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APPENDICES

APPENDIX A**Example of Meteorological Data Files (*.obs)****For year-long CO simulation**

Example file: January 1999

Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)

Date	Hour	WS	WD
19990101	2	0	0
19990101	3	0	0
19990101	4	0	0
19990101	5	0	0
19990101	6	0	0
19990101	7	0	0
19990101	8	0	0
19990101	9	0	0
19990101	10	1.542	30
19990101	11	1.542	360
19990101	12	2.056	90
19990101	13	2.056	30
19990101	14	0	0
19990101	15	0	0
19990101	16	0	0
19990101	17	0	0
19990101	18	0	0
19990101	19	0	0
19990101	20	0	0
19990101	21	0	0
19990101	22	0	0
19990101	23	0	0
19990101	24	0	0
19990102	1	0	0
19990102	2	0	0
19990102	3	0	0
19990102	4	0	0
19990102	5	0	0
19990102	6	0	0
19990102	7	0	0
19990102	8	0	0
19990102	9	0	0
19990102	10	1.542	40
19990102	11	2.57	60
19990102	12	1.542	40
19990102	13	2.056	180
19990102	14	0	0
19990102	15	2.056	90
19990102	16	1.028	40
19990102	17	0	0
19990102	18	0	0
19990102	19	0	0
19990102	20	0	0
19990102	21	0	0
19990102	22	0	0
19990102	23	0	0
19990102	24	0	0
19990103	1	0	0
19990103	2	0	0
19990103	3	0	0
19990103	4	0	0
19990103	5	0	0
19990103	6	0	0
19990103	7	2.056	90
19990103	8	2.57	40
19990103	9	2.056	80
19990103	10	2.056	20

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Example file: February 1999

Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)

Date	Hour	WS	WD
19990201	1	0	0
19990201	2	0	0
19990201	3	0	0
19990201	4	0	0
19990201	5	1.542	180
19990201	6	0	0
19990201	7	0	0
19990201	8	0	0
19990201	9	1.028	130
19990201	10	2.57	90
19990201	11	1.028	90
19990201	12	1.028	200
19990201	13	1.028	130
19990201	14	3.598	180
19990201	15	1.542	180
19990201	16	2.056	220
19990201	17	1.028	180
19990201	18	1.028	240
19990201	19	2.056	220
19990201	20	0	0
19990201	21	0	0
19990201	22	0	0
19990201	23	0	0
19990201	24	0	0
19990202	1	0	0
19990202	2	0	0
19990202	3	0	0
19990202	4	0	0
19990202	5	0	0
19990202	6	0	0
19990202	7	0	0
19990202	8	0	0
19990202	9	0	0
19990202	10	0	0
19990202	11	1.542	270
19990202	12	1.542	270
19990202	13	1.542	90
19990202	14	3.084	180
19990202	15	2.57	160
19990202	16	2.056	180
19990202	17	2.57	180
19990202	18	1.542	180
19990202	19	2.57	180
19990202	20	2.57	140
19990202	21	2.056	140
19990202	22	0	0
19990202	23	2.57	90
19990202	24	0	0
19990203	1	0	0
19990203	2	4.112	90
19990203	3	0	0
19990203	4	0	0
19990203	5	0	0
19990203	6	2.056	320
19990203	7	2.056	320
19990203	8	3.084	360
19990203	9	3.084	360

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Example file: March 1999

Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)

Date	Hour	WS	WD
19990301	1	0	0
19990301	2	0	0
19990301	3	0	0
19990301	4	0	0
19990301	5	0	0
19990301	6	0	0
19990301	7	0	0
19990301	8	0	0
19990301	9	2.056	90
19990301	10	1.028	40
19990301	11	1.028	90
19990301	12	2.056	100
19990301	13	3.598	110
19990301	14	1.028	40
19990301	15	1.028	130
19990301	16	0	0
19990301	17	1.028	90
19990301	18	1.028	130
19990301	19	1.028	90
19990301	20	1.028	90
19990301	21	0	0
19990301	22	0	0
19990301	23	0	0
19990301	24	0	0
19990302	1	0	0
19990302	2	0	0
19990302	3	0	0
19990302	4	0	0
19990302	5	0	0
19990302	6	0	0
19990302	7	0	0
19990302	8	0	0
19990302	9	1.542	40
19990302	10	1.542	320
19990302	11	1.542	290
19990302	12	2.57	180
19990302	13	1.542	180
19990302	14	1.542	200
19990302	15	2.57	180
19990302	16	2.57	180
19990302	17	2.57	200
19990302	18	1.542	220
19990302	19	2.57	200
19990302	20	2.57	220
19990302	21	3.084	220
19990302	22	2.57	180
19990302	23	2.57	200
19990302	24	2.57	160
19990303	1	2.57	180
19990303	2	2.57	160
19990303	3	2.57	180
19990303	4	2.57	180
19990303	5	2.57	200
19990303	6	2.57	200
19990303	7	2.57	180
19990303	8	1.542	180
19990303	9	2.056	130

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Example file: April 1999*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
19990401	1	0	0
19990401	2	1.542	180
19990401	3	1.542	180
19990401	4	1.542	180
19990401	5	0	0
19990401	6	0	0
19990401	7	1.542	180
19990401	8	2.056	180
19990401	9	2.056	180
19990401	10	2.056	180
19990401	11	3.084	100
19990401	12	1.542	180
19990401	13	1.542	180
19990401	14	1.542	180
19990401	15	2.056	160
19990401	16	2.57	260
19990401	17	1.542	180
19990401	18	2.056	180
19990401	19	3.084	180
19990401	20	2.57	160
19990401	21	0	0
19990401	22	1.542	180
19990401	23	2.57	180
19990401	24	1.542	180
19990402	1	1.542	180
19990402	2	0	0
19990402	3	0	0
19990402	4	1.542	180
19990402	5	0	0
19990402	6	0	0
19990402	7	0	0
19990402	8	0	0
19990402	9	1.028	150
19990402	10	1.028	270
19990402	11	2.056	220
19990402	12	1.028	180
19990402	13	1.028	130
19990402	14	1.028	220
19990402	15	1.028	240
19990402	16	2.056	180
19990402	17	2.056	180
19990402	18	1.028	180
19990402	19	1.028	180
19990402	20	1.028	160
19990402	21	0	0
19990402	22	0	0
19990402	23	0	0
19990402	24	0	0
19990403	1	0	0
19990403	2	0	0
19990403	3	0	0
19990403	4	0	0
19990403	5	0	0
19990403	6	0	0
19990403	7	1.028	160
19990403	8	1.028	130
19990403	9	1.542	220

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Example file: May 1999*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
19990501	1	0	0
19990501	2	0	0
19990501	3	0	0
19990501	4	0	0
19990501	5	0	0
19990501	6	0	0
19990501	7	0	0
19990501	8	0	0
19990501	9	0	0
19990501	10	0	0
19990501	11	0	0
19990501	12	0.514	180
19990501	13	2.056	120
19990501	14	1.028	170
19990501	15	0	0
19990501	16	2.056	120
19990501	17	2.056	140
19990501	18	1.542	90
19990501	19	1.542	110
19990501	20	0	0
19990501	21	0.514	150
19990501	22	1.028	90
19990501	23	1.028	90
19990501	24	0	0
19990502	1	1.028	90
19990502	2	0	0
19990502	3	0	0
19990502	4	0	0
19990502	5	0	0
19990502	6	0	0
19990502	7	1.028	60
19990502	8	1.542	30
19990502	9	1.028	60
19990502	10	1.542	70
19990502	11	0	0
19990502	12	3.598	180
19990502	13	2.056	110
19990502	14	0	0
19990502	15	0.514	120
19990502	16	0.514	90
19990502	17	0.514	90
19990502	18	0	0
19990502	19	1.028	190
19990502	20	0	0
19990502	21	0	0
19990502	22	0	0
19990502	23	0	0
19990502	24	0	0
19990503	1	0	0
19990503	2	0	0
19990503	3	0	0
19990503	4	0	0
19990503	5	0	0
19990503	6	0	0
19990503	7	0	0
19990503	8	0	0
19990503	9	0	0

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Example file: June 1999

Remark: WS = Wind Speed (m/s), WD = Wind Direction (Degree)

Date	Hour	WS	WD
19990601	1	0	0
19990601	2	0	0
19990601	3	0	0
19990601	4	0	0
19990601	5	0	0
19990601	6	0	0
19990601	7	0	0
19990601	8	0	0
19990601	9	2.056	270
19990601	10	1.542	230
19990601	11	1.028	250
19990601	12	2.056	250
19990601	13	1.542	280
19990601	14	2.056	260
19990601	15	1.542	230
19990601	16	2.57	180
19990601	17	2.57	180
19990601	18	3.084	290
19990601	19	1.028	250
19990601	20	1.028	90
19990601	21	0	0
19990601	22	0	0
19990601	23	1.028	110
19990601	24	0	0
19990602	1	0	0
19990602	2	0	0
19990602	3	0	0
19990602	4	0	0
19990602	5	0	0
19990602	6	0	0
19990602	7	1.028	200
19990602	8	1.542	230
19990602	9	0	0
19990602	10	0.514	240
19990602	11	1.028	270
19990602	12	2.056	190
19990602	13	1.542	150
19990602	14	6.168	160
19990602	15	2.57	180
19990602	16	4.626	210
19990602	17	3.598	180
19990602	18	2.056	190
19990602	19	0	0
19990602	20	2.57	190
19990602	21	1.542	210
19990602	22	1.028	240
19990602	23	1.028	190
19990602	24	0.514	210
19990603	1	1.542	240
19990603	2	1.542	210
19990603	3	1.028	220
19990603	4	0	0
19990603	5	0	0
19990603	6	1.028	230
19990603	7	3.598	220
19990603	8	3.598	160
19990603	9	2.056	210

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Example file: July 1999

Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)

Date	Hour	WS	WD
19990701	1	2.056	240
19990701	2	0	0
19990701	3	0	0
19990701	4	0	0
19990701	5	0	0
19990701	6	1.542	290
19990701	7	1.542	270
19990701	8	4.112	270
19990701	9	4.112	260
19990701	10	1.542	270
19990701	11	5.14	300
19990701	12	2.57	300
19990701	13	3.084	290
19990701	14	2.056	280
19990701	15	2.57	270
19990701	16	4.112	250
19990701	17	3.598	200
19990701	18	2.056	210
19990701	19	1.542	240
19990701	20	2.056	240
19990701	21	2.57	210
19990701	22	3.598	240
19990701	23	0.514	270
19990701	24	1.028	240
19990702	1	3.084	250
19990702	2	2.056	240
19990702	3	2.57	260
19990702	4	2.056	280
19990702	5	3.084	250
19990702	6	2.056	240
19990702	7	1.542	290
19990702	8	1.542	250
19990702	9	3.598	250
19990702	10	1.542	250
19990702	11	5.14	270
19990702	12	2.57	250
19990702	13	3.084	270
19990702	14	2.57	240
19990702	15	3.084	300
19990702	16	2.57	280
19990702	17	2.57	280
19990702	18	2.57	190
19990702	19	2.056	230
19990702	20	2.57	230
19990702	21	1.028	250
19990702	22	1.028	250
19990702	23	1.542	240
19990702	24	0	0
19990703	1	3.084	250
19990703	2	1.542	290
19990703	3	0	0
19990703	4	1.542	270
19990703	5	0	0
19990703	6	0	0
19990703	7	0	0
19990703	8	1.028	300
19990703	9	1.542	270

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Example file: August 1999*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
19990801	1	0	0
19990801	2	0	0
19990801	3	0	0
19990801	4	0	0
19990801	5	2.056	240
19990801	6	0	0
19990801	7	0	0
19990801	8	0	0
19990801	9	3.084	210
19990801	10	2.056	210
19990801	11	3.598	190
19990801	12	2.57	190
19990801	13	2.57	180
19990801	14	2.57	220
19990801	15	2.056	180
19990801	16	3.084	220
19990801	17	3.084	220
19990801	18	3.598	220
19990801	19	3.084	230
19990801	20	1.028	240
19990801	21	1.542	200
19990801	22	1.028	240
19990801	23	2.57	190
19990801	24	1.028	240
19990802	1	0	0
19990802	2	0	0
19990802	3	0	0
19990802	4	0	0
19990802	5	0	0
19990802	6	0	0
19990802	7	0	0
19990802	8	1.542	230
19990802	9	0	0
19990802	10	0	0
19990802	11	3.084	180
19990802	12	2.056	220
19990802	13	0	0
19990802	14	3.084	260
19990802	15	1.542	180
19990802	16	2.056	210
19990802	17	1.542	210
19990802	18	3.598	210
19990802	19	0	0
19990802	20	0	0
19990802	21	0	0
19990802	22	0	0
19990802	23	0	0
19990802	24	0	0
19990803	1	0	0
19990803	2	0	0
19990803	3	0	0
19990803	4	0	0
19990803	5	0	0
19990803	6	0	0
19990803	7	0	0
19990803	8	0	0
19990803	9	3.598	220

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Example file: September 1999

Remark: WS = Wind Speed (m/s), WD = Wind Direction (Degree)

Date	Hour	WS	WD
19990901	1	0	0
19990901	2	0	0
19990901	3	0	0
19990901	4	0	0
19990901	5	0	0
19990901	6	0	0
19990901	7	0	0
19990901	8	0	0
19990901	9	1.028	250
19990901	10	2.056	230
19990901	11	1.028	260
19990901	12	2.056	290
19990901	13	1.028	270
19990901	14	2.056	210
19990901	15	1.542	210
19990901	16	2.056	120
19990901	17	1.542	240
19990901	18	1.542	190
19990901	19	1.542	270
19990901	20	0.514	270
19990901	21	1.028	270
19990901	22	1.028	300
19990901	23	0.514	240
19990901	24	0.514	270
19990902	1	0	0
19990902	2	0	0
19990902	3	0	0
19990902	4	0	0
19990902	5	1.542	240
19990902	6	1.028	240
19990902	7	1.542	250
19990902	8	2.056	250
19990902	9	1.542	250
19990902	10	1.542	250
19990902	11	2.57	230
19990902	12	1.028	230
19990902	13	0	0
19990902	14	0	0
19990902	15	2.57	270
19990902	16	1.542	270
19990902	17	1.542	270
19990902	18	3.084	270
19990902	19	3.084	270
19990902	20	0	0
19990902	21	0	0
19990902	22	0	0
19990902	23	0	0
19990902	24	0	0
19990903	1	0	0
19990903	2	0	0
19990903	3	0	0
19990903	4	0	0
19990903	5	0	0
19990903	6	0	0
19990903	7	0	0
19990903	8	0	0
19990903	9	0	0

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*
*

Example file: October 1999

Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)

Date	Hour	WS	WD
19991001	1	0	0
19991001	2	0	0
19991001	3	0	0
19991001	4	0	0
19991001	5	0	0
19991001	6	0	0
19991001	7	0	0
19991001	8	0	0
19991001	9	1.028	30
19991001	10	0.514	30
19991001	11	1.542	330
19991001	12	0	0
19991001	13	0	0
19991001	14	1.028	30
19991001	15	1.028	140
19991001	16	0	0
19991001	17	3.084	130
19991001	18	0	0
19991001	19	0	0
19991001	20	0	0
19991001	21	0	0
19991001	22	0	0
19991001	23	0	0
19991001	24	0	0
19991002	1	0	0
19991002	2	0	0
19991002	3	0	0
19991002	4	0	0
19991002	5	0	0
19991002	6	0	0
19991002	7	0	0
19991002	8	0	0
19991002	9	2.056	100
19991002	10	1.542	90
19991002	11	1.542	90
19991002	12	3.084	20
19991002	13	0	0
19991002	14	0	0
19991002	15	0	0
19991002	16	1.542	180
19991002	17	0	0
19991002	18	1.542	180
19991002	19	2.056	150
19991002	20	0	0
19991002	21	0	0
19991002	22	0	0
19991002	23	0	0
19991002	24	0	0
19991003	1	0	0
19991003	2	0	0
19991003	3	0	0
19991003	4	0	0
19991003	5	0	0
19991003	6	0	0
19991003	7	0	0
19991003	8	0	0
19991003	9	0	0

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Example file: November 1999*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
19991101	1	4.112	270
19991101	2	1.542	270
19991101	3	0	0
19991101	4	1.542	320
19991101	5	0	0
19991101	6	0	0
19991101	7	0	0
19991101	8	0	0
19991101	9	0	0
19991101	10	1.028	30
19991101	11	1.542	280
19991101	12	1.028	270
19991101	13	1.028	240
19991101	14	1.028	340
19991101	15	2.056	80
19991101	16	1.028	300
19991101	17	0	0
19991101	18	1.542	10
19991101	19	0	0
19991101	20	0	0
19991101	21	0	0
19991101	22	0	0
19991101	23	0	0
19991101	24	0	0
19991102	1	0	0
19991102	2	0	0
19991102	3	0	0
19991102	4	0	0
19991102	5	0	0
19991102	6	0	0
19991102	7	0	0
19991102	8	0	0
19991102	9	3.598	300
19991102	10	0	0
19991102	11	0	0
19991102	12	1.028	300
19991102	13	2.056	30
19991102	14	0	0
19991102	15	0	0
19991102	16	2.57	300
19991102	17	0	0
19991102	18	1.028	330
19991102	19	1.028	330
19991102	20	3.084	360
19991102	21	0.514	70
19991102	22	0.514	20
19991102	23	0	0
19991102	24	0	0
19991103	1	1.542	330
19991103	2	0.514	50
19991103	3	1.542	350
19991103	4	1.028	340
19991103	5	0	0
19991103	6	0.514	70
19991103	7	1.542	360
19991103	8	0	0
19991103	9	1.028	330

*

*

*

Example file: December 1999

Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)

Date	Hour	WS	WD
19991201	1	0	0
19991201	2	0	0
19991201	3	0	0
19991201	4	1.542	270
19991201	5	3.084	60
19991201	6	4.112	30
19991201	7	1.542	10
19991201	8	0	0
19991201	9	2.57	360
19991201	10	1.542	360
19991201	11	1.028	120
19991201	12	1.542	300
19991201	13	3.084	300
19991201	14	2.056	360
19991201	15	2.57	360
19991201	16	3.084	330
19991201	17	0	0
19991201	18	1.028	310
19991201	19	2.056	10
19991201	20	0	0
19991201	21	0	0
19991201	22	0	0
19991201	23	1.028	80
19991201	24	0	0
19991202	1	0	0
19991202	2	0	0
19991202	3	0	0
19991202	4	0	0
19991202	5	0	0
19991202	6	0	0
19991202	7	1.028	350
19991202	8	1.028	350
19991202	9	0	0
19991202	10	0	0
19991202	11	1.542	300
19991202	12	2.056	100
19991202	13	1.028	270
19991202	14	1.542	300
19991202	15	2.056	340
19991202	16	0	0
19991202	17	0	0
19991202	18	0	0
19991202	19	0	0
19991202	20	0	0
19991202	21	0	0
19991202	22	0	0
19991202	23	0	0
19991202	24	0	0
19991203	1	2.056	360
19991203	2	2.57	30
19991203	3	2.056	40
19991203	4	2.57	60

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APPENDIX B**Meteorological Data Files (*.obs)****For PM10 simulation in future year****Worst Case Scenario**

Meteorological file (*.obs file)
based on worst case meteorological scenario in winter season

Hour	WS	WD
1	0.31	41
2	0.4	4
3	0.4	2
4	0.4	6
5	0.4	35
6	0.55	41
7	0.6	30
8	0.82	19
9	0.9	43
10	1.34	64
11	1.61	81
12	2	117
13	1.85	120
14	1.9	110
15	1.88	111
16	1.34	121
17	1.2	79
18	0.72	76
19	0.69	99
20	0.72	117
21	0.6	79
22	0.58	92
23	0.58	94
24	0.27	27

Remark: WS = Wind Speed (m/s), WD = Wind Direction (Degree)

APPENDIX C**Meteorological Data Files (*.obs)****For Validation of PM10 simulation****During 11,13,14 and 26,27,28 January 2006**

Meteorological file (*.obs file) on 11 January 2006*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
20060111	1	1632	428
20060111	1	11	20000
20060111	1	25	1
20060111	1	0	0
20060111	2	0	0
20060111	3	0	0
20060111	4	0	0
20060111	5	0	0
20060111	6	0	0
20060111	7	1.542	350
20060111	8	0	0
20060111	9	0.514	330
20060111	10	2.056	330
20060111	11	1.542	350
20060111	12	1.028	360
20060111	13	0	0
20060111	14	1.028	110
20060111	15	2.056	290
20060111	16	0	0
20060111	17	0	0
20060111	18	0	0
20060111	19	0	0
20060111	20	0	0
20060111	21	0	0
20060111	22	0	0
20060111	23	0	0
20060111	24	0	0

Meteorological file (*.obs file) on 13 January 2006*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
20060113	1	1632	428
20060113	1	11	20000
20060113	1	25	1
20060113	1	0	0
20060113	2	0	0
20060113	3	0	0
20060113	4	0	0
20060113	5	0	0
20060113	6	0	0
20060113	7	0	0
20060113	8	0	0
20060113	9	0	0
20060113	10	0	0
20060113	11	1.028	330
20060113	12	0	0
20060113	13	1.542	160
20060113	14	2.056	210
20060113	15	1.542	170
20060113	16	0.514	180
20060113	17	2.056	210
20060113	18	0	0
20060113	19	0	0
20060113	20	0	0
20060113	21	0	0
20060113	22	0	0
20060113	23	1.028	170
20060113	24	1.028	180

Meteorological file (*.obs file) on 14 January 2006*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
20060114	1	1632	428
20060114	1	11	20000
20060114	1	25	1
20060114	1	1.028	210
20060114	2	0	0
20060114	3	0	0
20060114	4	0	0
20060114	5	0	0
20060114	6	0	0
20060114	7	0	0
20060114	8	0	0
20060114	9	1.028	120
20060114	10	0	0
20060114	11	0	0
20060114	12	2.57	220
20060114	13	1.542	210
20060114	14	2.57	220
20060114	15	0	0
20060114	16	4.112	150
20060114	17	4.112	190
20060114	18	1.028	190
20060114	19	1.542	180
20060114	20	1.028	200
20060114	21	0	0
20060114	22	1.028	160
20060114	23	1.542	180
20060114	24	2.57	210

Meteorological file (*.obs file) on 26 January 2006*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
20060126	1	1632	428
20060126	1	11	20000
20060126	1	25	1
20060126	1	0	0
20060126	2	0	0
20060126	3	0	0
20060126	4	0	0
20060126	5	0	0
20060126	6	0	0
20060126	7	1.028	30
20060126	8	1.542	330
20060126	9	0.514	360
20060126	10	1.028	150
20060126	11	2.57	90
20060126	12	1.542	360
20060126	13	2.57	330
20060126	14	2.056	330
20060126	15	1.028	310
20060126	16	0	0
20060126	17	4.112	330
20060126	18	2.056	350
20060126	19	1.028	330
20060126	20	2.57	310
20060126	21	0	0
20060126	22	0	0
20060126	23	1.028	120
20060126	24	1.028	90

Meteorological file (*.obs file) on 27 January 2006*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
20060127	1	1632	428
20060127	1	11	20000
20060127	1	25	1
20060127	1	0	0
20060127	2	0	0
20060127	3	0	0
20060127	4	0	0
20060127	5	0	0
20060127	6	0	0
20060127	7	0	0
20060127	8	1.542	90
20060127	9	1.028	150
20060127	10	0	0
20060127	11	0.514	30
20060127	12	0	0
20060127	13	0	0
20060127	14	1.542	330
20060127	15	1.542	330
20060127	16	1.542	360
20060127	17	1.028	310
20060127	18	2.57	330
20060127	19	1.542	330
20060127	20	1.542	300
20060127	21	0	0
20060127	22	1.028	300
20060127	23	0.514	300
20060127	24	1.542	340

Meteorological file (*.obs file) on 28 January 2006*Remark: WS = Wind Speed (m/s), WD= Wind Direction (Degree)*

Date	Hour	WS	WD
20060128	1	1632	428
20060128	1	11	20000
20060128	1	25	1
20060128	1	0	0
20060128	2	0	0
20060128	3	0	0
20060128	4	0	0
20060128	5	0	0
20060128	6	0	0
20060128	7	0	0
20060128	8	0	0
20060128	9	0	0
20060128	10	1.542	90
20060128	11	0	0
20060128	12	0	0
20060128	13	1.028	290
20060128	14	3.084	290
20060128	15	1.542	330
20060128	16	2.57	320
20060128	17	0.514	330
20060128	18	1.028	320
20060128	19	2.056	300
20060128	20	1.028	300
20060128	21	1.028	350
20060128	22	2.056	350
20060128	23	2.056	350
20060128	24	1.028	330

APPENDIX D

Example of Line Source Emission files (*.lse)

For Year-long CO Simulation

Example of *.lse file for year-long CO simulation

```

98      24
0      2898  4106  0      3481  4278  0      0.5  0.5 (coordinate of 1st road link)
0      2899  4107  0      3482  4279  0      0.5  0.5
0      -3741 2072  0      -3979 2846  0      0.5  0.5
*
*
*
0      6310  12568  0      8526  16553  0      0.5  0.5 (coordinate of 98th road link)
9.731809653  0      0      0      (emission rate of 1st road link at hour 1)
5.195622441  0      0      0
1.454488145  0      0      0
0.114332189  0      0      0
0.114332189  0      0      0
0.114332189  0      0      0
0.114332189  0      0      0
0.363622036  0      0      0
0.363622036  0      0      0
0.363622036  0      0      0
0.363622036  0      0      0
12.84664405  0      0      0
*
*
*
*
17.21971579  0      0      0
38.03887458  0      0      0
36.94790033  0      0      0
35.72328178  0      0      0
21.72522515  0      0      0
20.10531278  0      0      0
12.37267702  0      0      0
36.47860322  0      0      0      (emission rate of the 98th road link at hour 24)

```

APPENDIX E**Example of Line Source Emission Files (*.lse)****For Validation of PM10 simulation****During 11, 13, 14 and 26,27,28 January 2006**

Example of Line Source Emission File: 11 January 2006

7	24							
0	966	1369	0	1160	1426	0	0.5	0.5 (coordinate of link Dindaeng 1&2)
0	1161	1423	0	1401	1299	0	0.5	0.5 (coordinate of link Dindaeng 3&6)
0	1403	1297	0	1774	1139	0	0.5	0.5 (coordinate of link Dindaeng 4&5)
0	2094	2938	0	1567	3230	0	0.5	0.5 (coordinate of link Ladphrao 1&2)
0	3185	2334	0	4621	1525	0	0.5	0.5 (coordinate of link Ladphrao 3&4)
0	2090	2937	0	2803	2542	0	0.5	0.5 (coordinate of link Ladphrao 5&6)
0	2803	2542	0	3190	2334	0	0.5	0.5 (coordinate of link Ladphrao 8&9)
0	0.04	0	0	(emission of link Dindaeng 1&2 at hour 1)				
0	0.09	0	0					
0	0.07	0	0					
0	0.29	0	0					
0	0.80	0	0					
0	0.38	0	0					
0	0.20	0	0					
0	0.04	0	0					
0	0.09	0	0					
0	0.07	0	0					
0	0.22	0	0					
0	0.61	0	0					
0	0.29	0	0					
0	0.15	0	0					
0	0.04	0	0					
0	0.09	0	0					
0	0.07	0	0					
0	0.21	0	0					
0	0.57	0	0					
0	0.27	0	0					
*								
*								
*								
*								
0	0.34	0	0					
0	0.04	0	0					
0	0.09	0	0					
0	0.07	0	0					
0	0.37	0	0					
0	1.03	0	0					
0	0.48	0	0					
0	0.26	0	0	(emission of link Ladphrao 8&9 at hour 24)				

Example of Line Source Emission File: 13 January 2006

```

7      24
0      966  1369  0      1160  1426  0      0.5  0.5 (coordinate of link Dindaeng 1&2)
0      1161  1423  0      1401  1299  0      0.5  0.5 (coordinate of link Dindaeng 3&6)
0      1403  1297  0      1774  1139  0      0.5  0.5 (coordinate of link Dindaeng 4&5)
0      2094  2938  0      1567  3230  0      0.5  0.5 (coordinate of link Ladphrao 1&2)
0      3185  2334  0      4621  1525  0      0.5  0.5 (coordinate of link Ladphrao 3&4)
0      2090  2937  0      2803  2542  0      0.5  0.5 (coordinate of link Ladphrao 5&6)
0      2803  2542  0      3190  2334  0      0.5  0.5 (coordinate of link Ladphrao 8&9)
0      0.04  0      0 (emission of link Dindaeng 1&2 at hour 1)
0      0.09  0      0
0      0.07  0      0
0      0.29  0      0
0      0.80  0      0
0      0.38  0      0
0      0.20  0      0
0      0.04  0      0
0      0.09  0      0
0      0.07  0      0
0      0.22  0      0
0      0.61  0      0
0      0.29  0      0
0      0.15  0      0
0      0.04  0      0
0      0.09  0      0
0      0.07  0      0
0      0.21  0      0
0      0.57  0      0
0      0.27  0      0
0      0.15  0      0
0      0.04  0      0
0      0.09  0      0
*
*
*
*
0      0.09  0      0
0      0.07  0      0
0      0.37  0      0
0      1.03  0      0
0      0.48  0      0
0      0.26  0      0 (emission of link Ladphrao 8&9 at hour 24)

```

Example of Line Source Emission File: 14 January 2006

7	24							
0	966	1369	0	1160	1426	0	0.5	0.5 (coordinate of link Dindaeng 1&2)
0	1161	1423	0	1401	1299	0	0.5	0.5 (coordinate of link Dindaeng 3&6)
0	1403	1297	0	1774	1139	0	0.5	0.5 (coordinate of link Dindaeng 4&5)
0	2094	2938	0	1567	3230	0	0.5	0.5 (coordinate of link Ladphrao 1&2)
0	3185	2334	0	4621	1525	0	0.5	0.5 (coordinate of link Ladphrao 3&4)
0	2090	2937	0	2803	2542	0	0.5	0.5 (coordinate of link Ladphrao 5&6)
0	2803	2542	0	3190	2334	0	0.5	0.5 (coordinate of link Ladphrao 8&9)
0	0.04	0	0	(emission of link Dindaeng 1&2 at hour 1)				
0	2.46	0	0					
0	3.23	0	0					
0	9.34	0	0					
0	4.38	0	0					
0	2.36	0	0					
0	1.12	0	0					
0	1.81	0	0					
0	1.81	0	0					
0	3.20	0	0					
0	9.25	0	0					
0	4.33	0	0					
0	2.34	0	0					
0	1.42	0	0					
0	2.29	0	0					
0	2.29	0	0					
0	3.38	0	0					
0	9.75	0	0					
*								
*								
*								
*								
0	0.09	0	0					
0	0.07	0	0					
0	0.48	0	0					
0	1.35	0	0					
0	0.63	0	0					
0	0.34	0	0					
0	0.04	0	0					
0	0.09	0	0					
0	0.07	0	0					
0	0.37	0	0					
0	1.03	0	0					
0	0.48	0	0					
0	0.26	0	0	(emission of link Ladphrao 8&9 at hour 24)				

Example of Line Source Emission File: 26 January 2006

7	24							
0	966	1369	0	1160	1426	0	0.5	0.5 (coordinate of link Dindaeng 1&2)
0	1161	1423	0	1401	1299	0	0.5	0.5 (coordinate of link Dindaeng 3&6)
0	1403	1297	0	1774	1139	0	0.5	0.5 (coordinate of link Dindaeng 4&5)
0	2094	2938	0	1567	3230	0	0.5	0.5 (coordinate of link Ladphrao 1&2)
0	3185	2334	0	4621	1525	0	0.5	0.5 (coordinate of link Ladphrao 3&4)
0	2090	2937	0	2803	2542	0	0.5	0.5 (coordinate of link Ladphrao 5&6)
0	2803	2542	0	3190	2334	0	0.5	0.5 (coordinate of link Ladphrao 8&9)
0	0.04	0	0	(emission of link Dindaeng 1&2 at hour 1)				
0	0.09	0	0					
0	1.46	0	0					
0	2.36	0	0					
0	2.36	0	0					
0	2.04	0	0					
0	5.88	0	0					
0	2.76	0	0					
0	1.49	0	0					
0	1.85	0	0					
0	2.99	0	0					
0	2.99	0	0					
0	2.15	0	0					
0	6.20	0	0					
0	2.91	0	0					
0	1.57	0	0					
0	2.27	0	0					
0	3.68	0	0					
0	3.68	0	0					
0	1.75	0	0					
*								
*								
*								
*								
0	3.76	0	0					
0	3.76	0	0					
0	1.84	0	0					
0	5.32	0	0					
0	0.34	0	0					
0	0.04	0	0					
0	0.09	0	0					
0	0.07	0	0					
0	0.37	0	0					
0	1.03	0	0					
0	0.48	0	0					
0	0.26	0	0	(emission of link Ladphrao 8&9 at hour 24)				

Example of Line Source Emission File: 27 January 2006

```

7      24
0      966  1369  0      1160  1426  0      0.5  0.5 (coordinate of link Dindaeng 1&2)
0      1161  1423  0      1401  1299  0      0.5  0.5 (coordinate of link Dindaeng 3&6)
0      1403  1297  0      1774  1139  0      0.5  0.5 (coordinate of link Dindaeng 4&5)
0      2094  2938  0      1567  3230  0      0.5  0.5 (coordinate of link Ladphrao 1&2)
0      3185  2334  0      4621  1525  0      0.5  0.5 (coordinate of link Ladphrao 3&4)
0      2090  2937  0      2803  2542  0      0.5  0.5 (coordinate of link Ladphrao 5&6)
0      2803  2542  0      3190  2334  0      0.5  0.5 (coordinate of link Ladphrao 8&9)
0      0.04  0      0 (emission of link Dindaeng 1&2 at hour 1)
0      2.49  0      0
0      1.35  0      0
0      2.52  0      0
0      4.08  0      0
0      4.08  0      0
0      1.73  0      0
0      5.01  0      0
0      2.35  0      0
0      1.27  0      0
0      2.51  0      0
0      4.06  0      0
0      4.06  0      0
0      2.03  0      0
0      5.87  0      0
0      2.75  0      0
0      1.48  0      0
0      2.12  0      0
0      3.43  0      0
0      5.51  0      0
0      2.58  0      0

*
*
*
*
0      3.76  0      0
0      3.76  0      0
0      1.84  0      0
0      5.32  0      0
0      0.34  0      0
0      0.04  0      0
0      0.09  0      0
0      0.07  0      0
0      0.37  0      0
0      1.03  0      0
0      0.48  0      0
0      0.26  0      0 (emission of link Ladphrao 8&9 at hour 24)

```

Example of Line Source Emission File: 28 January 2006

```

7      24
0      966  1369  0      1160  1426  0      0.5  0.5 (coordinate of link Dindaeng 1&2)
0      1161  1423  0      1401  1299  0      0.5  0.5 (coordinate of link Dindaeng 3&6)
0      1403  1297  0      1774  1139  0      0.5  0.5 (coordinate of link Dindaeng 4&5)
0      2094  2938  0      1567  3230  0      0.5  0.5 (coordinate of link Ladphrao 1&2)
0      3185  2334  0      4621  1525  0      0.5  0.5 (coordinate of link Ladphrao 3&4)
0      2090  2937  0      2803  2542  0      0.5  0.5 (coordinate of link Ladphrao 5&6)
0      2803  2542  0      3190  2334  0      0.5  0.5 (coordinate of link Ladphrao 8&9)
0      0.04  0      0 (emission of link Dindaeng 1&2 at hour 1)
0      0.07  0      0
0      0.21  0      0
0      0.57  0      0
0      0.27  0      0
0      0.15  0      0
0      0.04  0      0
0      0.09  0      0
0      0.07  0      0
0      0.18  0      0
0      0.52  0      0
0      0.24  0      0
0      0.13  0      0
0      0.04  0      0
0      0.09  0      0
0      0.07  0      0
0      0.23  0      0
0      0.66  0      0
0      0.31  0      0
0      0.17  0      0
*
*
*
*
0      3.76  0      0
0      3.76  0      0
0      1.84  0      0
0      5.32  0      0
0      0.34  0      0
0      0.04  0      0
0      0.09  0      0
0      0.07  0      0
0      0.37  0      0
0      1.03  0      0
0      0.48  0      0
0      0.26  0      0 (emission of link Ladphrao 8&9 at hour 24)

```

APPENDIX F

Line Source Emission Files (*.lse)

For PM10 simulation in Future Year

Line Source Emission files: 2007-2015

7	24											
0	966	1369	0	1160	1426	0	0	1	(coordinate of link Dindaeng 1&2)			
0	1161	1423	0	1401	1299	0	0	1	(coordinate of link Dindaeng 3&6)			
0	1403	1297	0	1774	1139	0	0	1	(coordinate of link Dindaeng 4&5)			
0	2094	2938	0	1567	3230	0	0	1	(coordinate of link Lachphao 1&2)			
0	3185	2334	0	4621	1525	0	0	1	(coordinate of link Lachphao 3&4)			
0	2090	2937	0	2803	2542	0	0	1	(coordinate of link Lachphao 5&6)			
0	2803	2542	0	3190	2334	0	0	1	(coordinate of link Lachphao 8&9)			

Depending on simulation year

	2007	2008	2009	2010	2011	2012	2013	2014	2015			
0	0.039	0.041	0.042	0.044	0.046	0.047	0.049	0.050	0.052	0	0	0
0	0.095	0.098	0.102	0.105	0.108	0.111	0.114	0.117	0.121	0	0	0
0	0.071	0.073	0.076	0.079	0.082	0.084	0.087	0.090	0.092	0	0	0
0	0.302	0.312	0.321	0.330	0.339	0.348	0.357	0.366	0.376	0	0	0
0	0.828	0.853	0.878	0.904	0.929	0.954	0.980	1.005	1.030	0	0	0
0	0.388	0.400	0.412	0.423	0.435	0.447	0.459	0.471	0.483	0	0	0
0	0.239	0.246	0.253	0.260	0.267	0.274	0.281	0.288	0.261	0	0	0
0	0.039	0.041	0.042	0.044	0.046	0.047	0.049	0.050	0.052	0	0	0
0	0.095	0.098	0.102	0.105	0.108	0.111	0.114	0.117	0.121	0	0	0
0	0.071	0.073	0.076	0.079	0.082	0.084	0.087	0.090	0.092	0	0	0
0	0.224	0.231	0.238	0.244	0.251	0.258	0.265	0.272	0.278	0	0	0
0	0.630	0.650	0.669	0.688	0.707	0.727	0.746	0.765	0.784	0	0	0
0	0.295	0.304	0.313	0.322	0.331	0.340	0.349	0.359	0.368	0	0	0
0	0.182	0.187	0.192	0.198	0.203	0.208	0.213	0.219	0.198	0	0	0
0	0.039	0.041	0.042	0.044	0.046	0.047	0.049	0.050	0.052	0	0	0
0	0.095	0.098	0.102	0.105	0.108	0.111	0.114	0.117	0.121	0	0	0
0	0.071	0.073	0.076	0.079	0.082	0.084	0.087	0.090	0.092	0	0	0
0	0.214	0.220	0.227	0.233	0.240	0.246	0.253	0.259	0.266	0	0	0
0	0.592	0.610	0.628	0.646	0.664	0.682	0.700	0.718	0.736	0	0	0
0	0.277	0.286	0.294	0.303	0.311	0.320	0.328	0.337	0.345	0	0	0
0	0.171	0.176	0.181	0.186	0.191	0.196	0.201	0.206	0.186	0	0	0
0	0.039	0.041	0.042	0.044	0.046	0.047	0.049	0.050	0.052	0	0	0
0	0.095	0.098	0.102	0.105	0.108	0.111	0.114	0.117	0.121	0	0	0
0	0.071	0.073	0.076	0.079	0.082	0.084	0.087	0.090	0.092	0	0	0
0	0.188	0.194	0.200	0.206	0.211	0.217	0.223	0.228	0.234	0	0	0
0	0.532	0.548	0.564	0.580	0.596	0.613	0.629	0.645	0.661	0	0	0
0	0.249	0.257	0.264	0.272	0.279	0.287	0.295	0.302	0.310	0	0	0
0	0.153	0.158	0.162	0.167	0.171	0.176	0.180	0.184	0.167	0	0	0
0	0.039	0.041	0.042	0.044	0.046	0.047	0.049	0.050	0.052	0	0	0
0	0.095	0.098	0.102	0.105	0.108	0.111	0.114	0.117	0.121	0	0	0
0	0.071	0.073	0.076	0.079	0.082	0.084	0.087	0.090	0.092	0	0	0
0	0.238	0.245	0.252	0.259	0.267	0.274	0.281	0.288	0.295	0	0	0
0	0.677	0.698	0.718	0.739	0.759	0.780	0.801	0.821	0.842	0	0	0
0	0.317	0.327	0.336	0.346	0.356	0.365	0.375	0.385	0.394	0	0	0
0	0.195	0.201	0.206	0.212	0.218	0.223	0.229	0.235	0.213	0	0	0
0	1.084	1.175	1.281	1.399	1.531	1.674	1.829	1.995	2.172	0	0	0
0	1.756	1.905	2.075	2.268	2.481	2.713	2.964	3.234	3.520	0	0	0
0	1.756	1.905	2.075	2.268	2.481	2.713	2.964	3.234	3.520	0	0	0
0	1.814	2.014	2.245	2.507	2.798	3.116	3.460	3.830	4.224	0	0	0

	2007	2008	2009	2010	2011	2012	2013	2014	2015			
0	5.240	5.818	6.487	7.244	8.083	9.002	9.997	11.065	12.203	0	0	0
0	2.455	2.726	3.040	3.394	3.787	4.218	4.684	5.185	5.718	0	0	0
0	1.358	1.508	1.682	1.878	2.095	2.333	2.591	2.867	3.087	0	0	0
0	1.440	1.559	1.695	1.849	2.019	2.205	2.406	2.621	2.849	0	0	0
0	2.334	2.526	2.747	2.997	3.273	3.574	3.899	4.247	4.618	0	0	0
0	2.334	2.526	2.747	2.997	3.273	3.574	3.899	4.247	4.618	0	0	0
0	1.733	1.923	2.143	2.391	2.667	2.968	3.294	3.645	4.018	0	0	0
0	5.007	5.556	6.191	6.909	7.705	8.576	9.519	10.530	11.609	0	0	0
0	2.346	2.603	2.901	3.237	3.610	4.018	4.460	4.934	5.439	0	0	0
0	1.285	1.426	1.589	1.774	1.978	2.201	2.443	2.703	2.937	0	0	0
0	1.630	1.764	1.919	2.093	2.286	2.496	2.724	2.967	3.226	0	0	0
0	2.641	2.859	3.110	3.392	3.705	4.046	4.414	4.809	5.228	0	0	0
0	2.641	2.859	3.110	3.392	3.705	4.046	4.414	4.809	5.228	0	0	0
0	2.262	2.507	2.792	3.113	3.470	3.859	4.281	4.733	5.215	0	0	0
0	6.535	7.244	8.067	8.995	10.024	11.150	12.368	13.675	15.067	0	0	0
0	3.062	3.395	3.780	4.215	4.697	5.225	5.795	6.408	7.060	0	0	0
0	1.680	1.862	2.073	2.312	2.576	2.866	3.179	3.514	3.811	0	0	0
0	1.203	1.304	1.421	1.552	1.698	1.857	2.028	2.212	2.408	0	0	0
0	1.949	2.114	2.303	2.516	2.752	3.009	3.287	3.585	3.902	0	0	0
0	1.949	2.114	2.303	2.516	2.752	3.009	3.287	3.585	3.902	0	0	0
0	2.241	2.486	2.771	3.092	3.448	3.838	4.259	4.712	5.194	0	0	0
0	6.474	7.184	8.005	8.933	9.962	11.088	12.307	13.614	15.008	0	0	0
0	3.034	3.366	3.751	4.186	4.668	5.196	5.767	6.379	7.032	0	0	0
0	1.662	1.845	2.055	2.294	2.558	2.847	3.160	3.495	3.797	0	0	0
0	1.522	1.649	1.795	1.960	2.142	2.341	2.555	2.785	3.030	0	0	0
0	2.466	2.672	2.909	3.176	3.471	3.793	4.141	4.514	4.911	0	0	0
0	2.466	2.672	2.909	3.176	3.471	3.793	4.141	4.514	4.911	0	0	0
0	2.363	2.622	2.921	3.260	3.635	4.046	4.490	4.967	5.475	0	0	0
0	6.827	7.575	8.440	9.418	10.502	11.689	12.973	14.351	15.819	0	0	0
0	3.199	3.549	3.955	4.413	4.921	5.477	6.079	6.724	7.412	0	0	0
0	1.752	1.943	2.165	2.416	2.694	2.999	3.328	3.681	4.002	0	0	0
0	1.874	2.029	2.207	2.409	2.631	2.874	3.137	3.418	3.717	0	0	0
0	3.036	3.288	3.578	3.904	4.264	4.658	5.083	5.539	6.024	0	0	0
0	3.036	3.288	3.578	3.904	4.264	4.658	5.083	5.539	6.024	0	0	0
0	1.923	2.135	2.381	2.659	2.967	3.304	3.669	4.061	4.479	0	0	0
0	5.557	6.170	6.880	7.682	8.572	9.546	10.601	11.733	12.940	0	0	0
0	2.604	2.891	3.224	3.600	4.017	4.473	4.967	5.498	6.063	0	0	0
0	1.433	1.591	1.774	1.981	2.210	2.461	2.733	3.025	3.274	0	0	0
0	1.912	2.070	2.252	2.457	2.684	2.931	3.198	3.484	3.788	0	0	0
0	3.099	3.355	3.650	3.982	4.349	4.750	5.183	5.647	6.140	0	0	0
0	3.099	3.355	3.650	3.982	4.349	4.750	5.183	5.647	6.140	0	0	0
0	2.027	2.249	2.506	2.796	3.119	3.471	3.852	4.262	4.698	0	0	0
0	5.856	6.497	7.240	8.079	9.010	10.029	11.131	12.314	13.574	0	0	0
0	2.744	3.045	3.393	3.786	4.222	4.699	5.216	5.770	6.360	0	0	0
0	1.507	1.673	1.864	2.080	2.319	2.581	2.865	3.169	3.434	0	0	0
0	2.076	2.248	2.445	2.668	2.914	3.183	3.473	3.783	4.114	0	0	0
0	3.365	3.643	3.963	4.324	4.723	5.158	5.628	6.132	6.668	0	0	0
0	3.365	3.643	3.963	4.324	4.723	5.158	5.628	6.132	6.668	0	0	0
0	1.910	2.122	2.368	2.646	2.954	3.291	3.657	4.049	4.467	0	0	0
0	5.518	6.131	6.842	7.644	8.534	9.509	10.565	11.698	12.907	0	0	0
0	2.586	2.873	3.206	3.582	3.999	4.456	4.950	5.482	6.048	0	0	0
0	1.420	1.578	1.761	1.967	2.197	2.447	2.719	3.010	3.265	0	0	0
0	2.066	2.238	2.436	2.658	2.905	3.173	3.463	3.774	4.105	0	0	0

	2007	2008	2009	2010	2011	2012	2013	2014	2015			
0	3.349	3.627	3.948	4.308	4.707	5.143	5.613	6.117	6.653	0	0	0
0	3.349	3.627	3.948	4.308	4.707	5.143	5.613	6.117	6.653	0	0	0
0	2.236	2.482	2.767	3.090	3.447	3.838	4.262	4.716	5.201	0	0	0
0	6.460	7.172	7.996	8.926	9.959	11.089	12.313	13.626	15.026	0	0	0
0	3.027	3.360	3.746	4.183	4.667	5.196	5.769	6.385	7.041	0	0	0
0	1.656	1.838	2.050	2.288	2.553	2.842	3.156	3.492	3.801	0	0	0
0	1.746	1.892	2.060	2.249	2.458	2.686	2.933	3.197	3.478	0	0	0
0	2.830	3.066	3.338	3.645	3.984	4.354	4.753	5.182	5.637	0	0	0
0	2.830	3.066	3.338	3.645	3.984	4.354	4.753	5.182	5.637	0	0	0
0	2.101	2.332	2.600	2.902	3.237	3.604	4.002	4.428	4.883	0	0	0
0	6.070	6.738	7.511	8.384	9.354	10.414	11.562	12.795	14.108	0	0	0
0	2.844	3.157	3.519	3.929	4.383	4.880	5.418	5.995	6.611	0	0	0
0	1.560	1.732	1.930	2.155	2.404	2.676	2.971	3.287	3.569	0	0	0
0	1.426	1.546	1.685	1.841	2.014	2.202	2.406	2.624	2.856	0	0	0
0	2.311	2.506	2.731	2.984	3.263	3.569	3.899	4.253	4.629	0	0	0
0	2.311	2.506	2.731	2.984	3.263	3.569	3.899	4.253	4.629	0	0	0
0	1.833	2.036	2.271	2.536	2.830	3.152	3.500	3.875	4.274	0	0	0
0	5.297	5.882	6.560	7.326	8.176	9.106	10.113	11.194	12.347	0	0	0
0	2.482	2.756	3.074	3.433	3.831	4.267	4.739	5.245	5.786	0	0	0
0	1.365	1.516	1.691	1.888	2.107	2.346	2.606	2.884	3.124	0	0	0
0	1.264	1.371	1.493	1.632	1.785	1.952	2.132	2.325	2.531	0	0	0
0	2.049	2.221	2.420	2.644	2.892	3.163	3.455	3.769	4.102	0	0	0
0	2.049	2.221	2.420	2.644	2.892	3.163	3.455	3.769	4.102	0	0	0
0	2.015	2.236	2.493	2.784	3.106	3.458	3.840	4.249	4.686	0	0	0
0	5.821	6.462	7.204	8.042	8.973	9.991	11.094	12.278	13.539	0	0	0
0	2.727	3.028	3.376	3.768	4.204	4.682	5.198	5.753	6.344	0	0	0
0	1.497	1.662	1.853	2.069	2.308	2.570	2.853	3.157	3.425	0	0	0
0	1.183	1.283	1.398	1.527	1.670	1.826	1.995	2.176	2.368	0	0	0
0	1.917	2.079	2.265	2.475	2.706	2.959	3.233	3.526	3.838	0	0	0
0	1.917	2.079	2.265	2.475	2.706	2.959	3.233	3.526	3.838	0	0	0
0	2.001	2.221	2.476	2.765	3.085	3.435	3.814	4.221	4.655	0	0	0
0	5.781	6.417	7.155	7.988	8.912	9.924	11.019	12.195	13.449	0	0	0
0	2.709	3.007	3.352	3.743	4.176	4.650	5.163	5.714	6.302	0	0	0
0	1.484	1.648	1.837	2.051	2.288	2.547	2.829	3.130	3.402	0	0	0
0	1.017	1.103	1.202	1.313	1.437	1.571	1.717	1.873	2.039	0	0	0
0	1.648	1.787	1.948	2.129	2.328	2.547	2.783	3.036	3.305	0	0	0
0	1.648	1.787	1.948	2.129	2.328	2.547	2.783	3.036	3.305	0	0	0
0	1.778	1.974	2.201	2.458	2.743	3.056	3.394	3.756	4.143	0	0	0
0	5.136	5.703	6.360	7.103	7.927	8.828	9.805	10.853	11.971	0	0	0
0	2.407	2.672	2.980	3.328	3.714	4.137	4.594	5.086	5.609	0	0	0
0	1.320	1.466	1.635	1.825	2.037	2.268	2.519	2.788	3.028	0	0	0
0	0.244	0.253	0.261	0.270	0.279	0.288	0.296	0.305	0.314	0	0	0
0	0.696	0.718	0.740	0.762	0.784	0.807	0.829	0.851	0.873	0	0	0
0	0.514	0.534	0.553	0.572	0.592	0.611	0.630	0.649	0.668	0	0	0
0	0.551	0.567	0.584	0.601	0.617	0.634	0.651	0.667	0.684	0	0	0
0	1.546	1.593	1.640	1.687	1.735	1.782	1.829	1.876	1.923	0	0	0
0	0.724	0.746	0.769	0.791	0.813	0.835	0.857	0.879	0.901	0	0	0
0	0.446	0.459	0.472	0.485	0.498	0.511	0.523	0.536	0.487	0	0	0
0	0.268	0.278	0.288	0.297	0.307	0.317	0.326	0.336	0.346	0	0	0
0	0.738	0.761	0.783	0.806	0.829	0.852	0.875	0.898	0.921	0	0	0
0	0.484	0.502	0.520	0.538	0.556	0.574	0.592	0.610	0.628	0	0	0
0	0.573	0.590	0.608	0.625	0.642	0.660	0.677	0.694	0.712	0	0	0
0	1.592	1.640	1.689	1.737	1.786	1.835	1.883	1.932	1.980	0	0	0

	2007	2008	2009	2010	2011	2012	2013	2014	2015			
0	0.746	0.769	0.791	0.814	0.837	0.860	0.882	0.905	0.928	0	0	0
0	0.460	0.473	0.487	0.500	0.513	0.527	0.540	0.553	0.501	0	0	0
0	0.136	0.148	0.162	0.176	0.193	0.210	0.229	0.250	0.271	0	0	0
0	0.242	0.261	0.283	0.307	0.334	0.363	0.394	0.427	0.462	0	0	0
0	0.215	0.234	0.256	0.279	0.305	0.334	0.364	0.397	0.432	0	0	0
0	0.606	0.636	0.670	0.706	0.745	0.787	0.831	0.877	0.926	0	0	0
0	1.682	1.770	1.865	1.968	2.078	2.196	2.321	2.453	2.593	0	0	0
0	0.788	0.829	0.874	0.922	0.974	1.029	1.088	1.150	1.215	0	0	0
0	0.480	0.503	0.528	0.555	0.584	0.615	0.647	0.681	0.656	0	0	0
0	0.039	0.041	0.042	0.044	0.046	0.047	0.049	0.050	0.052	0	0	0
0	0.095	0.098	0.102	0.105	0.108	0.111	0.114	0.117	0.121	0	0	0
0	0.071	0.073	0.076	0.079	0.082	0.084	0.087	0.090	0.092	0	0	0
0	0.496	0.511	0.526	0.541	0.556	0.571	0.586	0.602	0.617	0	0	0
0	1.393	1.435	1.478	1.520	1.563	1.605	1.648	1.690	1.733	0	0	0
0	0.653	0.673	0.692	0.712	0.732	0.752	0.772	0.792	0.812	0	0	0
0	0.402	0.413	0.425	0.437	0.448	0.460	0.472	0.483	0.438	0	0	0
0	0.039	0.041	0.042	0.044	0.046	0.047	0.049	0.050	0.052	0	0	0
0	0.095	0.098	0.102	0.105	0.108	0.111	0.115	0.117	0.121	0	0	0
0	0.071	0.073	0.076	0.079	0.082	0.084	0.087	0.090	0.092	0	0	0
0	0.382	0.393	0.405	0.416	0.428	0.440	0.456	0.463	0.474	0	0	0
0	1.057	1.089	1.122	1.154	1.186	1.219	1.265	1.284	1.316	0	0	0
0	0.495	0.510	0.526	0.541	0.556	0.571	0.593	0.601	0.617	0	0	0
0	0.305	0.314	0.323	0.332	0.341	0.350	0.362	0.367	0.333	0	0	0

APPENDIX G

Line Source Emission Files (*.lse)

For Policy Analysis

Line Source Emission files: 2007-2015

7	24								
0	966	1369	0	1160	1426	0	0.5	0.5	(coordinate of link Dindaberg 1&2)
0	1161	1423	0	1401	1299	0	0.5	0.5	(coordinate of link Dindaberg 3&6)
0	1403	1297	0	1774	1139	0	0.5	0.5	(coordinate of link Dindaberg 4&5)
0	2094	2938	0	1567	3230	0	0.5	0.5	(coordinate of link Ladphrao 1&2)
0	3185	2334	0	4621	1525	0	0.5	0.5	(coordinate of link Ladphrao 3&4)
0	2090	2937	0	2803	2542	0	0.5	0.5	(coordinate of link Ladphrao 5&6)
0	2803	2542	0	3190	2334	0	0.5	0.5	(coordinate of link Ladphrao 8&9)

Depending on policy

	Mass Transit	Car Pool	Bus Lane	No Truck	10% EURO	50% EURO	100% EURO		
0	0.039	0.039	0.039	0.039	0.037	0.037	0.037	0	0
0	0.095	0.095	0.095	0.095	0.087	0.056	0.018	0	0
0	0.071	0.071	0.071	0.071	0.066	0.045	0.019	0	0
0	0.302	0.302	0.302	0.302	0.166	0.166	0.031	0	0
0	0.828	0.828	0.828	0.828	0.753	0.455	0.083	0	0
0	0.388	0.388	0.388	0.388	0.353	0.213	0.039	0	0
0	0.239	0.239	0.239	0.239	0.221	0.221	0.051	0	0
0	0.039	0.039	0.039	0.039	0.035	0.035	0.035	0	0
0	0.095	0.095	0.095	0.095	0.075	0.056	0.018	0	0
0	0.071	0.071	0.071	0.071	0.052	0.045	0.019	0	0
0	0.224	0.224	0.224	0.224	0.177	0.124	0.023	0	0
0	0.630	0.630	0.630	0.630	0.490	0.346	0.062	0	0
0	0.295	0.295	0.295	0.295	0.230	0.162	0.029	0	0
0	0.182	0.182	0.182	0.182	0.146	0.146	0.038	0	0
0	0.039	0.039	0.039	0.039	0.037	0.037	0.037	0	0
0	0.095	0.095	0.095	0.095	0.087	0.056	0.018	0	0
0	0.071	0.071	0.071	0.071	0.066	0.045	0.019	0	0
0	0.214	0.214	0.214	0.214	0.195	0.118	0.022	0	0
0	0.592	0.592	0.592	0.592	0.538	0.325	0.059	0	0
0	0.277	0.277	0.277	0.277	0.252	0.152	0.027	0	0
0	0.171	0.171	0.171	0.171	0.157	0.157	0.036	0	0
0	0.039	0.039	0.039	0.039	0.037	0.037	0.037	0	0
0	0.095	0.095	0.095	0.095	0.087	0.056	0.018	0	0
0	0.071	0.071	0.071	0.071	0.066	0.045	0.019	0	0
0	0.188	0.188	0.188	0.188	0.172	0.104	0.019	0	0
0	0.532	0.532	0.532	0.532	0.484	0.292	0.052	0	0
0	0.249	0.249	0.249	0.249	0.227	0.137	0.024	0	0
0	0.153	0.153	0.153	0.153	0.141	0.141	0.032	0	0
0	0.039	0.039	0.039	0.039	0.037	0.037	0.037	0	0
0	0.095	0.095	0.095	0.095	0.087	0.056	0.018	0	0
0	0.071	0.071	0.071	0.071	0.066	0.045	0.019	0	0
0	0.238	0.238	0.238	0.238	0.216	0.131	0.024	0	0
0	0.677	0.677	0.677	0.677	0.616	0.371	0.066	0	0
0	0.317	0.317	0.317	0.317	0.289	0.174	0.031	0	0
0	0.195	0.195	0.195	0.195	0.180	0.180	0.040	0	0
0	0.975	1.084	1.084	1.066	0.979	0.562	0.041	0	0
0	1.581	1.756	1.756	1.727	1.587	0.912	0.067	0	0

	Mass Transit	Car Pool	Bus Lane	No Truck	10% EURO	50% EURO	100% EURO		
0	1.581	1.756	1.756	1.727	1.587	0.912	0.067	0	0
0	1.632	1.814	1.814	1.804	1.638	0.937	0.060	0	0
0	4.716	5.240	5.240	5.211	4.733	2.707	0.174	0	0
0	2.210	2.455	2.455	2.442	2.218	1.268	0.081	0	0
0	1.222	1.358	1.358	1.351	1.230	1.230	0.077	0	0
0	1.296	1.436	1.489	1.431	1.300	0.740	0.039	0	0
0	2.100	2.328	2.414	2.320	2.107	1.199	0.063	0	0
0	2.100	2.328	2.414	2.320	2.107	1.199	0.063	0	0
0	1.560	1.747	1.818	1.724	1.565	0.892	0.050	0	0
0	4.506	4.988	5.252	4.982	4.521	2.576	0.145	0	0
0	2.112	2.337	2.461	2.334	2.118	1.207	0.068	0	0
0	1.157	1.281	1.347	1.279	1.162	1.162	0.055	0	0
0	1.467	1.625	1.684	1.614	1.471	0.838	0.046	0	0
0	2.377	2.634	2.729	2.615	2.384	1.358	0.075	0	0
0	2.377	2.634	2.729	2.615	2.384	1.358	0.075	0	0
0	2.036	2.259	2.341	2.243	2.042	1.162	0.062	0	0
0	5.881	6.517	6.764	6.481	5.899	3.356	0.178	0	0
0	2.756	3.054	3.169	3.037	2.764	1.573	0.084	0	0
0	1.512	1.675	1.737	1.666	1.519	1.519	0.071	0	0
0	1.083	1.198	1.263	1.146	1.086	0.620	0.038	0	0
0	1.754	1.942	2.047	1.857	1.761	1.006	0.062	0	0
0	1.754	1.942	2.047	1.857	1.761	1.006	0.062	0	0
0	2.017	2.231	2.325	2.159	2.023	1.152	0.063	0	0
0	5.827	6.455	6.716	6.238	5.845	3.329	0.183	0	0
0	2.730	3.025	3.147	2.923	2.739	1.560	0.086	0	0
0	1.496	1.658	1.724	1.603	1.503	1.503	0.071	0	0
0	1.370	1.522	1.522	1.453	1.374	0.783	0.045	0	0
0	2.220	2.466	2.466	2.355	2.227	1.269	0.072	0	0
0	2.220	2.466	2.466	2.355	2.227	1.269	0.072	0	0
0	2.127	2.363	2.363	2.297	2.133	1.214	0.065	0	0
0	6.145	6.827	6.827	6.636	6.164	3.508	0.189	0	0
0	2.879	3.199	3.199	3.109	2.888	1.644	0.089	0	0
0	1.576	1.752	1.752	1.703	1.584	1.584	0.072	0	0
0	1.686	1.874	1.874	1.822	1.692	0.963	0.053	0	0
0	2.733	3.036	3.036	2.952	2.741	1.561	0.086	0	0
0	2.733	3.036	3.036	2.952	2.741	1.561	0.086	0	0
0	1.731	1.923	1.923	1.863	1.737	0.992	0.061	0	0
0	5.001	5.557	5.557	5.384	5.019	2.866	0.176	0	0
0	2.343	2.604	2.604	2.523	2.352	1.343	0.083	0	0
0	1.290	1.433	1.433	1.389	1.297	1.297	0.072	0	0
0	1.721	1.912	1.912	1.859	1.727	0.983	0.054	0	0
0	2.789	3.099	3.099	3.013	2.798	1.594	0.088	0	0
0	2.789	3.099	3.099	3.013	2.798	1.594	0.088	0	0
0	1.824	2.027	2.027	1.982	1.830	1.043	0.060	0	0
0	5.270	5.856	5.856	5.727	5.288	3.014	0.172	0	0
0	2.470	2.744	2.744	2.684	2.478	1.412	0.081	0	0
0	1.357	1.507	1.507	1.475	1.364	1.364	0.070	0	0
0	1.868	2.076	2.076	1.997	1.874	1.066	0.057	0	0
0	3.028	3.365	3.365	3.237	3.037	1.728	0.092	0	0
0	3.028	3.365	3.365	3.237	3.037	1.728	0.092	0	0
0	1.719	1.910	1.910	1.804	1.725	0.986	0.061	0	0
0	4.966	5.518	5.518	5.213	4.984	2.848	0.177	0	0
0	2.327	2.586	2.586	2.443	2.335	1.334	0.083	0	0

	Mass Transit	Car Pool	Bus Lane	No Truck	10% EURO	50% EURO	100% EURO		
0	1.278	1.420	1.420	1.343	1.285	1.285	0.069	0	0
0	1.860	2.066	2.066	1.990	1.866	1.063	0.060	0	0
0	3.014	3.349	3.349	3.225	3.024	1.723	0.097	0	0
0	3.014	3.349	3.349	3.225	3.024	1.723	0.097	0	0
0	2.012	2.236	2.236	2.162	2.019	1.151	0.065	0	0
0	5.814	6.460	6.460	6.247	5.833	3.324	0.189	0	0
0	2.724	3.027	3.027	2.927	2.733	1.558	0.089	0	0
0	1.490	1.656	1.656	1.602	1.497	1.497	0.070	0	0
0	1.571	1.746	1.746	1.689	1.577	0.899	0.052	0	0
0	2.547	2.830	2.830	2.737	2.555	1.457	0.085	0	0
0	2.547	2.830	2.830	2.737	2.555	1.457	0.085	0	0
0	1.891	2.101	2.101	2.057	1.897	1.082	0.064	0	0
0	5.463	6.070	6.070	5.943	5.481	3.127	0.184	0	0
0	2.560	2.844	2.844	2.785	2.568	1.465	0.086	0	0
0	1.404	1.560	1.560	1.528	1.411	1.411	0.071	0	0
0	1.283	1.426	1.426	1.377	1.288	0.737	0.049	0	0
0	2.080	2.311	2.311	2.231	2.088	1.195	0.079	0	0
0	2.080	2.311	2.311	2.231	2.088	1.195	0.079	0	0
0	1.650	1.833	1.833	1.812	1.656	0.946	0.059	0	0
0	4.767	5.297	5.297	5.235	4.784	2.733	0.170	0	0
0	2.234	2.482	2.482	2.453	2.242	1.281	0.080	0	0
0	1.229	1.365	1.365	1.349	1.235	1.235	0.068	0	0
0	1.138	1.258	1.342	1.241	1.142	0.653	0.042	0	0
0	1.844	2.039	2.176	2.011	1.850	1.058	0.068	0	0
0	1.844	2.039	2.176	2.011	1.850	1.058	0.068	0	0
0	1.813	2.006	2.129	1.999	1.819	1.038	0.061	0	0
0	5.239	5.795	6.153	5.774	5.256	2.999	0.176	0	0
0	2.455	2.715	2.883	2.706	2.463	1.405	0.083	0	0
0	1.347	1.490	1.581	1.485	1.354	1.354	0.069	0	0
0	1.065	1.177	1.263	1.161	1.068	0.609	0.035	0	0
0	1.726	1.907	2.047	1.882	1.731	0.987	0.057	0	0
0	1.726	1.907	2.047	1.882	1.731	0.987	0.057	0	0
0	1.801	1.991	2.119	1.987	1.807	1.030	0.059	0	0
0	5.203	5.754	6.121	5.742	5.220	2.976	0.170	0	0
0	2.438	2.696	2.868	2.690	2.446	1.394	0.080	0	0
0	1.336	1.477	1.570	1.474	1.342	1.342	0.065	0	0
0	0.915	1.011	1.089	1.004	0.919	0.525	0.034	0	0
0	1.483	1.639	1.765	1.628	1.489	0.852	0.055	0	0
0	1.483	1.639	1.765	1.628	1.489	0.852	0.055	0	0
0	1.600	1.769	1.883	1.762	1.605	0.917	0.056	0	0
0	4.623	5.112	5.441	5.092	4.639	2.648	0.161	0	0
0	2.166	2.395	2.550	2.386	2.174	1.241	0.075	0	0
0	1.188	1.314	1.397	1.309	1.194	1.194	0.061	0	0
0	0.244	0.244	0.244	0.194	0.225	0.149	0.053	0	0
0	0.696	0.696	0.696	0.534	0.638	0.407	0.118	0	0
0	0.514	0.514	0.514	0.438	0.476	0.323	0.132	0	0
0	0.551	0.551	0.551	0.409	0.501	0.303	0.056	0	0
0	1.546	1.546	1.546	1.156	1.407	0.849	0.152	0	0
0	0.724	0.724	0.724	0.542	0.659	0.398	0.071	0	0
0	0.446	0.446	0.446	0.347	0.410	0.410	0.093	0	0
0	0.268	0.268	0.268	0.268	0.248	0.166	0.063	0	0
0	0.738	0.738	0.738	0.738	0.678	0.439	0.140	0	0
0	0.484	0.484	0.484	0.484	0.451	0.319	0.154	0	0

	Mass Transit	Car Pool	Bus Lane	No Truck	10% EURO	50% EURO	100% EURO		
0	0.573	0.573	0.573	0.573	0.522	0.316	0.059	0	0
0	1.592	1.592	1.592	1.592	1.449	0.875	0.158	0	0
0	0.746	0.746	0.746	0.746	0.679	0.410	0.074	0	0
0	0.460	0.460	0.460	0.460	0.423	0.423	0.097	0	0
0	0.127	0.136	0.136	0.136	0.124	0.074	0.011	0	0
0	0.226	0.242	0.242	0.242	0.219	0.130	0.018	0	0
0	0.199	0.215	0.215	0.215	0.196	0.117	0.019	0	0
0	0.593	0.606	0.606	0.606	0.551	0.331	0.055	0	0
0	1.645	1.682	1.682	1.682	1.529	0.916	0.150	0	0
0	0.771	0.788	0.788	0.788	0.717	0.429	0.070	0	0
0	0.470	0.480	0.480	0.480	0.441	0.441	0.092	0	0
0	0.039	0.039	0.039	0.039	0.037	0.025	0.011	0	0
0	0.095	0.095	0.095	0.095	0.087	0.056	0.018	0	0
0	0.071	0.071	0.071	0.071	0.066	0.045	0.019	0	0
0	0.496	0.496	0.496	0.496	0.452	0.273	0.051	0	0
0	1.393	1.393	1.393	1.393	1.267	0.765	0.137	0	0
0	0.653	0.653	0.653	0.653	0.594	0.358	0.064	0	0
0	0.402	0.402	0.402	0.402	0.370	0.370	0.084	0	0
0	0.039	0.039	0.039	0.039	0.037	0.025	0.011	0	0
0	0.095	0.095	0.095	0.095	0.087	0.056	0.018	0	0
0	0.071	0.071	0.071	0.071	0.066	0.045	0.019	0	0
0	0.382	0.382	0.382	0.382	0.347	0.210	0.039	0	0
0	1.057	1.057	1.057	1.057	0.962	0.581	0.104	0	0
0	0.495	0.495	0.495	0.495	0.451	0.272	0.049	0	0
0	0.305	0.305	0.305	0.305	0.281	0.281	0.064	0	0

APPENDIX H**Point Source Emission Files (*.pse)****For Year-long CO Simulation**

Point Source Emission File (*.pse)

62	1						
0	-7826	-5575	25	0.5	1	0	0
0	-7493	-5388	20	0.05	1	0	0
0	-7338	-5407	20	0.02	1	0	0
0	-7316	-5364	20	0.02	1	0	0
0	-7313	-5261	20	0.09	1	0	0
0	-7276	-5023	20	0.04	1	0	0
0	-7261	-5007	20	0.05	1	0	0
0	-7249	-4884	20	0.02	1	0	0
0	-7238	-4825	20	0.03	1	0	0
0	-6895	-3764	15	0.5	1	0	0
0	-3398	338	20	0.03	1	0	0
0	-3375	-375	20	0.02	1	0	0
0	-2500	-250	20	0.03	1	0	0
0	-2500	350	20	0.05	1	0	0
0	-2307	960	20	0.5	1	0	0
0	-2277	-21	23	0.5	1	0	0
0	-2113	1135	20	0.04	1	0	0
0	-1505	894	18	0.5	1	0	0
0	2550	-3425	20	0.03	1	0	0
0	2617	-2612	20	0.04	1	0	0
0	2650	-3325	20	0.07	1	0	0
0	2691	-3053	20	0.07	1	0	0
0	2703	-3381	22	0.5	1	0	0
0	2723	-3050	20	0.08	1	0	0
0	2727	-2501	20	0.05	1	0	0
0	2737	-2723	20	0.02	1	0	0
0	2745	-3272	20	0.12	1	0	0
0	2747	-2945	20	0.02	1	0	0
0	2750	-3225	20	0.06	1	0	0
0	2752	-2944	20	0.11	1	0	0
0	2757	-3079	20	0.06	1	0	0
0	2800	-3495	20	0.02	1	0	0
0	2850	-3125	20	0.07	1	0	0
0	2950	-3025	20	0.02	1	0	0
0	2956	-3390	20	0.03	1	0	0
0	3050	-3150	20	0	1	0	0
0	3050	-2925	20	0.13	1	0	0
0	3067	-3278	20	0.02	1	0	0
0	3137	-3056	20	0.07	1	0	0
0	3150	-3245	20	0.06	1	0	0
0	3150	-2825	20	0.13	1	0	0
0	3250	-3375	20	0.03	1	0	0
0	3250	-2725	20	0.09	1	0	0
0	3277	-3167	20	0.03	1	0	0
0	3287	-2834	20	0.03	1	0	0
0	3350	-3158	20	0.04	1	0	0
0	3350	-2625	20	0.04	1	0	0
0	3432	-3383	20	0.06	1	0	0
0	3450	-2525	20	0.09	1	0	0
0	-596527	-3158	20	0.04	1	0	0
0	3487	-3266	20	0.07	1	0	0
0	3497	-2777	20	0.08	1	0	0
0	3500	-3000	20	0.03	1	0	0
0	2525	4625	20	0.05	1	0	0
0	2600	3600	20	0.03	1	0	0
0	2700	3700	20	0.02	1	0	0
0	2750	5000	20	0.03	1	0	0
0	2800	3800	20	0.02	1	0	0
0	2900	3900	20	0.02	1	0	0
0	2999	4000	20	0.04	1	0	0
0	3100	4100	20	0.03	1	0	0
0	12100	2700	10	0.3	1	0	0

5	423.15	0.000374176	0	0	0
10	423.15	0.001801116	0	0	0
10	423.15	0.000374176	0	0	0
10	423.15	0.00022514	0	0	0
10	423.15	0.005625317	0	0	0
10	423.15	0.001274734	0	0	0
10	423.15	0.001950152	0	0	0
10	423.15	0.000374176	0	0	0
10	423.15	0.000748351	0	0	0
5	423.15	0.000802258	0	0	0
10	423.15	0.000900558	0	0	0
10	423.15	0.00022514	0	0	0
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5	423.15	0.00016172	0	0	0
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5	423.15	0.000212456	0	0	0
10	423.15	0.000675419	0	0	0
10	423.15	0.001049594	0	0	0
10	423.15	0.004125444	0	0	0
10	423.15	0.003748097	0	0	0
5	423.15	0.000107813	0	0	0
10	423.15	0.005400178	0	0	0
10	423.15	0.001950152	0	0	0
10	423.15	0.000450279	0	0	0
10	423.15	0.011247463	0	0	0
10	423.15	0.000301243	0	0	0
10	423.15	0.003148782	0	0	0
10	423.15	0.008999239	0	0	0
10	423.15	0.00285071	0	0	0
10	423.15	0.000301243	0	0	0
10	423.15	0.003824201	0	0	0
10	423.15	0.00022514	0	0	0
10	423.15	0.000900558	0	0	0
10	423.15	0	0	0	0
10	423.15	0.012373161	0	0	0
10	423.15	0.000301243	0	0	0
10	423.15	0.003297818	0	0	0
10	423.15	0.002549467	0	0	0
10	423.15	0.011995814	0	0	0
10	423.15	0.000900558	0	0	0
10	423.15	0.005999493	0	0	0
10	423.15	0.000599315	0	0	0
10	423.15	0.000748351	0	0	0
10	423.15	0.000973491	0	0	0
10	423.15	0.001125698	0	0	0
10	423.15	0.002625571	0	0	0
10	423.15	0.005999493	0	0	0
10	423.15	0.001049594	0	0	0
10	423.15	0.003599061	0	0	0
10	423.15	0.004724759	0	0	0
10	423.15	0.000599315	0	0	0
10	423.15	0.001575977	0	0	0
10	423.15	0.000599315	0	0	0
10	423.15	0.00022514	0	0	0
10	423.15	0.000748351	0	0	0
10	423.15	0.00022514	0	0	0
10	423.15	0.000301243	0	0	0
10	423.15	0.000973491	0	0	0
10	423.15	0.000599315	0	0	0
10	423.15	0.012087773	0	0	0

APPENDIX I

Area Source Emission Files (*.ase)

For Year-long CO Simulation

APPENDIX J

The Historical Data

For Analysis of Explanatory variables

Year (AD.)	89	90	91	92	93	94	95	96	97
BKK population	5,832,843	5,546,937	5,620,591	5,562,141	5,572,712	5,584,226	5,570,743	5,584,963	5,604,772
National income per capita (Baht)	24,755	29,983	33,552	37,007	41,315	46,410	53,019	56,549	56,891
GNP per capita at 1988 price (Baht)	31,875	34,408	36,532	39,603	41,953	45,043	48,726	50,848	49,672
GPP per capita-Bangkok current market price (Baht)	116,884	142,675	159,187	176,857	200,630	216,902	236,270	226,002	227,580
Fuel price (Benzene+Diesel) (Baht)	14.55	15.87	18.20	17.08	17.11	15.80	16.55	17.86	19.97
Vehicle price (LDGV+MC+LDDV) (Baht)	494,050	768,750	771,891	725,190	757,467	810,175	801,422	802,536	762,434
Annual new vehicle registration number (veh/year)		310,036	79,662	260,773	282,819	497,109	509,296	462,450	341,934

Year (AD.)	98	99	00	01	02	03	04	05
BKK population	5,647,799	5,662,499	5,680,380	5,726,203	5,782,159	5,844,607	5,634,132	5,641,915
National income per capita (Baht)	54,101	53,957	58,411	60,257	63,015	67,784	75,001	N/A
GNP per capita at 1988 price (Baht)	43,749	45,554	48,001	48,642	50,776	53,639	56,491	N/A
GPP per capita-Bangkok current market price (Baht)	209,647	228,745	243,418	253,306	253,456	262,556	283,780	N/A
Fuel price (Benzene+Diesel) (Baht)	21.05	21.11	28.58	28.94	28.41	30.66	33.63	48.43
Vehicle price (LDGV+MC+LDDV) (Baht)	880,999	903,810	1,003,930	1,087,472	1,100,331	1,112,588	1,123,588	1,161,848
Annual new vehicle registration number (veh/year)	151,854	195,737	256,744	299,433	423,284	514,530	701,530	733,252

Source: National Statistical Office, data accessed range 1989-2005; N/A: Not available

APPENDIX K

SPSS Result

Nonlinear Regression Analysis

Model Description

Output Created		23-FEB-2006 16:02:35
Comments		
Input	Data	C:\Documents and Settings\test\My Documents\Thesis\PhD Thesis\Statistic Analytical.sav
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	29
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used. Predicted values are calculated for cases with missing values on the dependent variable.
Syntax		<pre> MODEL PROGRAM COMPUTE PRED_ = 1.5 / (1+ EXP(- a) * GNP*EXP(- b1) * Time*EXP(- b2)) /OUTFILE='C:\DOCUME~1\test\LOCALS~1\Temp\spss2772\SPSSFNLR.TMP' /PRED PRED_ /SAVE PRED RESID /CRITERIA SSCONVERGENCE 1E-8 PCON 1E-8 . </pre>
Resources	Elapsed Time	0:00:00.56
Variables Created or Modified	PRED_ RESID	Predicted Values Residuals
Files Saved	Parameter Estimates File	C:\DOCUME~1\test\LOCALS~1\Temp\spss2772\SPSSFNLR.TMP

Coefficient Estimation

Parameter	Estimate	Adjusted R Square
a	2.120	.926
b1	0.017	
b2	0.817	

Curve Fit

Model Description

Model Name		MOD_2
Dependent Variable	1	LPr
	2	DDr
Equation	1	Linear
	2	Logarithmic
	3	Inverse
	4	Quadratic
	5	Cubic
	6	Compound(a)
	7	Power(a)
	8	S(a)
	9	Growth(a)
	10	Exponential(a)
	11	Logistic(a)
Independent Variable		P
Constant		Included
Variable Whose Values Label Observations in Plots		Unspecified
Tolerance for Entering Terms in Equations		0.0001

Model Summary and Parameter Estimates For Dependent Variable 1

Dependent Variable: LPr

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Quadratic	0.795	9.723	2	5	0.019	0.234	-0.521	0.300	

Model Summary and Parameter Estimates For Dependent Variable 2

Dependent Variable: DDr

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Quadratic	0.599	9.700	2	5	0.015	0.263	-0.571	0.325	

APPENDIX L
On-site Traffic Count

DATE ROAD	VEH TYPE	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	10.00-11.00	11.00-12.00	12.00-13.00	13.00-14.00	14.00-15.00	15.00-16.00	16.00-17.00	17.00-18.00	18.00-19.00	19.00-20.00	TOTAL
11-Jan-06 LADPHRAO	Sedan	3047	2094	1918	2208	2354	2213	2275	2362	2638	2436	2553	3123	2993	2721	34,935
	Pick up & Van	1213	1171	1224	1357	1442	1318	1108	1430	1508	1691	1567	1414	1465	1274	19,182
	Tuk-tuk & small 4-wheel taxi	49	35	25	45	38	41	33	28	40	47	30	31	29	32	494
	Motorcycle	1064	1167	1584	1307	1448	1106	1211	1001	1401	1358	1250	1335	1323	1147	17,672
	Minibus	52	24	28	35	32	33	49	36	43	38	24	28	26	29	478
	Medium Truck	11	10	13	92	56	51	63	127	90	43	37	13	5	13	624
	Heavy Truck	0	2	1	3	18	11	9	13	7	10	9	5	8	5	101
	Bus	276	138	249	170	216	262	198	210	172	193	237	178	162	155	2,816
	TOTAL	5712	4640	5043	5217	5604	5035	4946	5207	5899	5816	5707	6127	6011	5376	76,302

DATE ROAD	VEH TYPE	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	10.00-11.00	11.00-12.00	12.00-13.00	13.00-14.00	14.00-15.00	15.00-16.00	16.00-17.00	17.00-18.00	18.00-19.00	19.00-20.00	TOTAL
13-Jan-06 LADPHRAO	Sedan	3361	2226	2562	2414	3089	2929	2709	2960	3230	3126	3488	3406	3695	3191	42,386
	Pick up & Van	1423	1318	1466	1504	1951	1617	1588	1748	1864	1627	1494	1672	1755	1660	22,687
	Tuk-tuk & small 4-wheel taxi	87	53	35	68	47	42	52	27	40	61	44	45	43	38	673
	Motorcycle	1393	1296	1622	1767	1684	1272	1503	1301	1542	1460	1243	1427	1507	1135	20,152
	Minibus	51	30	37	38	45	40	55	31	34	37	28	35	30	26	517
	Medium Truck	12	6	46	101	53	65	54	125	78	72	19	22	13	17	683
	Heavy Truck	0	1	3	9	27	13	7	29	20	5	2	2	5	4	127
	Bus	319	181	292	215	253	236	311	205	221	213	280	241	259	198	3,158
	TOTAL	6646	5111	6063	6116	7149	6214	6279	6426	7029	6601	6598	6850	7307	6269	90,383

DATE ROAD	VEH TYPE	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	10.00-11.00	11.00-12.00	12.00-13.00	13.00-14.00	14.00-15.00	15.00-16.00	16.00-17.00	17.00-18.00	18.00-19.00	19.00-20.00	TOTAL
14-Jan-06 LADPHRAO	Sedan	3133	2787	2177	2419	2592	2853	2314	2918	2706	2816	3088	3120	3215	2957	39,095
	Pick up & Van	1268	1304	1225	1381	1117	1424	1293	1479	1759	1542	1469	1554	1415	1668	19,898
	Tuk-tuk & small 4-wheel taxi	45	28	47	73	32	35	29	35	43	49	45	52	39	33	538
	Motorcycle	1178	1073	1532	1430	1656	1407	1395	1322	1473	1372	1136	1283	1189	1239	18,685
	Minibus	49	25	23	33	29	38	54	47	28	35	27	44	36	29	497
	Medium Truck	15	17	10	117	86	78	42	122	97	45	18	16	18	20	701
	Heavy Truck	1	3	5	3	14	21	15	23	12	7	9	4	6	8	131
	Bus	302	189	310	227	271	232	283	244	172	206	212	204	250	196	3,026
TOTAL	5991	5426	5329	5683	5797	6088	5425	6190	6290	6072	6004	6277	6668	6150	82,571	

DATE ROAD	VEH TYPE	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	10.00-11.00	11.00-12.00	12.00-13.00	13.00-14.00	14.00-15.00	15.00-16.00	16.00-17.00	17.00-18.00	18.00-19.00	19.00-20.00	TOTAL
26-Jan-06 DINDAENG	Sedan	3551	2554	2414	2868	3029	3395	2945	2794	3270	3551	3776	4176	4037	3968	45,443
	Pick up & Van	1612	1179	1407	1758	1726	1821	2317	2274	2508	2338	2633	1835	1229	1513	26,050
	Tuk-tuk & small 4-wheel taxi	98	81	76	79	71	65	69	67	59	73	77	92	85	87	1,079
	Motorcycle	1223	1773	1852	1545	2012	2344	2234	2811	2958	2737	1746	1426	1684	1328	28,573
	Minibus	47	37	28	32	43	54	48	49	41	44	35	42	45	41	586
	Medium Truck	27	17	45	78	125	116	147	283	212	174	94	53	63	37	1,571
	Heavy Truck	3	1	5	19	37	32	11	25	16	8	5	9	7	5	183
	Bus	274	102	247	194	235	197	185	206	218	227	258	161	114	224	2,842
TOTAL	6835	5744	6074	6573	7378	8024	7954	8511	9282	9152	8624	7794	7264	7207	106,327	

DATE ROAD	VEH TYPE	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	10.00-11.00	11.00-12.00	12.00-13.00	13.00-14.00	14.00-15.00	15.00-16.00	16.00-17.00	17.00-18.00	18.00-19.00	19.00-20.00	TOTAL
27-Jan-06 DINDAENG	Sedan	4854	2546	2814	3086	3476	4203	3713	3656	3828	4437	4975	5339	5503	5273	57,703
	Pick up & Van	1986	1972	2468	1763	1909	2425	1558	1664	2784	2659	2489	1877	1338	1380	28,172
	Tuk-tuk & small 4-wheel taxi	113	107	121	118	84	94	66	84	82	88	94	80	86	74	1,297
	Motorcycle	1520	2441	3255	2149	2714	3108	3034	2981	2531	2070	2309	2043	1842	1625	32,732
	Minibus	33	44	51	54	43	56	63	45	47	57	68	58	39	37	724
	Medium Truck	56	29	43	274	235	131	109	86	157	117	152	48	63	21	1,621
	Heavy Truck	11	6	13	8	28	35	40	22	12	19	10	14	8	4	234
	Bus	348	198	265	254	281	277	324	304	314	257	227	236	145	138	3,268
	TOTAL	8821	7343	9030	7706	8770	8770	8907	8842	9755	9704	10324	9689	9030	8553	125,751

DATE ROAD	VEH TYPE	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	10.00-11.00	11.00-12.00	12.00-13.00	13.00-14.00	14.00-15.00	15.00-16.00	16.00-17.00	17.00-18.00	18.00-19.00	19.00-20.00	TOTAL
28-Jan-06 DINDAENG	Sedan	2509	2834	3532	3748	2593	1978	2118	2432	3115	3601	2959	3115	3327	2358	39,334
	Pick up & Van	786	1442	1333	836	1117	1881	1924	2115	1935	1347	1219	1365	1428	1014	20,535
	Tuk-tuk & small 4-wheel taxi	53	43	62	57	77	49	53	47	71	68	54	63	55	49	791
	Motorcycle	1349	1598	1438	809	1131	1932	2323	2397	2544	1920	1268	1332	1012	914	22,767
	Minibus	39	21	30	36	25	47	41	37	42	28	37	38	35	34	487
	Medium Truck	44	16	18	65	97	75	106	193	207	135	128	59	34	28	1,305
	Heavy Truck	1	0	3	14	29	27	13	22	8	3	5	4	2	6	218
	Bus	211	161	126	78	109	191	238	222	207	209	233	217	215	182	2,329
	TOTAL	4992	6115	6542	5643	5178	6180	6816	7465	8104	7152	5849	6134	6022	4528	87,766

APPENDIX M
EURO Standard Emission Factor

Example of Emission Factors Calculated from Functions at Typical Speeds on Urban

Factors based on new speed-emission functions, averaged over distribution of engine sizes/vehicle weights in UK fleet

Vehicle Class	Standard	Urban (g/km)
PETROL CARS	Pre-Euro I	0.0235
	Euro I	0.0029
	Euro II	0.0007
	Euro III	0.0007
	Euro IV	0.0007
DIESEL CARS	Pre-Euro I	0.171
	Euro I	0.064
	Euro II	0.057
	Euro III	0.040
	Euro IV	0.020
PETROL LGVs	Pre-Euro I	0.0292
	Euro I	0.0037
	Euro II	0.0009
	Euro III	0.0009
	Euro IV	0.0009
DIESEL LGVs	Pre-Euro I	0.321
	Euro I	0.090
	Euro II	0.090
	Euro III	0.072
	Euro IV	0.044
RIGID HGVs	Pre-1988 models	1.081
	Pre-Euro I (88/77/EC)	0.517
	Euro I	0.267
	Euro II	0.163
	Euro III	0.117
	Euro IV	0.024
	Euro IV+ (2008)	0.024
ARTIC HGVs	Pre-1988 models	0.870
	Pre-Euro I (88/77/EC)	0.763
	Euro I	0.701
	Euro II	0.423
	Euro III	0.305
	Euro IV	0.064
	Euro IV+ (2008)	0.064
BUSES	Pre-1988 models	2.344
	Pre-Euro I (88/77/EC)	1.017
	Euro I	0.515
	Euro II	0.296
	Euro III	0.213
	Euro IV	0.044
	Euro IV+ (2008)	0.044

Source: Compiled by NAEI (National Atmospheric Emission Inventory), UK

BIOGRAPHY

Mr. Chumpol Sripraparkorn was born on October 15, 1975 in Bangkok, Thailand. After finished high school from Satri Witthaya 2 School, he continued the program of Chemistry Training at Institute of Analytical Chemistry Training (Affiliated institute of Chulalongkorn University) and received Diploma in Analytical Chemistry in 1997. He graduated in Bachelor Degree of Science in General Science from Faculty of Science and Master Degree of Environmental Science of Graduate School, Chulalongkorn University in 1999 and 2002, respectively. At the present, he pursued his Philosophy of Doctoral Degree studies in the International Postgraduate Programs in Environmental Management, Inter-Department of Environmental Management, Chulalongkorn University, Thailand. In 2004-2005, he visited school of Mathematical Science, Monash University, Australia for developing his research. He completed his Philosophy of Doctoral Degree of Science in Environmental Management in April 2007. At the present time, he pursues his dream career as environmental scientist at TEAM Consulting Engineering and Management Co. Ltd.,