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APPENDIX 01: Pollution level of the 20km area around LakVijaya coal power plant, Norechcholei, Puttalam: Specimen Computation

Direction-North

Required Parameters

Q (g/s)	234 (NOx)
	50.4 (SOx)

H (m)	150

U (m/s)	1.375

Where , Q = Emission rate

H = Stack height

U = Wind speed

The Gaussian plume equation

$$C = \frac{Q}{2\,\pi u \sigma_z \sigma_y} . exp \frac{-y^2}{2{\sigma_y}^2} . exp \frac{-(H-z)^2}{2{\sigma_z}^2}$$

Where,

(x, y, z) = coordinates of the midpoint of a grid cell

σ_y and σ_y = Lateral and Vertical Dispersion coefficient

C = Pollution Concentration

Data Matrices of NOx Concentration

X (m)	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000
	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000
	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000
	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000
	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000
	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000
	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000
	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000
	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000
	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000
	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000
	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000

y (m)	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000

z(m)	0	0	0	0	0	0	0	0	4	7	6	1	0	0	2	13	26	56	60	51
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	0	0	0	0	0	0	0	0	1	8	3	0	0	0	0	7	23	43	46	55
	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	9	29	34	38	48
	0	0	0	0	0	0	0	0	2	7	3	0	0	0	0	16	20	22	27	36
	0	0	0	0	0	0	0	0	1	9	4	0	0	0	5	8	10	12	15	22
	0	0	0	0	0	0	0	0	1	10	3	0	0	1	3	4	6	18	21	14
	0	0	0	0	0	0	0	0	0	8	3	0	0	1	2	2	8	27	41	33
	0	0	0	0	0	0	0	0	0	6	5	1	0	0	0	5	12	32	52	53
	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	6	13	27	47	50
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	14	27	40	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	14	35	52	58
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	0	0	0	0	0	0	0	0	0	0	0	0	2	5	7	12	15	20	26	32
	0	0	0	0	0	0	0	0	0	0	0	0	2	4	5	9	13	19	27	34

σy (m)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125
	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550
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	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400

σz (m)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
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	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Data Matrices of NOx Concentration – 20 km area-Northern Direction

9E-20	5E-17	1E-14	2E-12	1E-10	3E-09	5E-08	4E-07	2E-06	3E-06	3E-06	2E-06	4E-07	5E-08	3E-09	1E-10	2E-12	1E-14	5E-17	9E-20
3E-22	4E-19	3E-16	1E-13	2E-11	1E-09	3E-08	3E-07	2E-06	4E-06	4E-06	2E-06	3E-07	3E-08	1E-09	2E-11	1E-13	3E-16	4E-19	3E-22
1E-25	9E-22	3E-18	3E-15	1E-12	2E-10	1E-08	2E-07	1E-06	4E-06	4E-06	1E-06	2E-07	1E-08	2E-10	1E-12	3E-15	3E-18	9E-22	1E-25
3E-30	2E-25	4E-21	2E-17	4E-14	2E-11	3E-09	1E-07	1E-06	4E-06	4E-06	1E-06	1E-07	3E-09	2E-11	4E-14	2E-17	4E-21	2E-25	3E-30
1E-36	2E-30	5E-25	3E-20	3E-16	8E-13	4E-10	4E-08	1E-06	5E-06	5E-06	1E-06	4E-08	4E-10	8E-13	3E-16	3E-20	5E-25	2E-30	1E-36
7E-46	6E-38	8E-31	1E-24	3E-19	7E-15	2E-11	1E-08	6E-07	5E-06	5E-06	6E-07	1E-08	2E-11	7E-15	3E-19	1E-24	8E-31	6E-38	7E-46
9E-68	2E-55	2E-44	8E-35	1E-26	1E-19	3E-14	4E-10	2E-07	5E-06	5E-06	2E-07	4E-10	3E-14	1E-19	1E-26	8E-35	2E-44	2E-55	9E-68
3E-114	1E-92	3E-73	2E-56	5E-42	5E-30	2E-20	3E-13	2E-08	5E-06	5E-06	2E-08	3E-13	2E-20	5E-30	5E-42	2E-56	3E-73	1E-92	3E-114
1E-264	6E-213	5E-167	8E-127	2E-92	1E-63	1E-40	2E-23	6E-12	3E-06	3E-06	6E-12	2E-23	1E-40	1E-63	2E-92	8E-127	5E-167	6E-213	1E-264
0	0	0	0	0	0	3E-270	5E-140	4E-53	1E-09	1E-09	4E-53	5E-140	3E-270	0	0	0	0	0	0
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1E-264	6E-213	5E-167	8E-127	2E-92	1E-63	1E-40	2E-23	6E-12	3E-06	3E-06	6E-12	2E-23	1E-40	1E-63	2E-92	8E-127	5E-167	6E-213	1E-264
3E-114	1E-92	3E-73	2E-56	5E-42	5E-30	2E-20	3E-13	2E-08	5E-06	5E-06	2E-08	3E-13	2E-20	5E-30	5E-42	2E-56	3E-73	1E-92	3E-114
9E-68	2E-55	2E-44	8E-35	1E-26	1E-19	3E-14	4E-10	2E-07	5E-06	5E-06	2E-07	4E-10	3E-14	1E-19	1E-26	8E-35	2E-44	2E-55	9E-68
7E-46	6E-38	8E-31	1E-24	3E-19	7E-15	2E-11	1E-08	6E-07	5E-06	5E-06	6E-07	1E-08	2E-11	7E-15	3E-19	1E-24	8E-31	6E-38	7E-46
1E-36	2E-30	5E-25	3E-20	3E-16	8E-13	4E-10	4E-08	1E-06	5E-06	5E-06	1E-06	4E-08	4E-10	8E-13	3E-16	3E-20	5E-25	2E-30	1E-36
3E-30	2E-25	4E-21	2E-17	4E-14	2E-11	3E-09	1E-07	1E-06	4E-06	4E-06	1E-06	1E-07	3E-09	2E-11	4E-14	2E-17	4E-21	2E-25	3E-30
1E-25	9E-22	3E-18	3E-15	1E-12	2E-10	1E-08	2E-07	1E-06	4E-06	4E-06	1E-06	2E-07	1E-08	2E-10	1E-12	3E-15	3E-18	9E-22	1E-25
3E-22	4E-19	3E-16	1E-13	2E-11	1E-09	3E-08	3E-07	2E-06	4E-06	4E-06	2E-06	3E-07	3E-08	1E-09	2E-11	1E-13	3E-16	4E-19	3E-22

Data Matrices of SOx Concentration

X (m)	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000
	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000
	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000
	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000
	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000
	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000
	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000
	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000
	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000
	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000
	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000
	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000

y (m)	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000
	19000	17000	15000	13000	11000	9000	7000	5000	3000	1000	-1000	-3000	-5000	-7000	-9000	-11000	-13000	-15000	-17000	-19000

z(m)																			
0	0	0	0	0	0	0	0	4	7	6	1	0	0	2	13	26	56	60	51
0	0	0	0	0	0	0	0	3	9	5	1	0	0	1	10	21	46	52	59
0	0	0	0	0	0	0	0	1	8	3	0	0	0	0	7	23	43	46	55
0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	9	29	34	38	48
0	0	0	0	0	0	0	0	2	7	3	0	0	0	0	16	20	22	27	36
0	0	0	0	0	0	0	0	1	9	4	0	0	0	5	8	10	12	15	22
0	0	0	0	0	0	0	0	1	10	3	0	0	1	3	4	6	18	21	14
0	0	0	0	0	0	0	0	0	8	3	0	0	1	2	2	8	27	41	33
0	0	0	0	0	0	0	0	0	6	5	1	0	0	0	5	12	32	52	53
0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	6	13	27	47	50
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	14	27	40	41
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	14	35	52	58
0	0	0	0	0	0	0	0	0	0	0	1	4	4	4	11	15	34	61	69
0	0	0	0	0	0	0	0	0	0	1	5	7	8	9	12	16	38	57	61
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0	0	0	0	0	0	0	0	0	0	0	1	3	6	9	13	17	28	36	48
0	0	0	0	0	0	0	0	0	0	0	0	2	5	7	12	15	20	26	32
0	0	0	0	0	0	0	0	0	0	0	0	2	4	5	9	13	19	27	34

σy (m)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125
	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550
	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550
	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	2400	2400	1125
	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	2200	2200	1400
	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	2000	2000	1600
	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	1600	1600	2000
	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	1400	1400	2200
	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	1125	1125	2400

σz (m)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
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	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
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	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Data Matrices of SOx Concentration– 20 km area-Northern Direction

2E-20	1E-17	3E-15	3E-13	2E-11	7E-10	1E-08	9E-08	4E-07	7E-07	0	4E-07	9E-08	1E-08	7E-10	2E-11	3E-13	3E-15	1E-17	2E-20
5.6E-23	1E-19	7E-17	2E-14	3E-12	2E-10	6E-09	7E-08	3E-07	8E-07	0	3E-07	7E-08	6E-09	2E-10	3E-12	2E-14	7E-17	1E-19	6E-23
2.5E-26	2E-22	6E-19	7E-16	3E-13	4E-11	2E-09	4E-08	3E-07	9E-07	0	3E-07	4E-08	2E-09	4E-11	3E-13	7E-16	6E-19	2E-22	2E-26
6.9E-31	5E-26	9E-22	5E-18	8E-15	4E-12	6E-10	2E-08	3E-07	9E-07	0	3E-07	2E-08	6E-10	4E-12	8E-15	5E-18	9E-22	5E-26	7E-31
2.9E-37	4E-31	1E-25	6E-21	7E-17	2E-13	8E-11	9E-09	2E-07	1E-06	0	2E-07	9E-09	8E-11	2E-13	7E-17	6E-21	1E-25	4E-31	3E-37
1.4E-46	1E-38	2E-31	3E-25	5E-20	1E-15	5E-12	2E-09	1E-07	1E-06	0	1E-07	2E-09	5E-12	1E-15	5E-20	3E-25	2E-31	1E-38	1E-46
2E-68	4E-56	4E-45	2E-35	3E-27	2E-20	7E-15	9E-11	5E-08	1E-06	0	5E-08	9E-11	7E-15	2E-20	3E-27	2E-35	4E-45	4E-56	2E-68
7E-115	3E-93	5E-74	4E-57	1E-42	1E-30	4E-21	7E-14	5E-09	1E-06	0	5E-09	7E-14	4E-21	1E-30	1E-42	4E-57	5E-74	3E-93	7E-115
3E-265	1E-213	1E-167	2E-127	5E-93	3E-64	2E-41	4E-24	1E-12	7E-07	0	1E-12	4E-24	2E-41	3E-64	5E-93	2E-127	1E-167	1.2362E-213	3E-265
0	0	0	0	0	0	8E-271	1E-140	8E-54	2E-10	0	8E-54	1E-140	6E-271	0	0	0	0	0	0
0	0	0	0	0	0	6E-271	1E-140	8E-54	2E-10	0	8E-54	1E-140	6E-271	0	0	0	0	0	0
3E-265	1E-213	1E-167	2E-127	5E-93	3E-64	2E-41	4E-24	1E-12	7E-07	0	1E-12	4E-24	2E-41	3E-64	5E-93	2E-127	1E-167	1.2362E-213	3E-265
7E-115	3E-93	5E-74	4E-57	1E-42	1E-30	4E-21	7E-14	5E-09	1E-06	0	5E-09	7E-14	4E-21	1E-30	1E-42	4E-57	5E-74	3E-93	7E-115
2E-68	4E-56	4E-45	2E-35	3E-27	2E-20	7E-15	9E-11	5E-08	1E-06	0	5E-08	9E-11	7E-15	2E-20	3E-27	2E-35	4E-45	4E-56	2E-68
1.4E-46	1E-38	2E-31	3E-25	5E-20	1E-15	5E-12	2E-09	1E-07	1E-06	0	1E-07	2E-09	5E-12	1E-15	5E-20	3E-25	2E-31	1E-38	1E-46
2.9E-37	4E-31	1E-25	6E-21	7E-17	2E-13	8E-11	9E-09	2E-07	1E-06	0	2E-07	9E-09	8E-11	2E-13	7E-17	6E-21	1E-25	4E-31	3E-37
6.9E-31	5E-26	9E-22	5E-18	8E-15	4E-12	6E-10	2E-08	3E-07	9E-07	0	3E-07	2E-08	6E-10	4E-12	8E-15	5E-18	9E-22	5E-26	7E-31
2.5E-26	2E-22	6E-19	7E-16	3E-13	4E-11	2E-09	4E-08	3E-07	9E-07	0	3E-07	4E-08	2E-09	4E-11	3E-13	7E-16	6E-19	2E-22	2E-26
5.6E-23	1E-19	7E-17	2E-14	3E-12	2E-10	6E-09	7E-08	3E-07	8E-07	0	3E-07	7E-08	6E-09	2E-10	3E-12	2E-14	7E-17	1E-19	6E-23
2E-20	1E-17	3E-15	3E-13	2E-11	7E-10	1E-08	9E-08	4E-07	7E-07	0	4E-07	9E-08	1E-08	7E-10	2E-11	3E-13	3E-15	1E-17	2E-20

APPENDIX 02: Pollution level of the 20km area around Trincomalee Coal Power Plant, Sampoor, Trincomalee: Specimen Computation

Direction-South

Required Parameters

Q (g/s)	169.31 (NOx)
	283.63 (SOx)

H (m)	135

U (m/s)	2.333

Where , Q = Emission rate

H = Stack height

U = Wind speed

The Gaussian plume equation

$$C = \frac{Q}{2\,\pi u \sigma_z\, \sigma_y} . exp\frac{-y^2}{2{\sigma_y}^2} . exp\frac{-(\,H-z)^2}{2{\sigma_z}^2}$$

Where,

(x, y, z) = coordinates of the midpoint of a grid cell

σ_y and σ_y = Lateral and Vertical Dispersion coefficient

C = Pollution Concentration

Data Matrices of NOx Concentration

X (m)																				
	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000
	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000
	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000
	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000
	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000
	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000
	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000
	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000
	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000
	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000
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	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000
	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000

y (m)	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
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	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
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	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
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	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-19000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000

Z (m)	0	0	0	0	0	0	0	0	4	7	6	1	0	0	2	13	26	56	60	51
	0	0	0	0	0	0	0	0	3	9	5	1	0	0	1	10	21	46	52	59
	0	0	0	0	0	0	0	0	1	8	3	0	0	0	0	7	23	43	46	55
	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	9	29	34	38	48
	0	0	0	0	0	0	0	0	2	7	3	0	0	0	0	16	20	22	27	36
	0	0	0	0	0	0	0	0	1	9	4	0	0	0	5	8	10	12	15	22
	0	0	0	0	0	0	0	0	1	10	3	0	0	1	3	4	6	18	21	14
	0	0	0	0	0	0	0	0	0	8	3	0	0	1	2	2	8	27	41	33
	0	0	0	0	0	0	0	0	0	6	5	1	0	0	0	5	12	32	52	53
	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	6	13	27	47	50
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	14	27	40	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	14	35	52	58
	0	0	0	0	0	0	0	0	0	0	0	1	4	4	4	11	15	34	61	69
	0	0	0	0	0	0	0	0	0	0	1	5	7	8	9	12	16	38	57	61
	0	0	0	0	0	0	0	0	0	0	0	4	8	8	11	16	37	42	42	44
	0	0	0	0	0	0	0	0	0	0	0	4	8	10	11	19	24	29	44	71
	0	0	0	0	0	0	0	0	0	0	0	3	6	7	11	15	20	30	41	64
	0	0	0	0	0	0	0	0	0	0	0	1	3	6	9	13	17	28	36	48
	0	0	0	0	0	0	0	0	0	0	0	0	2	5	7	12	15	20	26	32
	0	0	0	0	0	0	0	0	0	0	0	0	2	4	5	9	13	19	27	34

σy (m)	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845
	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675
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	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335
	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
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	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335
	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505
	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675
	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845
	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
σz (m)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

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3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
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3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
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3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Data Matrices of NOx Concentration– 20 km area-Sothern Direction

2E-25	2E-21	4E-18	4E-15	1E-12	2E-10	1E-08	2E-07	1E-06	4E-06	4E-06	1E-06	2E-07	1E-08	2E-10	1E-12	4.04978E-15	4.09826E-18	0	0
5E-29	2E-24	2E-20	8E-17	9E-14	3E-11	4E-09	1E-07	1E-06	4E-06	4E-06	1E-06	1E-07	4E-09	3E-11	9E-14	8.00456E-17	2.14361E-20	0	0
6E-34	2E-28	2E-23	4E-19	2E-15	3E-12	9E-10	6E-08	1E-06	4E-06	4E-06	1E-06	6E-08	9E-10	3E-12	2E-15	4.4254E-19	2.05028E-23	0	0
1E-40	1E-33	2E-27	4E-22	1E-17	1E-13	1E-10	2E-08	8E-07	5E-06	5E-06	8E-07	2E-08	1E-10	1E-13	1E-17	3.72045E-22	1.59191E-27	0	0
7E-50	4E-41	3E-33	2E-26	1E-20	9E-16	7E-12	6E-09	5E-07	5E-06	5E-06	5E-07	6E-09	7E-12	9E-16	1E-20	1.7121E-26	2.57319E-33	0	0
1E-70	1E-57	3E-46	4E-36	2E-27	2E-20	1E-14	3E-10	2E-07	5E-06	5E-06	2E-07	3E-10	1E-14	2E-20	2E-27	3.79998E-36	3.38847E-46	0	0
3E-114	1E-92	2E-73	2E-56	5E-42	5E-30	2E-20	3E-13	2E-08	5E-06	5E-06	2E-08	3E-13	2E-20	5E-30	5E-42	1.68905E-56	2.49415E-73	0	0
6E-191	6E-154	5E-121	3E-92	1E-67	5E-47	1E-30	3E-18	5E-10	6E-06	6E-06	5E-10	3E-18	1E-30	5E-47	1E-67	2.84306E-92	4.7031E-121	0	0
0	0	0	4E-234	5E-169	1E-114	3E-71	1E-38	5E-17	4E-06	4E-06	5E-17	1E-38	3E-71	1E-114	5E-169	3.5929E-234	0	0	0
0	0	0	0	0	0	0	6E-216	3E-80	3E-12	3E-12	3E-80	6E-216	0	0	0	0	0	0	0
0	0	0	0	0	0	0	6E-216	3E-80	2E-12	2E-12	3E-80	6E-216	0	0	0	0	0	0	0
0	0	0	4E-234	5E-169	1E-114	3E-71	1E-38	5E-17	4E-06	4E-06	5E-17	1E-38	3E-71	1E-114	5E-169	3.5943E-234	0	0	0
6E-191	6E-154	5E-121	3E-92	1E-67	5E-47	1E-30	3E-18	5E-10	6E-06	6E-06	5E-10	3E-18	1E-30	5E-47	1E-67	2.84368E-92	4.7039E-121	0	0
3E-114	1E-92	2E-73	2E-56	5E-42	5E-30	2E-20	3E-13	2E-08	5E-06	5E-06	2E-08	3E-13	2E-20	5E-30	5E-42	1.68928E-56	2.49474E-73	0	0
1E-70	1E-57	3E-46	4E-36	2E-27	2E-20	1E-14	3E-10	2E-07	5E-06	5E-06	2E-07	3E-10	1E-14	2E-20	2E-27	3.80125E-36	3.38969E-46	0	0
7E-50	4E-41	3E-33	2E-26	1E-20	9E-16	7E-12	6E-09	5E-07	5E-06	5E-06	5E-07	6E-09	7E-12	9E-16	1E-20	1.71219E-26	2.57341E-33	0	0
1E-40	1E-33	2E-27	4E-22	1E-17	1E-13	1E-10	2E-08	8E-07	5E-06	5E-06	8E-07	2E-08	1E-10	1E-13	1E-17	3.72004E-22	1.59183E-27	0	0
6E-34	2E-28	2E-23	4E-19	2E-15	3E-12	9E-10	6E-08	1E-06	4E-06	4E-06	1E-06	6E-08	9E-10	3E-12	2E-15	4.42506E-19	2.04994E-23	0	0
5E-29	2E-24	2E-20	8E-17	9E-14	3E-11	4E-09	1E-07	1E-06	4E-06	4E-06	1E-06	1E-07	4E-09	3E-11	9E-14	8.00394E-17	2.14298E-20	0	0
2E-25	2E-21	4E-18	4E-15	1E-12	2E-10	1E-08	2E-07	1E-06	4E-06	4E-06	1E-06	2E-07	1E-08	2E-10	1E-12	4.04911E-15	4.09662E-18	0	0

high low

Data Matrices of SOx Concentration

X (m)	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000	-19000
	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000	-17000
	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000	-15000
	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000	-13000
	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000	-11000
	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000	-9000
	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000	-7000
	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000
	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000
	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000
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	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000
	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000

y (m)	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000
	-19000	-17000	-15000	-13000	-11000	-9000	-7000	-5000	-3000	-1000	1000	3000	5000	7000	9000	11000	13000	15000	17000	19000

z(m)	0	0	0	0	0	0	0	0	4	7	6	1	0	0	2	13	26	56	60	51
	0	0	0	0	0	0	0	0	3	9	5	1	0	0	1	10	21	46	52	59
	0	0	0	0	0	0	0	0	1	8	3	0	0	0	0	7	23	43	46	55
	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	9	29	34	38	48
	0	0	0	0	0	0	0	0	2	7	3	0	0	0	0	16	20	22	27	36
	0	0	0	0	0	0	0	0	1	9	4	0	0	0	5	8	10	12	15	22
	0	0	0	0	0	0	0	0	1	10	3	0	0	1	3	4	6	18	21	14
	0	0	0	0	0	0	0	0	0	8	3	0	0	1	2	2	8	27	41	33
	0	0	0	0	0	0	0	0	0	6	5	1	0	0	0	5	12	32	52	53
	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	6	13	27	47	50
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	14	27	40	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	14	35	52	58
	0	0	0	0	0	0	0	0	0	0	0	1	4	4	4	11	15	34	61	69
	0	0	0	0	0	0	0	0	0	0	1	5	7	8	9	12	16	38	57	61
	0	0	0	0	0	0	0	0	0	0	0	4	8	8	11	16	37	42	42	44
	0	0	0	0	0	0	0	0	0	0	0	4	8	10	11	19	24	29	44	71
	0	0	0	0	0	0	0	0	0	0	0	3	6	7	11	15	20	30	41	64
	0	0	0	0	0	0	0	0	0	0	0	1	3	6	9	13	17	28	36	48
	0	0	0	0	0	0	0	0	0	0	0	0	2	5	7	12	15	20	26	32
	0	0	0	0	0	0	0	0	0	0	0	0	2	4	5	9	13	19	27	34

σy (m)	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845
	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675
	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505
	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335
	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160
	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160
	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335	1335
	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505	1505
	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675	1675
	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845
	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015

σz (m)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Data Matrices of SOx Concentration– 20 km area-Sothern Direction

4E-25	3E-21	7E-18	7E-15	3E-12	3E-10	2E-08	3E-07	2E-06	7E-06	7E-06	2E-06	3E-07	2E-08	3E-10	3E-12	7E-15	7E-18	3E-21	4E-25
8E-29	3E-24	4E-20	1E-16	2E-13	6E-11	6E-09	2E-07	2E-06	7E-06	7E-06	2E-06	2E-07	6E-09	6E-11	2E-13	1E-16	4E-20	3E-24	8E-29
1E-33	4E-28	3E-23	7E-19	4E-15	5E-12	1E-09	1E-07	2E-06	7E-06	7E-06	2E-06	1E-07	1E-09	5E-12	4E-15	7E-19	3E-23	4E-28	1E-33
2E-40	2E-33	3E-27	6E-22	2E-17	2E-13	2E-10	4E-08	1E-06	8E-06	8E-06	1E-06	4E-08	2E-10	2E-13	2E-17	6E-22	3E-27	2E-33	2E-40
1E-49	7E-41	4E-33	3E-26	2E-20	2E-15	1E-11	1E-08	9E-07	8E-06	8E-06	9E-07	1E-08	1E-11	2E-15	2E-20	3E-26	4E-33	7E-41	1E-49
2E-70	2E-57	6E-46	6E-36	3E-27	4E-20	2E-14	4E-10	3E-07	9E-06	9E-06	3E-07	4E-10	2E-14	4E-20	3E-27	6E-36	6E-46	2E-57	2E-70
6E-114	2E-92	4E-73	3E-56	8E-42	8E-30	3E-20	5E-13	3E-08	9E-06	9E-06	3E-08	5E-13	3E-20	8E-30	8E-42	3E-56	4E-73	2E-92	6E-114
1E-190	1E-153	8E-121	5E-92	2E-67	8E-47	2E-30	5E-18	8E-10	1E-05	1E-05	8E-10	5E-18	2E-30	8E-47	2E-67	5E-92	8E-121	1E-153	1E-190
0	0	0	6E-234	8E-169	2E-114	4E-71	2E-38	8E-17	6E-06	6E-06	8E-17	2E-38	4E-71	2E-114	8E-169	6E-234	0	0	0
0	0	0	0	0	0	0	1E-215	6E-80	4E-12	4E-12	6E-80	1E-215	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1E-215	6E-80	4E-12	4E-12	6E-80	1E-215	0	0	0	0	0	0	0
0	0	0	6E-234	8E-169	2E-114	4E-71	2E-38	8E-17	6E-06	6E-06	8E-17	2E-38	4E-71	2E-114	8E-169	6E-234	0	0	0
1E-190	1E-153	8E-121	5E-92	2E-67	8E-47	2E-30	5E-18	8E-10	1E-05	1E-05	8E-10	5E-18	2E-30	8E-47	2E-67	5E-92	8E-121	1E-153	1E-190
6E-114	2E-92	4E-73	3E-56	8E-42	8E-30	3E-20	5E-13	3E-08	9E-06	9E-06	3E-08	5E-13	3E-20	8E-30	8E-42	3E-56	4E-73	2E-92	6E-114
2E-70	2E-57	6E-46	6E-36	3E-27	4E-20	2E-14	4E-10	3E-07	9E-06	9E-06	3E-07	4E-10	2E-14	4E-20	3E-27	6E-36	6E-46	2E-57	2E-70
1E-49	7E-41	4E-33	3E-26	2E-20	2E-15	1E-11	1E-08	9E-07	8E-06	8E-06	9E-07	1E-08	1E-11	2E-15	2E-20	3E-26	4E-33	7E-41	1E-49
2E-40	2E-33	3E-27	6E-22	2E-17	2E-13	2E-10	4E-08	1E-06	8E-06	8E-06	1E-06	4E-08	2E-10	2E-13	2E-17	6E-22	3E-27	2E-33	2E-40
1E-33	4E-28	3E-23	7E-19	4E-15	5E-12	1E-09	1E-07	2E-06	7E-06	7E-06	2E-06	1E-07	1E-09	5E-12	4E-15	7E-19	3E-23	4E-28	1E-33
8E-29	3E-24	4E-20	1E-16	2E-13	6E-11	6E-09	2E-07	2E-06	7E-06	7E-06	2E-06	2E-07	6E-09	6E-11	2E-13	1E-16	4E-20	3E-24	8E-29
4E-25	3E-21	7E-18	7E-15	3E-12	3E-10	2E-08	3E-07	2E-06	7E-06	7E-06	2E-06	3E-07	2E-08	3E-10	3E-12	7E-15	7E-18	3E-21	4E-25

high low

APPENDIX 03: Pollution level of the 100km area around LakVijaya coal power plant, Norechcholei, Puttalam: For Economic Valuation

NOx Emissions - Northern Direction

9.2E-07	7E-07	4E-07	2E-07	6E-08	1E-08	3E-09	4E-10	4E-11	4E-12	2E-13	1E-14	4E-16	1E-17	2E-19	3E-21	4E-23	4E-25	2E-27	1E-29
1E-06	7E-07	4E-07	1E-07	3E-08	6E-09	7E-10	6E-11	4E-12	2E-13	6E-15	1E-16	2E-18	2E-20	2E-22	9E-25	4E-27	1E-29	2E-32	3E-35
1.1E-06	7E-07	3E-07	9E-08	2E-08	2E-09	2E-10	1E-11	3E-13	8E-15	1E-16	1E-18	9E-21	4E-23	1E-25	2E-28	3E-31	2E-34	1E-37	5E-41
1.2E-06	7E-07	3E-07	6E-08	9E-09	7E-10	4E-11	1E-12	2E-14	3E-16	2E-18	9E-21	2E-23	4E-26	4E-29	3E-32	1E-35	2E-39	3E-43	3E-47
1.3E-06	7E-07	2E-07	4E-08	4E-09	2E-10	7E-12	1E-13	1E-15	6E-18	2E-20	3E-23	3E-26	2E-29	5E-33	9E-37	9E-41	5E-45	1E-49	2E-54
1.5E-06	6E-07	1E-07	1E-08	4E-10	6E-12	4E-14	1E-16	2E-19	1E-22	3E-26	3E-30	1E-34	3E-39	3E-44	1E-49	2E-55	2E-61	6E-68	9E-75
1.8E-06	5E-07	3E-08	7E-10	4E-12	5E-15	2E-18	2E-22	7E-27	5E-32	1E-37	6E-44	1E-50	4E-58	5E-66	1E-74	1E-83	3E-93	2E-103	3E-114
2.1E-06	2E-07	2E-09	1E-12	1E-16	8E-22	5E-28	3E-35	2E-43	1E-52	6E-63	3E-74	1E-86	6E-100	2E-114	9E-130	3E-146	1E-163	3E-182	1E-201
2.1E-06	4E-09	1E-14	1E-22	1E-33	4E-47	2E-63	2E-82	4E-104	1E-128	1E-155	1E-185	4E-218	2E-253	2E-291	0	0	0	0	0
1.4E-07	1E-22	1E-52	1E-97	7E-158	5E-233	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.4E-07	1E-22	1E-52	1E-97	7E-158	5E-233	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1E-06	4E-09	1E-14	1E-22	1E-33	4E-47	2E-63	2E-82	4E-104	1E-128	1E-155	1E-185	4E-218	2E-253	2E-291	0	0	0	0	0
2.1E-06	2E-07	2E-09	1E-12	1E-16	8E-22	5E-28	3E-35	2E-43	1E-52	6E-63	3E-74	1E-86	6E-100	2E-114	9E-130	3E-146	1E-163	3E-182	1E-201
1.8E-06	5E-07	3E-08	7E-10	4E-12	5E-15	2E-18	2E-22	7E-27	5E-32	1E-37	6E-44	1E-50	4E-58	5E-66	1E-74	1E-83	3E-93	2E-103	3E-114
1.5E-06	6E-07	1E-07	1E-08	4E-10	6E-12	4E-14	1E-16	2E-19	1E-22	3E-26	3E-30	1E-34	3E-39	3E-44	1E-49	2E-55	2E-61	6E-68	9E-75
1.3E-06	7E-07	2E-07	4E-08	4E-09	2E-10	7E-12	1E-13	1E-15	6E-18	2E-20	3E-23	3E-26	2E-29	5E-33	9E-37	9E-41	5E-45	1E-49	2E-54
1.2E-06	7E-07	3E-07	6E-08	9E-09	7E-10	4E-11	1E-12	2E-14	3E-16	2E-18	9E-21	2E-23	4E-26	4E-29	3E-32	1E-35	2E-39	3E-43	3E-47
1.1E-06	7E-07	3E-07	9E-08	2E-08	2E-09	2E-10	1E-11	3E-13	8E-15	1E-16	1E-18	9E-21	4E-23	1E-25	2E-28	3E-31	2E-34	1E-37	5E-41
1E-06	7E-07	4E-07	1E-07	3E-08	6E-09	7E-10	6E-11	4E-12	2E-13	6E-15	1E-16	2E-18	2E-20	2E-22	9E-25	4E-27	1E-29	2E-32	3E-35
9.2E-07	7E-07	4E-07	2E-07	6E-08	1E-08	3E-09	4E-10	4E-11	4E-12	2E-13	1E-14	4E-16	1E-17	2E-19	3E-21	4E-23	4E-25	2E-27	1E-29

high low

NOx Emissions – North Eastern Direction

4.8E-20	8E-18	6E-16	2E-14	4E-13	6E-12	6E-11	4E-10	2E-09	8E-09	2E-08	6E-08	1E-07	2E-07	4E-07	6E-07	7E-07	8E-07	9E-07	8E-07
2.4E-19	7E-17	7E-15	3E-13	5E-12	6E-11	5E-10	3E-09	1E-08	4E-08	1E-07	2E-07	4E-07	6E-07	7E-07	9E-07	1E-06	9E-07	8E-07	7E-07
1.1E-18	6E-16	7E-14	3E-12	6E-11	7E-10	4E-09	2E-08	6E-08	2E-07	3E-07	5E-07	8E-07	9E-07	1E-06	1E-06	9E-07	7E-07	6E-07	4E-07
2.3E-18	3E-15	7E-13	3E-11	6E-10	6E-09	3E-08	1E-07	3E-07	5E-07	8E-07	1E-06	1E-06	1E-06	1E-06	8E-07	5E-07	4E-07	2E-07	1E-07
9.1E-18	2E-14	6E-12	3E-10	6E-09	4E-08	2E-07	4E-07	8E-07	1E-06	1E-06	1E-06	1E-06	8E-07	5E-07	3E-07	2E-07	1E-07	5E-08	3E-08
2.3E-16	5E-13	1E-10	4E-09	5E-08	3E-07	7E-07	1E-06	1E-06	1E-06	1E-06	8E-07	5E-07	3E-07	1E-07	7E-08	3E-08	1E-08	6E-09	3E-09
9.3E-15	3E-11	4E-09	8E-08	5E-07	1E-06	2E-06	2E-06	1E-06	7E-07	4E-07	2E-07	9E-08	4E-08	1E-08	6E-09	2E-09	8E-10	3E-10	1E-10
3.3E-13	2E-09	2E-07	1E-06	2E-06	2E-06	1E-06	6E-07	2E-07	8E-08	3E-08	1E-08	3E-09	1E-09	4E-10	1E-10	4E-11	1E-11	3E-12	1E-12
5.1E-10	4E-07	3E-06	3E-06	1E-06	3E-07	5E-08	9E-09	2E-09	4E-10	1E-10	3E-11	1E-11	3E-12	9E-13	3E-13	9E-14	3E-14	7E-15	2E-15
1.1E-06	4E-06	2E-07	4E-09	2E-10	2E-11	2E-12	3E-13	4E-14	6E-15	1E-15	3E-16	2E-16	8E-17	5E-17	2E-17	8E-18	3E-18	1E-18	4E-19
6.3E-65	4E-172	2E-60	3E-33	2E-25	6E-27	8E-26	5E-25	2E-24	2E-24	1E-24	6E-25	3E-25	4E-25	9E-25	2E-24	3E-24	3E-24	2E-24	1E-24
1.9E-22	2E-96	0	0	6E-258	7E-104	3E-64	1E-60	2E-52	6E-47	5E-43	8E-41	1E-39	9E-39	5E-38	7E-37	2E-35	3E-34	3E-33	1E-32
5.3E-21	3E-33	4E-82	0	0	0	0	7E-218	1E-123	5E-110	3E-90	4E-77	5E-68	2E-62	4E-59	2E-56	4E-54	2E-51	1E-48	4E-46
7.6E-21	2E-31	1E-50	4E-77	3E-185	0	0	0	0	0	1E-203	2E-175	3E-139	9E-116	2E-99	2E-89	5E-83	7E-78	2E-73	7E-69
4.3E-21	2E-28	1E-40	8E-61	3E-96	1E-141	0	0	0	0	0	0	2E-304	2E-256	2E-199	1E-162	2E-137	1E-121	2E-111	4E-103
4.2E-22	5E-28	3E-36	1E-48	8E-69	2E-101	1E-157	7E-227	0	0	0	0	0	0	0	0	6E-271	5E-218	9E-182	5E-159
1.3E-22	4E-28	6E-35	4E-44	1E-56	3E-75	2E-105	3E-153	1E-234	0	0	0	0	0	0	0	0	0	0	1E-281
2.3E-22	3E-27	1E-33	1E-41	1E-51	1E-64	4E-82	2E-108	3E-150	3E-216	0	0	0	0	0	0	0	0	0	0
2.4E-22	3E-26	1E-31	2E-38	2E-47	1E-58	4E-72	1E-89	5E-113	7E-148	2E-203	2E-290	0	0	0	0	0	0	0	0
7E-23	3E-26	2E-30	9E-36	6E-43	3E-52	3E-64	7E-79	2E-96	3E-119	4E-149	7E-194	6E-265	0	0	0	0	0	0	0

high low

NOx Emissions – South Western Direction

1.8E-28	1E-24	6E-22	2E-19	2E-17	2E-15	9E-14	2E-12	4E-11	4E-10	2E-09	1E-08	3E-08	8E-08	2E-07	3E-07	4E-07	5E-07	6E-07	6E-07
2E-28	9E-24	4E-20	2E-17	2E-15	9E-14	2E-12	4E-11	5E-10	4E-09	2E-08	6E-08	1E-07	3E-07	4E-07	6E-07	6E-07	6E-07	5E-07	4E-07
5.4E-28	4E-23	4E-19	4E-16	1E-13	5E-12	8E-11	9E-10	6E-09	3E-08	1E-07	2E-07	4E-07	6E-07	7E-07	7E-07	6E-07	4E-07	3E-07	2E-07
2.7E-26	2E-21	8E-18	8E-15	2E-12	1E-10	2E-09	2E-08	7E-08	2E-07	4E-07	6E-07	8E-07	7E-07	6E-07	4E-07	3E-07	1E-07	8E-08	4E-08
1.2E-24	2E-19	1E-15	6E-13	6E-11	2E-09	3E-08	1E-07	4E-07	7E-07	9E-07	8E-07	7E-07	4E-07	2E-07	1E-07	5E-08	2E-08	8E-09	3E-09
7.6E-24	1E-17	2E-13	7E-11	4E-09	5E-08	3E-07	7E-07	1E-06	1E-06	7E-07	4E-07	2E-07	7E-08	3E-08	8E-09	3E-09	8E-10	2E-10	7E-11
3.8E-22	2E-15	2E-11	6E-09	1E-07	7E-07	1E-06	1E-06	7E-07	3E-07	1E-07	4E-08	1E-08	3E-09	7E-10	1E-10	2E-11	5E-12	1E-12	3E-13
5.4E-18	6E-12	1E-08	4E-07	2E-06	1E-06	7E-07	2E-07	4E-08	7E-09	1E-09	2E-10	3E-11	8E-12	2E-12	3E-13	4E-14	5E-15	5E-16	8E-17
1.4E-14	7E-08	2E-06	2E-06	3E-07	3E-08	2E-09	2E-10	2E-11	1E-12	1E-13	9E-15	8E-16	1E-16	3E-17	8E-18	3E-18	4E-19	4E-20	3E-21
3.9E-07	2E-06	4E-09	7E-11	2E-13	1E-15	1E-17	4E-19	5E-20	1E-20	2E-21	3E-22	3E-23	3E-24	4E-25	1E-25	7E-26	5E-26	4E-26	8E-27
6E-104	3E-281	3E-72	6E-49	4E-47	6E-38	8E-39	2E-39	5E-40	2E-39	3E-38	3E-37	2E-36	2E-36	7E-37	2E-37	1E-37	1E-37	5E-37	2E-36
5.8E-32	2E-115	0	0	0	3E-159	1E-128	4E-89	8E-83	4E-78	2E-74	1E-69	3E-64	4E-60	8E-57	4E-55	2E-54	5E-54	1E-53	2E-52
6E-29	2E-63	3E-125	0	0	0	0	0	2E-253	3E-164	2E-145	2E-131	1E-120	3E-109	6E-98	3E-89	2E-82	2E-78	3E-76	2E-74
3.7E-32	4E-48	5E-74	1E-155	2E-286	0	0	0	0	0	0	2E-263	2E-226	2E-199	5E-179	1E-158	2E-139	1E-124	3E-113	4E-106
1.5E-33	2E-47	4E-67	1E-96	3E-143	2E-291	0	0	0	0	0	0	0	0	0	4E-282	3E-249	2E-217	2E-188	2E-166
1.5E-32	5E-44	3E-61	7E-85	1E-116	7E-164	2E-236	0	0	0	0	0	0	0	0	0	0	0	0	5E-286
2E-32	5E-41	8E-54	6E-72	2E-98	3E-134	5E-181	2E-249	0	0	0	0	0	0	0	0	0	0	0	0
1E-33	6E-41	5E-50	1E-62	2E-81	1E-107	2E-145	2E-195	5E-260	0	0	0	0	0	0	0	0	0	0	0
2.4E-34	2E-41	2E-49	1E-59	4E-72	1E-89	3E-115	7E-151	8E-202	1E-268	0	0	0	0	0	0	0	0	0	0
1.1E-33	3E-40	2E-48	5E-58	6E-69	3E-82	9E-99	8E-122	2E-155	7E-202	6E-268	0	0	0	0	0	0	0	0	0

NOx Emissions – North Western Direction

1.4E-22	5E-26	4E-30	2E-35	1E-42	6E-52	6E-64	1E-78	4E-96	7E-119	7E-149	1E-193	1E-264	0	0	0	0	0	0	0
4.6E-22	5E-26	3E-31	3E-38	3E-47	2E-58	7E-72	2E-89	9E-113	1E-147	4E-203	3E-290	0	0	0	0	0	0	0	0
4.5E-22	6E-27	2E-33	2E-41	2E-51	2E-64	7E-82	4E-108	7E-150	5E-216	0	0	0	0	0	0	0	0	0	0
2.5E-22	8E-28	1E-34	7E-44	3E-56	5E-75	5E-105	6E-153	2E-234	0	0	0	0	0	0	0	0	0	0	9E-281
8.1E-22	1E-27	6E-36	2E-48	2E-68	4E-101	3E-157	1E-226	0	0	0	0	0	0	0	0	1E-270	1E-217	6E-181	4E-158
8.2E-21	3E-28	2E-40	2E-60	6E-96	2E-141	0	0	0	0	0	0	4E-304	3E-256	3E-199	2E-162	4E-137	3E-121	1E-110	3E-102
1.5E-20	4E-31	2E-50	7E-77	5E-185	0	0	0	0	0	2E-203	4E-175	6E-139	2E-115	3E-99	4E-89	9E-83	1E-77	1E-72	5E-68
1E-20	6E-33	7E-82	0	0	0	0	1E-217	2E-123	9E-110	6E-90	7E-77	1E-67	3E-62	7E-59	4E-56	8E-54	4E-51	1E-47	3E-45
3.7E-22	4E-96	0	0	1E-257	1E-103	6E-64	3E-60	4E-52	1E-46	1E-42	2E-40	2E-39	2E-38	1E-37	1E-36	4E-35	6E-34	2E-32	8E-32
1.2E-64	7E-172	3E-60	5E-33	3E-25	1E-26	2E-25	1E-24	4E-24	4E-24	2E-24	1E-24	6E-25	8E-25	2E-24	3E-24	6E-24	6E-24	1E-23	1E-23
2.1E-06	7E-06	4E-07	8E-09	4E-10	4E-11	5E-12	6E-13	8E-14	1E-14	2E-15	6E-16	3E-16	2E-16	9E-17	4E-17	2E-17	6E-18	9E-18	3E-18
9.9E-10	7E-07	6E-06	6E-06	2E-06	5E-07	1E-07	2E-08	3E-09	7E-10	2E-10	6E-11	2E-11	6E-12	2E-12	6E-13	2E-13	5E-14	5E-14	1E-14
6.4E-13	4E-09	3E-07	2E-06	5E-06	4E-06	3E-06	1E-06	4E-07	2E-07	6E-08	2E-08	7E-09	2E-09	8E-10	2E-10	7E-11	2E-11	2E-11	7E-12
1.8E-14	6E-11	8E-09	2E-07	1E-06	3E-06	4E-06	3E-06	2E-06	1E-06	8E-07	4E-07	2E-07	7E-08	3E-08	1E-08	4E-09	1E-09	2E-09	6E-10
4.5E-16	9E-13	2E-10	8E-09	1E-07	5E-07	1E-06	2E-06	3E-06	3E-06	2E-06	2E-06	9E-07	5E-07	3E-07	1E-07	6E-08	3E-08	4E-08	2E-08
1.8E-17	4E-14	1E-11	7E-10	1E-08	8E-08	3E-07	8E-07	2E-06	2E-06	2E-06	2E-06	2E-06	2E-06	1E-06	6E-07	4E-07	2E-07	4E-07	2E-07
4.5E-18	6E-15	1E-12	7E-11	1E-09	1E-08	6E-08	2E-07	5E-07	1E-06	2E-06	2E-06	2E-06	2E-06	2E-06	1E-06	1E-06	7E-07	1E-06	8E-07
2.2E-18	1E-15	1E-13	6E-12	1E-10	1E-09	8E-09	4E-08	1E-07	3E-07	6E-07	1E-06	1E-06	2E-06	2E-06	2E-06	2E-06	1E-06	4E-06	3E-06
4.7E-19	1E-16	1E-14	6E-13	1E-11	1E-10	1E-09	6E-09	2E-08	7E-08	2E-07	4E-07	7E-07	1E-06	1E-06	2E-06	2E-06	2E-06	5E-06	5E-06
9.3E-20	2E-17	1E-15	4E-14	9E-13	1E-11	1E-10	8E-10	4E-09	1E-08	4E-08	1E-07	2E-07	5E-07	8E-07	1E-06	1E-06	2E-06	5E-06	5E-06

high low

NOx Emissions – Resultant Monthly Average Concentration

2.3E-07	2E-07	1E-07	4E-08	1E-08	4E-09	7E-10	2E-10	5E-10	2E-09	6E-09	2E-08	4E-08	8E-08	1E-07	2E-07	3E-07	3E-07	4E-07	3E-07
2.5E-07	2E-07	9E-08	3E-08	8E-09	1E-09	3E-10	7E-10	3E-09	1E-08	3E-08	7E-08	1E-07	2E-07	3E-07	4E-07	4E-07	4E-07	3E-07	3E-07
2.8E-07	2E-07	8E-08	2E-08	4E-09	7E-10	1E-09	5E-09	2E-08	5E-08	1E-07	2E-07	3E-07	4E-07	4E-07	4E-07	4E-07	3E-07	2E-07	1E-07
3E-07	2E-07	7E-08	2E-08	2E-09	2E-09	8E-09	3E-08	8E-08	2E-07	3E-07	4E-07	5E-07	5E-07	4E-07	3E-07	2E-07	1E-07	8E-08	4E-08
3.2E-07	2E-07	6E-08	1E-08	2E-09	1E-08	5E-08	1E-07	3E-07	4E-07	5E-07	5E-07	4E-07	3E-07	2E-07	1E-07	6E-08	3E-08	2E-08	7E-09
3.7E-07	2E-07	3E-08	4E-09	1E-08	8E-08	3E-07	5E-07	6E-07	6E-07	5E-07	3E-07	2E-07	9E-08	4E-08	2E-08	9E-09	4E-09	2E-09	7E-10
4.4E-07	1E-07	1E-08	2E-08	2E-07	5E-07	8E-07	7E-07	5E-07	3E-07	1E-07	6E-08	3E-08	1E-08	4E-09	1E-09	5E-10	2E-10	7E-11	2E-11
5.2E-07	5E-08	5E-08	4E-07	1E-06	9E-07	5E-07	2E-07	7E-08	2E-08	8E-09	3E-09	9E-10	3E-10	1E-10	3E-11	9E-12	3E-12	8E-13	2E-13
5.2E-07	1E-07	1E-06	1E-06	4E-07	7E-08	1E-08	2E-09	4E-10	9E-11	2E-11	7E-12	3E-12	8E-13	2E-13	7E-14	2E-14	7E-15	2E-15	5E-16
4.1E-07	1E-06	5E-08	1E-09	5E-11	5E-12	6E-13	8E-14	1E-14	1E-15	3E-16	8E-17	4E-17	2E-17	1E-17	5E-18	2E-18	8E-19	3E-19	1E-19
5.7E-07	2E-06	1E-07	2E-09	1E-10	9E-12	1E-12	2E-13	2E-14	3E-15	5E-16	2E-16	8E-17	4E-17	2E-17	1E-17	4E-18	1E-18	2E-18	7E-19
5.2E-07	2E-07	2E-06	1E-06	5E-07	1E-07	2E-08	4E-09	8E-10	2E-10	5E-11	1E-11	5E-12	2E-12	4E-13	1E-13	5E-14	1E-14	1E-14	3E-15
5.2E-07	5E-08	8E-08	6E-07	1E-06	1E-06	6E-07	3E-07	1E-07	4E-08	1E-08	5E-09	2E-09	6E-10	2E-10	6E-11	2E-11	5E-12	6E-12	2E-12
4.4E-07	1E-07	1E-08	4E-08	2E-07	6E-07	9E-07	8E-07	6E-07	4E-07	2E-07	9E-08	4E-08	2E-08	7E-09	3E-09	1E-09	4E-10	5E-10	2E-10
3.7E-07	2E-07	3E-08	5E-09	3E-08	1E-07	4E-07	6E-07	7E-07	7E-07	5E-07	4E-07	2E-07	1E-07	7E-08	3E-08	2E-08	7E-09	1E-08	4E-09
3.2E-07	2E-07	6E-08	1E-08	4E-09	2E-08	8E-08	2E-07	4E-07	5E-07	6E-07	6E-07	5E-07	4E-07	3E-07	2E-07	9E-08	5E-08	9E-08	4E-08
3E-07	2E-07	7E-08	2E-08	2E-09	3E-09	1E-08	5E-08	1E-07	2E-07	4E-07	5E-07	5E-07	5E-07	5E-07	4E-07	3E-07	2E-07	4E-07	2E-07
2.8E-07	2E-07	8E-08	2E-08	4E-09	9E-10	2E-09	9E-09	3E-08	8E-08	2E-07	3E-07	4E-07	5E-07	5E-07	5E-07	4E-07	4E-07	9E-07	7E-07
2.5E-07	2E-07	9E-08	3E-08	8E-09	1E-09	4E-10	1E-09	6E-09	2E-08	5E-08	9E-08	2E-07	3E-07	4E-07	4E-07	5E-07	4E-07	1E-06	1E-06
2.3E-07	2E-07	1E-07	4E-08	1E-08	4E-09	7E-10	3E-10	1E-09	4E-09	1E-08	3E-08	6E-08	1E-07	2E-07	3E-07	3E-07	4E-07	1E-06	1E-06

high low

SOx Emissions - Northern Direction

2E-07	1E-07	9E-08	4E-08	1E-08	3E-09	6E-10	8E-11	9E-12	8E-13	5E-14	2E-15	8E-17	2E-18	5E-20	7E-22	9E-24	8E-26	5E-28	3E-30
2E-07	2E-07	8E-08	3E-08	7E-09	1E-09	2E-10	1E-11	9E-13	4E-14	1E-15	3E-17	4E-19	5E-21	4E-23	2E-25	8E-28	2E-30	4E-33	6E-36
2E-07	2E-07	7E-08	2E-08	4E-09	5E-10	4E-11	2E-12	7E-14	2E-15	3E-17	3E-19	2E-21	8E-24	2E-26	5E-29	6E-32	5E-35	3E-38	1E-41
3E-07	2E-07	6E-08	1E-08	2E-09	2E-10	8E-12	3E-13	5E-15	6E-17	4E-19	2E-21	5E-24	9E-27	9E-30	6E-33	2E-36	5E-40	7E-44	6E-48
3E-07	2E-07	5E-08	9E-09	8E-10	5E-11	1E-12	3E-14	3E-16	1E-18	4E-21	7E-24	7E-27	4E-30	1E-33	2E-37	2E-41	1E-45	3E-50	5E-55
3E-07	1E-07	3E-08	2E-09	8E-11	1E-12	9E-15	3E-17	4E-20	2E-23	6E-27	7E-31	3E-35	7E-40	7E-45	3E-50	5E-56	4E-62	1E-68	2E-75
4E-07	1E-07	7E-09	1E-10	8E-13	1E-15	5E-19	5E-23	1E-27	1E-32	2E-38	1E-44	2E-51	9E-59	1E-66	3E-75	3E-84	6E-94	4E-104	6E-115
4E-07	4E-08	4E-10	3E-13	2E-17	2E-22	1E-28	7E-36	4E-44	2E-53	1E-63	6E-75	3E-87	1E-100	5E-115	2E-130	7E-147	2E-164	7E-183	2E-202
4E-07	9E-10	3E-15	2E-23	3E-34	9E-48	4E-64	4E-83	9E-105	3E-129	2E-156	3E-186	9E-219	4E-254	4E-292	0	0	0	0	0
3E-08	3E-23	3E-53	2E-98	2E-158	1E-233	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3E-08	3E-23	3E-53	2E-98	2E-158	1E-233	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4E-07	9E-10	3E-15	2E-23	3E-34	9E-48	4E-64	4E-83	9E-105	3E-129	2E-156	3E-186	9E-219	4E-254	4E-292	0	0	0	0	0
4E-07	4E-08	4E-10	3E-13	2E-17	2E-22	1E-28	7E-36	4E-44	2E-53	1E-63	6E-75	3E-87	1E-100	5E-115	2E-130	7E-147	2E-164	7E-183	2E-202
4E-07	1E-07	7E-09	1E-10	8E-13	1E-15	5E-19	5E-23	1E-27	1E-32	2E-38	1E-44	2E-51	9E-59	1E-66	3E-75	3E-84	6E-94	4E-104	6E-115
3E-07	1E-07	3E-08	2E-09	8E-11	1E-12	9E-15	3E-17	4E-20	2E-23	6E-27	7E-31	3E-35	7E-40	7E-45	3E-50	5E-56	4E-62	1E-68	2E-75
3E-07	2E-07	5E-08	9E-09	8E-10	5E-11	1E-12	3E-14	3E-16	1E-18	4E-21	7E-24	7E-27	4E-30	1E-33	2E-37	2E-41	1E-45	3E-50	5E-55
3E-07	2E-07	6E-08	1E-08	2E-09	2E-10	8E-12	3E-13	5E-15	6E-17	4E-19	2E-21	5E-24	9E-27	9E-30	6E-33	2E-36	5E-40	7E-44	6E-48
2E-07	2E-07	7E-08	2E-08	4E-09	5E-10	4E-11	2E-12	7E-14	2E-15	3E-17	3E-19	2E-21	8E-24	2E-26	5E-29	6E-32	5E-35	3E-38	1E-41
2E-07	2E-07	8E-08	3E-08	7E-09	1E-09	2E-10	1E-11	9E-13	4E-14	1E-15	3E-17	4E-19	5E-21	4E-23	2E-25	8E-28	2E-30	4E-33	6E-36
2E-07	1E-07	9E-08	4E-08	1E-08	3E-09	6E-10	8E-11	9E-12	8E-13	5E-14	2E-15	8E-17	2E-18	5E-20	7E-22	8E-24	8E-26	5E-28	3E-30

high low

SOx Emissions – North Eastern Direction

1E-20	2E-18	1E-16	4E-15	9E-14	1E-12	1E-11	9E-11	4E-10	2E-09	5E-09	1E-08	3E-08	5E-08	8E-08	1E-07	2E-07	2E-07	2E-07	2E-07
5E-20	2E-17	2E-15	6E-14	1E-12	1E-11	1E-10	6E-10	3E-09	8E-09	2E-08	4E-08	8E-08	1E-07	2E-07	2E-07	2E-07	2E-07	2E-07	2E-07
2E-19	1E-16	1E-14	7E-13	1E-11	1E-10	9E-10	4E-09	1E-08	3E-08	7E-08	1E-07	2E-07	2E-07	2E-07	2E-07	2E-07	2E-07	1E-07	9E-08
5E-19	7E-16	2E-13	7E-12	1E-10	1E-09	6E-09	2E-08	6E-08	1E-07	2E-07	2E-07	2E-07	2E-07	2E-07	2E-07	1E-07	8E-08	5E-08	3E-08
2E-18	4E-15	1E-12	7E-11	1E-09	9E-09	4E-08	9E-08	2E-07	2E-07	3E-07	3E-07	2E-07	2E-07	1E-07	7E-08	4E-08	2E-08	1E-08	5E-09
5E-17	1E-13	2E-11	9E-10	1E-08	6E-08	2E-07	3E-07	3E-07	3E-07	2E-07	2E-07	1E-07	6E-08	3E-08	2E-08	7E-09	3E-09	1E-09	6E-10
2E-15	7E-12	9E-10	2E-08	1E-07	3E-07	4E-07	4E-07	3E-07	2E-07	9E-08	4E-08	2E-08	8E-09	3E-09	1E-09	4E-10	2E-10	6E-11	2E-11
7E-14	5E-10	4E-08	3E-07	5E-07	5E-07	3E-07	1E-07	5E-08	2E-08	6E-09	2E-09	7E-10	2E-10	8E-11	3E-11	8E-12	2E-12	7E-13	2E-13
1E-10	8E-08	7E-07	7E-07	2E-07	6E-08	1E-08	2E-09	4E-10	8E-11	2E-11	6E-12	2E-12	7E-13	2E-13	6E-14	2E-14	6E-15	2E-15	4E-16
2E-07	8E-07	4E-08	8E-10	5E-11	4E-12	5E-13	7E-14	8E-15	1E-15	2E-16	7E-17	3E-17	2E-17	1E-17	5E-18	2E-18	6E-19	3E-19	9E-20
1E-65	8E-173	3E-61	6E-34	4E-26	1E-27	2E-26	1E-25	4E-25	5E-25	2E-25	1E-25	7E-26	9E-26	2E-25	4E-25	7E-25	7E-25	4E-25	3E-25
4E-23	4E-97	0	0	1E-258	2E-104	7E-65	3E-61	4E-53	1E-47	1E-43	2E-41	2E-40	2E-39	1E-38	2E-37	4E-36	6E-35	7E-34	2E-33
1E-21	6E-34	8E-83	0	0	0	0	2E-218	3E-124	1E-110	7E-91	8E-78	1E-68	4E-63	8E-60	4E-57	9E-55	4E-52	3E-49	8E-47
2E-21	4E-32	2E-51	8E-78	6E-186	0	0	0	0	0	2E-204	5E-176	6E-140	2E-116	4E-100	5E-90	1E-83	2E-78	3E-74	2E-69
9E-22	4E-29	2E-41	2E-61	7E-97	2E-142	0	0	0	0	0	0	5E-305	4E-257	4E-200	2E-163	4E-138	3E-122	4E-112	9E-104
9E-23	1E-28	7E-37	3E-49	2E-69	4E-102	3E-158	1E-227	0	0	0	0	0	0	0	0	1E-271	1E-218	2E-182	1E-159
3E-23	9E-29	1E-35	8E-45	3E-57	6E-76	5E-106	6E-154	2E-235	0	0	0	0	0	0	0	0	0	0	3E-282
5E-23	7E-28	3E-34	2E-42	3E-52	2E-65	8E-83	5E-109	7E-151	6E-217	0	0	0	0	0	0	0	0	0	0
5E-23	6E-27	3E-32	4E-39	3E-48	2E-59	8E-73	2E-90	1E-113	1E-148	5E-204	3E-291	0	0	0	0	0	0	0	0
2E-23	6E-27	4E-31	2E-36	1E-43	7E-53	6E-65	1E-79	4E-97	7E-120	8E-150	1E-194	1E-265	0	0	0	0	0	0	0

high low

SOx Emissions – South Western Direction

4E-29	2E-25	1E-22	4E-20	5E-18	4E-16	2E-14	5E-13	8E-12	8E-11	5E-10	2E-09	7E-09	2E-08	4E-08	6E-08	9E-08	1E-07	1E-07	1E-07
4E-29	2E-24	9E-21	4E-18	4E-16	2E-14	5E-13	9E-12	1E-10	8E-10	4E-09	1E-08	3E-08	6E-08	9E-08	1E-07	1E-07	1E-07	1E-07	9E-08
1E-28	8E-24	8E-20	9E-17	2E-14	1E-12	2E-11	2E-10	1E-09	6E-09	2E-08	5E-08	9E-08	1E-07	1E-07	1E-07	1E-07	9E-08	6E-08	4E-08
6E-27	3E-22	2E-18	2E-15	4E-13	2E-11	4E-10	3E-09	1E-08	4E-08	9E-08	1E-07	2E-07	2E-07	1E-07	9E-08	6E-08	3E-08	2E-08	8E-09
3E-25	5E-20	2E-16	1E-13	1E-11	4E-10	6E-09	3E-08	8E-08	1E-07	2E-07	2E-07	1E-07	9E-08	5E-08	2E-08	1E-08	4E-09	2E-09	7E-10
2E-24	3E-18	4E-14	2E-11	8E-10	1E-08	6E-08	2E-07	2E-07	2E-07	1E-07	8E-08	4E-08	2E-08	5E-09	2E-09	5E-10	2E-10	5E-11	1E-11
8E-23	4E-16	5E-12	1E-09	3E-08	1E-07	3E-07	3E-07	2E-07	7E-08	2E-08	8E-09	2E-09	7E-10	1E-10	3E-11	5E-12	1E-12	2E-13	5E-14
1E-18	1E-12	2E-09	9E-08	3E-07	3E-07	1E-07	4E-08	8E-09	1E-09	2E-10	4E-11	7E-12	2E-12	4E-13	7E-14	8E-15	1E-15	1E-16	2E-17
3E-15	1E-08	4E-07	4E-07	7E-08	6E-09	4E-10	4E-11	4E-12	3E-13	2E-14	2E-15	2E-16	3E-17	6E-18	2E-18	6E-19	9E-20	8E-21	7E-22
8E-08	3E-07	8E-10	1E-11	5E-14	3E-16	2E-18	9E-20	1E-20	2E-21	5E-22	7E-23	6E-24	6E-25	8E-26	2E-26	2E-26	1E-26	8E-27	2E-27
1E-104	7E-282	6E-73	1E-49	8E-48	1E-38	2E-39	4E-40	1E-40	3E-40	6E-39	6E-38	4E-37	5E-37	1E-37	5E-38	2E-38	3E-38	1E-37	3E-37
1E-32	5E-116	0	0	0	7E-160	3E-129	1E-89	2E-83	9E-79	4E-75	3E-70	6E-65	9E-61	2E-57	9E-56	3E-55	1E-54	3E-54	4E-53
1E-29	4E-64	6E-126	0	0	0	0	0	4E-254	7E-165	5E-146	5E-132	2E-121	6E-110	1E-98	6E-90	4E-83	5E-79	7E-77	5E-75
8E-33	9E-49	1E-74	2E-156	4E-287	0	0	0	0	0	0	4E-264	5E-227	5E-200	1E-179	3E-159	5E-140	2E-125	6E-114	8E-107
3E-34	3E-48	1E-67	2E-97	7E-144	4E-292	0	0	0	0	0	0	0	0	0	9E-283	7E-250	4E-218	4E-189	4E-167
3E-33	1E-44	7E-62	1E-85	2E-117	2E-164	5E-237	0	0	0	0	0	0	0	0	0	0	0	0	1E-286
4E-33	1E-41	2E-54	1E-72	4E-99	7E-135	1E-181	3E-250	0	0	0	0	0	0	0	0	0	0	0	0
2E-34	1E-41	1E-50	2E-63	5E-82	3E-108	5E-146	4E-196	1E-260	0	0	0	0	0	0	0	0	0	0	0
5E-35	5E-42	4E-50	3E-60	9E-73	2E-90	6E-116	1E-151	2E-202	3E-269	0	0	0	0	0	0	0	0	0	0
2E-34	7E-41	4E-49	1E-58	1E-69	6E-83	2E-99	2E-122	4E-156	1E-202	1E-268	0	0	0	0	0	0	0	0	0

high low

SOx Emissions – North Western Direction

3E-23	1E-26	9E-31	4E-36	2E-43	1E-52	1E-64	3E-79	8E-97	1E-119	2E-149	3E-194	3E-265	0	0	0	0	0	0	0
1E-22	1E-26	5E-32	7E-39	7E-48	5E-59	2E-72	4E-90	2E-113	3E-148	9E-204	7E-291	0	0	0	0	0	0	0	0
1E-22	1E-27	5E-34	4E-42	5E-52	4E-65	1E-82	1E-108	1E-150	1E-216	0	0	0	0	0	0	0	0	0	0
5E-23	2E-28	2E-35	2E-44	6E-57	1E-75	1E-105	1E-153	4E-235	0	0	0	0	0	0	0	0	0	0	2E-281
2E-22	2E-28	1E-36	5E-49	3E-69	8E-102	6E-158	3E-227	0	0	0	0	0	0	0	0	3E-271	2E-218	1E-181	8E-159
2E-21	7E-29	5E-41	3E-61	1E-96	4E-142	0	0	0	0	0	0	1E-304	7E-257	7E-200	4E-163	9E-138	6E-122	3E-111	6E-103
3E-21	9E-32	5E-51	2E-77	1E-185	0	0	0	0	0	5E-204	1E-175	1E-139	4E-116	7E-100	9E-90	2E-83	3E-78	2E-73	1E-68
2E-21	1E-33	2E-82	0	0	0	0	3E-218	5E-124	2E-110	1E-90	1E-77	2E-68	7E-63	2E-59	8E-57	2E-54	8E-52	2E-48	6E-46
8E-23	9E-97	0	0	3E-258	3E-104	1E-64	6E-61	8E-53	3E-47	2E-43	4E-41	4E-40	4E-39	2E-38	3E-37	8E-36	1E-34	5E-33	2E-32
3E-65	2E-172	7E-61	1E-33	7E-26	3E-27	3E-26	2E-25	8E-25	9E-25	4E-25	2E-25	1E-25	2E-25	4E-25	8E-25	1E-24	1E-24	3E-24	2E-24
5E-07	2E-06	8E-08	2E-09	9E-11	8E-12	1E-12	1E-13	2E-14	2E-15	4E-16	1E-16	7E-17	3E-17	2E-17	9E-18	3E-18	1E-18	2E-18	6E-19
2E-10	2E-07	1E-06	1E-06	5E-07	1E-07	2E-08	4E-09	7E-10	2E-10	4E-11	1E-11	4E-12	1E-12	4E-13	1E-13	4E-14	1E-14	1E-14	3E-15
1E-13	9E-10	7E-08	5E-07	1E-06	9E-07	5E-07	2E-07	9E-08	3E-08	1E-08	4E-09	1E-09	5E-10	2E-10	5E-11	2E-11	4E-12	5E-12	1E-12
4E-15	1E-11	2E-09	3E-08	2E-07	5E-07	8E-07	7E-07	5E-07	3E-07	2E-07	8E-08	4E-08	2E-08	6E-09	2E-09	9E-10	3E-10	4E-10	1E-10
1E-16	2E-13	4E-11	2E-09	2E-08	1E-07	3E-07	5E-07	6E-07	6E-07	5E-07	3E-07	2E-07	1E-07	6E-08	3E-08	1E-08	6E-09	9E-09	4E-09
4E-18	8E-15	2E-12	1E-10	2E-09	2E-08	7E-08	2E-07	3E-07	5E-07	5E-07	5E-07	4E-07	3E-07	2E-07	1E-07	8E-08	4E-08	8E-08	4E-08
1E-18	1E-15	3E-13	1E-11	3E-10	2E-09	1E-08	4E-08	1E-07	2E-07	3E-07	4E-07	5E-07	5E-07	4E-07	3E-07	2E-07	2E-07	3E-07	2E-07
5E-19	3E-16	3E-14	1E-12	3E-11	3E-10	2E-09	8E-09	3E-08	7E-08	1E-07	2E-07	3E-07	4E-07	4E-07	4E-07	4E-07	3E-07	8E-07	6E-07
1E-19	3E-17	3E-15	1E-13	2E-12	3E-11	2E-10	1E-09	5E-09	2E-08	4E-08	8E-08	2E-07	2E-07	3E-07	4E-07	4E-07	4E-07	1E-06	1E-06
2E-20	4E-18	2E-16	8E-15	2E-13	3E-12	2E-11	2E-10	9E-10	3E-09	1E-08	2E-08	5E-08	1E-07	2E-07	2E-07	3E-07	3E-07	1E-06	1E-06

high low

SOx Emissions – Resultant Monthly Average Concentration

5E-08	4E-08	2E-08	9E-09	3E-09	8E-10	2E-10	4E-11	1E-10	4E-10	1E-09	4E-09	9E-09	2E-08	3E-08	5E-08	6E-08	7E-08	8E-08	8E-08
5E-08	4E-08	2E-08	7E-09	2E-09	3E-10	7E-11	2E-10	7E-10	2E-09	6E-09	1E-08	3E-08	4E-08	6E-08	8E-08	9E-08	8E-08	7E-08	6E-08
6E-08	4E-08	2E-08	5E-09	9E-10	2E-10	2E-10	1E-09	4E-09	1E-08	2E-08	4E-08	6E-08	8E-08	9E-08	9E-08	8E-08	6E-08	5E-08	3E-08
6E-08	4E-08	1E-08	3E-09	5E-10	3E-10	2E-09	6E-09	2E-08	4E-08	6E-08	9E-08	1E-07	1E-07	8E-08	6E-08	4E-08	3E-08	2E-08	9E-09
7E-08	4E-08	1E-08	2E-09	5E-10	2E-09	1E-08	3E-08	6E-08	1E-07	1E-07	1E-07	9E-08	6E-08	4E-08	2E-08	1E-08	7E-09	3E-09	2E-09
8E-08	3E-08	7E-09	8E-10	3E-09	2E-08	5E-08	1E-07	1E-07	1E-07	1E-07	6E-08	4E-08	2E-08	9E-09	4E-09	2E-09	8E-10	4E-10	1E-10
9E-08	3E-08	2E-09	5E-09	3E-08	1E-07	2E-07	2E-07	1E-07	6E-08	3E-08	1E-08	5E-09	2E-09	8E-10	3E-10	1E-10	4E-11	1E-11	5E-12
1E-07	1E-08	1E-08	9E-08	2E-07	2E-07	1E-07	4E-08	1E-08	5E-09	2E-09	6E-10	2E-10	6E-11	2E-11	7E-12	2E-12	6E-13	2E-13	5E-14
1E-07	2E-08	3E-07	3E-07	8E-08	2E-08	3E-09	5E-10	9E-11	2E-11	5E-12	2E-12	5E-13	2E-13	5E-14	2E-14	5E-15	1E-15	4E-16	1E-16
9E-08	3E-07	1E-08	2E-10	1E-11	1E-12	1E-13	2E-14	2E-15	3E-16	6E-17	2E-17	8E-18	4E-18	3E-18	1E-18	4E-19	2E-19	7E-20	2E-20
1E-07	4E-07	2E-08	4E-10	2E-11	2E-12	3E-13	3E-14	4E-15	6E-16	1E-16	3E-17	2E-17	9E-18	5E-18	2E-18	8E-19	3E-19	5E-19	2E-19
1E-07	4E-08	3E-07	3E-07	1E-07	3E-08	5E-09	1E-09	2E-10	4E-11	1E-11	3E-12	1E-12	3E-13	1E-13	3E-14	1E-14	3E-15	3E-15	7E-16
1E-07	1E-08	2E-08	1E-07	2E-07	2E-07	1E-07	6E-08	2E-08	9E-09	3E-09	1E-09	4E-10	1E-10	4E-11	1E-11	4E-12	1E-12	1E-12	4E-13
9E-08	3E-08	2E-09	9E-09	5E-08	1E-07	2E-07	2E-07	1E-07	8E-08	4E-08	2E-08	9E-09	4E-09	2E-09	6E-10	2E-10	8E-11	1E-10	3E-11
8E-08	3E-08	7E-09	1E-09	6E-09	3E-08	8E-08	1E-07	2E-07	1E-07	1E-07	8E-08	5E-08	3E-08	1E-08	7E-09	3E-09	2E-09	2E-09	1E-09
7E-08	4E-08	1E-08	2E-09	8E-10	5E-09	2E-08	4E-08	8E-08	1E-07	1E-07	1E-07	1E-07	8E-08	6E-08	3E-08	2E-08	1E-08	2E-08	9E-09
6E-08	4E-08	1E-08	3E-09	5E-10	6E-10	3E-09	1E-08	3E-08	5E-08	8E-08	1E-07	1E-07	1E-07	1E-07	8E-08	6E-08	4E-08	8E-08	5E-08
6E-08	4E-08	2E-08	5E-09	9E-10	2E-10	4E-10	2E-09	6E-09	2E-08	3E-08	6E-08	8E-08	1E-07	1E-07	1E-07	9E-08	8E-08	2E-07	1E-07
5E-08	4E-08	2E-08	7E-09	2E-09	3E-10	9E-11	3E-10	1E-09	4E-09	1E-08	2E-08	4E-08	6E-08	8E-08	9E-08	1E-07	1E-07	3E-07	3E-07
5E-08	4E-08	2E-08	9E-09	3E-09	8E-10	2E-10	6E-11	2E-10	8E-10	2E-09	6E-09	1E-08	2E-08	4E-08	6E-08	7E-08	8E-08	2E-07	3E-07

high low

APPENDIX 04: Calculations of Sensitivity Analysis

Key Parameters

GDP ratio

Dose Response Function Mortality/Morbidity (DRF Mt/DRF Mb)

Mortality Rate (Mt)

Morbidity Rate (Mb)

Value of Statistical Life (VSL)

Cost of Illness (COI)

Pollution Concentration (PC)

OUT PUT - COST OF EXTERNALATY

Mt X Population X VSL [{PC Nox X DFR(Mt-Nox)} + { PC Sox X DFR(Mt-Sox) }] +
Mb X Population X COI [{PC Nox X DFR(Mb-Nox)} +{ PC Sox X DFR(Mb-Sox) }]

Case 01 : Puttalam District		Base Case		10% Increment of DRF (Mt)		20% Increment of DRF (Mt)		30% Increment of DRF (Mt)		50% Increment of DRF (Mt)	
		NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx
Incremental Pollution Concerntration	PC	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148
Dose Response Function Mortality DFR	DRF (Mt)	3.80%	4.35%	4.18%	4.79%	4.56%	5.22%	4.94%	5.66%	5.70%	6.53%
Dose Response Function Morbidity DFR	DRF (Mb)	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%
Mortality Rate	Mt	0.00014		0.00014		0.00014		0.00014		0.00014	
Morbidity Rate	Mb	0.022		0.022		0.022		0.022		0.022	
Value of Statistical Life	VSL	149,400	USD	149,400	USD	149,400	USD	149,400	USD	149,400	USD
Cost of Illness	COI	910	USD	910	USD	910	USD	910	USD	910	USD
Affected Population	Population	762,396		762,396		762,396		762,396		762,396	
Out put	USD	2002020.3		2179014		2356009		2533002.6		2886990.75	
Change% of the output				**8.840773**		**17.6815**		**26.52232**		**44.2038671**	

Case 01 : Puttalam District		Base Case		10% Increment of DRF (Mb)		20% Increment of DRF (Mb)		30% Increment of DRF (Mb)		50% Increment of DRF (Mb)	
		NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx
Incremental Pollution Concerntration	PC	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148
Dose Response Function Mortality DFR	DRF (Mt)	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%
Dose Response Function Morbidity DFR	DRF (Mb)	0.92%	0.51%	1.01%	0.56%	1.10%	0.61%	1.20%	0.66%	1.38%	0.77%
Mortality Rate	Mt	0.00014		0.00014		0.00014		0.00014		0.00014	
Morbidity Rate	Mb	0.022		0.022		0.022		0.022		0.022	
Value of Statistical Life	VSL	149,400	USD	149,400	USD	149,400	USD	149,400	USD	149,400	USD
Cost of Illness	COI	910	USD	910	USD	910	USD	910	USD	910	USD
Affected Population	Population	762,396		762,396		762,396		762,396		762,396	
Out put	USD	2002020.3		2025228		2048436		2071644.2		2118060.1	
Change% of the output				1.159227		2.31845		3.4776798		5.79613294	

Case 01 : Puttalam District		Base Case		10% Increment of Mortality Rate		20% Increment of Mortality Rate		30% Increment of Mortality Rate		50% Increment of Mortality Rate	
		NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx
Incremental Pollution Concerntration	**PC**	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148
Dose Response Function Mortality DFR	**DRF (Mt)**	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%
Dose Response Function Morbidity DFR	**DRF (Mb)**	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%
Mortality Rate	**Mt**	0.00014		0.000154		0.00017		0.000182		0.00021	
Morbidity Rate	**Mb**	0.022		0.022		0.022		0.022		0.022	
Value of Statistical Life	**VSL**	149,400	USD	149,400	USD	149,400	USD	149,400	USD	149,400	USD
Cost of Illness	**COI**	910	USD	910	USD	910	USD	910	USD	910	USD
Affected Population	**Population**	762,396		762,396		762,396		762,396		762,396	
Out put	**USD**	2002020.3		2179014		2356009		2533002.6		2886990.75	
Change% of the output				**8.840773**		**17.6815**		**26.52232**		**44.2038671**	

Case 01 : Puttalam District		Base Case		10% Increment of Morbidity Rate		20% Increment of Morbidity Rate		30% Increment of Morbidity Rate		50% Increment of Morbidity Rate	
		NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx
Incremental Pollution Concerntration	**PC**	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148
Dose Response Function Mortality DFR	**DRF (Mt)**	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%
Dose Response Function Morbidity DFR	**DRF (Mb)**	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%
Mortality Rate	**Mt**	0.00014		0.00014		0.00014		0.00014		0.00014	
Morbidity Rate	**Mb**	0.022		0.0242		0.0264		0.0286		0.033	
Value of Statistical Life	**VSL**	149,400	USD	149,400	USD	149,400	USD	149,400	USD	149,400	USD
Cost of Illness	**COI**	910	USD	910	USD	910	USD	910	USD	910	USD
Affected Population	**Population**	762,396		762,396		762,396		762,396		762,396	
Out put	**USD**	2002020.3		2025228		2048436		2071644.2		2118060.1	
Change% of the output				**1.159227**		**2.31845**		**3.4776798**		**5.79613294**	

Case 01 : Puttalam District		Base Case		10% Increment of VSL		20% Increment of VSL		30% Increment of VSL		50% Increment of VSL	
		NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx
Incremental Pollution Concerntration	**PC**	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148
Dose Response Function Mortality DFR	**DRF (Mt)**	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%
Dose Response Function Morbidity DFR	**DRF (Mb)**	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%
Mortality Rate	**Mt**	0.00014		0.00014		0.00014		0.00014		0.00014	
Morbidity Rate	**Mb**	0.022		0.022		0.022		0.022		0.022	
Value of Statistical Life	**VSL**	149,400	USD	164,340	USD	179,280	USD	194,220	USD	224,100	USD
Cost of Illness	**COI**	910	USD	910	USD	910	USD	910	USD	910	USD
Affected Population	**Population**	762,396		762,396		762,396		762,396		762,396	
Out put	**USD**	2002020.3		2179014		2356009		2533002.6		2886990.75	
Change% of the output				**8.840773**		**17.6815**		**26.52232**		**44.2038671**	

Case 01 : Puttalam District		Base Case		10% Increment of COI		20% Increment of COI		30% Increment of COI		50% Increment of COI	
		NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx
Incremental Pollution Concerntration	**PC**	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148
Dose Response Function Mortality DFR	**DRF (Mt)**	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%
Dose Response Function Morbidity DFR	**DRF (Mb)**	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%
Mortality Rate	**Mt**	0.00014		0.00014		0.00014		0.00014		0.00014	
Morbidity Rate	**Mb**	0.022		0.022		0.022		0.022		0.022	
Value of Statistical Life	**VSL**	149,400	USD	149,400	USD	149,400	USD	149,400	USD	149,400	USD
Cost of Illness	**COI**	910	USD	1,001	USD	1,092	USD	1,183	USD	1,365	USD
Affected Population	**Population**	762,396		762,396		762,396		762,396		762,396	
Out put	**USD**	2002020.3		2025228		2048436		2071644.2		2118060.1	
Change% of the output				**1.159227**		**2.31845**		**3.4776798**		**5.79613294**	

Case 01 : Puttalam District		Base Case		10% Increment of Pollution Concentration		20% Increment of Pollution Concentration		30% Increment of Pollution Concentration		50% Increment of Pollution Concentration	
		NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx
Incremental Pollution Concerntration	**PC**	0.462	2.148	0.5082	2.3628	0.5544	2.5776	0.6006	2.7924	0.693	3.222
Dose Response Function Mortality DFR	**DRF (Mt)**	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%
Dose Response Function Morbidity DFR	DRF (Mb)	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%
Mortality Rate	Mt	0.00014		0.00014		0.00014		0.00014		0.00014	
Morbidity Rate	Mb	0.022		0.022		0.022		0.022		0.022	
Value of Statistical Life	**VSL**	149,400	USD	149,400	USD	149,400	USD	149,400	USD	149,400	USD
Cost of Illness	**COI**	910	USD	910	USD	910	USD	910	USD	910	USD
Affected Population	**Population**	762,396		762,396		762,396		762,396		762,396	
Out put	**USD**	2002020.3		2202222		2402424		2602626.4		3003030.51	
Change% of the output				**10**		**20**		**30**		**50**	

Case 01 : Puttalam District		Base Case		10% Increment of GDP ratio of India/Sri Lanka		20% Increment of GDP ratio of India/Sri Lanka		30% Increment of GDP ratio of India/Sri Lanka		50% Increment of GDP ratio of India/Sri Lanka	
		NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx	NOx	SOx
Incremental Pollution Concerntration	PC	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148	0.462	2.148
Dose Response Function Mortality DFR	DRF (Mt)	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%	3.80%	4.35%
Dose Response Function Morbidity DFR	DRF (Mb)	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%	0.92%	0.51%
Mortality Rate	Mt	0.00014		0.00014		0.00014		0.00014		0.00014	
Morbidity Rate	Mb	0.022		0.022		0.022		0.022		0.022	
Value of Statistical Life	VSL	149,400	USD	164,340	USD	179,280	USD	194,220	USD	224,100	USD
Cost of Illness	COI	910	USD	1,001	USD	1,092	USD	1,183	USD	1,365	USD
Affected Population	Population	762,396		762,396		762,396		762,396		762,396	
Out put	USD	2002020.3		2202222		2402424		2602626.4		3003030.51	
Change% of the output				10		20		30		50	

APPENDIX 05: Description of 'ISC-AERMOD View'

Source: *REPORT ON AIR DISPERSION MODELLING STUDY FOR PROPOSED 500 MW COAL POWER PLANT AT SAMPOOR*, Report No: CS 1415036, Prepared by Environmental Technology Section, Industrial Technology Institute, 2014.11.27

Model Description

'AERMOD View' is a complete and powerful air dispersion modeling Package .It incorporates the following popular U.S. EPA air dispersion models into one integrated interface.

1. AERMOD
2. ISCST3
3. ISC-PRIME

These US EPA air dispersion models are widely used to assess pollution concentration and deposition from a wide variety of sources.

- The **A**MS/**E**PA **R**egulatory **Mod**el (AERMOD) is the next generation air dispersion model based on planetary boundary layer theory

- The **I**ndustrial **S**ource **C**omplex - **S**hort **T**erm regulatory air dispersion model (ISCST3) is a Gaussian plume model and is widely used to assess pollution concentration and/or deposition flux on receptors from a wide variety of sources

- The **I**ndustrial **S**ource **C**omplex - **P**lume **Ri**se **M**odel **E**nhancements (ISCPRIME) dispersion model is similar to the ISCST3 model, but contains enhanced building downwash analysis.

Technical specifications of each are given below in Table 1, 2 and 3 respectively. AERMOD utilizes a similar input and output structure to ISCST3 and shares many of the same features, as well as offering additional features. AERMOD fully incorporates the PRIME building downwash algorithms, advanced depositional parameters, local terrain effects, and advanced meteorological turbulence calculations.

Table 1: Technical Specifications - AERMOD

Parameter	Description
Model Name	AERMOD
Developed By	AERMIC - (American Meteorological Society (AMS) and United States Environmental Protection Agency (US EPA)
Model Type	Steady-state Gaussian plume air dispersion model
Range	Up to 50km from the source
Atmospheric Stability Model	Planetary boundary layer theory, turbulence scaling concepts
Wind Field	Homogeneous
Release Types	Buoyant or neutrally buoyant plumes
Emission Types	Constant or time-varying, planned or fugitive
Atmospheric Chemistry	NOX to NO2 and SO2 decay
Source Types	Point, area, volume, open pit, line*, flare*
Meteorology	Hourly surface and upper air data (processed by AERMET)
Terrain	Flat or elevated (terrain processed by AERMAP)
Receptors	Several types of grids (Cartesian, polar) and discrete receptors
Other Options	Building downwash (modelled by BPIP-PRIME)
Regulatory Status	Preferred US EPA regulatory model for near-field applications

Table 2: Technical Specifications - ISCST3

Parameter	Description
Model Name	ISCST3 - Industrial Source Complex Short Term model (US EPA)
Developed By	United States Environmental Protection Agency (US EPA)
Model Type	Steady-state Gaussian plume air dispersion model
Time Step	1 hour
Range	Up to 50km from the source
Terrain	Flat and elevated
Building Downwash	Modelled by BPIP
Source Types	Point, area, volume, open pit, line*, flare*
Input Meteorology	Hourly surface data and mixing height data (through PCRAMMET)
Atmospheric Stability Model	Pasquill-Gifford Stability Classes
Wind Field	Homogeneous
Release Types	Buoyant or neutrally buoyant plumes
Emission Types	Constant or time-varying, planned or fugitive
Atmospheric Chemistry	NOX to NO2 and SO2 decay
Regulatory Status	Former US EPA regulatory model for near-field applications

Table 3: Technical Specifications - ISC-PRIME

Parameter	Description
Model Name	ISC-PRIME model
Developed By	United States Environmental Protection Agency (US EPA)
Model Type	Steady-state Gaussian plume air dispersion model
Time Step	1 hour
Range	Up to 50km from the source
Terrain	Flat and elevated
Building Downwash	Modeled by BPIP-PRIME
Source Types	Point, area, volume, open pit, line*, flare*
Input Meteorology	Hourly surface data and mixing height data (through RAMMET)
Atmospheric Stability Model	Pasquill-Gifford Stability Classes
Wind Field	Homogeneous
Release Types	Buoyant or neutrally buoyant plumes
Emission Types	Constant or time-varying, planned or fugitive
Atmospheric Chemistry	NOX à NO2 and SO2 decay
Regulatory Status	Former US EPA regulatory model for near-field applications

APPENDIX 06: The National Environmental (Ambient Air Quality) Regulations

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The Gazette of the Democratic Socialist Republic of Sri Lanka

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No. 1562/22 - FRIDAY, AUGUST 15, 2008

(Published by Authority)

PART I : SECTION (I) — GENERAL

Government Notifications

L.D.B. 4/81.

THE NATIONAL ENVIRONMENTAL ACT, No. 47 OF 1980

REGULATIONS made by Minister of Environment and Natural Resources under Section 32 of the National Environmental Act, No. 47 of 1980.

PATALI CHAMPIKA RANAWAKA,
Minister of Environment and Natural Resources.

Colombo,
13th August, 2008.

Regulations

The National Environmental (Ambient Air Quality) Regulations, 1994, published in *Gazette Extraordinary*, No. 850/4 of December, 1994 are hereby amended by the subsitution for the Schedule to that regulation of the following :-

"SCHEDULE

Pollutant	*Averaging Time**	*Maximum Permissible Level*		*+ Method of measurement*
		μgm^{-3}	*ppm*	
1. Particulate Matter - Aerodynamic diameter is less than 10 μm in size (PM_{10})	Annual	50	—	Hi-volume sampling and Gravimtric or Beta Attenuation
	24 hrs.	100	—	
2. Particulate Matter - Aerodynamic diameter is less than 2.5 μm in size ($PM_{2.5}$)	Annual	25	—	Hi-volume sampling and Gravimtric or Beta Attenuation
	24 hrs.	50	—	

1A

SCHEDULE *(Contd.,)*

Pollutant	*Averaging Time**	*Maximum Permissible Level*		*+ Method of measurement*
		μgm^{-3}	*ppm*	
3. Nitrogen Dioxide (NO_2)	24 hrs.	100	0.05	Colorimetric using saltzman Method or equivalent Gas phase chemiluminescence
	8 hrs.	150	0.08	
	1hr.	250	0.13	
4. Sulphur Dixoxide (SO_2)	24 hrs.	80	0.03	Pararosaniliene Method or equivalent Pulse Flourescent
	8 hrs.	120	0.05	
	1hrs.	200	0.08	
5. Ozone (O_3)	1 hr.	200	0.10	Chemiluminescence Method or equivalent Ultraviolet photometric
6. Carbon Monoxide (CO)	8 hrs.	10,000	9.00	Non-Dispersive Infrared Spectroscopy"
	1 hr.	30,000	26.00	
	Any time	58,000	50.00	

* Minimum number of observatons required to determine the average over the specified period —

03 hour average - 03 consecutive hourly average
08 hour average - 08 hourly average
24 hour average - 18 hourly average
Yearly average - 09 monthly average with at least 02 monthly average each quarter.

\+ By using Chemicals or Automatic Analysers.

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APPENDIX 07: Summary of case study: 800 MW Coal power plant in Cheyyur in Kancheepuram, Tamil Nadu, India

Regulations

A. Technology and Pollutant Load

Only one 800 MW unit of a proposed 4000 MW plant has been considered. The assumed characteristics of the thermal power plant and fuel specification are outlined in Tables 5 and 6, respectively. The efficiencies assumed are in line with the highest standards of the industry and are representative of the future of thermal energy generation. The fuel with a calorific value of 4000 kcal/kg, from an indigenous source would have typical characteristics as indicated in Table 6.

Table 5: Pollution Load from 800 MW Coal Power Plant.

Assumptions	
Capacity	800 MW
Plant Load Factor	85%
Specific fuel consumption	0.53 kg/kWh
Fuel consumption rate	8664 Tons/day
Conversion Efficiency	90.0%
Cycle Efficiency	45.0%
Overall Efficiency	40.5%
Heat rate	2123.5 kcal/kWh
Unabated Pollution Load (tons/day)	
SO_2 production	139
NO_2 production	171
CO_2 production	10,801
PM_{10} production	358

CO_2= carbon dioxide; kcal=kilocalorie; kg= kilogram; kWh=kilowatt hour; MW= megawatt; NO_2= nitrogen dioxide; PM10= Particulate matter up to 10 micrometers in size; SO_2= sulfur dioxide;

The assumptions about calorific value, ash, and sulfur content are typical of Indian sub-bituminous coals. Imported coal would be more desirable, but a significantly more expensive option. The resulting emissions from the proposed unit are calculated based on simple stoichiometric ratios for the combustion products. Table 5 outlines the unabated pollution load at the plant site, the highest of which is CO2 production at 10,801 tons a day. The net emissions given a standard abatement process and technology are calculated based on efficiency assumptions of the abatement devices. Table 7 provides the pollution load after standard abatement.

Table 6: Fuel Specification

Coal composition	Percent (%)
C	34.0
S	0.8
N	0.6
Ash	35.0

C=carbon, N=nitrogen, S=sulfur

Table 7: Pollution Load at Plant Site

Emission	% Control	Emissions after control (tons/day)
SO_2	95.0	6.9
NO_2	85.0	25.6
PM_{10}	99.0	3.6

B. Dispersion Modelling

The figures corresponding to the emissions in Table 7 are used as inputs to the dispersion model. The parameters required to model the dispersion of pollutant are derived from the power plant at Mundra (Table 8). The locally relevant parameters such as wind speed and direction are approximated using the data available for a nearby station (i.e., Cuddalore is located 50 kms. away from Cheyyur). To simplify assumptions associated with the calculations, moderately unstable conditions were assumed in assigning the stability parameter.

Table 8: Dispersion Parameters

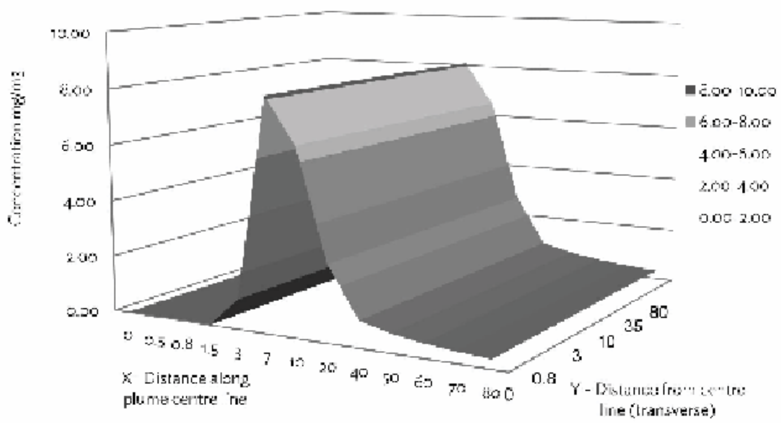
Table 8: Dispersion Parameters

	Value
Stack height (m)	275
Stack diameter (m)	6
Gas exit velocity (m/s)	5
Gas exit temperature (C)	200
Ambient Temperature(C)	30
Wind Velocity (m/s)	1

NO2= nitrogen dioxide, PM10= Particulate matter up to 10 micrometers in size, SO2= sulfur dioxide.

A Gaussian plume model was evaluated using the parameters established in Table 8. The above and ground level concentration profile over a 100km radius was established (See Appendix 4 for a detailed information of the dispersion parameters). Figure 4 shows the variation of PM10 concentration.

Figure 4: Concentration Surface Profile of Pollutants Downstream of Source



Source: *Authors estimates.*

Note: Output from the Gaussian-Plume model for PM_{10} dispersion.

Since the concentration profile (at the ground level) is a continuous variable rather than discrete one, the increased pollutant load was evaluated in specific urban clusters around the power plant. A list of all major towns and cities within a 100 km radius was initially considered and only the significant population centers were retained for this exercise (Table 9). The estimated marginal increases in pollutant concentration (mg/m3) for SO2, NO2, and PM10 are computed using the pollution load data and parameter values discussed above for the coal power plant project.

Table 9: Pollutant Concentration at Discrete Population Cluster Locations

City	Population	Distance from Cheyyur (kms)	SO_2 Increase per 10 ug/m^3	NO_2 Increase per 10 ug/m^3	PM_{10} Increase per 10 ug/m^3
Chennai	6,540,462	85	0.57	2.10	0.29
Pondicherry	505,959	51	1.12	4.16	0.58
Kancheepuram	188,733	64	0.86	3.19	0.45
Cuddalore	158,634	75	0.69	2.55	0.36
Thiruvannamalai	130,567	100	0.44	1.62	0.23
Arakonam	78,686	89	0.57	2.10	0.29
Thindivanam	67,737	40	1.55	5.72	0.80
Chengalpattu	62,852	39	1.55	5.72	0.80
Arani	60,815	85	0.57	2.10	0.29
Thiruvallur	45,732	89	0.57	2.10	0.29
Melvisharam	36,757	100	0.44	1.62	0.23
Sriperumbudur	16,156	69	0.86	3.19	0.45
Ananthapuram	6,138	73	0.69	2.55	0.36
Vandavasi	29,620	52	1.12	4.16	0.58

C. Quantification of Health Impacts

After estimating the incremental increase in pollutant concentration, the next step entails quantifying the physical health impacts. We use the mean estimates of DRFs reported for both mortality and morbidity outcomes presented in HEI Summary Estimates. Here we apply the direct transfer of average values in these tables.

Mortality Impacts

Baseline deaths associated with acute mortality are first computed based on national health figures. After applying the estimated increase in pollutant concentration from the dispersion modelling and the mean risk rate reported, we estimate the total increase in mortality incidence at about 94 premature deaths per year (Table 10). It should be noted that the relatively small increase in premature mortality incidence may be attributed, to a large extent, to the high abatement measures being applied at the plant site, removing about 95%, 85%, and 99% of SO2, NO2, and PM10 respectively. In the absence of any abatement, mortality incidence is estimated at 1,243 premature deaths per year.

Table 10: Estimated Increase in Mortality Incidence Associated with Air Pollution, by City

City	Population	Distance from Source (kms)	SO_2	NO_2	PM_{10}	Total by City
Chennai	6,540,462	85	10	56	3	70
Pondicherry	505,959	51	2	9	1	11
Kancheepuram	188,733	64	0	2	0	3
Cuddalore	158,634	75	0	2	0	2
Thiruvannamalai	130,567	100	0	1	0	1
Arakonam	78,686	89	0	1	0	1
Thindivanam	67,737	40	0	2	0	2
Chengalpattu	62,852	39	0	1	0	2
Arani	60,815	85	0	1	0	1
Thiruvallur	45,732	89	0	0	0	0
Melvisharam	36,757	100	0	0	0	0
Sriperumbudur	16,156	69	0	0	0	0
Ananthapuram	6,138	73	0	0	0	0
Vandavasi	29,620	52	0	1	0	1
TOTAL	7,928,848	–	14	75	5	94

Morbidity Impacts

Respiratory Hospital Admissions (RHAs) and Work Loss Days (WLDs) are two of the most common representations of morbidity incidence; hence these are reflected in this exercise. Using the same information for pollutant concentration, we have estimated the cases per person for a given increase in pollutant load (per 10µg/m3). Table 11 reports an increase of approximately 22,862 in RHA (all-cause) and 8,117 lost work days annually because of illnesses linked to pollution from coal-fired power plants such as minor respiratory infections, cough, and asthma. Again, such increase in morbidity incidence is moderated by the high abatement level for SO2, NO2, and PM10 applied at the plant site. Without abatement measures, RHA incidence is estimated at approximately 500,000 cases and WLD at 800,000.

Table 11: Increased Morbidity Incidence by Pollutant type

City	Respiratory Hospital Admissions (all causes)				WLD
	SO_2	NO_2	PM_{10}	TOTAL	PM_{10}
Chennai	1,895	12,636	2,494	17,025	6,044
Pondicherry	290	1,935	382	2,607	926
Kancheepuram	83	555	109	747	265
Cuddalore	56	372	74	502	178
Thiruvannamalai	29	195	39	263	93
Arakonam	23	152	30	205	73
Thindivanam	53	357	70	480	171
Chengalpattu	50	331	65	446	158
Arani	18	117	23	158	56
Thiruvallur	13	88	17	119	42
Melvisharam	8	55	11	74	26
Sriperumbudur	7	47	9	64	23
Ananthapuram	2	14	3	19	7
Vandavasi	17	113	22	153	54
TOTAL	2,545	16,968	3,350	22,862	8,117

D. Economic Valuation

Following previous discussions, health outcomes are monetized in two ways. For the valuation of acute mortality, we apply a benefit transfer of a VSL estimate from Madheswaran (2007). This local study estimates VSL at Rs. 15 million ($331, 858), based on a sample of 1000 workers from Chennai and Mumbai. The cumulative cost for an increase in mortality risks is estimated at $31.08 million (Table 12). Meanwhile morbidity outcomes are monetized using a two-step valuation approach. First, COI is computed for RHA using available cost information from Patankar and Trivedi (2011). This study was the most recent study available in the literature and it was conducted in Mumbai which has very similar social economic setting to the study site. The average daily wage rate from the Ministry of Labor and Employment, Government of India was used to value WLD. Because cost of hospitalization

and medical care from public services is likely to be subsidized, the COI derived from this should only be considered as lower bound. Hence to accurately reflect real cost of hospitalization and medical care, we assume that total RHA cost constitutes about 75% private and 25% public treatment. The estimated COI is then multiplied to the mean scaling factor (2.16) to allow for the estimation of WTP.

As shown in Table 12, the WTP is estimated at $15.12 million. Cumulatively, the social cost of morbidity stands at about $46.21 million.

Table 12: Valuation Estimates for Mortality and Morbidity

Item	Increased incidence	Valuation basis	Valuation estimate	
			Rs.	$
Acute mortality	94	15,000,000	1,403,742,523	31,083,758
Morbidity (WTP)				
RHA	22,862	13,750	679,009,882	15,035,648
WLD	8,117	224	3,933,990	87,112
TOTAL	–	–	2,086,686,395	46,206,519

In Table 13, it can be observed that pollutant load is much lower after emission control. For instance, PM10 emission savings are estimated at 355 tons/day following a high level of abatement. On per kWh (per unit) basis, the total cost imposed by local air pollution is computed to be about $1.05 cents.

The only Indian estimate is this review is close to our estimate and it is within the range of estimates. This shows that our estimate is reasonably accurate. However, it must be noted that the estimated health cost achieved only because of the expenditures incurred in installing abatement measures (FGD and SCR) for the removal of pollutants to an assumed degree. In the absence of abatement measures, the hefty cost of pollution on society is estimated at $12.58 cents per kWh. Put differently, if the industry invests about $0.28 cents per kWh for pollution control spending (removing about 85% to 99% of three major pollutants), this brings down the health cost imposed on society to $1.05 per kWh with a net welfare gain of $11.25 cents per kWh.

Table 13: Pollution Load by Emission Control

Pollutant	Zero Pollution Control (tons/day)	With Pollution Control (tons/day)	Net gain
SO_2	138.62	6.93	131.69
NO_2	170.80	25.62	145.18
PM10	357.94	3.58	354.36
TC/kWh ($)	12.58	1.05	11.53

TC/kWh= total cost per kilowatt hour.