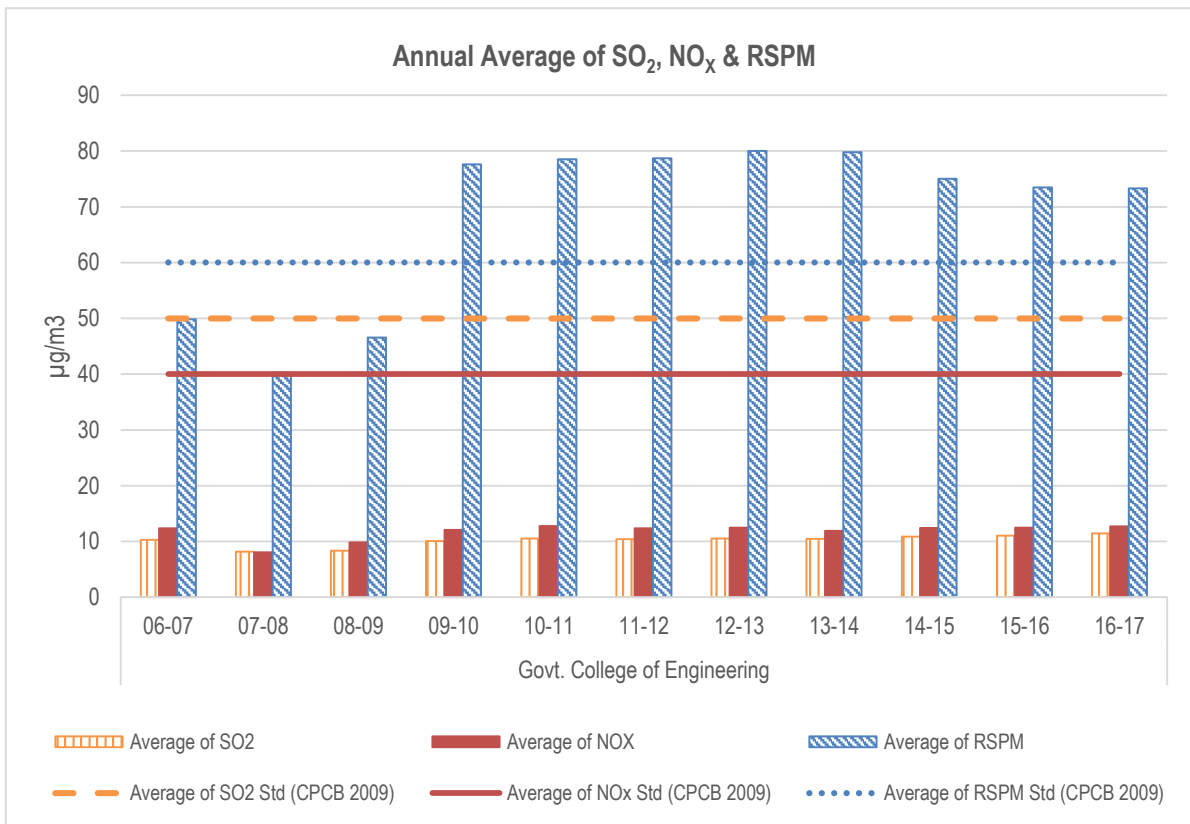


Figure No. 21: Annual average trend of SO₂, NO_x, and RSPM at Govt. college of Engineering - Amravati

Amravati - Godhadiwala Private Limited

Table No. 27: Data for Monthly average reading recorded at Godhadiwala Private Limited - Amravati

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Godhadiwala Private Limited	2016	Aug	12	13	108
		Oct	11	12	95
		Nov	12	13	106
		Dec	13	14	105
	2017	Jan	12	13	109
		Feb	13	14	114
		Mar	13	14	114

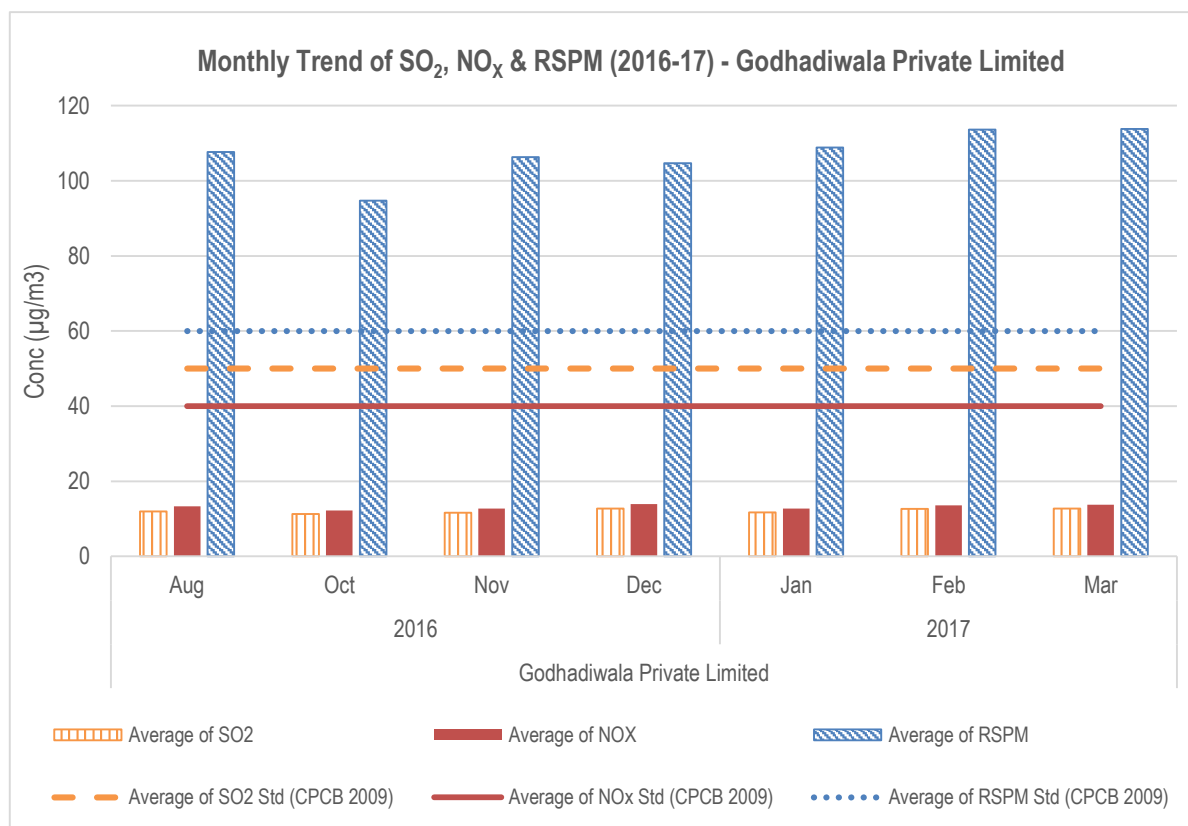


Figure No. 22: Monthly average reading recorded at Godhadiwala Private Limited - Amravati

Table No. 28: Data for Annual average trend of SO₂, NO_x, and RSPM at Godhadiwala Private Limited - Amravati

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Godhadiwala Private Limited	06-07	12	16	67
	07-08	9	12	58
	08-09	10	13	71
	09-10	12	14	102
	10-11	12	14	125
	11-12	11	13	100
	12-13	12	13	101
	13-14	11	12	94
	14-15	12	14	108
	15-16	11	13	110
	16-17	12	13	108

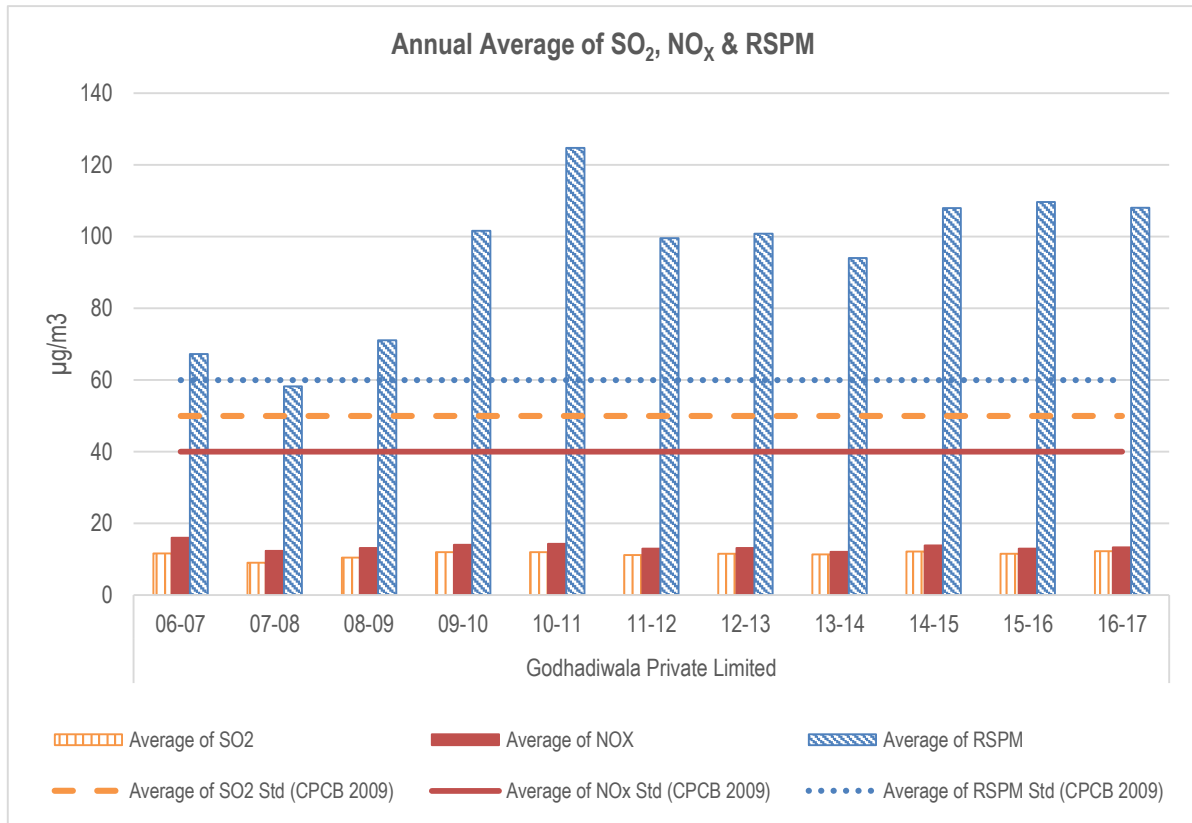
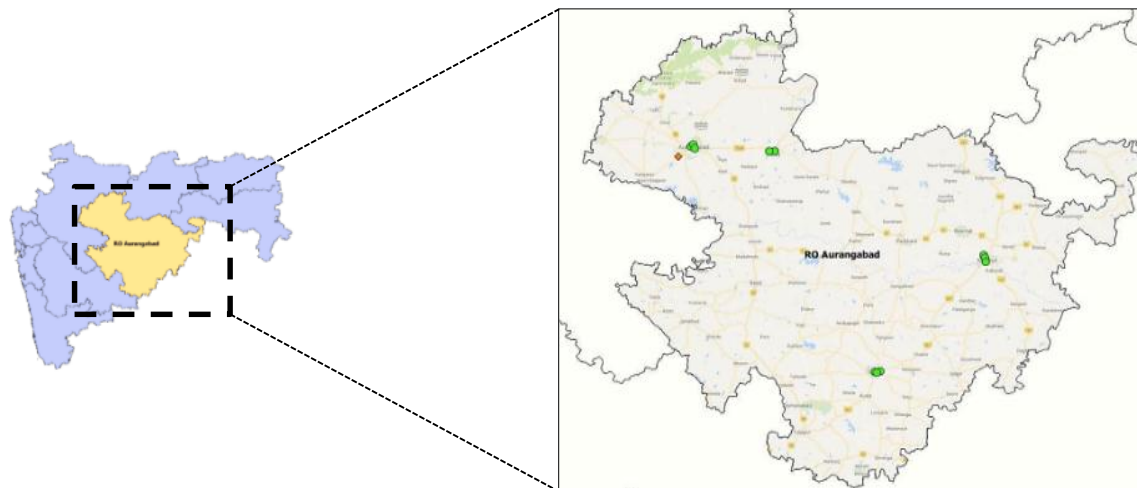
Figure No. 23: Annual average trend of SO₂, NO_x, and RSPM at Godhadiwala Private Limited - Amravati

Table No. 29: Percentage exceedance of pollutants at Amravati RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	EN	ER	SO ₂	NO _x	RSP M
LRT Commerce College	103	0	0	87	0	0	84
MIDC Water Works - Akola	107	0	0	91	0	0	85
Akola- College of Engg & Technology	91	0	0	83	0	0	91
Raj Kamal Chowk	61	0	0	58	0	0	95
Govt. College of Engineering	56	0	0	0	0	0	0
Godhadiwala Private Limited	53	0	0	44	0	0	83

RO – Aurangabad



Region	Station code	Station name	Program	Latitude	Longitude
Aurangabad	511	SBES College	NAMP	19°52'54.89764N	75°19'27.7608E
Aurangabad	512	Collector Office, Aurangabad	NAMP	19°53'33.4644N	75°20'28.4892E
Aurangabad	513	C.A.D.A. Office	NAMP	19°52'9.24604N	75°21'4.5432E
Aurangabad		Aurangabad CAAQMS	CAAQMS	19° 48' 59.11"N	75° 14' 18.65"E
Jalna	706	Jalna- Bachat Bhavan	NAMP	19°50'54.4704N	75°53'20.6088E
Jalna	707	Jalna- Krishnadhan seeds Ltd	NAMP	19°51'5.6592N	75°51'15.5808E
Latur	641	MIDC Water Works - Latur	NAMP	18°24'43.0416N	76°32'239.76E
Latur	642	Shyam Nagar-Kshewraj Vidyalaya	NAMP	18°24'21.62N	76°33'50.22E
Latur	643	Ganj Golai - Sidhshwar Bank	NAMP	18° 24' 3.8556N	76°34'49.1412E
Nanded	703	Ganeshnagar	NAMP	19°10'14.98"N	77°17'55.20"E
Nanded	704	Mutha Chowk	NAMP	19° 9'19.37"N	77°18'35.99"E
Nanded	705	Industrial Area CIDCO	NAMP	19° 7'33.81"N	77°18'52.29"E

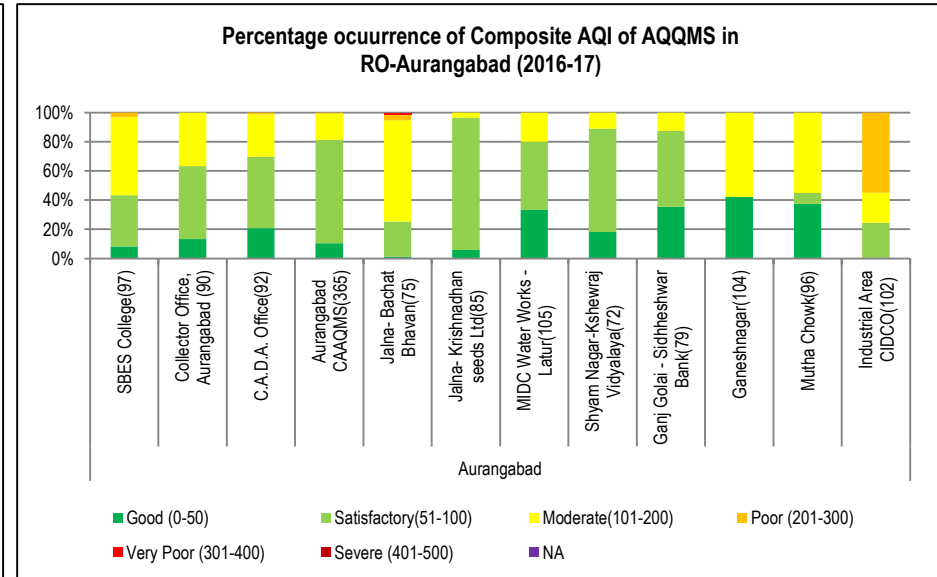
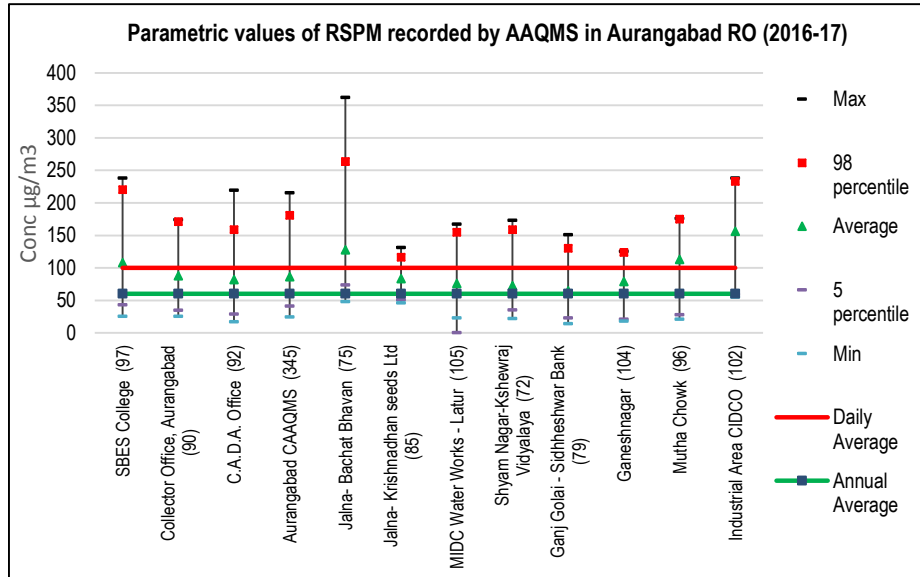
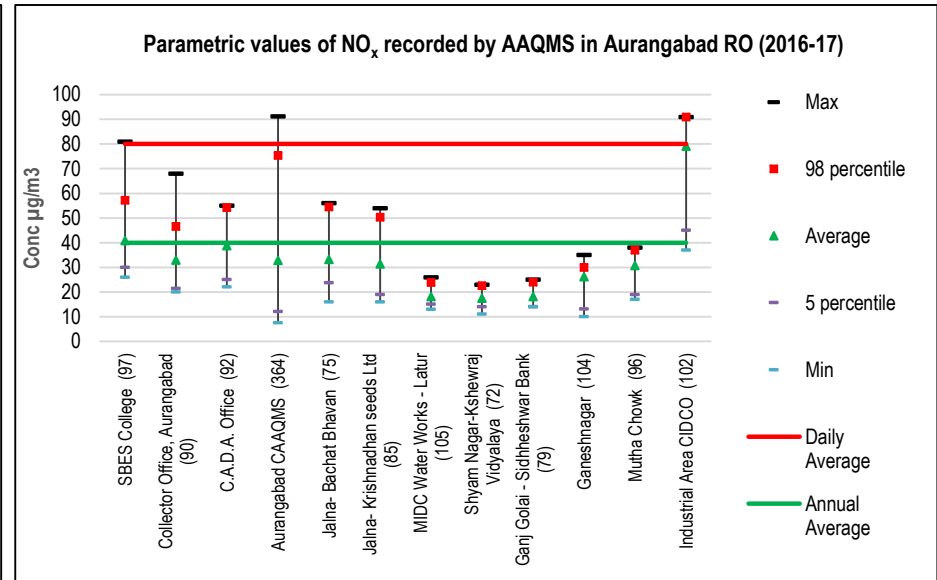
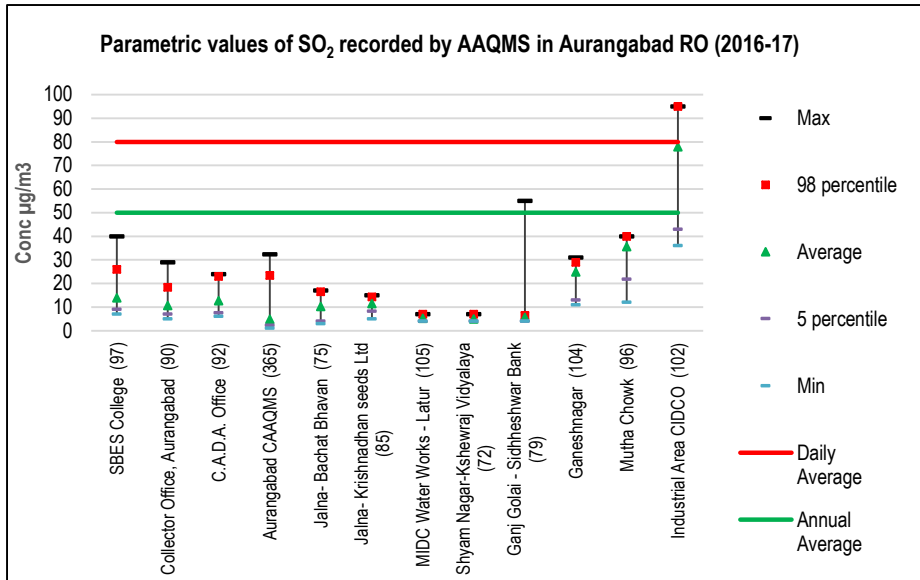


Table No. 30: Data for SO₂, NO_x & RSPM recorded at AAQMS in Aurangabad RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	80		50	80	
	SBES College (97)	40	26	14	9	7
	Collector Office, Aurangabad (90)	29	18	11	7	5
	C.A.D.A. Office (92)	24	23	13	8	6
	Aurangabad CAAQMS (365)	32	23	5	2	1
	Jalna- Bachat Bhavan (75)	17	17	10	4	3
	Jalna- Krishnadhan seeds Ltd (85)	15	14	12	8	5
	MIDC Water Works - Latur (105)	7	7	5	4	4
	Shyam Nagar-Kshewraj Vidyalaya (72)	7	7	5	4	4
	Ganj Golai - Sidhleshwar Bank (79)	55	6	6	4	4
	Ganeshnagar (104)	31	29	25	13	11
	Mutha Chowk (96)	40	40	36	22	12
Industrial Area CIDCO (102)	95	95	78	43	36	
NO _x	<i>CPCB Standard</i>	80		40	80	
	SBES College (97)	81	57	41	30	26
	Collector Office, Aurangabad (90)	68	47	33	21	20
	C.A.D.A. Office (92)	55	54	39	25	22
	Aurangabad CAAQMS (364)	91	75	33	12	7
	Jalna- Bachat Bhavan (75)	56	55	33	24	16
	Jalna- Krishnadhan seeds Ltd (85)	54	50	31	19	16
	MIDC Water Works - Latur (105)	26	24	18	15	13
	Shyam Nagar-Kshewraj Vidyalaya (72)	23	23	18	14	11
	Ganj Golai - Sidhleshwar Bank (79)	25	24	18	14	14
	Ganeshnagar (104)	35	30	26	13	10
	Mutha Chowk (96)	38	37	31	19	17
Industrial Area CIDCO (102)	91	91	79	45	37	
RSPM (PM ₁₀)	<i>CPCB Standard</i>	100		60	100	
	SBES College (97)	238	220	108	43	25
	Collector Office, Aurangabad (90)	174	171	88	34	25
	C.A.D.A. Office (92)	219	159	82	29	17
	Aurangabad CAAQMS (345)	215	181	86	41	24
	Jalna- Bachat Bhavan (75)	362	263	128	73	48
	Jalna- Krishnadhan seeds Ltd (85)	131	117	83	51	46
	MIDC Water Works - Latur (105)	167	155	76	0	23
	Shyam Nagar-Kshewraj Vidyalaya (72)	173	159	72	35	22
	Ganj Golai - Sidhleshwar Bank (79)	151	130	65	23	14
	Ganeshnagar (104)	125	124	79	21	18
	Mutha Chowk (96)	176	175	113	28	21
Industrial Area CIDCO (102)	238	233	156	59	55	

Aurangabad - SBES College

Table No. 31: Data for Monthly average reading recorded at SBES College - Aurangabad

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
SBES College	2016	Apr	13	38	140
		May	11	37	114
		Jun	11	36	83
		Jul	9	32	45
		Aug	9	32	91
		Sep	9	34	85
		Oct	16	46	89
		Nov	17	47	120
		Dec	22	54	167
	2017	Jan	23	54	153
		Feb	16	45	111
		Mar	12	39	112

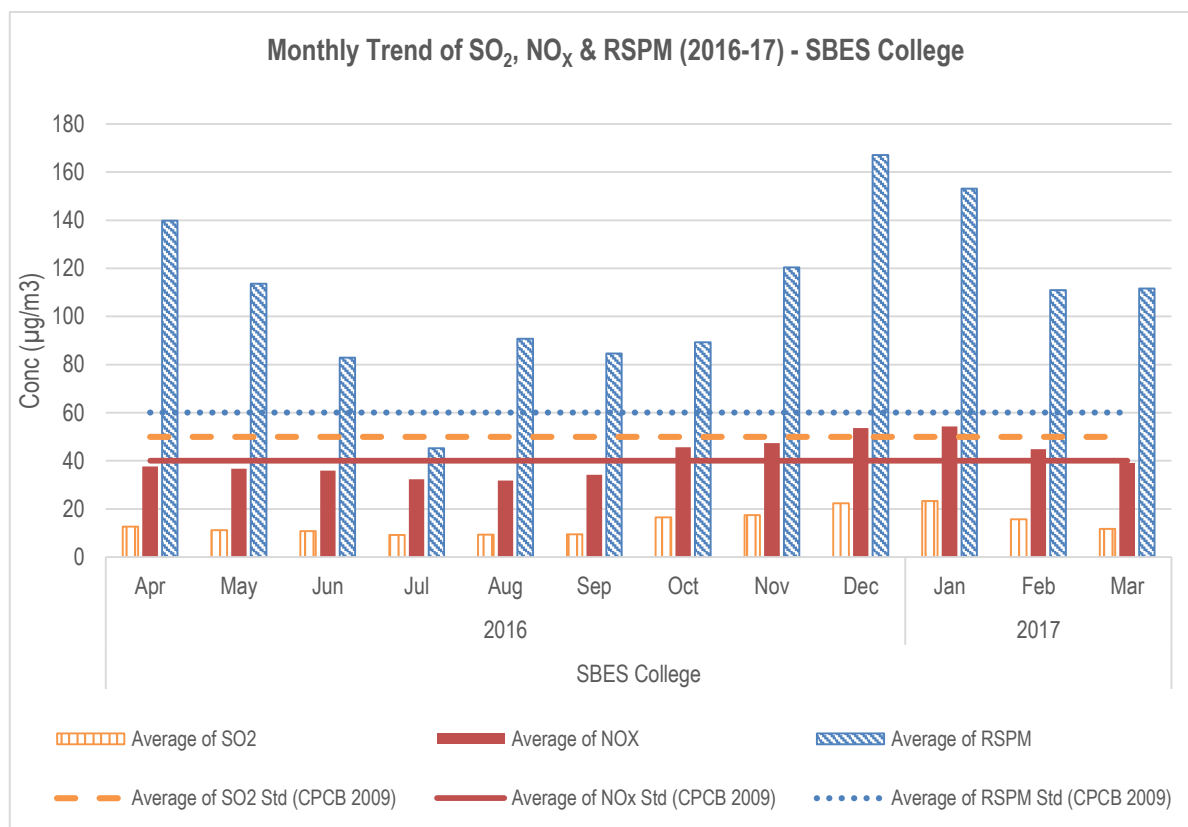


Figure No. 24: Monthly average reading recorded at SBES College - Aurangabad

Table No. 32: Data for Annual average trend of SO₂, NO_x, and RSPM at SBES College - Aurangabad

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
SBES College	05-06	7	30	166
	06-07	6	18	85
	07-08	6	22	79
	08-09	9	22	94
	09-10	7	25	98
	10-11	7	23	94
	11-12	9	33	90
	12-13	10	33	93
	13-14	11	39	102
	14-15	13	43	97
	15-16	16	44	111
	16-17	14	41	108

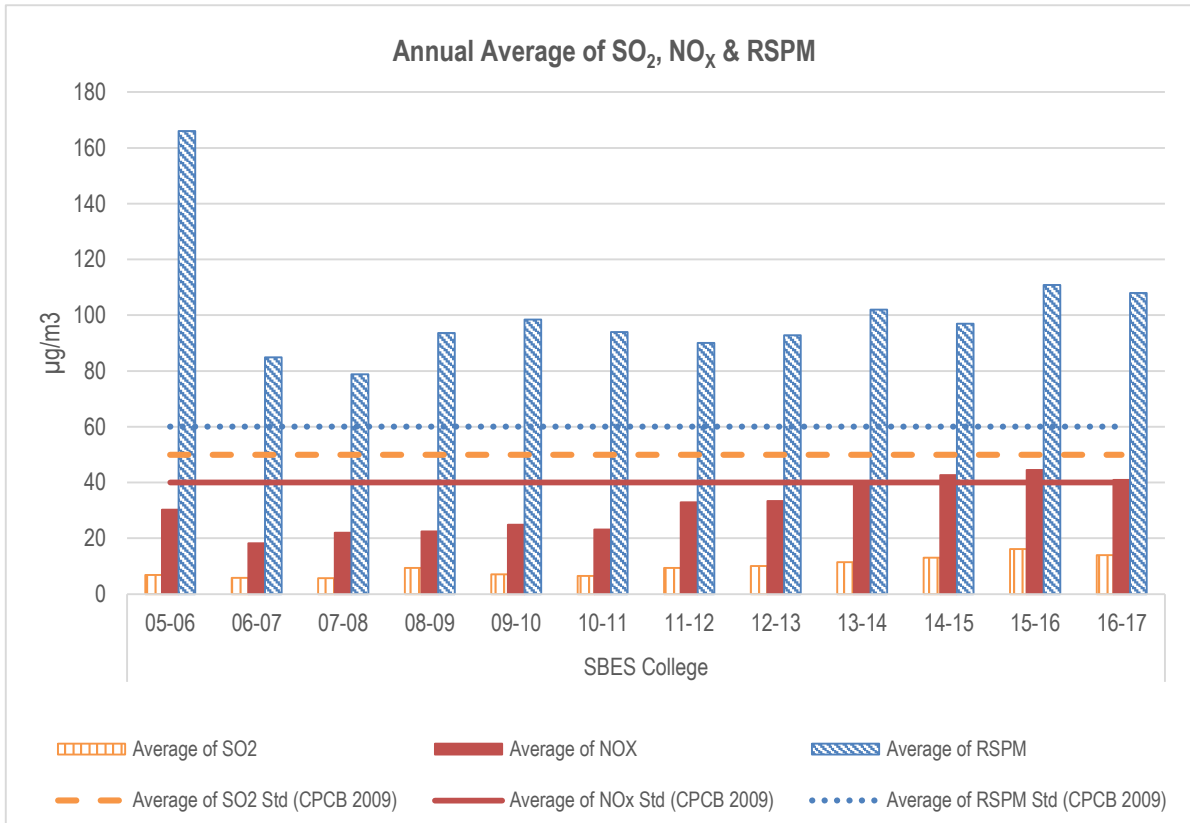


Figure No. 25: Annual average trend of SO₂, NO_x, and RSPM at SBES College - Aurangabad

Aurangabad - Collector Office

Table No. 33: Data for Monthly average reading recorded at Collector Office, Aurangabad

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Collector Office, Aurangabad	2016	Apr	10	30	66
		May	9	30	67
		Jun	8	30	58
		Jul	7	28	41
		Aug	7	23	54
		Sep	8	29	67
		Oct	15	42	96
		Nov	12	35	106
		Dec	15	39	132
	2017	Jan	15	41	135
		Feb	12	38	110
		Mar	8	29	93

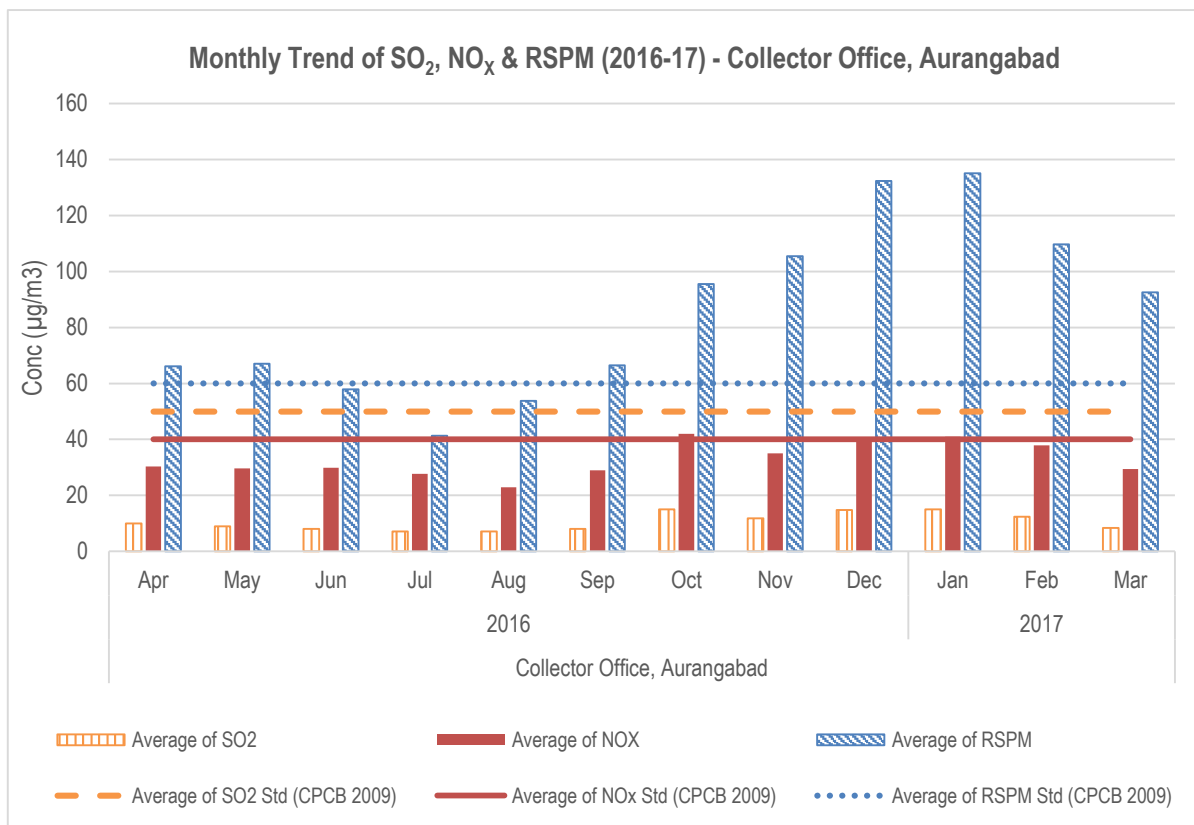


Figure No. 26: Monthly average reading recorded at Collector - Office, Aurangabad

Table No. 34: Data for Annual average trend of SO₂, NO_x, and RSPM at Collector Office, Aurangabad

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Collector Office, Aurangabad	05-06	6	19	108
	06-07	4	13	73
	07-08	5	16	56
	08-09	8	20	68
	09-10	6	22	85
	10-11	6	22	69
	11-12	8	29	92
	12-13	9	31	76
	13-14	9	36	79
	14-15	10	34	78
	15-16	12	35	73
	16-17	11	33	88

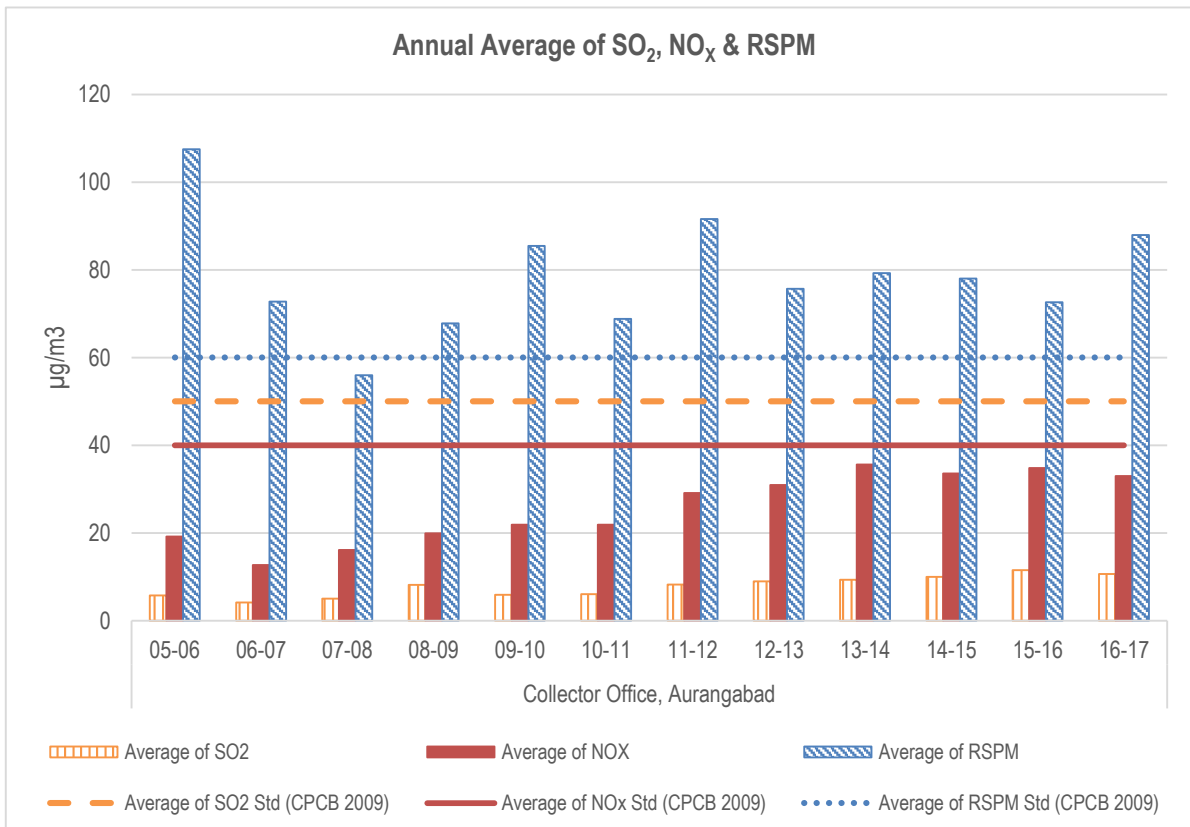


Figure No. 27: Annual average trend of SO₂, NO_x, and RSPM at Collector Office, Aurangabad

Aurangabad - C.A.D.A. Office

Table No. 35: Data for Monthly average reading recorded at C.A.D.A. Office - Aurangabad

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
C.A.D.A. Office	2016	Apr	12	37	78
		May	11	36	63
		Jun	11	37	51
		Jul	10	34	32
		Aug	8	27	46
		Sep	9	30	60
		Oct	16	44	86
		Nov	14	42	95
		Dec	20	51	142
	2017	Jan	20	51	126
		Feb	14	43	107
		Mar	11	38	94

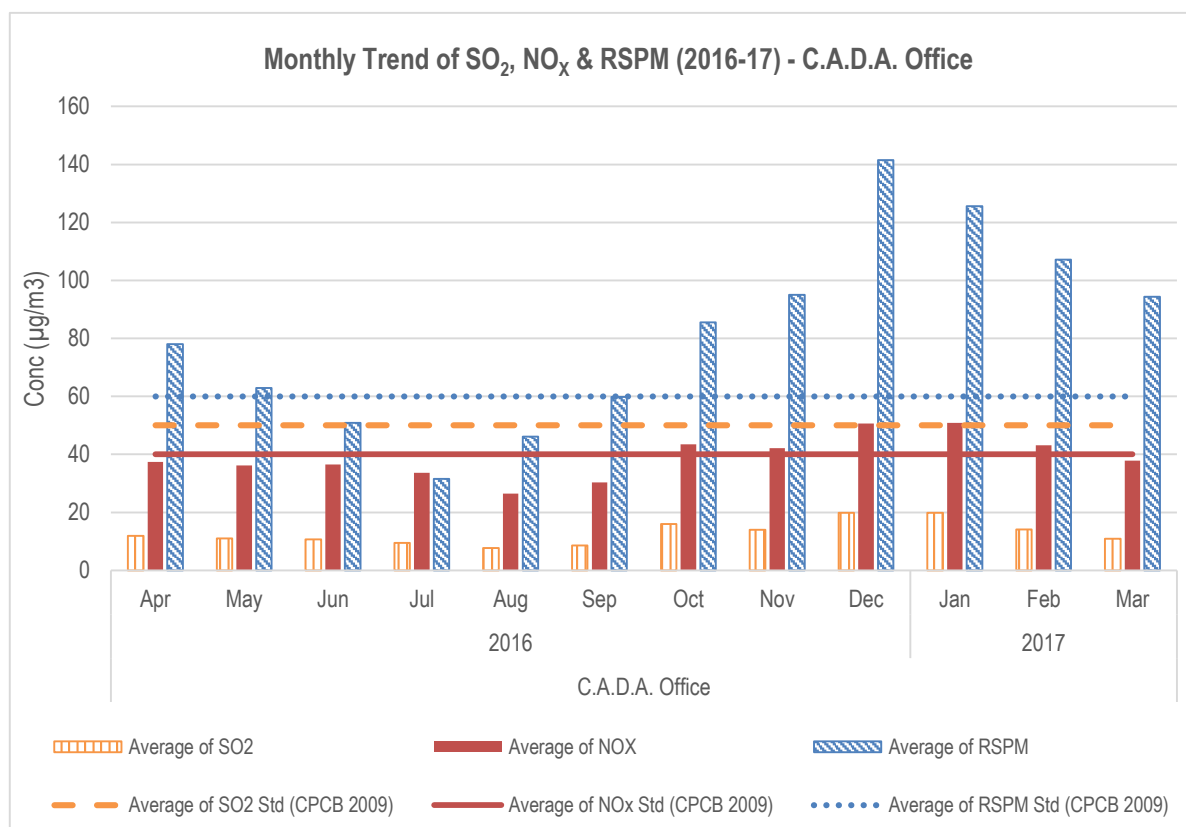


Figure No. 28: Monthly average reading recorded at C.A.D.A. Office - Aurangabad

Table No. 36: Data for Annual average trend of SO₂, NO_x, and RSPM at C.A.D.A. Office - Aurangabad

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
C.A.D.A. Office	05-06	7	23	119
	06-07	5	19	79
	07-08	5	23	79
	08-09	9	21	63
	09-10	6	22	66
	10-11	6	22	69
	11-12	10	34	75
	12-13	11	35	68
	13-14	10	38	74
	14-15	12	40	79
	15-16	15	43	75
	16-17	13	39	82

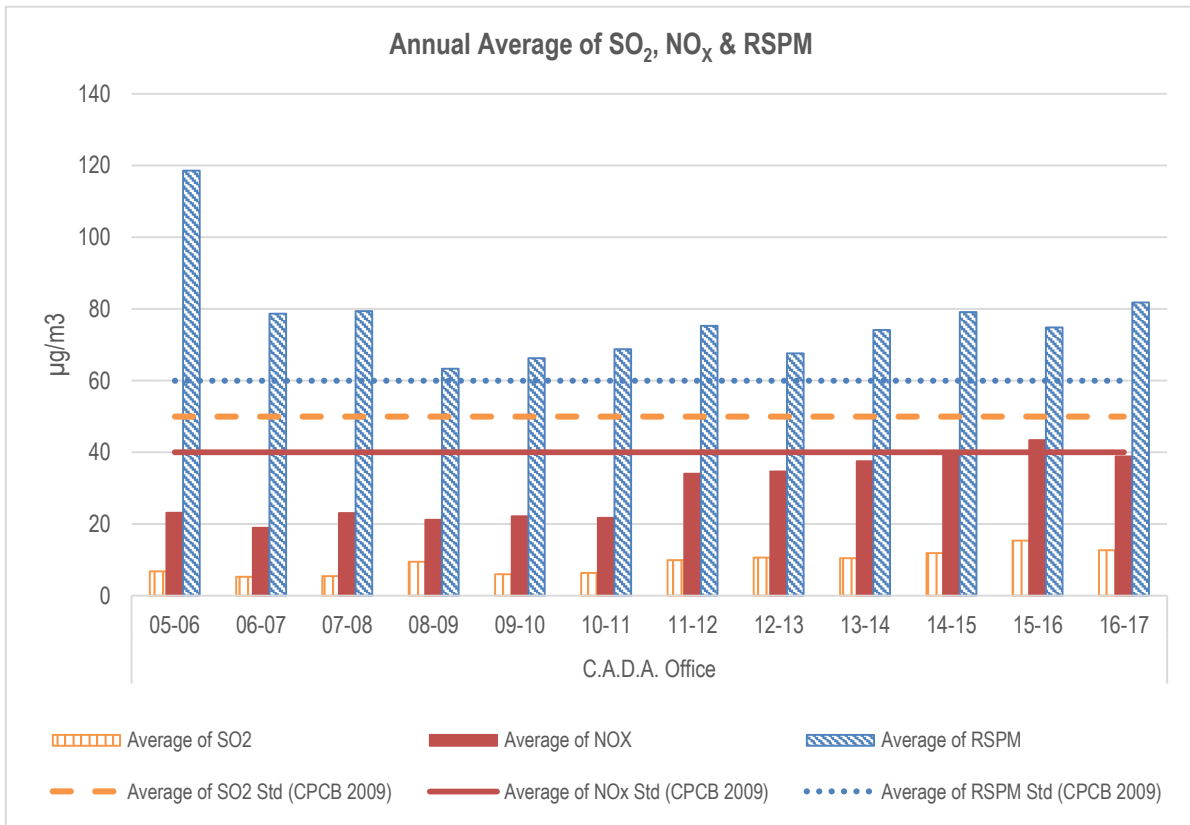


Figure No. 29: Annual average trend of SO₂, NO_x, and RSPM at C.A.D.A. Office - Aurangabad

Jalna - Bachat Bhavan

Table No. 37: Data for Monthly average reading recorded at Jalna - Bachat Bhavan

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Jalna- Bachat Bhavan	2016	Apr	12	28	128
		May	13	32	128
		Jul	13	28	89
		Aug	12	27	98
		Sep	12	29	84
		Oct	4	31	118
	2017	Jan	11	45	141
		Mar	10	48	162

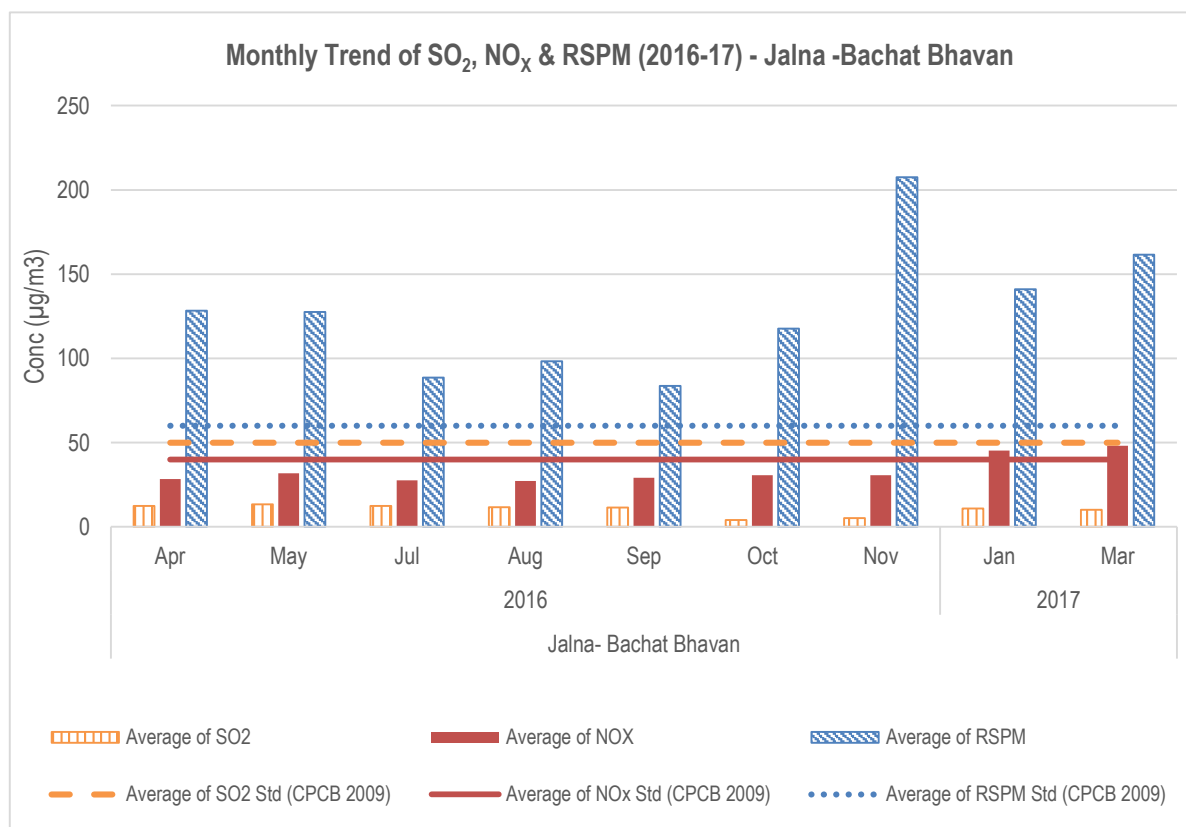


Figure No. 30: Monthly average reading recorded at Jalna-Bachat Bhavan

Table No. 38: Data for Annual average trend of SO₂, NO_x, and RSPM at Jalna-Bachat Bhavan

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Jalna- Bachat Bhavan	06-07	13	22	53
	07-08	17	28	87
	08-09	17	32	66
	09-10	5	28	84
	10-11	5	26	73
	11-12	6	25	89
	12-13	10	30	97
	13-14	10	30	100
	14-15	9	29	94
	15-16	11	29	111
	16-17	10	33	128

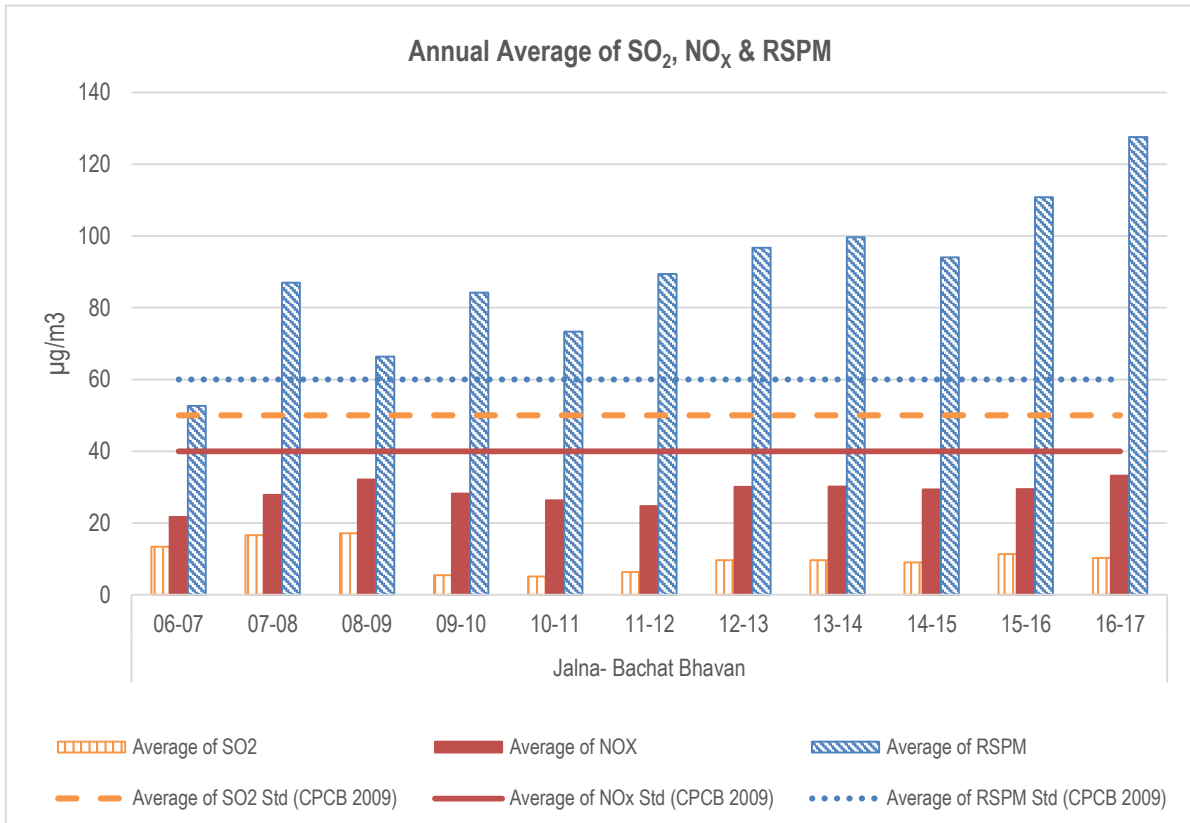


Figure No. 31: Annual average trend of SO₂, NO_x, and RSPM at Jalna-Bachat Bhavan

Jalna - Krishnadhan Seeds Ltd.

Table No. 39: Data for Monthly average reading recorded at Jalna-Krishnadhan Seeds Ltd.

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Jalna- Krishnadhan seeds Ltd	2016	Apr	14	33	92
		May	11	31	89
		Jun	11	20	52
		Jul	12	29	98
		Aug	12	29	84
		Sep	12	28	78
		Oct	13	30	91
		Nov	8	37	86
	2017	Jan	12	35	84
		Mar	11	45	77

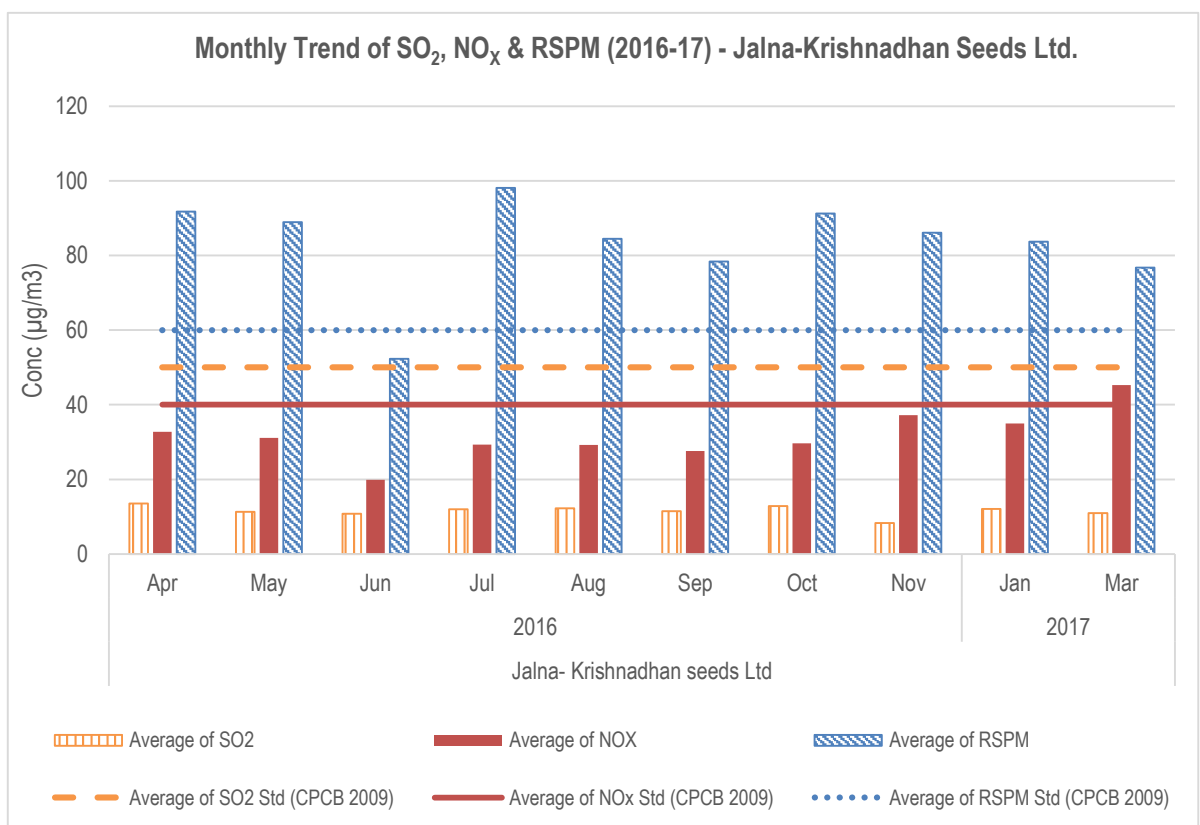


Figure No. 32: Monthly average reading recorded at Jalna-Krishnadhan Seeds Ltd.

Table No. 40: Data for Annual average trend of SO₂, NO_x, and RSPM at Jalna - Krishnadhan Seeds Ltd.

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Jalna-Krishnadhan seeds Ltd	06-07	17	29	125
	07-08	28	44	140
	08-09	30	45	182
	09-10	13	37	111
	10-11	7	33	139
	11-12	8	26	140
	12-13	11	32	143
	13-14	11	31	150
	14-15	11	31	180
	15-16	12	30	103
	16-17	12	31	83

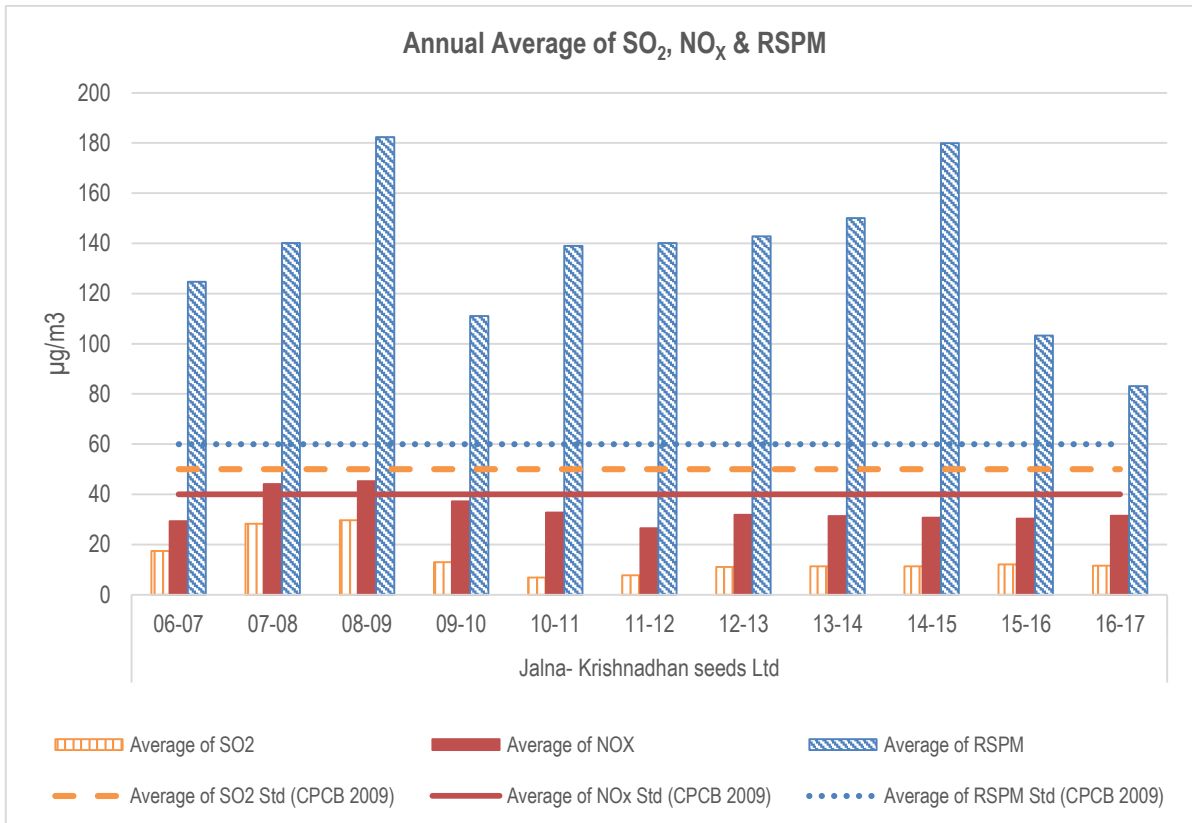


Figure No. 33: Annual average trend of SO₂, NO_x, and RSPM at Jalna-Krishnadhan Seeds Ltd.

Latur - MIDC Water Works

Table No. 41: Data for Monthly average reading recorded at MIDC Water Works - Latur

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
MIDC Water Works - Latur	2016	Apr	6	19	77
		May	5	17	69
		Jun	5	17	51
		Jul	5	17	57
		Aug	5	17	40
		Sep	5	18	37
		Oct	6	21	66
		Nov	6	18	102
		Dec	5	16	0
	2017	Feb	5	19	123
		Mar	5	23	105

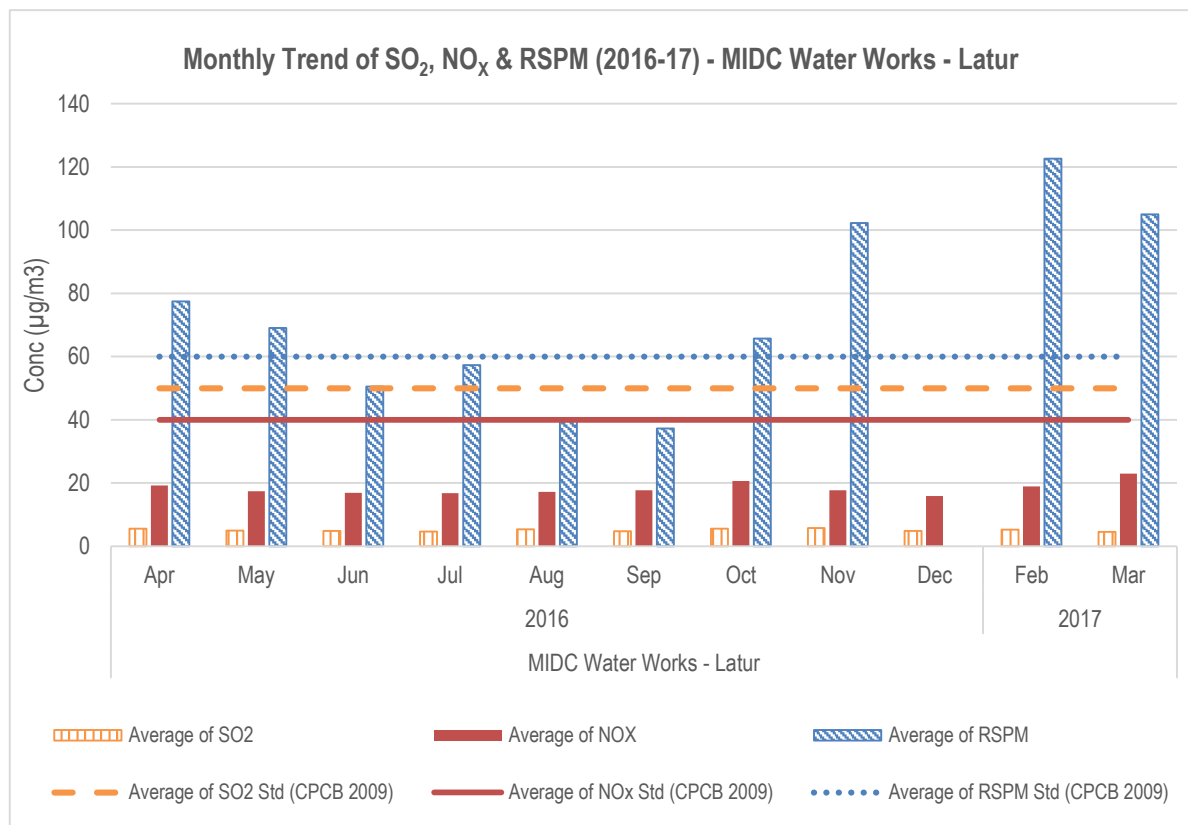


Figure No. 34: Monthly average reading recorded at MIDC Water Works – Latur

Table No. 42: Data for Annual average trend of SO₂, NO_x, and RSPM at MIDC Water Works - Latur

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
MIDC Water Works - Latur	08-09	4	22	77
	09-10	7	22	76
	10-11	6	15	95
	11-12	6	16	99
	12-13	8	19	82
	13-14	6	16	88
	14-15	5	14	81
	15-16	5	15	81
	16-17	5	18	67

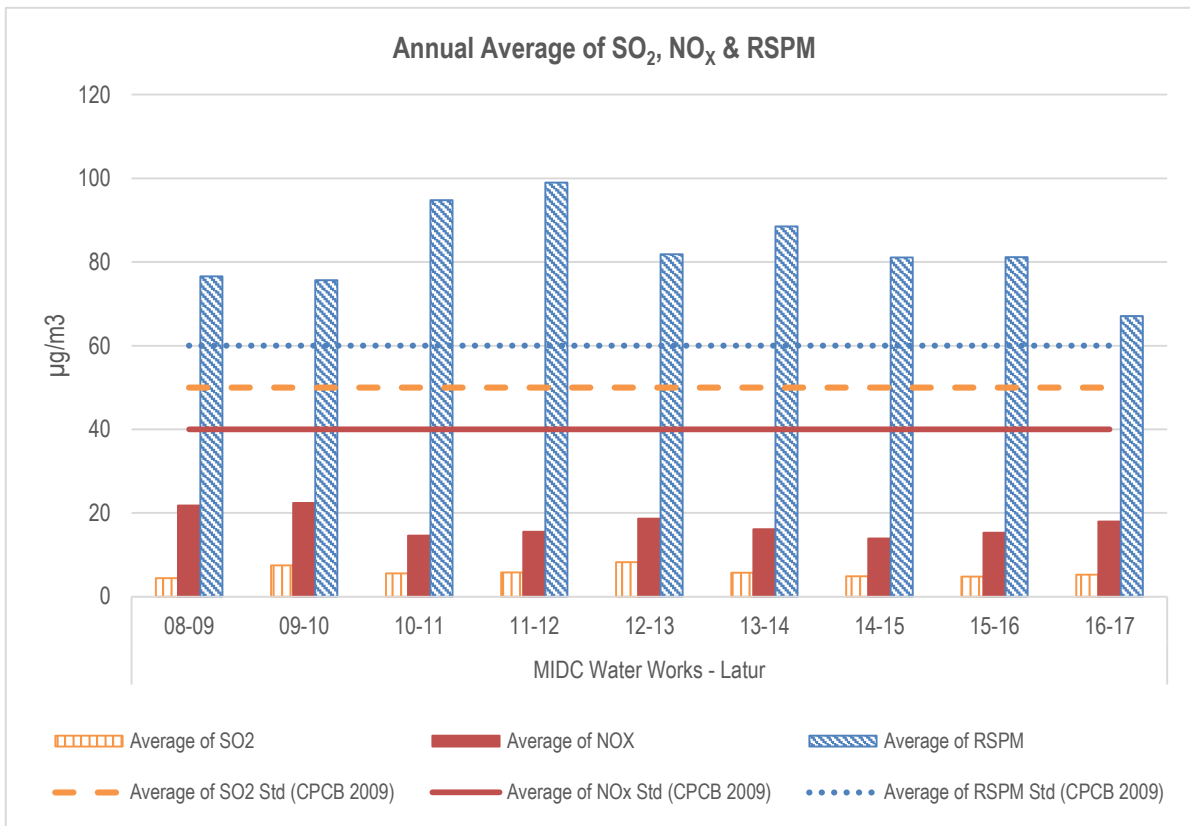


Figure No. 35: Annual average trend of SO₂, NO_x, and RSPM at MIDC Water Works - Latur

Latur - Shyam Nagar - Kshewraj Vidyalaya

Table No. 43: Data for Monthly average reading recorded at Shyam Nagar-Kshewraj Vidyalaya

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Shyam Nagar-Kshewraj Vidyalaya	2016	Apr	5	16	69
		May	5	16	82
		Jun	5	16	67
		Jul	5	17	44
		Aug	5	19	58
		Sep	5	18	49
		Oct	5	21	84
		Nov	6	18	92
	2017	Feb	5	20	98

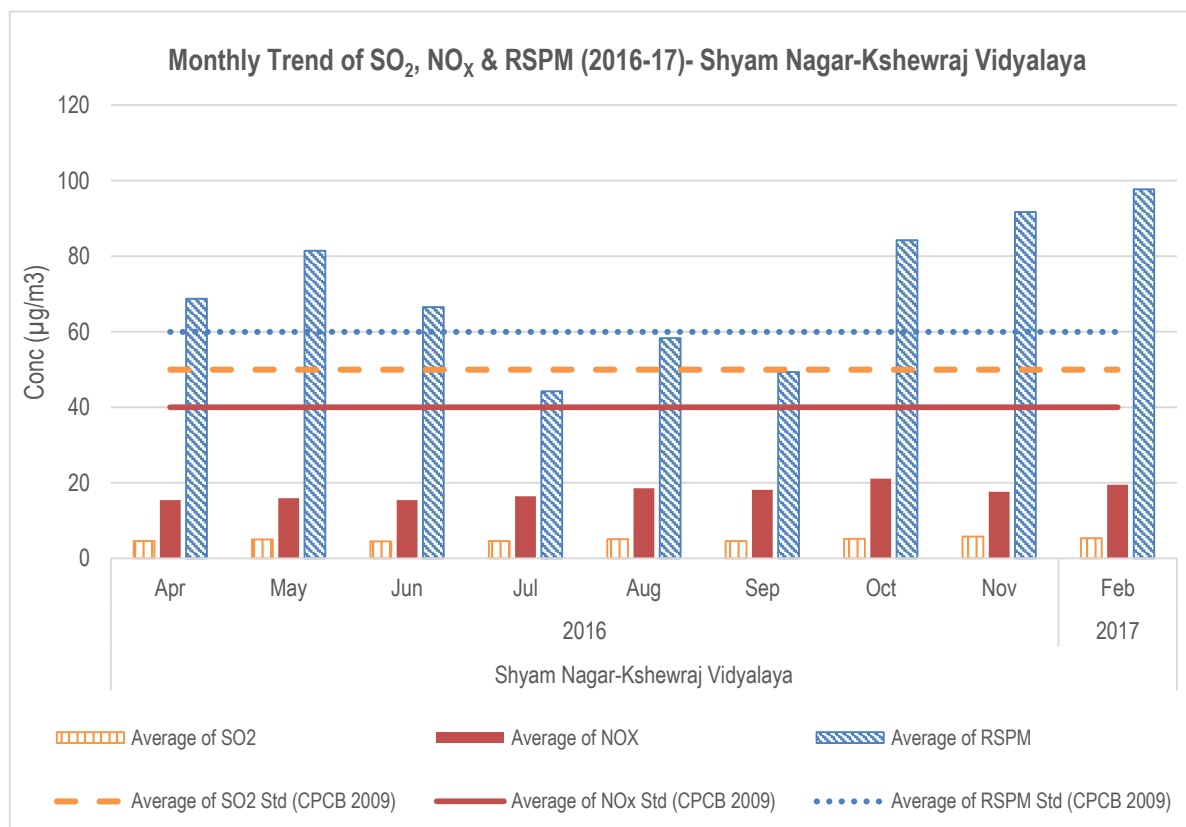


Figure No. 36: Monthly average reading recorded at Shyam Nagar-Kshewraj Vidyalaya

Table No. 44: Data for Annual average trend of SO₂, NO_x, and RSPM at Shyam Nagar-Kshewraj Vidyalaya

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Shyam Nagar-Kshewraj Vidyalaya	08-09	3	16	99
	09-10	6	19	123
	10-11	6	13	139
	11-12	6	14	124
	12-13	7	19	105
	13-14	7	17	95
	14-15	5	14	89
	15-16	5	15	85
	16-17	5	18	72

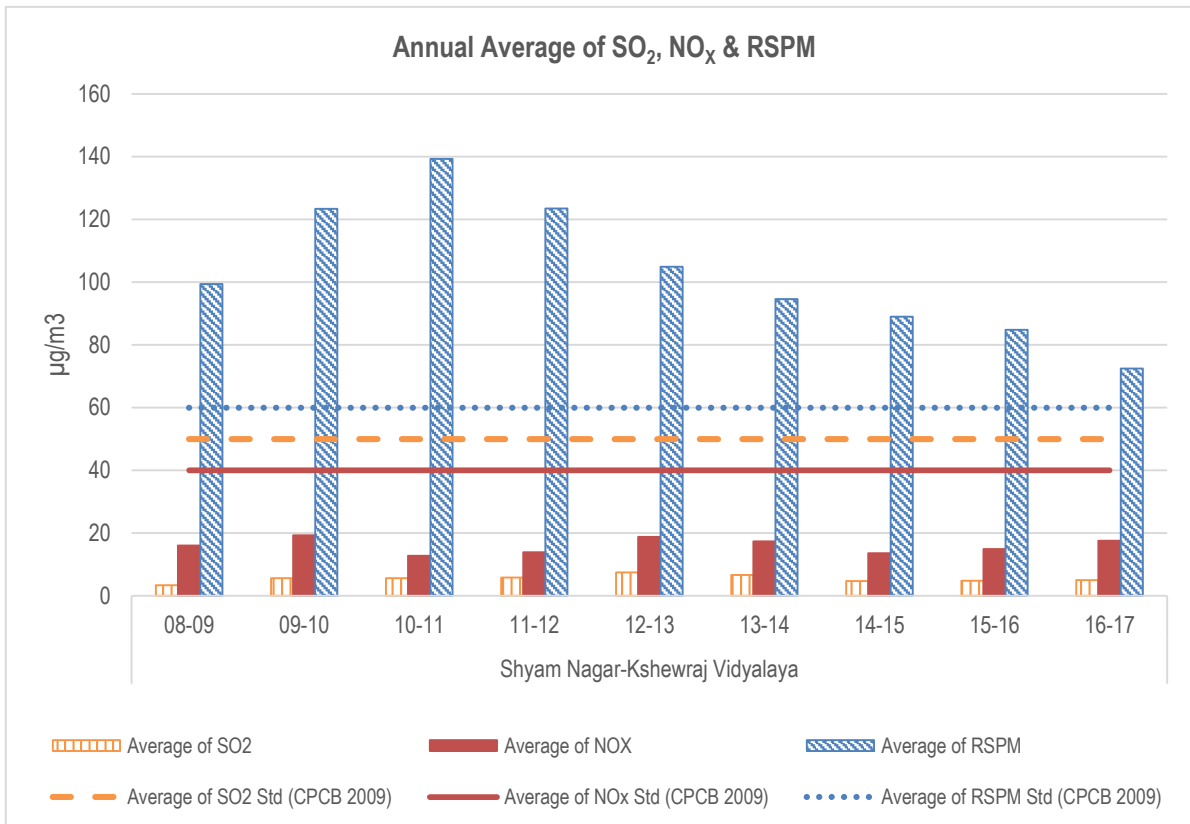


Figure No. 37: Annual average trend of SO₂, NO_x, and RSPM at Shyam Nagar-Kshewraj Vidyalaya

Latur - Ganj Golai - Sidhsheshwar Bank

Table No. 45: Data for Monthly average reading recorded at Ganj Golai- Sidhsheshwar Bank

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Ganj Golai - Sidhsheshwar Bank	2016	Apr	5	18	97
		May	5	16	84
		Jun	5	15	52
		Jul	4	17	49
		Aug	5	18	36
		Sep	5	18	58
		Oct	11	21	55
		Nov	6	18	76
	2017	Mar	5	22	71

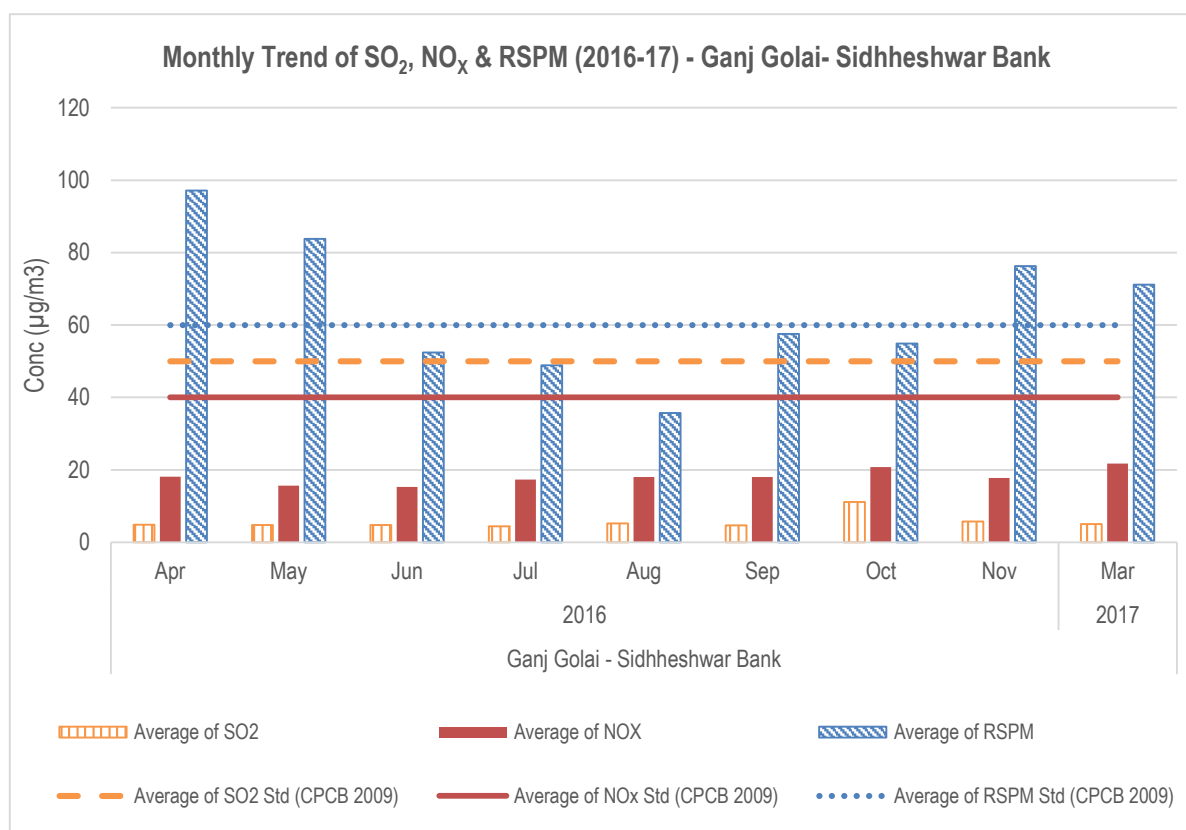


Figure No. 38: Monthly average reading recorded at Ganj Golai- Sidhsheshwar Bank

Table No. 46: Data for Annual average trend of SO₂, NO_x, and RSPM at Ganj Golai- Sidhsheshwar Bank

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Ganj Golai - Sidhsheshwar Bank	08-09	4	22	122
	09-10	6	26	144
	10-11	6	16	124
	11-12	6	17	140
	12-13	8	20	132
	13-14	7	18	107
	14-15	5	14	73
	15-16	5	17	80
	16-17	6	18	65

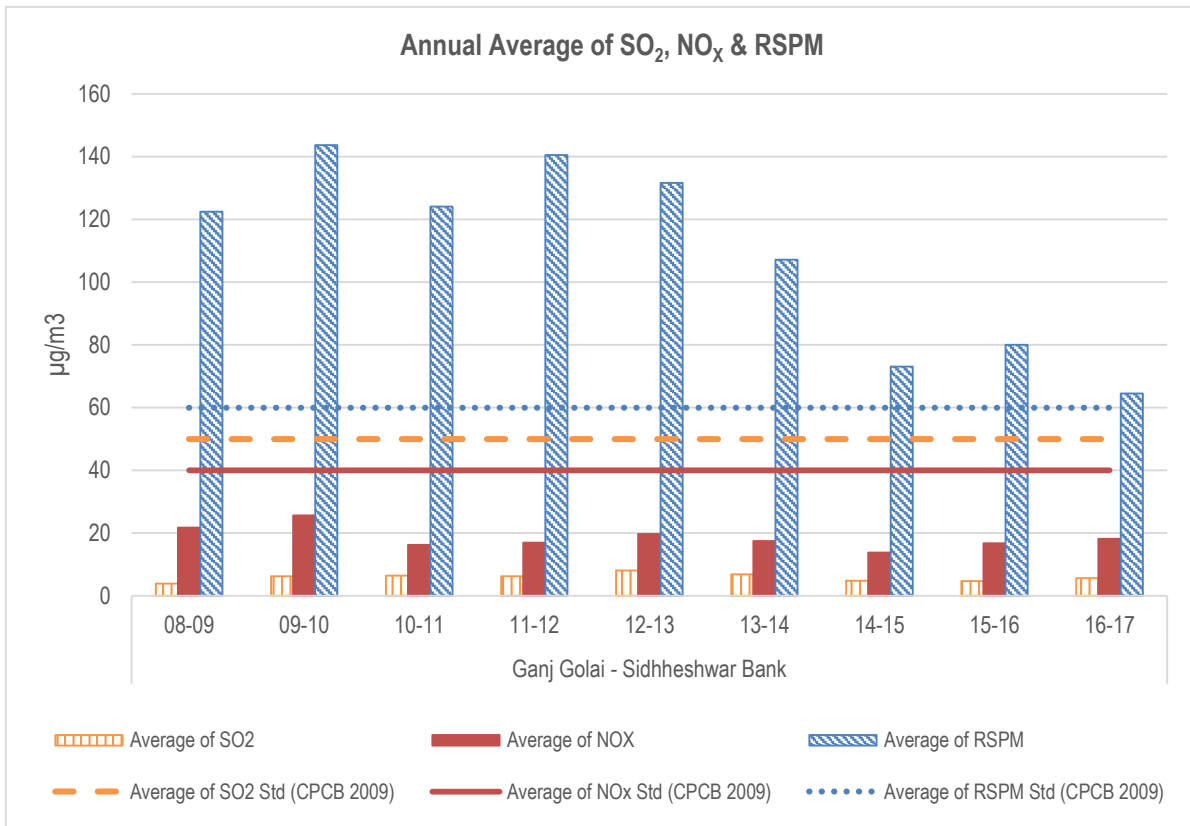


Figure No. 39: Annual average trend of SO₂, NO_x, and RSPM at Ganj Golai- Sidhsheshwar Bank

Nanded - Ganeshnagar

Table No. 47: Data for Monthly average reading recorded at Ganeshnagar

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Ganeshnagar	2016	Apr	27	28	114
		May	28	28	118
		Jun	27	27	117
		Jul	27	28	116
		Aug	28	28	116
		Sep	27	28	116
		Oct	27	28	121
		Nov	27	27	27
		Dec	24	23	37
	2017	Jan	18	29	25
		Feb	13	12	25
		Mar	26	28	24

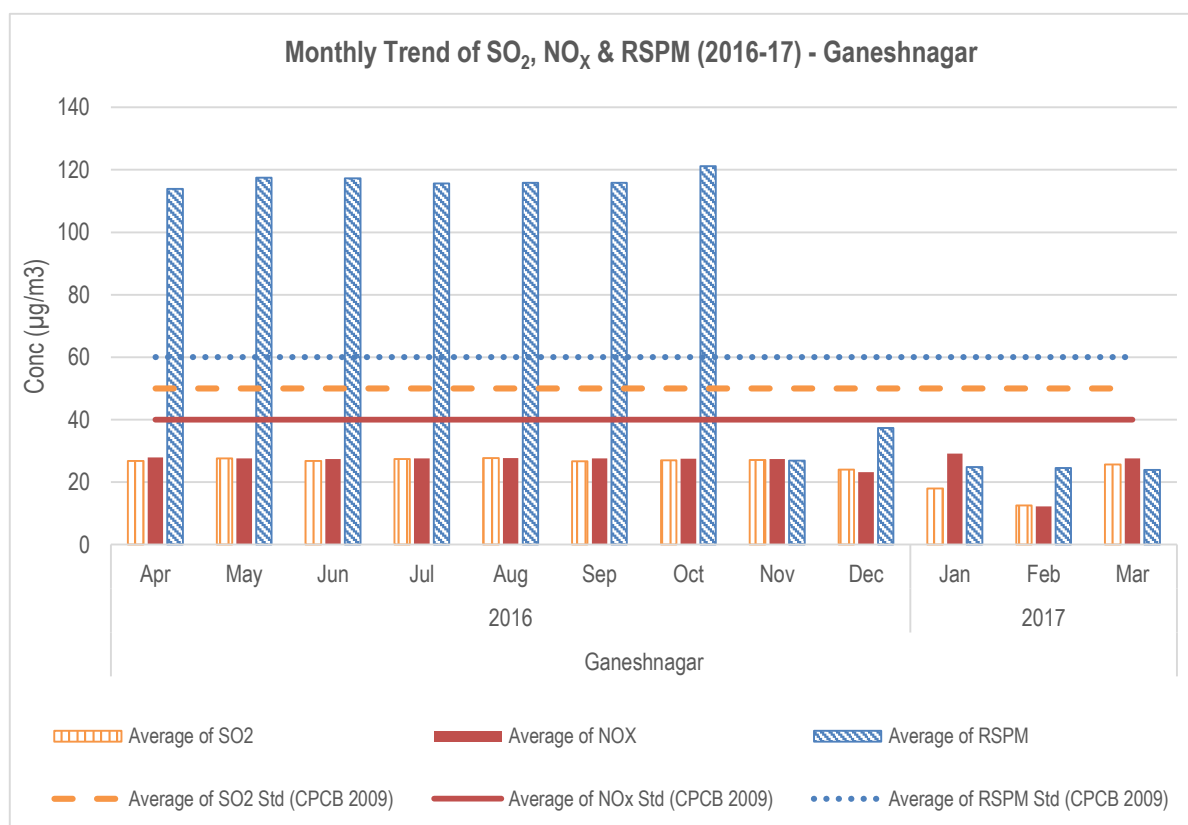


Figure No. 40: Monthly average reading recorded at Ganeshnagar

Table No. 48: Data for Annual average trend of SO₂, NO_x, and RSPM at Ganeshnagar

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Ganeshnagar	10-11	28	29	47
	11-12	18	19	26
	12-13	22	21	36
	13-14	17	16	29
	14-15	28	28	89
	15-16	27	28	117
	16-17	25	26	79

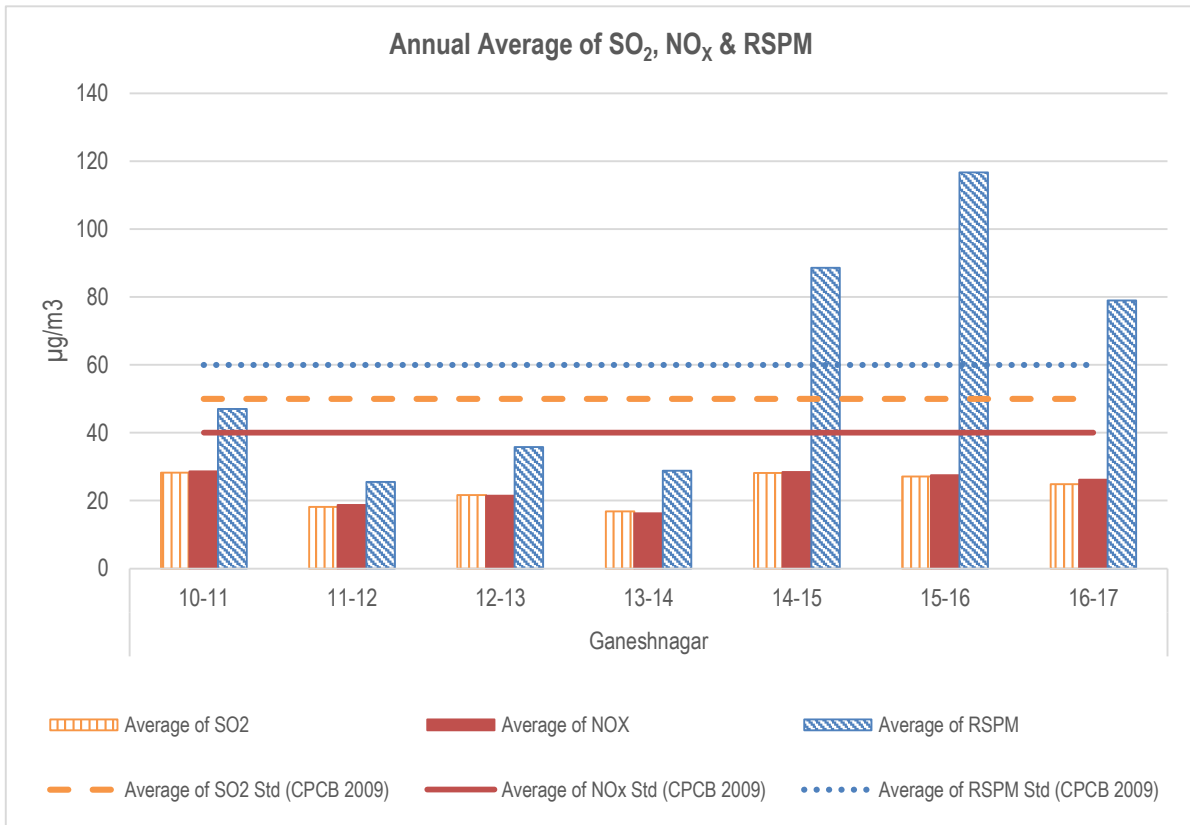


Figure No. 41: Annual average trend of SO₂, NO_x, and RSPM at Ganeshnagar

Nanded - Mutha Chowk

Table No. 49: Data for Monthly average reading recorded at Mutha Chowk

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Mutha Chowk	2016	Apr	38	33	166
		May	39	32	169
		Jun	37	32	168
		Jul	40	31	171
		Aug	38	33	168
		Sep	37	32	166
		Oct	38	32	172
		Nov	37	32	42
		Dec	28	26	58
	2017	Jan	29	25	41
		Feb	33	29	40
		Mar	37	34	40

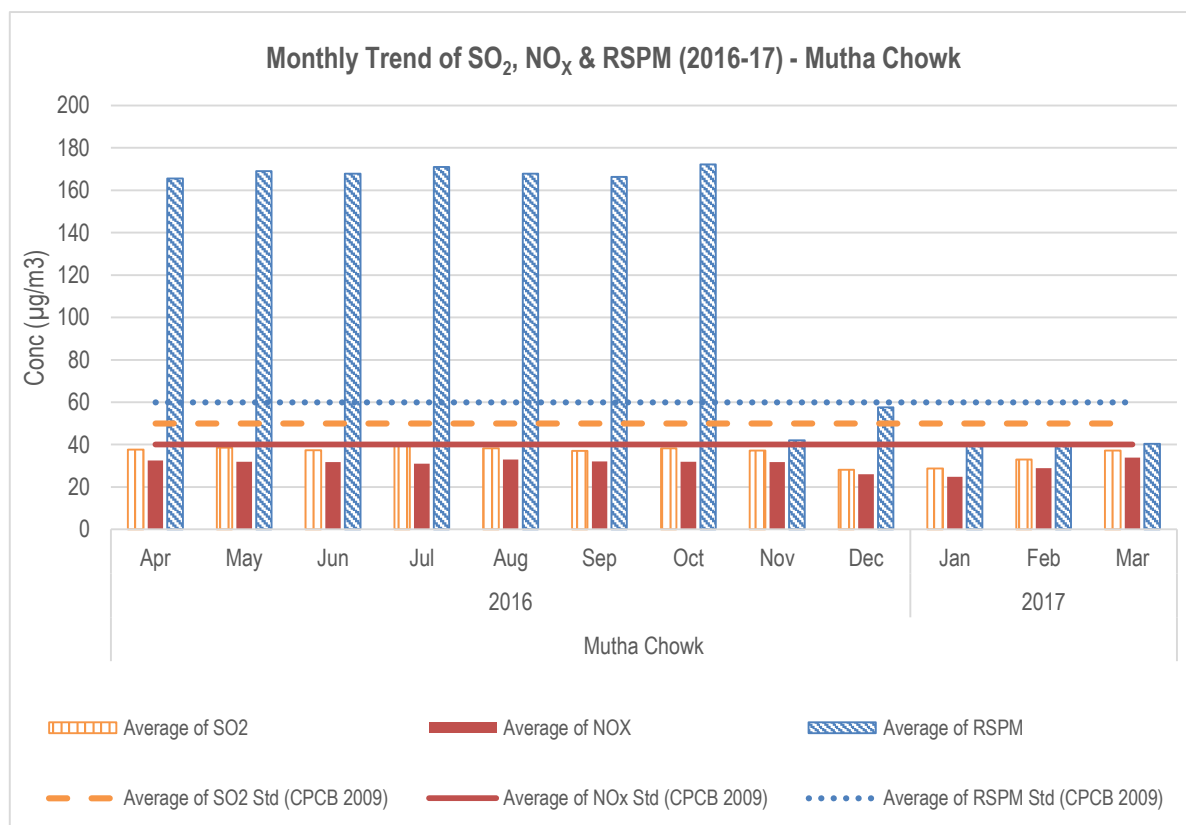


Figure No. 42: Monthly average reading recorded at Mutha Chowk

Table No. 50: Data for Annual average trend of SO₂, NO_x, and RSPM at Mutha Chowk

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Mutha Chowk	11-12	28	28	44
	12-13	27	25	53
	13-14	25	21	62
	14-15	39	33	124
	15-16	38	32	173
	16-17	36	31	113

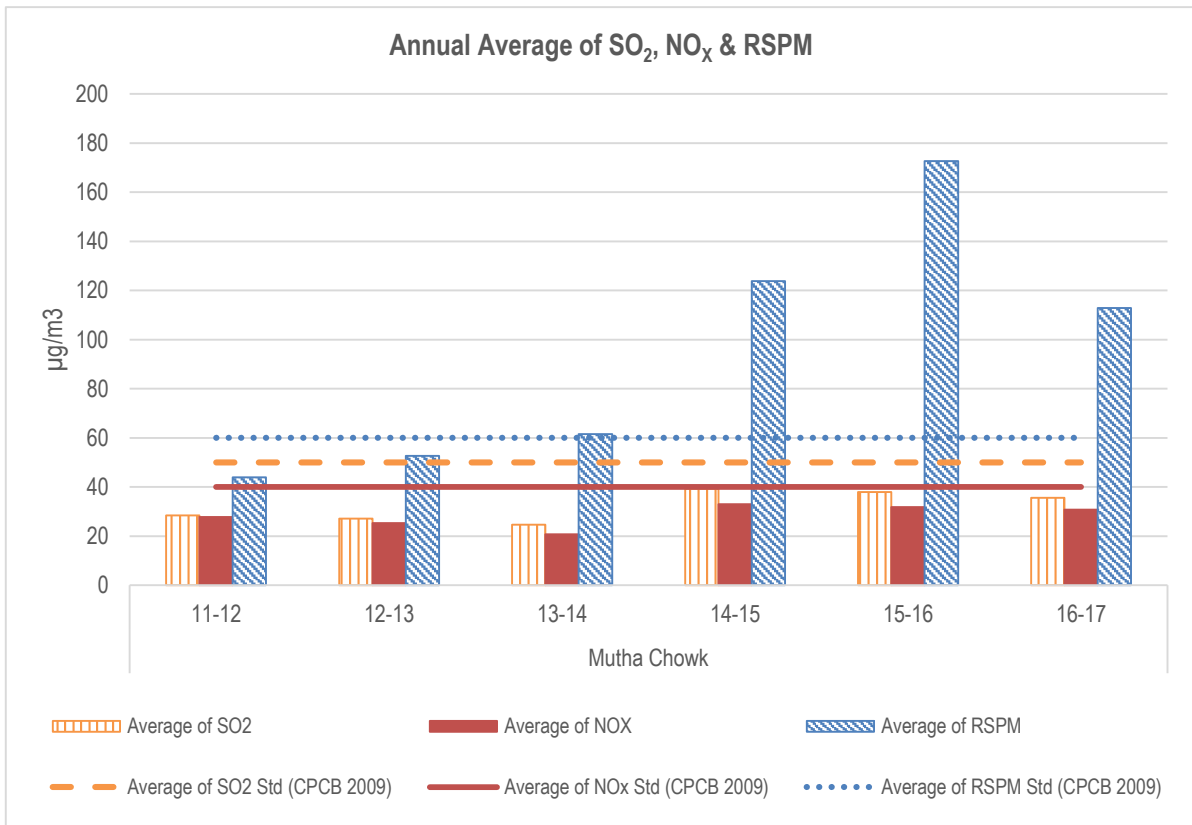


Figure No. 43: Annual average trend of SO₂, NO_x, and RSPM at Mutha Chowk

Nanded - Industrial Area CIDCO

Table No. 51: Data for Monthly average reading recorded at Industrial Area CIDCO

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Industrial Area CIDCO	2016	Apr	85	88	218
		May	90	89	217
		Jun	87	89	216
		Jul	85	89	215
		Aug	85	88	217
		Sep	85	88	220
		Oct	86	88	222
		Nov	85	87	65
	Dec	66	66	83	
	2017	Jan	46	48	66
		Feb	46	49	64
		Mar	86	81	64

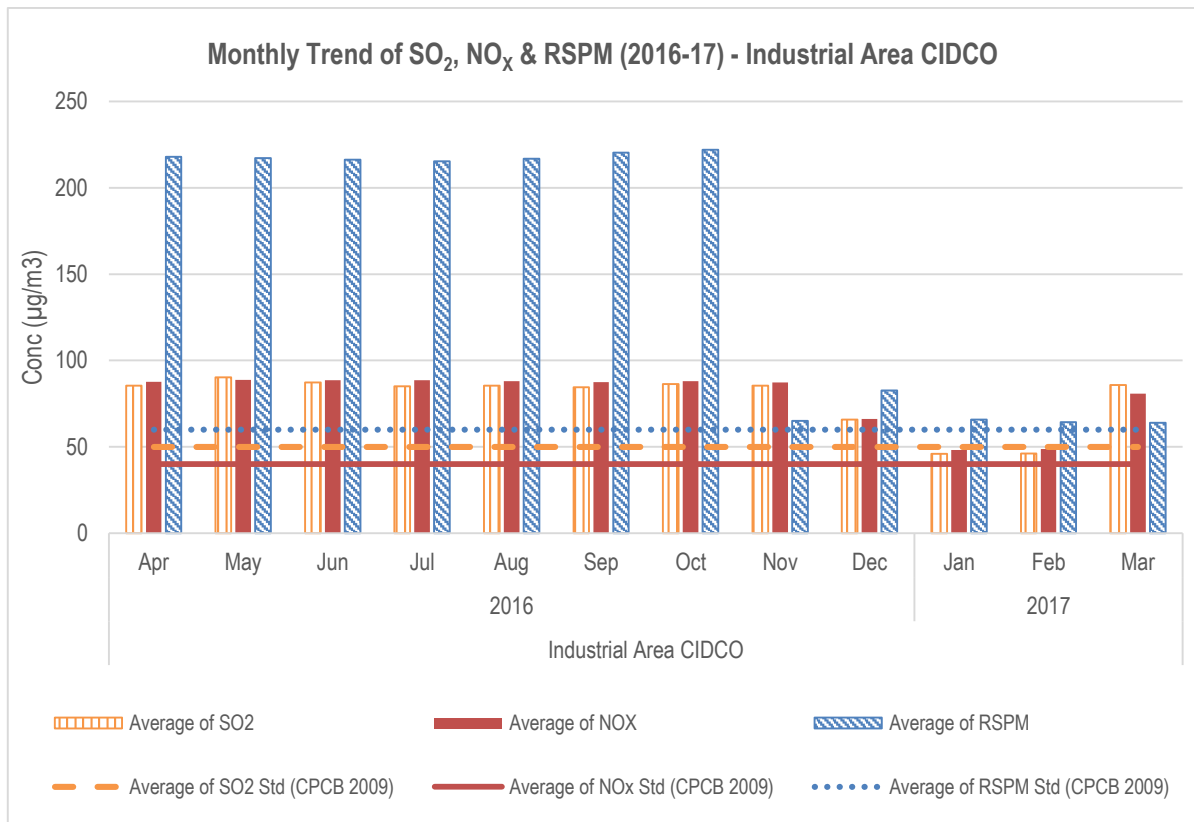


Figure No. 44: Monthly average reading recorded at Industrial Area CIDCO

Table No. 52: Data for Annual average trend of SO₂, NO_x, and RSPM at Industrial Area CIDCO

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Industrial Area CIDCO	11-12	43	45	65
	12-13	53	54	88
	13-14	48	43	85
	14-15	82	83	181
	15-16	80	81	212
	16-17	78	79	156

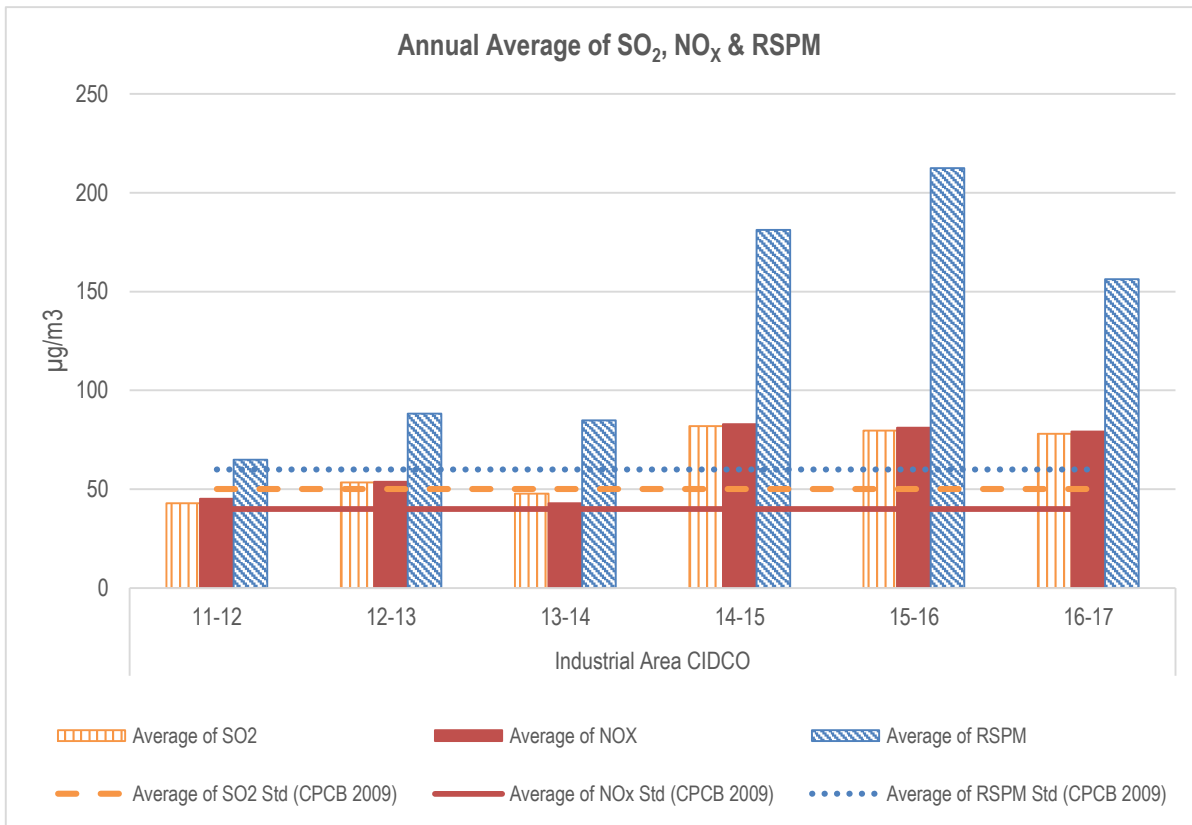


Figure No. 45: Annual average trend of SO₂, NO_x, and RSPM at Industrial Area CIDCO

Aurangabad - Aurangabad CAAQMS

Table No. 53: Data for Monthly average reading recorded at Aurangabad CAAQMS

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Aurangabad CAAQMS	2016	Apr	17	20	157
		May	10	21	115
		Jun	4	19	67
		Jul	3	20	55
		Aug	3	18	66
		Sep	3	14	63
		Oct	3	25	69
		Nov	3	47	71
		Dec	3	54	79
	2017	Jan	3	60	79
		Feb	3	52	79
		Mar	3	43	126

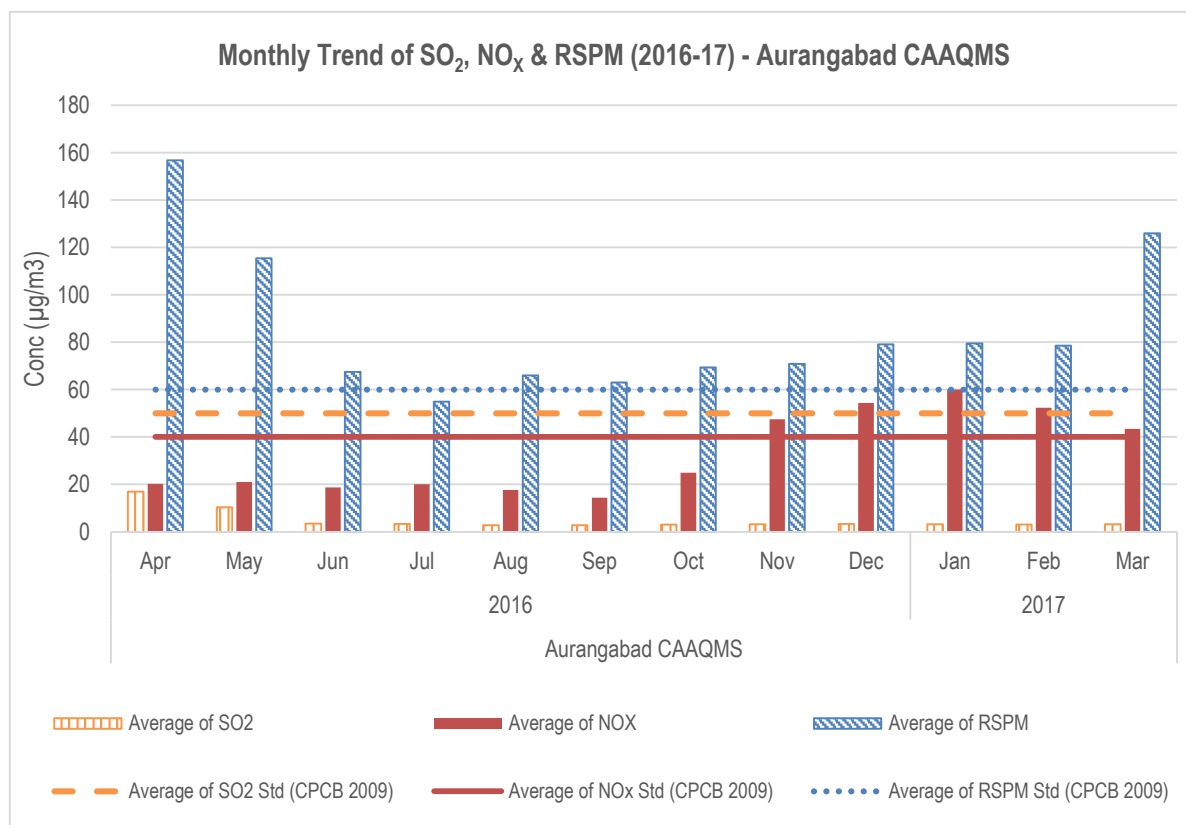


Figure No. 46: Monthly average reading recorded at Aurangabad CAAQMS

Table No. 54: Data for Annual average trend of SO₂, NO_x, and RSPM at Aurangabad CAAQMS

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Aurangabad CAAQMS	14-16			
	15-16			
	16-17*	4.88	32.83	86.21

*The Station is installed in current year 2016-17

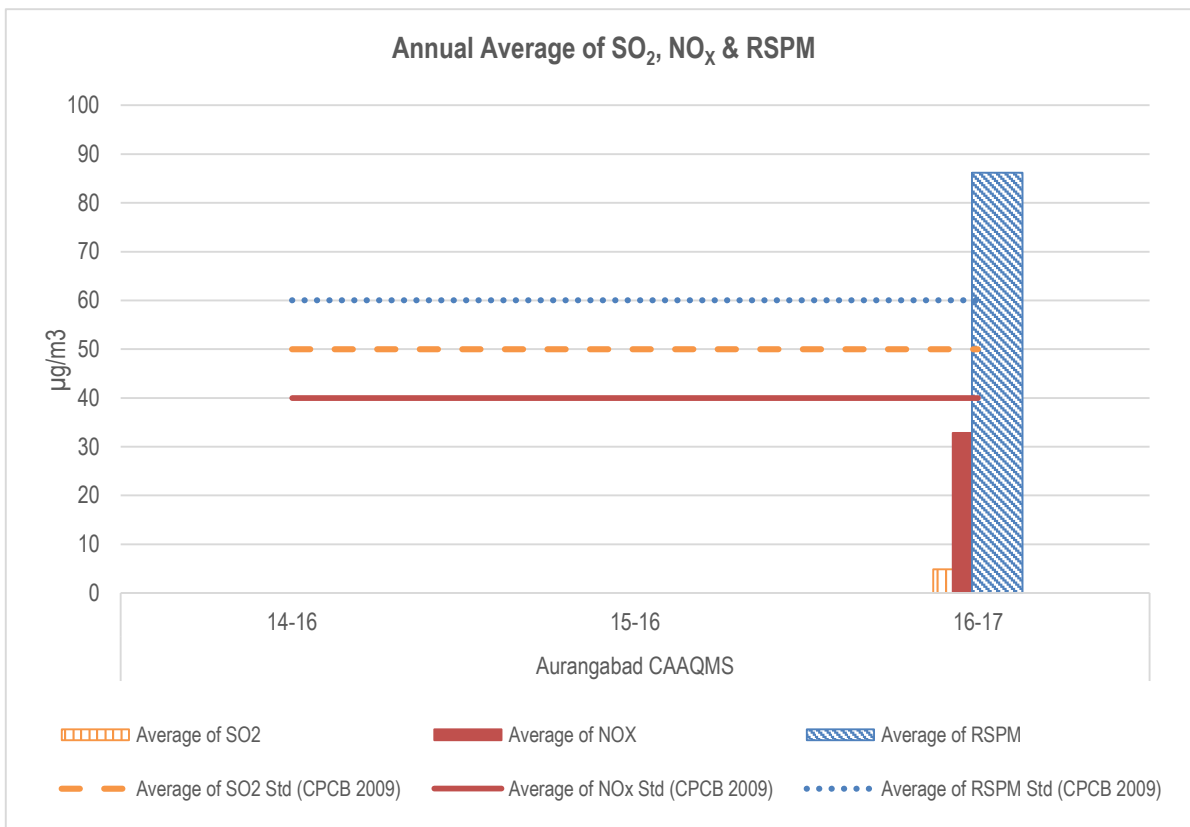
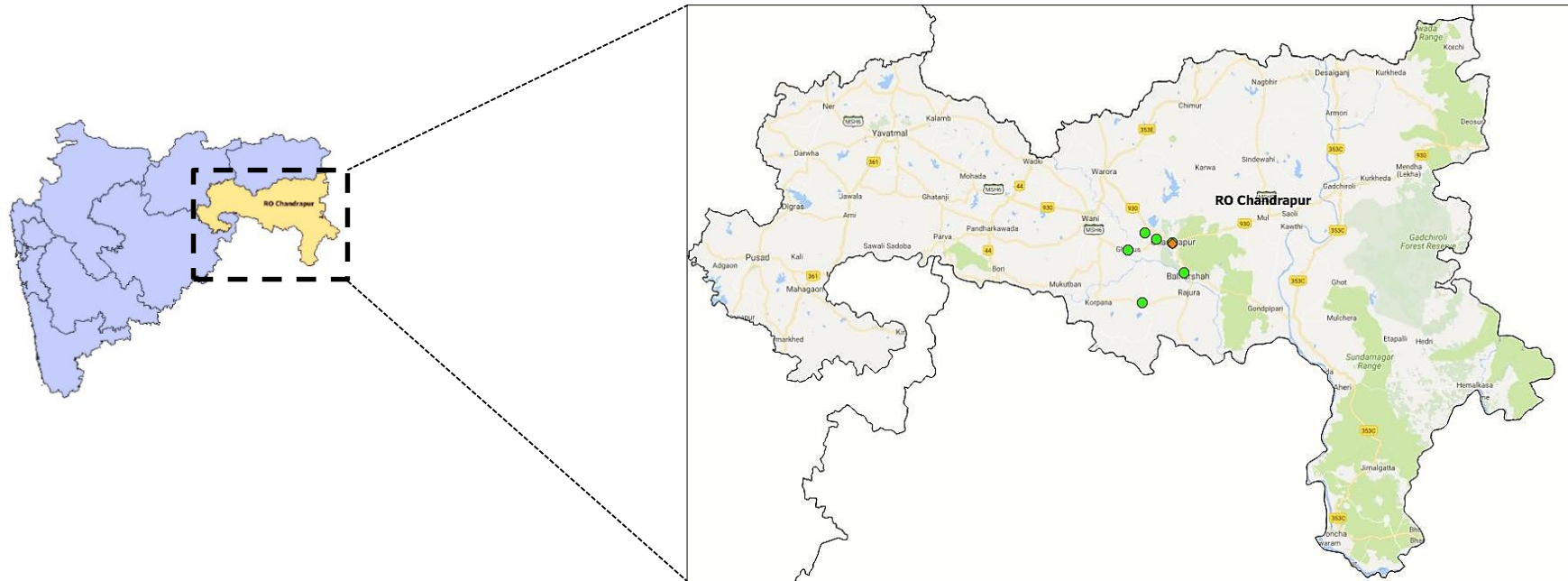


Figure No. 47: Annual average trend of SO₂, NO_x, and RSPM at Aurangabad CAAQMS

Table No. 55: Percentage exceedance of pollutants at Aurangabad RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
SBES College	97	0	1	55	0	1	57
Collector Office, Aurangabad	90	0	0	33	0	0	37
C.A.D.A. Office	92	0	0	28	0	0	30
Aurangabad CAAQMS	365	0	3	68	0	1	19
Jalna- Bachat Bhavan	75	0	0	56	0	0	75
Jalna- Krishnadhan seeds Ltd	85	0	0	3	0	0	4
MIDC Water Works - Latur	105	0	0	21	0	0	20
Shyam Nagar-Kshewraj Vidyalaya	72	0	0	8	0	0	11
Ganj Golai - Sidhleshwar Bank	79	0	0	10	0	0	13
Ganeshnagar	104	0	0	60	0	0	58
Mutha Chowk	96	0	0	53	0	0	55
Industrial Area CIDCO	102	76	74	60	75	73	59

RO – Chandrapur



Region	Station code	Station name	Program	Latitude	Longitude
Chandrapur	267	Ghuggus	NAMP	19°56'23.3916"N	79°6'51.1992"E
	281	Chandrapur - MIDC	NAMP	19°58'51.6000"N	79°13'54.7428"E
	396	Chandrapur - SRO MPCB	NAMP	19°57'54.1152"N	79°18'0.4248"E
	638	Tadali MIDC	NAMP	20°0'15.6312"N	79°11'8.7432"E
	639	Ballarshah	NAMP	19°51'11.5704"N	79°20'54.3228"E
	640	Rajura	NAMP	19°44'10.0464"N	79°10'29.172"E
			Chandrapur CAAQMS	CAAQMS	19° 57' 44.67"N

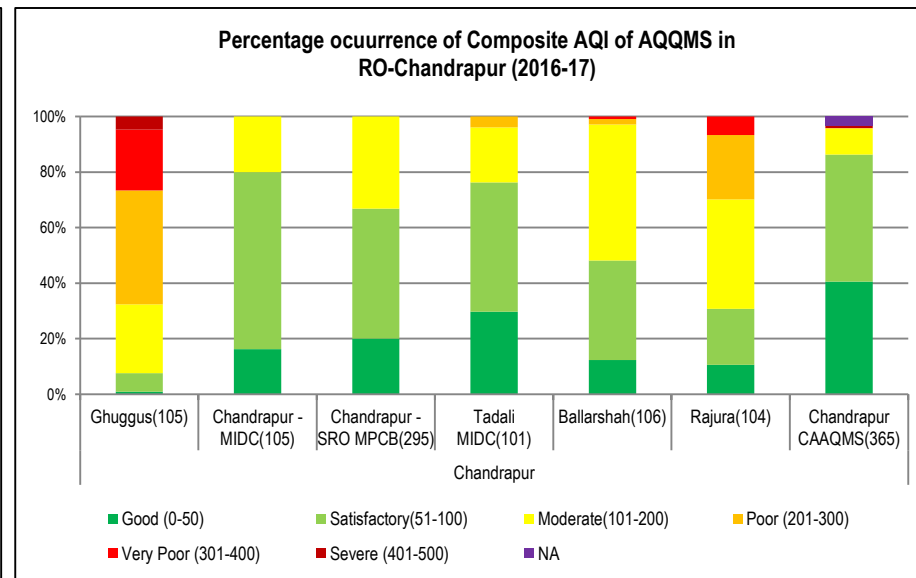
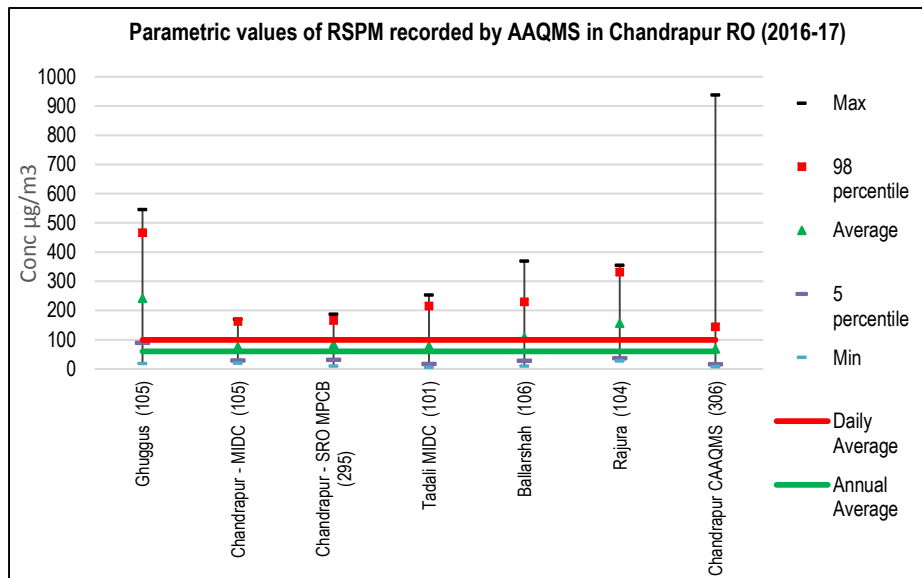
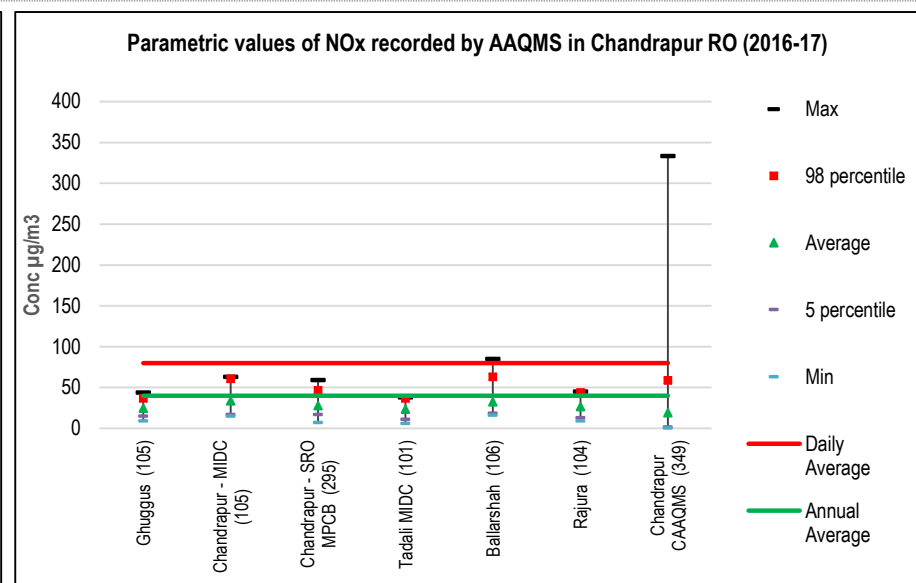
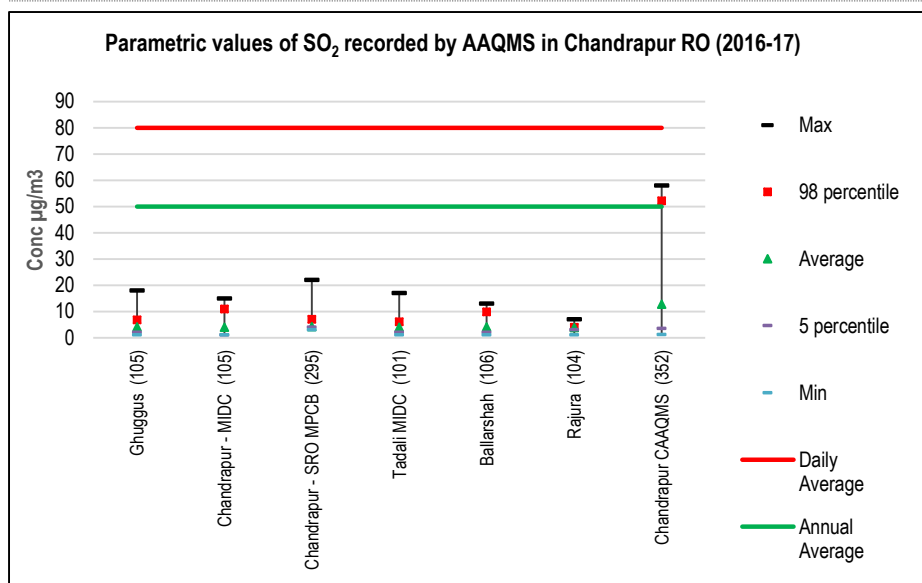


Table No. 56 : Data for SO₂, NO_x & RSPM recorded at AAQMS in Chandrapur RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	80		50	80	
	Ghuggus (105)	18	7	4	2	1
	Chandrapur - MIDC (105)	15	11	4	1	1
	Chandrapur - SRO MPCB (295)	22	7	4	4	3
	Tadali MIDC (101)	17	6	4	2	1
	Ballarshah (106)	13	10	4	2	1
	Rajura (104)	7	4	4	3	1
	Chandrapur CAAQMS (352)	58	52	13	3	1
NO _x	<i>CPCB Standard</i>	80		40	80	
	Ghuggus (105)	44	37	25	15	9
	Chandrapur - MIDC (105)	63	61	34	17	15
	Chandrapur - SRO MPCB (295)	59	47	28	17	7
	Tadali MIDC (101)	38	37	23	11	6
	Ballarshah (106)	85	63	32	18	16
	Rajura (104)	45	44	27	13	9
	Chandrapur CAAQMS (349)	333	59	19	2	0
RSPM (PM ₁₀)	<i>CPCB Standard</i>	100		60	100	
	Ghuggus (105)	545	466	242	90	18
	Chandrapur - MIDC (105)	170	164	77	30	20
	Chandrapur - SRO MPCB (295)	187	166	84	31	10
	Tadali MIDC (101)	253	216	79	17	5
	Ballarshah (106)	369	230	108	29	10
	Rajura (104)	355	332	156	37	27
	Chandrapur CAAQMS (306)	937	144	69	17	7

Chandrapur - Ghuggus

Table No. 57: Data for Monthly average reading recorded at Ghuggus - Chandrapur

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Ghuggus	2016	Apr	6	18	254
		May	4	22	307
		Jun	4	29	281
		Jul	4	15	198
		Aug	4	27	185
		Sep	4	29	160
		Oct	6	29	184
		Nov	4	18	145
		Dec	4	24	319
	2017	Jan	4	30	292
		Feb	2	30	302
		Mar	4	25	280

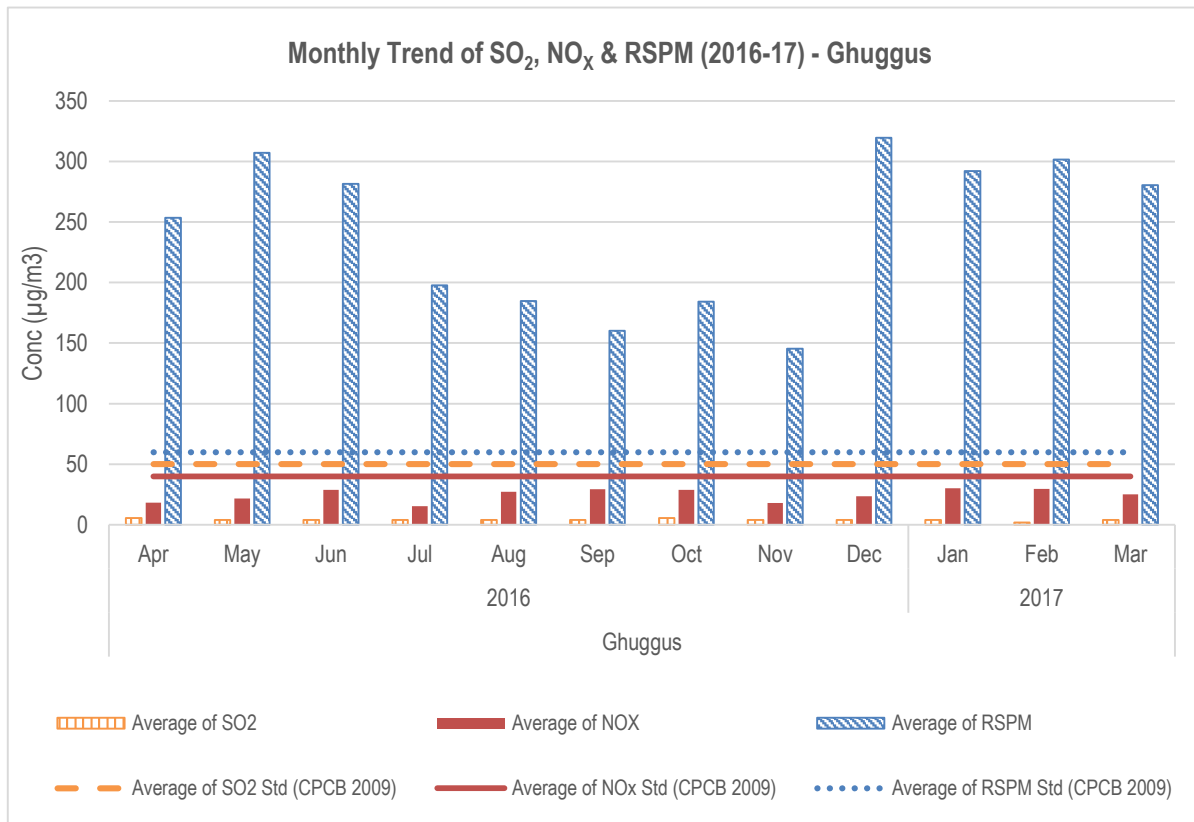


Figure No. 48: Monthly average reading recorded at Ghuggus - Chandrapur

Table No. 58: Data for Annual average trend of SO₂, NO_x, and RSPM at Ghuggus - Chandrapur

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Ghuggus	04-05	18	28	80
	05-06	21	31	131
	06-07	31	39	139
	07-08	36	53	186
	08-09	34	54	172
	09-10	46	32	180
	10-11	23	24	211
	11-12	18	21	206
	12-13	11	13	207
	13-14	9	19	174
	14-15	9	14	140
	15-16	4	17	180
	16-17	4	25	242

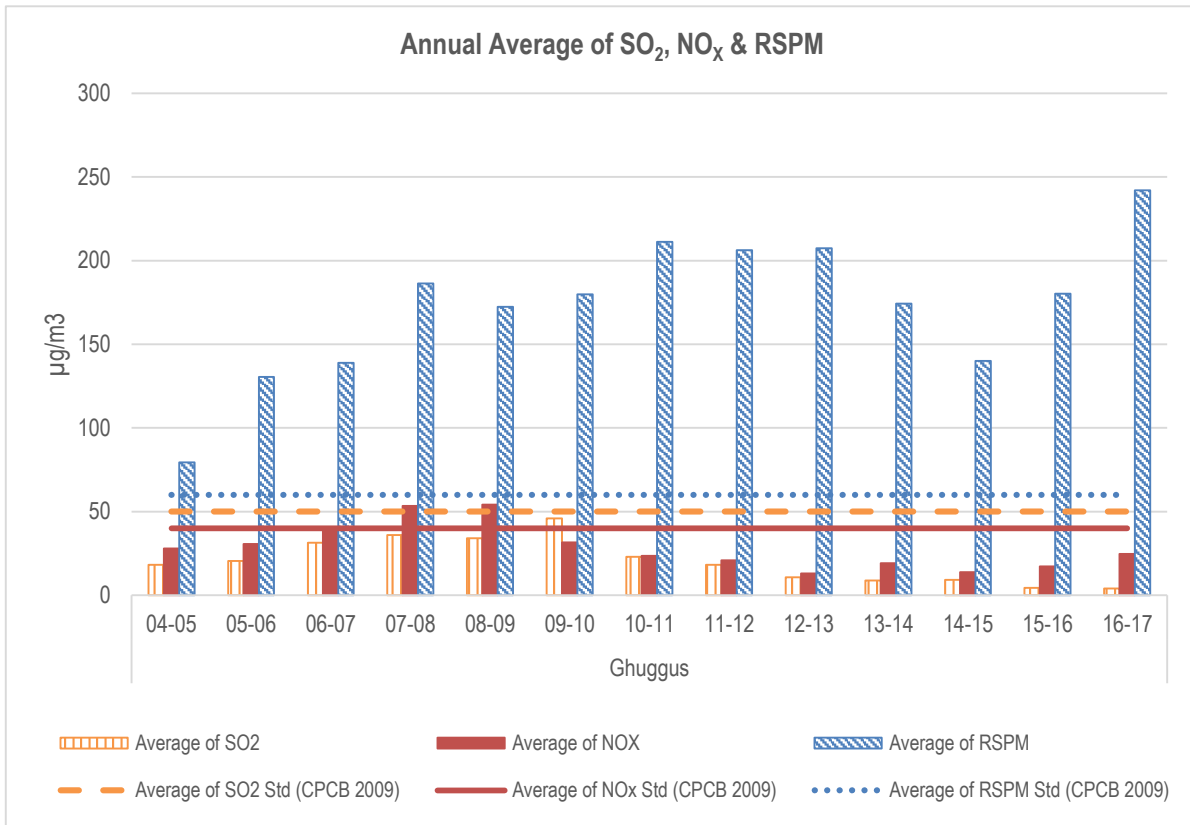


Figure No. 49: Annual average trend of SO₂, NO_x, and RSPM at Ghuggus - Chandrapur

Chandrapur - Chandrapur - MIDC

Table No. 59: Data for Monthly average reading recorded at Chandrapur - MIDC

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Chandrapur - MIDC	2016	Apr	5	27	66
		May	4	23	64
		Jun	4	49	75
		Jul	4	24	59
		Aug	4	38	65
		Sep	4	37	69
		Oct	6	33	72
		Nov	4	21	89
		Dec	4	48	113
	2017	Jan	4	43	86
		Feb	1	35	86
		Mar	4	30	75

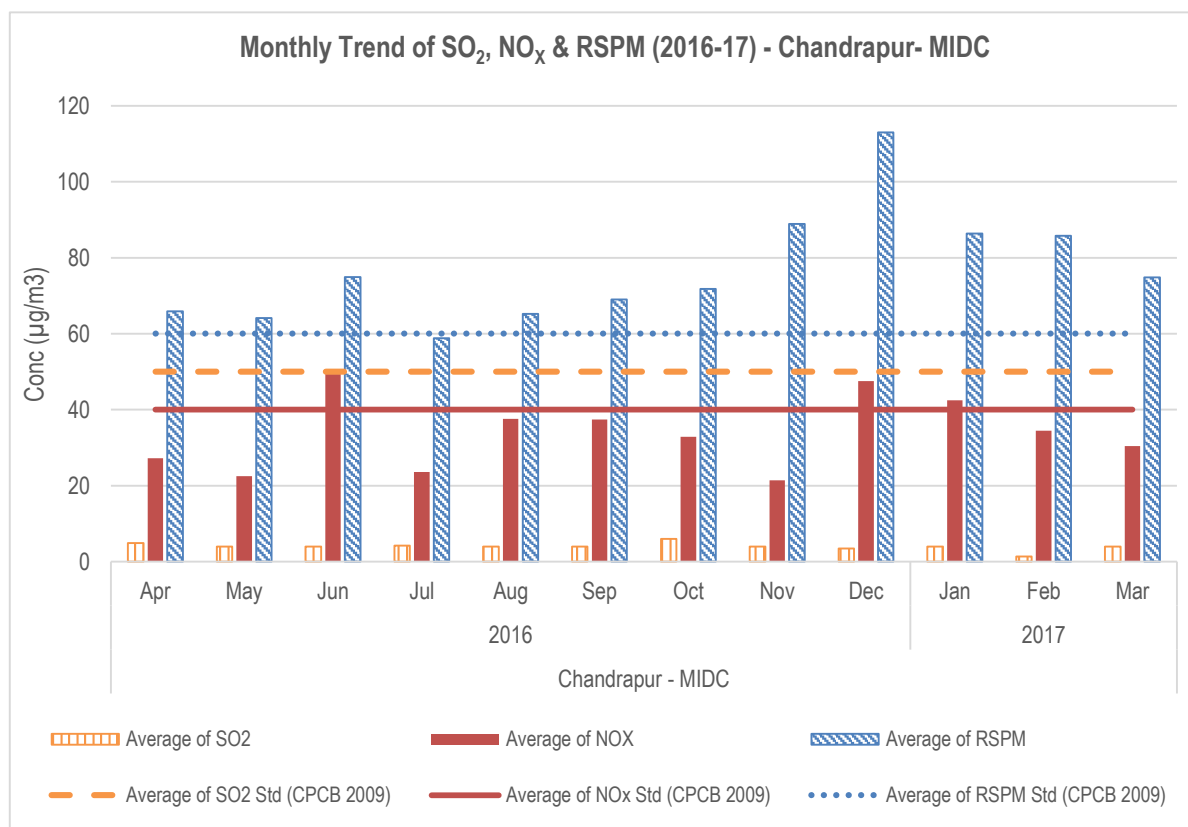


Figure No. 50: Monthly average reading recorded at Chandrapur – MIDC

Table No. 60: Data for Annual average trend of SO₂, NO_x, and RSPM at Chandrapur - MIDC

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Chandrapur - MIDC	04-05	25	37	110
	05-06	26	37	130
	06-07	38	41	123
	07-08	37	50	125
	08-09	34	53	148
	09-10	63	31	141
	10-11	25	25	150
	11-12	21	35	131
	12-13	14	17	105
	13-14	18	27	60
	14-15	14	30	70
	15-16	7	26	75
	16-17	4	34	77

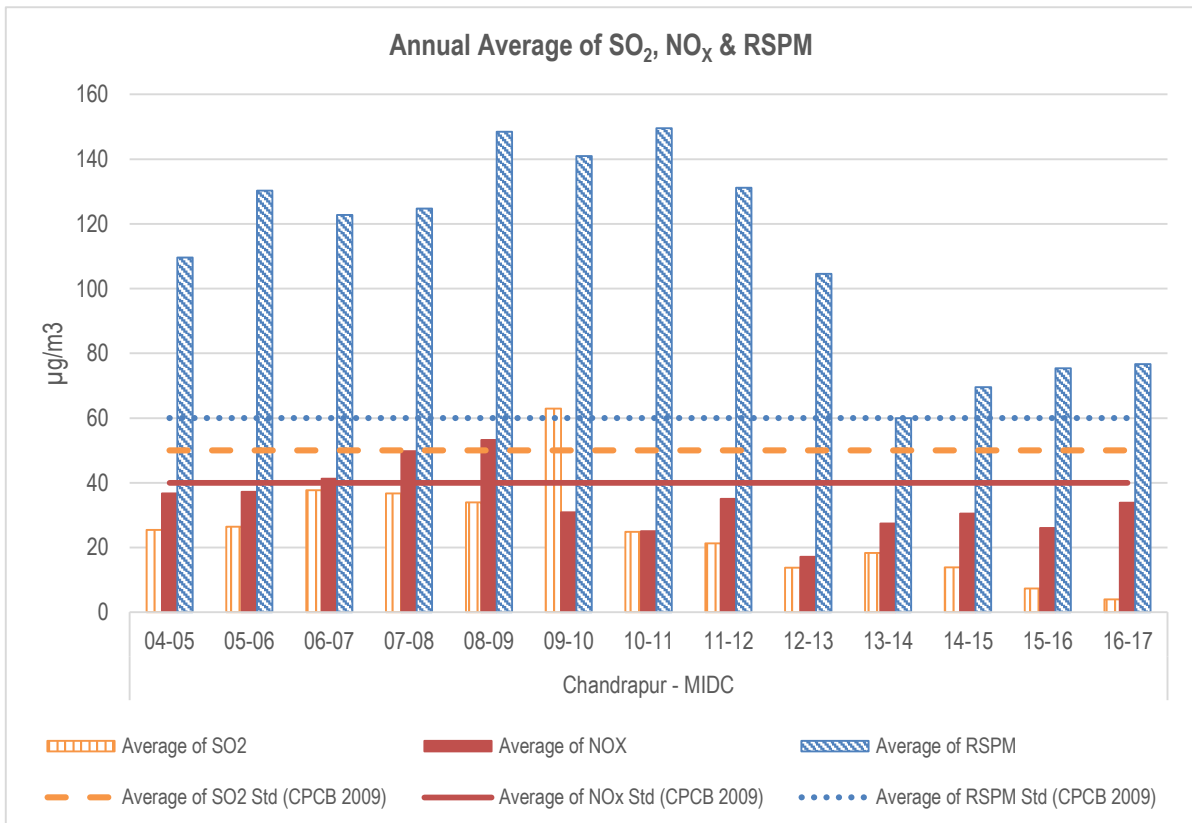


Figure No. 51: Annual average trend of SO₂, NO_x, and RSPM at Chandrapur – MIDC

Chandrapur - Chandrapur- SRO MPCB

Table No. 61: Data for Monthly average reading recorded at Chandrapur- SRO MPCB

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Chandrapur - SRO MPCB	2016	Apr	5	23	80
		May	4	22	58
		Jun	4	33	61
		Jul	4	21	66
		Aug	5	34	54
		Sep	4	25	48
		Oct	4	31	97
		Nov	4	26	144
		Dec	4	27	113
	2017	Jan	4	31	107
	Feb	4	33	95	

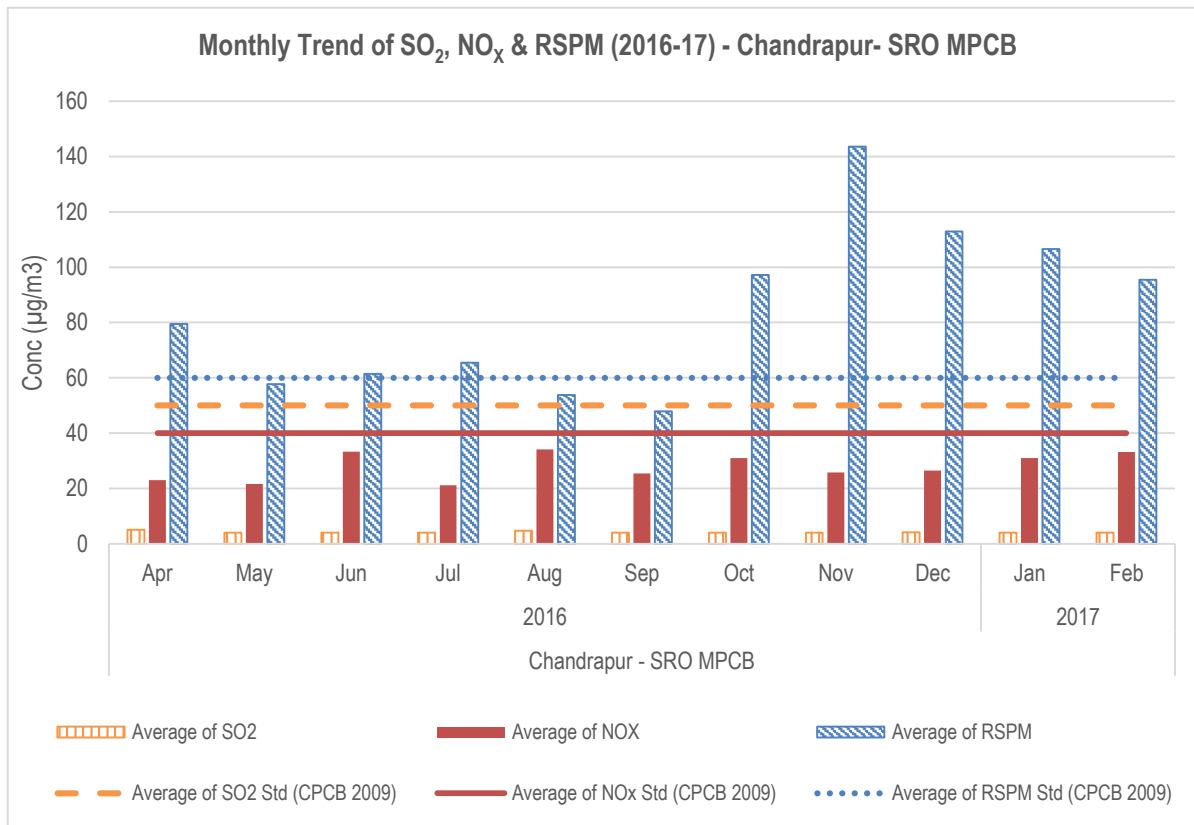


Figure No. 52: Monthly average reading recorded at Chandrapur- SRO MPCB

Table No. 62: Data for Annual average trend of SO₂, NO_x, and RSPM at Chandrapur - SRO MPCB

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Chandrapur - SRO MPCB	04-05	23	34	107
	05-06	20	30	116
	06-07	31	38	130
	07-08	30	46	161
	08-09	26	45	159
	09-10	41	35	74
	10-11	21	27	92
	11-12	18	31	66
	12-13	14	17	75
	13-14	10	26	66
	14-15	7	23	87
	15-16	4	20	70
	16-17	4	28	84

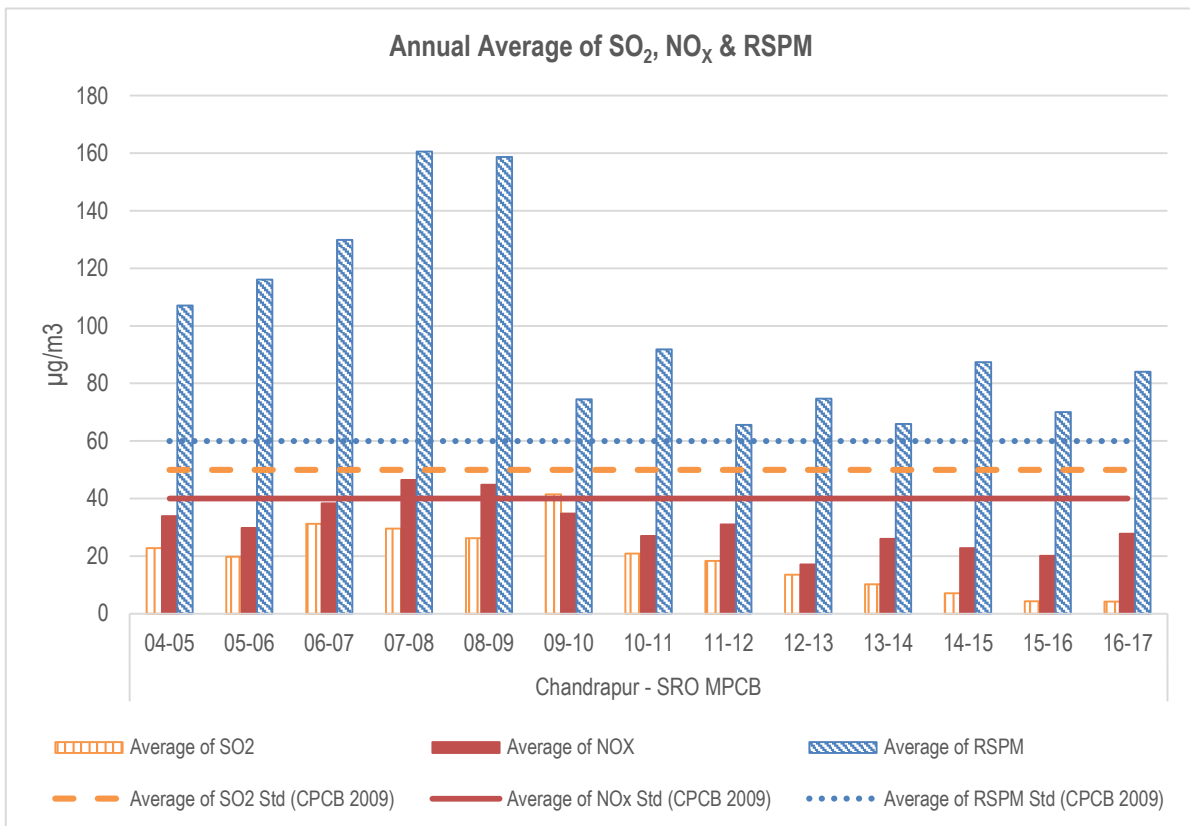


Figure No. 53: Annual average trend of SO₂, NO_x, and RSPM at Chandrapur - SRO MPCB

Chandrapur - Tadali MIDC

Table No. 63: Data for Monthly average reading recorded at Tadali MIDC

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Tadali MIDC	2016	May	4	22	71
		Jun	4	27	64
		Jul	4	19	68
		Aug	4	23	57
		Sep	4	20	78
		Oct	5	20	69
		Nov	4	19	62
		Dec	4	21	102
	2017	Jan	4	30	66
		Feb	2	31	103
		Mar	4	27	134

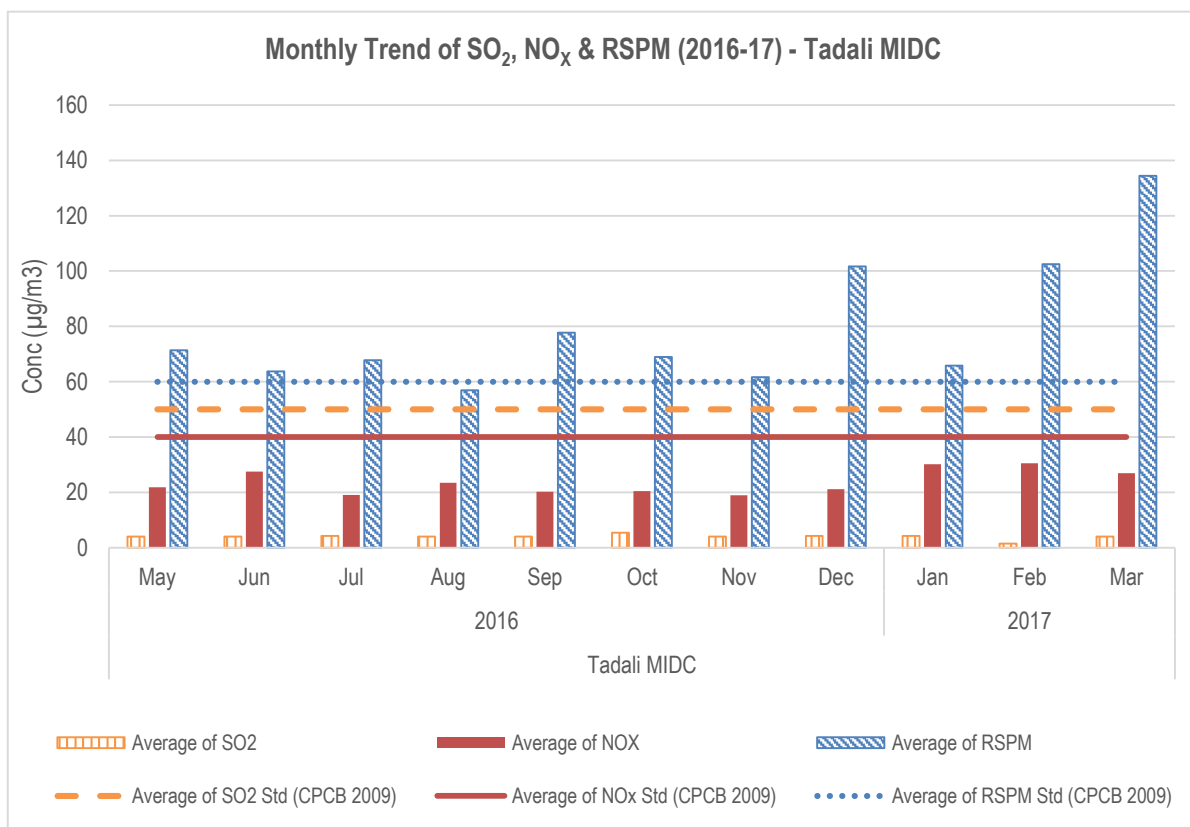


Figure No. 54: Monthly average reading recorded at Tadali MIDC

Table No. 64: Data for Annual average trend of SO₂, NO_x, and RSPM at Tadali MIDC

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Tadali MIDC	09-10	29	19	169
	10-11	18	20	216
	11-12	16	18	151
	12-13	9	13	173
	13-14	7	16	195
	14-15	7	15	112
	15-16	4	20	58
	16-17	4	23	79

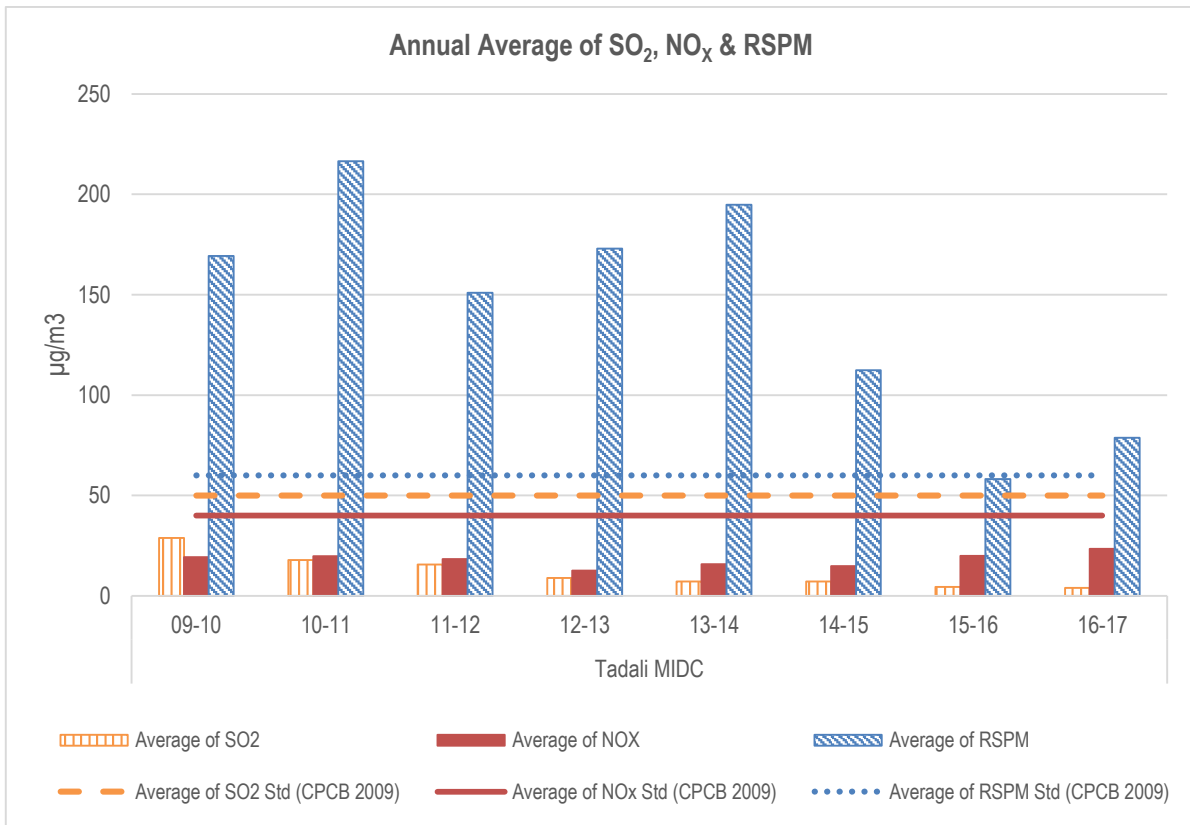


Figure No. 55: Annual average trend of SO₂, NO_x, and RSPM at Tadali MIDC

Chandrapur - Ballarshah

Table No. 65: Data for Monthly average reading recorded at Ballarshah

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Ballarshah	2016	Apr	5	25	99
		May	4	23	86
		Jun	4	50	76
		Jul	5	39	66
		Aug	4	31	60
		Sep	4	37	80
		Oct	5	36	74
		Nov	4	23	175
		Dec	4	26	166
	2017	Jan	4	34	168
		Feb	2	33	119
		Mar	4	32	136

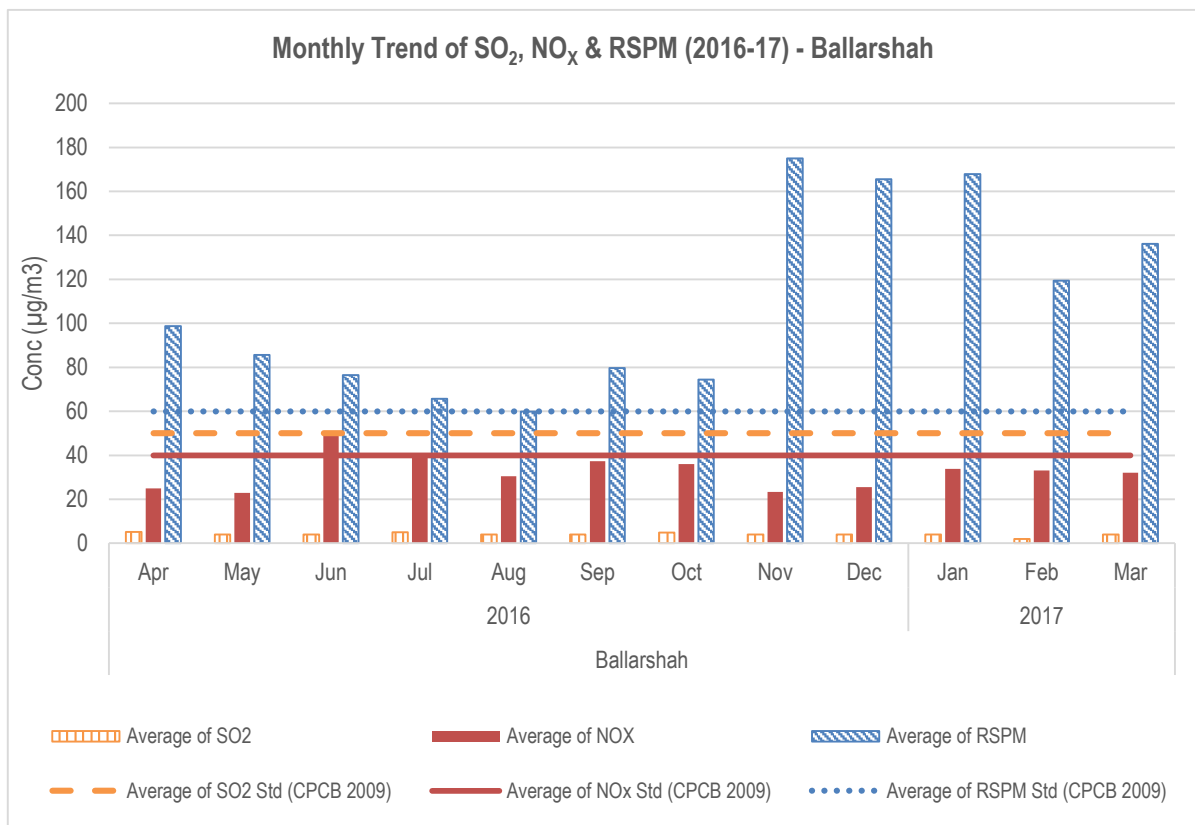


Figure No. 56: Monthly average reading recorded at Ballarshah

Table No. 66: Data for Annual average trend of SO₂, NO_x, and RSPM at Ballarshah

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Ballarshah	09-10	32	35	122
	10-11	17	32	129
	11-12	19	24	123
	12-13	9	19	192
	13-14	10	37	135
	14-15	10	48	130
	15-16	4	28	123
	16-17	4	32	108

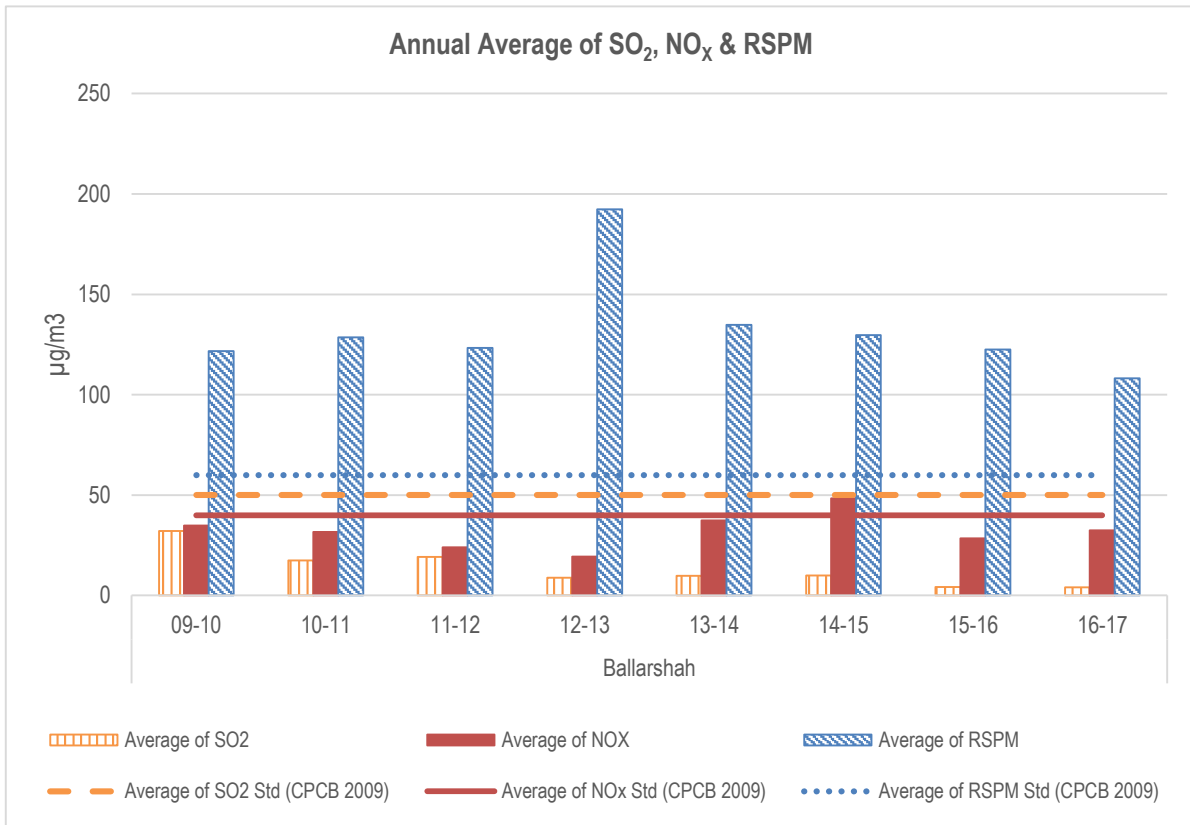


Figure No. 57: Annual average trend of SO₂, NO_x, and RSPM at Ballarshah

Chandrapur - Rajura

Table No. 67: Data for Monthly average reading recorded at Rajura

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Rajura	2016	Apr	4	20	130
		May	4	22	101
		Jun	4	33	132
		Jul	4	19	108
		Aug	4	23	98
		Sep	4	35	114
		Oct	4	27	64
		Nov	4	18	128
	2017	Jan	4	30	223
		Feb	2	31	317
		Mar	4	30	240

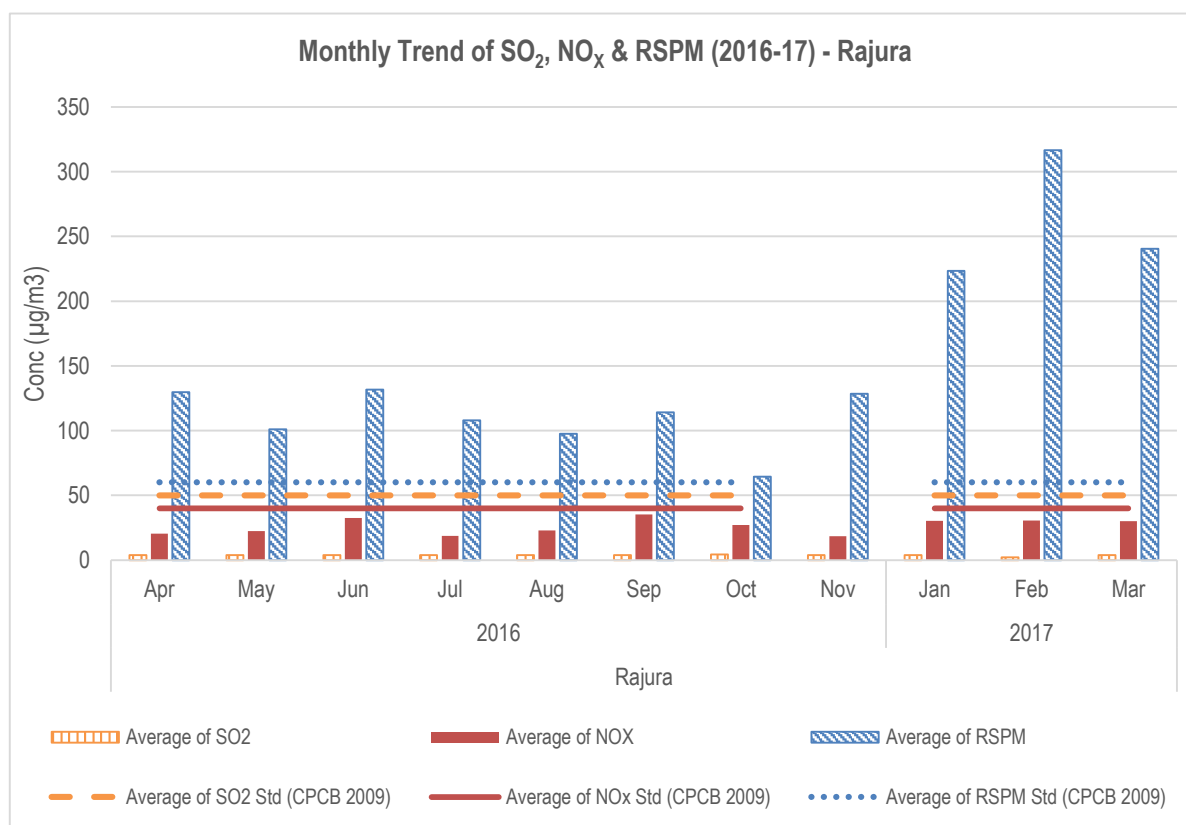


Figure No. 58: Monthly average reading recorded at Rajura

Table No. 68: Data for Annual average trend of SO₂, NO_x, and RSPM at Rajura

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Rajura	09-10	34	37	119
	10-11	17	19	115
	11-12	16	19	159
	12-13	9	21	196
	13-14	10	31	145
	14-15	7	17	144
	15-16	4	17	127
	16-17	4	27	156

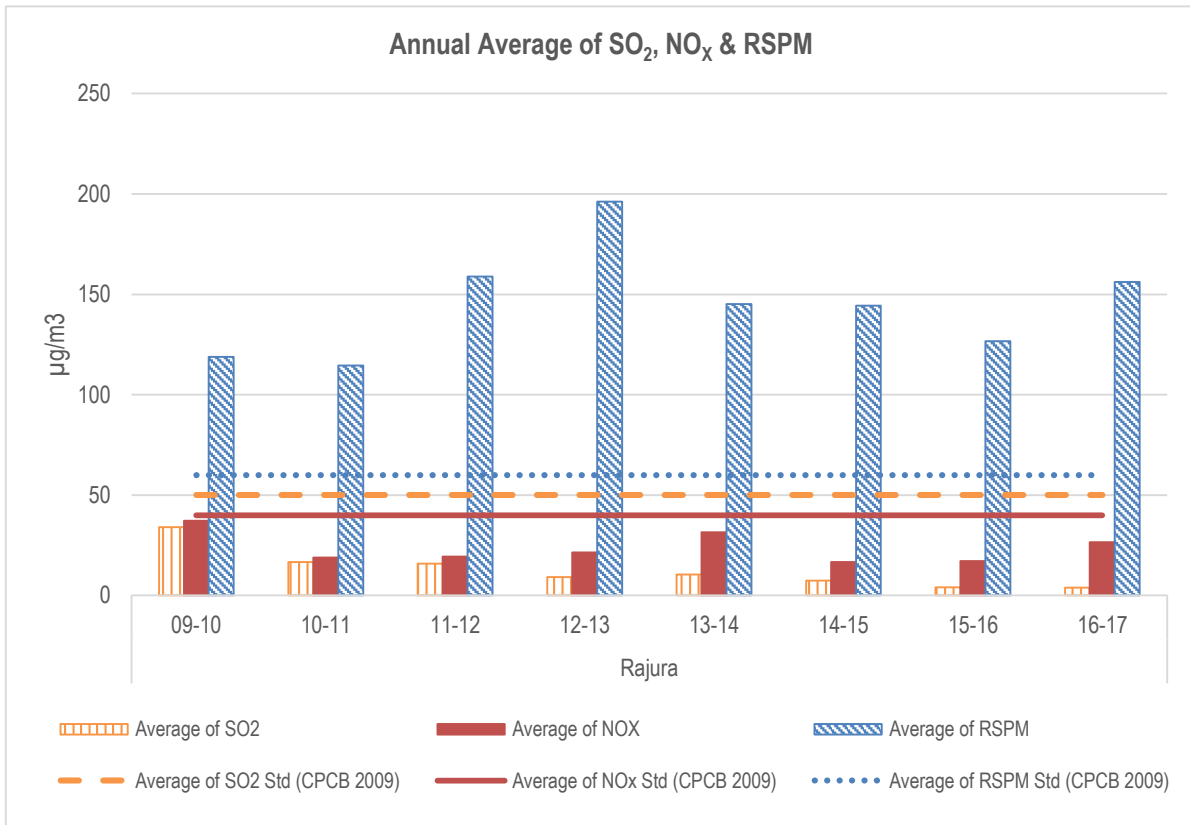


Figure No. 59: Annual average trend of SO₂, NO_x, and RSPM at Rajura

Chandrapur - Chandrapur CAAQMS

Table No. 69: Data for Monthly average reading recorded at Chandrapur CAAQMS

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Chandrapur CAAQMS	2016	Apr	39	16	93
		May	18	5	63
		Jun	19	3	46
		Jul	14	2	23
		Aug	5	34	39
		Sep	5	19	34
		Oct	7	19	67
		Nov	7	20	89
		Dec	10	26	79
	2017	Jan	8	45	60
		Feb	10	21	85
		Mar	11	24	161

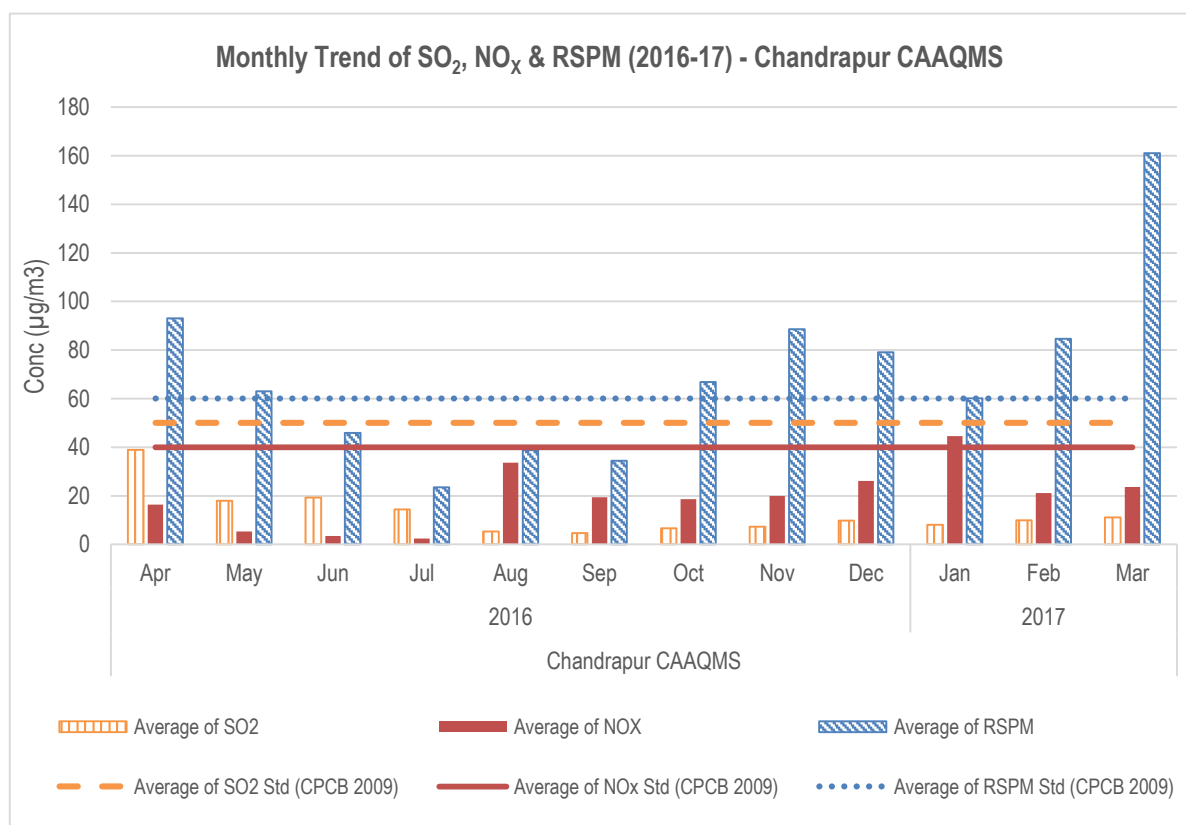


Figure No. 60: Monthly average reading recorded at Chandrapur CAAQMS

Table No. 70: Data for Annual average trend of SO₂, NO_x, and RSPM at Chandrapur CAAQMS

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Chandrapur CAAQMS	14-16			
	15-16			
	16-17*	12.81	19.12	68.51

*The station is installed in current year 2016-17

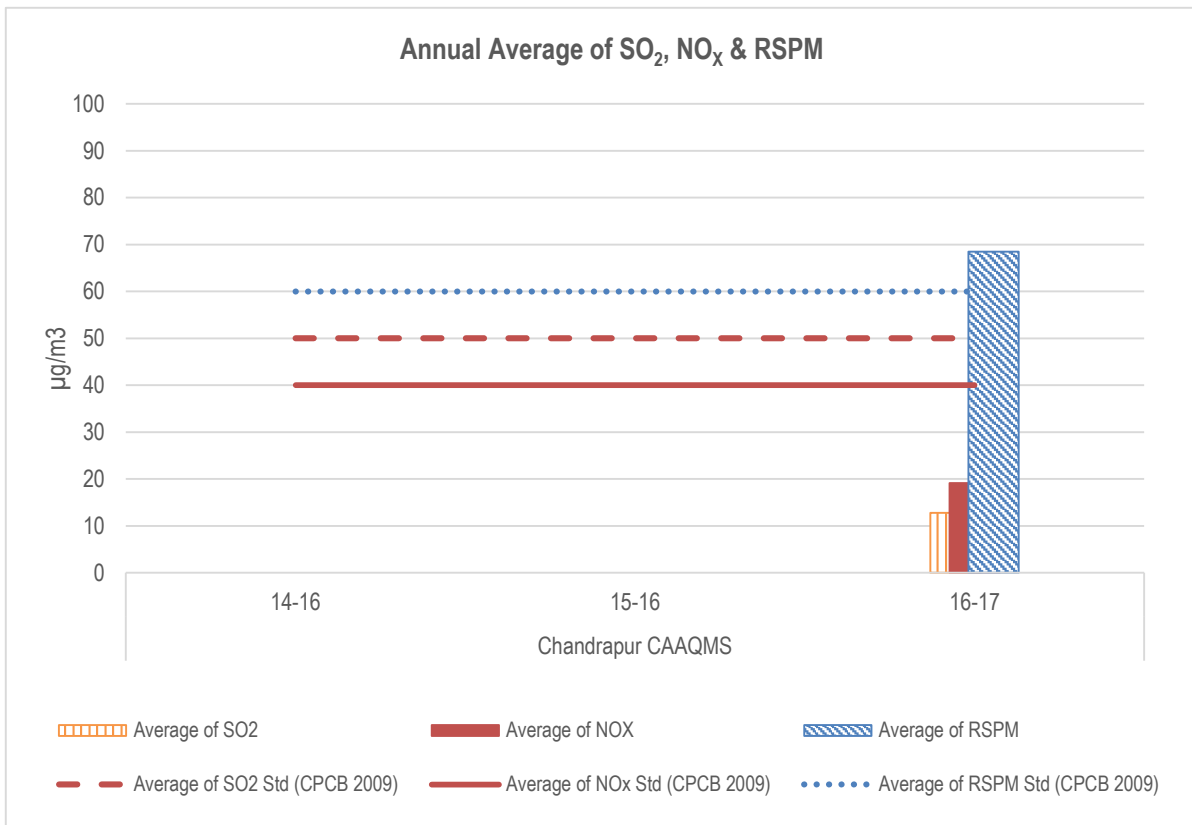
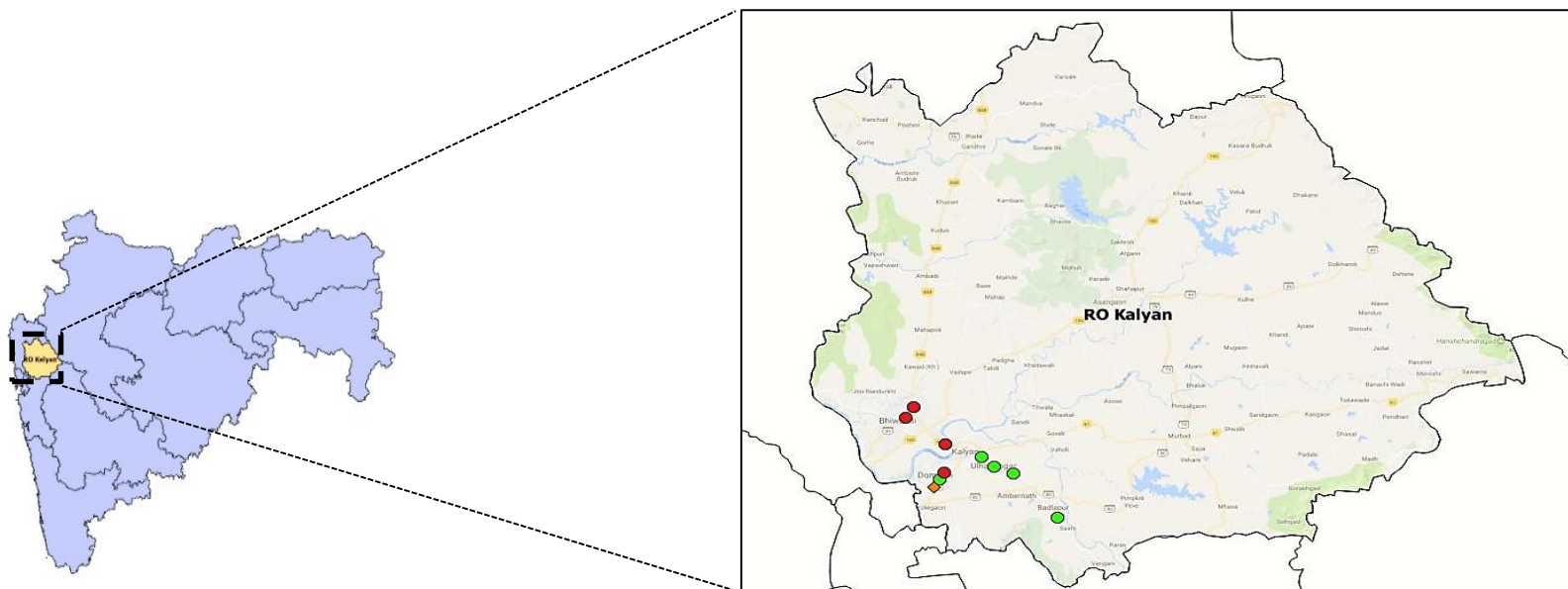


Figure No. 61: Annual average trend of SO₂, NO_x, and RSPM at Chandrapur CAAQMS

Table No. 71: Percentage exceedance of pollutants at Chandrapur RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Ghuggus	105	0	0	97	0	0	92
Chandrapur - MIDC	105	0	0	21	0	0	20
Chandrapur - SRO MPCB	295	0	0	98	0	0	33
Tadali MIDC	101	0	0	24	0	0	24
Ballarshah	106	0	1	54	0	1	51
Rajura	104	0	0	72	0	0	69
Chandrapur CAAQMS	365	0	6	33	0	2	9

RO - Kalyan



Region	Station code	Station name	Program	Latitude	Longitude
Ambarnath	445	Ambarnath	NAMP	19° 12' 41.7"N	73° 11' 15.5"E
Badlapur	649	Badlapur - BIWA House	NAMP	19° 09'13.93"N	73° 14' 28.82"E
Bhiwandi	-	I.G.M. Hospital	SAMP	19° 17'57.13"N	73° 04' 00.83"E
Bhiwandi	-	Prematai hall	SAMP	19° 17'08.2"N	73° 03' 29.0"E
Dombivali	265	Dombivali	NAMP	19° 12'15.06"N	73° 05' 54.25"E
Dombivali	-	MIDC Office Dombivali	SAMP	19° 12'47.36"N	73° 06' 17.02"E
Dombivali	-	Dombivali CAAQMS	CAAQMS	19° 11' 38.38"N	73° 05' 32.35"E
Kalyan	-	MPCB RO Kalyan office	SAMP	19° 15' 03.10" N	73° 06'19.9"E
Ulhasnagar	647	Smt. CHM College Campus	NAMP	19° 13'13.47"N	73° 09'50.70"E
Ulhasnagar	648	Powai Chowk	NAMP	19° 14'00.65"N	73° 08' 57.86"E

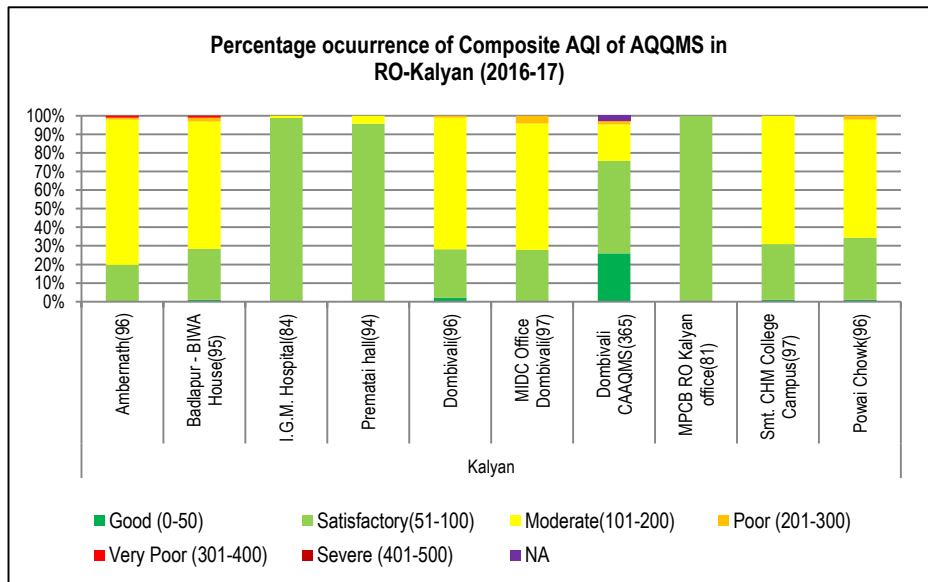
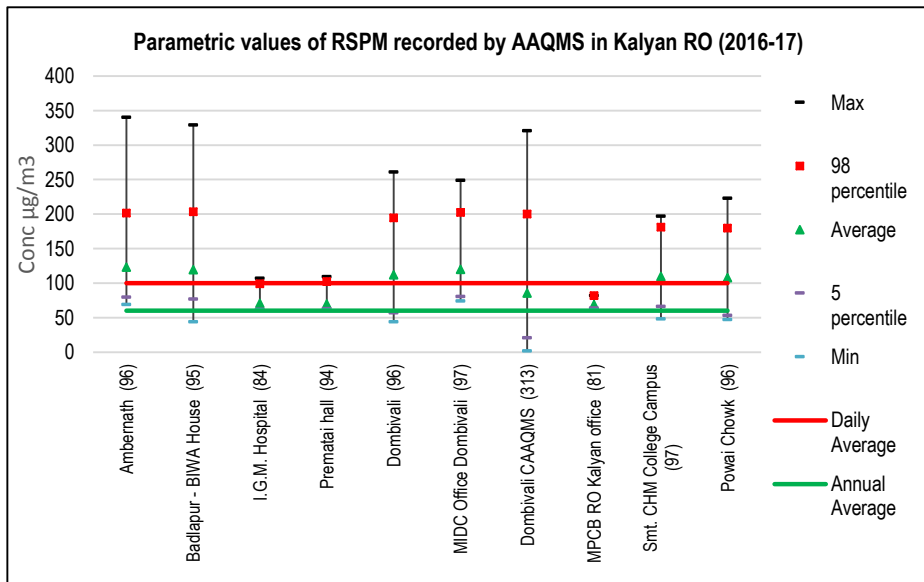
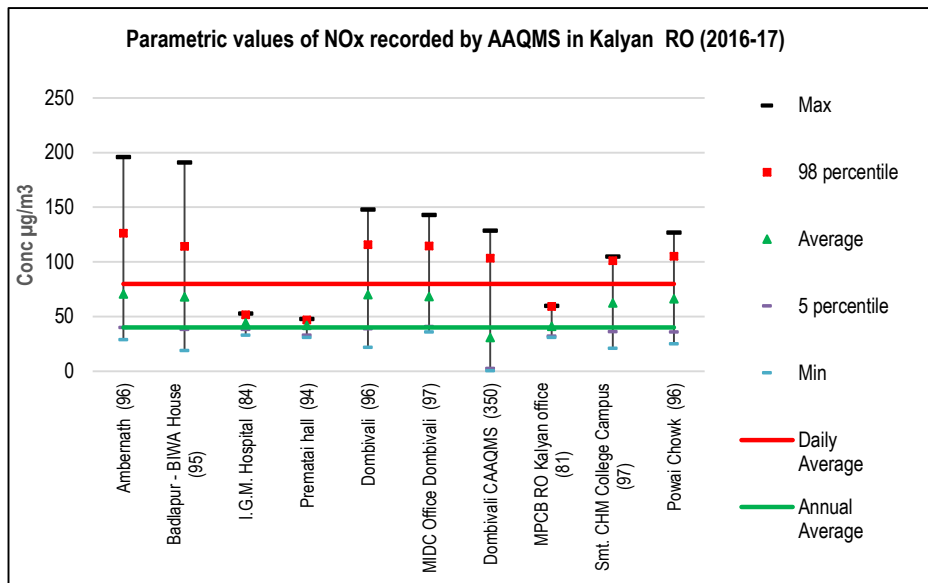
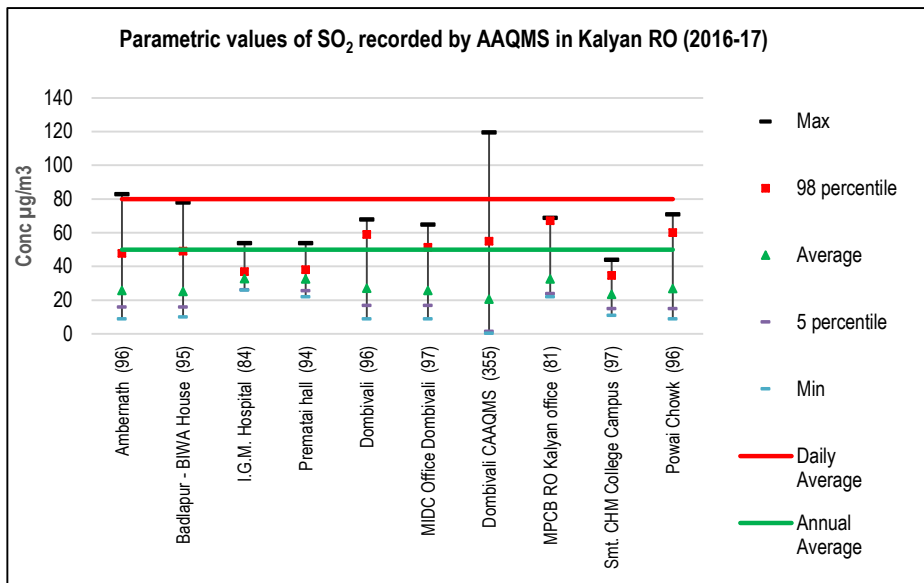


Table No. 72:Data for SO₂, NO_x & RSPM recorded at AAQMS in Chandrapur RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	<i>80</i>		<i>50</i>	<i>80</i>	
	Ambernath (96)	83	48	26	16	9
	Badlapur - BIWA House (95)	78	49	25	16	10
	I.G.M. Hospital (84)	54	37	33	26	26
	Prematai hall (94)	54	38	33	26	22
	Dombivali (96)	68	59	27	17	9
	MIDC Office Dombivali (97)	65	51	26	17	9
	Dombivali CAAQMS (355)	120	55	21	1	0
	MPCB RO Kalyan office (81)	69	67	33	24	22
	Smt. CHM College Campus (97)	44	35	23	15	11
	Powai Chowk (96)	71	60	27	15	9
NO _x	<i>CPCB Standard</i>	<i>80</i>		<i>40</i>	<i>80</i>	
	Ambernath (96)	196	126	71	40	29
	Badlapur - BIWA House (95)	191	114	68	38	19
	I.G.M. Hospital (84)	53	52	45	38	33
	Prematai hall (94)	48	47	42	33	31
	Dombivali (96)	148	116	70	39	22
	MIDC Office Dombivali (97)	143	115	69	41	36
	Dombivali CAAQMS (350)	129	104	31	3	0
	MPCB RO Kalyan office (81)	60	59	41	32	31
	Smt. CHM College Campus (97)	105	101	62	36	21
	Powai Chowk (96)	127	105	67	36	25
RSPM (PM ₁₀)	<i>CPCB Standard</i>	<i>100</i>		<i>60</i>	<i>100</i>	
	Ambernath (96)	340	202	123	80	69
	Badlapur - BIWA House (95)	329	203	120	77	44
	I.G.M. Hospital (84)	107	99	71	62	61
	Prematai hall (94)	109	102	70	63	61
	Dombivali (96)	261	195	112	57	44
	MIDC Office Dombivali (97)	249	202	120	81	74
	Dombivali CAAQMS (313)	321	200	86	21	2
	MPCB RO Kalyan office (81)	82	82	69	64	61
	Smt. CHM College Campus (97)	197	181	110	66	48
	Powai Chowk (96)	223	180	108	53	47

Ambernath

Table No. 73: Data for Monthly average reading recorded at Ambernath

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Ambernath	2016	Apr	25	78	126
		May	22	68	127
		Jun	23	63	117
		Jul	21	69	128
		Aug	23	60	113
		Sep	29	66	97
		Oct	32	98	107
		Nov	20	50	97
		Dec	28	92	166
	2017	Jan	27	56	106
		Feb	33	103	183
		Mar	29	72	132

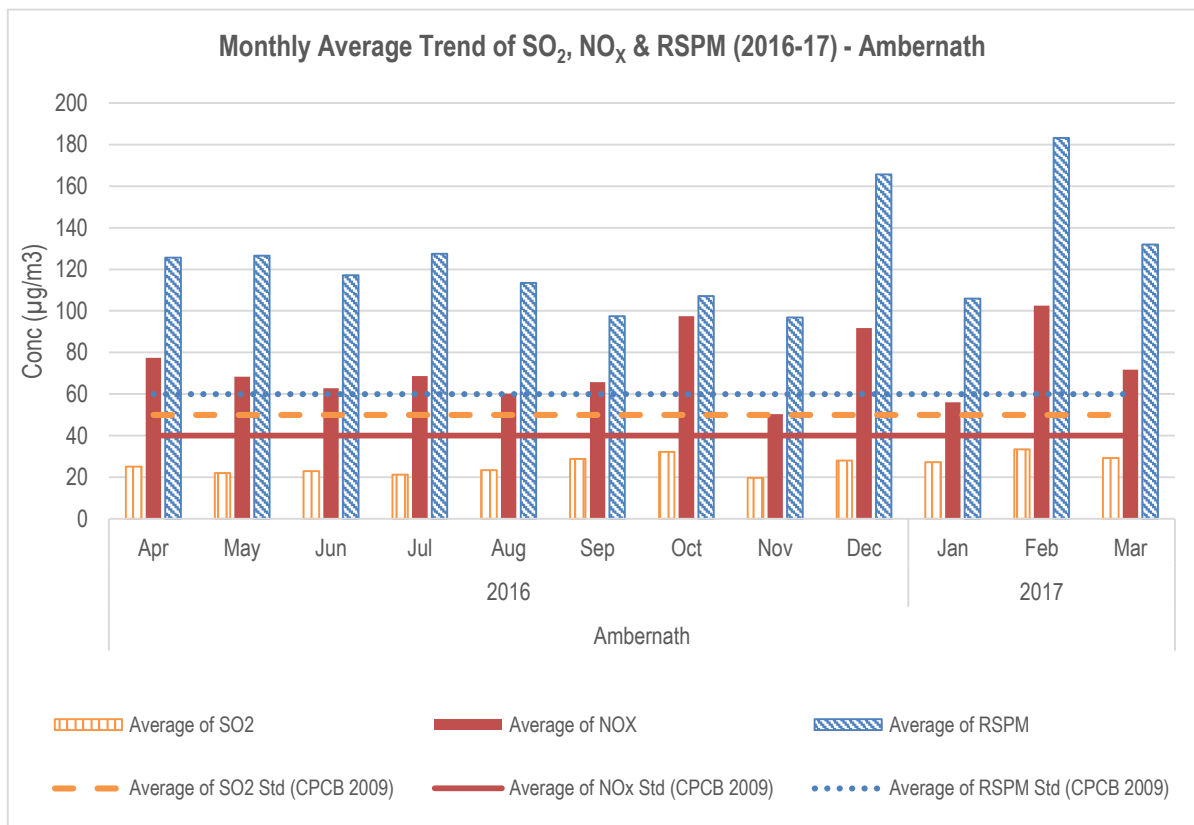


Figure No. 62: Monthly average reading recorded at Ambernath

Table No. 74: Data for Annual average trend of SO₂, NO_x, and RSPM at Ambernath

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Ambernath	04-05	31	36	97
	05-06	30	52	83
	06-07	24	44	93
	07-08	31	40	106
	08-09	29	53	70
	12-13	42	91	118
	13-14	31	64	111
	14-15	27	54	101
	15-16	22	58	111
	16-17	26	71	123

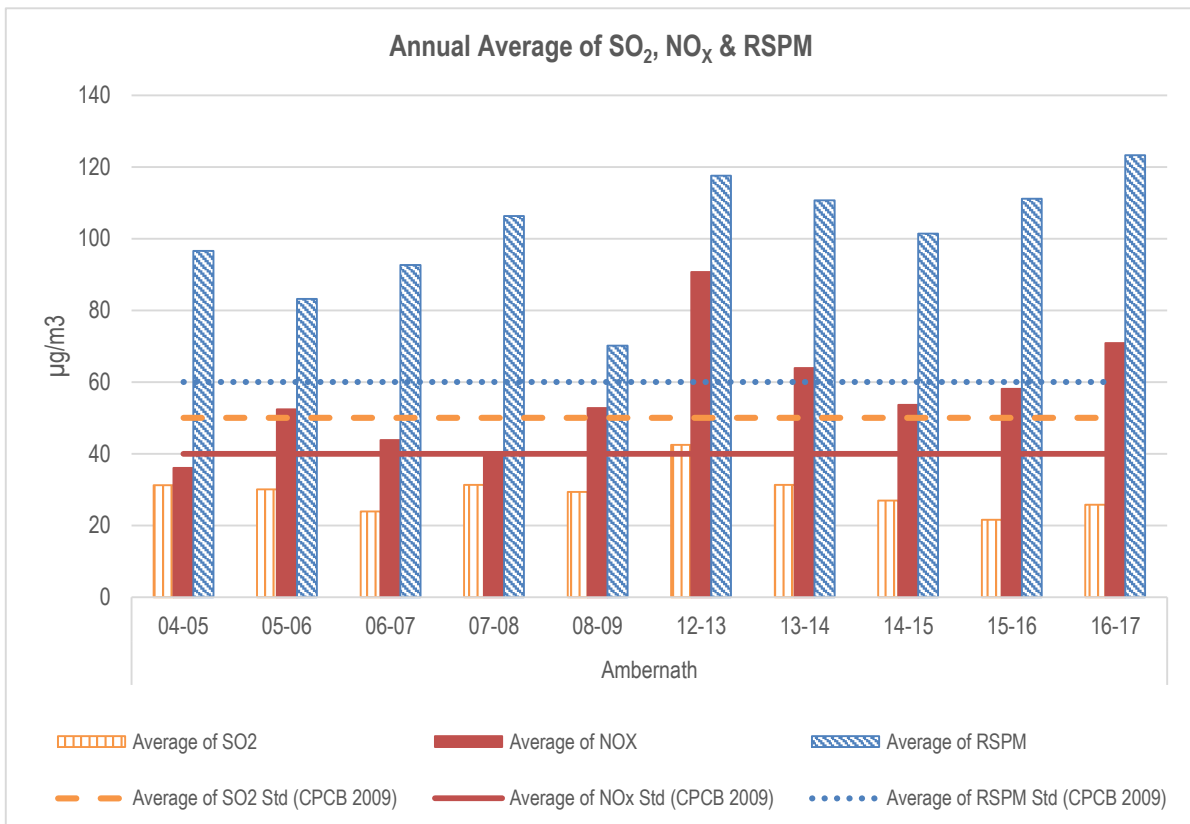


Figure No. 63: Annual average trend of SO₂, NO_x, and RSPM at Ambernath

Badlapur - Badlapur - BIWA House

Table No. 75: Data for Monthly average reading recorded at Badlapur - BIWA House

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Badlapur - BIWA House	2016	Apr	26	68	126
		May	22	69	128
		Jun	23	64	119
		Jul	21	67	125
		Aug	26	63	119
		Sep	32	72	103
		Oct	30	91	101
		Nov	19	51	98
		Dec	29	90	163
	2017	Jan	23	67	124
		Feb	40	85	153
		Mar	20	45	87

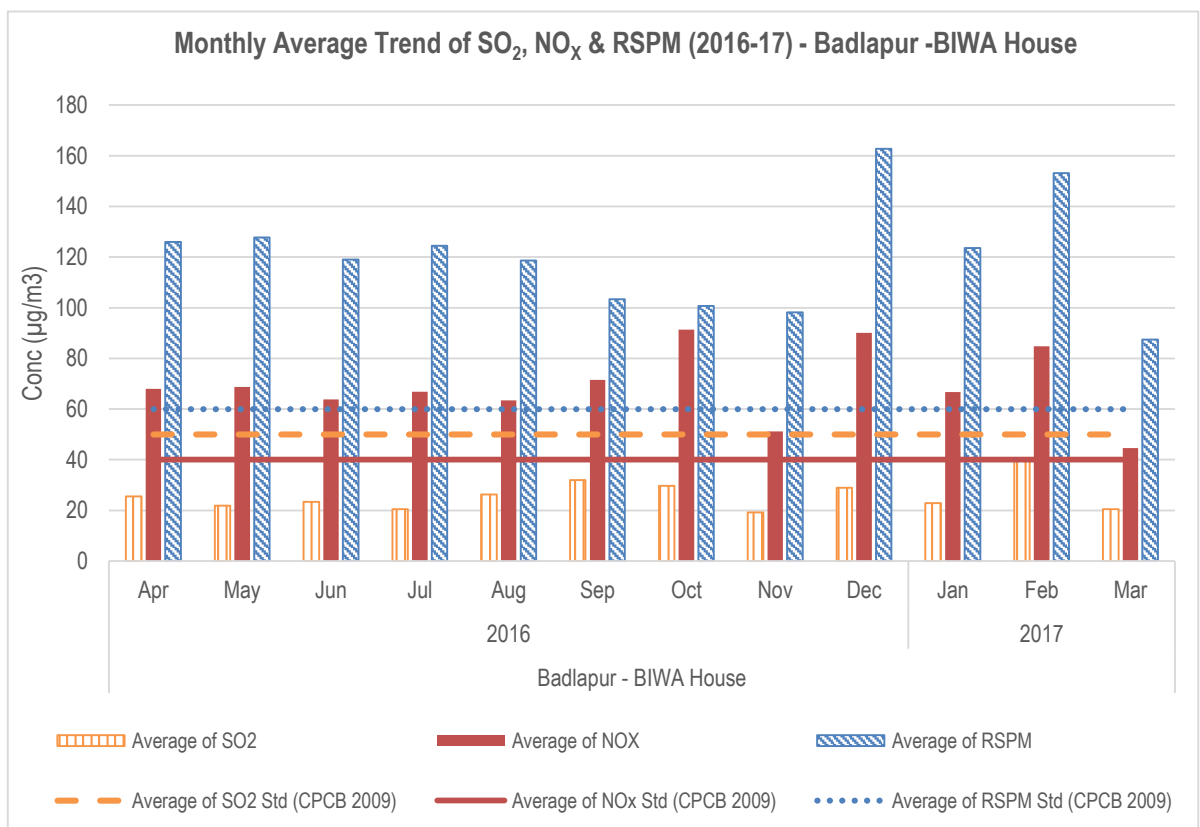


Figure No. 64: Monthly average reading recorded at Badlapur - BIWA House

Table No. 76: Data for Annual average trend of SO₂, NO_x, and RSPM at Badlapur - BIWA House

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Badlapur - BIWA House	06-07	27	39	141
	07-08	30	42	93
	08-09	35	76	98
	09-10	55	85	103
	10-11	36	74	118
	11-12	41	68	121
	12-13	41	69	100
	13-14	35	49	96
	14-15	29	51	101
	15-16	23	61	113
	16-17	25	68	120

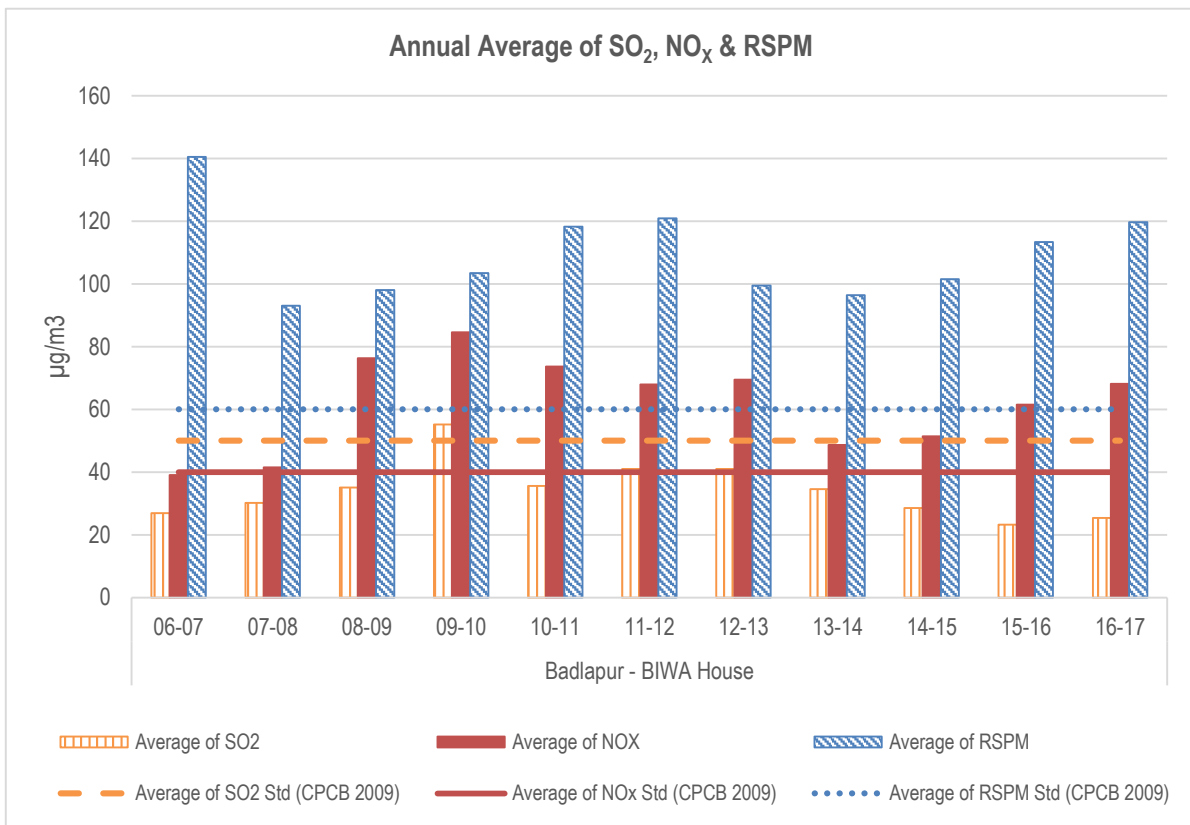


Figure No. 65: Annual average trend of SO₂, NO_x, and RSPM at Badlapur - BIWA House

Bhiwandi - IGM Hospital

Table No. 77: Data for Monthly average reading recorded at IGM Hospital - Bhiwandi

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
I.G.M. Hospital	2016	Apr	32	45	66
		May	34	44	67
		Jun	32	43	95
		Jul	32	44	80
		Aug	34	44	67
		Oct	31	50	62
		Nov	34	44	67
		Dec	37	33	68
	2017	Jan	33	42	65
		Feb	35	45	67
		Mar	32	46	71

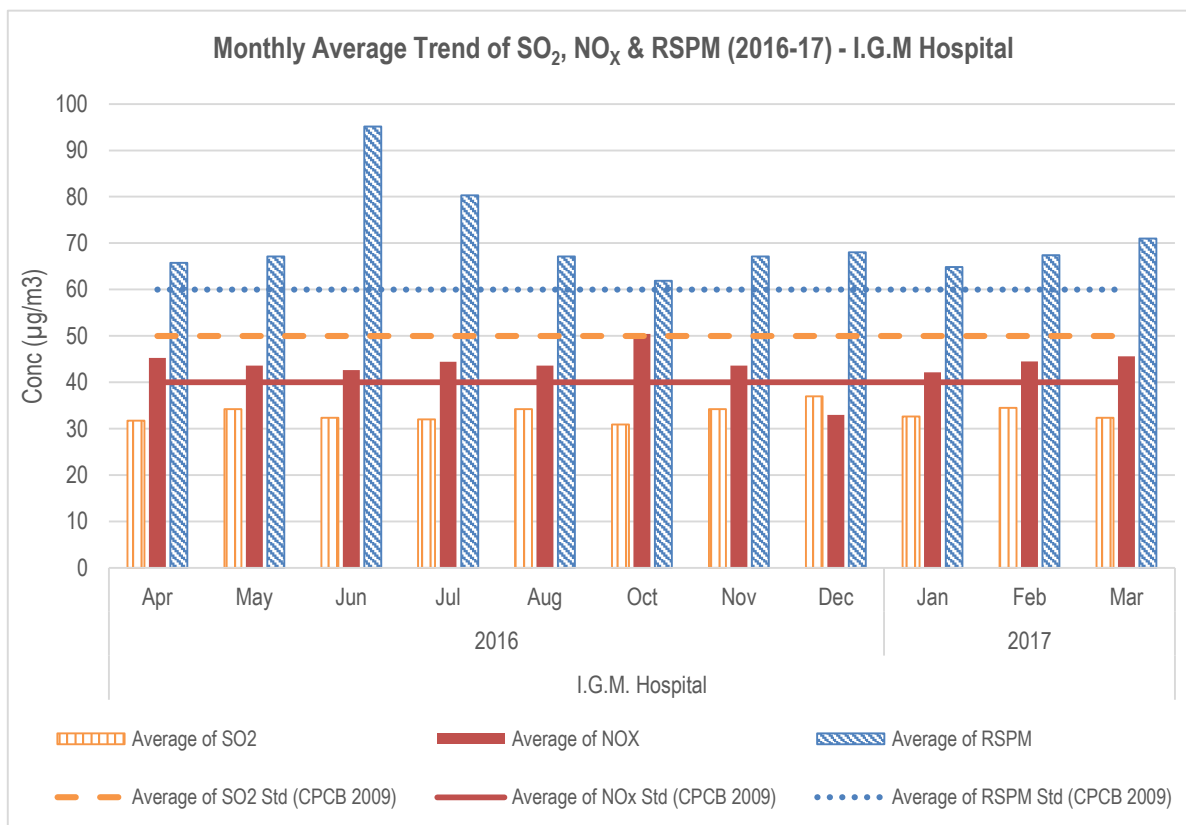


Figure No. 66: Monthly average reading recorded at IGM Hospital - Bhiwandi

Table No. 78: Data for Annual average trend of SO₂, NO_x, and RSPM at IGM Hospital - Bhiwandi

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
I.G.M. Hospital	11-12	23	29	62
	12-13	26	35	63
	13-14	30	40	72
	14-15	32	42	72
	15-16	34	43	73
	16-17	33	45	71

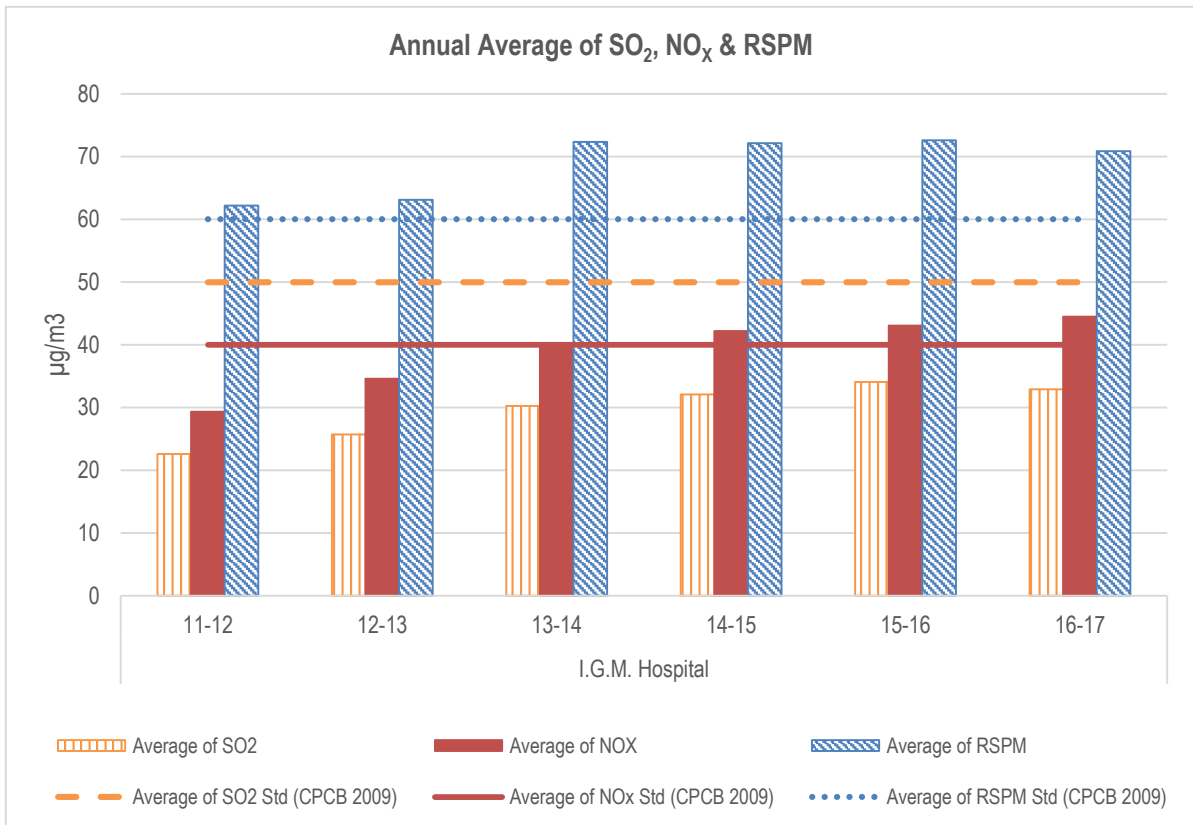


Figure No. 67: Annual average trend of SO₂, NO_x, and RSPM at IGM Hospital - Bhiwandi

Bhiwandi - Prematai Hall

Table No. 79: Data for Monthly average reading recorded at Prematai Hall - Bhiwandi

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Prematai hall	2016	Apr	30	42	63
		May	35	43	66
		Jun	30	42	97
		Jul	30	42	76
		Aug	35	43	66
		Oct	37	47	65
		Nov	35	43	66
		Dec	35	43	65
	2017	Jan	33	42	65
		Feb	35	43	66
Mar		29	35	68	

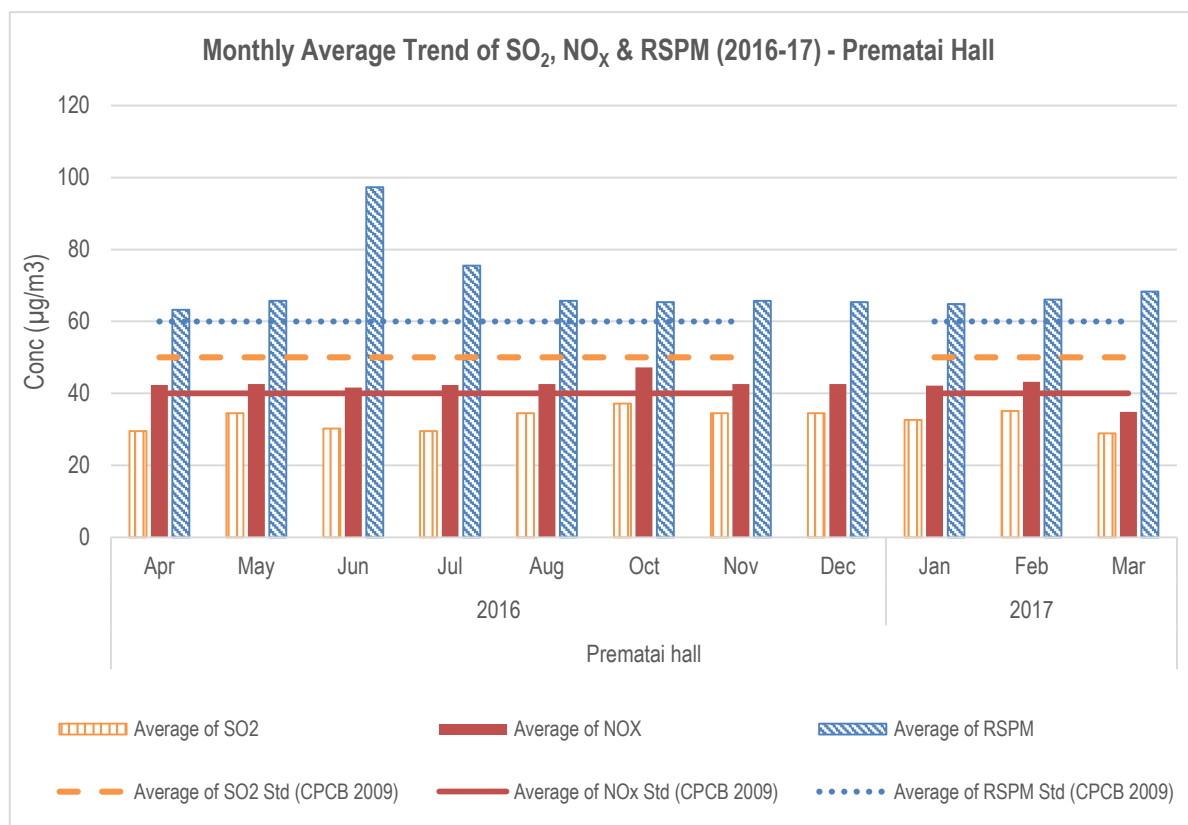


Figure No. 68: Monthly average reading recorded at Prematai Hall - Bhiwandi

Table No. 80: Data for Annual average trend of SO₂, NO_x, and RSPM at Prematai Hall - Bhiwandi

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Prematai hall	11-12	15	23	52
	12-13	24	33	59
	13-14	29	38	66
	14-15	32	42	71
	15-16	34	44	72
	16-17	33	42	70

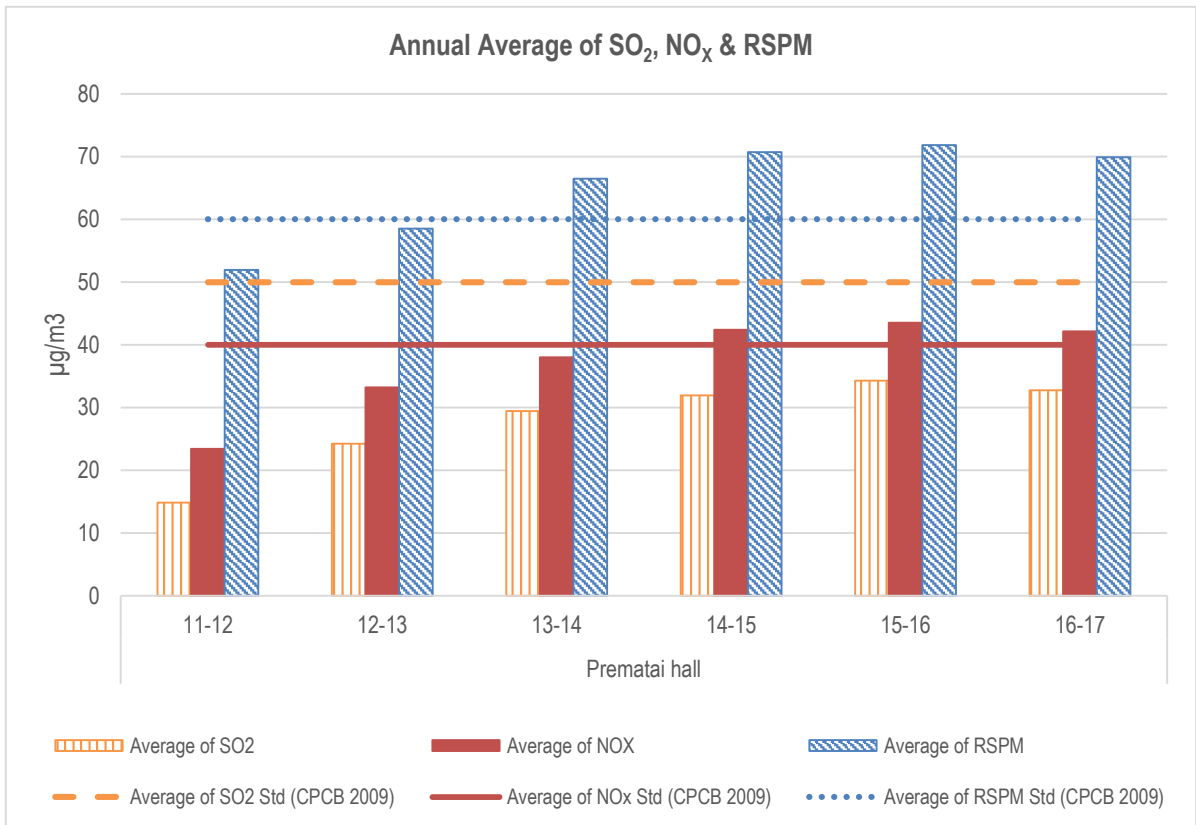


Figure No. 69: Annual average trend of SO₂, NO_x, and RSPM at Prematai Hall - Bhiwandi

Dombivali

Table No. 81: Data for Monthly average reading recorded at Dombivali

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Dombivali	2016	Apr	25	70	148
		May	23	75	138
		Jun	21	65	111
		Jul	27	86	156
		Aug	34	70	123
		Sep	29	74	105
		Oct	31	97	107
		Nov	19	52	79
		Dec	29	97	131
	2017	Jan	31	57	84
		Feb	33	54	96
		Mar	28	47	67

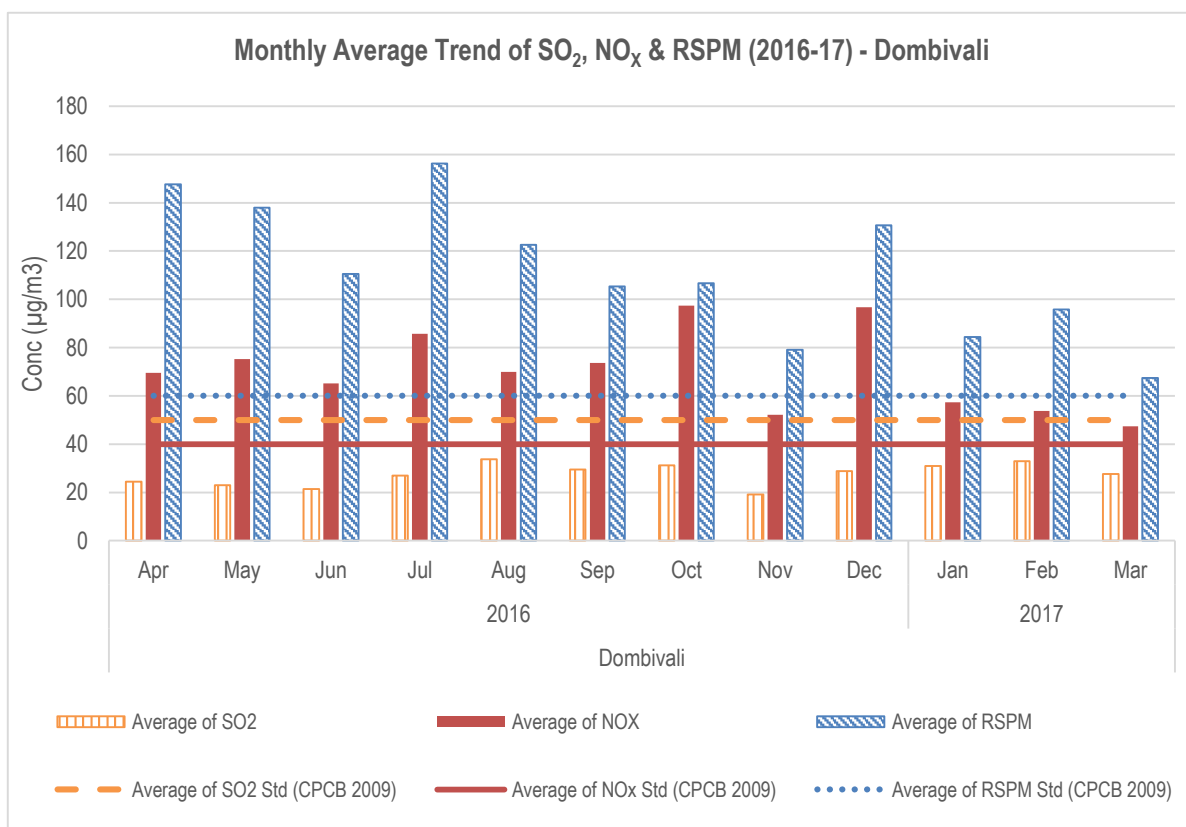


Figure No. 70: Monthly average reading recorded at Dombivali

Table No. 82: Data for Annual average trend of SO₂, NO_x, and RSPM at Dombivali

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Dombivali	04-05	42	38	71
	05-06	35	52	109
	06-07	24	38	120
	07-08	37	41	98
	08-09	34	55	68
	12-13	50	94	123
	13-14	35	66	111
	14-15	29	62	111
	15-16	23	58	112
	16-17	27	70	112

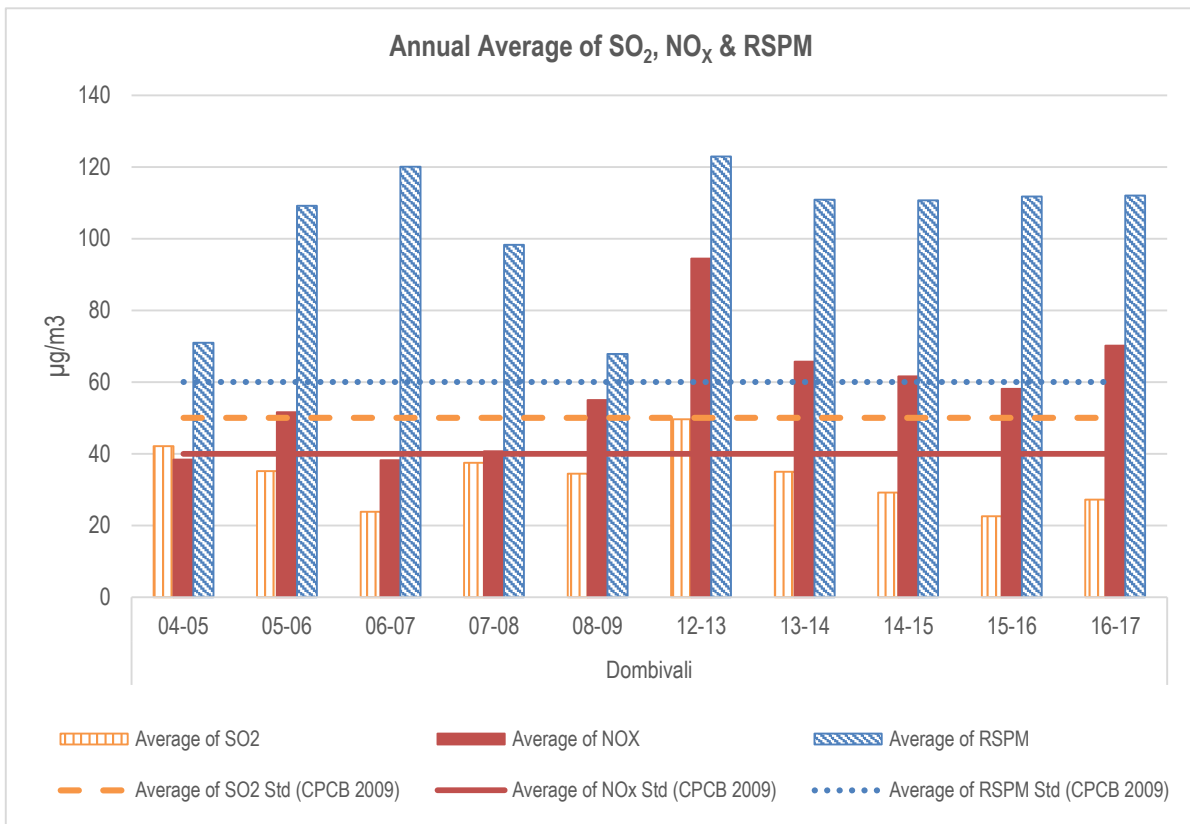


Figure No. 71: Annual average trend of SO₂, NO_x, and RSPM at Dombivali

Dombivali - MIDC Office Dombivali

Table No. 83: Data for Monthly average reading recorded at MIDC Office - Dombivali

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
MIDC Office Dombivali	2016	Apr	24	60	113
		May	20	65	121
		Jun	22	63	117
		Jul	18	63	118
		Aug	26	63	119
		Sep	29	69	95
		Oct	33	99	108
		Nov	22	50	96
		Dec	28	98	176
	2017	Jan	28	55	105
		Feb	33	77	140
		Mar	31	76	140

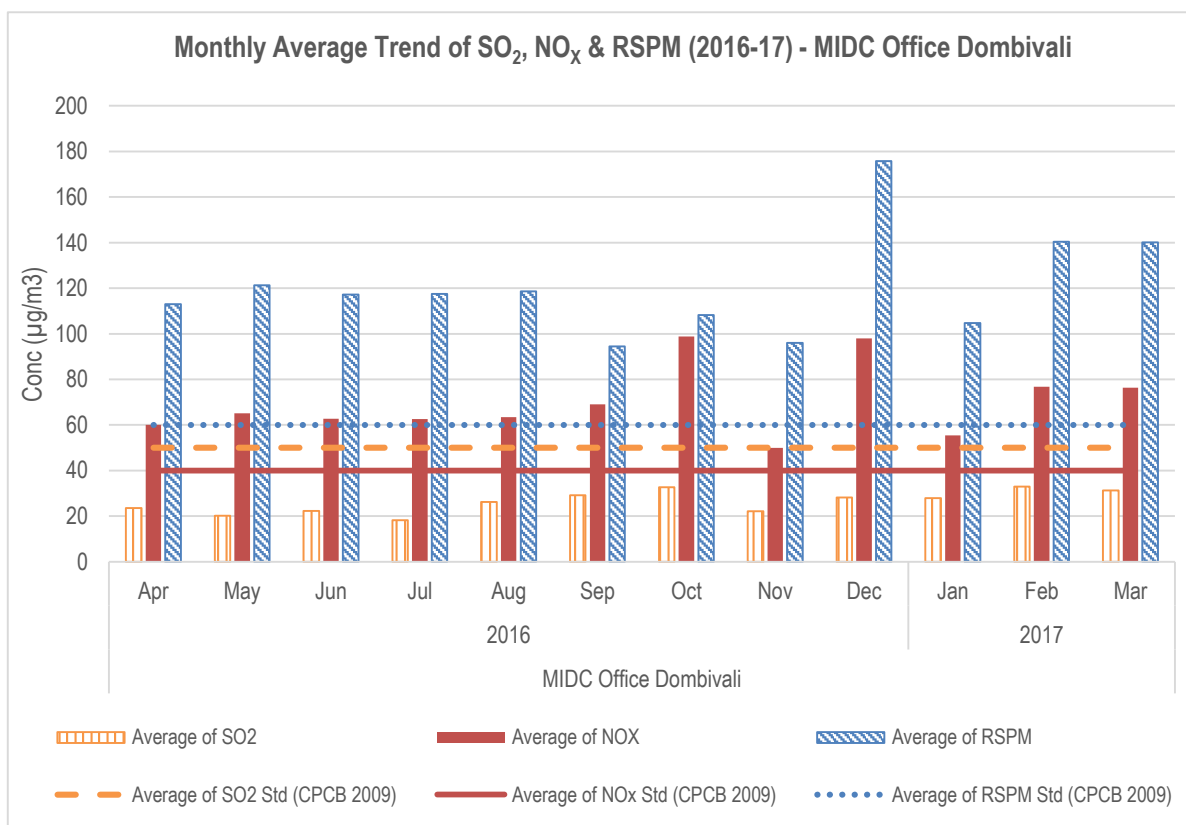


Figure No. 72: Monthly average reading recorded at MIDC Office - Dombivali

Table No. 84: Data for Annual average trend of SO₂, NO_x, and RSPM at MIDC Office - Dombivali

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
MIDC Office Dombivali	12-13	37	61	86
	13-14	32	62	109
	14-15	29	67	124
	15-16	21	58	110
	16-17	26	69	120

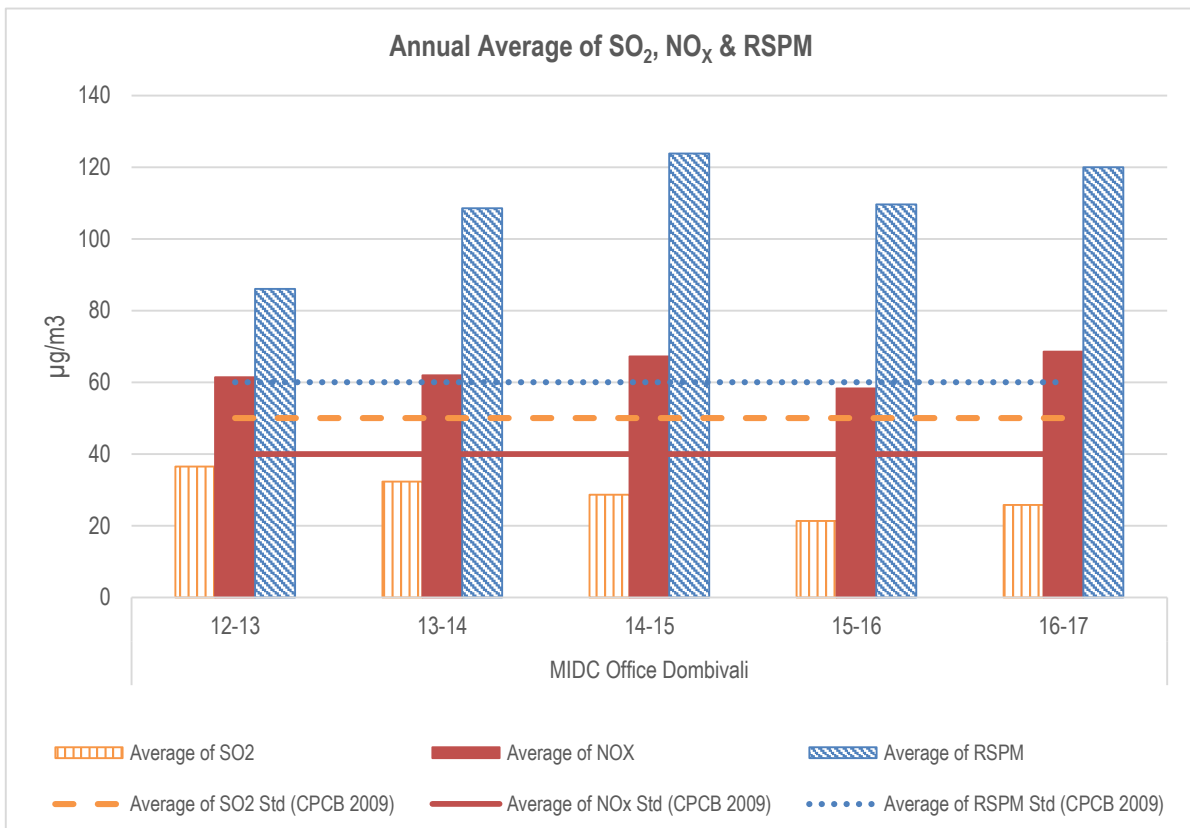


Figure No. 73: Annual average trend of SO₂, NO_x, and RSPM at MIDC Office - Dombivali

Dombivali - Dombivali CAAQMS

Table No. 85: Data for Monthly average reading recorded at Dombivali CAAQMS

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Dombivali CAAQMS	2016	Apr	16	9	166
		May	7	5	109
		Jun	2	4	63
		Jul	4	16	49
		Aug	11	21	40
		Sep	9	58	34
		Oct	25	21	68
		Nov	42	57	72
		Dec	36	54	81
	2017	Jan	31	53	87
		Feb	36	50	74
		Mar	35	32	163

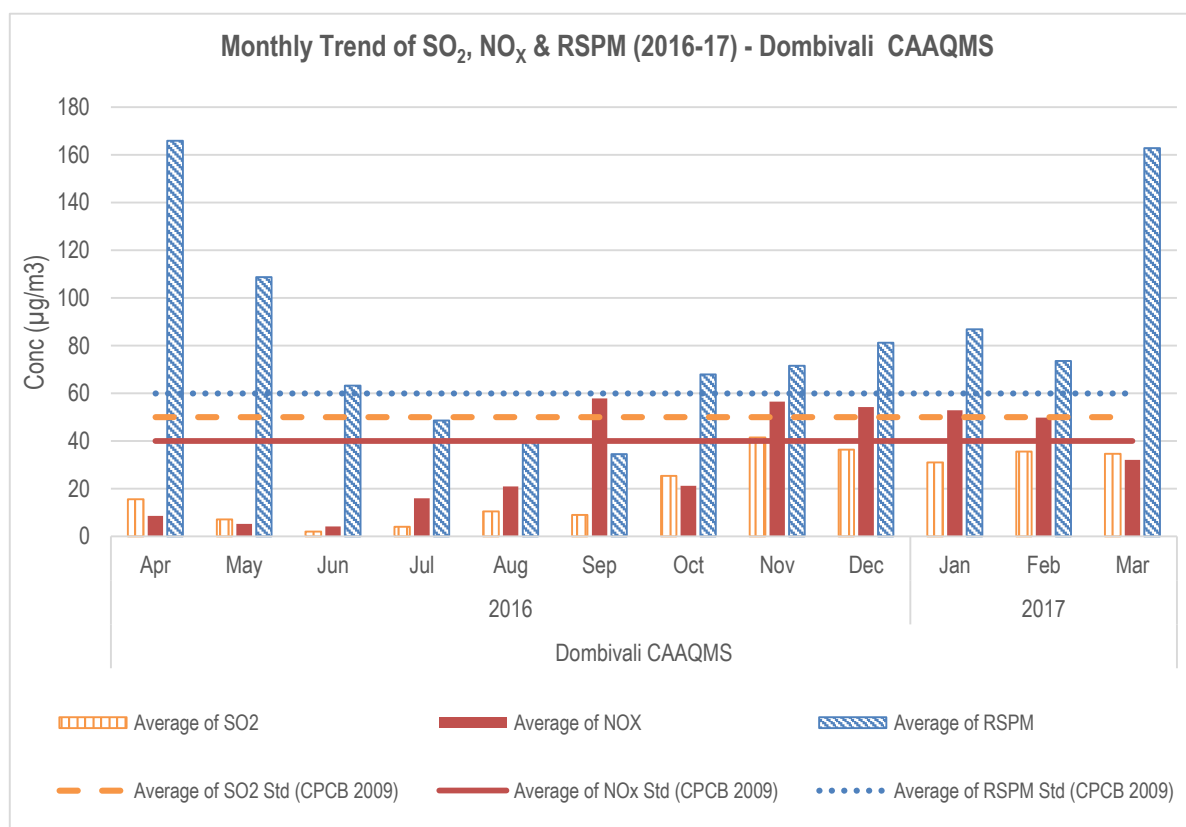


Figure No. 74: Monthly average reading recorded at Dombivali CAAQMS

Table No. 86: Data for Annual average trend of SO₂, NO_x, and RSPM at Dombivali CAAQMS

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Dombivali CAAQMS	14-16			
	15-16			
	16-17*	20.69	31.03	83.98

*The station is installed in current year 2016-17

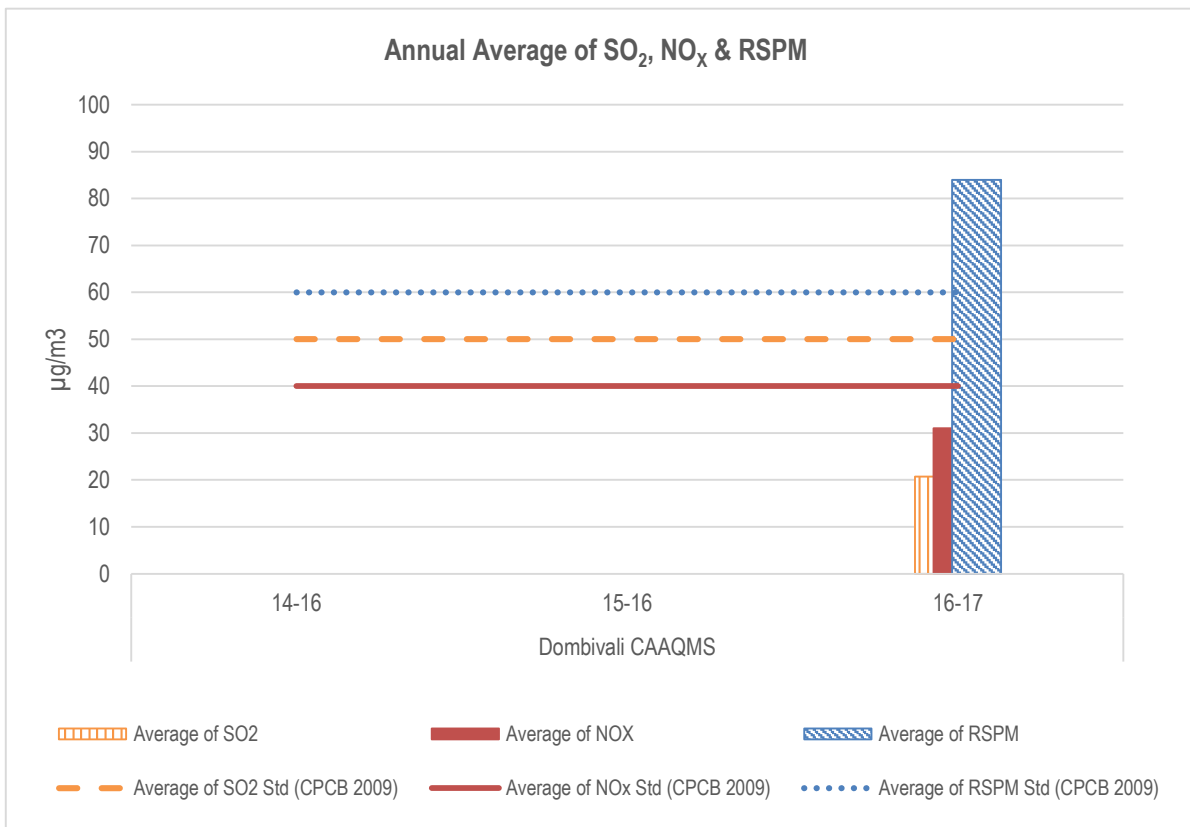


Figure No. 75: Annual average trend of SO₂, NO_x, and RSPM at Dombivali CAAQMS

Kalyan - MPCB RO Kalyan Office

Table No. 87: Data for Monthly average reading recorded at MPCB RO Kalyan Office

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
MPCB RO Kalyan office	2016	Apr	46	47	67
		May	27	37	68
		Jun	35	42	76
		Jul	47	49	81
		Aug	27	37	68
		Nov	26	37	68
	2017	Jan	30	43	64
		Feb	28	38	68
		Mar	33	43	65

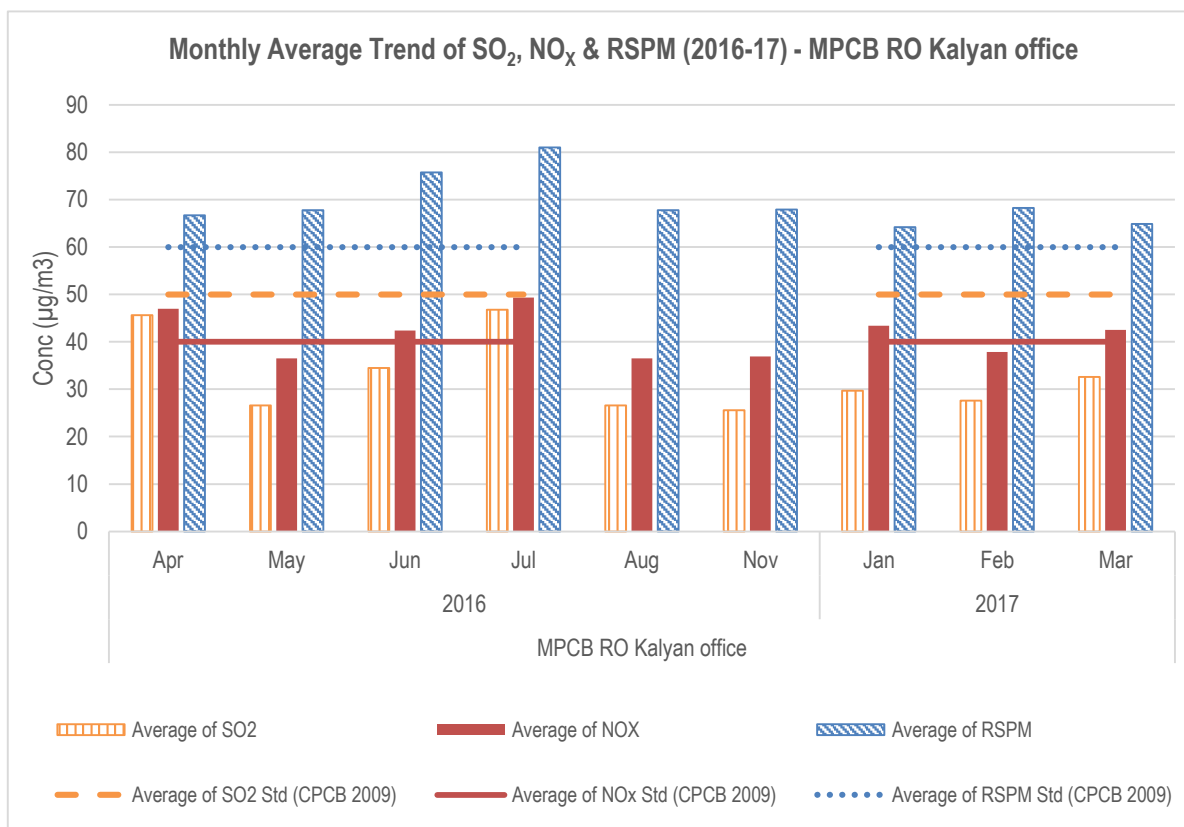


Figure No. 76: Monthly average reading recorded at MPCB RO Kalyan Office

Table No. 88: Data for Annual average trend of SO₂, NO_x, and RSPM at MPCB RO Kalyan Office

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
MPCB RO Kalyan office	11-12	22	34	71
	12-13	29	38	65
	13-14	30	38	69
	14-15	30	37	71
	15-16	32	40	71
	16-17	33	41	69

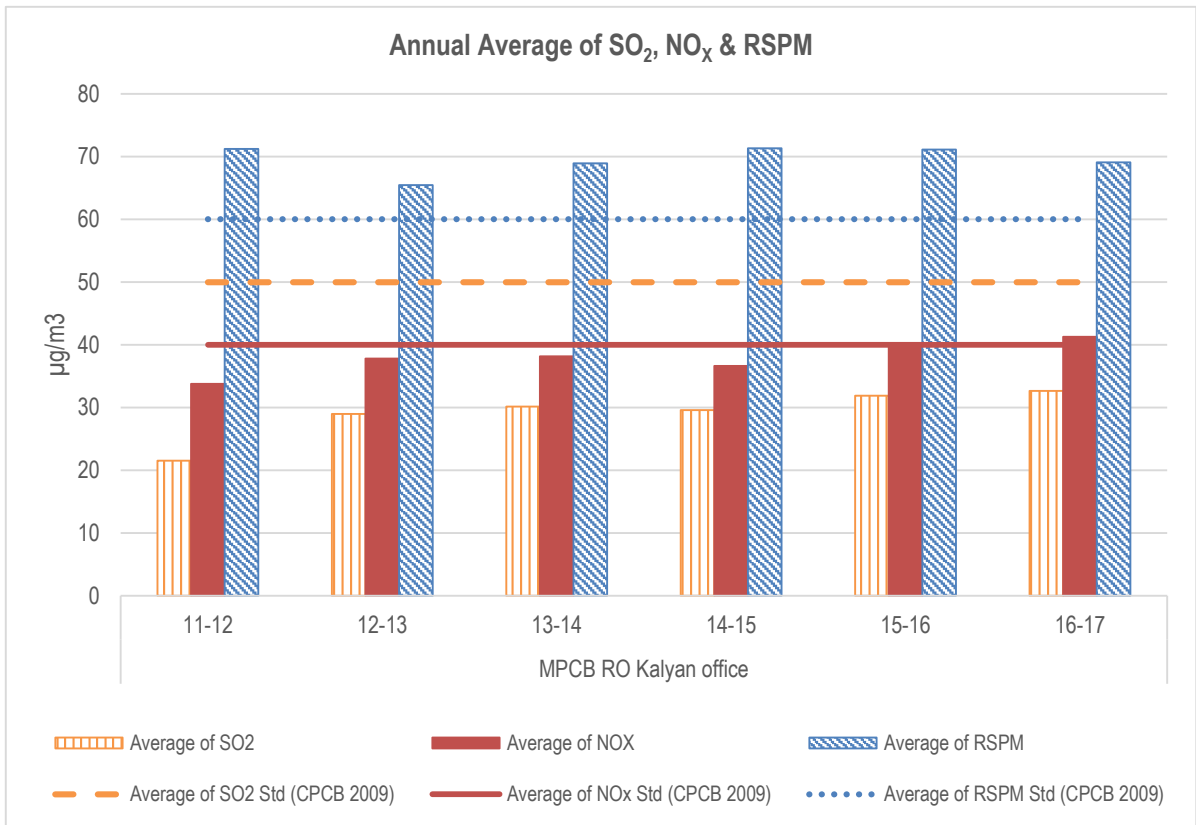


Figure No. 77: Annual average trend of SO₂, NO_x, and RSPM at MPCB RO Kalyan Office

Ulhasnagar - Smt. CHM College Campus

Table No. 89: Data for Monthly average reading recorded at Smt. CHM College Campus, Ulhasnagar

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Smt. CHM College Campus	2016	Apr	24	60	124
		May	20	66	122
		Jun	22	62	115
		Jul	18	60	112
		Aug	24	53	101
		Sep	30	72	99
		Oct	30	95	104
		Nov	17	50	96
		Dec	29	87	158
	2017	Jan	22	54	101
		Feb	25	61	114
		Mar	24	45	76

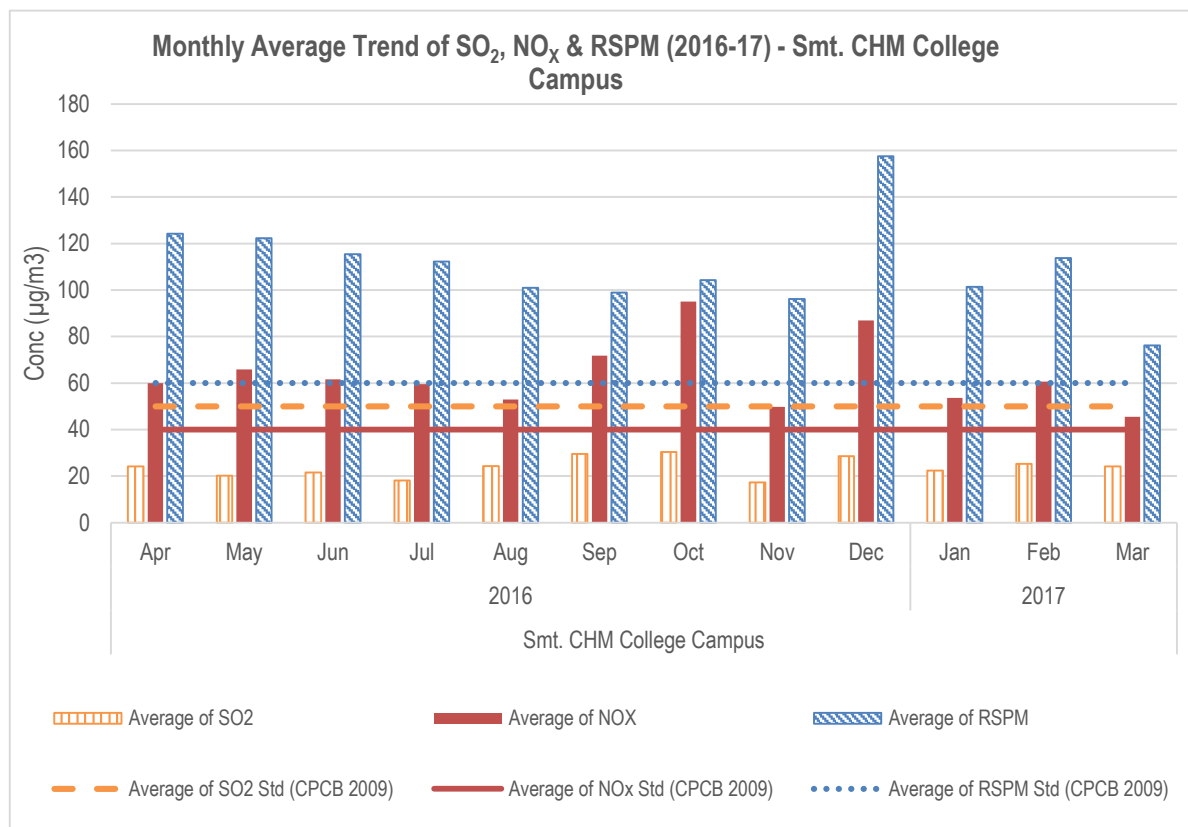


Figure No. 78: Monthly average reading recorded at Smt. CHM College Campus, Ulhasnagar

Table No. 90: Data for Annual average trend of SO₂, NO_x, and RSPM at Smt. CHM College Campus, Ulhasnagar

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Smt. CHM College Campus	06-07	28	46	159
	07-08	31	42	90
	08-09	30	57	87
	09-10	46	70	92
	10-11	30	61	99
	11-12	37	64	109
	12-13	34	58	85
	13-14	25	37	68
	14-15	22	42	82
	15-16	22	59	109
	16-17	23	62	110

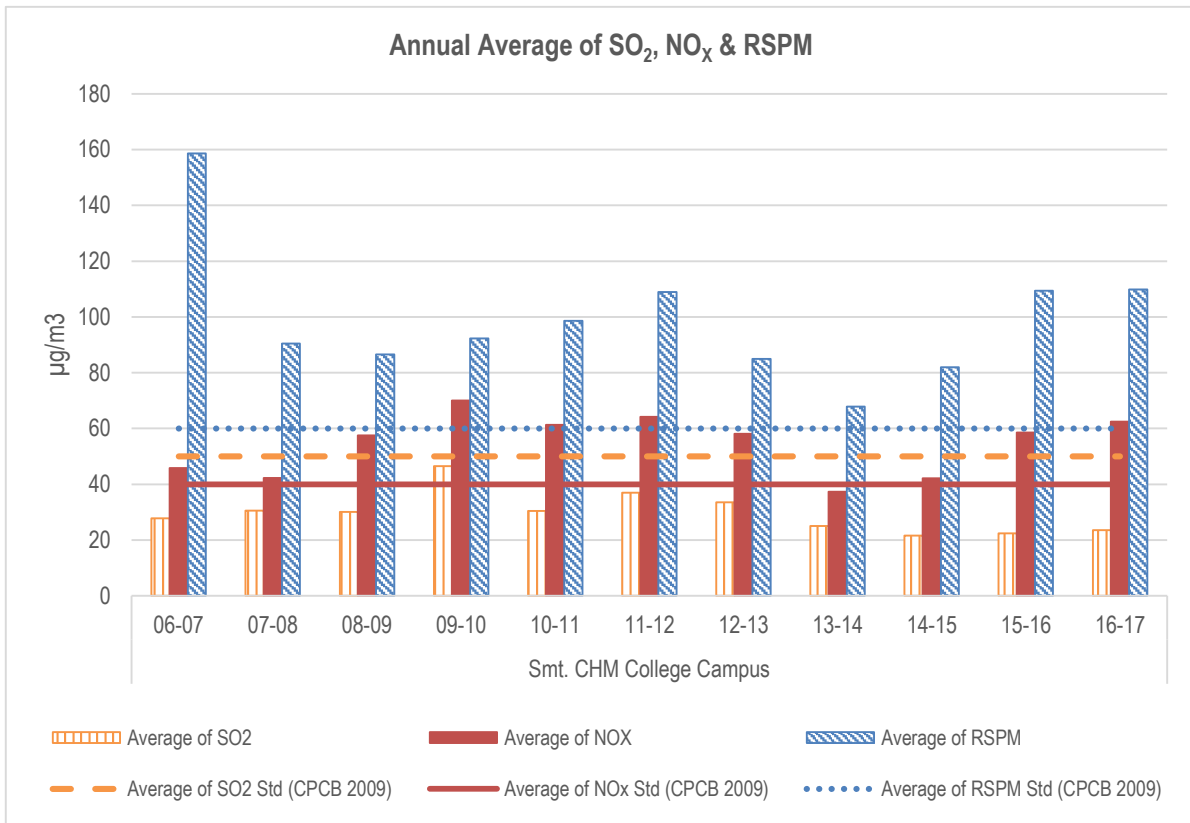


Figure No. 79: Annual average trend of SO₂, NO_x, and RSPM at Smt. CHM College Campus, Ulhasnagar

Ulhasnagar - Powai Chowk

Table No. 91: Data for Monthly average reading recorded at Powai Chowk - Ulhasnagar

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Powai Chowk	2016	Apr	26	73	134
		May	21	74	140
		Jun	23	65	116
		Jul	25	77	127
		Aug	35	50	97
		Sep	30	70	96
		Oct	31	95	104
		Nov	21	47	70
		Dec	32	81	127
	2017	Jan	25	63	98
		Feb	25	66	113
		Mar	33	53	82

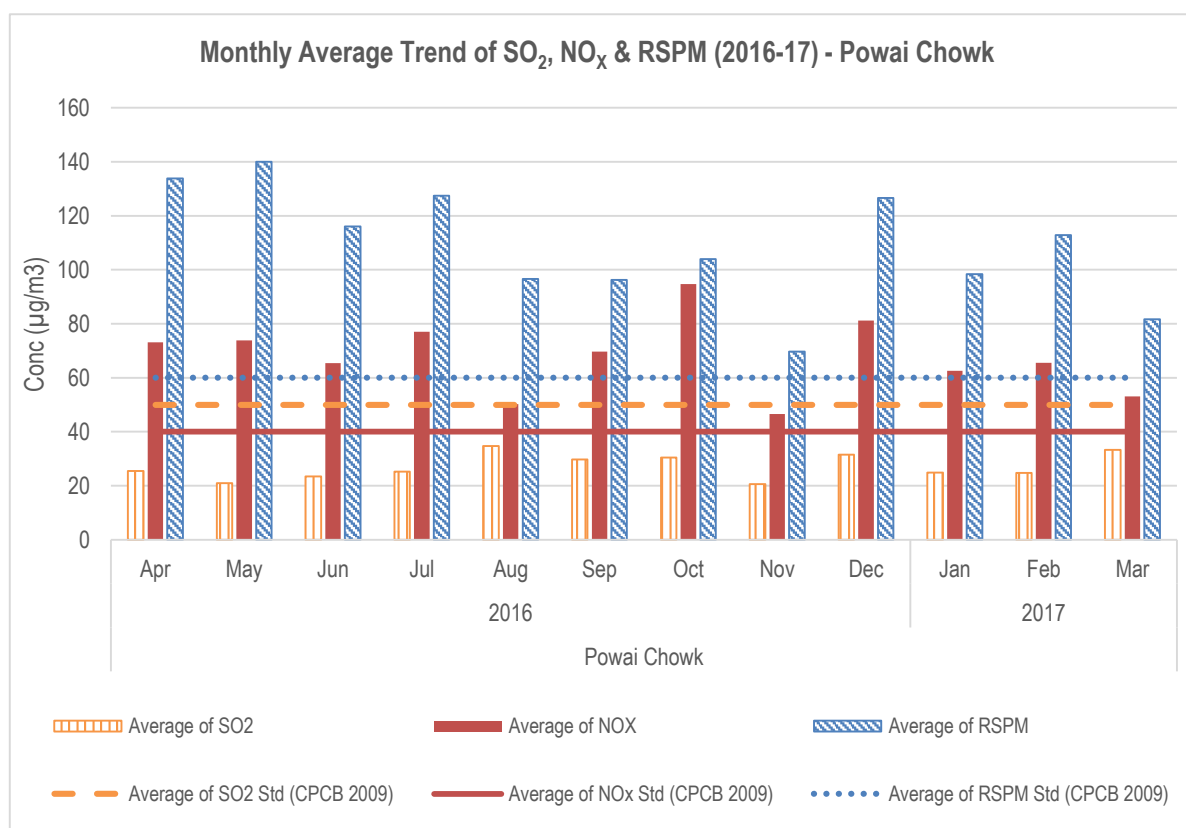


Figure No. 80: Monthly average reading recorded at Powai Chowk - Ulhasnagar

Table No. 92: Data for Annual average trend of SO₂, NO_x, and RSPM at Powai Chowk - Ulhasnagar

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Powai Chowk	06-07	24	38	121
	07-08	25	37	91
	08-09	33	69	95
	09-10	53	96	119
	10-11	31	69	114
	11-12	43	74	122
	12-13	43	81	106
	13-14	33	58	99
	14-15	30	57	106
	15-16	25	67	126
	16-17	27	67	108

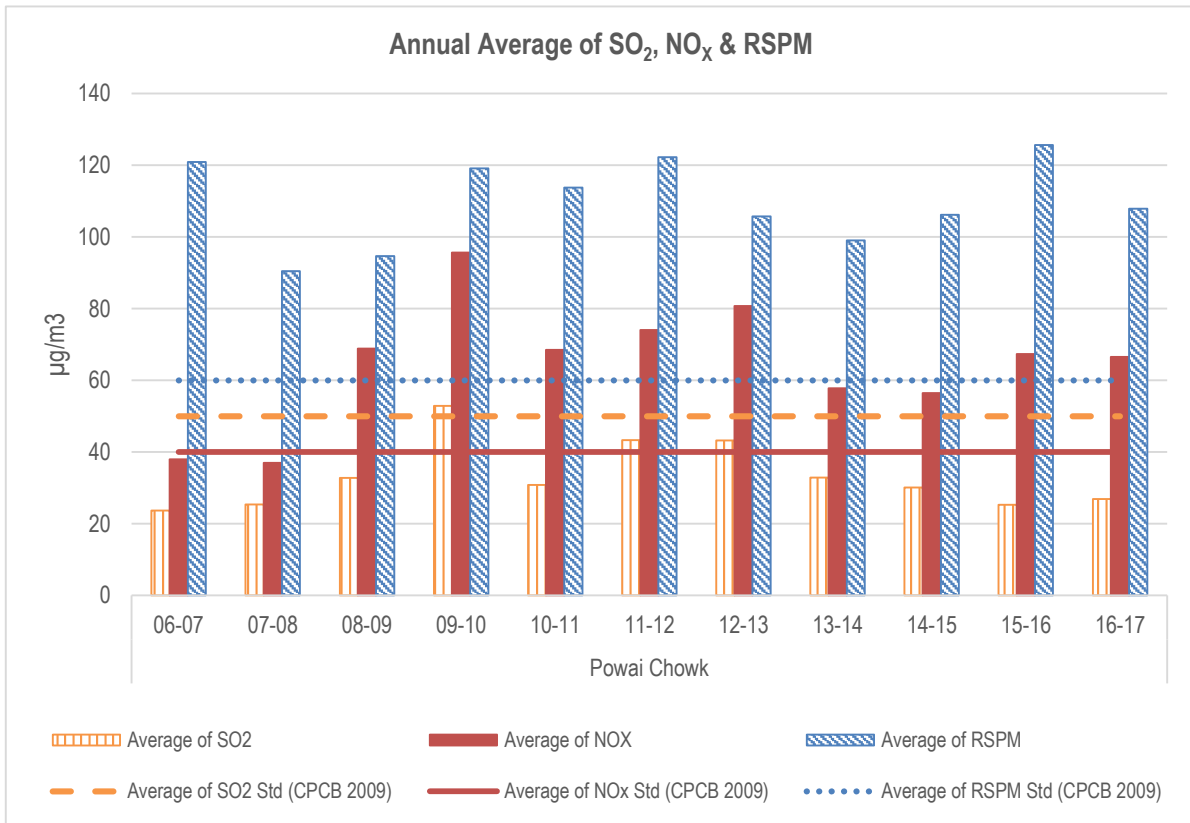
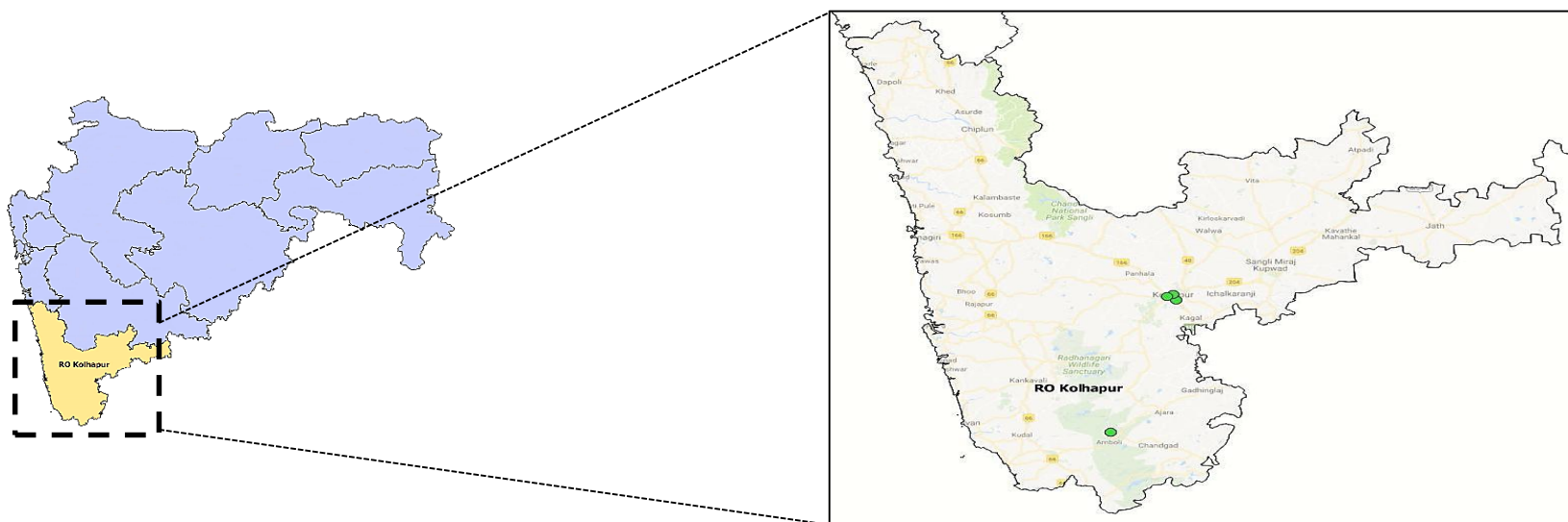


Figure No. 81: Annual average trend of SO₂, NO_x, and RSPM at Powai Chowk - Ulhasnagar

Table No. 93: Percentage exceedance of pollutants at Kalyan RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Ambernath	96	1	26	77	1	27	80
Badlapur - BIWA House	95	0	19	68	0	20	72
I.G.M. Hospital	84	0	0	1	0	0	1
Prematai hall	94	0	0	4	0	0	4
Dombivali	96	0	27	69	0	28	72
MIDC Office Dombivali	97	0	24	70	0	25	72
Dombivali CAAQMS	365	1	21	71	0	6	19
MPCB RO Kalyan office	81	0	0	0	0	0	0
Smt. CHM College Campus	97	0	17	67	0	18	69
Powai Chowk	96	0	23	63	0	24	66

Ro - Kolhapur



Region	Station code	Station name	Program	Latitude	Longitude
Kolhapur	508	Shivaji University Campus	NAMP	16° 40' 36.08"N	74° 15' 10.1514"E
Kolhapur	509	Ruikar Trust	NAMP	16° 42' 15.22"N	74° 14' 30.084"E
Kolhapur	510	Mahadwar Road	NAMP	16° 41' 40.2"N	74° 13' 18.336"E
Sangli	574	Terrace of SRO-Sangli, Udyog Bhavan	NAMP	16° 0'51.197"N	74° 0'35.481"E
Sangli	575	Sangli-Miraj Primary Municipal school	NAMP	16° 0' 51.656"N	74° 0'33.875"E
Sangli	576	Krishna Valley school	NAMP	16° 0'52.824"N	74° 0'38.038"E

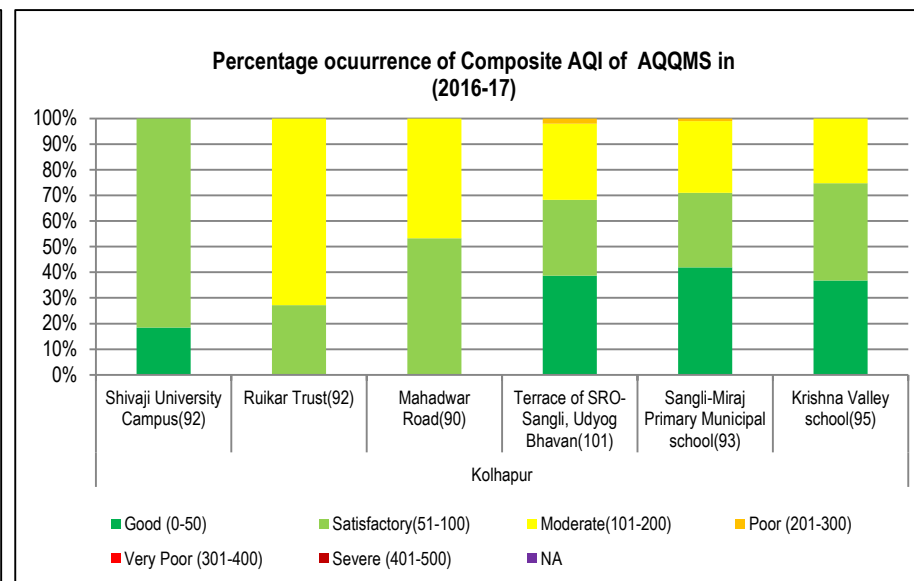
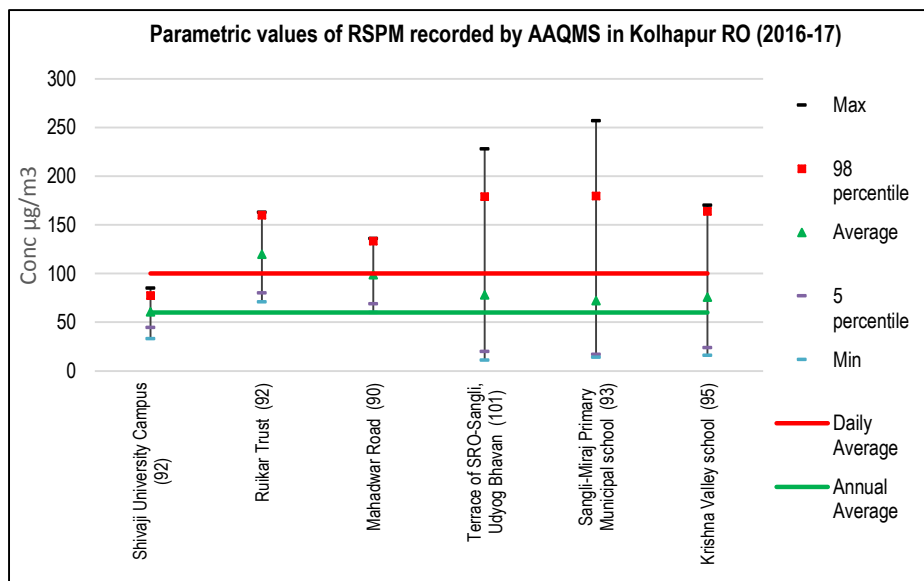
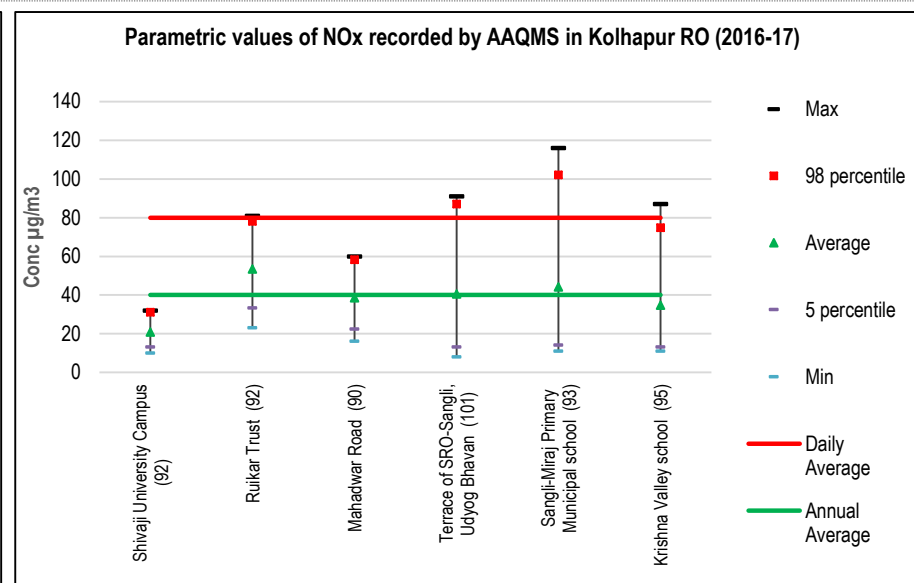
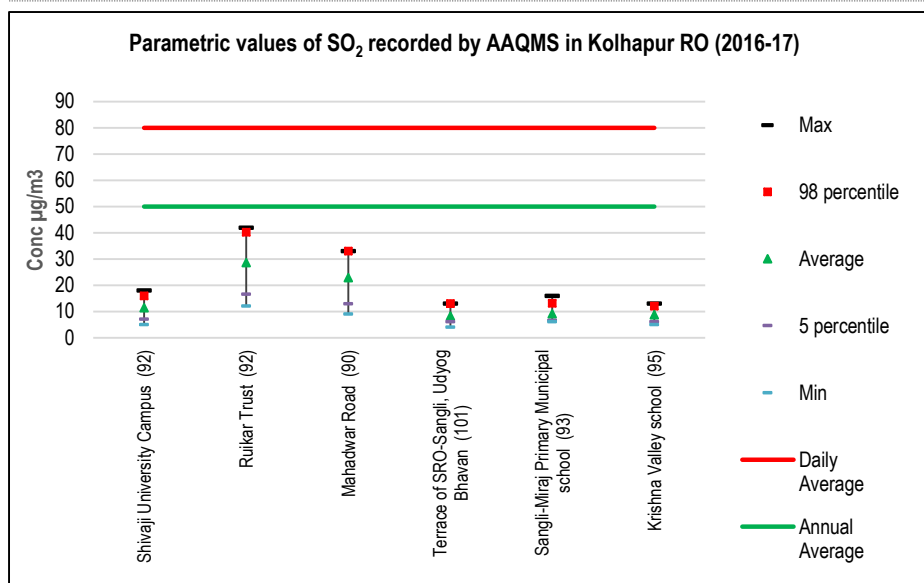


Table No. 94: Data for SO₂, NO_x & RSPM recorded at AAQMS in Kolhapur RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	<i>80</i>		<i>50</i>	<i>80</i>	
	Shivaji University Campus (92)	18	16	11	7	5
	Ruikar Trust (92)	42	40	29	17	12
	Mahadwar Road (90)	33	33	23	13	9
	Terrace of SRO-Sangli, Udyog Bhavan (101)	13	13	8	6	4
	Sangli-Miraj Primary Municipal school (93)	16	13	9	7	6
	Krishna Valley school (95)	13	12	9	6	5
NO _x	<i>CPCB Standard</i>	<i>80</i>		<i>40</i>	<i>80</i>	
	Shivaji University Campus (92)	32	31	21	13	10
	Ruikar Trust (92)	<i>81</i>	78	<i>53</i>	33	23
	Mahadwar Road (90)	60	58	39	22	16
	Terrace of SRO-Sangli, Udyog Bhavan (101)	<i>91</i>	<i>87</i>	<i>41</i>	13	8
	Sangli-Miraj Primary Municipal school (93)	<i>116</i>	<i>102</i>	<i>44</i>	14	11
	Krishna Valley school (95)	<i>87</i>	75	35	13	11
RSPM (PM ₁₀)	<i>CPCB Standard</i>	<i>100</i>		<i>60</i>	<i>100</i>	
	Shivaji University Campus (92)	85	77	<i>61</i>	45	33
	Ruikar Trust (92)	<i>163</i>	<i>160</i>	<i>120</i>	80	71
	Mahadwar Road (90)	<i>136</i>	<i>133</i>	<i>99</i>	69	60
	Terrace of SRO-Sangli, Udyog Bhavan (101)	<i>228</i>	<i>179</i>	<i>78</i>	20	11
	Sangli-Miraj Primary Municipal school (93)	<i>257</i>	<i>180</i>	<i>72</i>	17	14
	Krishna Valley school (95)	<i>170</i>	<i>164</i>	<i>76</i>	24	16

Kolhapur - Shivaji University Campus

Table No. 95: Data for Monthly average reading recorded at Shivaji University Campus

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Shivaji University Campus	2016	Apr	14	25	72
		Jun	11	19	51
		Jul	7	13	45
		Aug	9	18	64
		Sep	11	18	68
		Oct	10	16	54
		Nov	9	14	50
		Dec	12	22	69
	2017	Jan	14	26	63
		Feb	15	27	60
Mar		15	29	68	

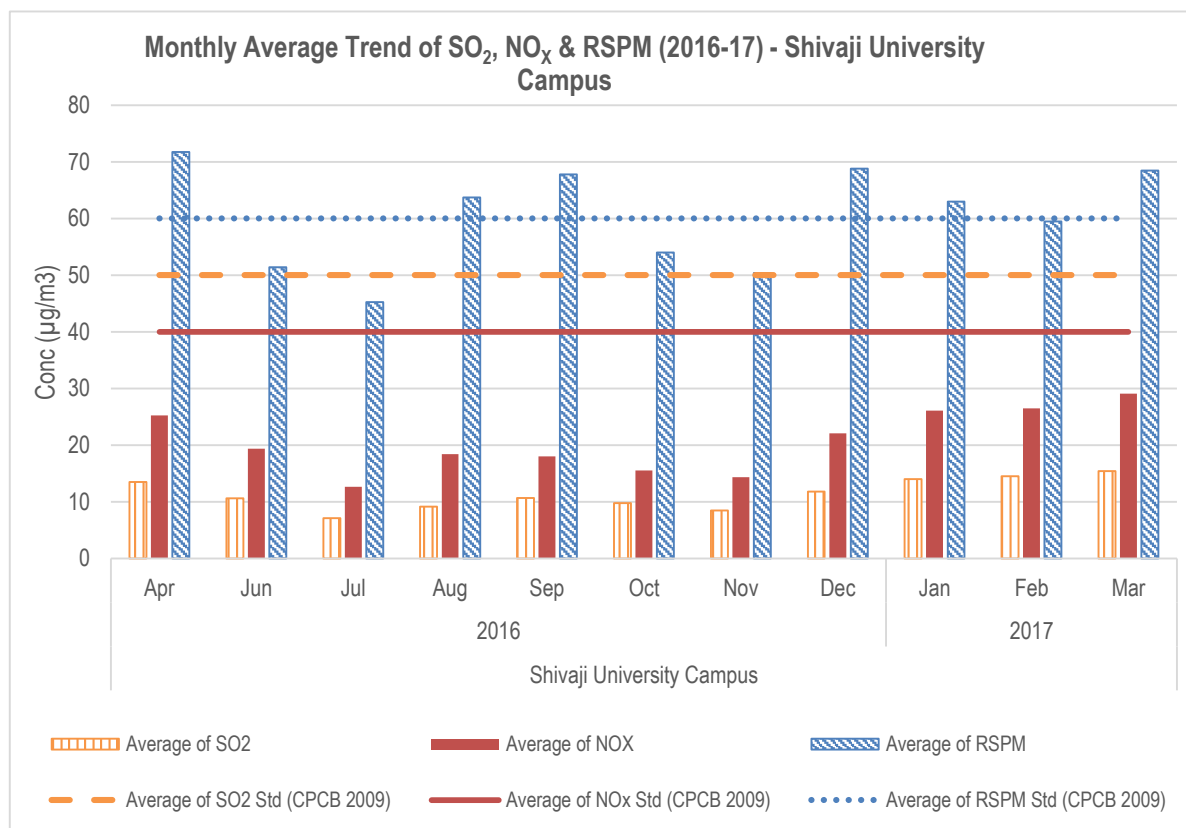


Figure No. 82: Monthly average reading recorded at Shivaji University Campus

Table No. 96: Data for Annual average trend of SO₂, NO_x, and RSPM at Shivaji University Campus

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Shivaji University Campus	05-06	4	7	40
	06-07	5	7	44
	07-08	5	3	46
	08-09	8	10	62
	09-10	8	4	55
	10-11	9	9	56
	11-12	10	13	60
	12-13	12	18	61
	13-14	14	20	64
	14-15	12	22	60
	15-16	13	23	63
	16-17	11	21	61

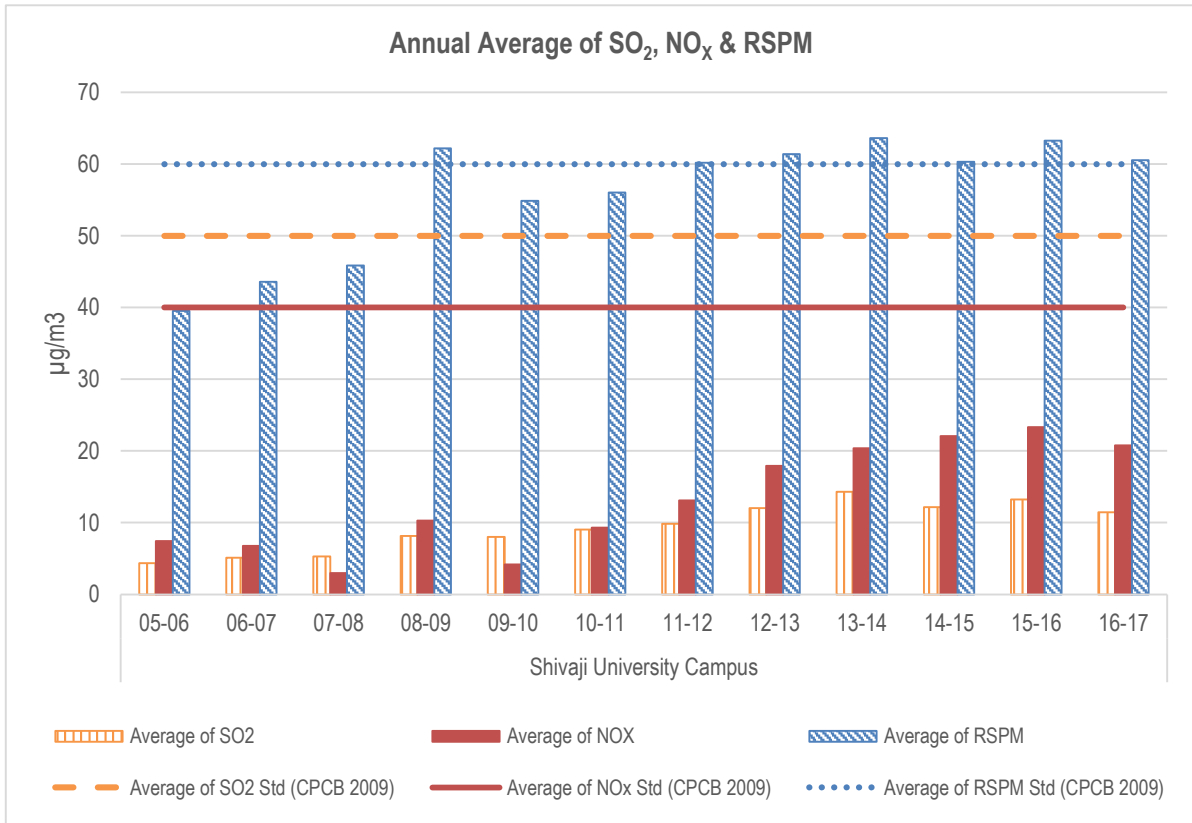


Figure No. 83: Annual average trend of SO₂, NO_x, and RSPM at Shivaji University Campus

Kolhapur - Ruikar Trust

Table No. 97: Data for Monthly average reading recorded at Ruikar Trust - Kolhapur

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Ruikar Trust	2016	Apr	27	54	140
		Jun	24	44	97
		Jul	17	31	79
		Aug	22	43	96
		Sep	26	47	103
		Oct	28	50	115
		Nov	27	44	105
	Dec	38	72	141	
	2017	Jan	37	68	145
		Feb	34	67	141
Mar		34	66	149	

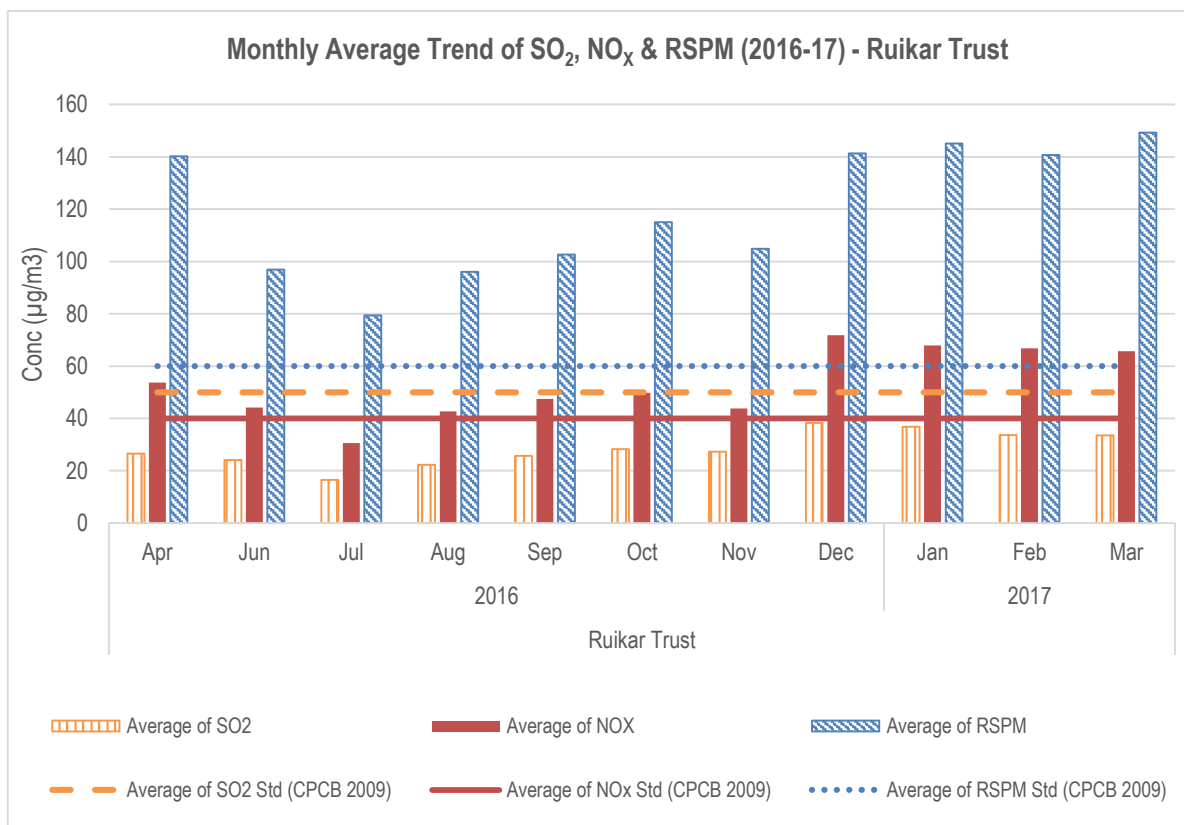


Figure No. 84: Monthly average reading recorded at Ruikar Trust - Kolhapur

Table No. 98: Data for Annual average trend of SO₂, NO_x, and RSPM at Ruikar Trust - Kolhapur

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Ruikar Trust	05-06	12	45	108
	06-07	11	39	96
	07-08	10	27	95
	08-09	16	27	100
	09-10	16	20	99
	10-11	21	27	105
	11-12	24	33	116
	12-13	27	42	159
	13-14	27	48	141
	14-15	28	50	118
	15-16	25	52	120
	16-17	29	53	120

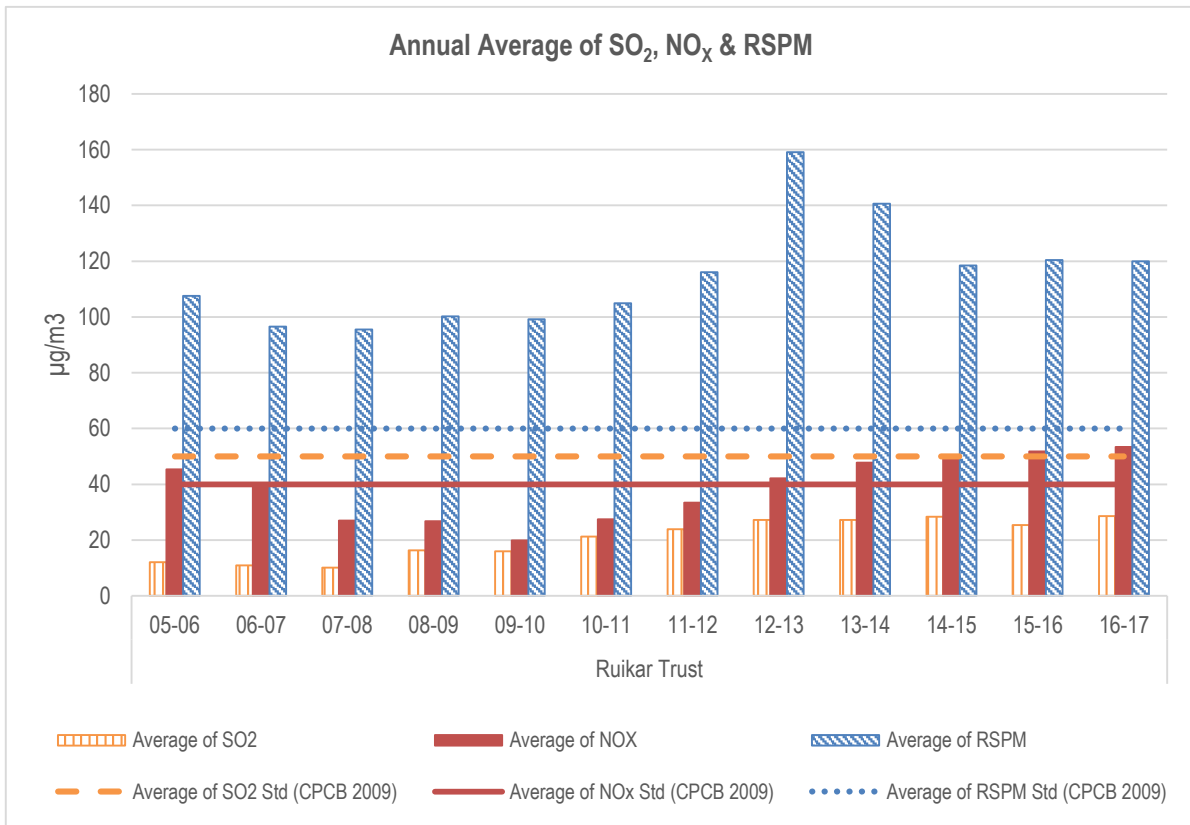


Figure No. 85: Annual average trend of SO₂, NO_x, and RSPM at Ruikar Trust - Kolhapur

Kolhapur - Mahadwar Road

Table No. 99: Data for Monthly average reading recorded at Mahadwar Road

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Mahadwar Road	2016	Apr	23	43	112
		Jun	17	30	84
		Jul	12	21	70
		Aug	18	32	84
		Sep	21	33	89
		Oct	23	36	95
		Nov	21	34	97
		Dec	30	54	121
	2017	Jan	30	48	121
		Feb	28	44	105
		Mar	27	44	102

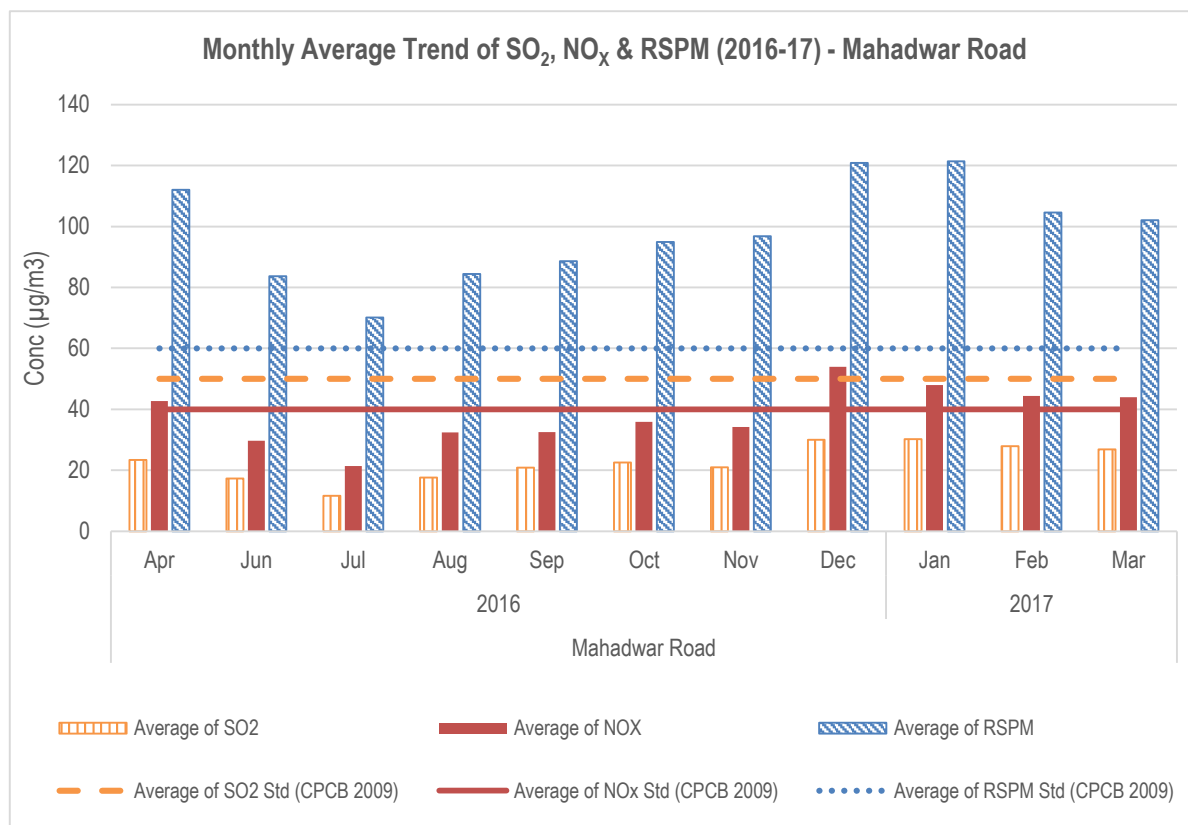


Figure No. 86: Monthly average reading recorded at Mahadwar Road

Table No. 100: Data for Annual average trend of SO₂, NO_x, and RSPM at Mahadwar Road

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Mahadwar Road	05-06	8	28	69
	06-07	8	21	64
	07-08	8	11	75
	08-09	12	17	84
	09-10	13	15	86
	10-11	17	21	92
	11-12	20	26	102
	12-13	25	35	136
	13-14	23	37	113
	14-15	24	38	104
	15-16	21	40	106
	16-17	23	39	99

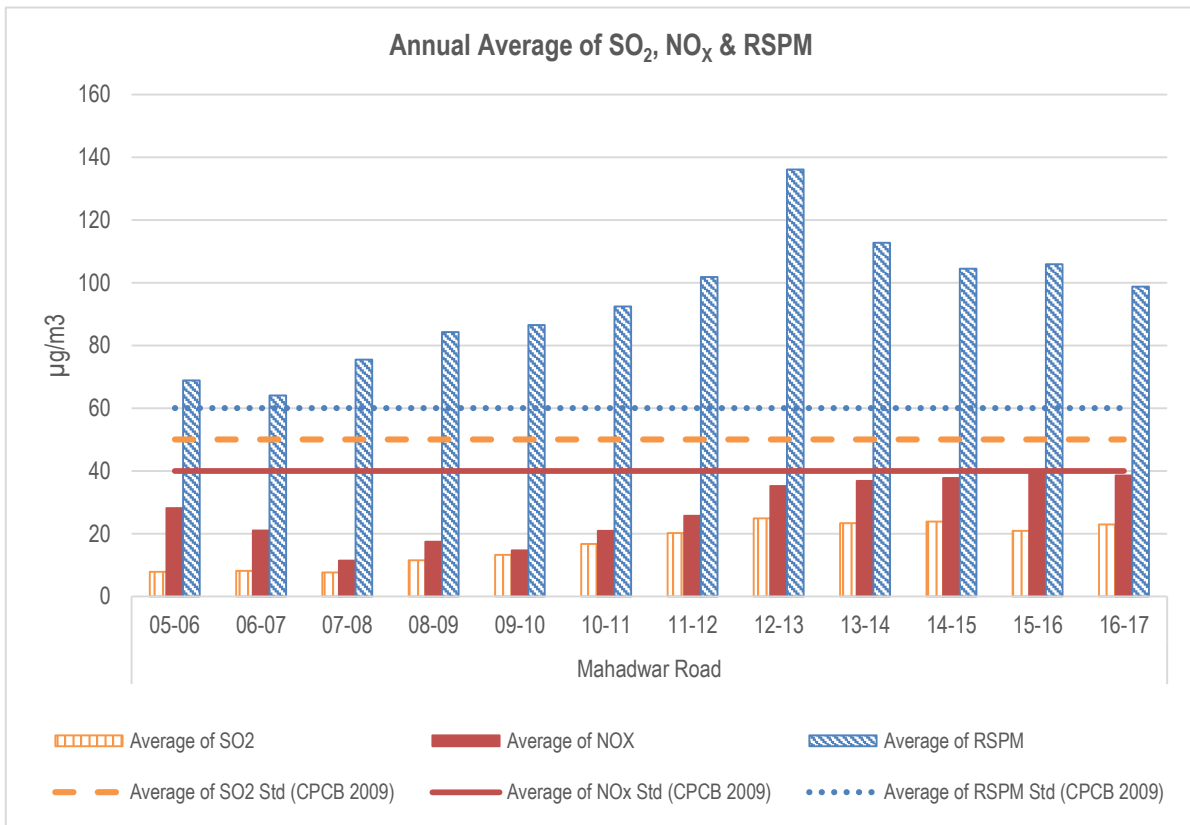


Figure No. 87: Annual average trend of SO₂, NO_x, and RSPM at Mahadwar Road

Sangli - Terrace of SRO – Sangli, Udyog Bhavan

Table No. 101: Data for Monthly average reading recorded at Terrace of SRO – Sangli, Udyog Bhavan

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Terrace of SRO-Sangli, Udyog Bhavan	2016	Apr	9	35	79
		May	10	27	53
		Jun	9	25	43
		Jul	8	20	28
		Aug	7	16	29
		Sep	7	21	38
		Oct	7	28	82
		Nov	7	64	107
		Dec	8	49	120
	2017	Jan	9	59	136
		Feb	9	76	126
		Mar	8	57	92

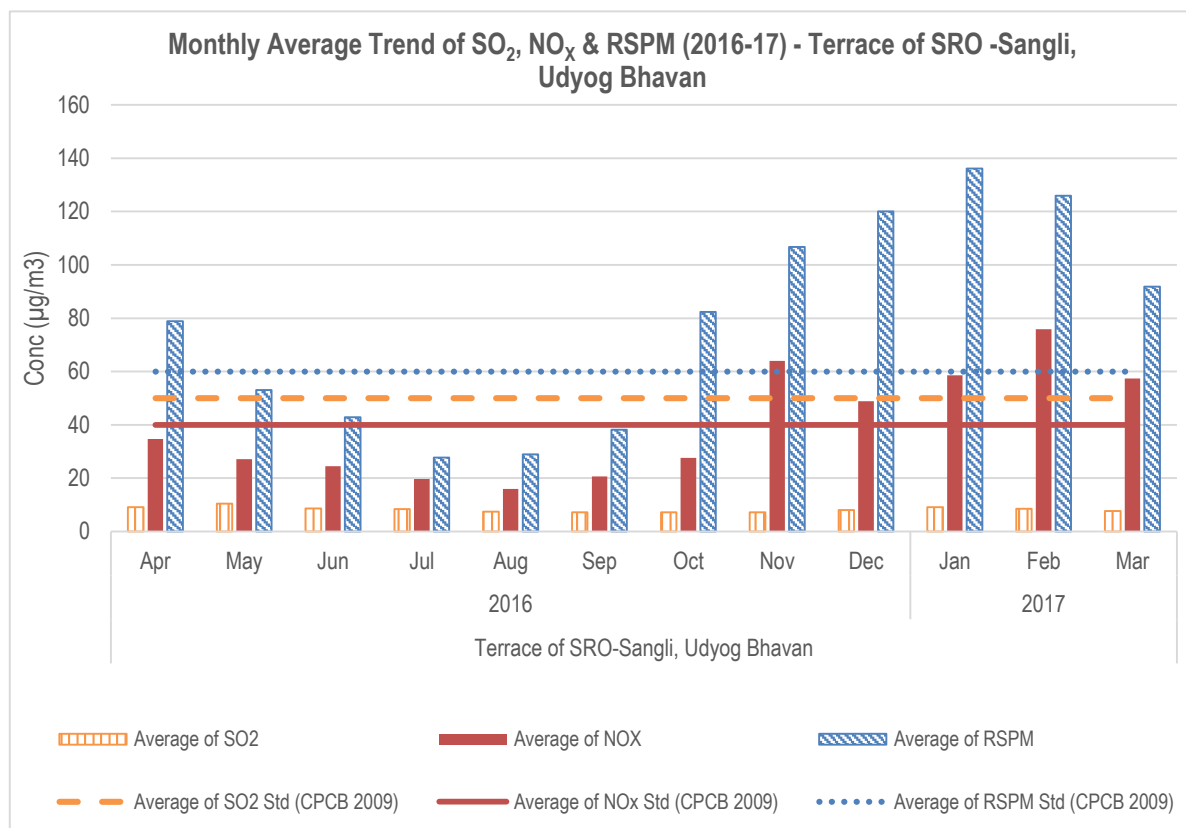
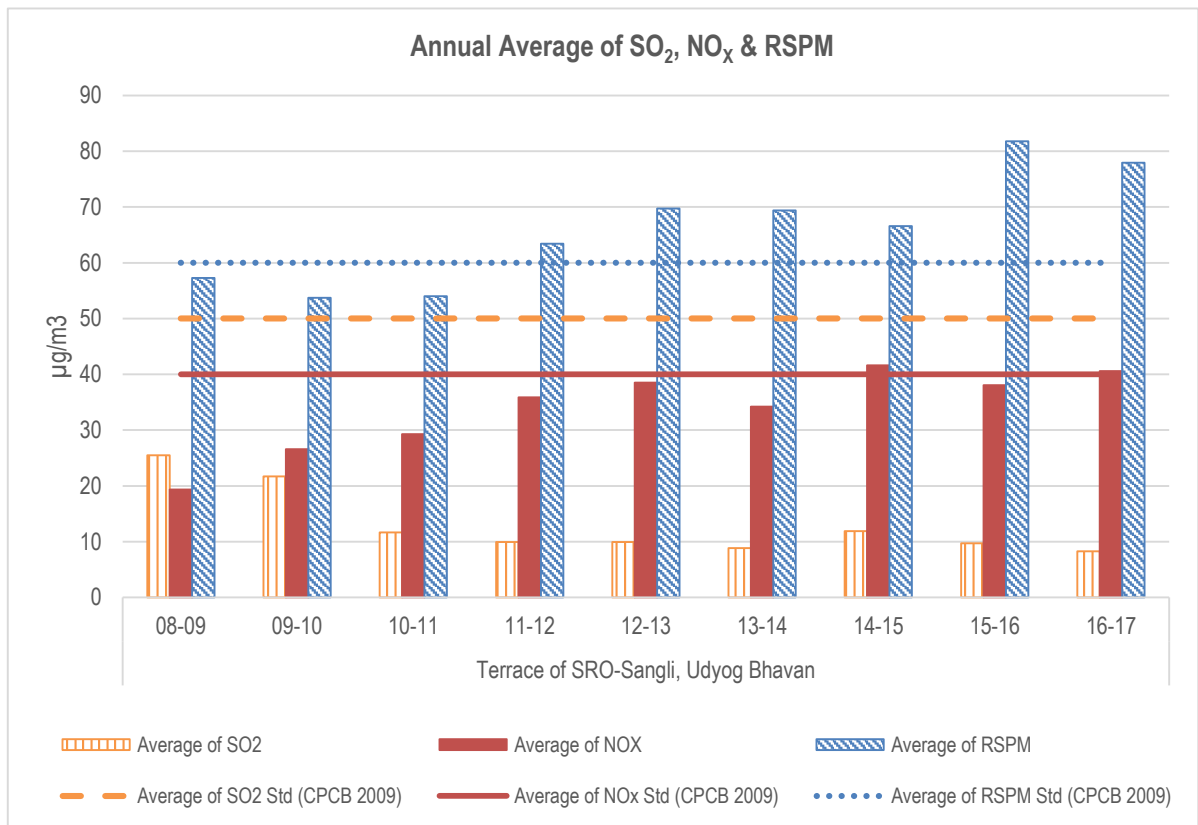


Figure No. 88: Monthly average reading recorded at Terrace of SRO – Sangli, Udyog Bhavan

Table No. 102: Data for Annual average trend of SO₂, NO_x, and RSPM at Terrace of SRO – Sangli, Udyog Bhavan

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Terrace of SRO-Sangli, Udyog Bhavan	08-09	25	19	57
	09-10	22	27	54
	10-11	12	29	54
	11-12	10	36	63
	12-13	10	39	70
	13-14	9	34	69
	14-15	12	42	67
	15-16	10	38	82
	16-17	8	41	78

Figure No. 89: Annual average trend of SO₂, NO_x, and RSPM at Terrace of SRO – Sangli, Udyog Bhavan

Sangli - Sangli - Miraj Primary Municipal School

Table No. 103: Data for Monthly average reading recorded at Sangli - Miraj Primary Municipal School

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Sangli-Miraj Primary Municipal school	2016	Apr	10	29	71
		May	12	25	50
		Jun	8	22	45
		Jul	9	21	33
		Aug	10	18	26
		Sep	9	21	30
		Oct	8	44	73
		Nov	8	67	100
		Dec	9	81	137
	2017	Jan	10	94	142
		Feb	9	82	122
		Mar	9	71	96

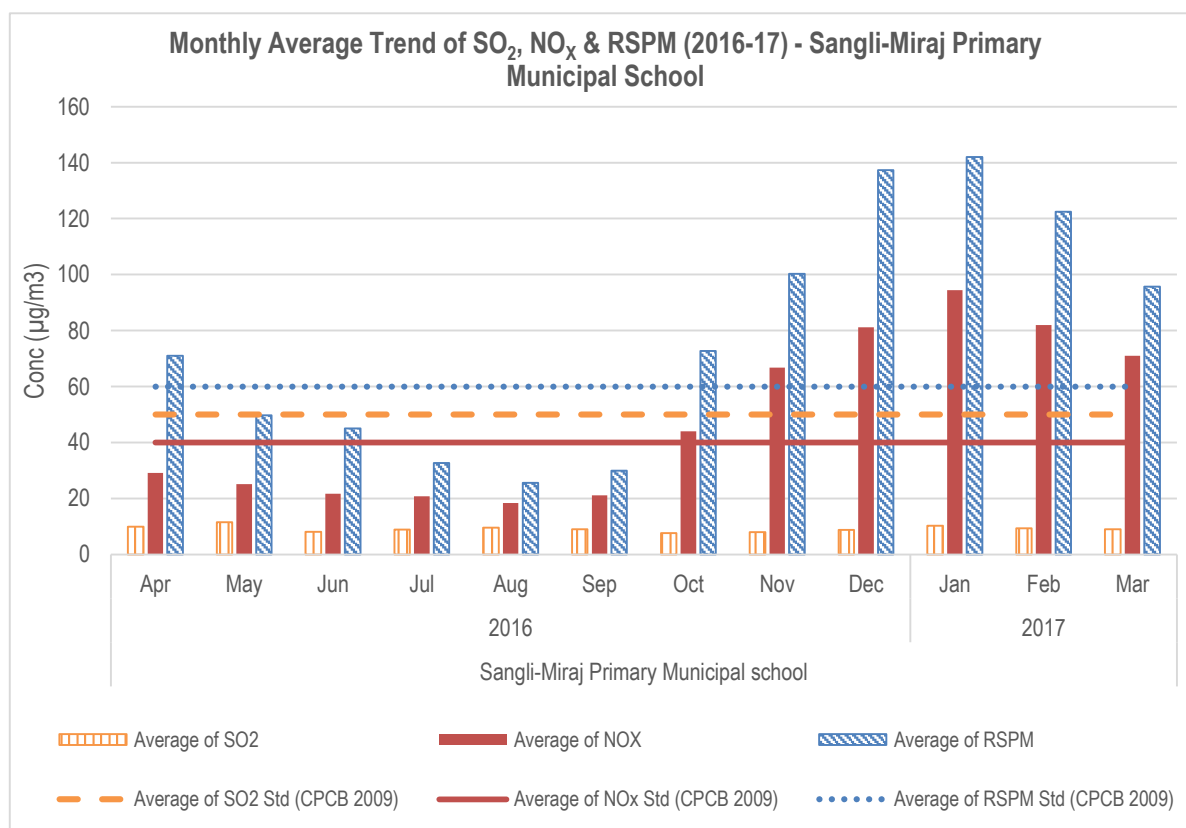


Figure No. 90: Monthly average reading recorded at Sangli - Miraj Primary Municipal School

Table No. 104: Data for Annual average trend of SO₂, NO_x, and RSPM at Sangli - Miraj Primary Municipal School

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Sangli-Miraj Primary Municipal school	08-09	22	23	87
	09-10	23	32	68
	10-11	13	32	69
	11-12	10	36	72
	12-13	11	44	79
	13-14	9	40	74
	14-15	13	48	91
	15-16	11	44	77
	16-17	9	44	72

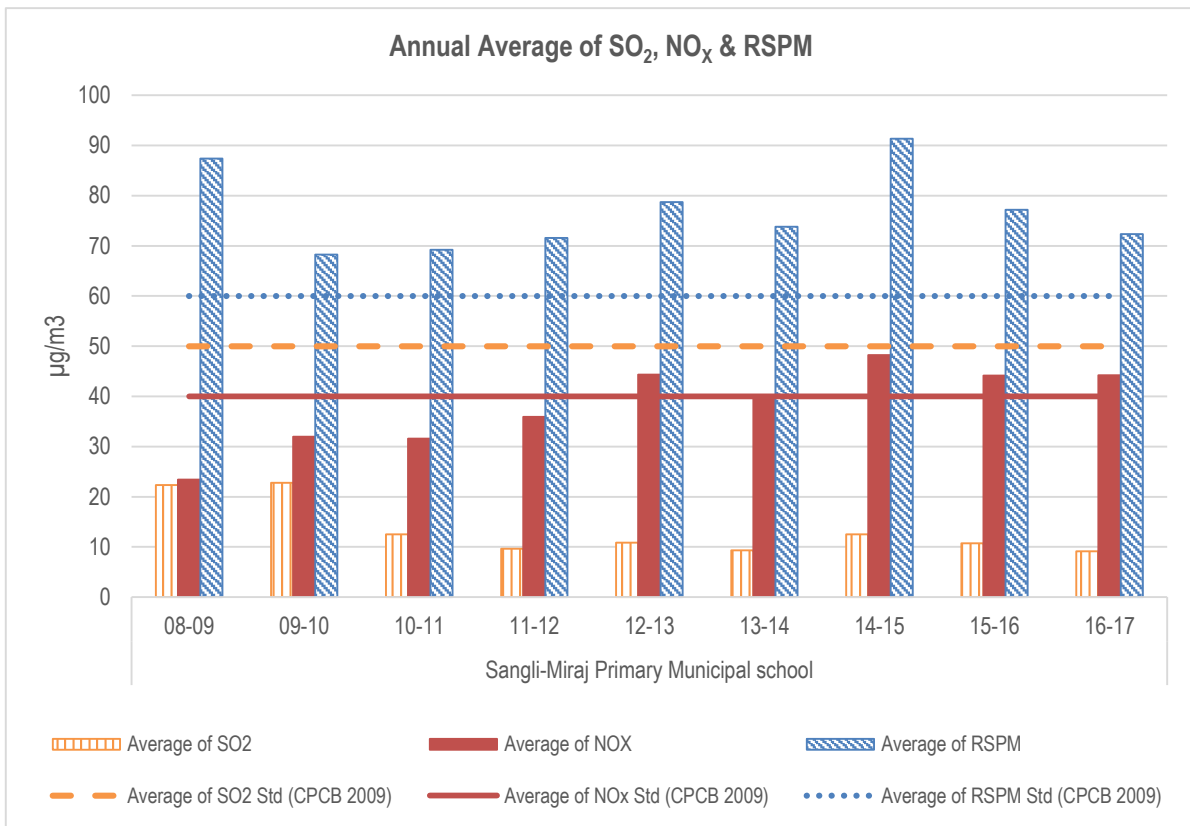


Figure No. 91: Annual average trend of SO₂, NO_x, and RSPM at Sangli - Miraj Primary Municipal School

Sangli - Krishna Valley School

Table No. 105: Data for Monthly average reading recorded at Krishna Valley School

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Krishna Valley school	2016	Apr	10	24	85
		May	11	25	58
		Jun	9	25	54
		Jul	9	21	39
		Aug	8	21	32
		Sep	8	16	33
		Oct	7	29	59
		Nov	8	53	113
		Dec	8	53	105
	2017	Jan	9	55	132
		Feb	9	68	139
		Mar	9	56	116

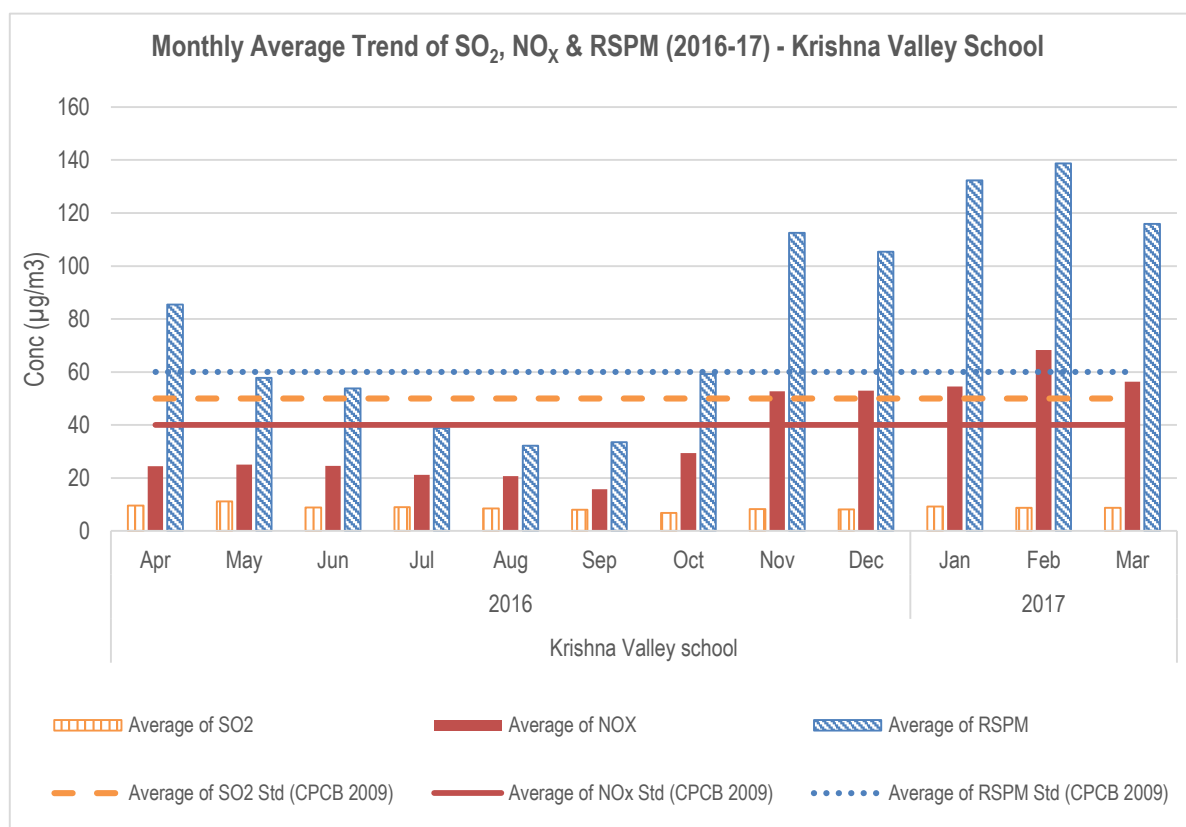


Figure No. 92: Monthly average reading recorded at Krishna Valley School

Table No. 106: Data for Annual average trend of SO₂, NO_x, and RSPM at Krishna Valley School

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Krishna Valley school	08-09	26	21	71
	09-10	24	34	82
	10-11	12	30	75
	11-12	10	36	89
	12-13	12	43	97
	13-14	11	37	95
	14-15	13	44	103
	15-16	11	37	92
	16-17	9	35	76

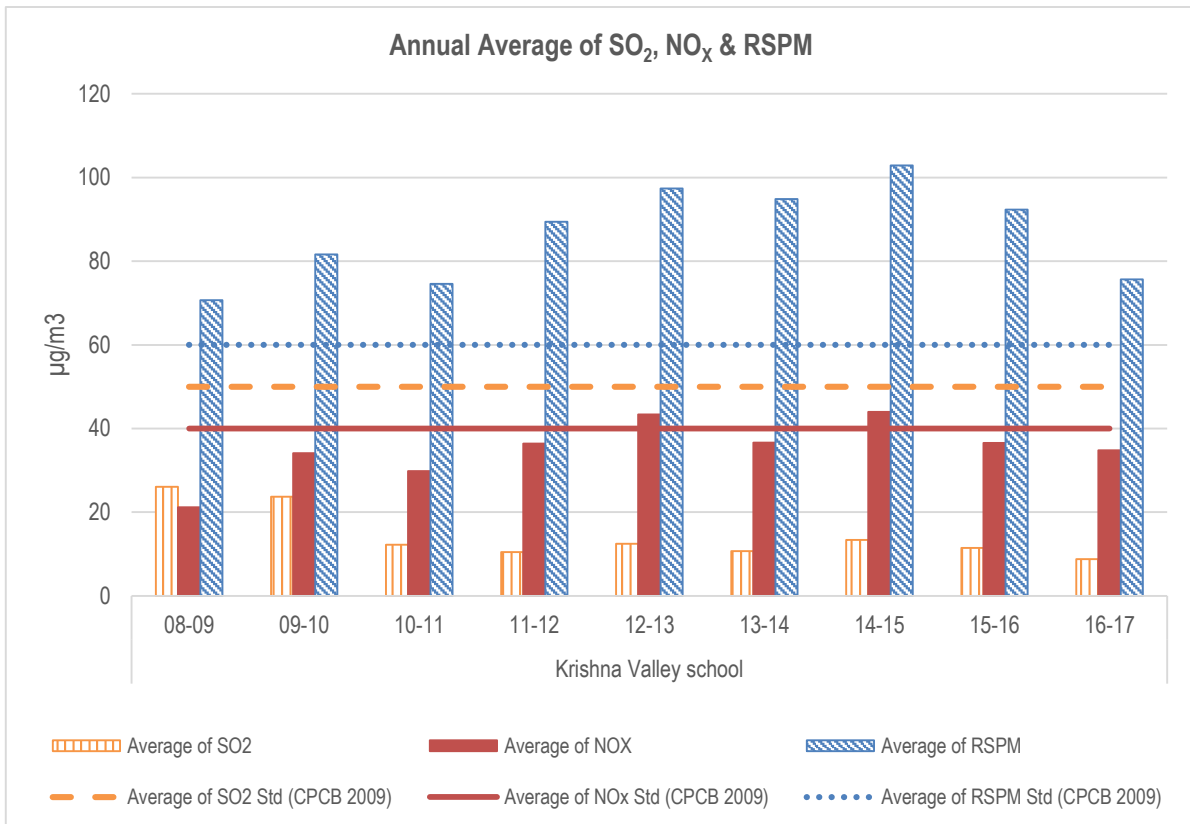
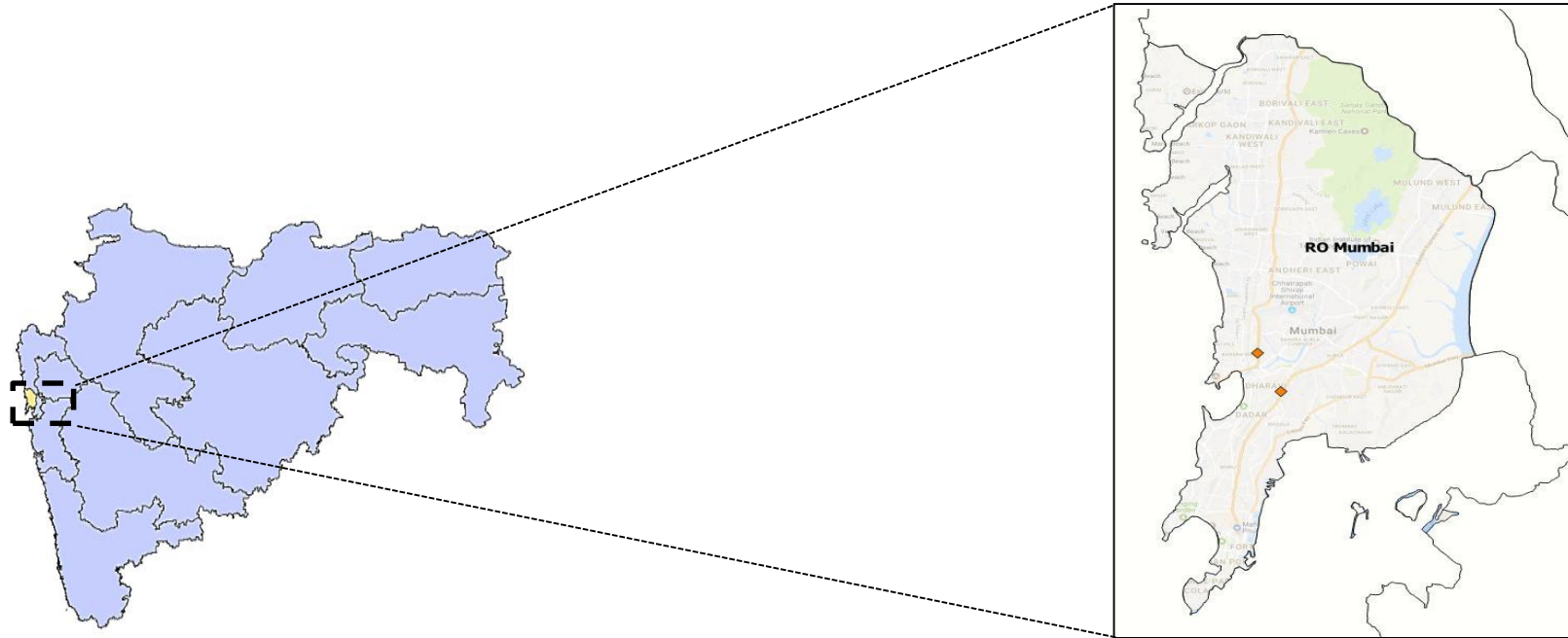


Figure No. 93: Annual average trend of SO₂, NO_x, and RSPM at Krishna Valley School

Table No. 107: Percentage exceedance of pollutants at Kolhapur RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Shivaji University Campus	92	0	0	0	0	0	0
Ruikar Trust	92	0	1	67	0	1	73
Mahadwar Road	90	0	0	42	0	0	47
Terrace of SRO-Sangli, Udyog Bhavan	101	0	7	30	0	7	30
Sangli-Miraj Primary Municipal school	93	0	15	25	0	16	27
Krishna Valley school	95	0	2	24	0	2	25

RO - Mumbai



Region	Station code	Station name	Program	Latitude	Longitude
Mumbai	-	Bandra	CAAQMS	19° 03' 41.8"N	72° 50'46.0"E
Mumbai	-	Sion	CAAQMS	19° 2' 10.34"N	72° 51'33.55"E

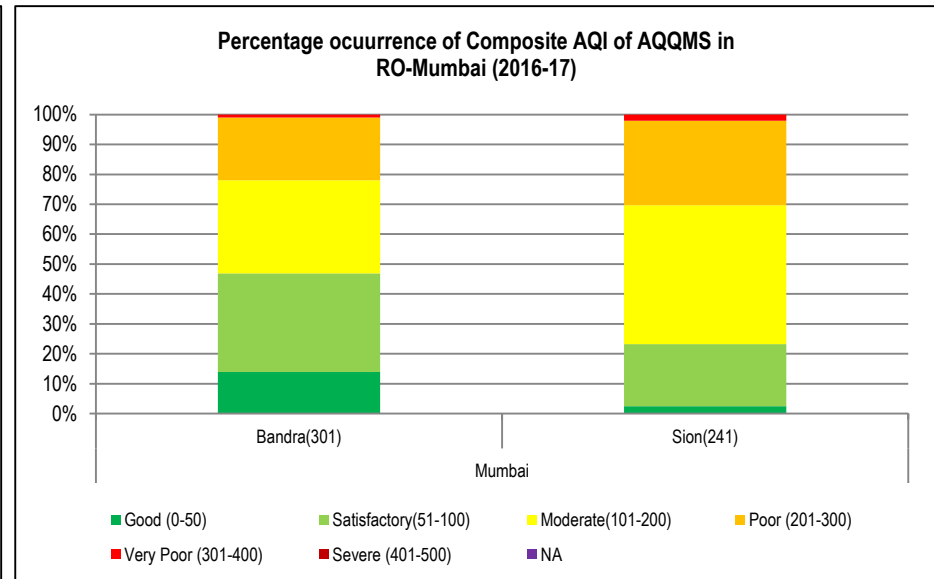
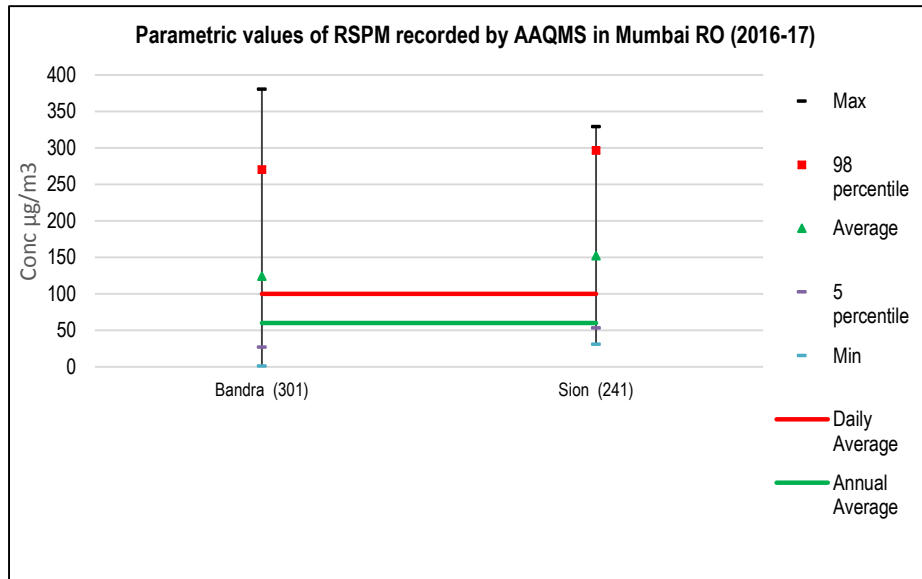
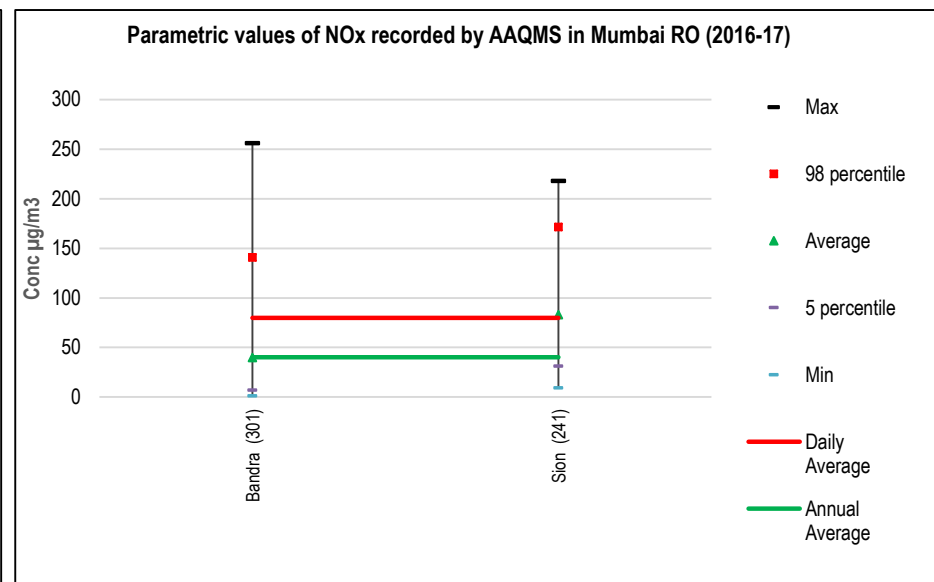
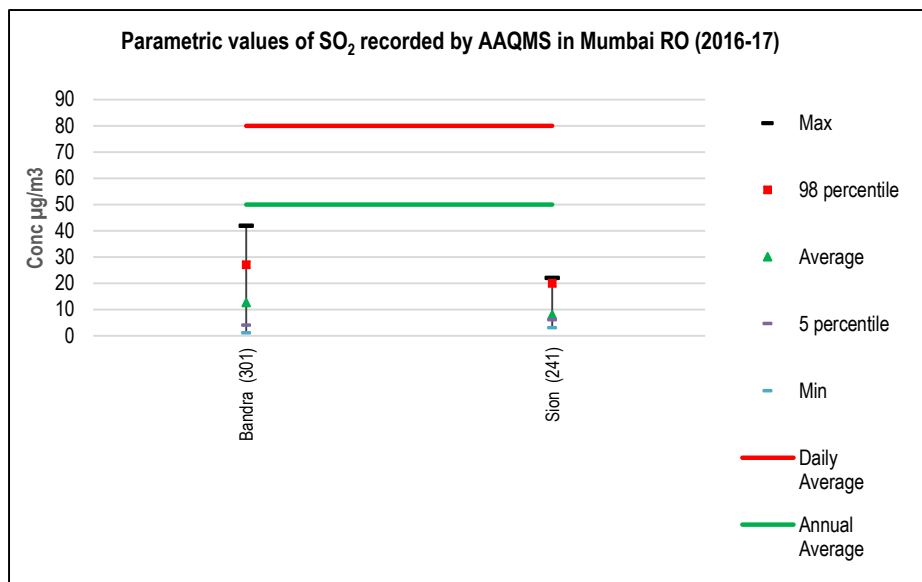


Table No. 108: Data for SO₂, NO_x & RSPM recorded at AAQMS in Mumbai RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	80		50	80	
	Bandra (301)	42	27	13	4	1
	Sion (241)	22	20	8	6	3
NO _x	<i>CPCB Standard</i>	80		40	80	
	Bandra (301)	256	141	40	7	1
	Sion (241)	218	172	83	31	9
RSPM (PM ₁₀)	<i>CPCB Standard</i>	100		60	100	
	Bandra (301)	380	270	124	27	1
	Sion (241)	329	296	152	53	31

Mumbai - Bandra

Table No. 109: Data for Monthly average reading recorded at Bandra

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Bandra	2016	Apr	8	26	75
		May	6	21	64
		Jun	4	8	30
		Jul	9	52	25
		Aug	7	81	51
		Sep	9	35	54
		Oct	18	48	130
		Nov	16	45	206
		Dec	15	30	202
	2017	Jan	18	35	202
		Feb	18	54	179
		Mar	19	52	151

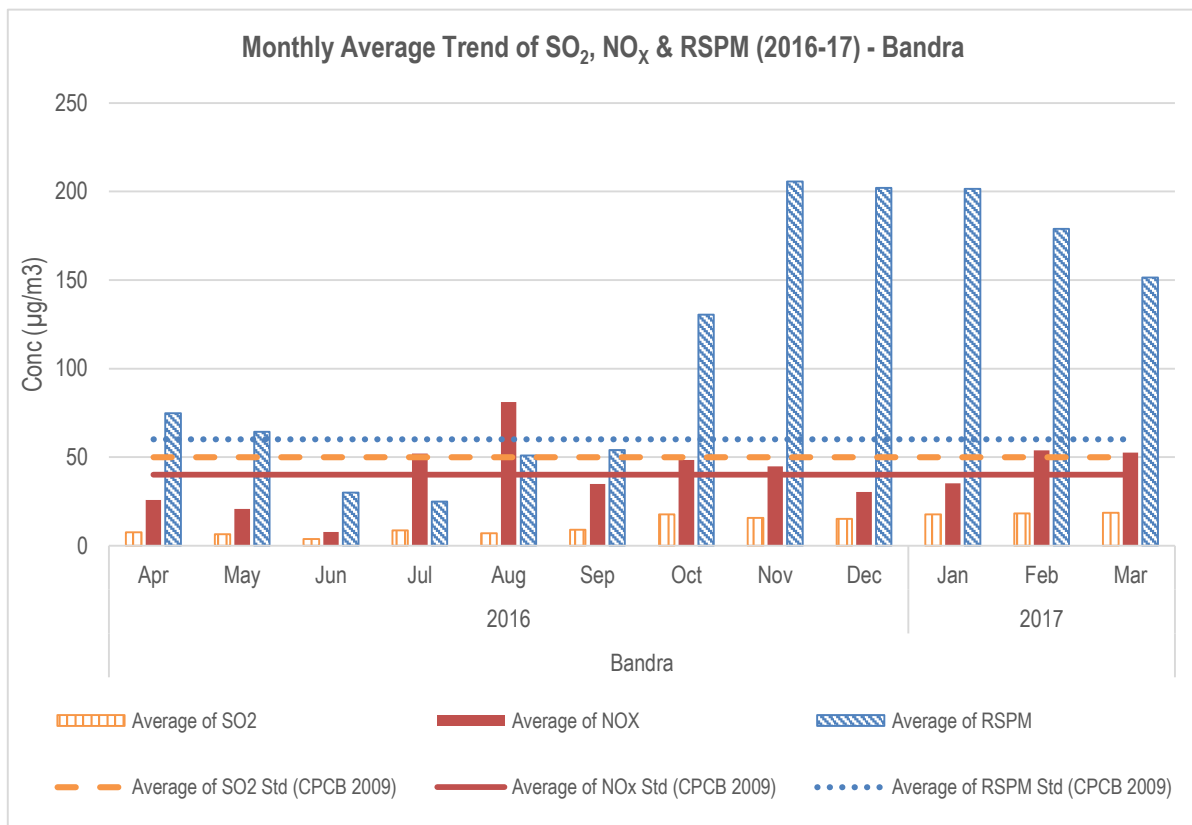


Figure No. 94: Monthly average reading recorded at Bandra

Table No. 110: Data for Annual average trend of SO₂, NO_x, and RSPM at Bandra

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Bandra	07-08	19	59	158
	08-09	19	60	137
	09-10	17	90	140
	10-11	19	48	116
	11-12	21	65	131
	12-13	18	48	116
	13-14	20	49	106
	14-15	16	52	114
	15-16	18	49	93
	16-17	13	40	122

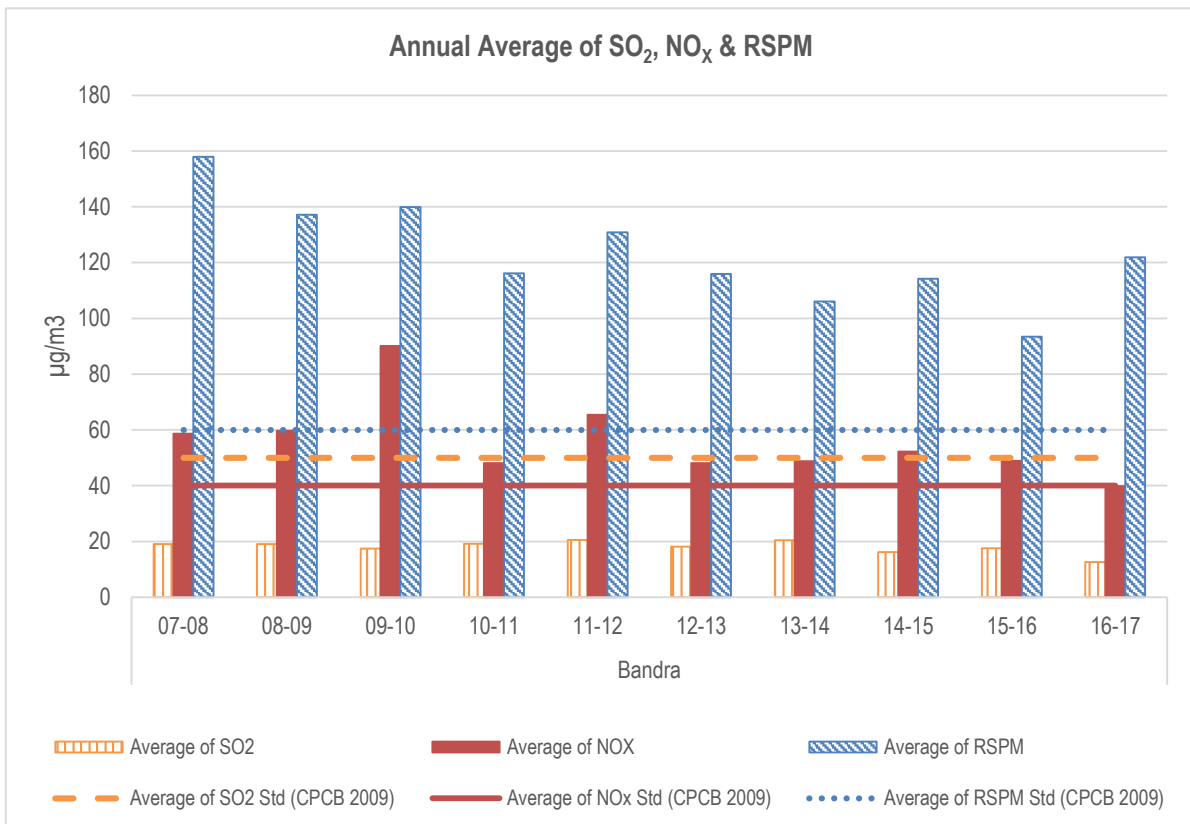


Figure No. 95: Annual average trend of SO₂, NO_x, and RSPM at Bandra

Mumbai - Sion

Table No. 111: Data for Monthly average reading recorded at Sion

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Sion	2016	Apr	12	104	243
		May	8	62	145
		Jun	8	67	109
		Jul	7	51	96
		Aug	7	37	78
		Sep	7	62	83
		Oct	7	72	127
		Nov	8	108	202
		Dec	7	117	225
	2017	Jan	9	92	159
		Feb	8	122	169
		Mar	8	105	156

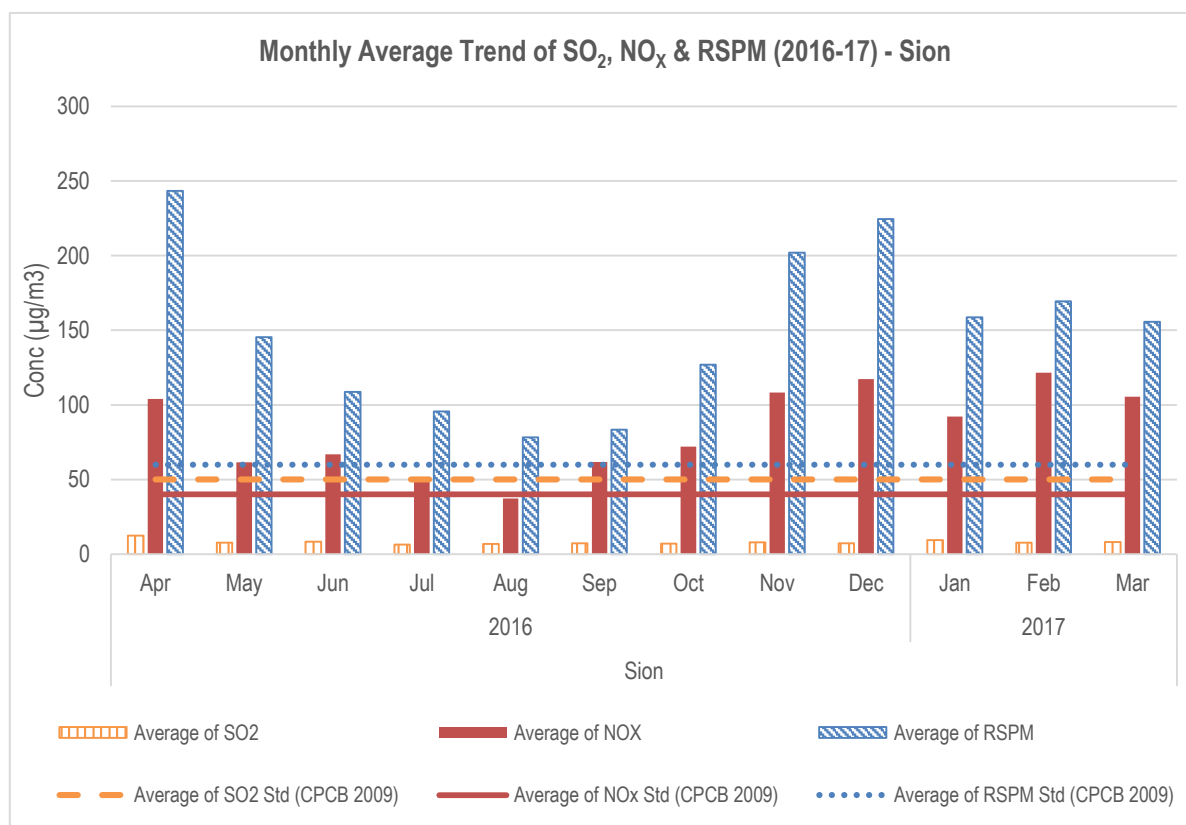


Figure No. 96: Monthly average reading recorded at Sion

Table No. 112: Data for Annual average trend of SO₂, NO_x, and RSPM at Sion

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Sion	04-05	21	67	197
	05-06	26	105	231
	06-07	30	91	255
	07-08	28	139	295
	08-09	24	97	202
	09-10	18	109	223
	10-11	14	116	181
	11-12	10	66	150
	12-13	11	106	136
	13-14	8	108	131
	14-15	8	91	117
	15-16	14	81	148
	16-17	8	83	149

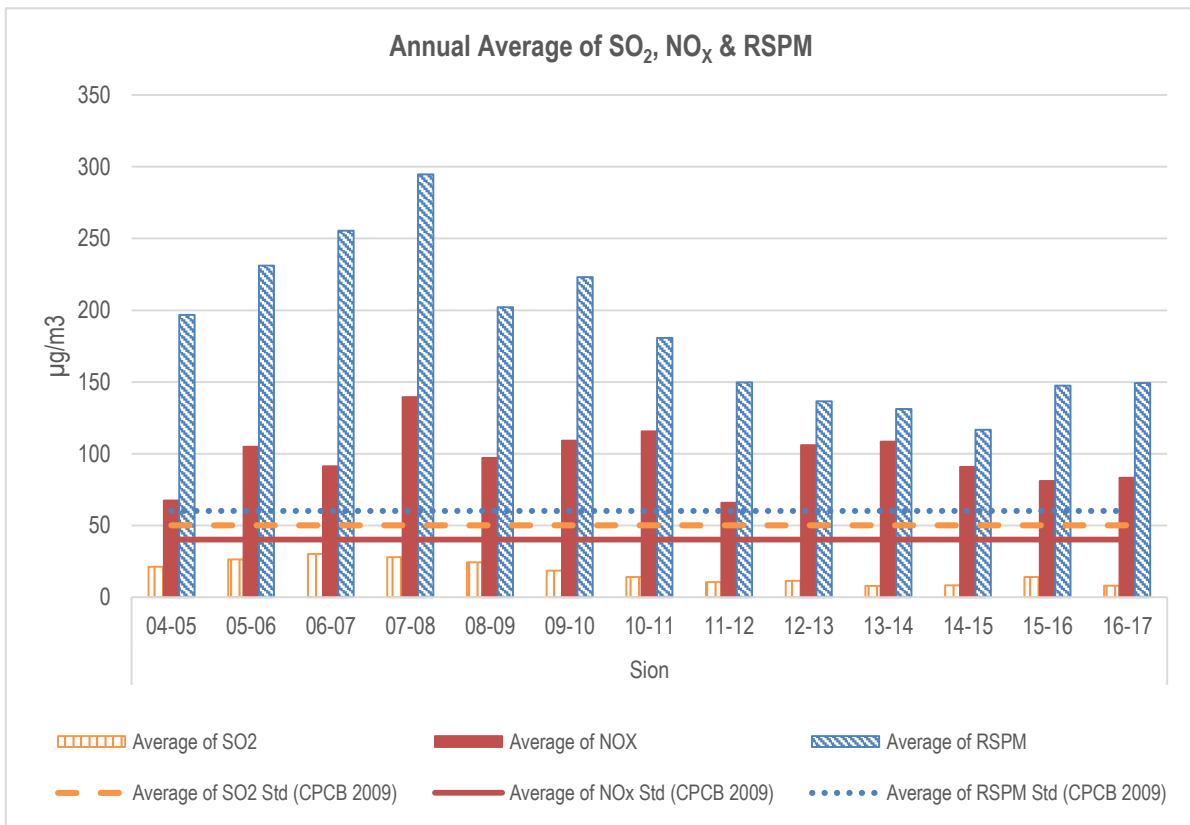
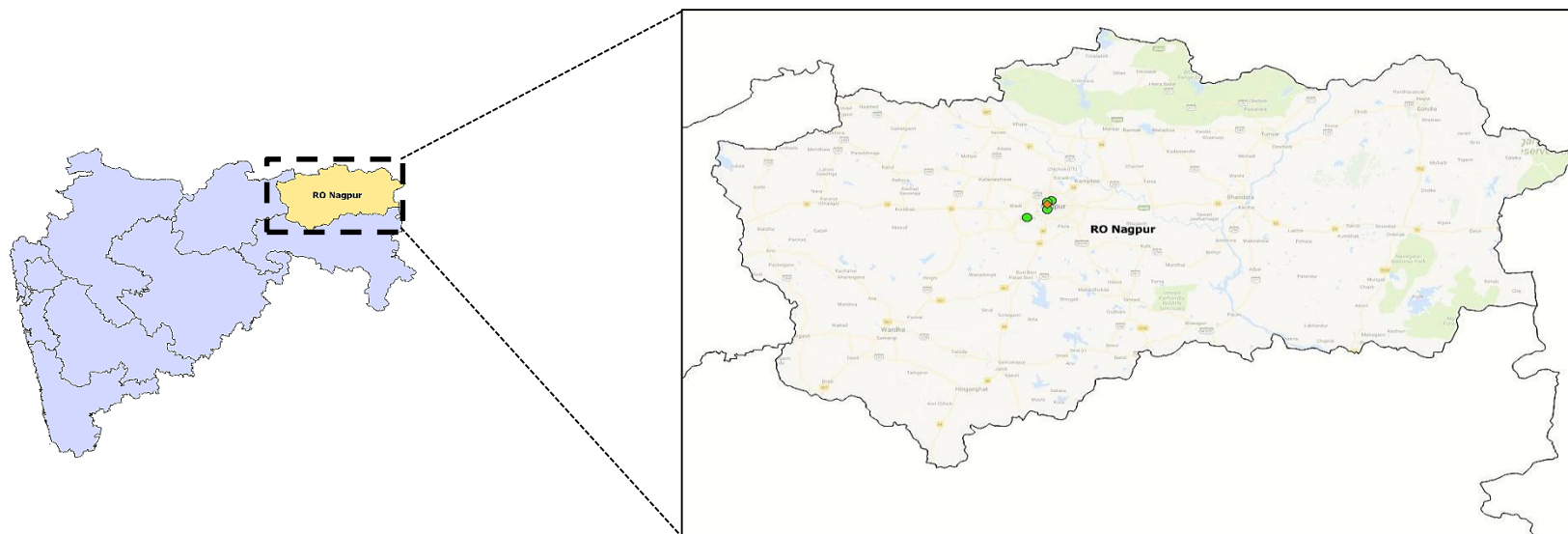


Figure No. 97: Annual average trend of SO₂, NO_x, and RSPM at Sion

Table No. 113: Percentage exceedance of pollutants at Mumbai RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Bandra	301	0	12	152	0	4	50
Sion	241	0	115	177	0	48	73

RO - Nagpur



Region	Station code	Station name	Program	Latitude	Longitude
Nagpur	287	IOE North Ambazari road	NAMP	21°08'10.0"N	79° 04' 08.5"E
Nagpur	288	MIDC Office, Hingna Road	NAMP	21°06'35.5"N	79° 00' 27.2"E
Nagpur	314	Govt Polytechnic Col, Sadar	NAMP	21°09'47.6"N	79° 04' 57.6"E
Nagpur	711	Civil lines Nagpur	NAMP	21°09'28.6"N	79° 04' 12.1"E
Nagpur		Nagpur CAAQMS	CAAQMS	21° 09'03.61"N	79° 04' 06.00"E

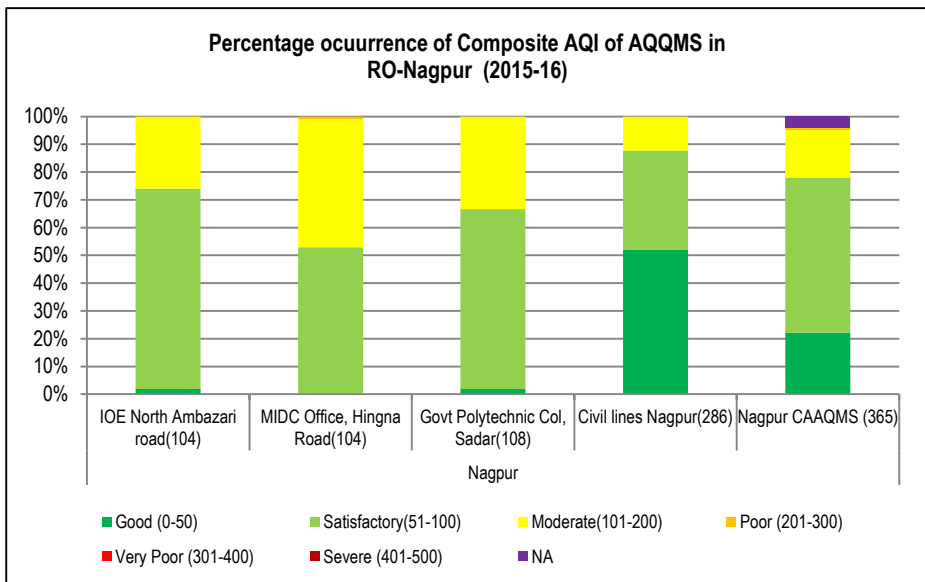
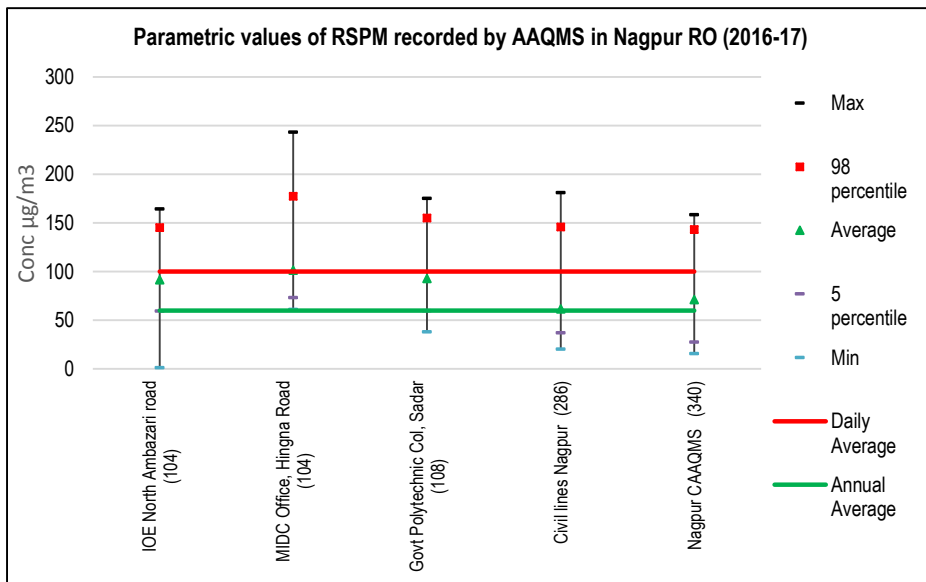
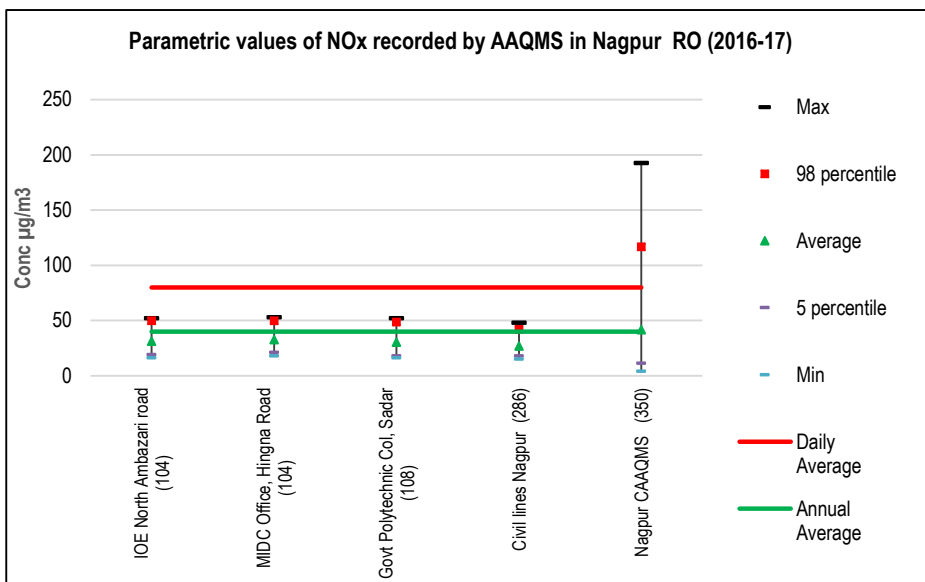
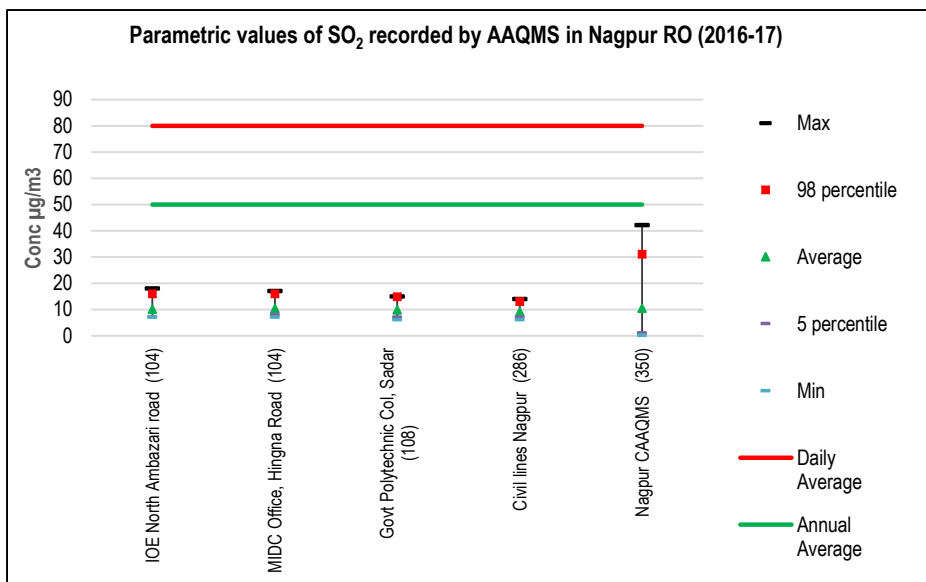


Table No. 114: Data for SO₂, NO_x & RSPM recorded at AAQMS in Nagpur RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	80		50	80	
	IOE North Ambazari road (104)	18	16	10	7	7
	MIDC Office, Hingna Road (104)	17	16	10	8	7
	Govt Polytechnic Col, Sadar (108)	15	15	10	7	6
	Civil lines Nagpur (286)	14	13	9	7	6
	Nagpur CAAQMS (350)	42	31	10	1	0
	NO _x	<i>CPCB Standard</i>	80		40	80
IOE North Ambazari road (104)		52	50	31	19	16
MIDC Office, Hingna Road (104)		53	50	33	21	18
Govt Polytechnic Col, Sadar (108)		52	49	30	18	16
Civil lines Nagpur (286)		48	42	27	18	15
Nagpur CAAQMS (350)		193	117	42	11	4
RSPM (PM ₁₀)		<i>CPCB Standard</i>	100		60	100
	IOE North Ambazari road (104)	164	145	92	59	1
	MIDC Office, Hingna Road (104)	243	177	101	73	61
	Govt Polytechnic Col, Sadar (108)	175	155	93	60	38
	Civil lines Nagpur (286)	181	146	62	37	20
	Nagpur CAAQMS (340)	158	143	71	27	15

Nagpur - IOE North Ambazari road

Table No. 115: Data for Monthly average reading recorded at IOE North Ambazari road

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM	
			50	40	60	
IOE North Ambazari road	2016	Apr	10	32	89	
		May	9	26	92	
		Jun	9	28	106	
		Jul	10	30	89	
		Aug	9	24	83	
		Sep	9	25	78	
		Oct	10	31	85	
		Nov	11	36	100	
		Dec	14	42	100	
		2017	Jan	12	38	97
			Feb	13	39	108
			Mar	10	34	83

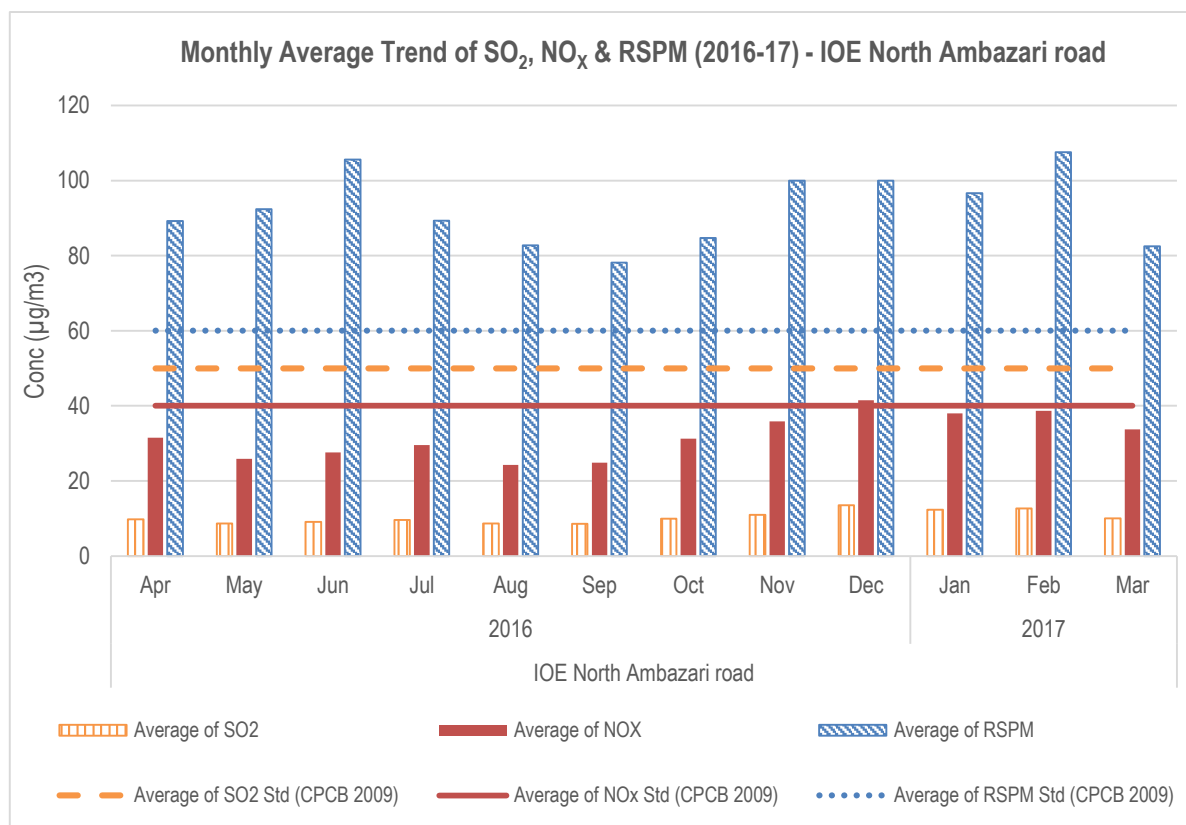


Figure No. 98: Monthly average reading recorded at IOE North Ambazari road

Table No. 116: Data for Annual average trend of SO₂, NO_x, and RSPM at IOE North Ambazari road

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
IOE North Ambazari road	04-05	8	21	52
	05-06	9	30	44
	06-07	10	27	66
	07-08	8	22	125
	08-09	8	30	114
	09-10	10	36	109
	10-11	10	33	96
	11-12	10	34	84
	12-13	11	39	96
	13-14	10	29	90
	14-15	10	32	106
	15-16	10	31	101
	16-17	10	31	92

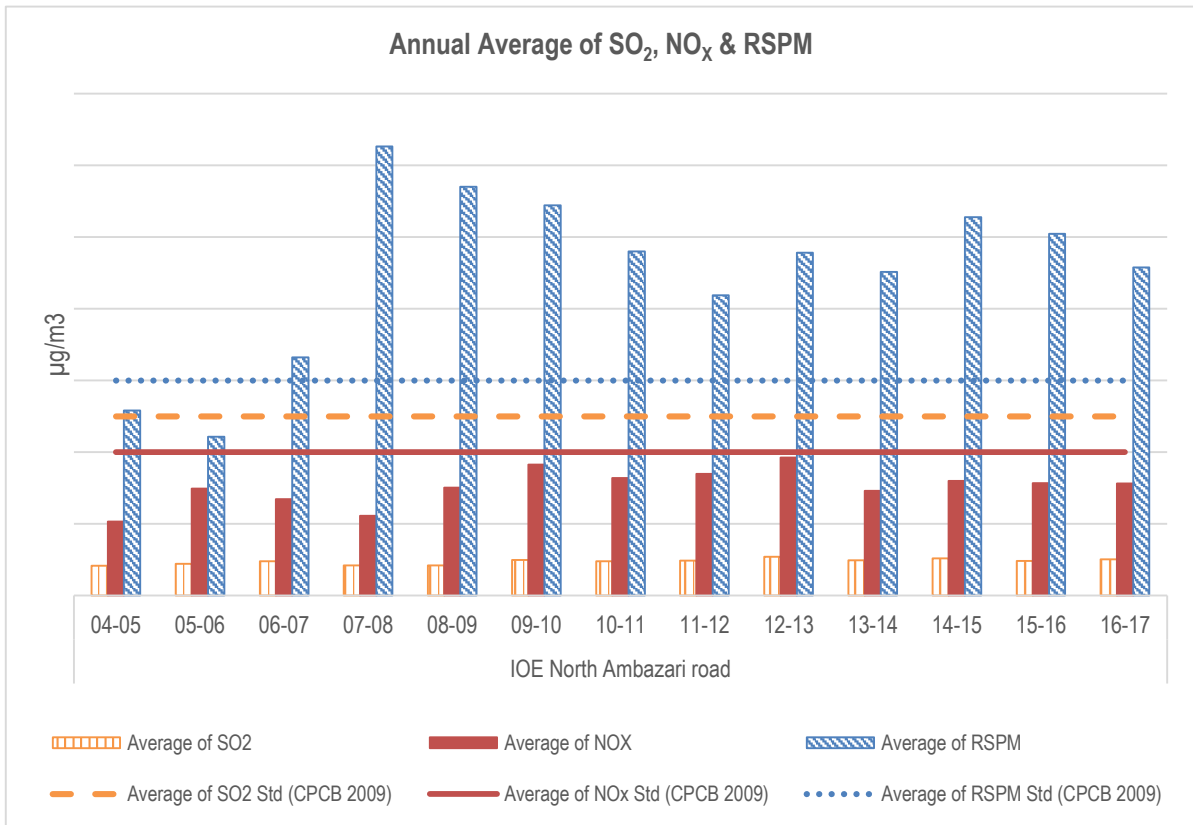


Figure No. 99: Annual average trend of SO₂, NO_x, and RSPM at IOE North Ambazari road

Nagpur - MIDC Office, Hingna Road

Table No. 117: Data for Monthly average reading recorded at MIDC Office, Hingna Road

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM	
			50	40	60	
MIDC Office, Hingna Road	2016	Apr	10	34	96	
		May	9	29	98	
		Jun	10	30	109	
		Jul	10	32	96	
		Aug	9	23	95	
		Sep	8	23	91	
		Oct	9	28	87	
		Nov	12	41	122	
		Dec	11	37	96	
		2017	Jan	12	39	102
			Feb	13	41	122
			Mar	11	35	95

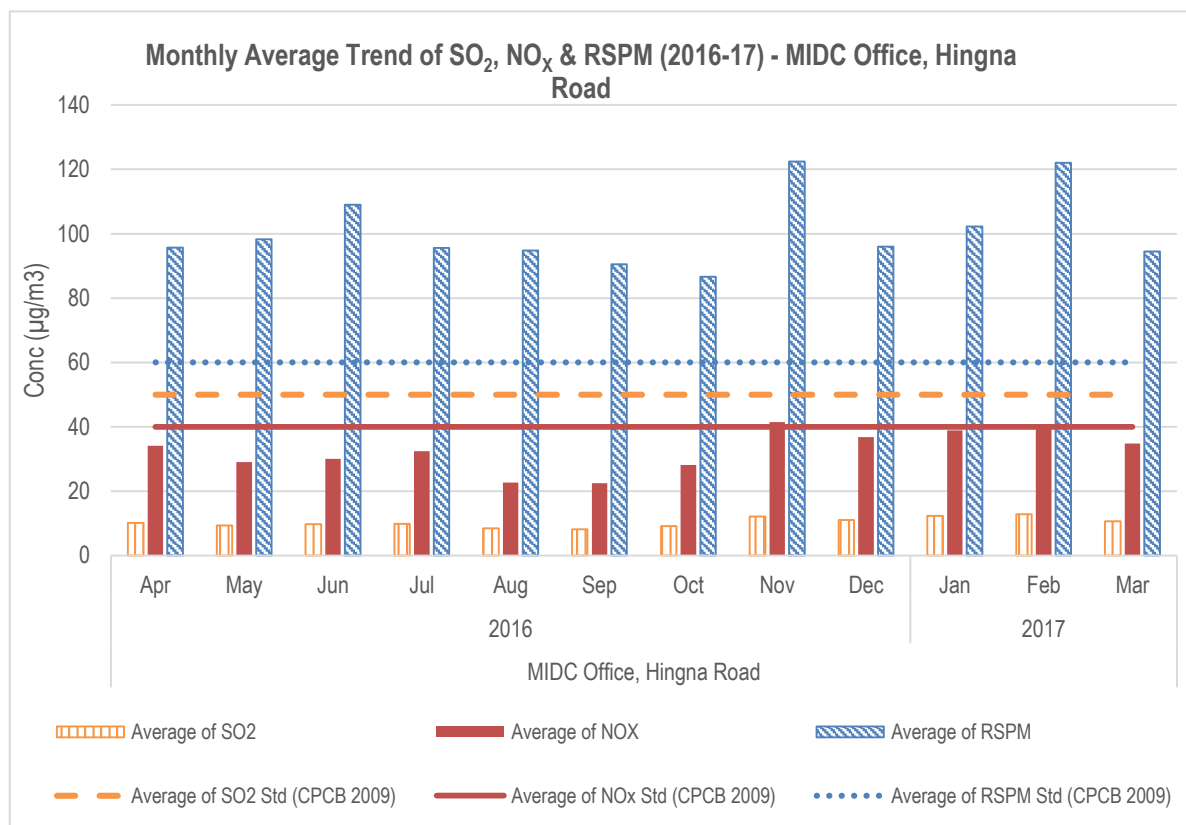


Figure No. 100: Monthly average reading recorded at MIDC Office, Hingna Road

Table No. 118: Data for Annual average trend of SO₂, NO_x, and RSPM at MIDC Office, Hingna Road

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
MIDC Office, Hingna Road	04-05	9	22	51
	05-06	10	34	40
	06-07	9	25	90
	07-08	9	24	160
	08-09	9	30	118
	09-10	10	38	128
	10-11	10	34	113
	11-12	10	35	105
	12-13	11	41	125
	13-14	10	31	119
	14-15	11	33	129
	15-16	10	32	110
	16-17	10	33	101

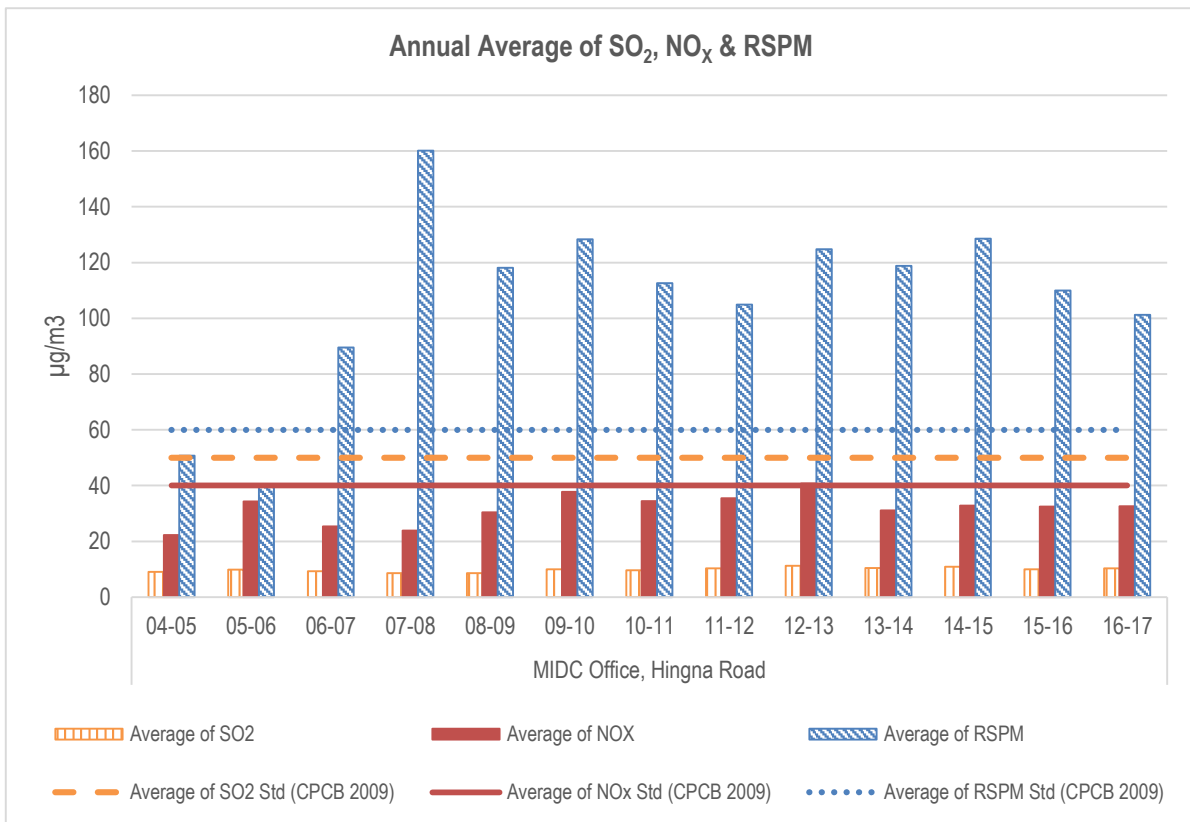


Figure No. 101: Annual average trend of SO₂, NO_x, and RSPM at MIDC Office, Hingna Road

Nagpur - Govt. Polytechnic Col, Sadar

Table No. 119: Data for Monthly average reading recorded at Govt. Polytechnic Col, Sadar

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Govt Polytechnic Col, Sadar	2016	Apr	9	27	78
		May	8	21	88
		Jun	10	32	96
		Jul	11	34	80
		Aug	8	24	87
		Sep	8	22	81
		Oct	10	31	101
		Nov	12	40	103
		Dec	10	31	122
	2017	Jan	11	35	105
		Feb	11	32	92
		Mar	10	33	91

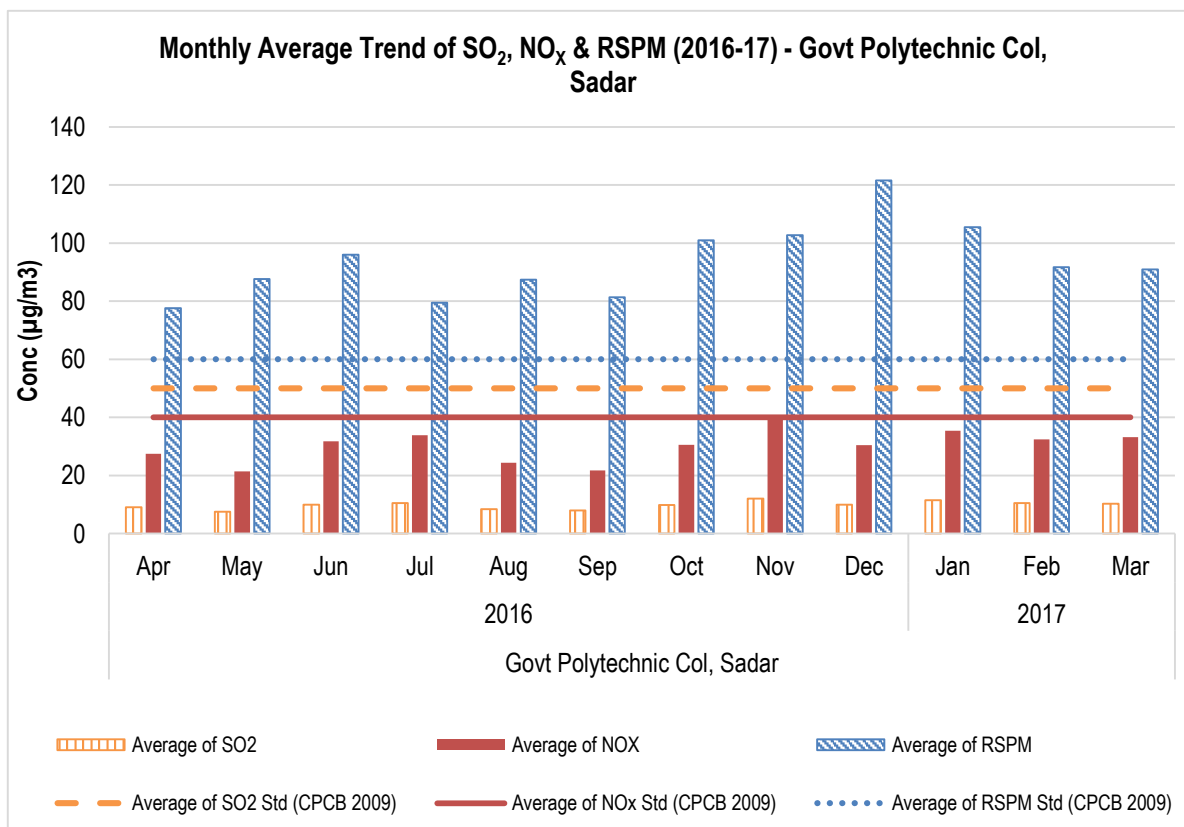


Figure No. 102: Monthly average reading recorded at Govt. Polytechnic Col, Sadar

Table No. 120: Data for Annual average trend of SO₂, NO_x, and RSPM at Govt. Polytechnic Col, Sadar

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Govt Polytechnic Col, Sadar	04-05	9	21	45
	05-06	9	32	52
	06-07	9	26	70
	07-08	8	21	107
	08-09	8	27	101
	09-10	9	31	93
	10-11	9	30	87
	11-12	9	30	80
	12-13	10	35	82
	13-14	9	28	92
	14-15	10	31	103
	15-16	10	33	91
	16-17	9	30	93

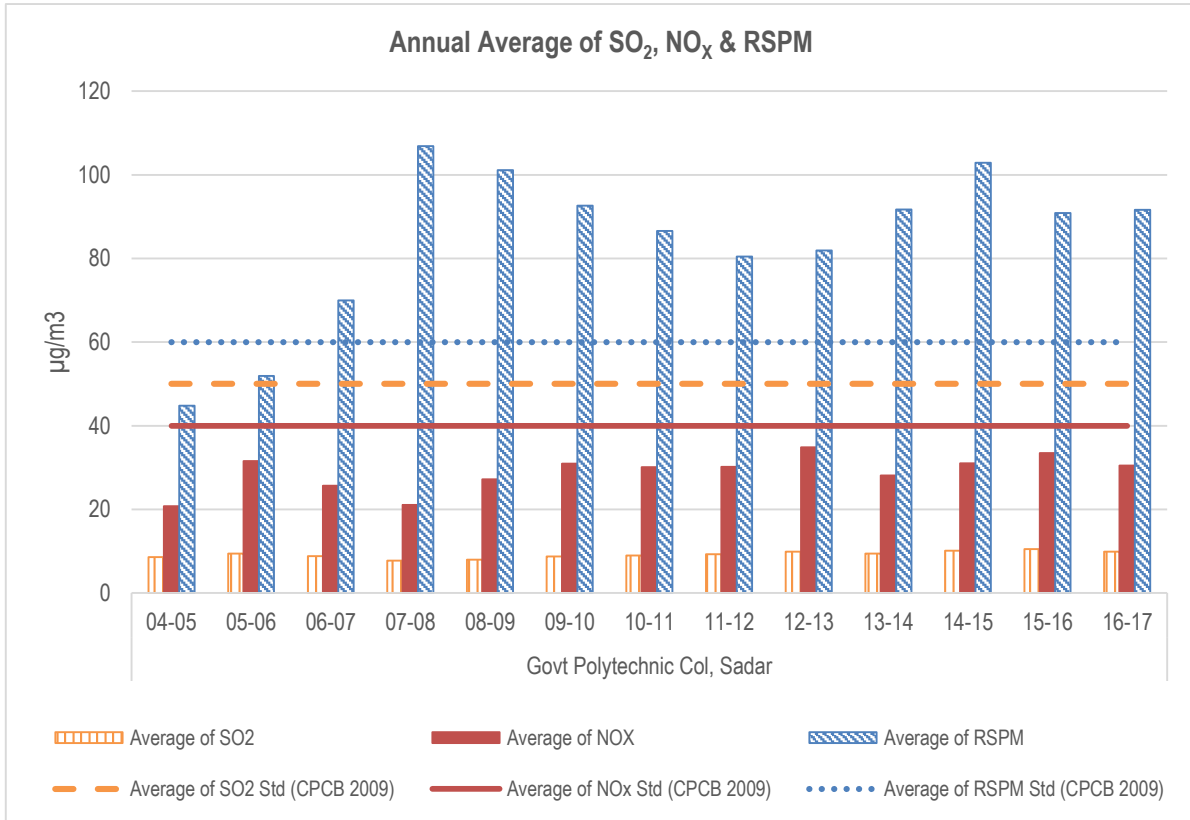


Figure No. 103: Annual average trend of SO₂, NO_x, and RSPM at Govt. Polytechnic Col, Sadar

Nagpur - Nagpur Civil Lines

Table No. 121: Data for Monthly average reading recorded at Civil Lines Nagpur

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Civil lines Nagpur	2016	Apr	8	24	47
		May	7	20	44
		Jun	8	22	43
		Jul	8	24	44
		Aug	8	25	46
		Sep	8	23	50
		Oct	9	29	70
		Nov	10	30	54
		Dec	11	33	83
	2017	Jan	11	33	91
		Feb	11	34	106
		Mar	9	28	78

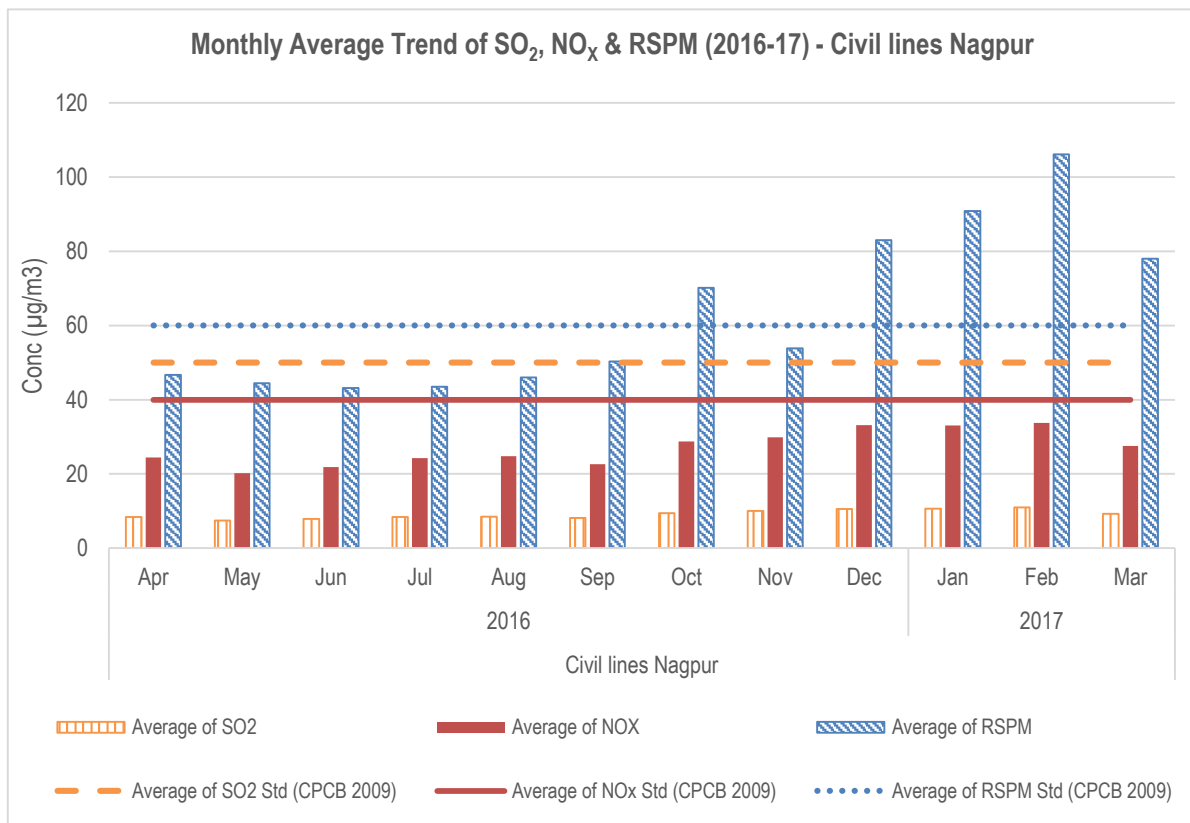


Figure No. 104: Monthly average reading recorded at Civil Lines Nagpur

Table No. 122: Data for Annual average trend of SO₂, NO_x, and RSPM at Civil Lines Nagpur

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Civil lines Nagpur	04-05	17	25	53
	05-06	15	22	66
	06-07	14	28	76
	07-08	14	30	70
	08-09	18	31	84
	09-10	13	35	85
	10-11	9	28	66
	11-12	9	26	55
	12-13	9	30	54
	13-14	9	24	61
	14-15	10	28	62
	15-16	9	29	54
	16-17	9	27	62

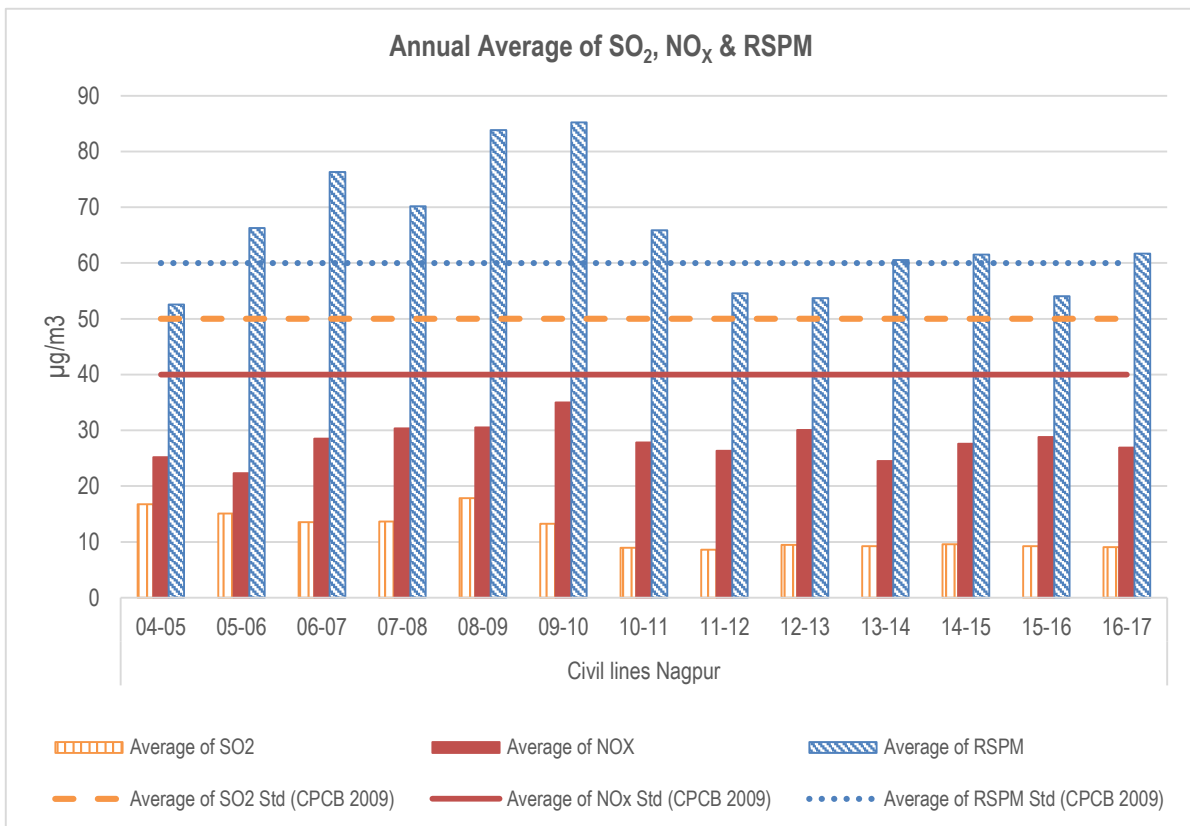


Figure No. 105: Annual average trend of SO₂, NO_x, and RSPM at Civil Lines Nagpur

Nagpur - Nagpur CAAQMS

Table No. 123: Data for Monthly average reading recorded at Nagpur CAAQMS

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Nagpur CAAQMS	2016	Apr	14	51	94
		May	13	35	70
		Jun	8	24	57
		Jul	1	24	36
		Aug	3	33	39
		Sep	4	20	40
		Oct	8	31	65
		Nov	12	51	83
	Dec	14	81	84	
	2017	Jan	15	44	87
		Feb	16	60	81
		Mar	18	44	119

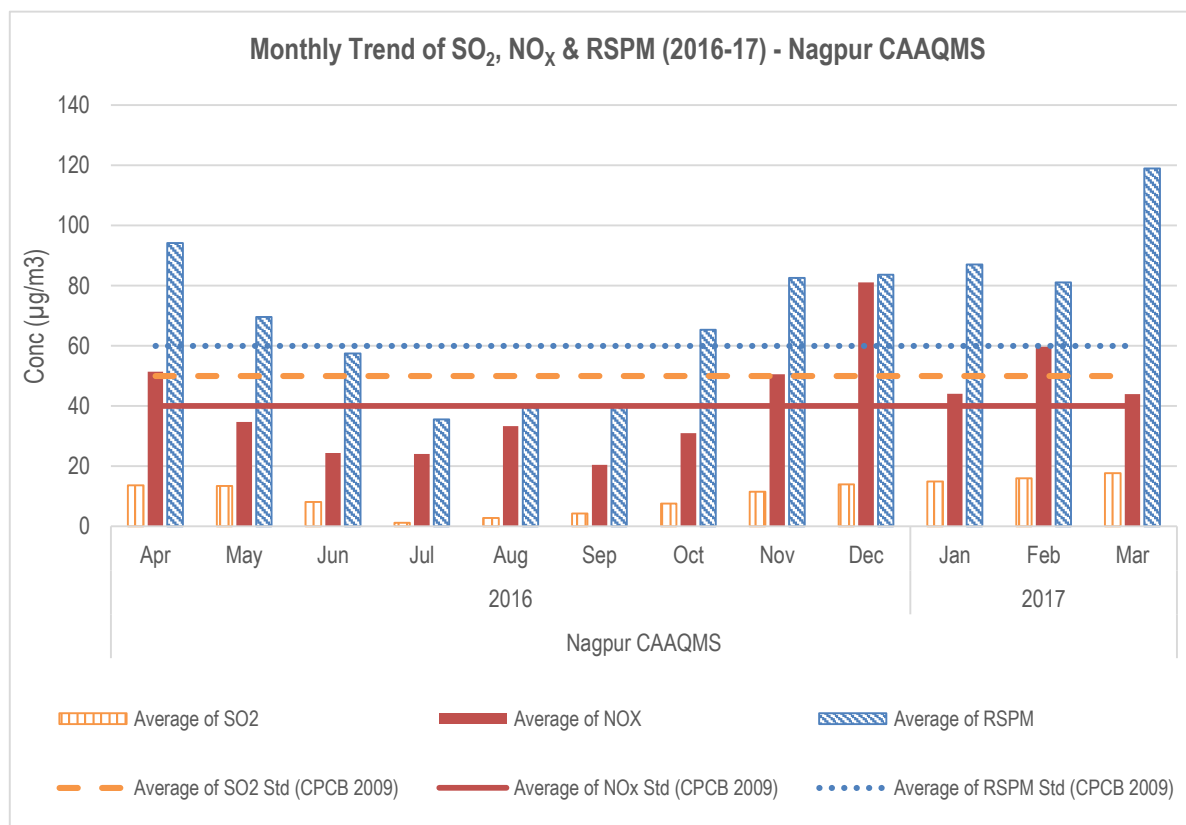


Figure No. 106: Monthly average reading recorded at Nagpur CAAQMS

Table No. 124: Data for Annual average trend of SO₂, NO_x, and RSPM at Nagpur CAAQMS

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Nagpur CAAQMS	14-16			
	15-16			
	16-17*	10.45	41.61	71.06

*The station is installed in the current year 2016-17

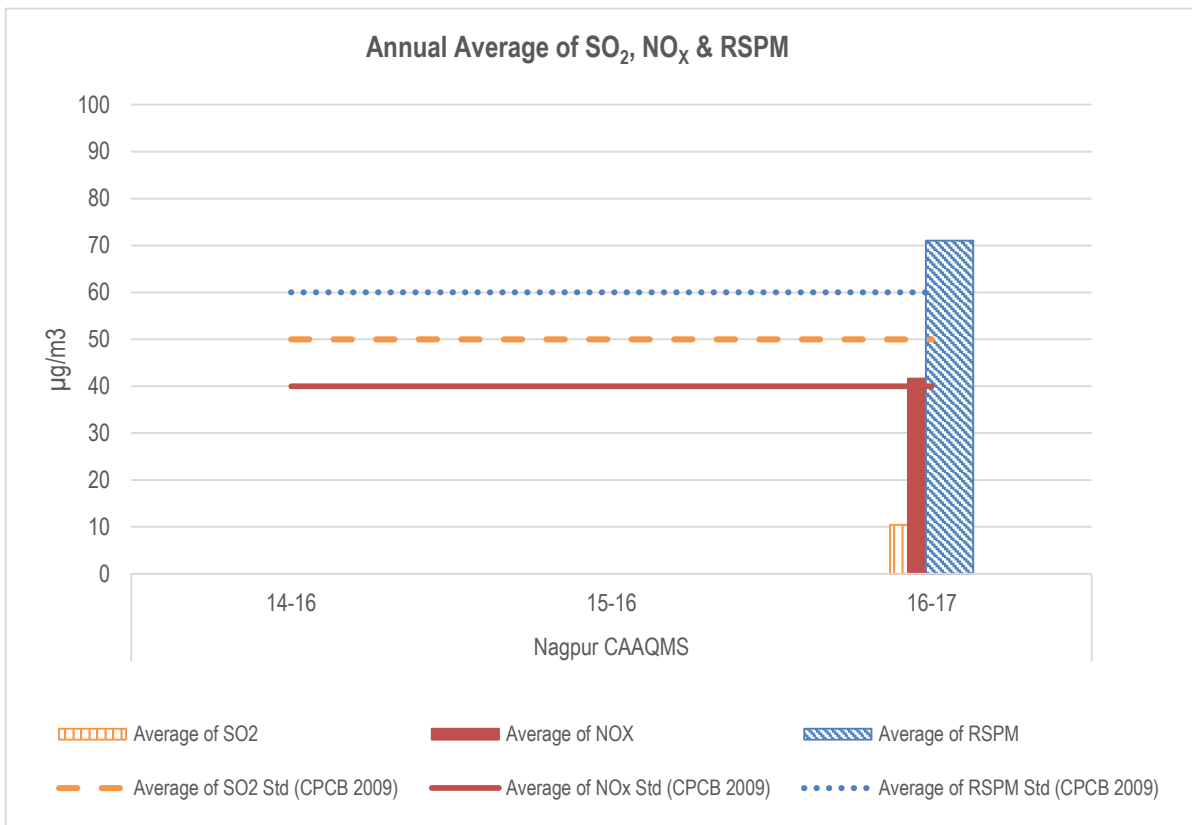
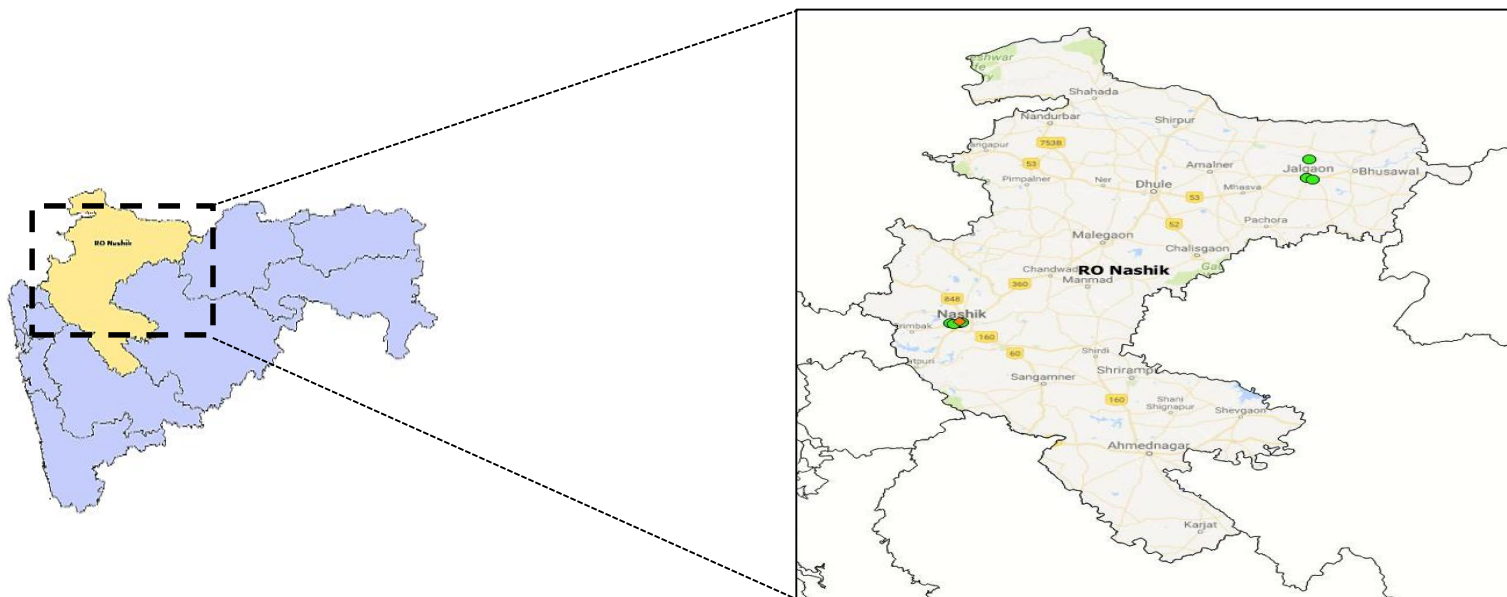


Figure No. 107: Annual average trend of SO₂, NO_x, and RSPM at Nagpur CAAQMS

Table No. 125: Percentage exceedance of pollutants at Nagpur RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
IOE North Ambazari road	104	0	0	27	0	0	26
MIDC Office, Hingna Road	104	0	0	49	0	0	47
Govt Polytechnic Col, Sadar	108	0	0	36	0	0	33
Civil lines Nagpur	286	0	0	35	0	0	12
Nagpur CAAQMS	365	0	34	37	0	9	10

RO - Nashik



Region	Station code	Station name	Program	Latitude	Longitude
Jalgaon	644	Old B. J. Market	NAMP	21° 07' 37.00"N	75 34' 0.79" E
Jalgaon	645	Girna Water Tank	NAMP	20°59'50.6"N	75° 33' 04.99"E
Jalgaon	646	MIDC Jalgaon	NAMP	20° 59' 20.2"N	75° 35'4.96"E
Nashik	259	RTO Colony	NAMP	19° 59' 49.038"N	73° 46'35.58"E
Nashik	269	MIDC Satpur - VIP	NAMP	19° 59' 54.37"N	73° 43'41.07"E
Nashik	280	NMC Nashik	NAMP	20° 0' 10.53"N	73° 47'20.22"E
Nashik	710	SRO Office Nashik	NAMP	19° 59' 33.20"N	73° 45'0.75"E
Nashik		Nashik CAAQMS	CAAQMS	20° 00'26.51"N	73° 46' 42.56"E

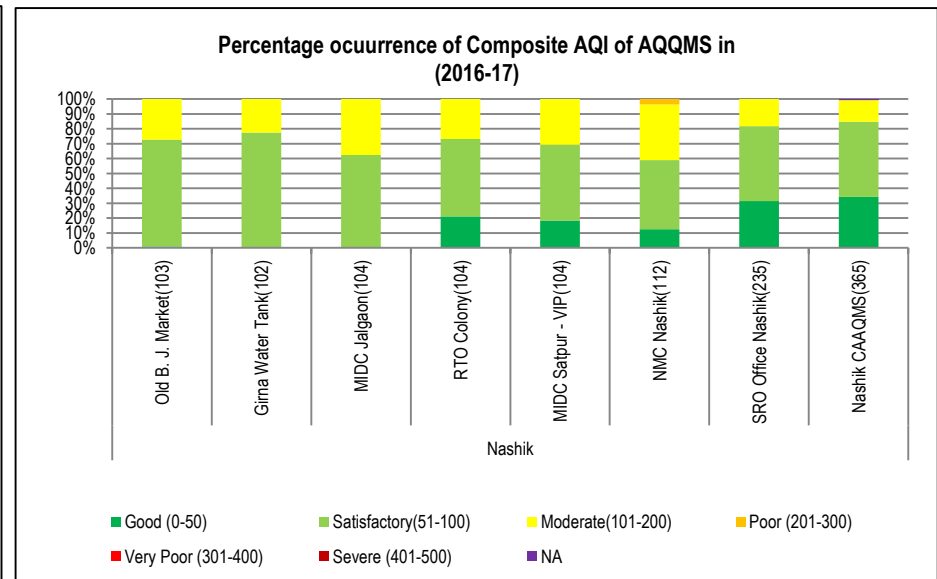
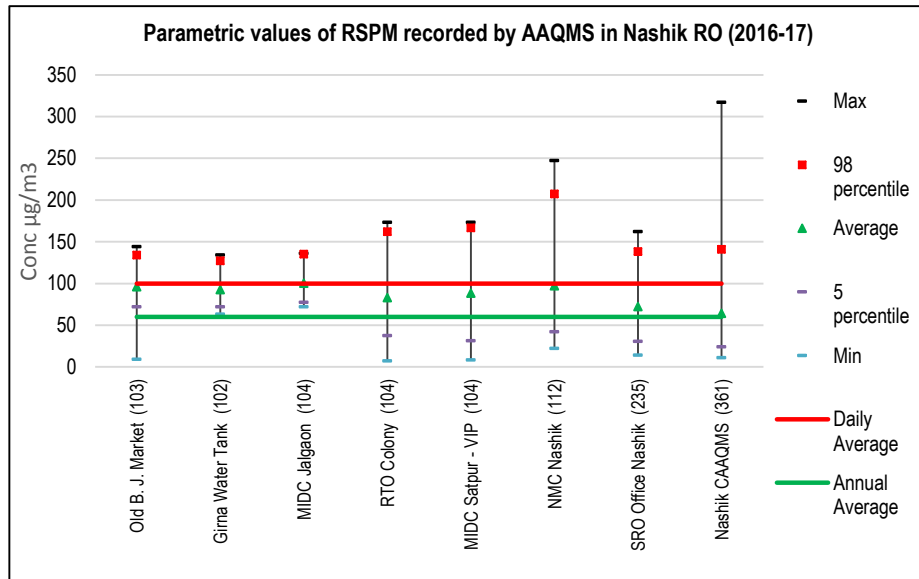
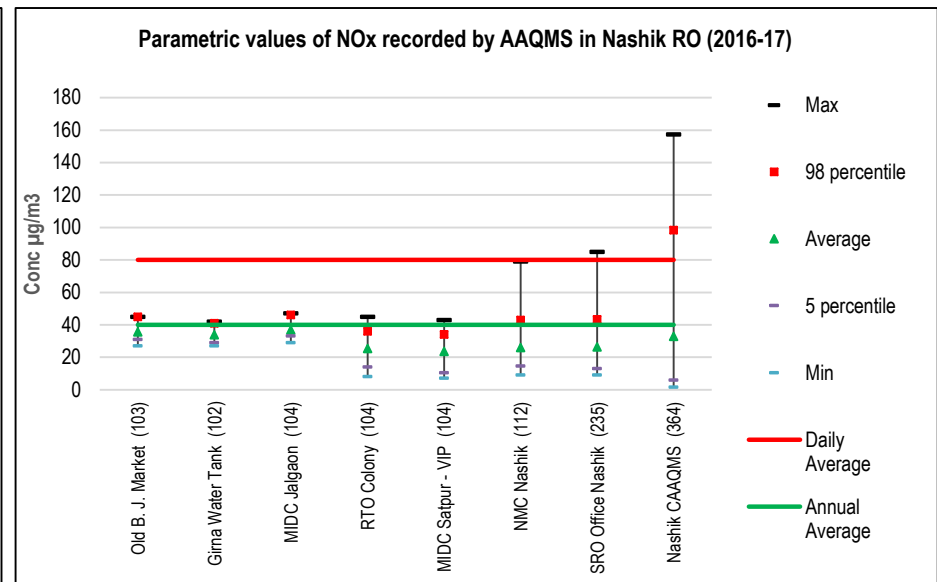
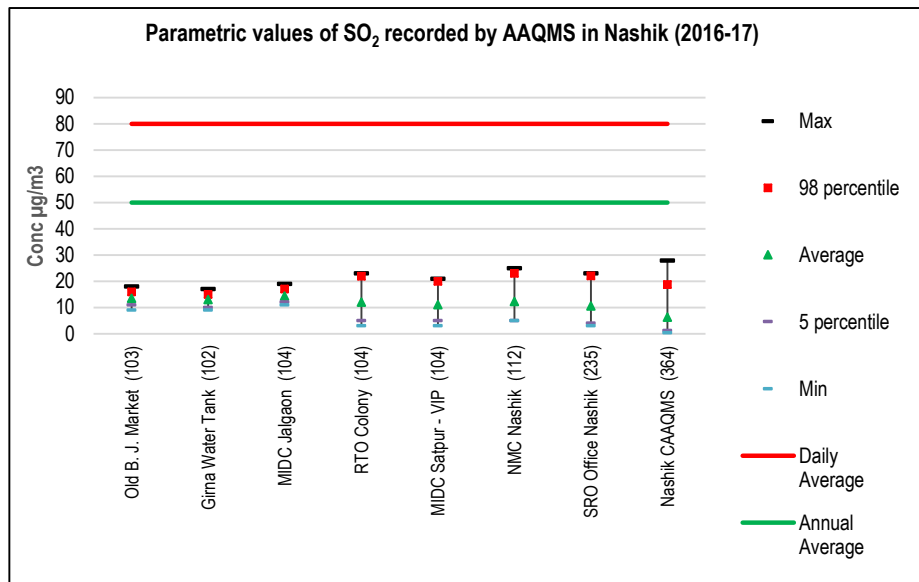


Table No. 126: Data for SO₂, NO_x & RSPM recorded at AAQMS in Nashik RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	<i>80</i>		<i>50</i>	<i>80</i>	
	Old B. J. Market (103)	18	16	14	11	9
	Girna Water Tank (102)	17	15	13	10	9
	MIDC Jalgaon (104)	19	17	14	12	11
	RTO Colony (104)	23	22	12	5	3
	MIDC Satpur - VIP (104)	21	20	11	5	3
	NMC Nashik (112)	25	23	12	5	5
	SRO Office Nashik (235)	23	22	11	4	3
	Nashik CAAQMS (364)	28	19	6	1	0
NO _x	<i>CPCB Standard</i>	<i>80</i>		<i>40</i>	<i>80</i>	
	Old B. J. Market (103)	45	45	36	31	27
	Girna Water Tank (102)	42	41	34	29	27
	MIDC Jalgaon (104)	47	46	37	33	29
	RTO Colony (104)	45	36	25	14	8
	MIDC Satpur - VIP (104)	43	34	24	10	7
	NMC Nashik (112)	79	43	26	15	9
	SRO Office Nashik (235)	85	43	26	13	9
	Nashik CAAQMS (364)	157	98	33	6	1
RSPM (PM ₁₀)	<i>CPCB Standard</i>	<i>100</i>		<i>60</i>	<i>100</i>	
	Old B. J. Market (103)	144	134	96	72	9
	Girna Water Tank (102)	134	127	92	72	63
	MIDC Jalgaon (104)	136	135	100	77	72
	RTO Colony (104)	173	162	83	37	7
	MIDC Satpur - VIP (104)	173	167	88	31	8
	NMC Nashik (112)	247	207	97	42	22
	SRO Office Nashik (235)	162	138	72	30	14
	Nashik CAAQMS (361)	317	141	64	24	11

Jalgaon - Old B. J. Market

Table No. 127: Data for Monthly average reading recorded at Old B. J. Market

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Old B. J. Market	2016	Apr	14	43	124
		May	14	42	121
		Jun	13	36	104
		Jul	12	33	75
		Aug	11	32	86
		Sep	13	33	79
		Oct	13	34	94
		Nov	14	35	94
		Dec	14	34	89
	2017	Jan	14	36	91
		Feb	15	35	96
		Mar	15	35	90

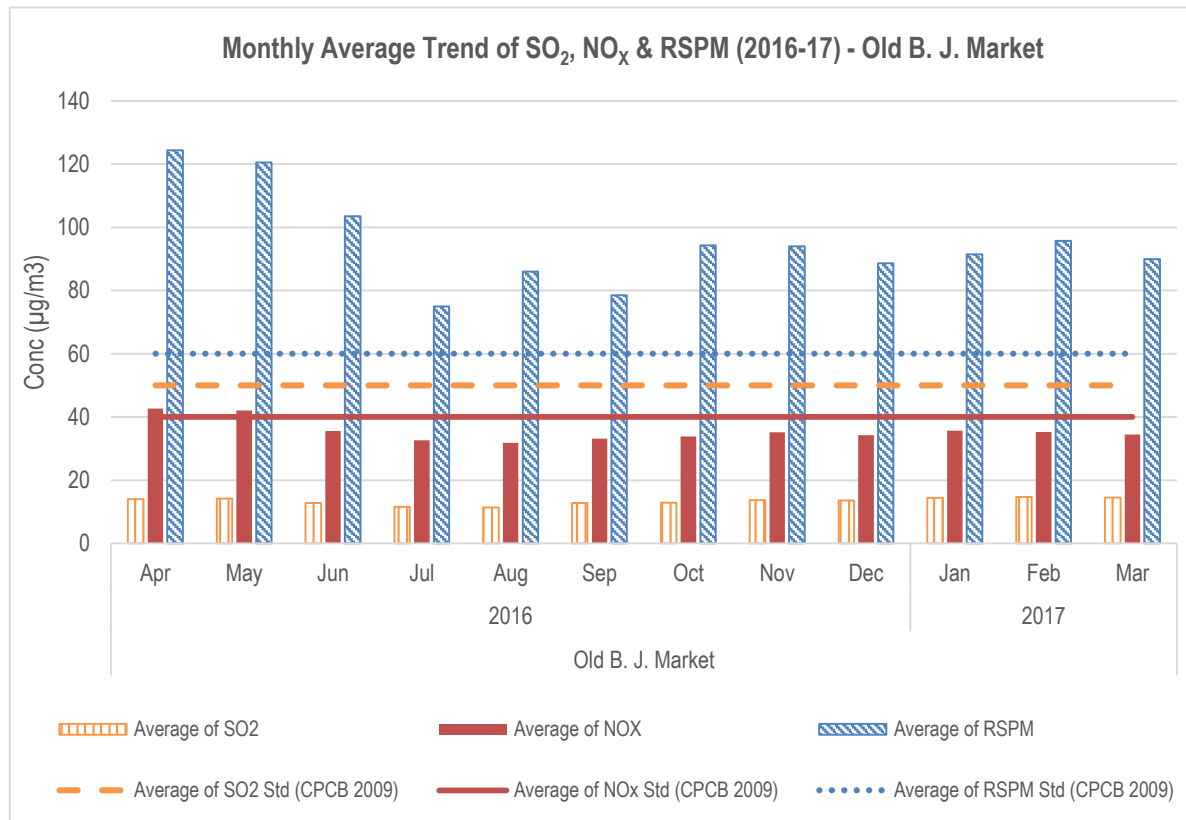


Figure No. 108: Monthly average reading recorded at Old B. J. Market

Table No. 128: Data for Annual average trend of SO₂, NO_x, and RSPM at Old B. J. Market

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Old B. J. Market	08-09	14	48	117
	09-10	15	45	109
	10-11	18	45	122
	11-12	16	43	111
	12-13	18	44	123
	13-14	19	41	118
	14-15	18	42	111
	15-16	14	38	108
	16-17	14	36	96

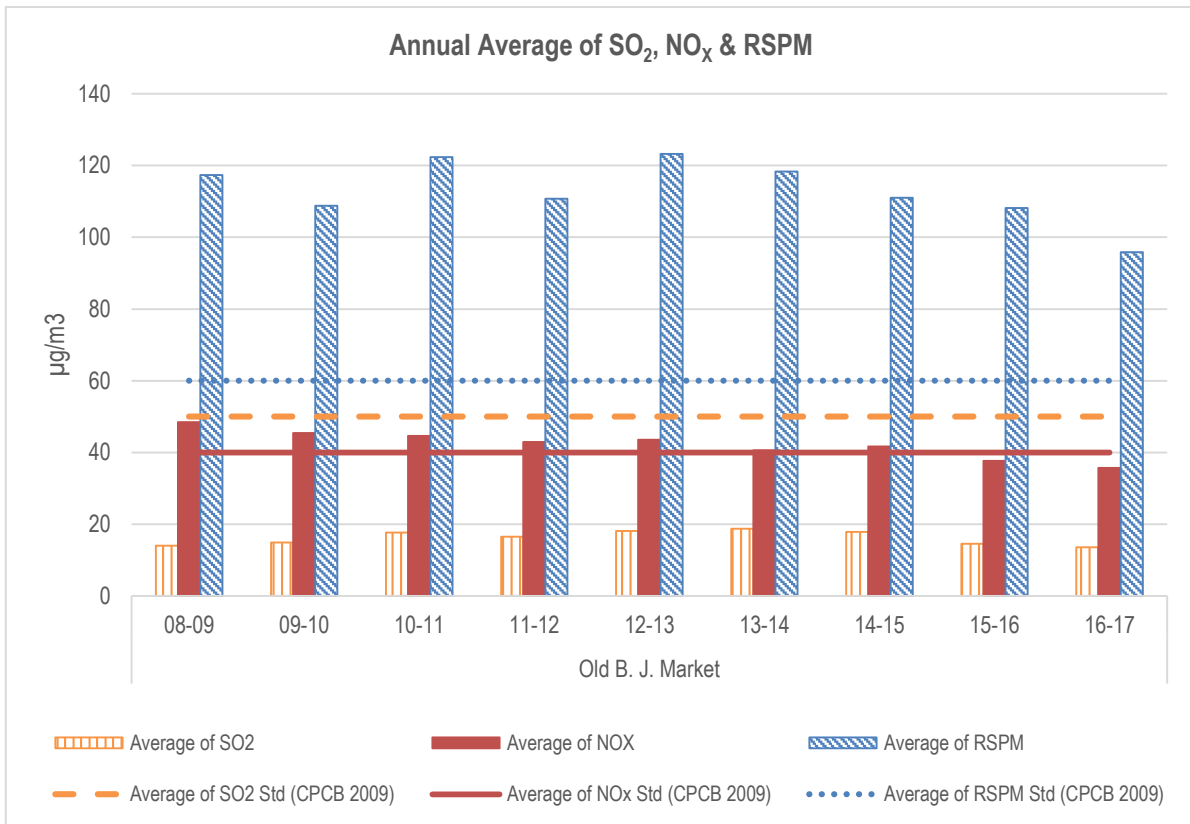


Figure No. 109: Annual average trend of SO₂, NO_x, and RSPM at Old B. J. Market

Jalgaon - Girna Water Tank

Table No. 129: Data for Monthly average reading recorded at Girna Water Tank

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM	
			50	40	60	
Girna Water Tank	2016	Apr	14	38	113	
		May	14	40	115	
		Jun	12	35	99	
		Jul	12	31	82	
		Aug	11	30	78	
		Sep	12	30	75	
		Oct	13	33	92	
		Nov	13	34	92	
		Dec	14	32	90	
		2017	Jan	14	35	90
			Feb	14	35	93
			Mar	14	34	88

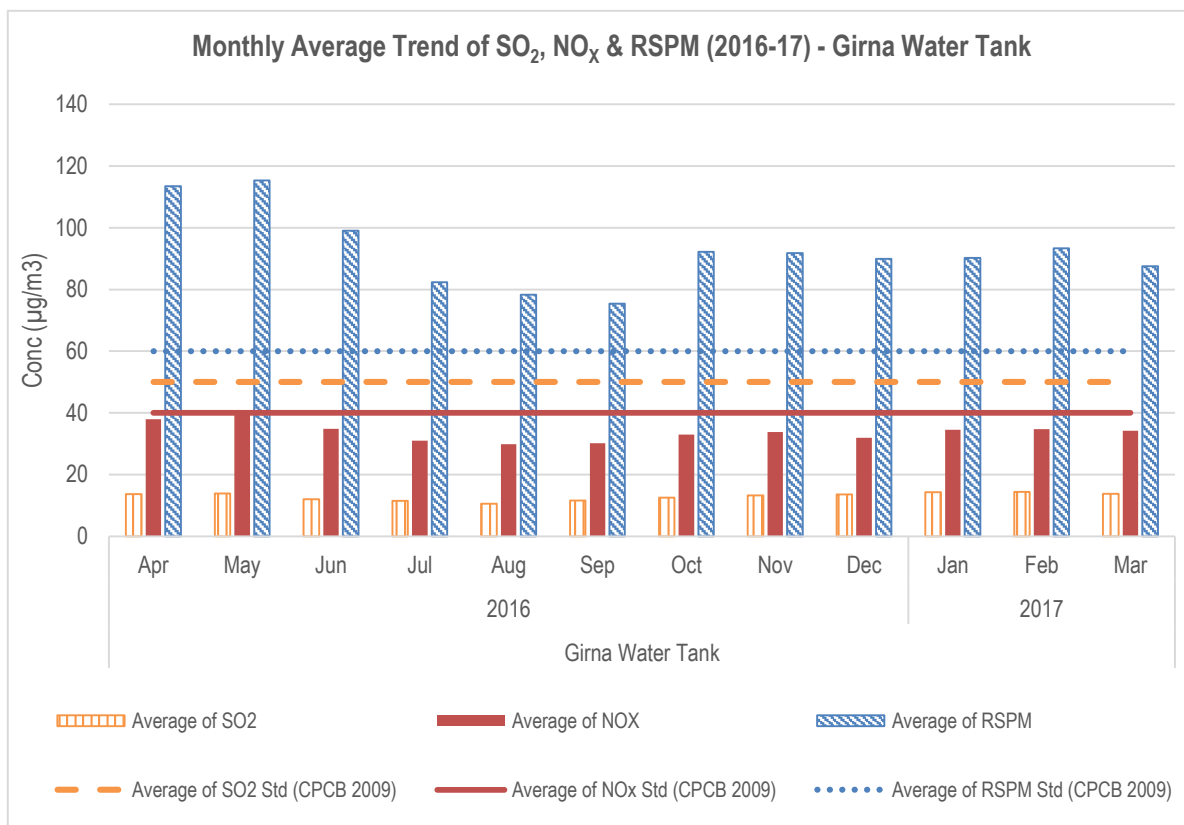


Figure No. 110: Monthly average reading recorded at Girna Water Tank

Table No. 130: Data for Annual average trend of SO₂, NO_x, and RSPM at Girna Water Tank

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Girna Water Tank	08-09	11	40	102
	09-10	13	43	110
	10-11	16	42	122
	11-12	13	38	116
	12-13	16	40	124
	13-14	17	37	116
	14-15	16	39	112
	15-16	13	33	103
	16-17	13	34	92

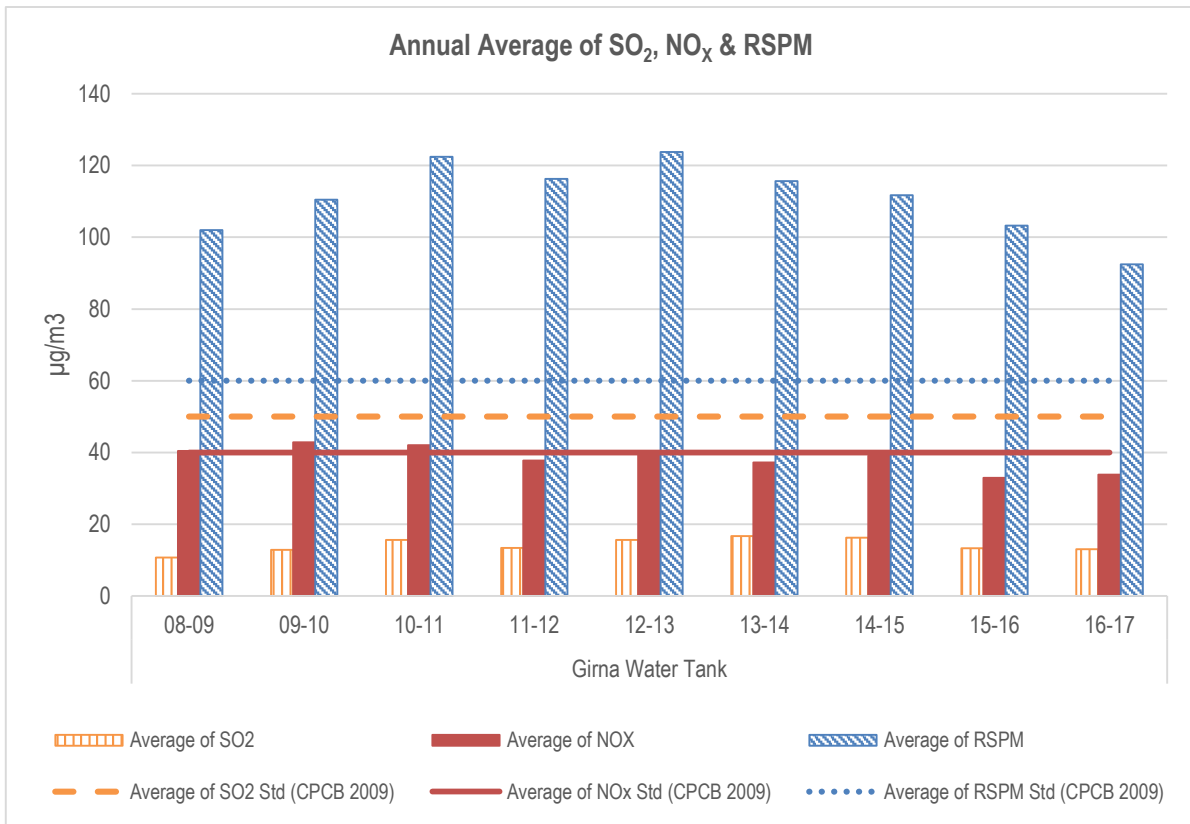


Figure No. 111: Annual average trend of SO₂, NO_x, and RSPM at Girna Water Tank

Jalgaon - MIDC Jalgaon

Table No. 131: Data for Monthly average reading recorded at MIDC Jalgaon

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
MIDC Jalgaon	2016	Apr	15	42	121
		May	16	44	125
		Jun	13	37	104
		Jul	13	35	96
		Aug	13	33	90
		Sep	13	34	81
		Oct	14	35	97
		Nov	15	36	102
		Dec	15	37	94
	2017	Jan	15	37	97
		Feb	15	37	101
		Mar	15	36	94

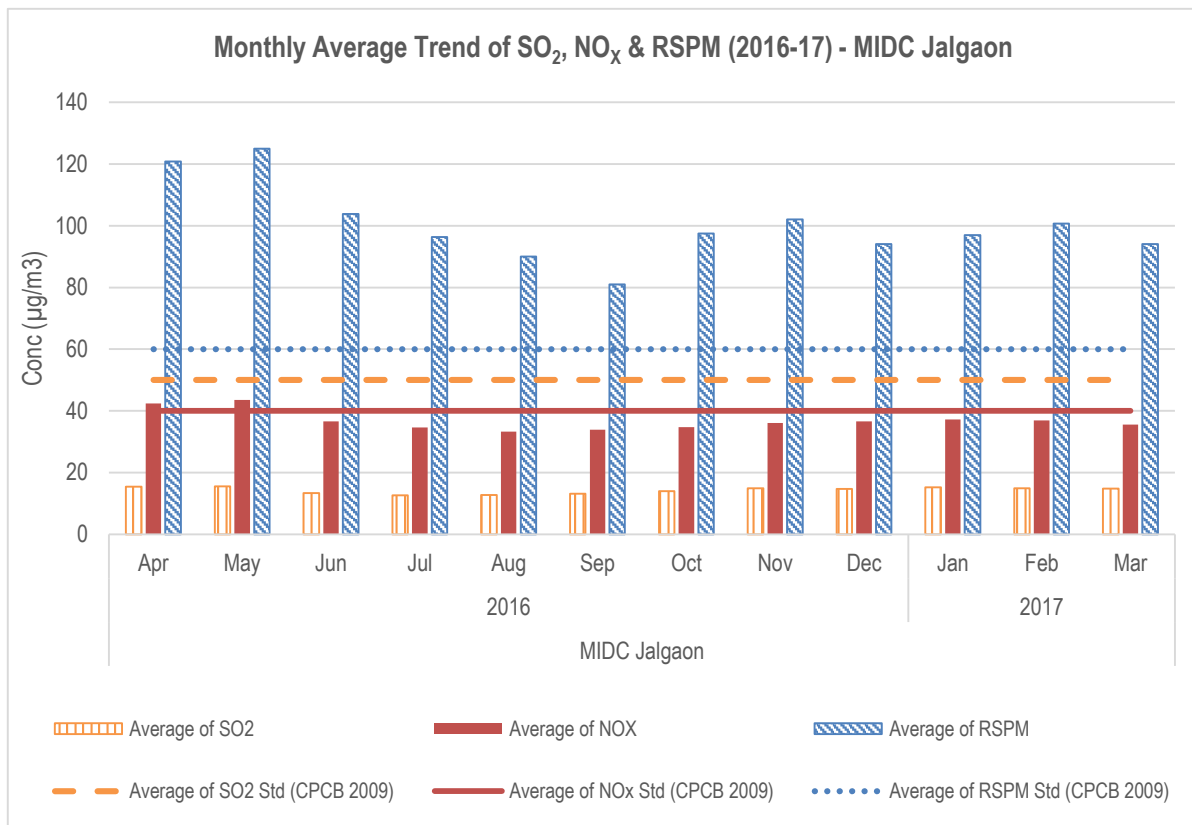
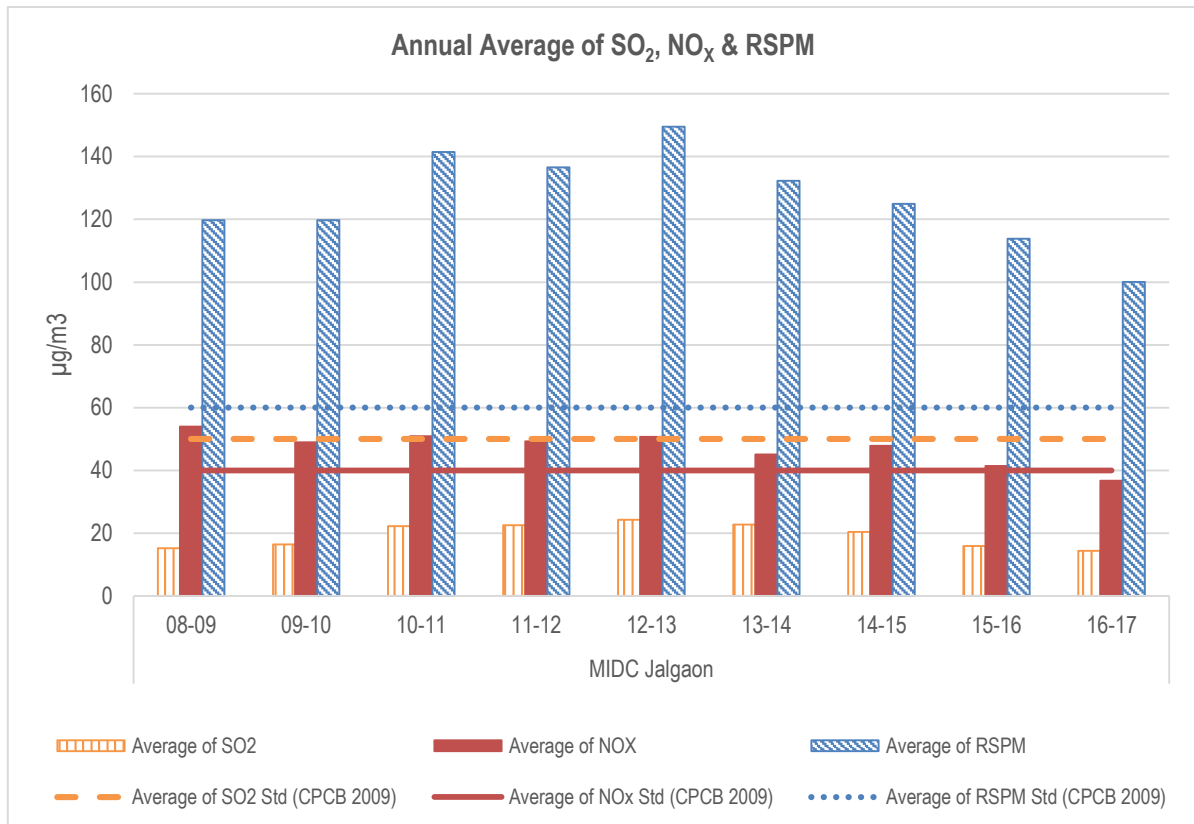


Figure No. 112: Monthly average reading recorded at MIDC Jalgaon

Table No. 132: Data for Annual average trend of SO₂, NO_x, and RSPM at MIDC Jalgaon

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
MIDC Jalgaon	08-09	15	54	120
	09-10	16	49	120
	10-11	22	51	142
	11-12	22	49	137
	12-13	24	51	150
	13-14	23	45	132
	14-15	20	48	125
	15-16	16	41	114
	16-17	14	37	100

Figure No. 113: Annual average trend of SO₂, NO_x, and RSPM at MIDC Jalgaon

Nashik - RTO Colony

Table No. 133: Data for Monthly average reading recorded at RTO Colony

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
RTO Colony	2016	Apr	15	24	84
		May	9	31	61
		Jun	8	20	72
		Jul	10	14	55
		Aug	7	21	49
		Sep	6	22	65
		Oct	8	26	55
		Nov	11	32	88
		Dec	13	28	148
	2017	Jan	17	28	102
		Feb	19	29	94
		Mar	20	29	115

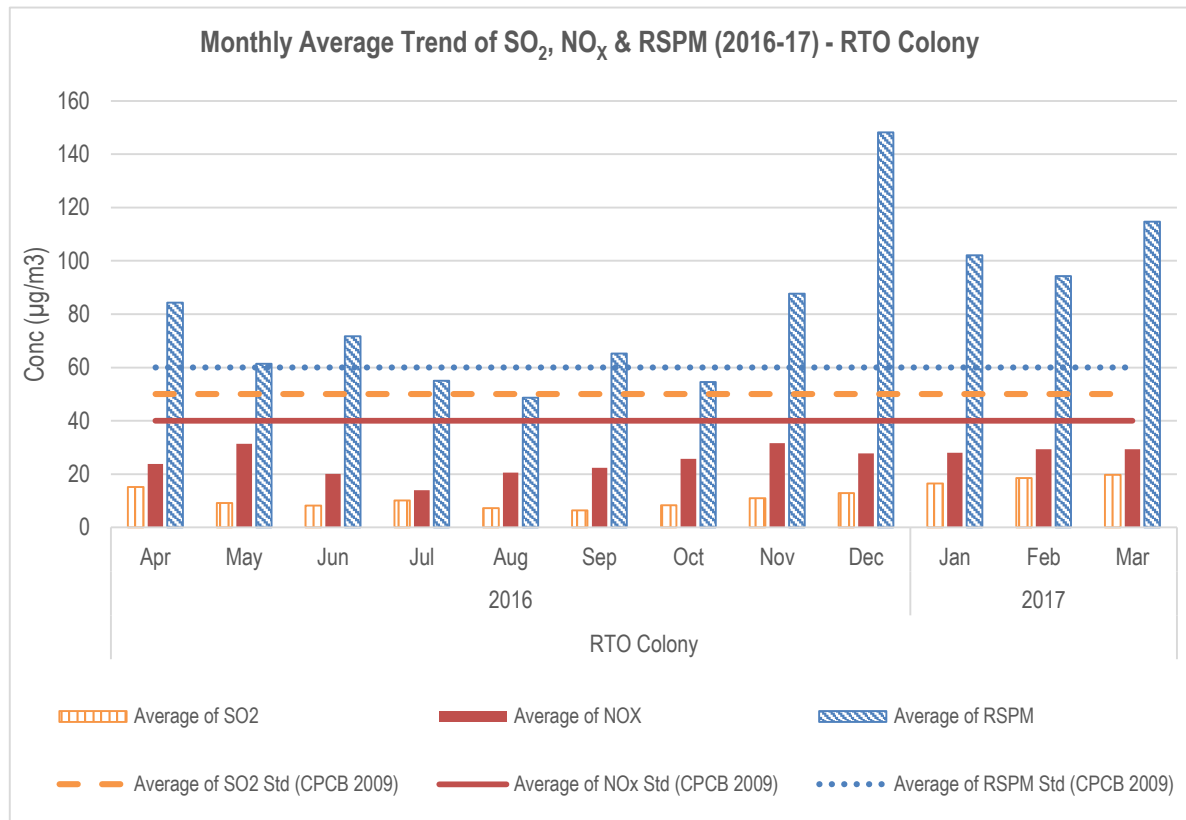


Figure No. 114: Monthly average reading recorded at RTO Colony

Table No. 134: Data for Annual average trend of SO₂, NO_x, and RSPM at RTO Colony

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
RTO Colony	04-05	33	25	79
	05-06	29	25	92
	06-07	32	26	51
	07-08	34	27	42
	08-09	26	25	88
	09-10	21	29	81
	10-11	21	23	75
	11-12	24	28	98
	12-13	25	27	90
	13-14	28	28	71
	14-15	24	26	77
	15-16	14	23	73
	16-17	12	25	83

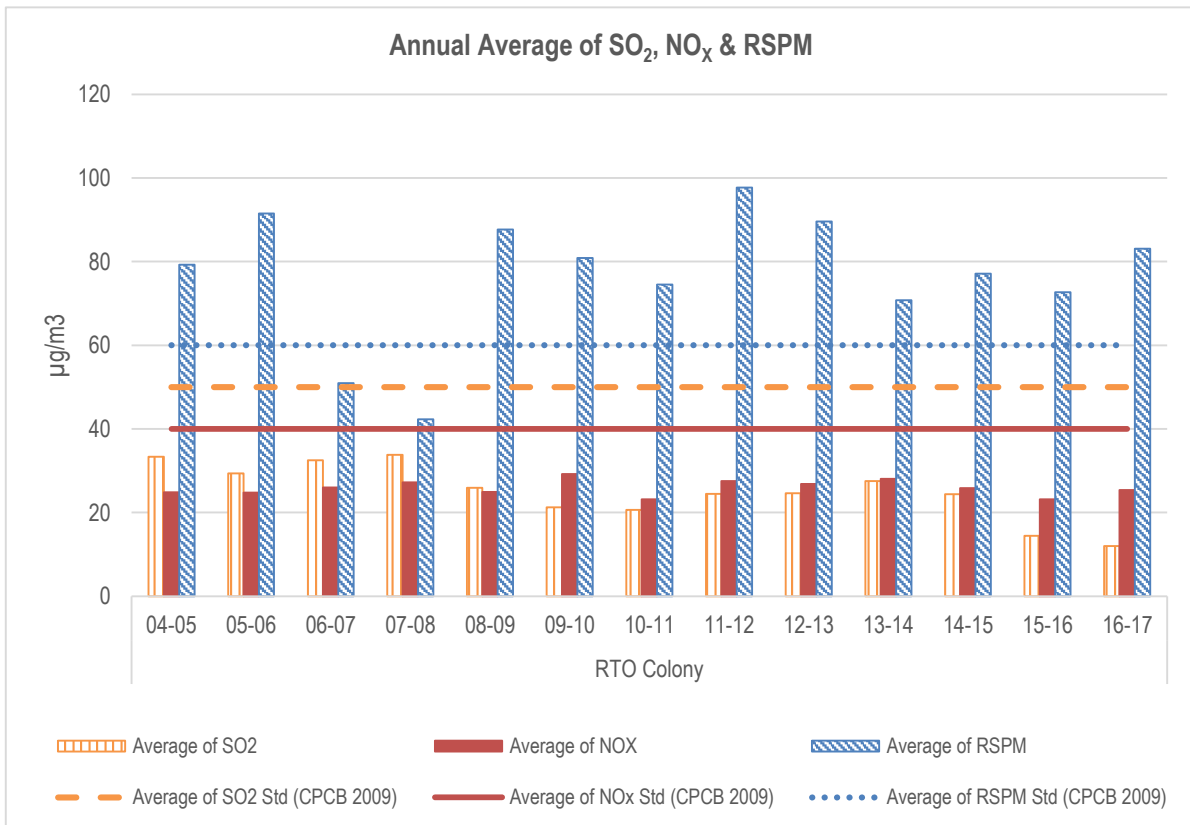


Figure No. 115: Annual average trend of SO₂, NO_x, and RSPM at RTO Colony

Nashik - MIDC Satpur - VIP

Table No. 135: Data for Monthly average reading recorded at MIDC Satpur - VIP

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
MIDC Satpur - VIP	2016	Apr	14	23	105
		May	9	30	88
		Jun	8	20	83
		Jul	8	11	36
		Aug	6	19	53
		Sep	7	22	65
		Oct	10	29	61
		Nov	10	29	103
		Dec	12	24	148
	2017	Jan	15	25	104
		Feb	17	26	97
		Mar	17	26	116

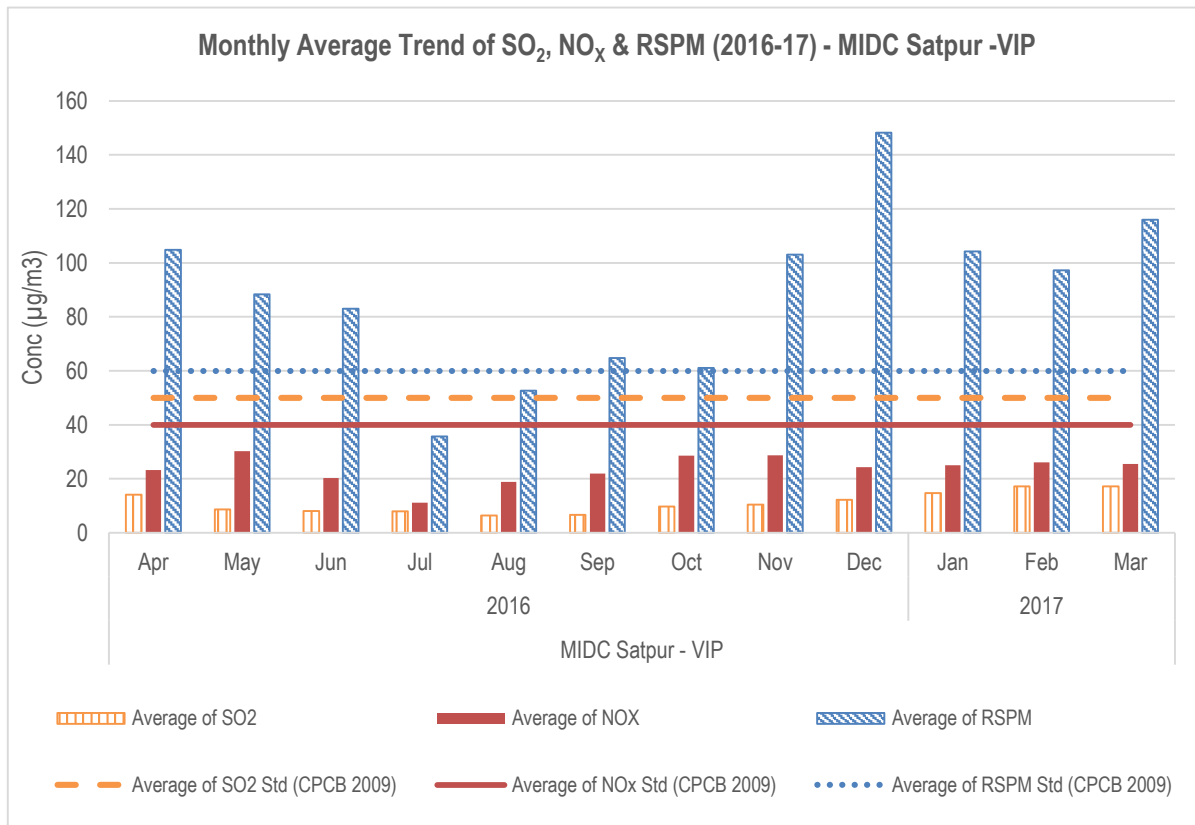


Figure No. 116: Monthly average reading recorded at MIDC Satpur - VIP

Table No. 136: Data for Annual average trend of SO₂, NO_x, and RSPM at MIDC Satpur - VIP

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
MIDC Satpur - VIP	04-05	36	27	90
	05-06	33	28	98
	06-07	34	28	58
	07-08	41	34	52
	08-09	30	27	91
	09-10	23	29	85
	10-11	23	25	70
	11-12	25	28	98
	12-13	25	27	92
	13-14	27	28	71
	14-15	25	26	80
	15-16	14	22	78
	16-17	11	24	88

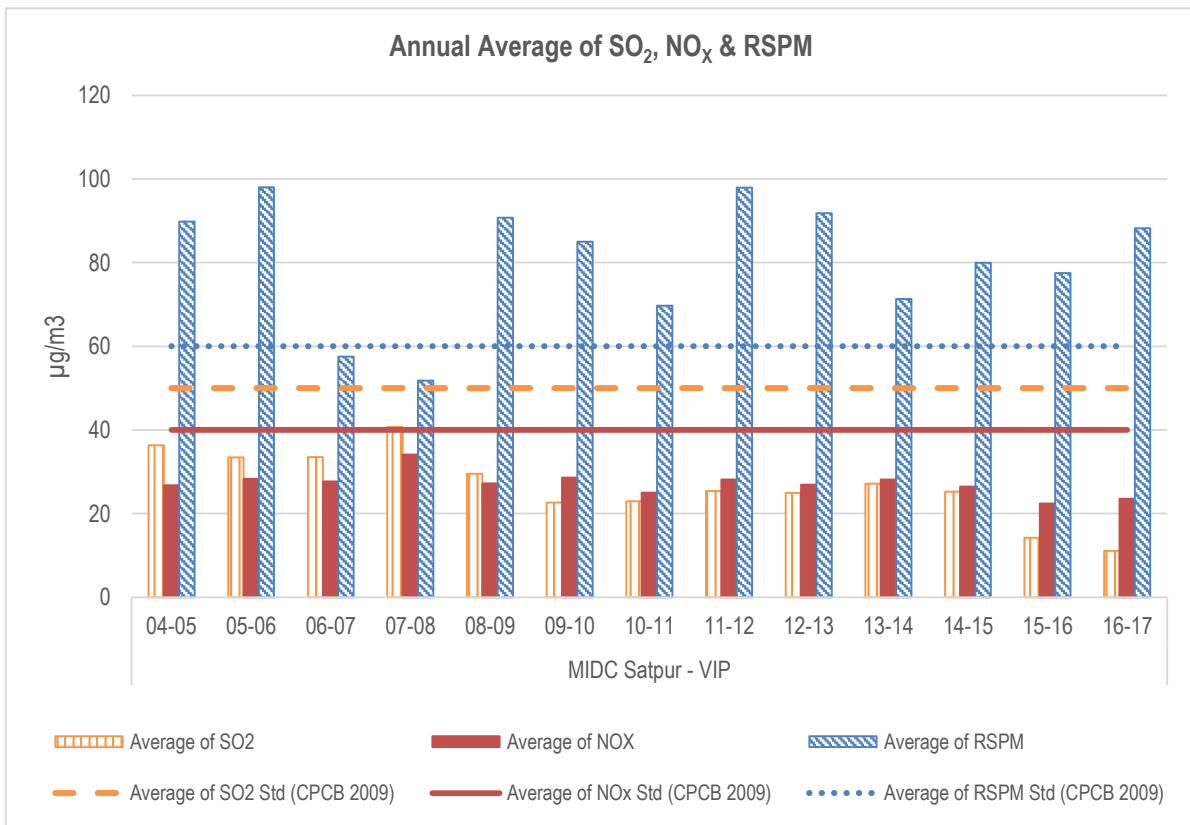


Figure No. 117: Annual average trend of SO₂, NO_x, and RSPM at MIDC Satpur - VIP

Nashik - NMC Nashik

Table No. 137: Data for Monthly average reading recorded at NMC Nashik

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
NMC Nashik	2016	Apr	15	23	102
		May	9	32	76
		Jun	8	25	96
		Jul	12	16	57
		Aug	7	18	56
		Sep	6	21	71
		Oct	8	33	82
		Nov	11	33	134
		Dec	13	26	151
	2017	Jan	17	28	115
		Feb	21	25	113
		Mar	19	29	120

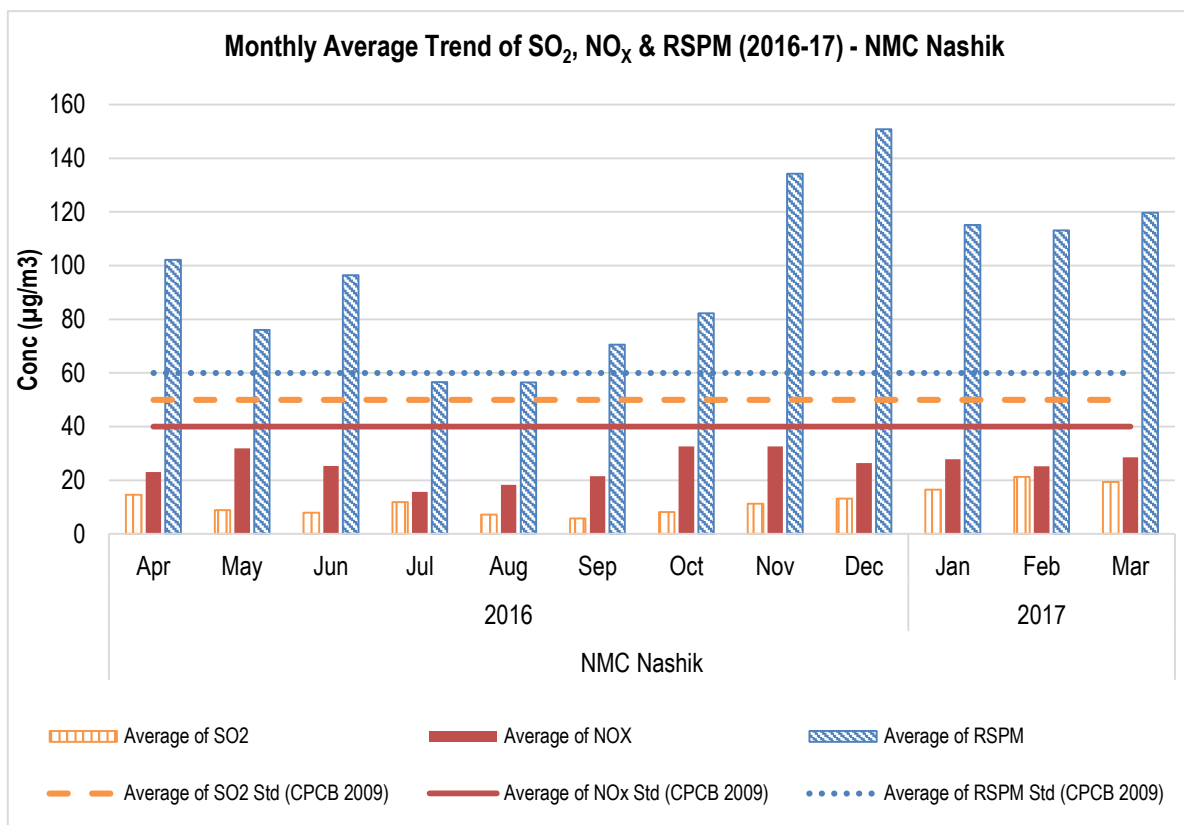


Figure No. 118: Monthly average reading recorded at NMC Nashik

Table No. 138: Data for Annual average trend of SO₂, NO_x, and RSPM at NMC Nashik

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
NMC Nashik	13-14	28	28	70
	14-15	25	26	78
	15-16	15	24	94
	16-17	12	26	97

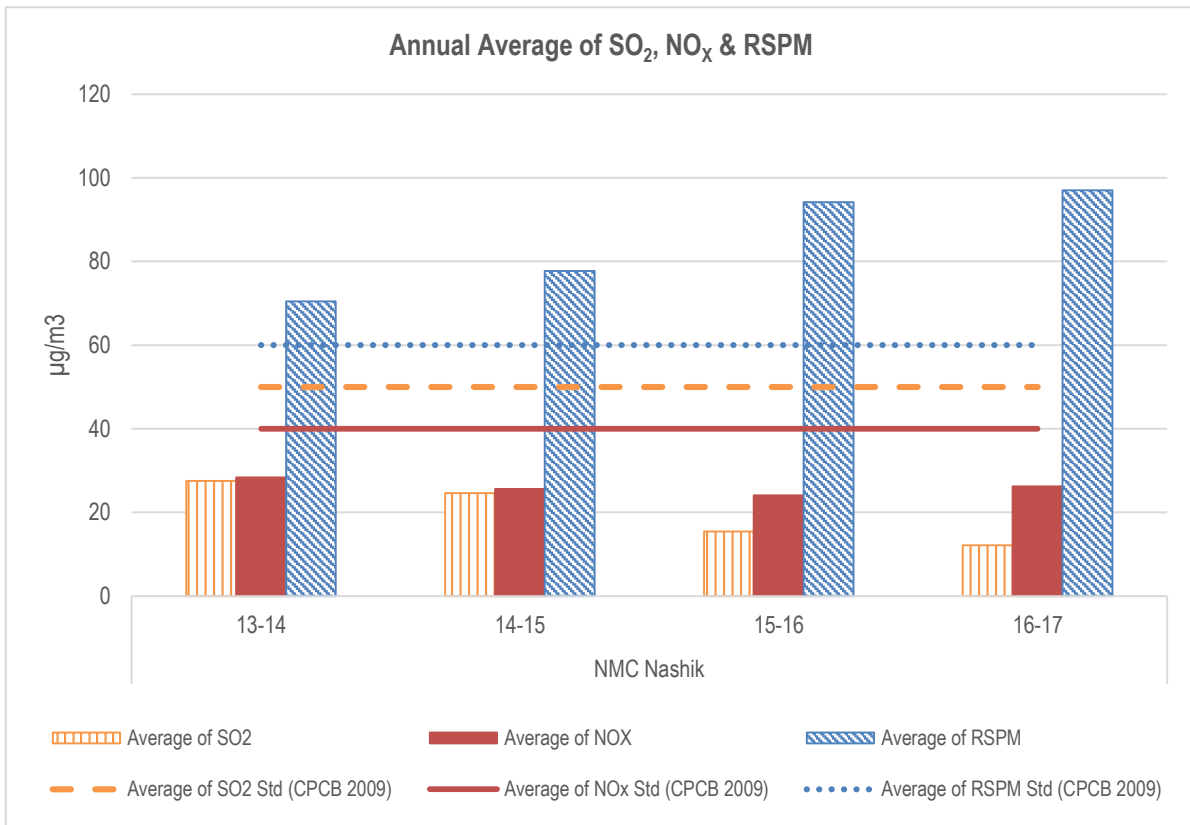


Figure No. 119: Annual average trend of SO₂, NO_x, and RSPM at NMC Nashik

Nashik - SRO Office Nashik

Table No. 139: Data for Monthly average reading recorded a SRO Office Nashik

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
SRO Office Nashik	2016	Apr	14	24	83
		May	9	37	89
		Jun	9	34	93
		Jul	8	16	36
		Aug	6	16	106
		Sep	6	20	50
		Oct	10	34	50
		Nov	10	30	48
	2017	Jan	19	23	82
		Feb	20	28	94
		Mar	19	29	94

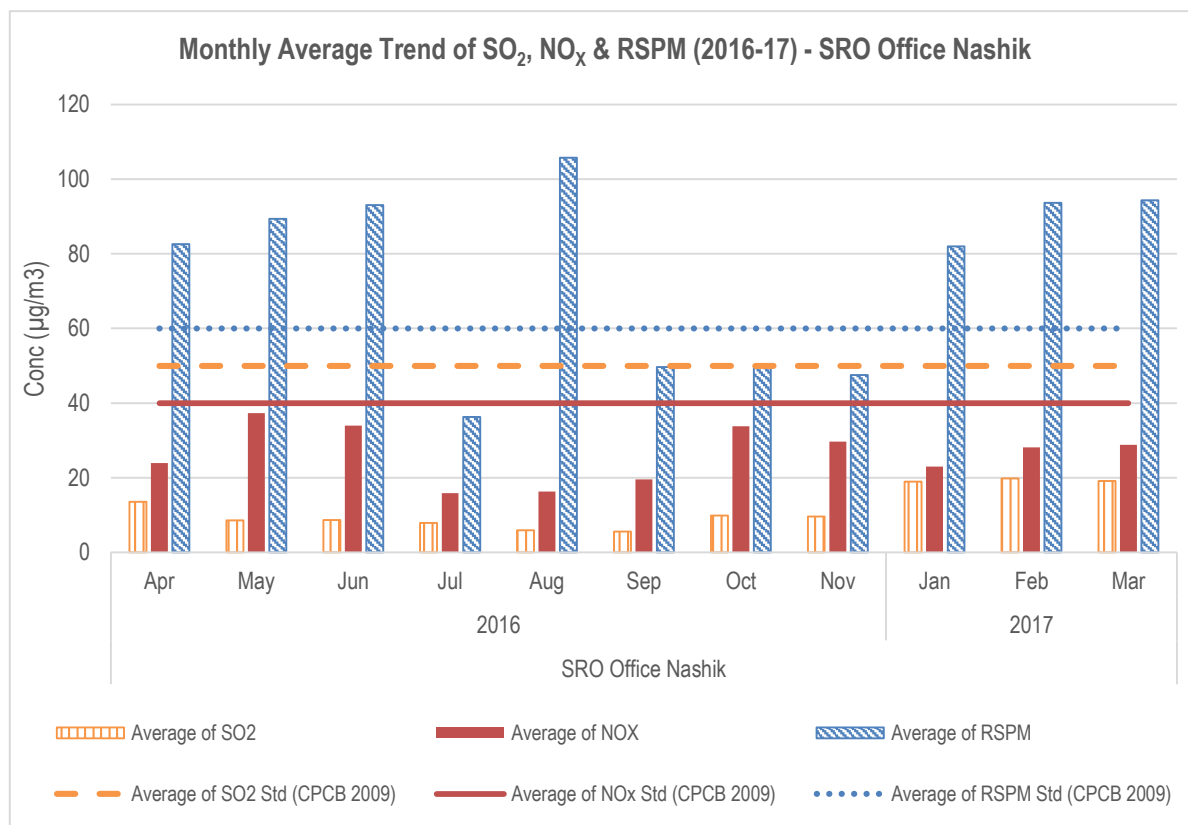


Figure No. 120: Monthly average reading recorded at SRO Office Nashik

Table No. 140: Data for Annual average trend of SO₂, NO_x, and RSPM at SRO Office Nashik

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
SRO Office Nashik	04-05	19	31	69
	05-06	14	27	78
	06-07	16	27	102
	07-08	17	26	114
	08-09	23	29	104
	09-10	21	27	86
	10-11	20	23	85
	11-12	24	28	114
	12-13	24	27	90
	13-14	28	28	78
	14-15	26	26	73
	15-16	15	24	76
	16-17	11	26	72

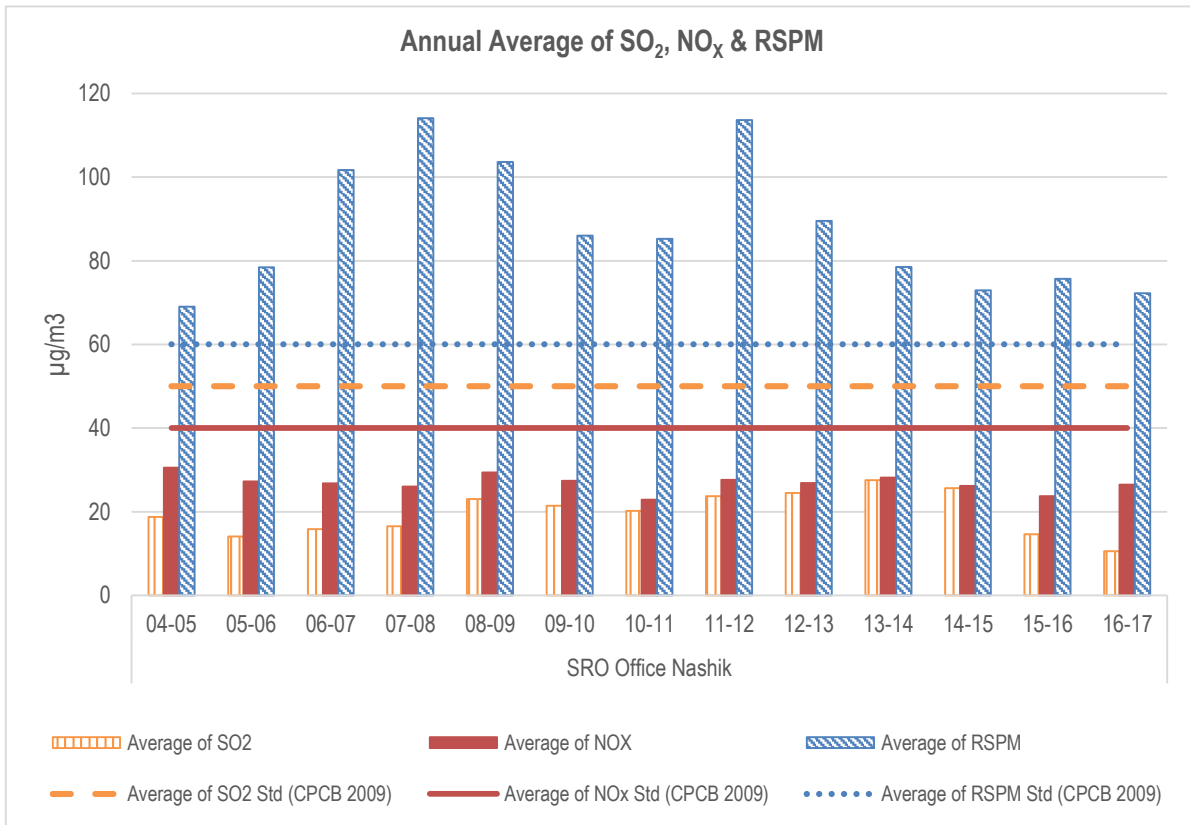


Figure No. 121: Annual average trend of SO₂, NO_x, and RSPM at SRO Office Nashik

Nashik - Nashik CAAQMS

Table No. 141: Data for Monthly average reading recorded at Nashik CAAQMS

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Nashik CAAQMS	2016	Apr	7	13	115
		May	3	10	72
		Jun	3	9	51
		Jul	2	24	29
		Aug	1	15	33
		Sep	1	16	34
		Oct	4	26	65
		Nov	12	66	79
		Dec	14	74	72
	2017	Jan	9	61	72
		Feb	10	50	70
		Mar	9	30	75

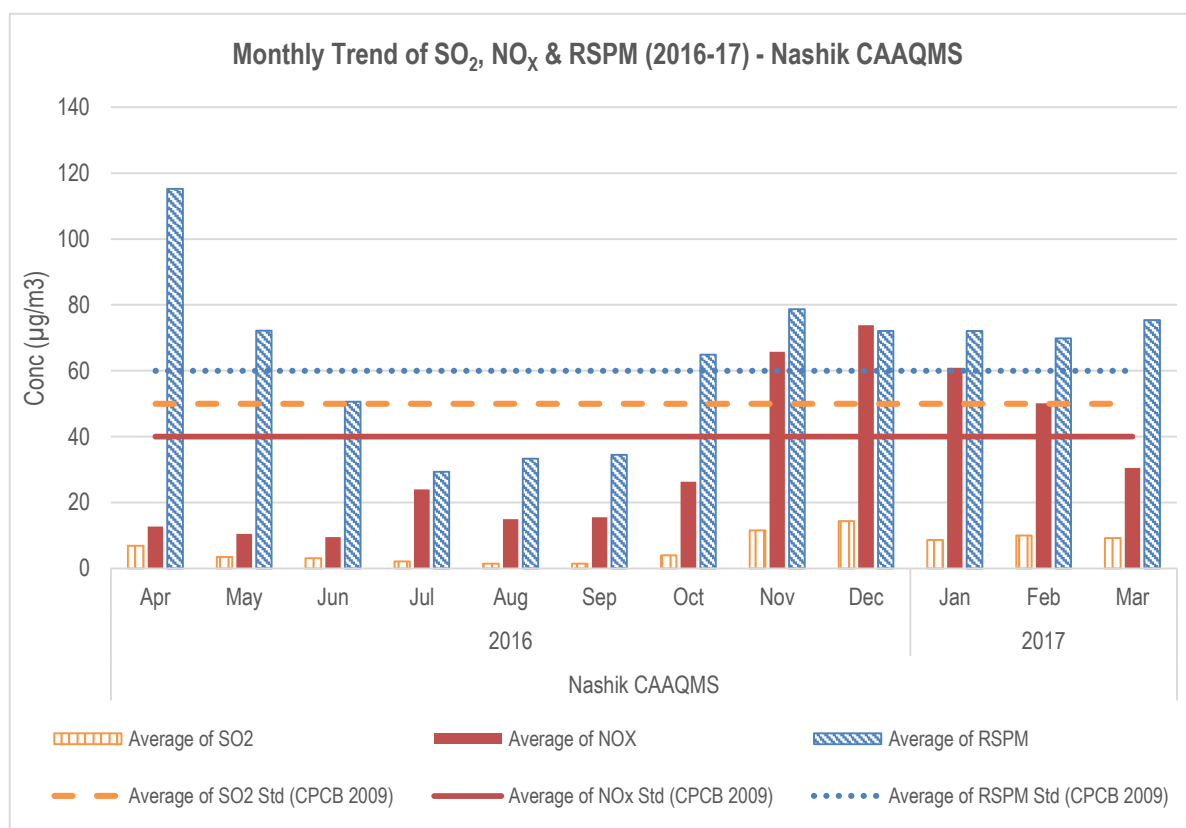


Figure No. 122: Monthly average reading recorded at Nashik CAAQMS

Table No. 142: Data for Annual average trend of SO₂, NO_x, and RSPM at Nashik CAAQMS

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Nashik CAAQMS	14-16			
	15-16			
	16-17*	6.34	32.83	63.86

*The station is installed in current year 2016-17

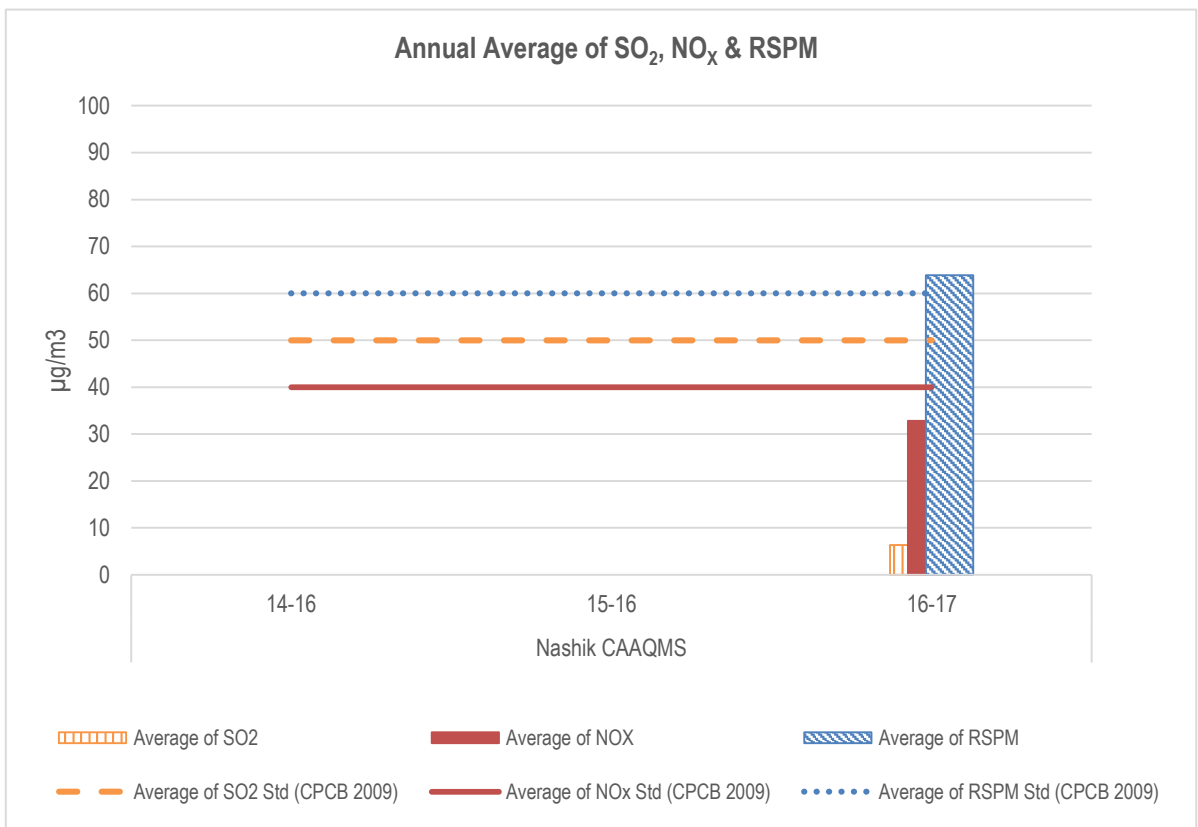
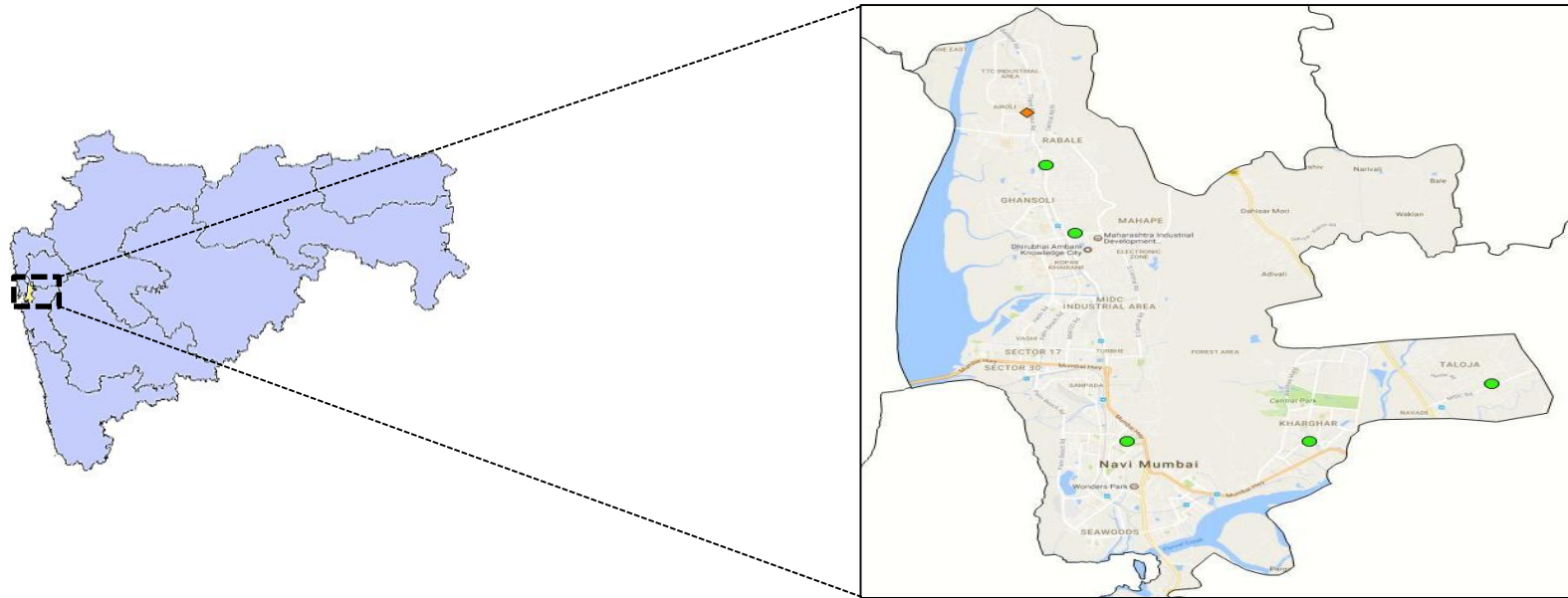


Figure No. 123: Annual average trend of SO₂, NO_x, and RSPM at Nashik CAAQMS

Table No. 143: Percentage exceedance of pollutants at Nashik RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Old B. J. Market	103	0	0	28	0	0	27
Girna Water Tank	102	0	0	23	0	0	23
MIDC Jalgaon	104	0	0	39	0	0	38
RTO Colony	104	0	0	28	0	0	27
MIDC Satpur - VIP	104	0	0	32	0	0	31
NMC Nashik	112	0	0	46	0	0	41
SRO Office Nashik	235	0	1	42	0	0	18
Nashik CAAQMS	365	0	29	27	0	8	7

RO – Navi Mumbai



Region	Station code	Station name	Program	Latitude	Longitude
Navi Mumbai	491	Rabale	NAMP	19° 08' 15.2"N	73° 00' 13.1"E
Navi Mumbai	492	Nerul - DY Patil	NAMP	19° 02' 28.2"N	73° 01' 27.1"E
Navi Mumbai	493	Mahape, MPCB-Nirmal Bhavan	NAMP	19° 06' 49.7"N	73° 00' 40.1"E
Navi Mumbai	-	Airoli	CAAQMS	19° 09' 21.5"N	72° 59' 55.8"E
Taloja	494	Kharghar - CIDCO Nodal Office	NAMP	19° 02' 28.3"N	73° 04' 11.2"E
Taloja	496	Taloja - MIDC Building	NAMP	19° 03' 40.1"N	73° 06' 57.1"E

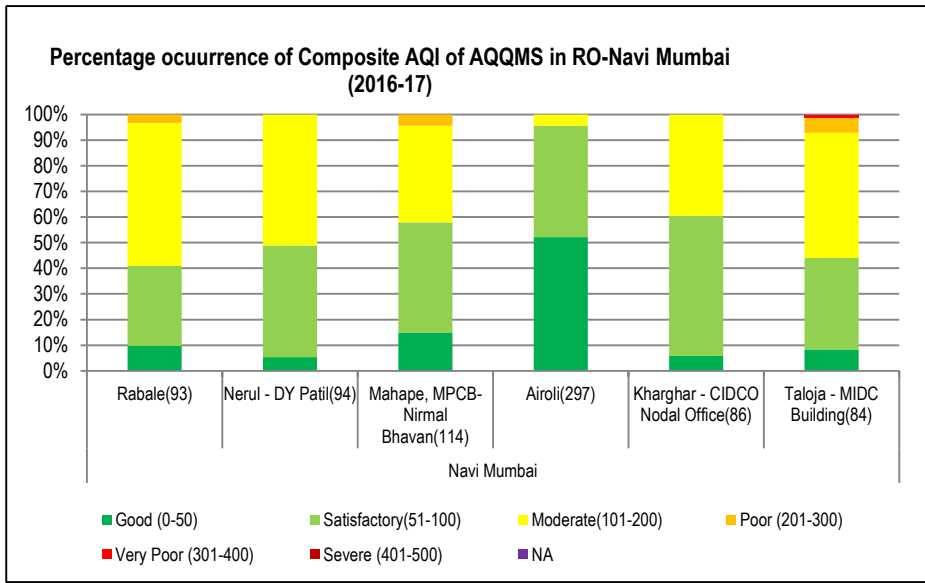
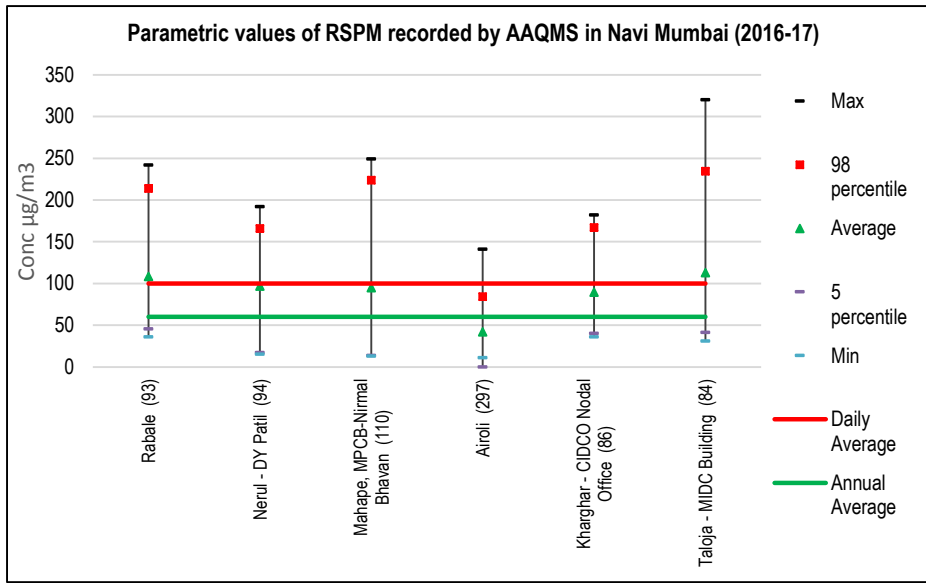
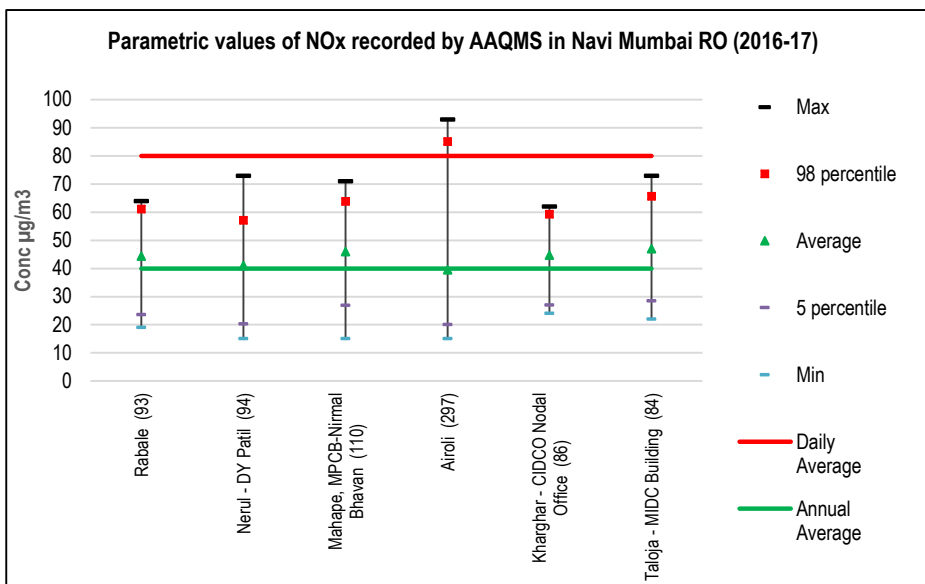
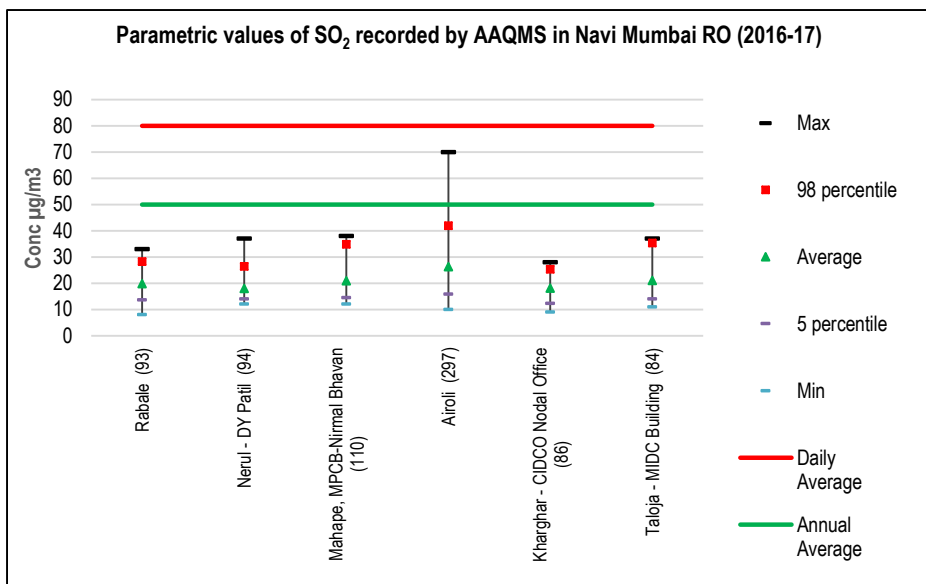


Table No. 144 : Data for SO₂, NO_x & RSPM recorded at AAQMS in Navi Mumbai RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	<i>80</i>		<i>50</i>	<i>80</i>	
	Rabale (93)	33	28	20	14	8
	Nerul - DY Patil (94)	37	26	18	14	12
	Mahape, MPCB-Nirmal Bhavan (110)	38	35	21	14	12
	Airoli (297)	70	42	26	16	10
	Kharghar - CIDCO Nodal Office (86)	28	25	18	12	9
	Taloja - MIDC Building (84)	37	35	21	14	11
NO _x	<i>CPCB Standard</i>	<i>80</i>		<i>40</i>	<i>80</i>	
	Rabale (93)	64	61	<i>44</i>	24	19
	Nerul - DY Patil (94)	73	57	<i>41</i>	20	15
	Mahape, MPCB-Nirmal Bhavan (110)	71	64	<i>46</i>	27	15
	Airoli (297)	<i>93</i>	<i>85</i>	39	20	15
	Kharghar - CIDCO Nodal Office (86)	62	59	<i>45</i>	27	24
	Taloja - MIDC Building (84)	73	66	<i>47</i>	28	22
RSPM (PM ₁₀)	<i>CPCB Standard</i>	<i>100</i>		<i>60</i>	<i>100</i>	
	Rabale (93)	<i>242</i>	<i>214</i>	<i>108</i>	45	36
	Nerul - DY Patil (94)	<i>192</i>	<i>166</i>	<i>97</i>	17	15
	Mahape, MPCB-Nirmal Bhavan (110)	<i>249</i>	<i>224</i>	<i>95</i>	13	13
	Airoli (297)	<i>141</i>	84	42	0	11
	Kharghar - CIDCO Nodal Office (86)	<i>182</i>	<i>167</i>	<i>90</i>	40	36
	Taloja - MIDC Building (84)	<i>320</i>	<i>234</i>	<i>113</i>	41	31

Navi Mumbai - Rabale

Table No. 145: Data for Monthly average reading recorded at Rabale

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Rabale	2016	Apr	25	54	165
		May	20	50	166
		Jun	13	30	137
		Jul	23	30	64
		Aug	17	28	50
		Sep	19	44	58
		Oct	19	51	79
		Nov	20	49	119
		Dec	18	51	108
		2017	Feb	21	51
Mar	24		50	126	

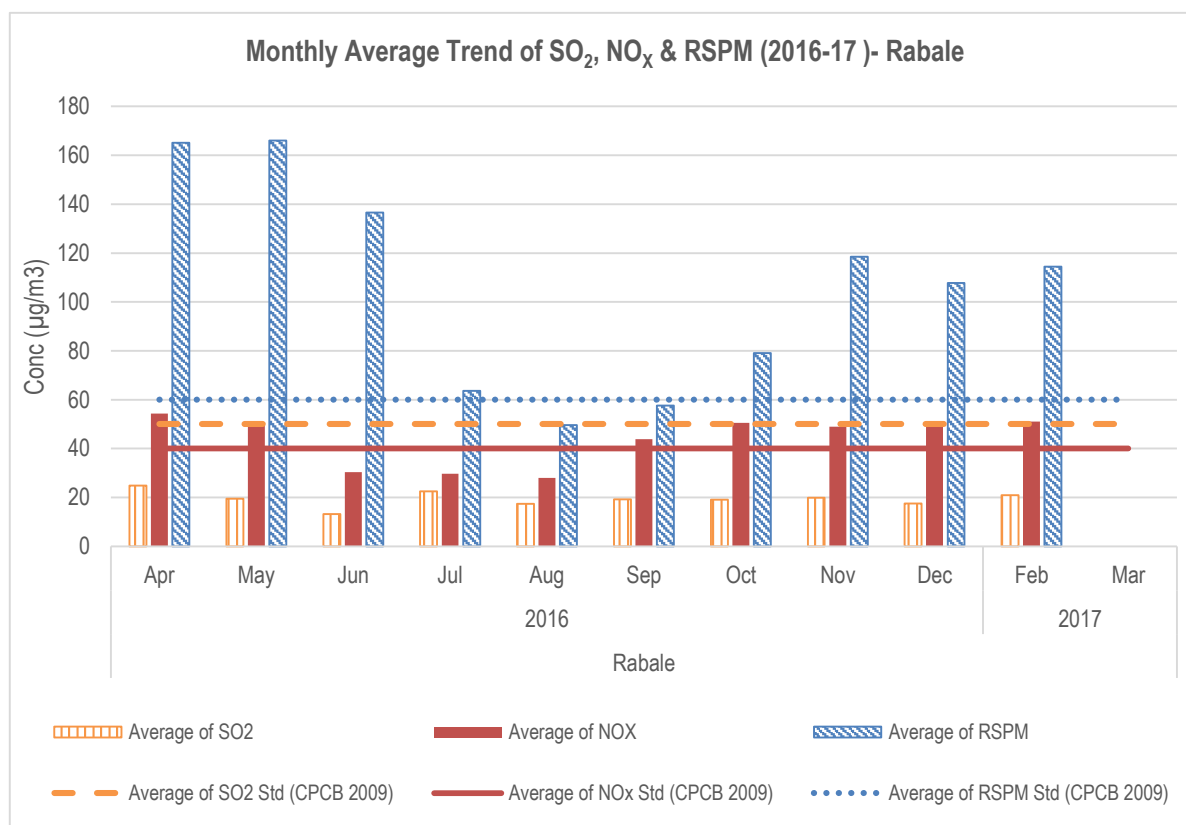


Figure No. 124: Monthly average reading recorded at Rabale

Table No. 146: Data for Annual average trend of SO₂, NO_x, and RSPM at Rabale

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Rabale	06-07	25	31	106
	07-08	12	27	79
	08-09	16	31	94
	09-10	13	36	83
	10-11	22	43	125
	11-12	18	47	100
	12-13	18	46	71
	13-14	18	44	90
	14-15	18	40	132
	15-16	21	48	131
	16-17	20	44	107

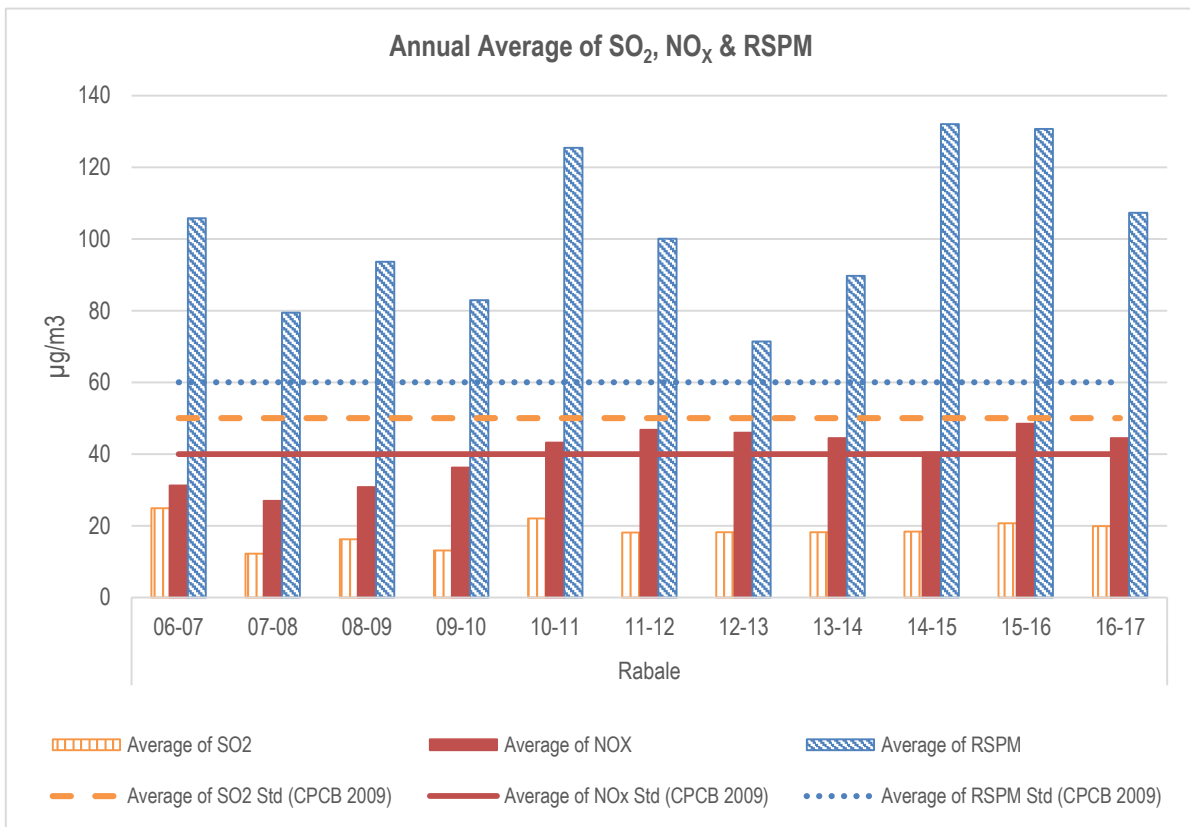


Figure No. 125: Annual average trend of SO₂, NO_x, and RSPM at Rabale

Navi Mumbai - Nerul – DY Patil

Table No. 147: Data for Monthly average reading recorded at Nerul – DY Patil

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Nerul - DY Patil	2016	Apr	22	53	147
		May	17	41	125
		Jun	16	43	131
		Jul	19	33	98
		Aug	16	20	56
		Sep	17	31	82
		Oct	19	52	93
		Nov	18	47	90
		Dec	17	46	17
	2017	Feb	19	45	114
		Mar	20	44	114

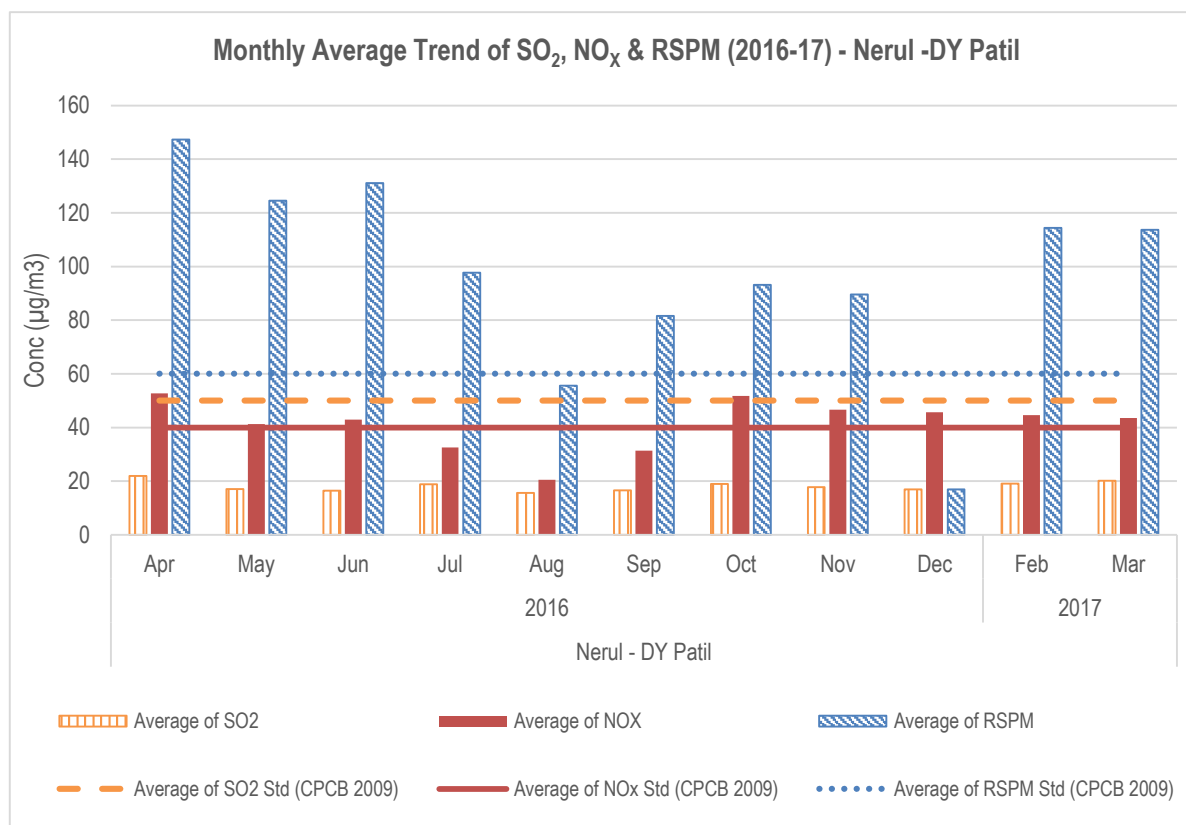


Figure No. 126: Monthly average reading recorded at Nerul – DY Patil

Table No. 148: Data for Annual average trend of SO₂, NO_x, and RSPM at Nerul – DY Patil

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Nerul - DY Patil	06-07	25	31	107
	07-08	17	33	90
	08-09	20	40	98
	09-10	10	37	71
	10-11	14	33	119
	11-12	15	43	118
	12-13	15	40	95
	13-14	17	41	109
	14-15	17	38	131
	15-16	17	41	136
	16-17	18	41	96

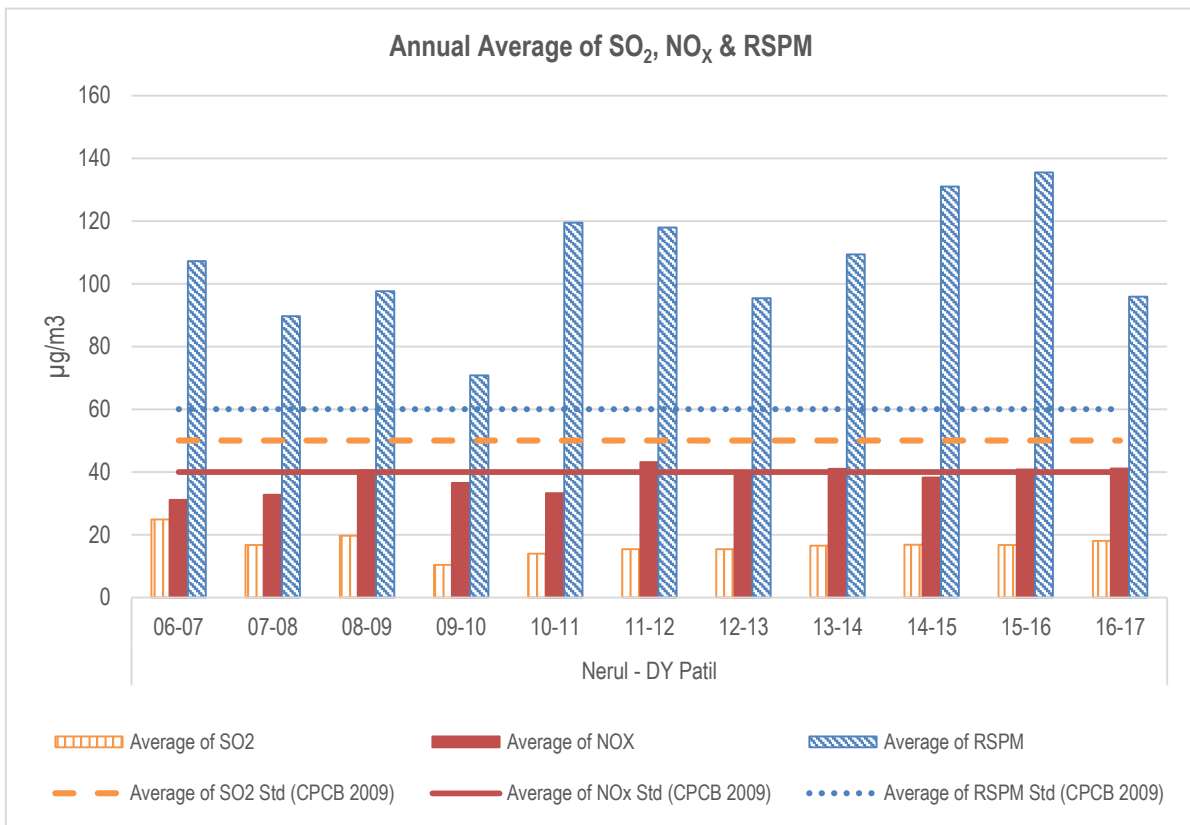


Figure No. 127: Annual average trend of SO₂, NO_x, and RSPM at Nerul – DY Patil

Navi Mumbai - Mahape, MPCB Nirmal Bhavan

Table No. 149: Data for Monthly average reading recorded at Mahape, MPCB Nirmal Bhavan

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Mahape, MPCB-Nirmal Bhavan	2016	Apr	27	56	107
		May	22	51	60
		Jun	19	57	129
		Jul	21	37	54
		Aug	21	28	40
		Sep	18	41	65
		Oct	19	46	74
		Nov	22	53	106
		Dec	18	48	154
	2017	Jan	24	34	0
		Feb	20	49	117
		Mar	22	49	120

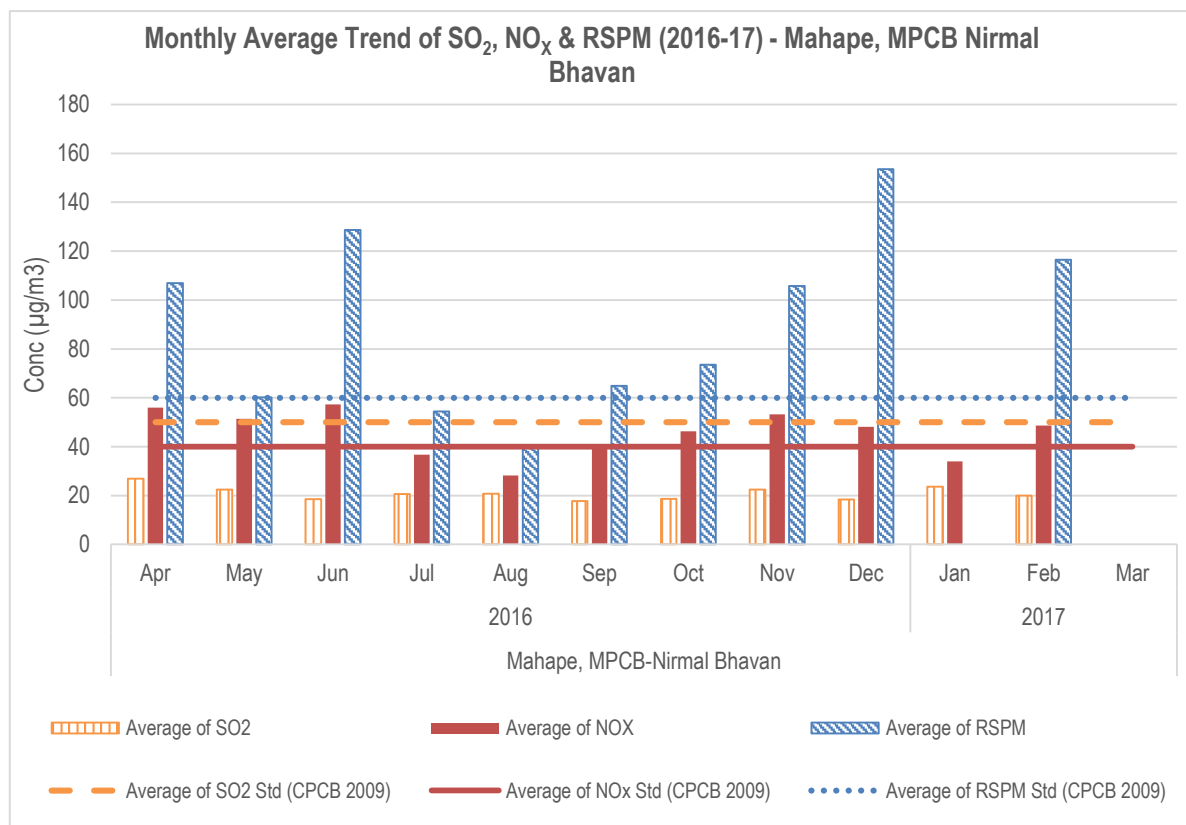


Figure No. 128: Monthly average reading recorded at Mahape, MPCB Nirmal Bhavan

Table No. 150: Data for Annual average trend of SO₂, NO_x, and RSPM at Mahape, MPCB Nirmal Bhavan

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Mahape, MPCB-Nirmal Bhavan	06-07	37	27	106
	07-08	17	32	94
	08-09	22	43	131
	09-10	15	42	95
	10-11	22	41	101
	11-12	17	44	133
	12-13	18	45	121
	13-14	18	45	182
	14-15	18	40	131
	15-16	20	43	85
	16-17	21	46	91

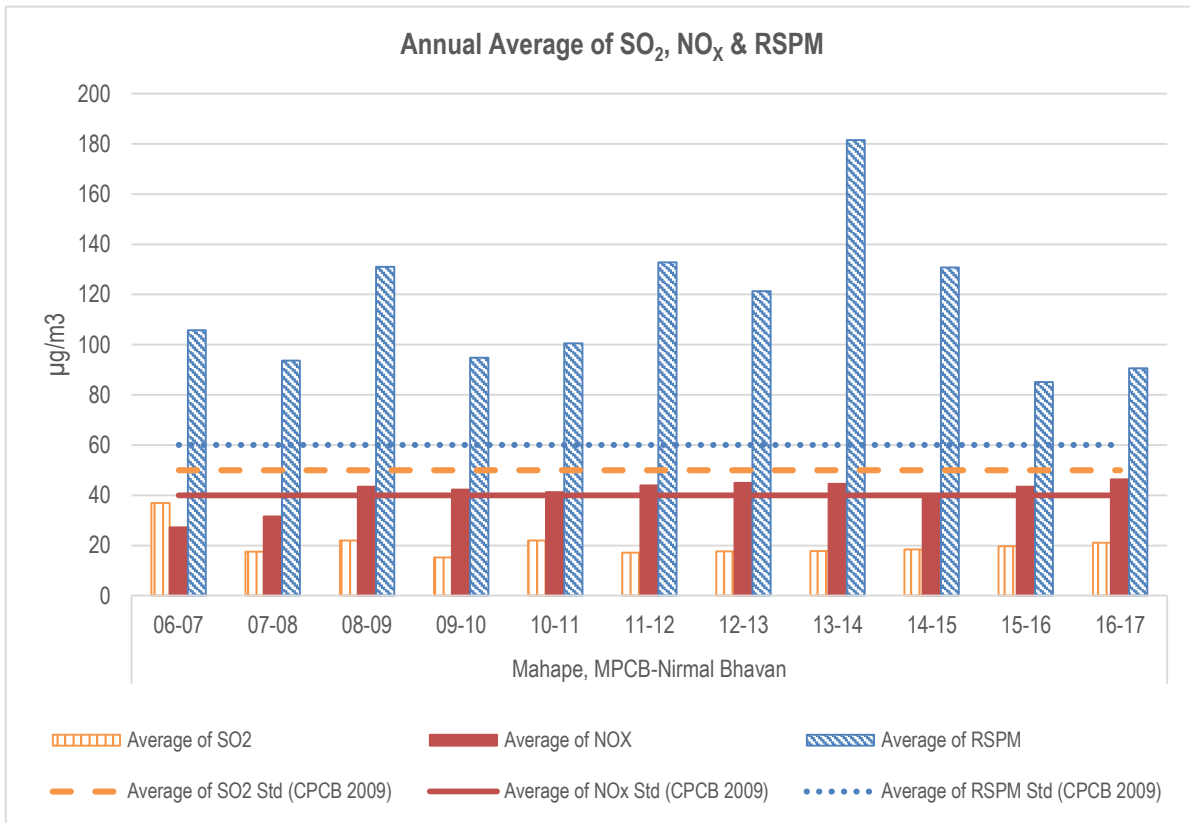


Figure No. 129: Annual average trend of SO₂, NO_x, and RSPM at Mahape, MPCB Nirmal Bhavan

Navi Mumbai - Airoli

Table No. 151: Data for Monthly average reading recorded at Airoli

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Airoli	2016	Apr	35	59	29
		May	34	57	43
		Jun	39	78	33
		Jul	26	43	42
		Aug	27	21	22
		Sep	26	33	29
		Oct	24	35	48
		Nov	22	33	40
		Dec	21	29	21
	2017	Jan	21	32	0
		Feb	21	32	24
		Mar	22	33	76

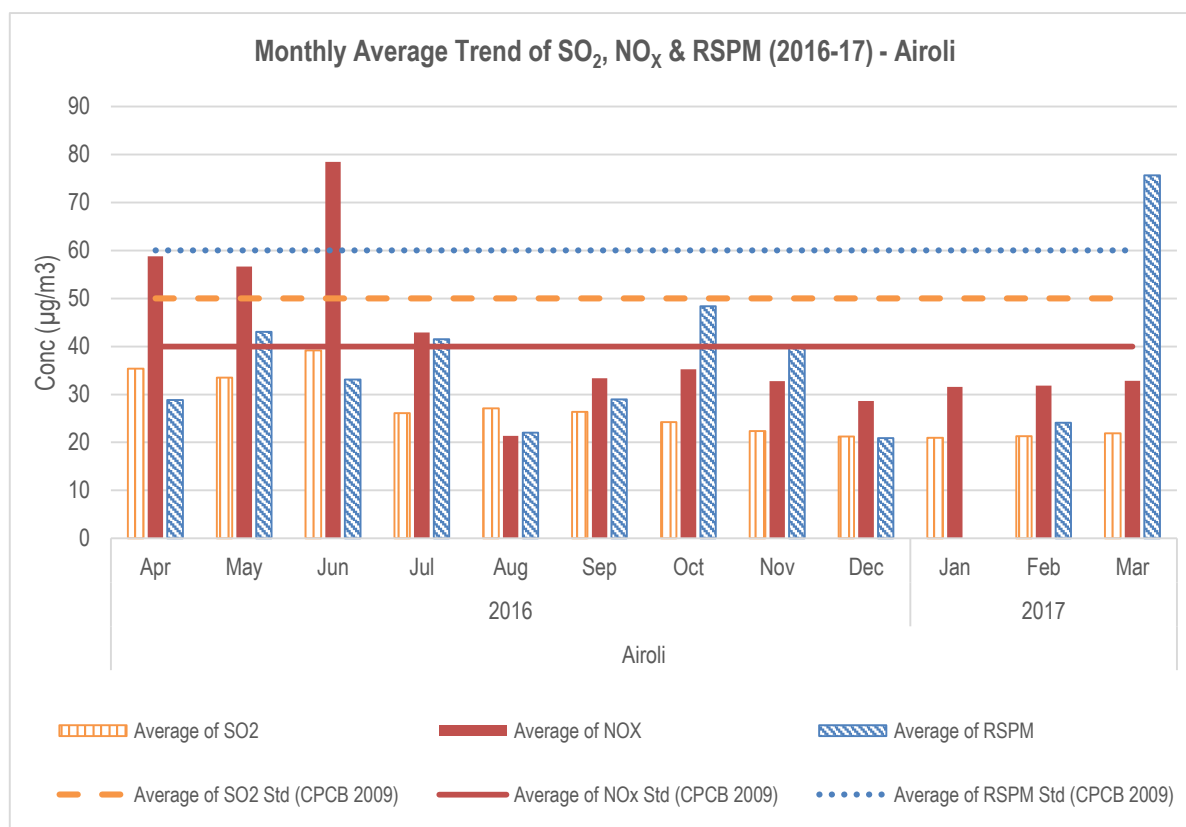


Figure No. 130: Monthly average reading recorded at Airoli

Table No. 152: Data for Annual average trend of SO₂, NO_x, and RSPM at Airoli

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Airoli	08-09	31	112	87
	09-10	23	89	120
	10-11	27	67	128
	11-12	13	75	181
	12-13	21	43	109
	13-14	22	53	53
	14-15	17	28	38
	15-16	26	39	36
	16-17	26	39	35

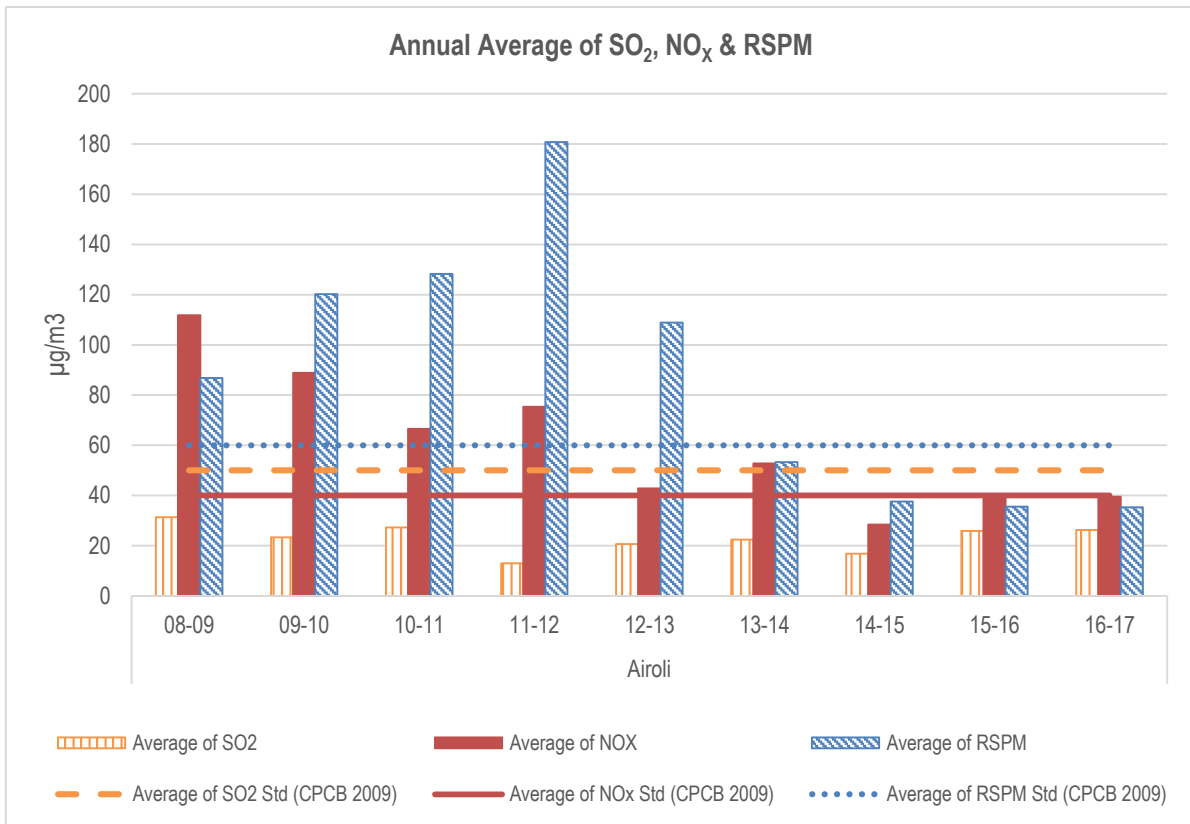


Figure No. 131: Annual average trend of SO₂, NO_x, and RSPM at Airoli

Taloja - Kharghar-CIDCO Nodel Office

Table No. 153: Data for Monthly average reading recorded at Kharghar-CIDCO Nodel Office

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Kharghar - CIDCO Nodal Office	2016	Apr	21	47	135
		May	18	43	76
		Jun	18	46	132
		Jul	18	29	57
		Aug	21	42	52
		Sep	18	38	53
		Oct	16	48	72
		Nov	16	52	103
		Dec	16	54	111
	2017	Feb	19	47	107

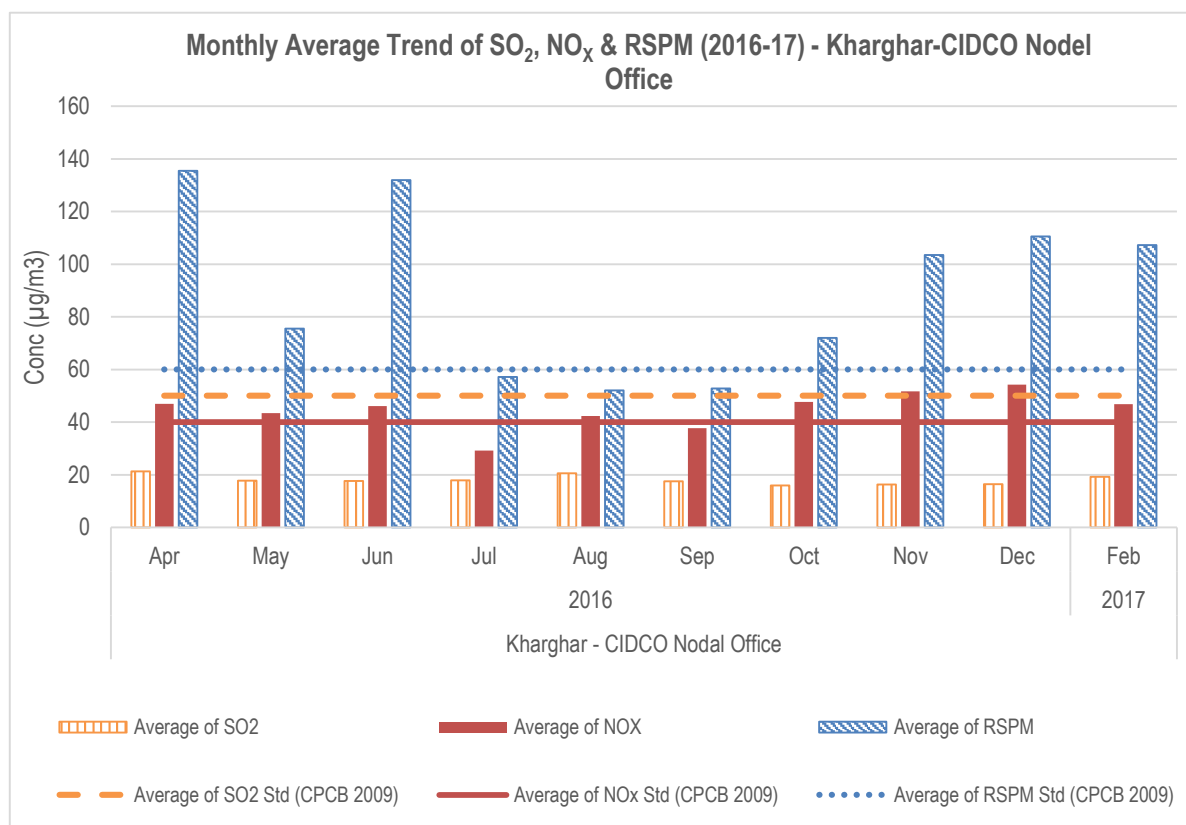


Figure No. 132: Monthly average reading recorded at Kharghar-CIDCO Nodel Office

Table No. 154: Data for Annual average trend of SO₂, NO_x, and RSPM at Kharghar-CIDCO Nodel Office

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Kharghar - CIDCO Nodal Office	06-07	18	33	96
	07-08	10	31	108
	08-09	13	40	115
	09-10	10	35	75
	10-11	17	37	122
	11-12	16	43	122
	12-13	16	41	122
	13-14	17	42	125
	14-15	17	38	127
	15-16	17	41	116
	16-17	18	45	90

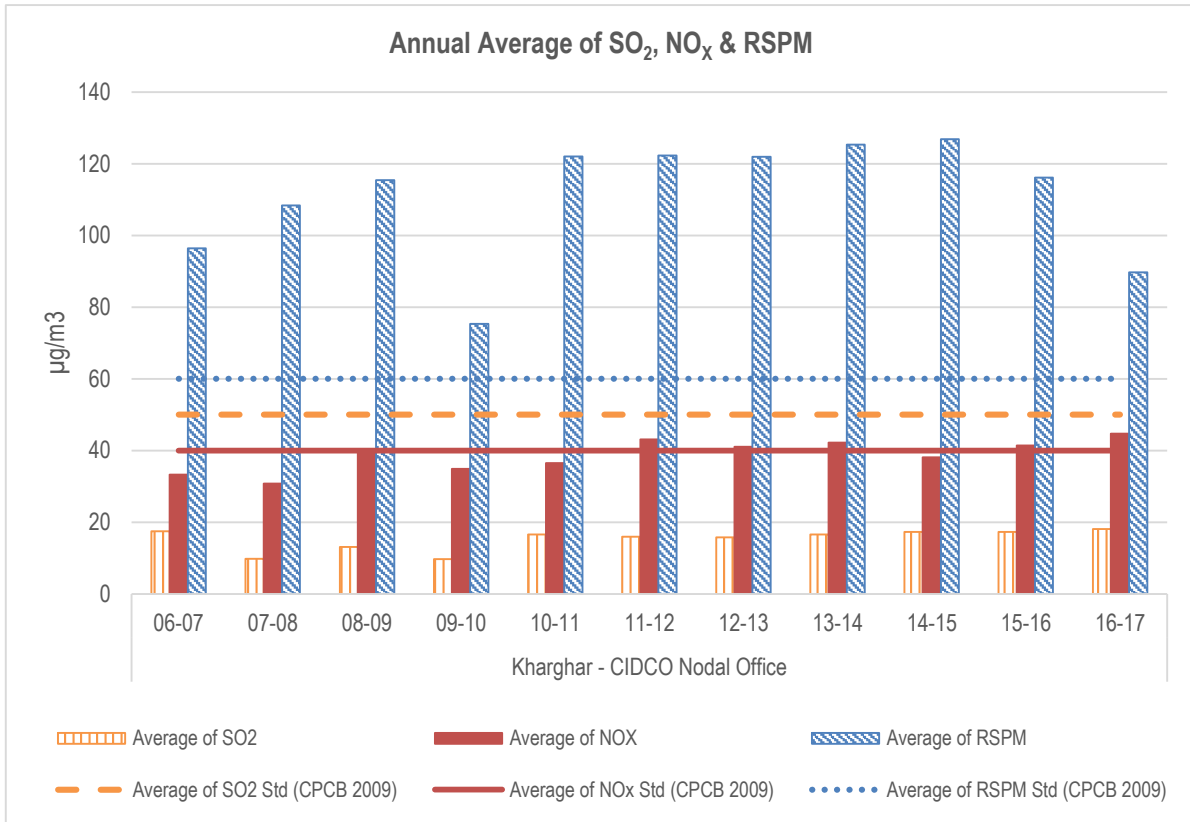


Figure No. 133: Annual average trend of SO₂, NO_x, and RSPM at Kharghar-CIDCO Nodel Office

Taloja - MIDC Building

Table No. 155: Data for Monthly average reading recorded at Taloja - MIDC Building

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Taloja - MIDC Building	2016	Apr	27	57	171
		May	19	47	127
		Jun	27	52	141
		Jul	18	40	57
		Aug	22	35	50
		Sep	22	38	67
		Oct	20	50	95
		Nov	19	51	98
		Dec	17	53	199
	2017	Feb	19	47	107

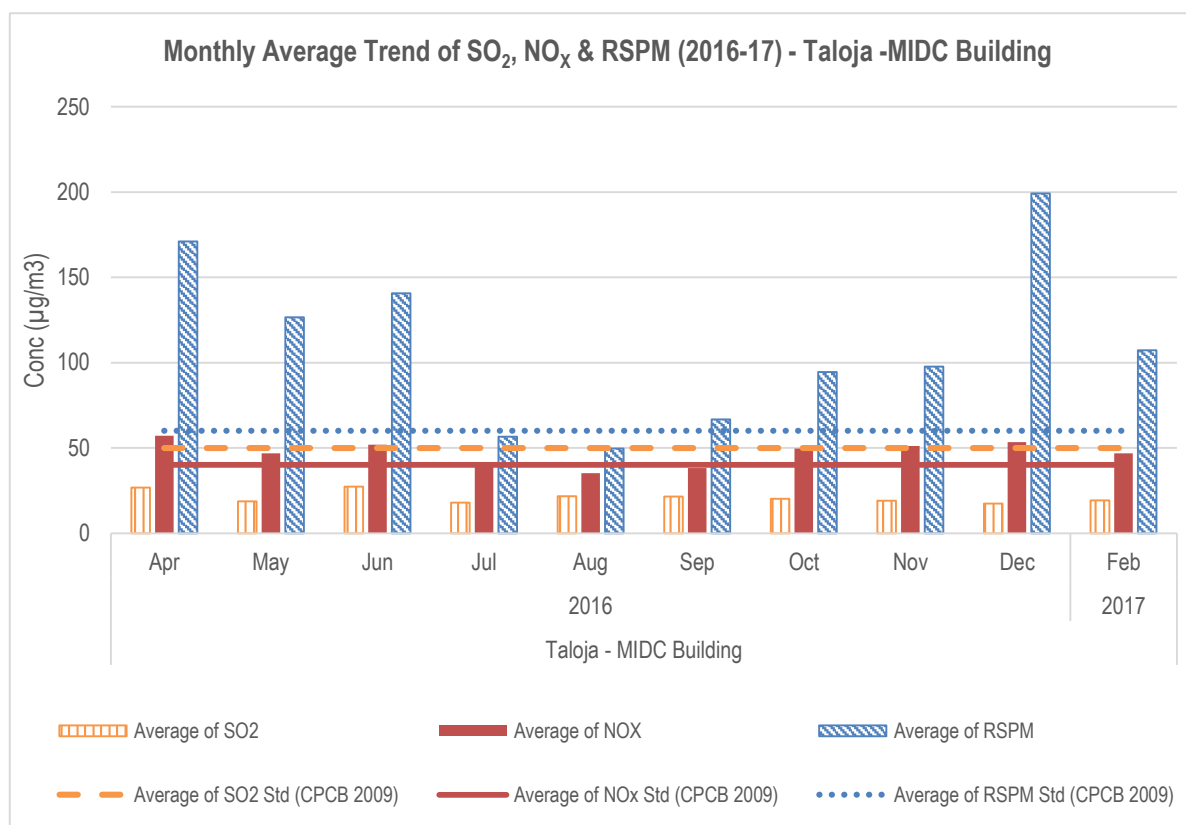


Figure No. 134: Monthly average reading recorded at Taloja -MIDC Building

Table No. 156: Data for Annual average trend of SO₂, NO_x, and RSPM at Taloja -MIDC Building

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Taloja - MIDC Building	06-07	32	40	101
	07-08	22	39	113
	08-09	29	46	241
	09-10	23	55	200
	10-11	27	48	194
	11-12	20	51	148
	12-13	18	45	129
	13-14	19	47	187
	14-15	18	41	142
	15-16	21	47	148
	16-17	21	47	111

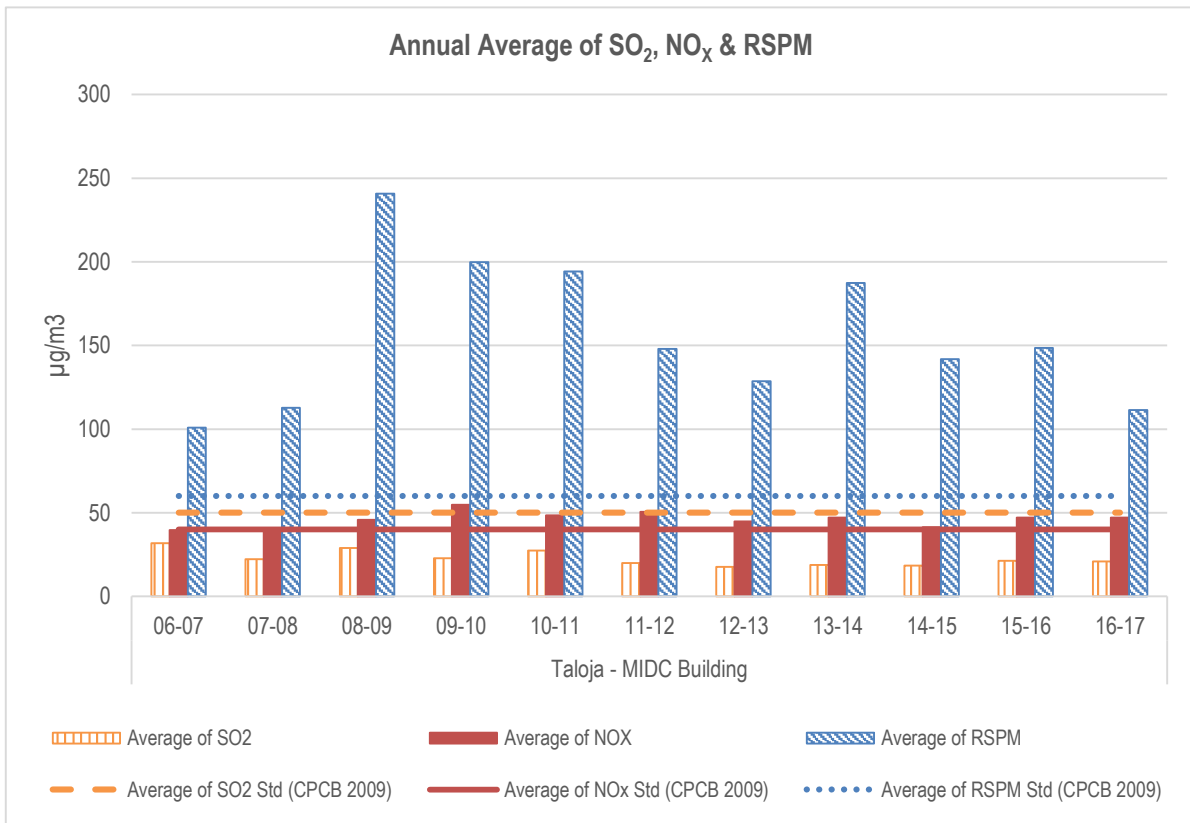
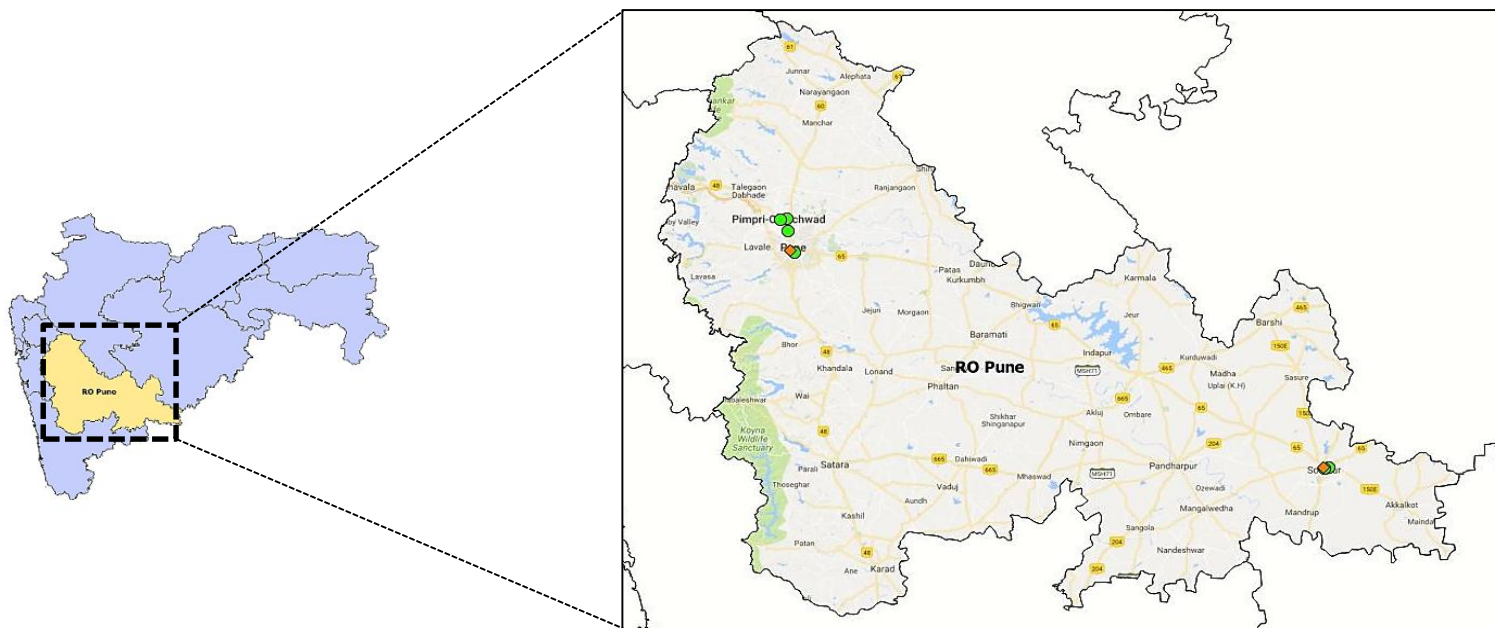


Figure No. 135: Annual average trend of SO₂, NO_x, and RSPM at Taloja -MIDC Building

Table No. 157: Percentage exceedance of pollutants at Navi Mumbai RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Rabale	93	0	0	55	0	0	59
Nerul - DY Patil	94	0	0	48	0	0	51
Mahape, MPCB-Nirmal Bhavan	114	0	0	48	0	0	42
Airoli	297	0	12	1	0	4	0
Kharghar - CIDCO Nodal Office	86	0	0	34	0	0	40

RO – Pune



Region	Station code	Station name	Program	Latitude	Longitude
Pune	312	Bhosari	NAMP	18 °38'05.9"N	73° 49 '44.8"E
Pune	379	Nal Stop	NAMP	18 °34' 72.92"N	73° 50' 9.96"E
Pune	381	Swargate, Pune	NAMP	18 °30' 02.13"N	73° 51' 28.39"E
Pune	708	Pimpri-Chinchwad - BOB Building	NAMP	18°37' 41.68"N	73° 48' 16.68"E
Pune	-	Karve Road - CAAQMS	CAAQMS	18 °30' 40.21"N	73° 50' 28.56"E
Solapur	299	WIT Campus	NAMP	17 °40' 6.29"N	75° 55' 19.18"E
Solapur	300	Saat Rasta- Chithale Clinic	NAMP	17 °39' 58.22"N	75° 54' 24.65"E
Solapur	0	Solapur	CAAQMS	17 °40'8.14"N	75° 54' 4.95"E

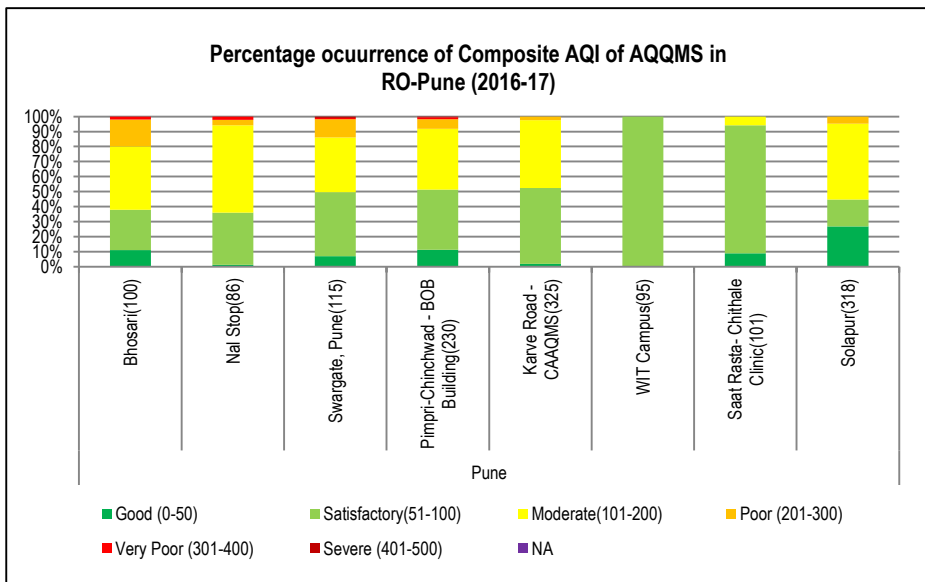
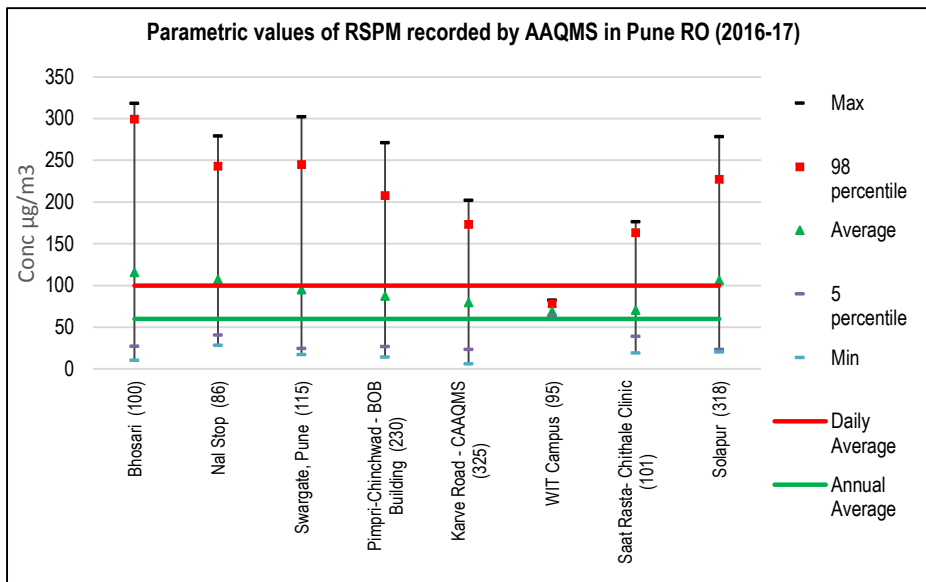
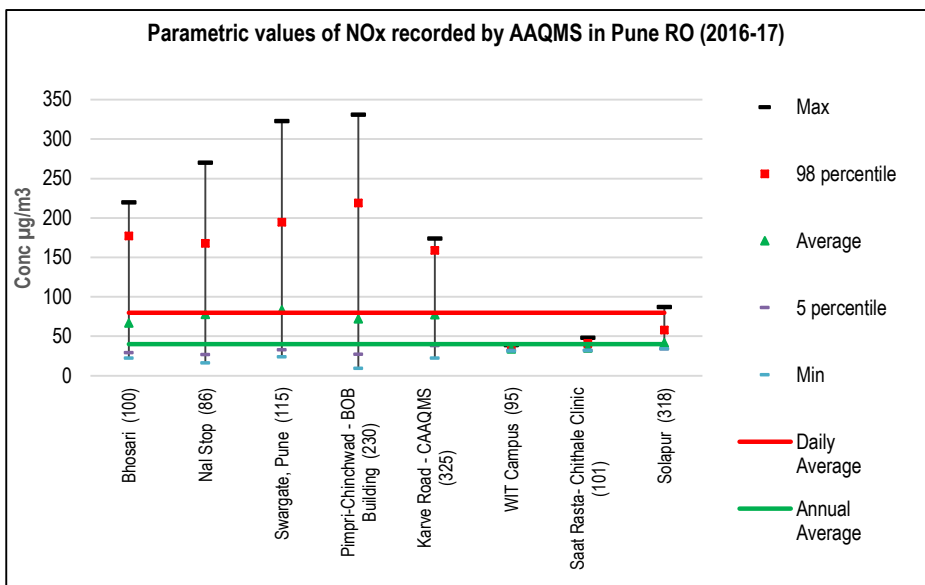
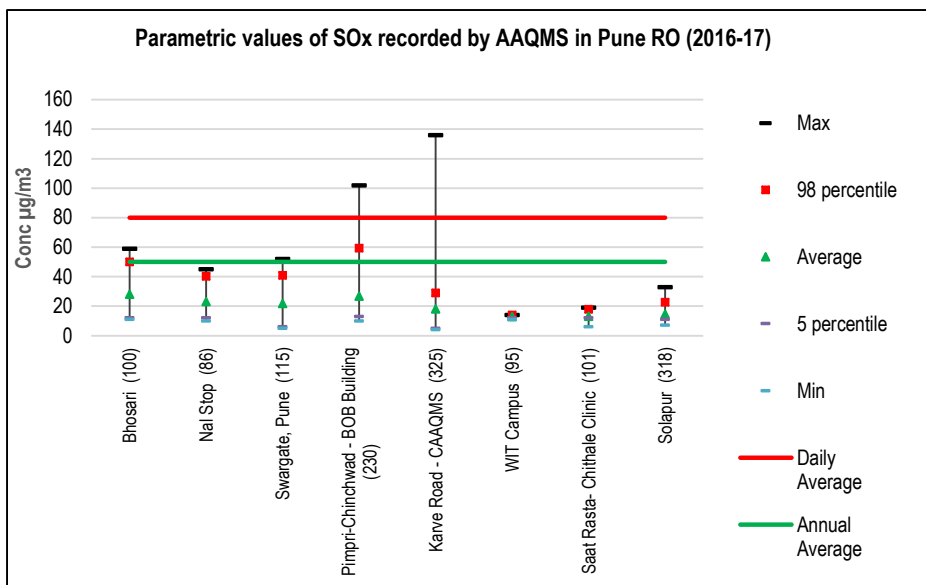


Table No. 158 : Data for SO₂, NO_x & RSPM recorded at AAQMS in Pune RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	80		50	80	
	Bhosari (100)	59	50	28	12	11
	Nal Stop (86)	45	40	23	12	10
	Swargate, Pune (115)	52	41	22	6	5
	Pimpri-Chinchwad - BOB Building (230)	102	59	27	13	10
	Karve Road - CAAQMS (325)	136	29	18	5	4
	WIT Campus (95)	14	14	13	12	11
	Saat Rasta- Chithale Clinic (101)	19	18	13	12	6
	Solapur (318)	33	23	15	11	7
NO _x	<i>CPCB Standard</i>	80		40	80	
	Bhosari (100)	220	177	67	29	22
	Nal Stop (86)	270	168	78	27	16
	Swargate, Pune (115)	323	195	84	33	24
	Pimpri-Chinchwad - BOB Building (230)	331	219	72	27	9
	Karve Road - CAAQMS (325)	174	159	77	38	22
	WIT Campus (95)	39	37	34	32	31
	Saat Rasta- Chithale Clinic (101)	48	41	35	32	32
	Solapur (318)	87	58	41	34	34
RSPM (PM ₁₀)	<i>CPCB Standard</i>	100		60	100	
	Bhosari (100)	318	299	115	27	10
	Nal Stop (86)	279	243	107	40	28
	Swargate, Pune (115)	302	245	95	24	17
	Pimpri-Chinchwad - BOB Building (230)	271	208	87	26	14
	Karve Road - CAAQMS (325)	202	173	79	23	6
	WIT Campus (95)	82	78	69	63	59
	Saat Rasta- Chithale Clinic (101)	176	163	70	39	19
	Solapur (318)	278	227	106	23	20

Pune - Bhosari

Table No. 159: Data for Monthly average reading recorded at Bhosari

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Bhosari	2016	Apr	28	48	127
		Jun	17	78	47
		Jul	27	87	63
		Aug	30	50	41
		Sep	27	65	46
		Oct	32	45	109
		Nov	38	68	215
		Dec	42	95	236
	2017	Jan	20	82	196
		Feb	31	66	161
Mar		25	48	116	

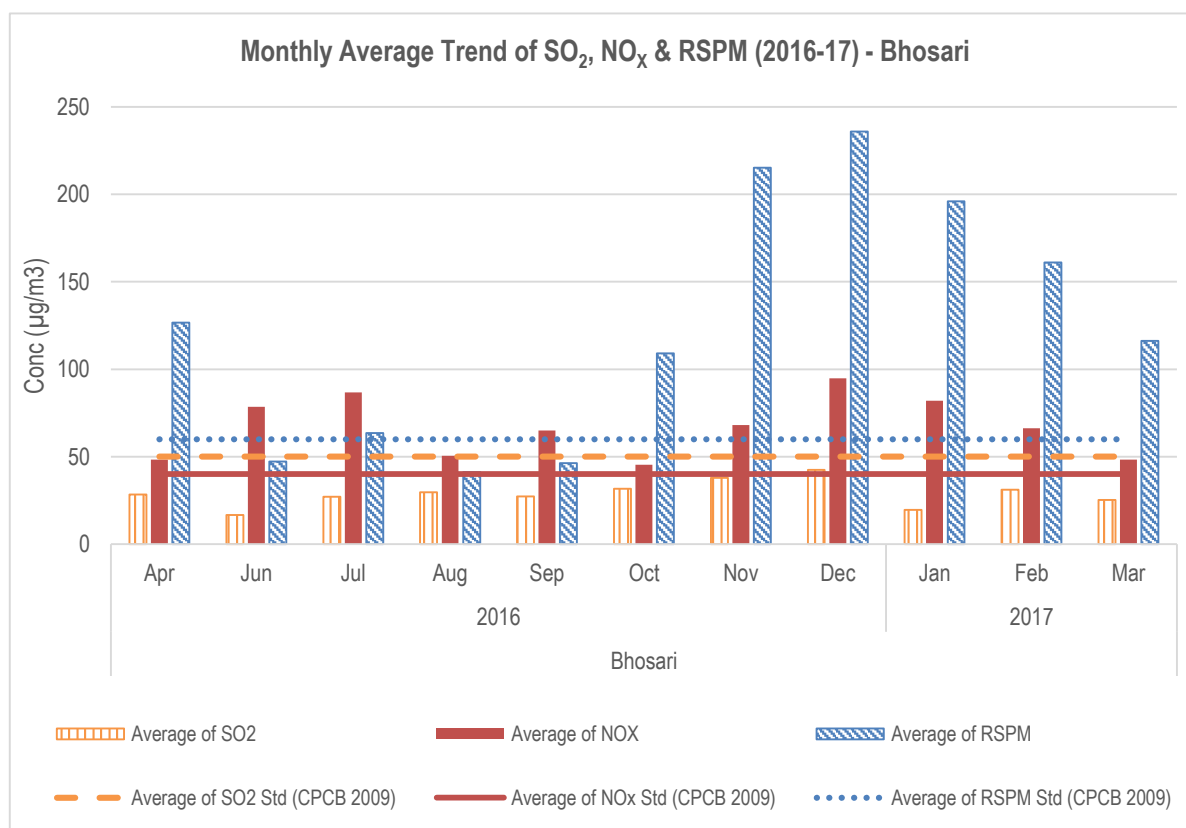


Figure No. 136: Monthly average reading recorded at Bhosari

Table No. 160: Data for Annual average trend of SO₂, NO_x, and RSPM at Bhosari

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Bhosari	05-06	27	42	144
	06-07	24	42	126
	07-08	20	42	111
	08-09	24	37	109
	09-10	42	36	88
	10-11	30	38	84
	11-12	37	49	130
	12-13	25	39	101
	13-14	23	35	93
	14-15	26	47	101
	15-16	31	50	97
	16-17	28	67	115

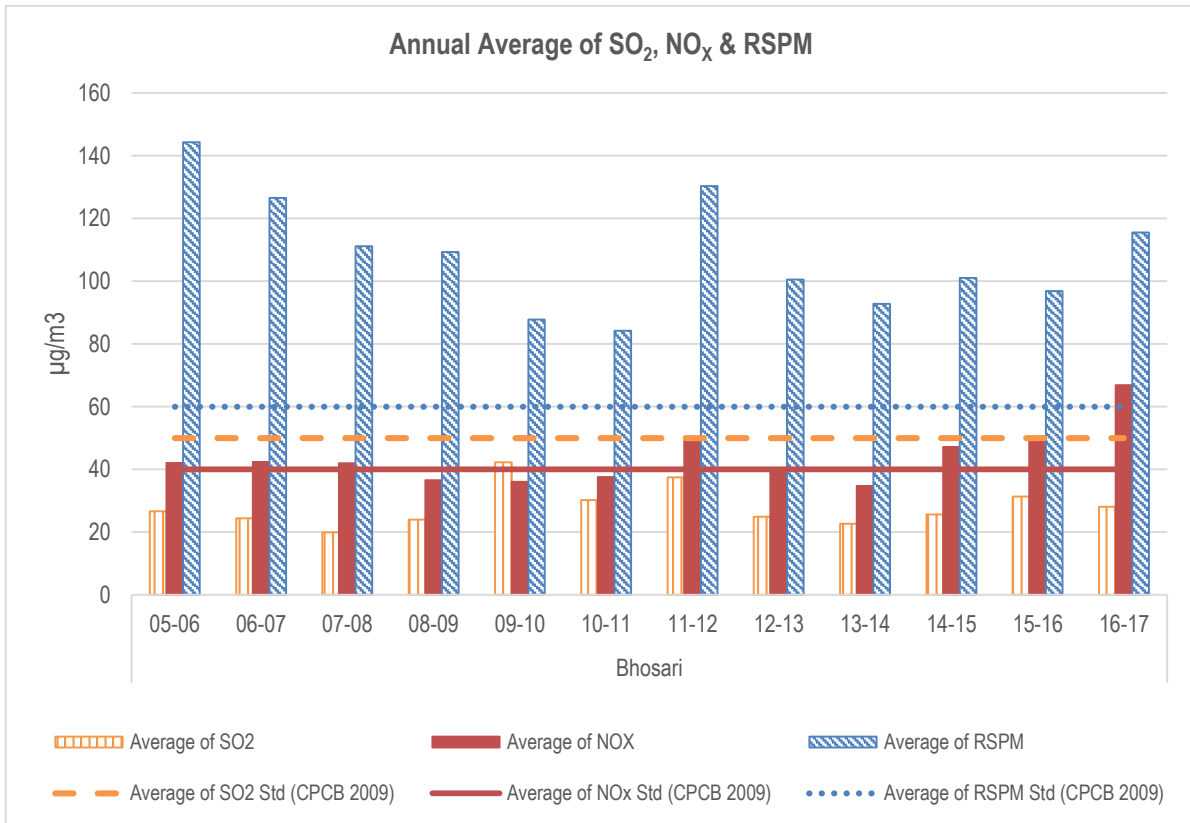


Figure No. 137: Annual average trend of SO₂, NO_x, and RSPM at Bhosari

Pune - Nal Stop

Table No. 161: Data for Monthly average reading recorded at Nal Stop

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM	
			50	40	60	
Nal Stop	2016	Apr	21	56	106	
		May	21	46	71	
		Jun	14	111	72	
		Jul	25	90	66	
		Aug	14	50	59	
		Sep	25	49	64	
		Oct	30	62	118	
		Nov	35	76	137	
		Dec	30	107	153	
		2017	Jan	18	101	162
			Feb	20	80	138
			Mar	19	74	106

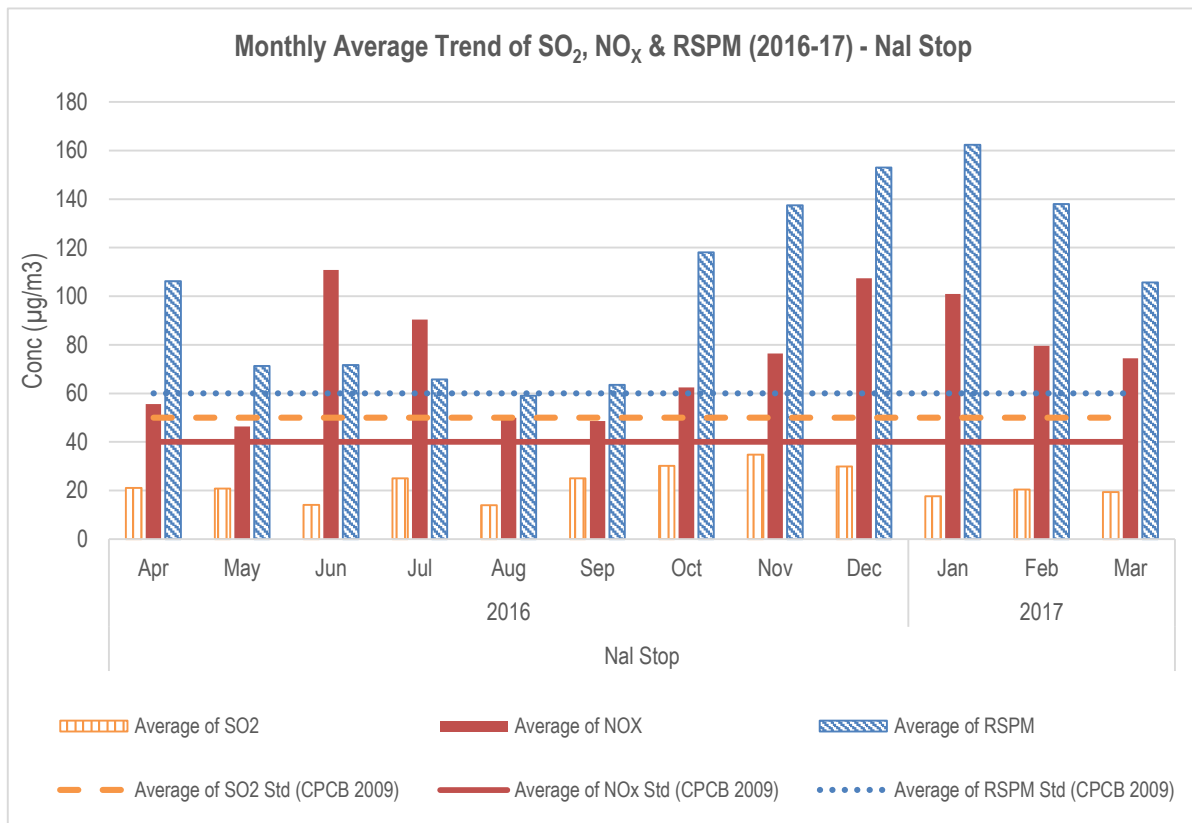


Figure No. 138: Monthly average reading recorded at Nal Stop

Table No. 162: Data for Annual average trend of SO₂, NO_x, and RSPM at Nal Stop

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Nal Stop	05-06	27	43	152
	06-07	23	42	129
	07-08	19	42	108
	08-09	21	41	91
	09-10	23	39	82
	10-11	21	43	88
	11-12	30	62	100
	12-13	19	45	82
	13-14	20	39	82
	14-15	22	48	92
	15-16	21	64	88
	16-17	23	78	107

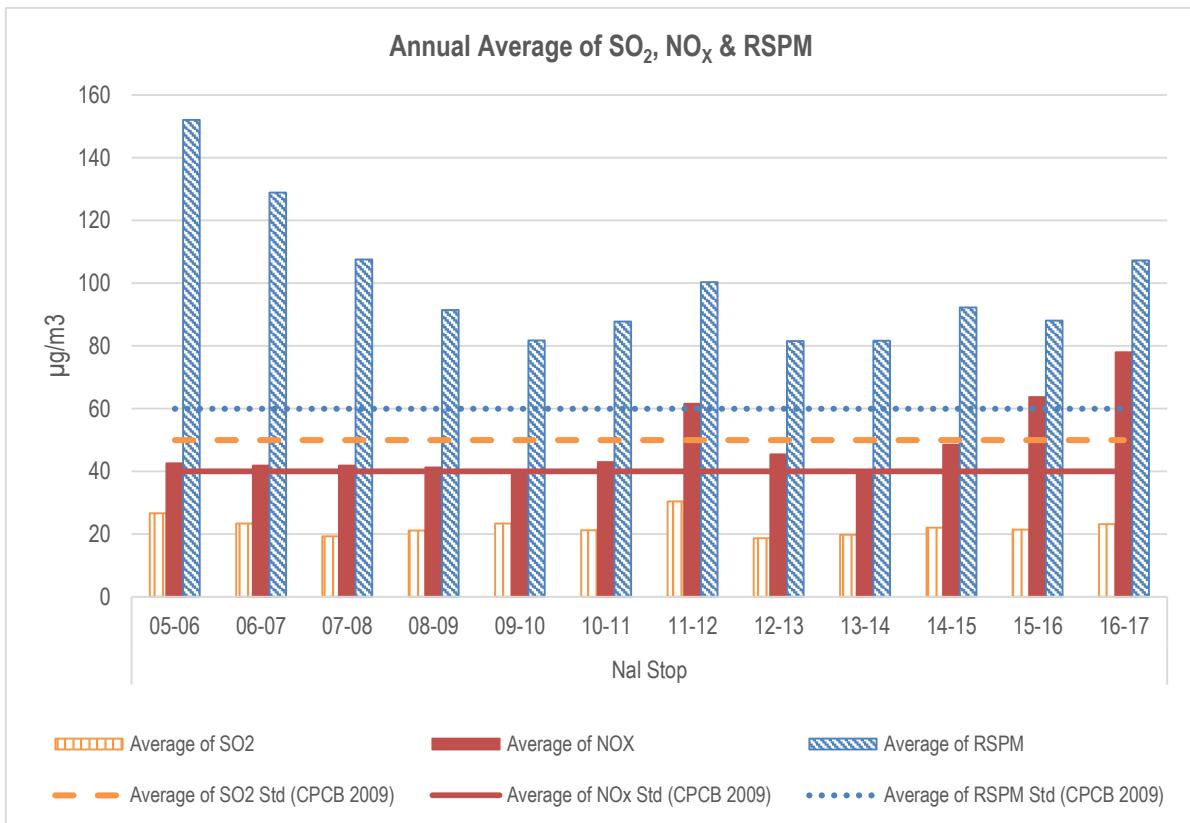


Figure No. 139: Annual average trend of SO₂, NO_x, and RSPM at Nal Stop

Pune - Swargate, Pune

Table No. 163: Data for Monthly average reading recorded at Swargate, Pune

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Swargate, Pune	2016	Apr	22	55	80
		May	22	51	50
		Jun	19	100	43
		Jul	27	76	51
		Aug	16	49	36
		Sep	25	67	47
		Oct	29	68	123
		Nov	21	103	164
		Dec	26	155	204
	2017	Jan	17	127	153
		Feb	20	133	148
		Mar	20	80	105

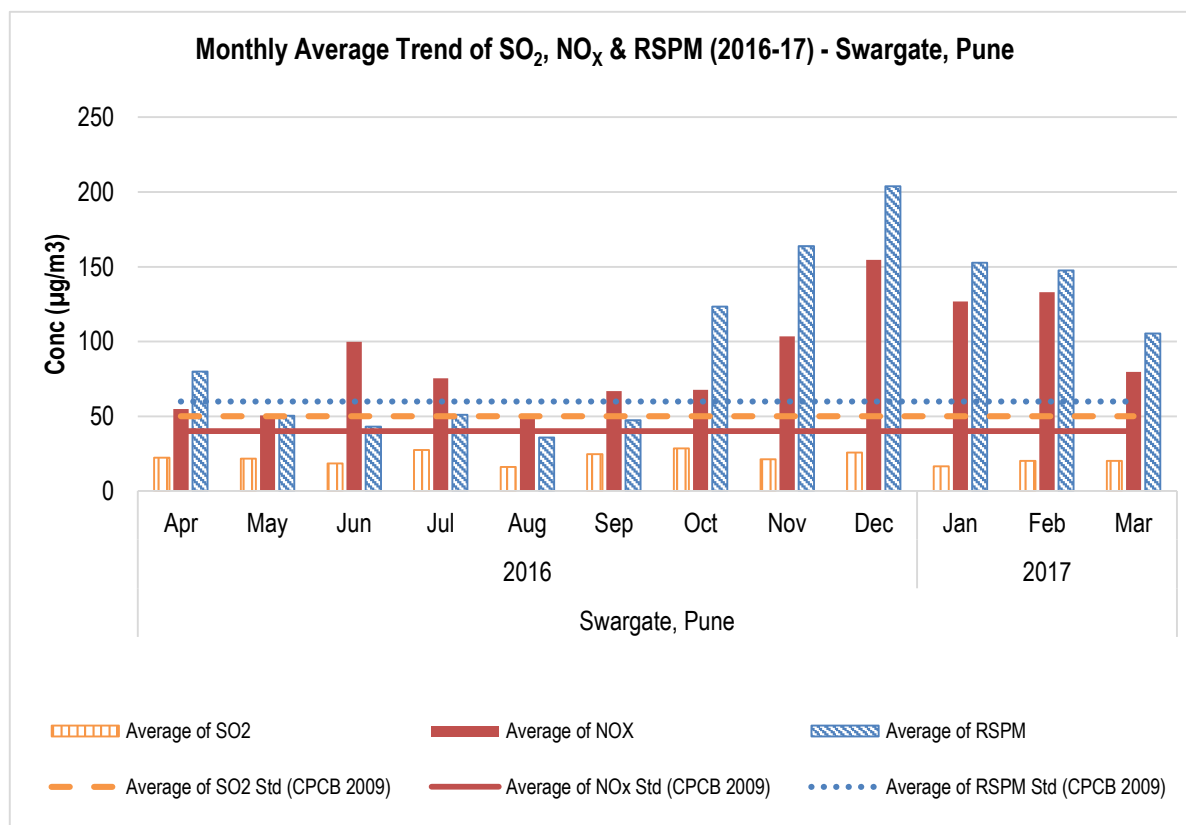


Figure No. 140: Monthly average reading recorded at Swargate, Pune

Table No. 164: Data for Annual average trend of SO₂, NO_x, and RSPM at Swargate, Pune

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Swargate, Pune	05-06	27	43	152
	06-07	25	43	138
	07-08	20	46	101
	08-09	23	44	100
	09-10	24	39	81
	10-11	23	50	80
	11-12	28	63	95
	12-13	19	53	75
	13-14	21	42	75
	14-15	22	50	87
	15-16	21	66	106
	16-17	21	83	95

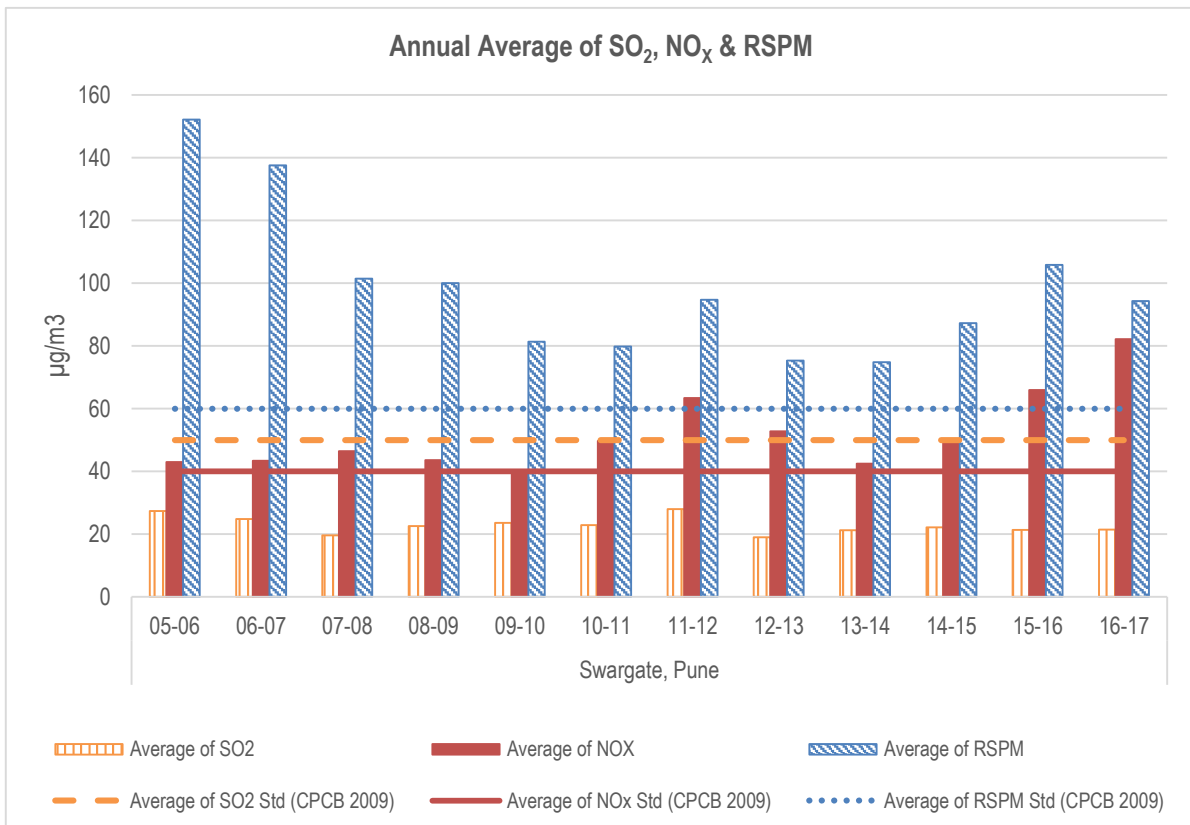


Figure No. 141: Annual average trend of SO₂, NO_x, and RSPM at Swargate, Pune

Pune - Pimpri - Chinchwad-BOB Building

Table No. 165: Data for Monthly average reading recorded at Pimpri - Chinchwad-BOB Building

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Pimpri-Chinchwad - BOB Building	2016	Apr	26	45	100
		May	21	40	70
		Jun	16	103	51
		Jul	22	90	51
		Aug	26	39	40
		Sep	26	53	39
		Nov	46	79	144
		Dec	17	92	95
	2017	Jan	25	110	147
		Feb	30	85	137
Mar		29	68	90	

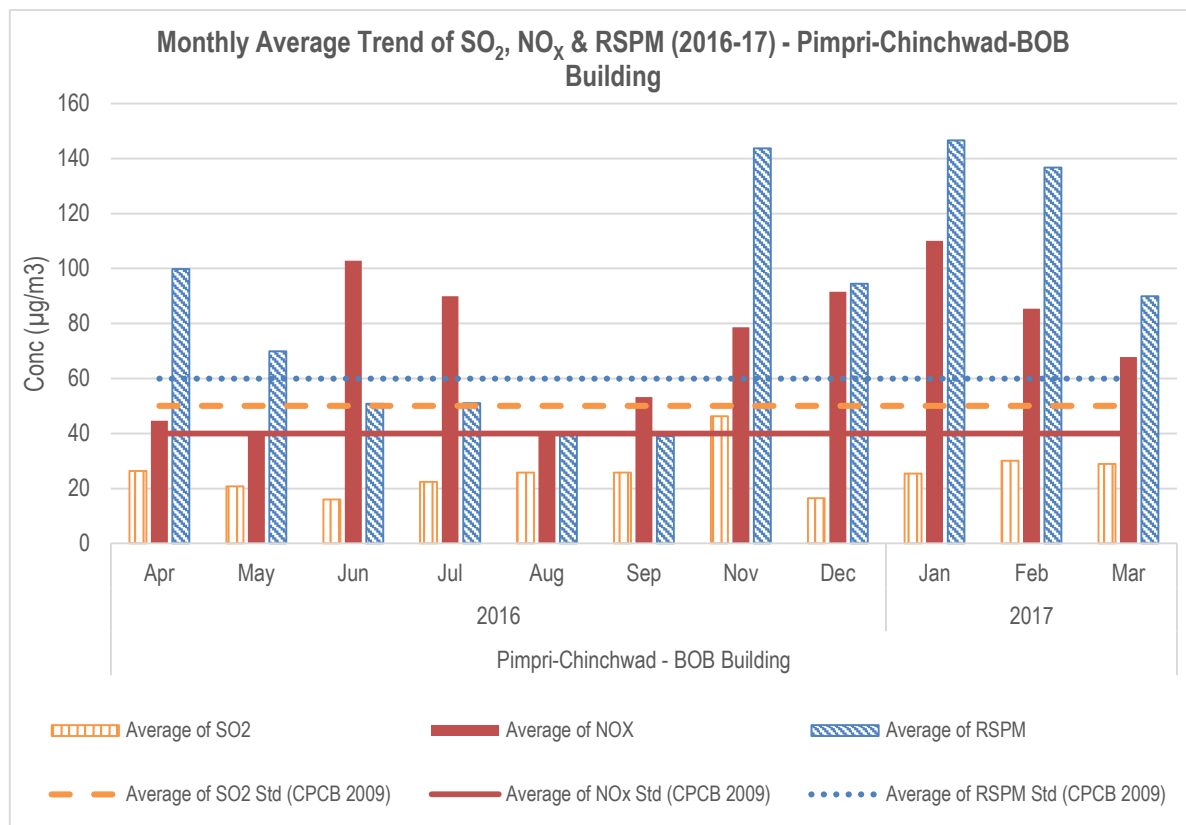


Figure No. 142: Monthly average reading recorded at Pimpri - Chinchwad-BOB Building

Table No. 166: Data for Annual average trend of SO₂, NO_x, and RSPM at Pimpri - Chinchwad-BOB Building

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Pimpri-Chinchwad - BOB Building	05-06	21	35	114
	06-07	24	42	127
	07-08	19	41	105
	08-09	23	39	96
	09-10	31	43	89
	10-11	26	49	86
	11-12	33	57	117
	12-13	20	49	84
	13-14	22	39	82
	14-15	22	44	94
	15-16	27	52	101
	16-17	27	72	87

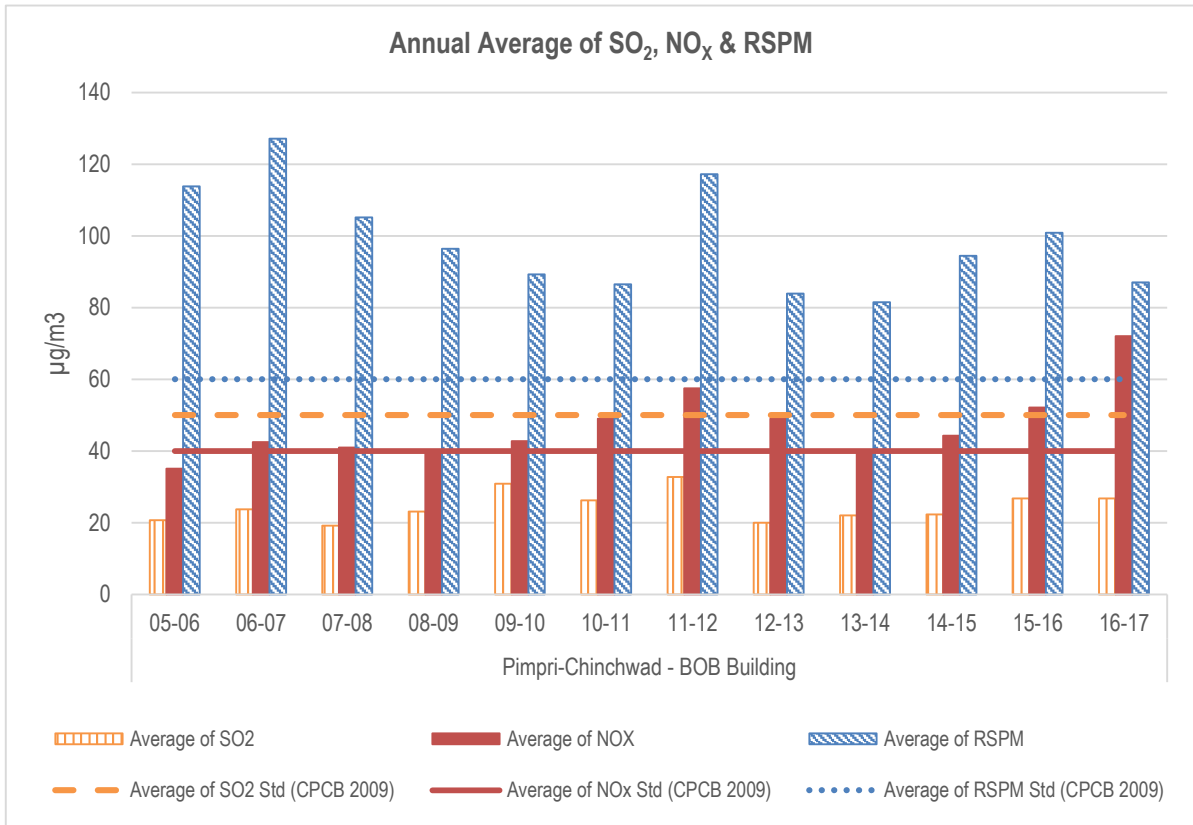


Figure No. 143: Annual average trend of SO₂, NO_x, and RSPM at Pimpri - Chinchwad-BOB Building

Pune - Karve Road - CAAQMS

Table No. 167: Data for Monthly average reading recorded at Karve Road - CAAQMS

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Karve Road - CAAQMS	2016	Apr	23	68	91
		May	26	83	75
		Jun	26	69	61
		Jul	11	51	36
		Aug	6	46	29
		Sep	27	142	41
		Oct	19	99	79
		Nov	17	101	145
		Dec	14	77	114
	2017	Jan	12	48	100
		Feb	17	65	82
		Mar	22	62	78

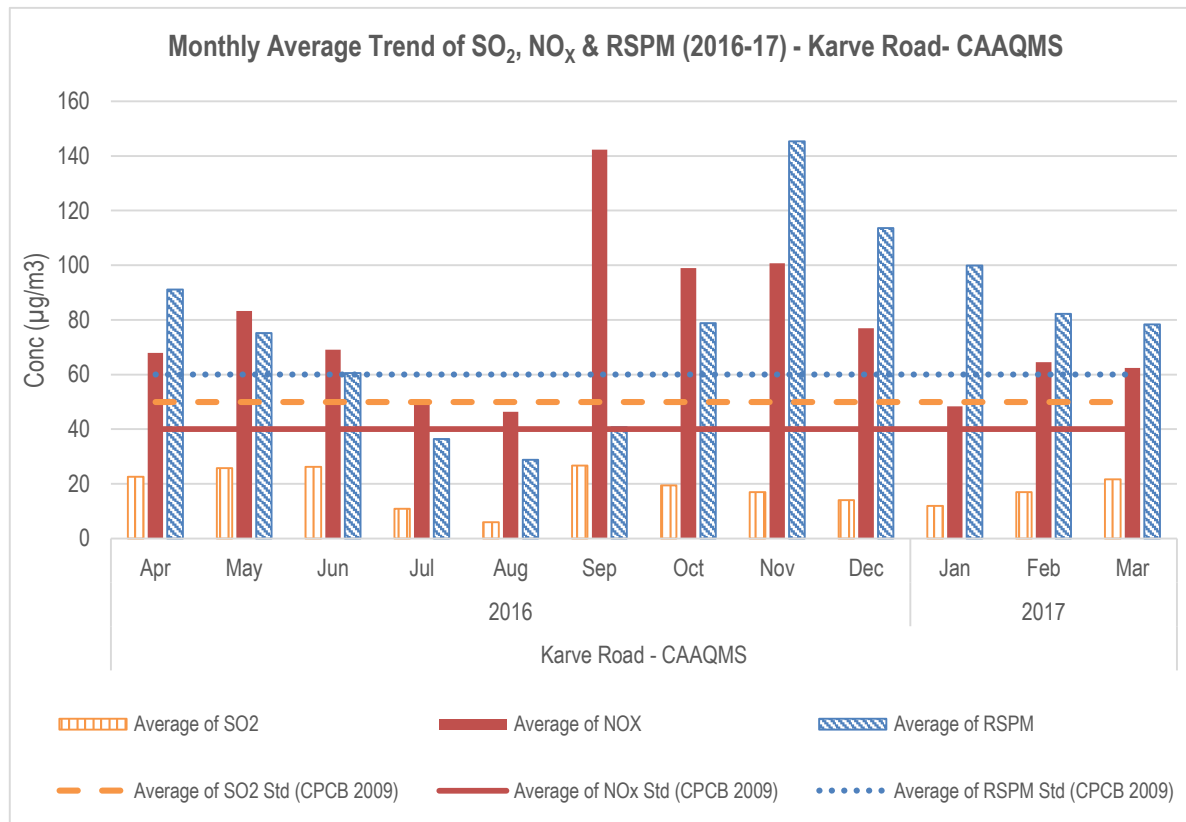


Figure No. 144: Monthly average reading recorded at Karve Road – CAAQMS

Table No. 168: Data for Annual average trend of SO₂, NO_x, and RSPM at Karve Road - CAAQMS

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Karve Road - CAAQMS	07-08	13	43	71
	08-09	25	39	121
	09-10	11	35	109
	10-11	12	39	128
	11-12	11	49	131
	12-13	22	66	124
	13-14	27	70	121
	14-15	15	36	123
	15-16	25	57	138
	16-17	18	77	79

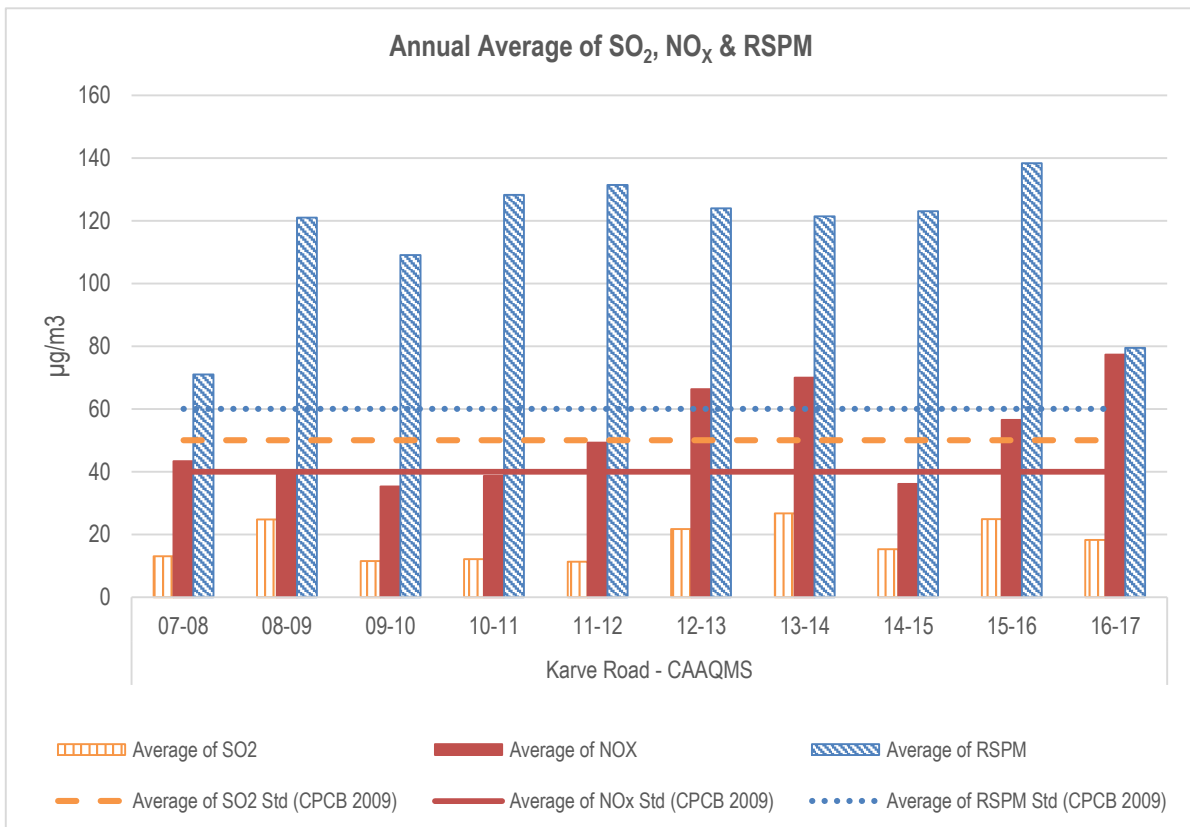


Figure No. 145: Annual average trend of SO₂, NO_x, and RSPM at Karve Road - CAAQMS

Solapur - WIT Campus

Table No. 169: Data for Monthly average reading recorded at WIT Campus

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
WIT Campus	2016	Apr	13	35	76
		May	12	36	74
		Jun	12	35	71
		Aug	12	36	70
		Sep	13	35	65
		Oct	13	33	69
		Nov	13	33	66
		Dec	13	33	67
	2017	Jan	14	33	66
		Feb	14	33	67
		Mar	14	33	67

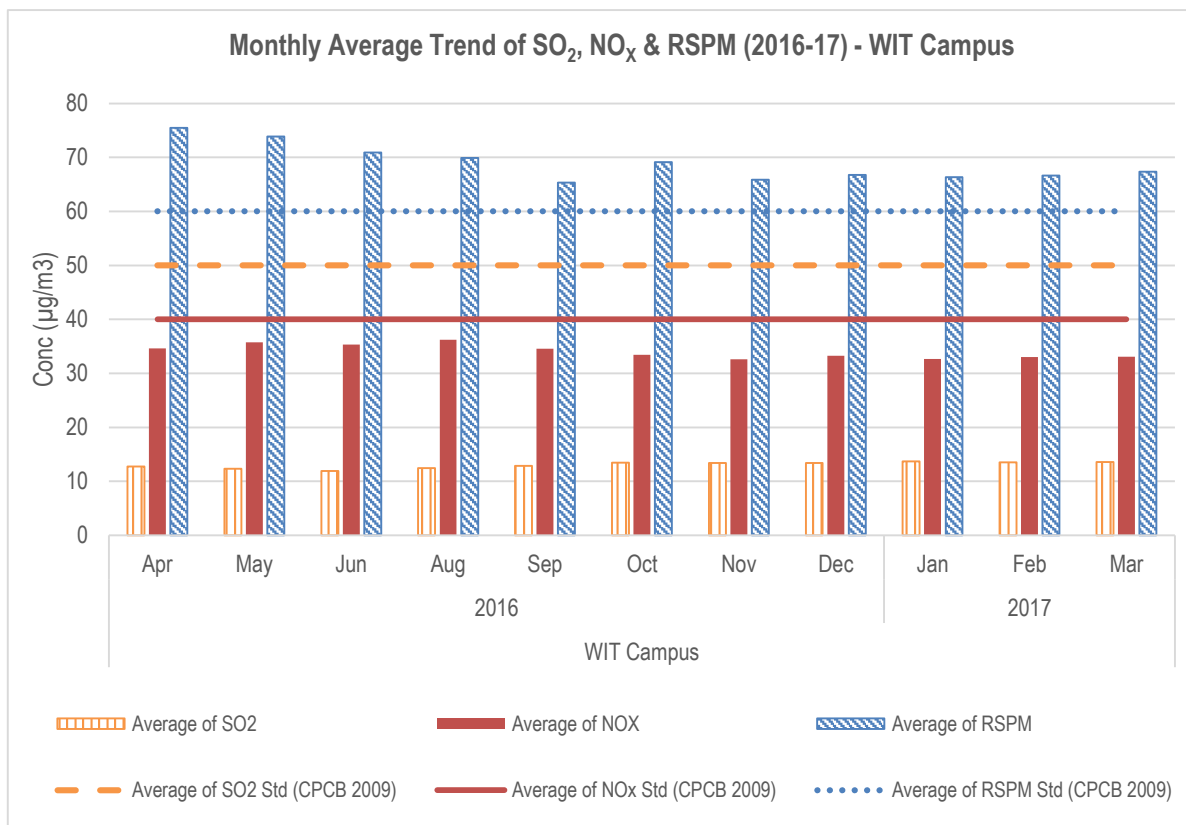


Figure No. 146: Monthly average reading recorded at WIT Campus

Table No. 170: Data for Annual average trend of SO₂, NO_x, and RSPM at WIT Campus

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
WIT Campus	04-05	18	40	137
	05-06	17	37	115
	06-07	16	35	97
	07-08	17	34	86
	08-09	17	35	76
	09-10	17	35	71
	10-11	17	35	74
	11-12	17	35	77
	12-13	17	35	78
	13-14	15	35	84
	14-15	14	34	77
	15-16	13	35	76
	16-17	13	34	69

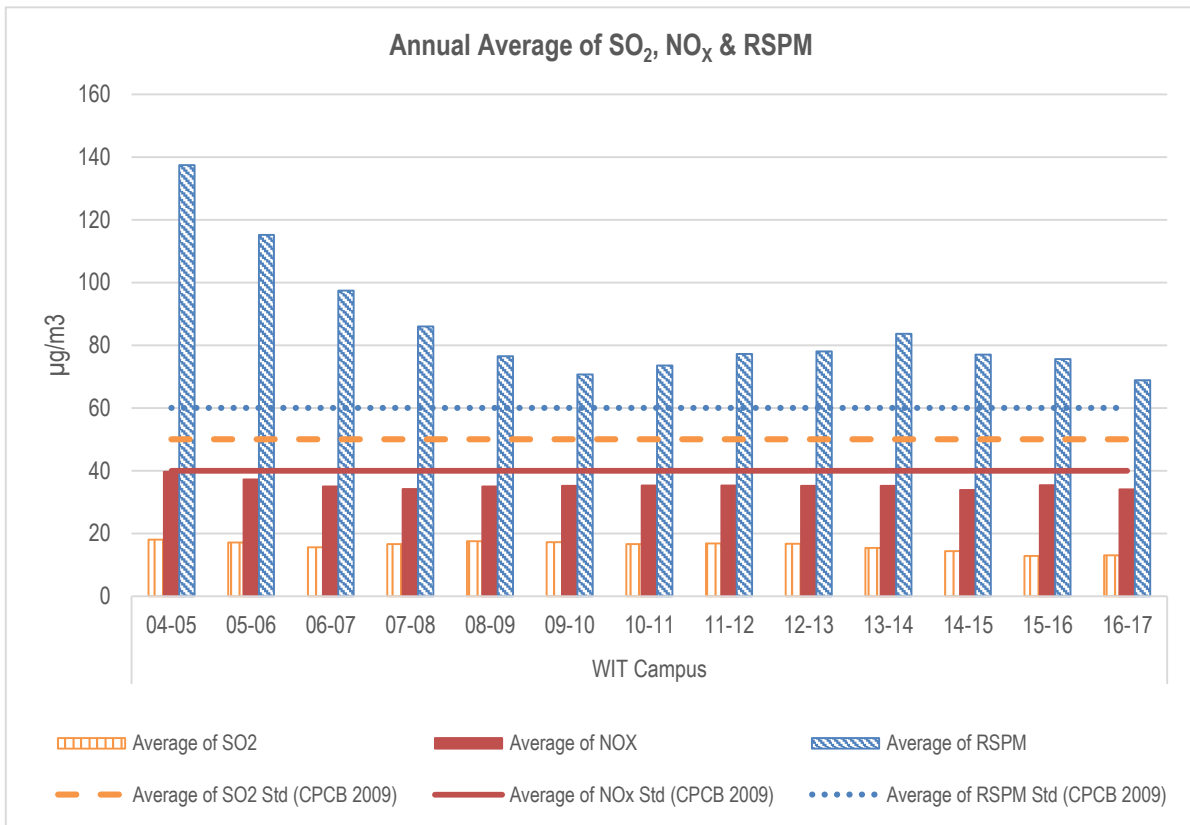


Figure No. 147: Annual average trend of SO₂, NO_x, and RSPM at WIT Campus

Solapur - Saat Rasta - Chithale Clinic

Table No. 171: Data for Monthly average reading recorded at Saat Rasta - Chithale Clinic

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Saat Rasta- Chithale Clinic	2016	Apr	12	35	76
		May	12	35	74
		Jun	12	35	69
		Jul	14	36	48
		Aug	12	37	57
		Sep	13	33	67
		Oct	14	34	65
		Nov	14	34	71
		Dec	14	33	68
	2017	Jan	18	40	166
	Mar	14	33	69	

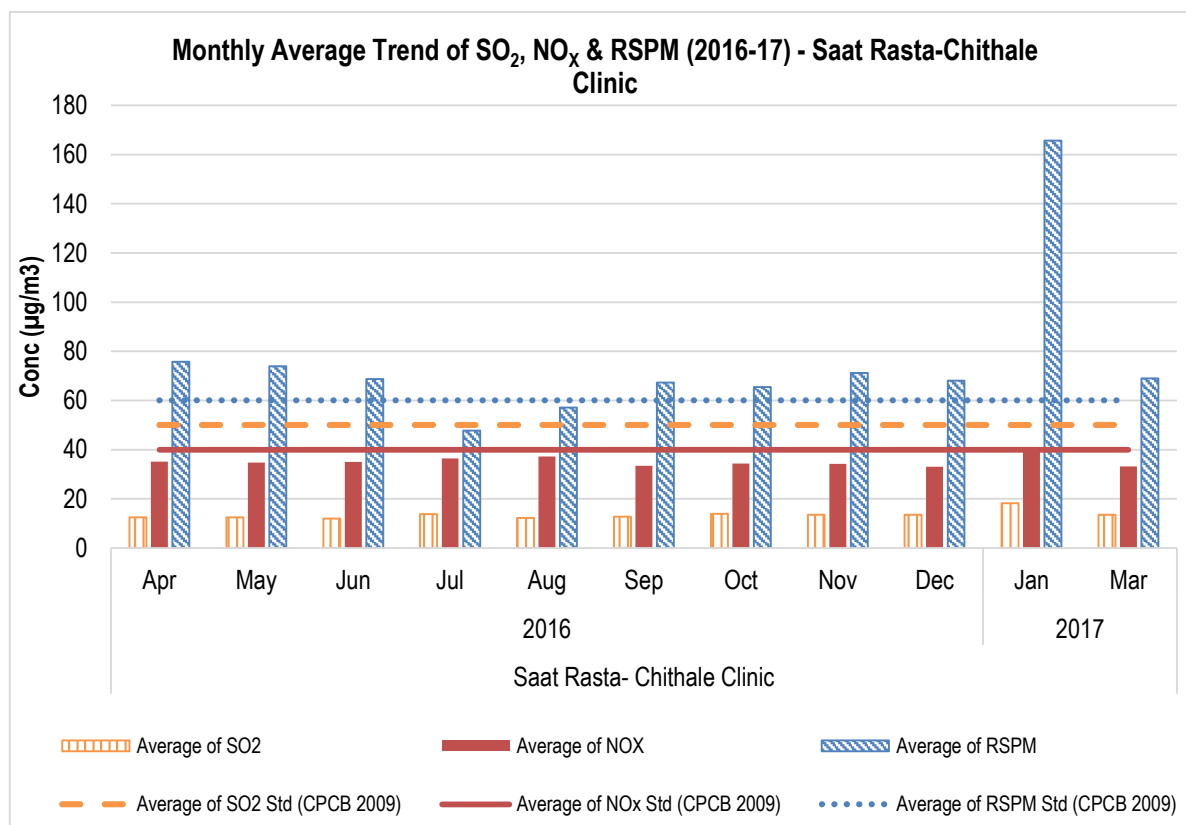
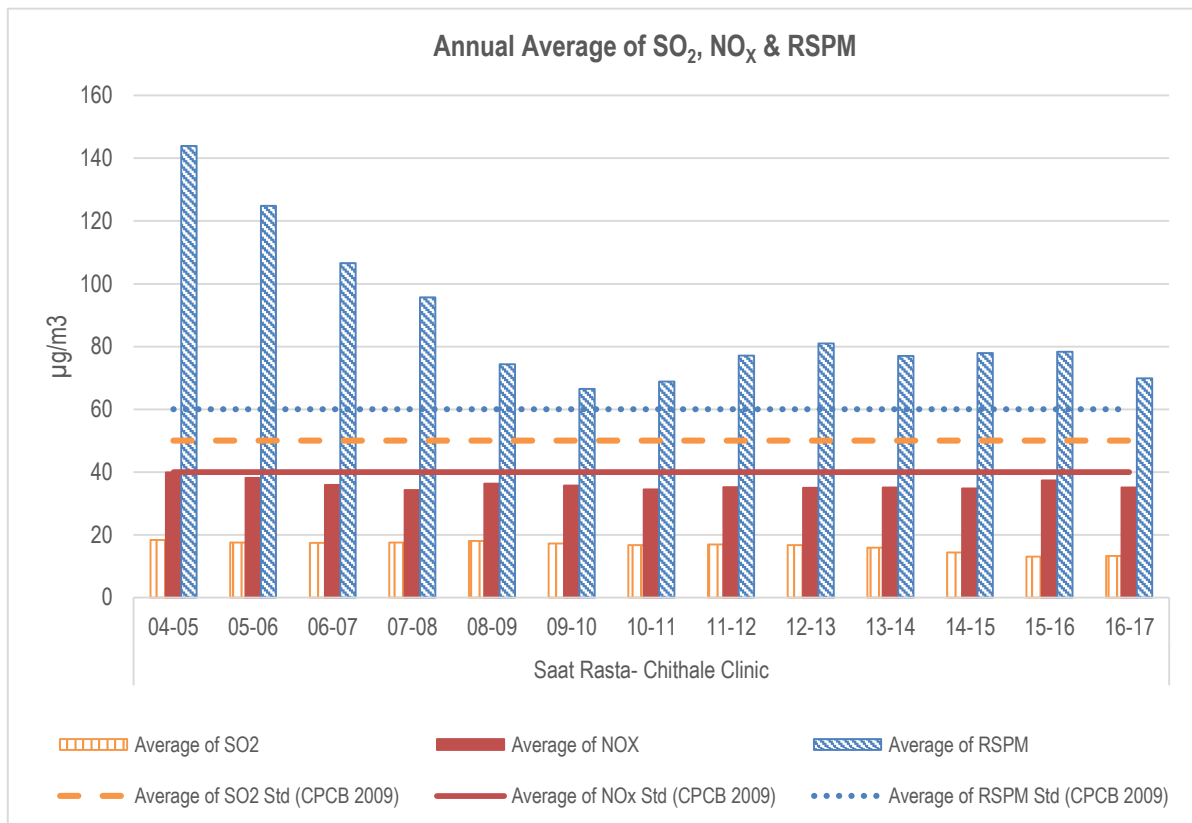


Figure No. 148: Monthly average reading recorded at Saat Rasta - Chithale Clinic

Table No. 172: Data for Annual average trend of SO₂, NO_x, and RSPM at Saat Rasta - Chithale Clinic

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Saat Rasta-Chithale Clinic	04-05	18	40	144
	05-06	18	38	125
	06-07	17	36	107
	07-08	18	34	96
	08-09	18	36	74
	09-10	17	36	66
	10-11	17	34	69
	11-12	17	35	77
	12-13	17	35	81
	13-14	16	35	77
	14-15	14	35	78
	15-16	13	37	78
	16-17	13	34	71

Figure No. 149: Annual average trend of SO₂, NO_x, and RSPM at Saat Rasta - Chithale Clinic

Solapur - Solapur

Table No. 173: Data for Monthly average reading recorded at Solapur

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM	
			50	40	60	
Solapur	2016	Apr	11	51	107	
		May	13	44	77	
		Jun	14	39	50	
		Jul	15	37	33	
		Aug	14	35	35	
		Sep	14	34	39	
		Oct	14	38	97	
		Nov	12	45	162	
		Dec	13	48	158	
		2017	Jan	17	44	172
			Feb	20	39	160
			Mar	18	42	131

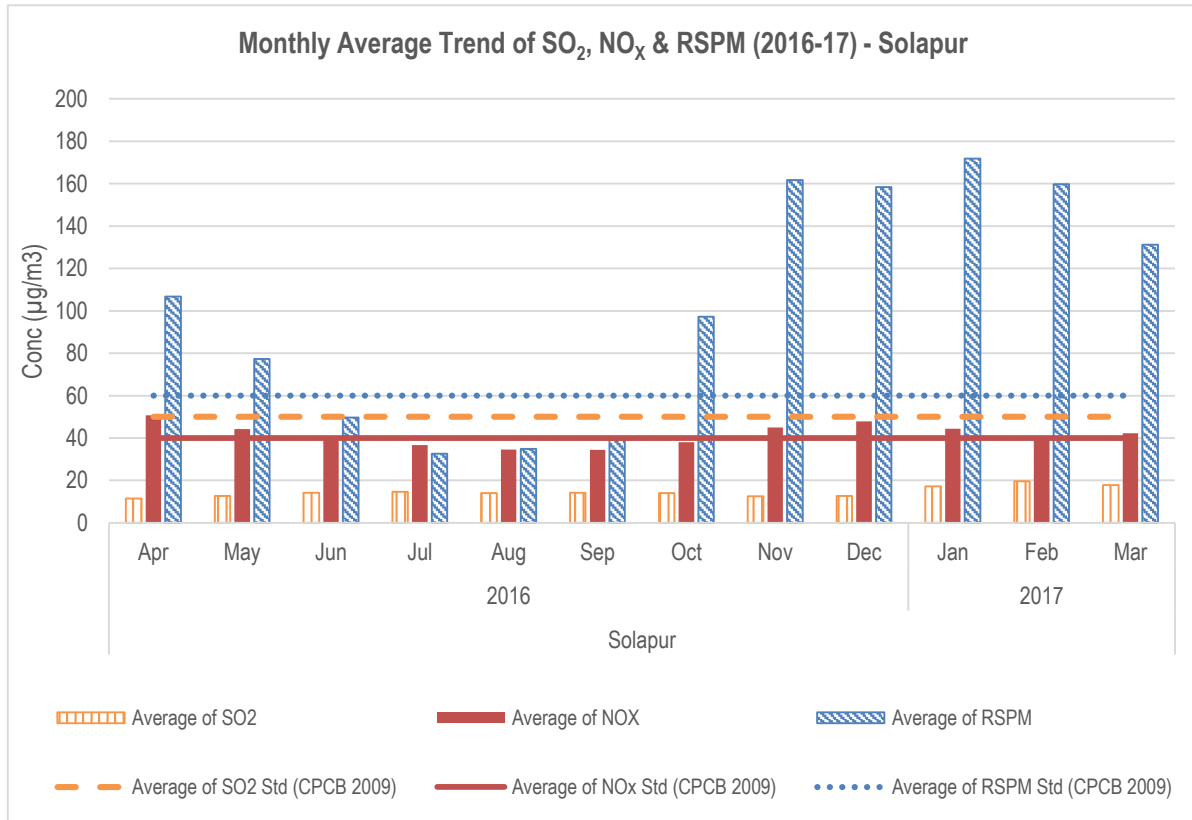


Figure No. 150: Monthly average reading recorded at Solapur

Table No. 174: Data for Annual average trend of SO₂, NO_x, and RSPM at Solapur

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Solapur	07-08	15	31	102
	08-09	15	30	96
	10-11	13	37	112
	11-12	12	40	116
	12-13	16	42	106
	13-14	15	42	96
	14-15	9	38	104
	15-16	13	49	100
	16-17	15	41	106

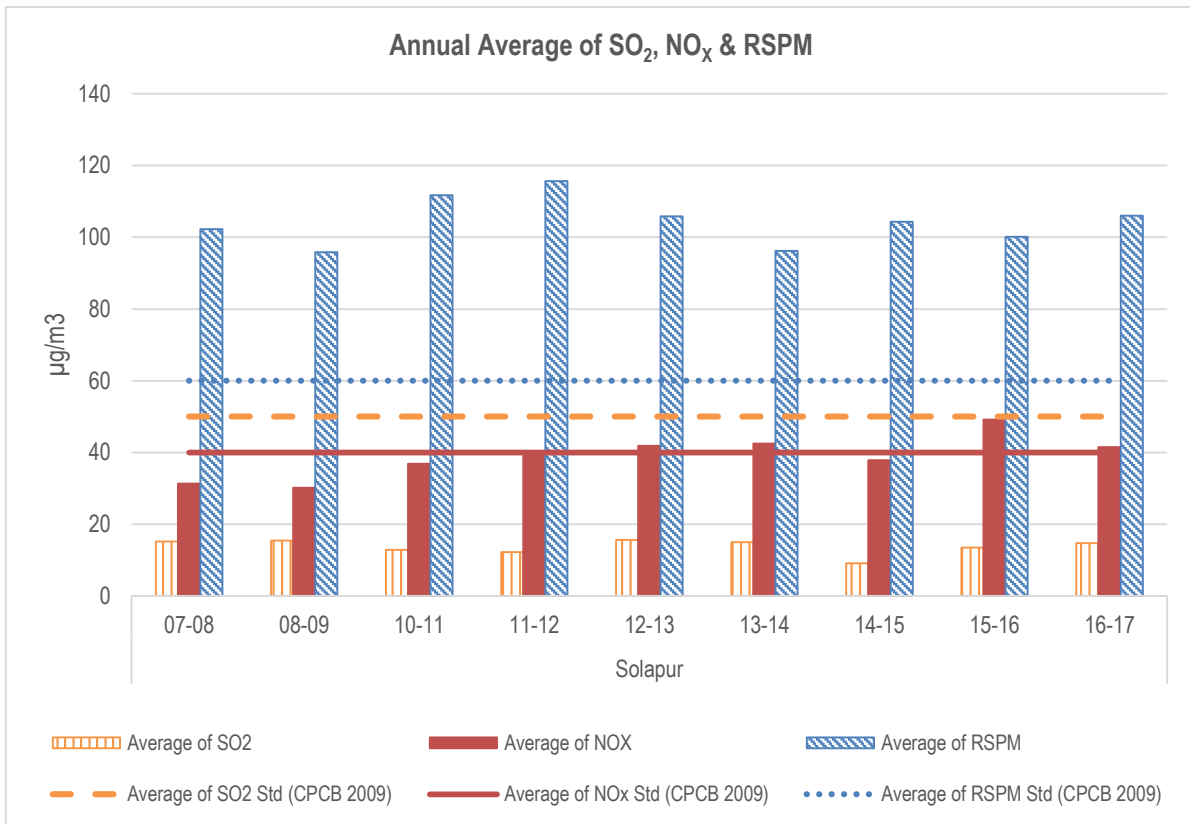
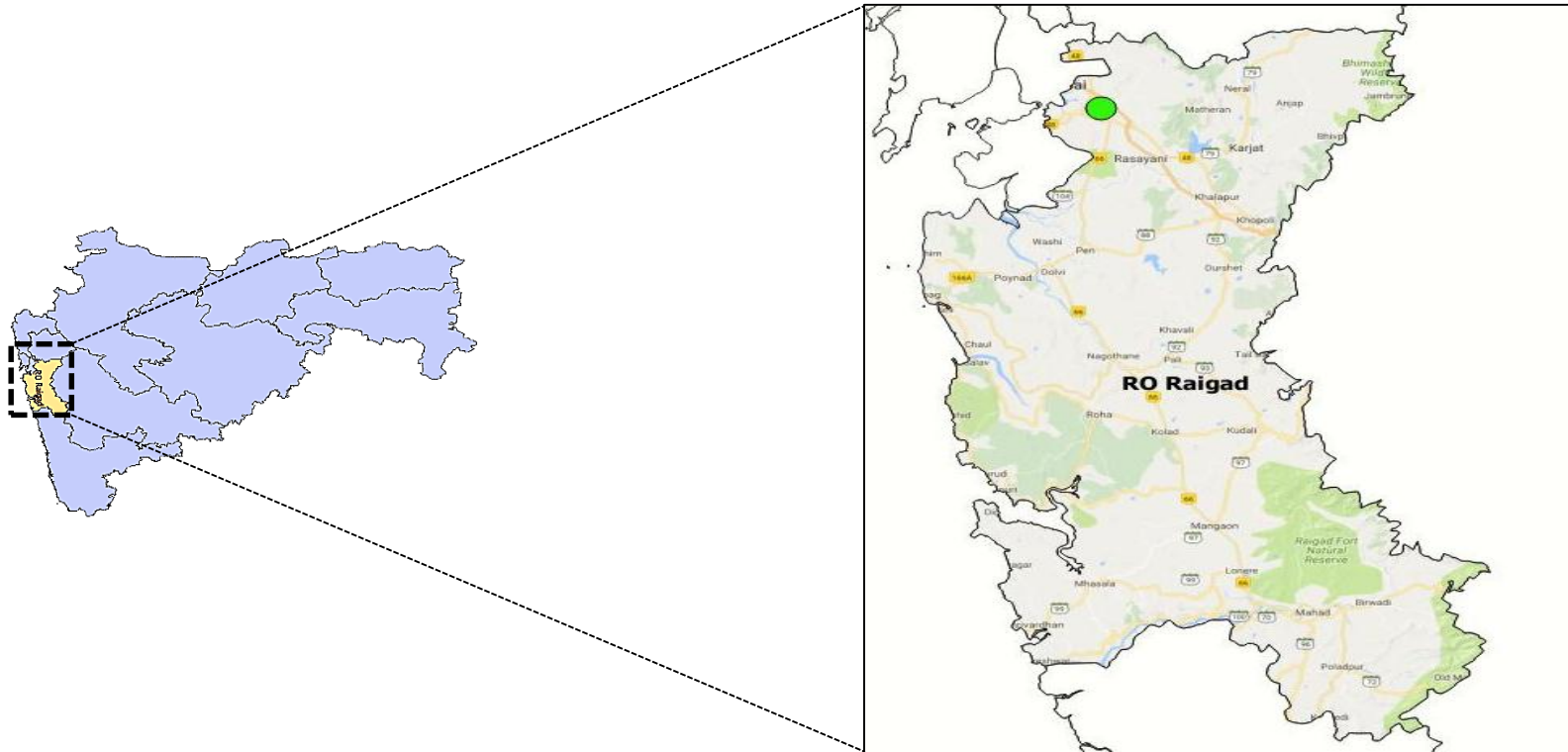


Figure No. 151: Annual average trend of SO₂, NO_x, and RSPM at Solapur

Table No. 175: Percentage exceedance of pollutants at Pune RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Bhosari	100	0	25	49	0	25	49
Nal Stop	86	0	38	44	0	44	51
Swargate, Pune	115	0	48	45	0	42	39
Pimpri-Chinchwad - BOB Building	230	1	74	79	0	32	34
Karve Road - CAAQMS	325	1	113	82	0	35	25
WIT Campus	95	0	0	0	0	0	0
Saat Rasta- Chithale Clinic	101	0	0	6	0	0	6
Solapur	318	0	1	176	0	0	55

RO - Raigad



Region	Station code	Station name	Program	Latitude	Longitude
Panvel	495	Panvel- Water Supply Plant	NAMP	18° 59' 23.8" N	73° 07'03.5" E

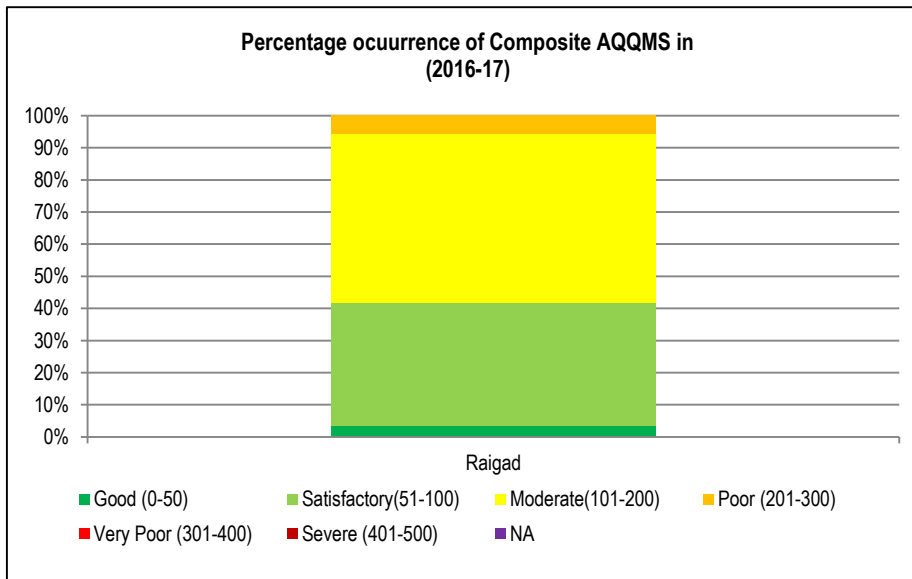
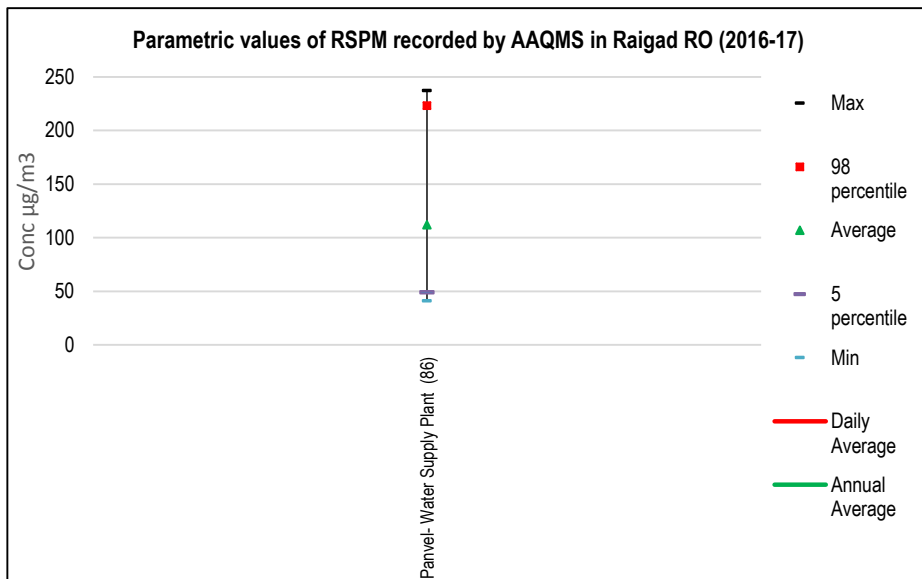
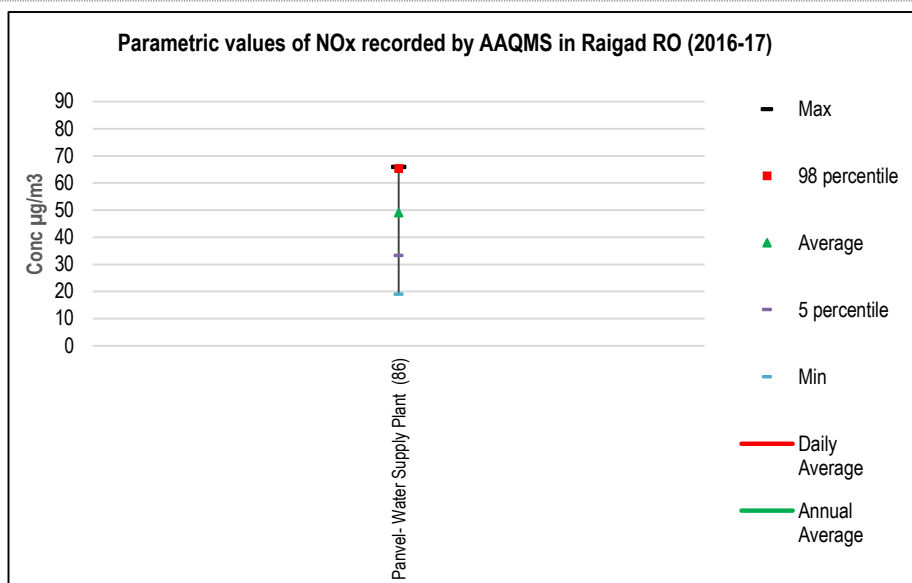
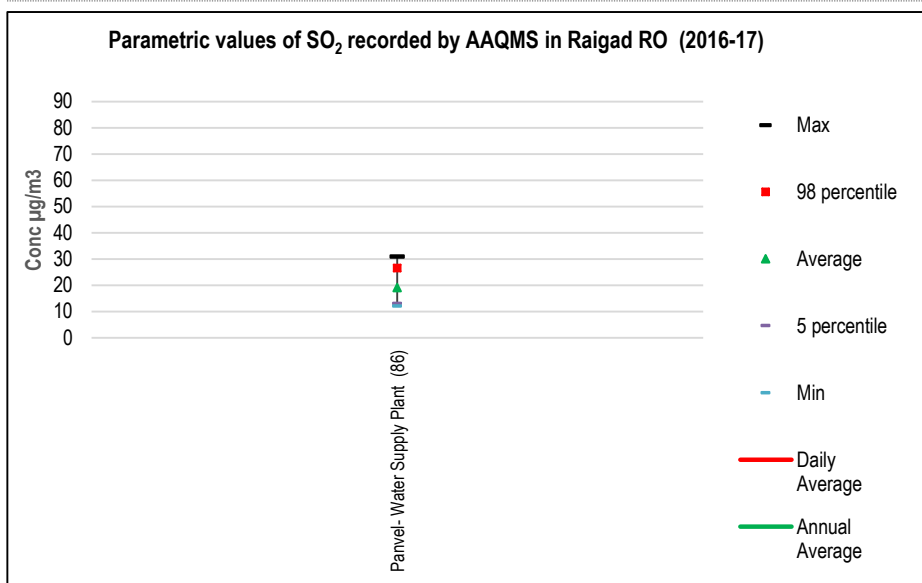


Table No. 176: Data for SO₂, NO_x & RSPM recorded at AAQMS in Raigad RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	80		50	80	
	Panvel-Water Supply Plant (86)	31	27	19	13	12
NO _x	<i>CPCB Standard</i>	80		40	80	
	Panvel-Water Supply Plant (86)	66	65	49	33	19
RSPM (PM ₁₀)	<i>CPCB Standard</i>	100		60	100	
	Panvel-Water Supply Plant (86)	237	223	112	49	41

Panvel - Panvel – Water Supply Plant

Table No. 177: Data for Monthly average reading recorded at Panvel – Water Supply Plant

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Panvel- Water Supply Plant	2016	Apr	21	47	150
		May	18	44	151
		Jun	18	58	141
		Jul	18	59	92
		Aug	22	46	66
		Sep	18	36	74
		Oct	19	49	82
		Nov	18	53	98
		Dec	19	52	157
	2017	Feb	18	48	107

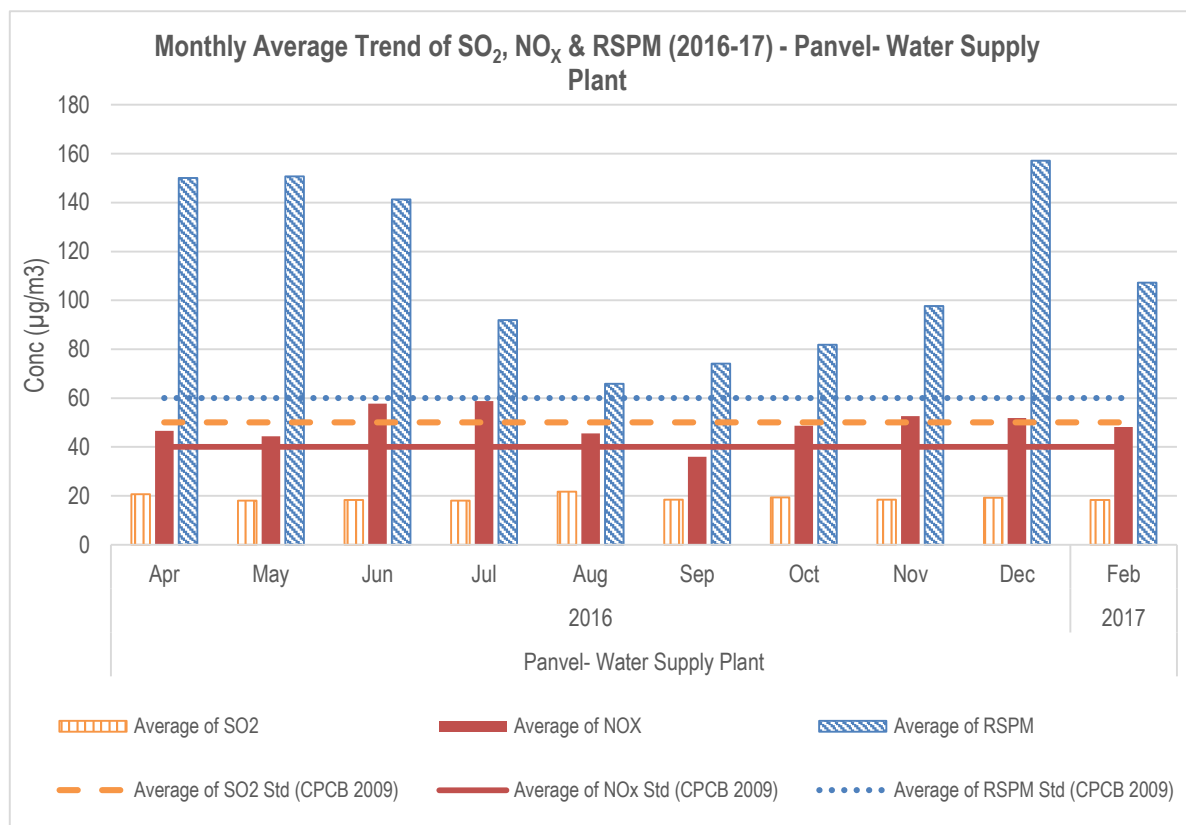


Figure No. 152: Monthly average reading recorded at Panvel – Water Supply Plant

Table No. 178: Data for Annual average trend of SO₂, NO_x, and RSPM at Panvel – Water Supply Plant

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Panvel- Water Supply Plant	06-07	14	35	115
	07-08	12	37	143
	08-09	14	40	132
	09-10	12	42	71
	10-11	15	35	119
	11-12	15	42	140
	12-13	16	42	168
	13-14	16	41	203
	14-15	17	38	136
	15-16	18	43	137
	16-17	19	49	112

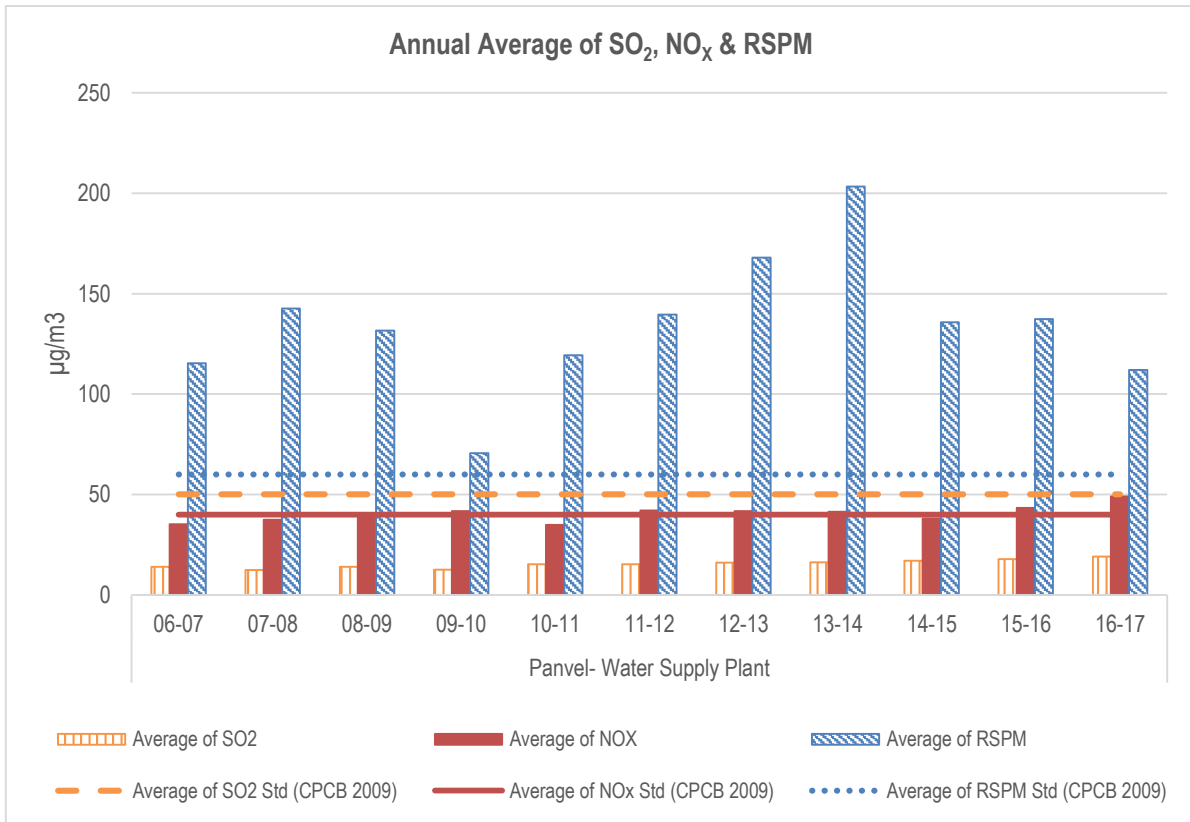
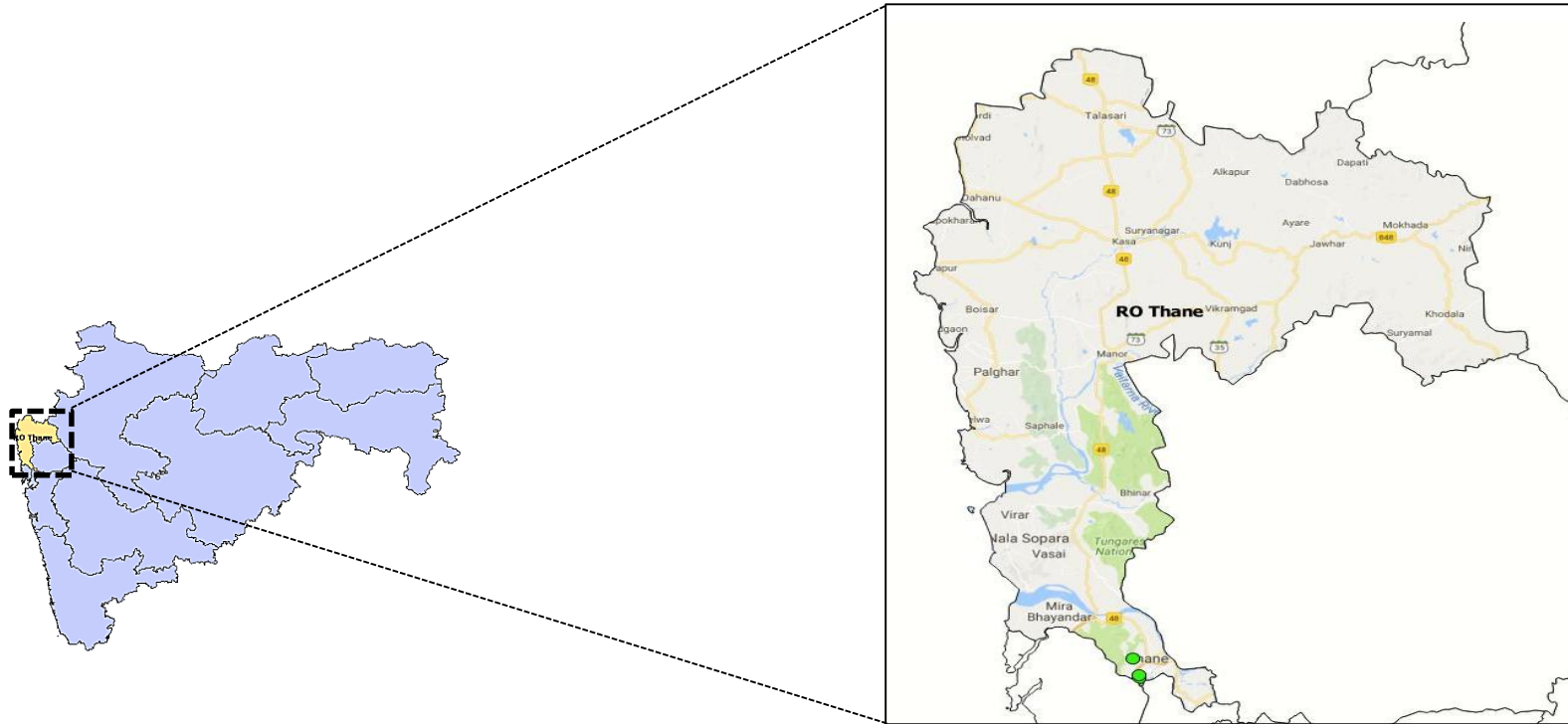


Figure No. 153: Annual average trend of SO₂, NO_x, and RSPM at Panvel – Water Supply Plant

Table No. 179: Percentage exceedance of pollutants at Raigad RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Panvel- Water Supply Plant	86	0	0	50	0	0	58

RO - Thane



Region	Station code	Station name	Program	Latitude	Longitude
Thane	303	Kopri	NAMP	19° 10' 59.8" N	72°58' 04.7" E
Thane	304	Naupada	NAMP	19 ° 11' 17.4" N	72°58' 04.7"E
Thane	305	Balkum/Glaxo	NAMP	19° 12' 58.97" N	72°57' 33.11"E

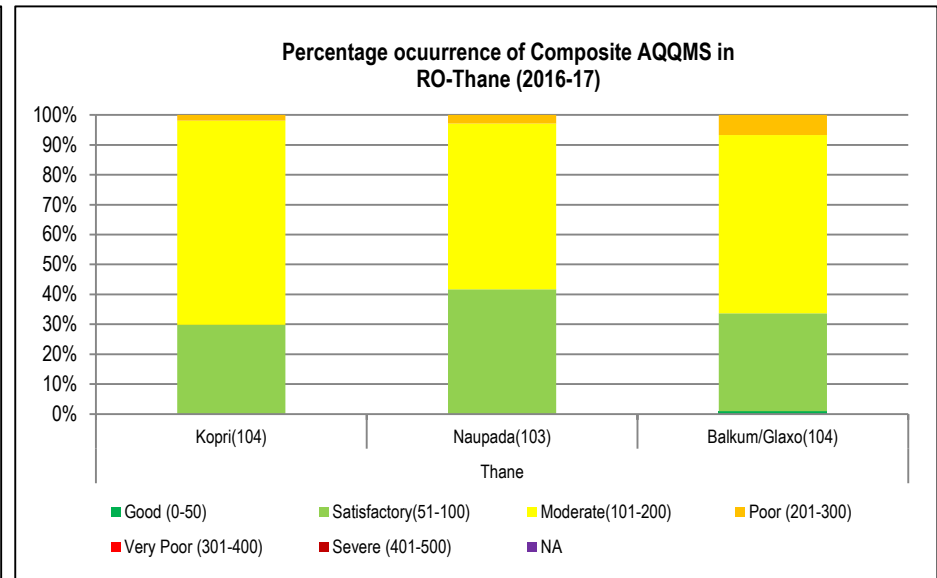
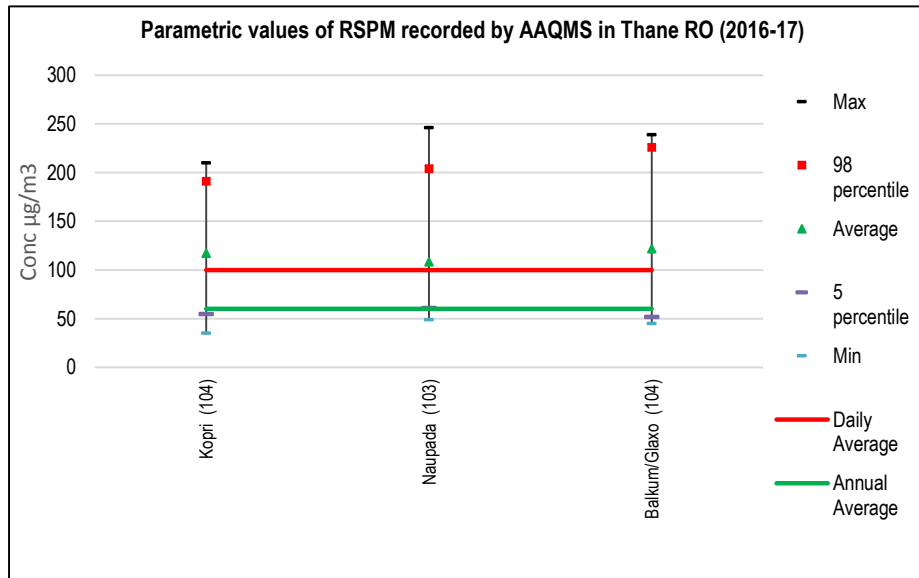
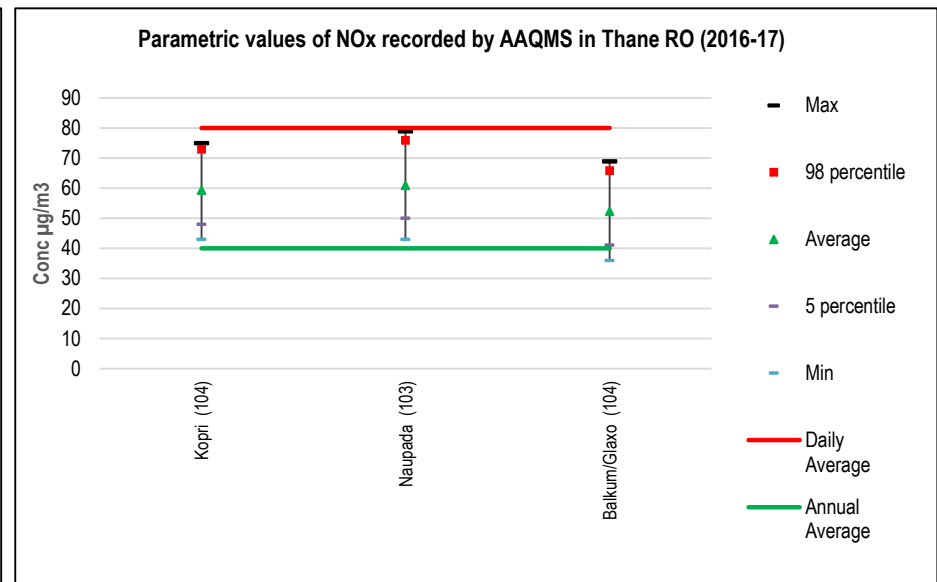
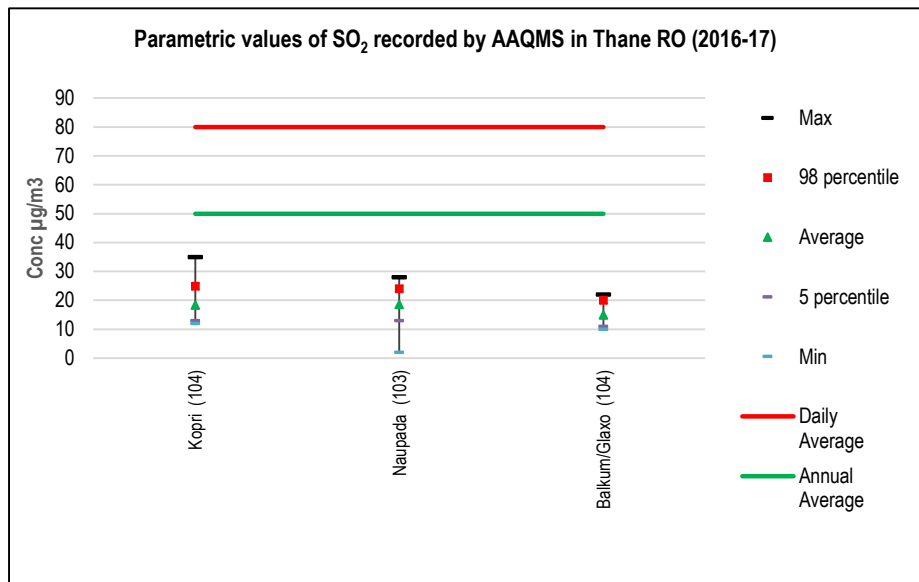


Table No. 180 : Data for SO₂, NO_x & RSPM recorded at AAQMS in Thane RO (2016-17)

Parameter	Station Name (no of daily observations)	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
SO ₂	<i>CPCB Standard</i>	80		50	80	
	Kopri (104)	35	25	18	13	12
	Naupada (103)	28	24	19	13	2
	Balkum/Glaxo (104)	22	20	15	11	10
NO _x	<i>CPCB Standard</i>	80		40	80	
	Kopri (104)	75	73	59	48	43
	Naupada (103)	79	76	61	50	43
	Balkum/Glaxo (104)	69	66	52	41	36
RSPM (PM ₁₀)	<i>CPCB Standard</i>	100		60	100	
	Kopri (104)	210	191	117	55	35
	Naupada (103)	246	204	108	61	49
	Balkum/Glaxo (104)	239	226	122	52	45

Thane - Kopri

Table No. 181: Data for Monthly average reading recorded at Kopri

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Kopri	2016	Apr	23	71	130
		May	21	69	109
		Jun	20	61	90
		Jul	18	53	102
		Aug	16	47	94
		Sep	16	54	73
		Oct	17	55	119
		Nov	14	57	134
		Dec	18	61	125
	2017	Jan	17	58	154
		Feb	19	60	140
		Mar	23	67	131

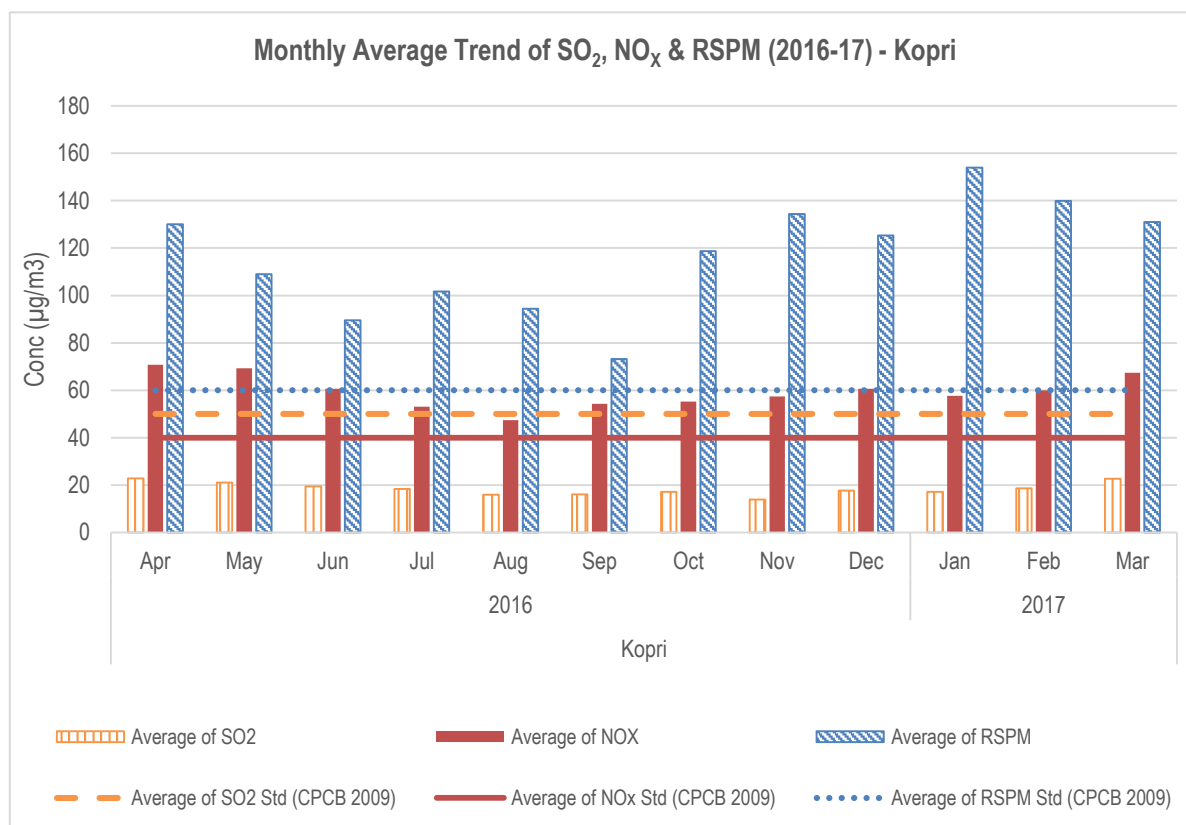


Figure No. 154: Monthly average reading recorded at Kopri

Table No. 182: Data for Annual average trend of SO₂, NO_x, and RSPM at Kopri

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Kopri	04-05	8	11	45
	05-06	6	9	51
	06-07	12	10	51
	07-08	11	10	50
	08-09	11	16	60
	09-10	11	13	50
	10-11	12	11	46
	11-12	12	9	60
	12-13	20	15	86
	13-14	16	41	114
	14-15	21	61	106
	15-16	27	62	136
	16-17	18	59	117

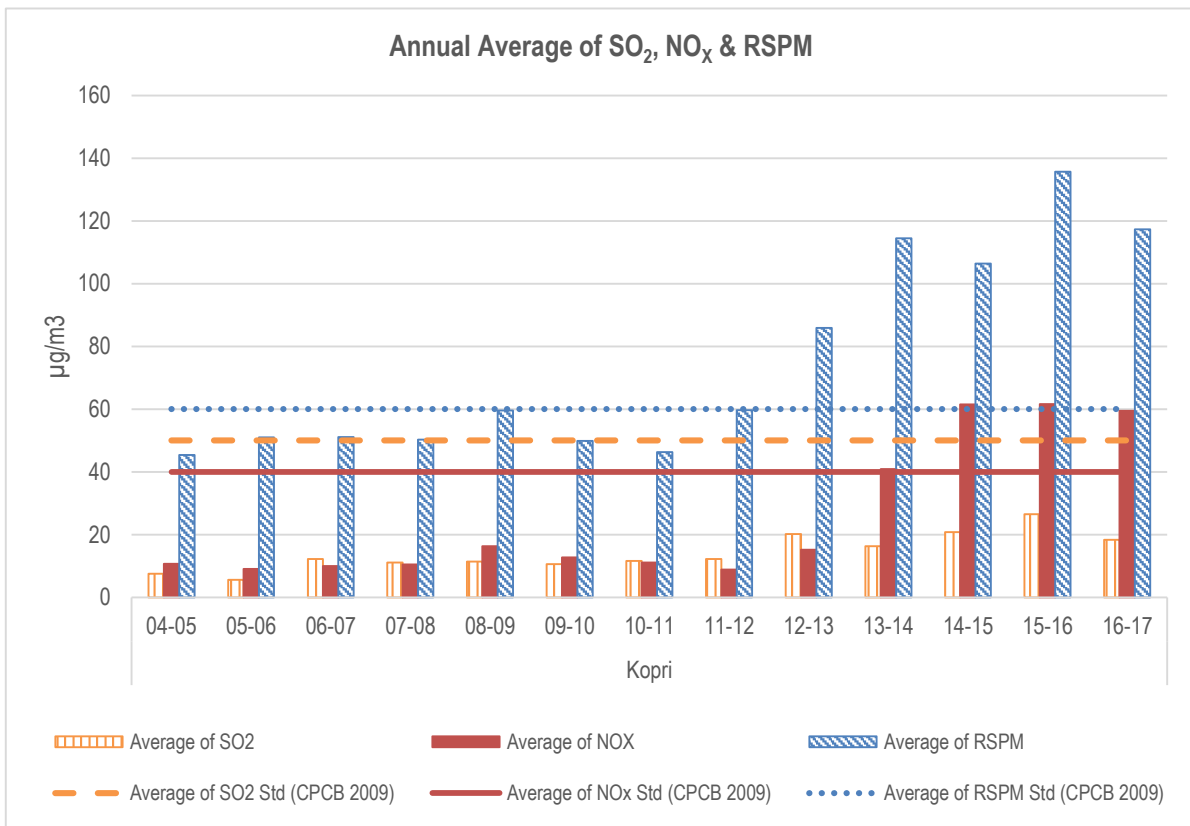


Figure No. 155: Annual average trend of SO₂, NO_x, and RSPM at Kopri

Thane - Naupada

Table No. 183: Data for Monthly average reading recorded at Naupada

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Naupada	2016	Apr	20	71	111
		May	22	74	99
		Jun	17	61	109
		Jul	19	55	96
		Aug	18	52	95
		Sep	17	53	95
		Oct	18	59	87
		Nov	15	55	94
		Dec	18	61	104
	2017	Jan	19	63	144
		Feb	18	62	139
		Mar	23	67	134

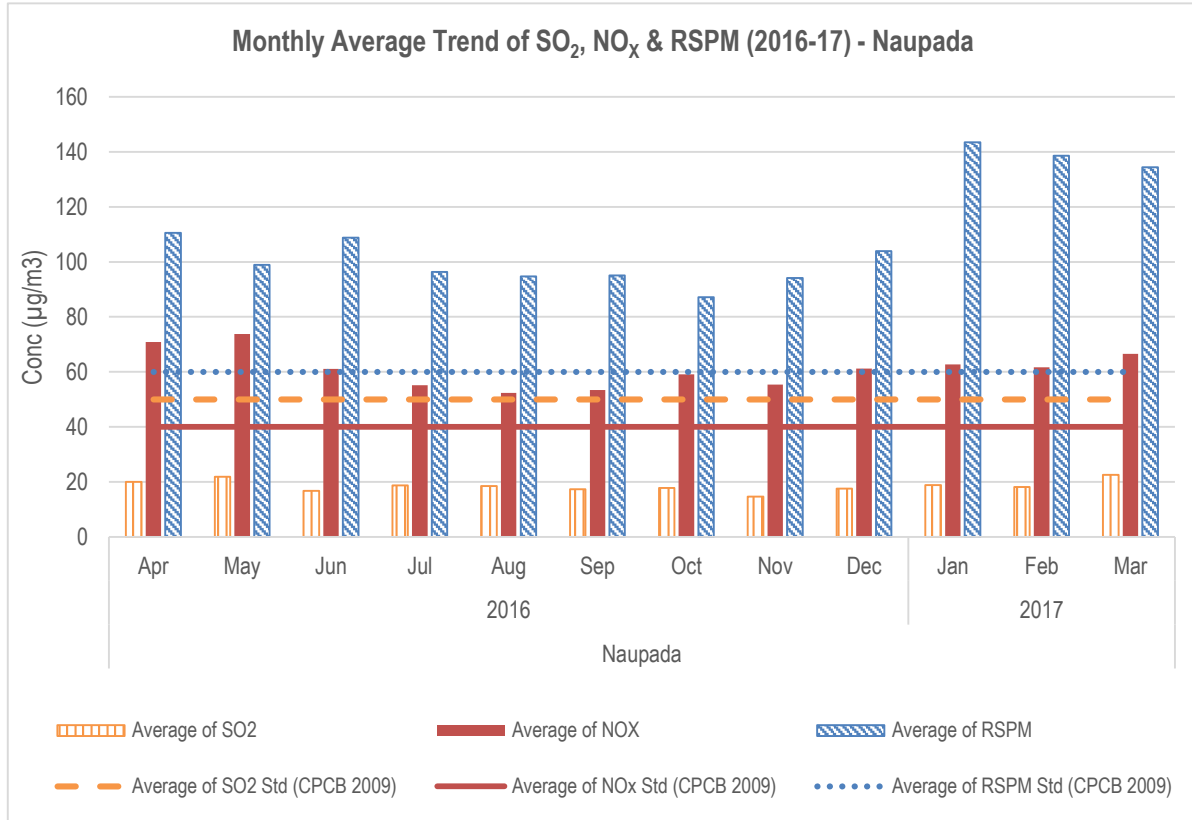


Figure No. 156: Monthly average reading recorded at Naupada

Table No. 184: Data for Annual average trend of SO₂, NO_x, and RSPM at Naupada

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Naupada	04-05	8	11	46
	05-06	6	10	51
	06-07	12	9	52
	07-08	11	10	50
	08-09	11	15	60
	09-10	14	21	55
	10-11	14	13	48
	11-12	13	10	56
	12-13	21	16	93
	13-14	17	43	113
	14-15	21	62	104
	15-16	28	63	102
	16-17	19	61	108

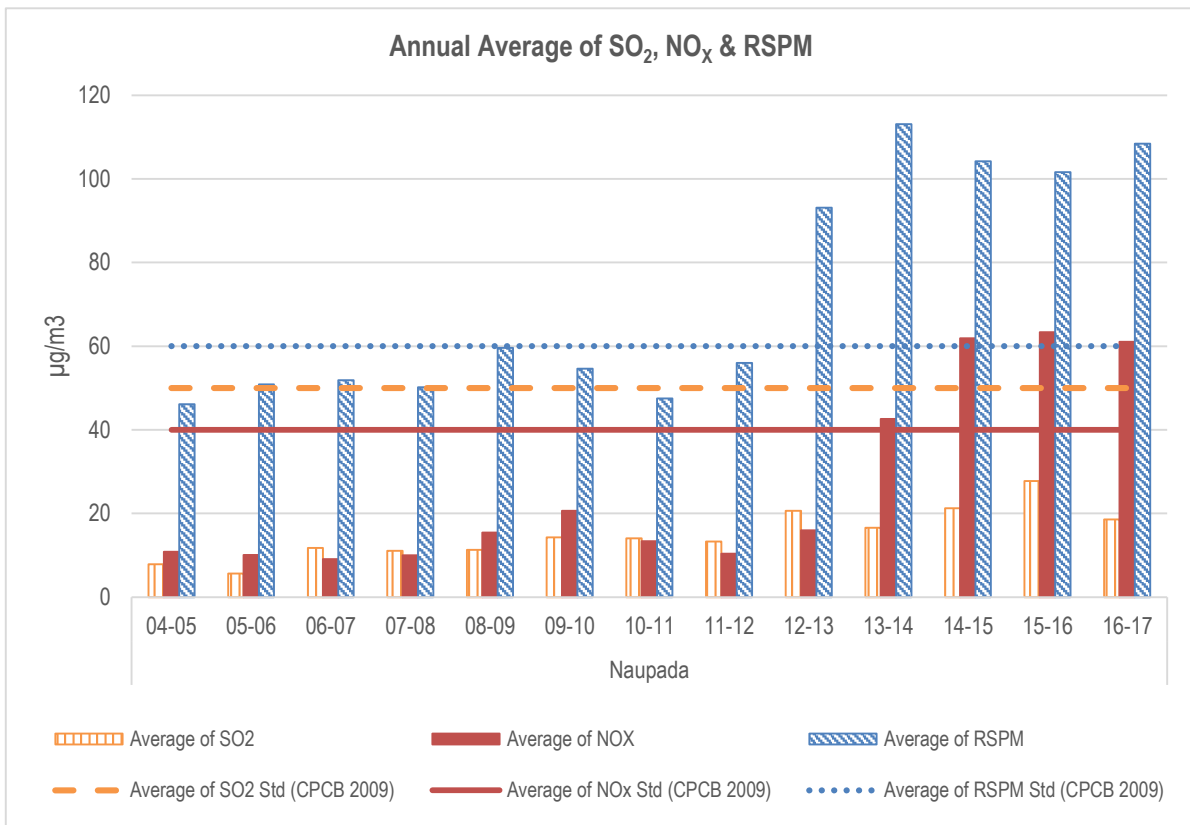


Figure No. 157: Annual average trend of SO₂, NO_x, and RSPM at Naupada

Thane - Balkum Glaxo

Table No. 185: Data for Monthly average reading recorded at Balkum Glaxo

Station Name	Year	Month	Average of SO ₂	Average of NO _x	Average of RSPM
			50	40	60
Balkum/Glaxo	2016	Apr	19	65	120
		May	18	61	106
		Jun	16	54	96
		Jul	14	48	92
		Aug	16	48	98
		Sep	15	48	74
		Oct	14	46	119
		Nov	11	47	142
		Dec	13	52	172
	2017	Jan	13	53	168
		Feb	14	53	154
		Mar	17	55	125

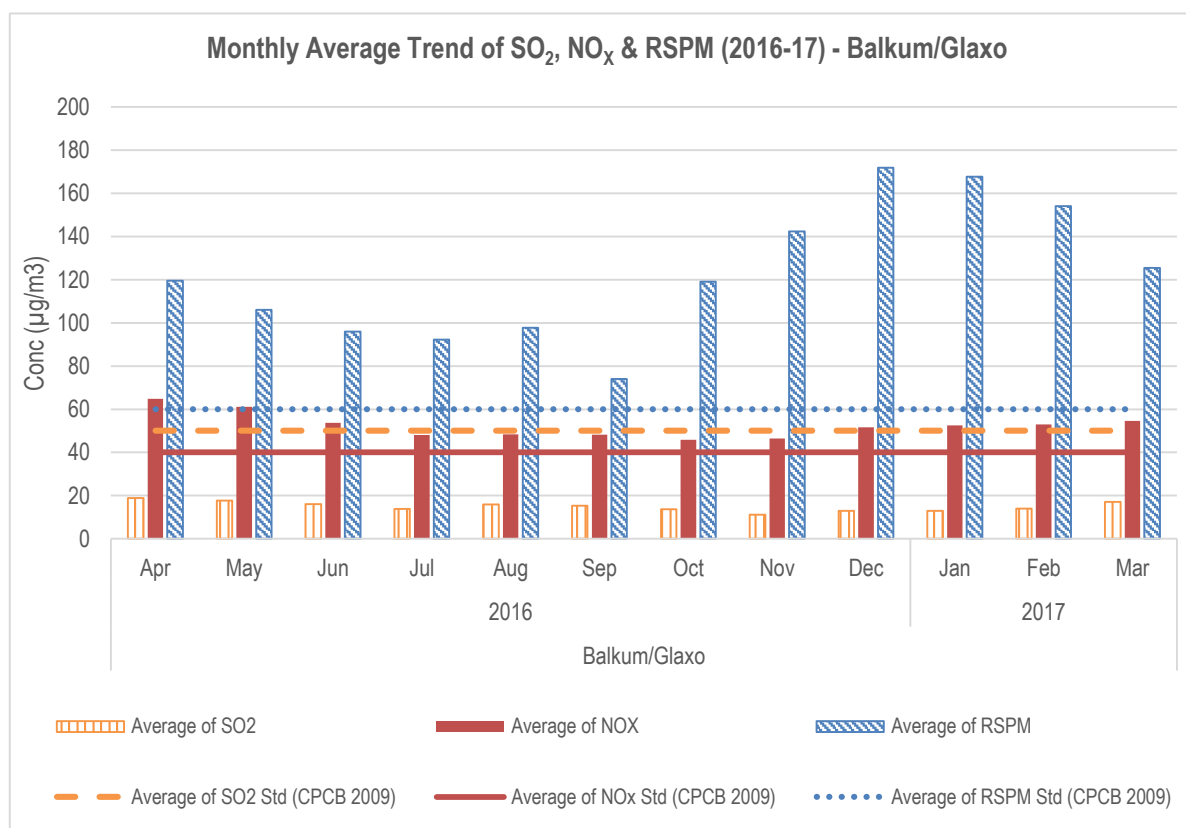


Figure No. 158: Monthly average reading recorded at Balkum Glaxo

Table No. 186: Data for Annual average trend of SO₂, NO_x, and RSPM at Balkum Glaxo

Station Name	Year	Average of SO ₂	Average of NO _x	Average of RSPM
		50	40	60
Kolshet/Balkum/Glaxo	04-05	9	12	48
	05-06	6	10	51
	06-07	13	11	63
	07-08	14	14	53
	08-09	15	21	63
	09-10	13	21	57
	10-11	12	13	48
	11-12	19	13	57
	12-13	18	14	73
	13-14	15	34	107
	14-15	20	60	131
	15-16	24	58	132
	16-17	15	52	122

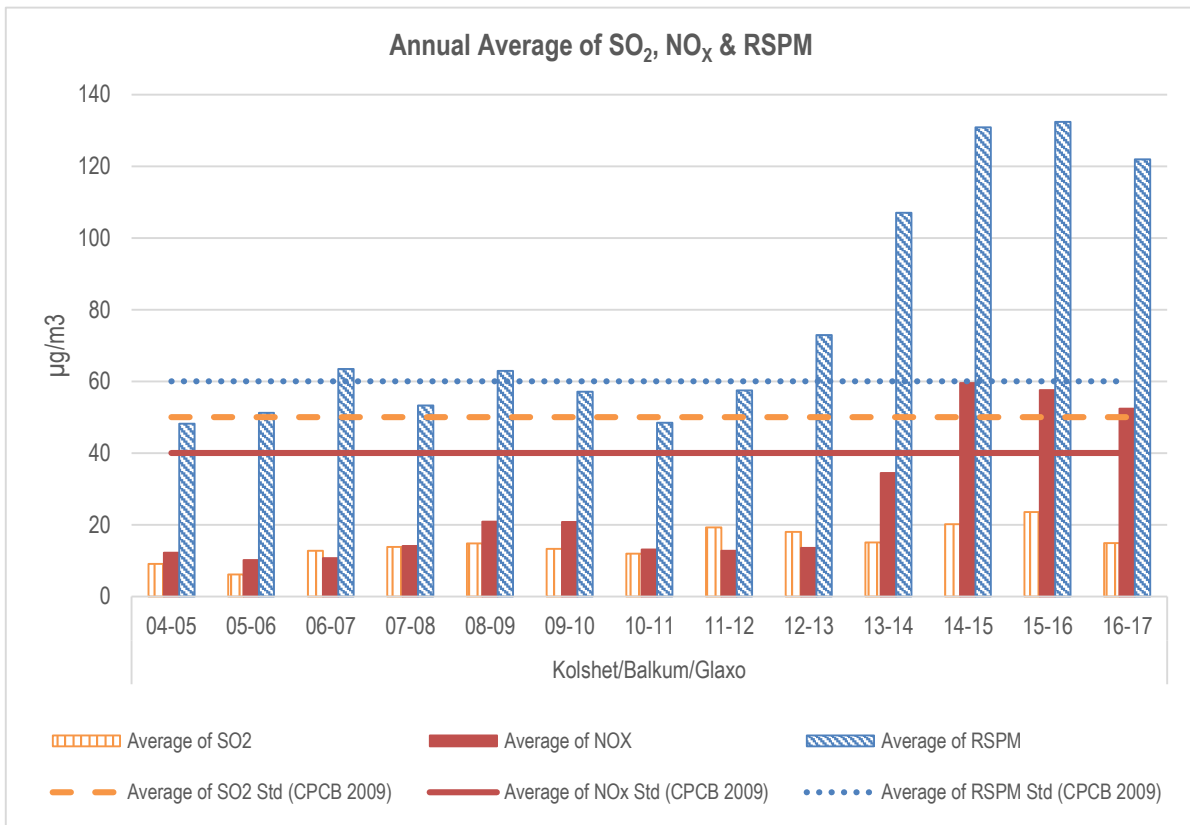


Figure No. 159: Annual average trend of SO₂, NO_x, and RSPM at Balkum Glaxo

Table No. 187: Percentage exceedance of pollutants at Thane RO

Station Name	Total Observations	Number of observations			Percentage Exceedance		
		ESO	E N	E R	SO ₂	NO _x	RSPM
Kopri	104	0	0	73	0	0	70
Naupada	103	0	0	60	0	0	58
Balkum/Glaxo	104	0	0	69	0	0	66

Annex – 3: Parametric values of pollutants recorded by AAQMS 2016-17

Sulphur -dioxide

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
Amravati	LRT Commerce College	103	11	11	8	5	3
	MIDC Water Works - Akola	107	13	12	9	5	4
	Akola- College of Engg & Technology	91	12	11	9	5	4
	Raj Kamal Chowk	61	17	16	13	8	7
	Govt. College of Engineering	56	14	14	11	9	6
	Godhadiwala Private Limited	53	16	16	12	10	8
Aurangabad	SBES College	97	40	26	14	9	7
	Collector Office, Aurangabad	90	29	18	11	7	5
	C.A.D.A. Office	92	24	23	13	8	6
	Aurangabad CAAQMS	365	32	23	5	2	1
	Jalna- Bachat Bhavan	75	17	17	10	4	3
	Jalna- Krishnadhan seeds Ltd	85	15	14	12	8	5
	MIDC Water Works - Latur	105	7	7	5	4	4
	Shyam Nagar-Kshewraj Vidyalaya	72	7	7	5	4	4
	Ganj Golai - Sidhsheshwar Bank	79	55	6	6	4	4
	Ganeshnagar	104	31	29	25	13	11
Mutha Chowk	96	40	40	36	22	12	

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
	Industrial Area CIDCO	102	95	95	78	43	36
Chandrapur	Ghuggus	105	18	7	4	2	1
	Chandrapur - MIDC	105	15	11	4	1	1
	Chandrapur - SRO MPCB	295	22	7	4	4	3
	Tadali MIDC	101	17	6	4	2	1
	Ballarshah	106	13	10	4	2	1
	Rajura	104	7	4	4	3	1
	Chandrapur CAAQMS	352	58	52	13	3	1
Kalyan	Ambernath	96	83	48	26	16	9
	Badlapur - BIWA House	95	78	49	25	16	10
	I.G.M. Hospital	84	54	37	33	26	26
	Prematai hall	94	54	38	33	26	22
	Dombivali	96	68	59	27	17	9
	MIDC Office Dombivali	97	65	51	26	17	9
	Dombivali CAAQMS	355	120	55	21	1	0
	MPCB RO Kalyan office	81	69	67	33	24	22
	Smt. CHM College Campus	97	44	35	23	15	11
	Powai Chowk	96	71	60	27	15	9
Kolhapur	Shivaji University Campus	92	18	16	11	7	5
	Ruikar Trust	92	42	40	29	17	12
	Mahadwar Road	90	33	33	23	13	9
	Terrace of SRO-Sangli, Udyog Bhavan	101	13	13	8	6	4

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
	Sangli-Miraj Primary Municipal school	93	16	13	9	7	6
	Krishna Valley school	95	13	12	9	6	5
Mumbai	Bandra	301	42	27	13	4	1
	Sion	241	22	20	8	6	3
Nagpur	IOE North Ambazari road	104	18	16	10	7	7
	MIDC Office, Hingna Road	104	17	16	10	8	7
	Govt Polytechnic Col, Sadar	108	15	15	10	7	6
	Civil lines Nagpur	286	14	13	9	7	6
	Nagpur CAAQMS	350	42	31	10	1	0
Nashik	Old B. J. Market	103	18	16	14	11	9
	Girna Water Tank	102	17	15	13	10	9
	MIDC Jalgaon	104	19	17	14	12	11
	RTO Colony	104	23	22	12	5	3
	MIDC Satpur - VIP	104	21	20	11	5	3
	NMC Nashik	112	25	23	12	5	5
	SRO Office Nashik	235	23	22	11	4	3
	Nashik CAAQMS	364	28	19	6	1	0
Navi Mumbai	Rabale	93	33	28	20	14	8
	Nerul - DY Patil	94	37	26	18	14	12
	Mahape, MPCB-Nirmal Bhavan	110	38	35	21	14	12
	Airoli	297	70	42	26	16	10
	Kharghar - CIDCO Nodal Office	86	28	25	18	12	9

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
	Taloja - MIDC Building	84	37	35	21	14	11
Pune	Bhosari	100	59	50	28	12	11
	Nal Stop	86	45	40	23	12	10
	Swargate, Pune	115	52	41	22	6	5
	Pimpri-Chinchwad - BOB Building	230	102	59	27	13	10
	Karve Road - CAAQMS	325	136	29	18	5	4
	WIT Campus	95	14	14	13	12	11
	Saat Rasta- Chithale Clinic	101	19	18	13	12	6
	Solapur	318	33	23	15	11	7
Raigad	Panvel- Water Supply Plant	86	31	27	19	13	12
Thane	Kopri	104	35	25	18	13	12
	Naupada	103	28	24	19	13	2
	Balkum/Glaxo	104	22	20	15	11	10

Oxides of Nitrogen

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
Amravati	LRT Commerce College	103	12	12	9	5	3
	MIDC Water Works - Akola	107	13	13	10	6	5
	Akola- College of Engg & Technology	91	12	12	9	6	5
	Raj Kamal Chowk	61	18	17	14	9	9
	Govt. College of Engineering	56	15	15	13	10	9
	Godhadiwala Private Limited	53	18	17	13	11	9
Aurangabad	SBES College	97	81	57	41	30	26
	Collector Office, Aurangabad	90	68	47	33	21	20
	C.A.D.A. Office	92	55	54	39	25	22
	Aurangabad CAAQMS	364	91	75	33	12	7
	Jalna- Bachat Bhavan	75	56	55	33	24	16
	Jalna- Krishnadhan seeds Ltd	85	54	50	31	19	16
	MIDC Water Works - Latur	105	26	24	18	15	13
	Shyam Nagar-Kshewraj Vidyalaya	72	23	23	18	14	11
	Ganj Golai - Sidhleshwar Bank	79	25	24	18	14	14
	Ganeshnagar	104	35	30	26	13	10
	Mutha Chowk	96	38	37	31	19	17
Industrial Area CIDCO	102	91	91	79	45	37	
Chandrapur	Ghuggus	105	44	37	25	15	9
	Chandrapur - MIDC	105	63	61	34	17	15

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
	Chandrapur - SRO MPCB	295	59	47	28	17	7
	Tadali MIDC	101	38	37	23	11	6
	Ballarshah	106	85	63	32	18	16
	Rajura	104	45	44	27	13	9
	Chandrapur CAAQMS	349	333	59	19	2	0
Kalyan	Ambernath	96	196	126	71	40	29
	Badlapur - BIWA House	95	191	114	68	38	19
	I.G.M. Hospital	84	53	52	45	38	33
	Prematai hall	94	48	47	42	33	31
	Dombivali	96	148	116	70	39	22
	MIDC Office Dombivali	97	143	115	69	41	36
	Dombivali CAAQMS	350	129	104	31	3	0
	MPCB RO Kalyan office	81	60	59	41	32	31
	Smt. CHM College Campus	97	105	101	62	36	21
	Powai Chowk	96	127	105	67	36	25
Kolhapur	Shivaji University Campus	92	32	31	21	13	10
	Ruikar Trust	92	81	78	53	33	23
	Mahadwar Road	90	60	58	39	22	16
	Terrace of SRO-Sangli, Udyog Bhavan	101	91	87	41	13	8
	Sangli-Miraj Primary Municipal school	93	116	102	44	14	11
	Krishna Valley school	95	87	75	35	13	11

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
Mumbai	Bandra	301	256	141	40	7	1
	Sion	241	218	172	83	31	9
Nagpur	IOE North Ambazari road	104	52	50	31	19	16
	MIDC Office, Hingna Road	104	53	50	33	21	18
	Govt Polytechnic Col, Sadar	108	52	49	30	18	16
	Civil lines Nagpur	286	48	42	27	18	15
	Nagpur CAAQMS	350	193	117	42	11	4
Nashik	Old B. J. Market	103	45	45	36	31	27
	Girna Water Tank	102	42	41	34	29	27
	MIDC Jalgaon	104	47	46	37	33	29
	RTO Colony	104	45	36	25	14	8
	MIDC Satpur - VIP	104	43	34	24	10	7
	NMC Nashik	112	79	43	26	15	9
	SRO Office Nashik	235	85	43	26	13	9
	Nashik CAAQMS	364	157	98	33	6	1
Navi Mumbai	Rabale	93	64	61	44	24	19
	Nerul - DY Patil	94	73	57	41	20	15
	Mahape, MPCB-Nirmal Bhavan	110	71	64	46	27	15
	Airoli	297	93	85	39	20	15
	Kharghar - CIDCO Nodal Office	86	62	59	45	27	24
	Taloja - MIDC Building	84	73	66	47	28	22
Pune	Bhosari	100	220	177	67	29	22
	Nal Stop	86	270	168	78	27	16

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
	Swargate, Pune	115	323	195	84	33	24
	Pimpri-Chinchwad - BOB Building	230	331	219	72	27	9
	Karve Road - CAAQMS	325	174	159	77	38	22
	WIT Campus	95	39	37	34	32	31
	Saat Rasta- Chithale Clinic	101	48	41	35	32	32
	Solapur	318	87	58	41	34	34
Raigad	Panvel- Water Supply Plant	86	66	65	49	33	19
Thane	Kopri	104	75	73	59	48	43
	Naupada	103	79	76	61	50	43
	Balkum/Glaxo	104	69	66	52	41	36

Particulate Matter (PM₁₀)

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration (µg/m ³)	98 percentile value for 24 hour concentrations (µg/m ³)	Annual Average concentration (µg/m ³)	5 percentile value for 24 hour concentrations (µg/m ³)	Minimum recorded 24 hour concentration (µg/m ³)
Amravati	LRT Commerce College	103	130	130	109	43	25
	MIDC Water Works - Akola	107	153	149	128	68	59
	Akola- College of Engg & Technology	91	167	165	142	90	81
	Raj Kamal Chowk	61	203	168	141	101	83
	Govt. College of Engineering	56	94	94	73	56	41
	Godhadiwala Private Limited	53	125	124	108	96	68
Aurangabad	SBES College	97	238	220	108	43	25
	Collector Office, Aurangabad	90	174	171	88	34	25
	C.A.D.A. Office	92	219	159	82	29	17
	Aurangabad CAAQMS	345	215	181	86	41	24
	Jalna- Bachat Bhavan	75	362	263	128	73	48
	Jalna- Krishnadhan seeds Ltd	85	131	117	83	51	46
	MIDC Water Works - Latur	105	167	155	76	0	23
	Shyam Nagar-Kshewraj Vidyalaya	72	173	159	72	35	22
	Ganj Golai - Sidhshwar Bank	79	151	130	65	23	14
	Ganeshnagar	104	125	124	79	21	18
	Mutha Chowk	96	176	175	113	28	21
Industrial Area CIDCO	102	238	233	156	59	55	
Chandrapur	Ghuggus	105	545	466	242	90	18
	Chandrapur - MIDC	105	170	164	77	30	20

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
	Chandrapur - SRO MPCB	295	187	166	84	31	10
	Tadali MIDC	101	253	216	79	17	5
	Ballarshah	106	369	230	108	29	10
	Rajura	104	355	332	156	37	27
	Chandrapur CAAQMS	306	937	144	69	17	7
Kalyan	Ambernath	96	340	202	123	80	69
	Badlapur - BIWA House	95	329	203	120	77	44
	I.G.M. Hospital	84	107	99	71	62	61
	Prematai hall	94	109	102	70	63	61
	Dombivali	96	261	195	112	57	44
	MIDC Office Dombivali	97	249	202	120	81	74
	Dombivali CAAQMS	313	321	200	86	21	2
	MPCB RO Kalyan office	81	82	82	69	64	61
	Smt. CHM College Campus	97	197	181	110	66	48
	Powai Chowk	96	223	180	108	53	47
Kolhapur	Shivaji University Campus	92	85	77	61	45	33
	Ruikar Trust	92	163	160	120	80	71
	Mahadwar Road	90	136	133	99	69	60
	Terrace of SRO-Sangli, Udyog Bhavan	101	228	179	78	20	11
	Sangli-Miraj Primary Municipal school	93	257	180	72	17	14
	Krishna Valley school	95	170	164	76	24	16

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
Mumbai	Bandra	301	380	270	124	27	1
	Sion	241	329	296	152	53	31
Nagpur	IOE North Ambazari road	104	164	145	92	59	1
	MIDC Office, Hingna Road	104	243	177	101	73	61
	Govt Polytechnic Col, Sadar	108	175	155	93	60	38
	Civil lines Nagpur	286	181	146	62	37	20
	Nagpur CAAQMS	340	158	143	71	27	15
Nashik	Old B. J. Market	103	144	134	96	72	9
	Girna Water Tank	102	134	127	92	72	63
	MIDC Jalgaon	104	136	135	100	77	72
	RTO Colony	104	173	162	83	37	7
	MIDC Satpur - VIP	104	173	167	88	31	8
	NMC Nashik	112	247	207	97	42	22
	SRO Office Nashik	235	162	138	72	30	14
	Nashik CAAQMS	361	317	141	64	24	11
Navi Mumbai	Rabale	93	242	214	108	45	36
	Nerul - DY Patil	94	192	166	97	17	15
	Mahape, MPCB-Nirmal Bhavan	110	249	224	95	13	13
	Airoli	297	141	84	42	0	11
	Kharghar - CIDCO Nodal Office	86	182	167	90	40	36
	Taloja - MIDC Building	84	320	234	113	41	31
Pune	Bhosari	100	318	299	115	27	10
	Nal Stop	86	279	243	107	40	28

Region	Station Name	Total no of 24 hour observations recorded in 2016-17	Maximum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)	98 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Annual Average concentration ($\mu\text{g}/\text{m}^3$)	5 percentile value for 24 hour concentrations ($\mu\text{g}/\text{m}^3$)	Minimum recorded 24 hour concentration ($\mu\text{g}/\text{m}^3$)
	Swargate, Pune	115	302	245	95	24	17
	Pimpri-Chinchwad - BOB Building	230	271	208	87	26	14
	Karve Road - CAAQMS	325	202	173	79	23	6
	WIT Campus	95	82	78	69	63	59
	Saat Rasta- Chithale Clinic	101	176	163	70	39	19
	Solapur	318	278	227	106	23	20
Raigad	Panvel- Water Supply Plant	86	237	223	112	49	41
Thane	Kopri	104	210	191	117	55	35
	Naupada	103	246	204	108	61	49
	Balkum/Glaxo	104	239	226	122	52	45

Air Quality Index Category wise count

MPCB RO	Station name	Good (0-50)	Satisfactory (51-100)	Moderate (101-200)	Poor (201-300)	Very Poor (301-400)	Severe (401-500)	NA
Amravati	LRT Commerce College(103)	7	9	87	--	--	--	--
	MIDC Water Works - Akola(107)	--	16	91	--	--	--	--
	Akola- College of Engg & Technology(91)	--	8	83	--	--	--	--
	Raj Kamal Chowk(61)	--	3	57	1	--	--	--
	Govt. College of Engineering(56)	1	55	--	--	--	--	--
	Godhadiwala Private Limited(53)	--	9	44	--	--	--	--
Aurangabad	SBES College(97)	8	34	52	3	--	--	--
	Collector Office, Aurangabad (90)	12	45	33	--	--	--	--
	C.A.D.A. Office(92)	19	45	27	1	--	--	--
	Aurangabad CAAQMS(365)	38	259	66	2	--	--	--
	Jalna- Bachat Bhavan(75)	1	18	52	3	1	--	--
	Jalna- Krishnadhan seeds Ltd(85)	5	77	3	--	--	--	--
	MIDC Water Works - Latur(105)	35	49	21	--	--	--	--
	Shyam Nagar-Kshewraj Vidyalaya(72)	13	51	8	--	--	--	--
	Ganj Golai - Sidhshewar Bank(79)	28	41	10	--	--	--	--
	Ganeshnagar(104)	44	--	60	--	--	--	--
	Mutha Chowk(96)	36	7	53	--	--	--	--
Industrial Area CIDCO(102)	--	25	21	56	--	--	--	
Chandrapur	Ghuggus(105)	1	7	26	43	23	5	--
	Chandrapur - MIDC(105)	17	67	21	--	--	--	--
	Chandrapur - SRO MPCB(295)	59	138	98	--	--	--	--
	Tadali MIDC(101)	30	47	20	4	--	--	--

MPCB RO	Station name	Good (0-50)	Satisfactory (51-100)	Moderate (101-200)	Poor (201-300)	Very Poor (301-400)	Severe (401-500)	NA
	Ballarshah(106)	13	38	52	2	1	--	--
	Rajura(104)	11	21	41	24	7	--	--
	Chandrapur CAAQMS(365)	148	167	34	1	--	3	12
Kalyan	Ambernath(96)	--	15	79	1	1	--	--
	Badlapur - BIWA House(95)	1	21	70	2	1	--	--
	I.G.M. Hospital(84)	--	83	1	--	--	--	--
	Prematai hall(94)	--	90	4	--	--	--	--
	Dombivali(96)	2	21	72	1	--	--	--
	MIDC Office Dombivali(97)	--	24	69	4	--	--	--
	Dombivali CAAQMS(365)	82	181	85	6	1	--	10
	MPCB RO Kalyan office(81)	--	81	--	--	--	--	--
	Smt. CHM College Campus(97)	1	27	69	--	--	--	--
	Powai Chowk(96)	--	27	67	2	--	--	--
Kolhapur	Shivaji University Campus(92)	17	75	--	--	--	--	--
	Ruikar Trust(92)	--	25	67	--	--	--	--
	Mahadwar Road(90)	--	48	42	--	--	--	--
	Terrace of SRO-Sangli, Udyog Bhavan(101)	39	30	30	2	--	--	--
	Sangli-Miraj Primary Municipal school(93)	39	27	26	1	--	--	--
	Krishna Valley school(95)	35	36	24	--	--	--	--
Mumbai	Bandra(301)	42	99	94	63	3	--	--
	Sion(241)	6	50	112	68	5	--	--
Nagpur	IOE North Ambazari road(104)	2	75	27	--	--	--	--
	MIDC Office, Hingna Road(104)	--	55	48	1	--	--	--
	Govt Polytechnic Col, Sadar(108)	2	70	36	--	--	--	--

MPCB RO	Station name	Good (0-50)	Satisfactory (51-100)	Moderate (101-200)	Poor (201-300)	Very Poor (301-400)	Severe (401-500)	NA
	Civil lines Nagpur(286)	149	102	35	--	--	--	--
	Nagpur CAAQMS (365)	81	204	62	3	--	--	15
Nashik	Old B. J. Market(103)	1	74	28	--	--	--	--
	Girna Water Tank(102)	--	79	23	--	--	--	--
	MIDC Jalgaon(104)	--	65	39	--	--	--	--
	RTO Colony(104)	22	54	28	--	--	--	--
	MIDC Satpur - VIP(104)	19	53	32	--	--	--	--
	NMC Nashik(112)	14	52	42	4	--	--	--
	SRO Office Nashik(235)	74	118	43	--	--	--	--
	Nashik CAAQMS(365)	125	184	51	2	2	--	1
Navi Mumbai	Rabale(93)	9	29	52	3	--	--	--
	Nerul - DY Patil(94)	5	41	48	--	--	--	--
	Mahape, MPCB-Nirmal Bhavan(114)	17	49	43	5	--	--	--
	Airoli(297)	155	129	13	--	--	--	--
	Kharghar - CIDCO Nodal Office(86)	5	47	34	--	--	--	--
	Taloja - MIDC Building(84)	7	30	41	5	1	--	--
Pune	Bhosari(100)	11	27	42	18	2	--	--
	Nal Stop(86)	1	30	50	3	2	--	--
	Swargate, Pune(115)	8	49	42	14	1	1	--
	Pimpri-Chinchwad - BOB Building(230)	26	92	93	15	3	1	--
	Karve Road - CAAQMS(325)	6	164	147	8	--	--	--
	WIT Campus(95)	--	95	--	--	--	--	--
	Saat Rasta- Chithale Clinic(101)	9	86	6	--	--	--	--
	Solapur(318)	85	57	161	15	--	--	--

MPCB RO	Station name	Good (0-50)	Satisfactory (51-100)	Moderate (101-200)	Poor (201-300)	Very Poor (301-400)	Severe (401-500)	NA
Raigad	Panvel- Water Supply Plant(86)	3	33	45	5	--	--	--
Thane	Kopri(104)	--	31	71	2	--	--	--
	Naupada(103)	--	43	57	3	--	--	--
	Balkum/Glaxo(104)	1	34	62	7	--	--	--

Appendix – A: Revised NAAQS 2009

चिह्न सं. डी.एल.-33004/99

REGD. NO. D. L.-33004/99



भारत का राजपत्र The Gazette of India

असाधारण
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PART III—Section 4

प्राधिकार से प्रकाशित

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NEW DELHI, WEDNESDAY, NOVEMBER 18, 2009/KARTIKA 27, 1931

राष्ट्रीय परिवेशी वायु गुणवत्ता मानक

केन्द्रीय प्रदूषण नियंत्रण बोर्ड

अधिसूचना

नई दिल्ली, 18 नवम्बर, 2009

सं. सी-29016/20/90/पी.सी.आई.-1.—वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 (1981 का 14) की धारा 16 की उपधारा (2) (एच) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए तथा अधिसूचना संख्या का.आ. 384(ई), दिनांक 11 अप्रैल, 1994 और का.आ. 935 (ई) दिनांक 14 अक्टूबर, 1998 के अधिक्रमण में केन्द्रीय प्रदूषण नियंत्रण बोर्ड इसके द्वारा तत्काल प्रभाव से राष्ट्रीय परिवेशी वायु गुणवत्ता मानक अधिसूचित करता है, जो इस प्रकार है—

राष्ट्रीय परिवेशी वायु गुणवत्ता मानक

क्र. सं.	प्रदूषक	समय आधारित औसत	परिवेशी वायु में सान्द्रण		
			औद्योगिक, शिपयरी, ग्रामीण और अन्य क्षेत्र	पारिस्थितिकीय संवेदनशील क्षेत्र (केन्द्र सरकार द्वारा अधिसूचित)	प्रबोधन की पद्धति
(1)	(2)	(3)	(4)	(5)	(6)
1	सल्फर डाई आक्साइड (SO ₂), µg/m ³	वार्षिक* 24 घंटे**	50 80	20 80	-उन्नत वेस्ट और गार्डक -परवेगनी परिधीयता
2	नाइट्रोजन डाई आक्साइड (NO ₂), µg/m ³	वार्षिक* 24 घंटे**	40 80	30 80	-उपतस्थित जेकब और हॉवाइजर (सोडियम-आर्सेनाइट) -सासायनिक संदीप्ति
3	विश्वित पदार्थ (10माइक्रोन से कम आकार)या PM ₁₀ . µg/m ³	वार्षिक* 24 घंटे**	60 100	60 100	-हरात्मक विश्लेषण -टोयम -बीटा तनुकरण पद्धति

3187 GI/2009

(1)

4	विविक्त पदार्थ (2.5 माइक्रान से कम आकार या PM _{2.5} , µg/m ³)	वार्षिक* 24 घंटे**	40 60	40 60	-हरात्मक विश्लेषण -टोयम -बीटा तनुकरण पद्धति
5	ओजोन (O ₃) µg/m ³	8 घंटे** 1 घंटा**	100 180	100 180	-पराबैगनी द्विप्तिकाल -रासायनिक संदीप्ति -रासायनिक पद्धति
6	सीसा (Pb) µg/m ³	वार्षिक* 24 घंटे**	0.50 1.0	0.50 1.0	ई.पी.एम. 2000 या समरूप फिल्टर पेपर का प्रयोग करके AAS/ICP पद्धति -टेफ्लॉन फिल्टर पेपर का प्रयोग करते हुए ED-XRF
7	कार्बन मोनोक्साइड (CO) mg/m ³	8 घंटे** 1 घंटा**	02 04	02 04	-अविपेक्षी अवरक्त (NDIR) स्पैक्ट्रम मापन
8	अमोनिया (NH ₃) µg/m ³	वार्षिक* 24 घंटे**	100 400	100 400	-रासायनिक संदीप्ति -इण्डोफिनॉल ब्ल्यू पद्धति
9	बैन्जीन (C ₆ H ₆) µg/m ³	वार्षिक*	05	05	- गैस क्रोमेटोग्राफी आधारित सतत विश्लेषक -अधिशोषण तथा निशोषण के बाद गैस क्रोमेटोग्राफी
10	बैन्जो (ए) पाईरीन (BaP) केवल विविक्त कण, ng/m ³	वार्षिक*	01	01	-विलायक निष्कर्षण के बाद HPLC/GC द्वारा विश्लेषण
11	आर्सेनिक (As) ng/m ³	वार्षिक*	06	06	-असंवितरक अवरक्त स्पैक्ट्रोमिती ई.पी.एम. 2000 या समरूप फिल्टर पेपर का प्रयोग करके ICP/AAS पद्धति
12	निकिल (Ni) ng/m ³	वार्षिक*	20	20	ई.पी.एम. 2000 या समरूप फिल्टर पेपर का प्रयोग करके ICP/AAS पद्धति

* वर्ष में एक समान अंतरालों पर सप्ताह में दो बार प्रति 24 घंटे तक किसी एक स्थान विशेष पर लिये गये न्यूनतम 104 मापों का वार्षिक अंकगणीतीय औसत ।

** वर्ष में 98 प्रतिशत समय पर 24 घंटे या 8 घंटे या 1 घंटा के मानीटर मापमान, जो लागू हो, अनुपालन कये जाएंगे । दो प्रतिशत समय पर यह मापमान अधिक हो सकता है, किन्तु क्रमिक दो मानीटर करने के दिनों पर नहीं ।

टिप्पणी:

1. जब कभी और जहां भी किसी अपने-अपने प्रवर्ग के लिये दो क्रमिक प्रबोधन दिनों पर मापित मूल्य, उमर विनिर्दिष्ट सीमा से अधिक हो तो इसे नियमित या निरंतर प्रबोधन तथा अतिरिक्त अन्वेषण करवाने के लिये पर्याप्त कारण समझा जायेगा ।

संत प्रसाद गौतम, अध्यक्ष
[विज्ञापन-III/4/184/09/असम.]

टिप्पणी: राष्ट्रीय परिवेशी वायु गुणवत्ता मानक संबंधी अधिसूचनाएँ, केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा भारत के राजपत्र आसाधरण में अधिसूचना संख्या का.आ. 384 (ई), दिनांक 11 अप्रैल, 1994 एवं का. आ. 935 (ई), दिनांक 14 अक्टूबर, 1998 द्वारा प्रकाशित की गयी थी ।

(1)	(2)	(3)	(4)	(5)	(6)
9	Benzene (C ₆ H ₆) µg/m ³	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m ³	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m ³	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m ³	Annual*	20	20	- AAS /ICP method after sampling on EPM 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 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may 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.

SANT PRASAD GAUTAM, Chairman
[ADVT-III/4/184/09/Exty.]

Note: The notifications on National Ambient Air Quality Standards were published by the Central Pollution Control Board in the Gazette of India, Extraordinary vide notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998.



Maharashtra Pollution Control Board

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