0.518*1.38*(160-25)=96.5KJ/kg

As heat value of fuel is 8.50MJ/kg, loss can be calculated as 1.1 % of the heat which comes in. If the average load is 75t/h, energy saving of about 3,000t will be achieved annually. However, it is needless to say that adjustment must be made while confirming the balance of the whole boiler.

5-7-2. Non-Combustion Loss

In the case of bubbling fluidized-bed combustion, there is a large amount of carbon which hasn't burnt and scattered from the layer, and it was reported that there was lime with the high fuel ratio which exceeded 10-15%. With these as backgrounds, circulating fluidized-bed combustion has been developed. Non-combustion loss was estimated from the analysis results of ash under this test. For ash in the tested boiler, 2% was collected as excess bed materials, 15% was collected from the economizer, 5% from the air preheater, and 78% from the electric dust collector. As total carbon and CO2 values had been obtained from the analysis results, the amount of carbon unburnt was obtained from the difference between them.

Mode No.	1	2	3	4
Type of fuel	Lyuko coal		Mixed coal	
Quantity of evaporation t/h	85	60	80	43
Unburnt carbon %*	2.4	1.6	1.3	1.1

*: The rate in fuel between the total carbon content of unburnt carbon contained in ash, provided that the unbalance of ash before and after combustion doesn't change.

From the table, it is found that non-combustion loss was around 1.1-2.4%.
If combustion efficiency (hc) is defined according to the following formula, combustion efficiency is as follows:

hc = (net heat value - (unburnt loss + incomplete combustion))/net calorific value

If combustion heat of carbon is 32,730kJ/kg and net heat value of raw coal is 7,667kJ/kg, loss calories due to unburnt ones is 193kJ/kg, and good combustion efficiency of 98.2% was achieved as a result.

6. Summary

According to the results of the test:

(1) The results of measurement of the desulfurization efficiency and NOx in the hybrid fluidized-bed combustion boiler

The results showed a desulfurization efficiency of only 42-45% (when desulfurization agents were added, 23-34%). Concentration of NOx was 40-80ppm lower than the pulverized-coal boiler.

(2) Insufficient Heat value at High Load

Although it is technically possible to make up for insufficient heat value by using fuel with a lower sulfur content, as CaSO4 (gypsum) after desulfurization reaction in the range of the fluid-layer combustion passes the area of high-temperature combustion together with exhausted gas, a part of CaSO4 is reduced and lowers the desulfurization efficiency.

(3) Investigation of Potentialities of Combustion System Improvement

If the oxygen concentration is lowered from 6% to 3%, energy will be saved by 1.1%. Combustion efficiency will be 98.2%.

If a hybrid fluidized-bed combustion boiler is introduced to the study area , it is required (a) to increase capacity of a stoker and a drier, (b) to aim at making temperature in the fluid layer uniform, and (c) to examine particle diameters of desulfurization agents and methods of feeding desulfurization agents. As mentioned above, there are many substantial problems to be solved technically. Measures against air pollution by means of a hybrid fluidized-bed combustion boiler using coal of low quality which contains a large amount of sulfur content are considered to be difficult to take at in the current stage.

TABLE 7-1-1 Analysis of Fuel and Burnt Ash (Mode 1)

Data of coal analysis:		Data of ash analysis:	
Wet content	25.60 %	CO2	0.20 %
Ash content	38.10 %	SO3	6.10 %
Total carbon	24.40 %	CaO	15.40 %
Total sulphur	1.90 %		
Total hydrogen	1.10 %		%
Nitrogen	0.40 %	Measured @SO2	2927 ppm
Oxygen	8.50 %	Ca/S	1.77 -
Carbonate carbon-dioxide	1.80 %		
Heat value	8.500 MJ/kg		

Theoretical dry combustion air volume	2.163 m3/kg coal
Theoretical dry flue-gas volume	2.179 m3/kg coal
Theoretical quantity of combustion steam	0.354 kg/kg coal
Max. sulphur-dioxide concentration @6%O2	4241 vpm 12430 mg/m3
Efficiency of sulphur-bonding	31.0 %
Rate of nitrogen conversion	7.9 %

Analysis and other data of solid combustion residues:

	Slag	ECO p.	LH p.	EF p.
Wet content	0.9	0.2	0.4	0.3 %
Ignition loss	0.7	1.7	4.0	1.6 %
Total carbon	0.2	1.8	3.0	1.6 %
CO2	0.3	0.6	1.8	0.3 %
SO3	1.9	2.2	3.0	1.9 %
CaO	7.9	11.4	12.9	10.7
Ash rate	0.02	0.15	0.05	0.78

Calculated data of solid combustion residues:

	Slag	ECO p.	LH p.	EF p.	
Combustible carbon	0.0012	0.0164	0.0252	0.0152	kg/kg
CaO/S mol.	3.81	6.36	7.14	7.58	-

TABLE 7-1-2 Analysis of Fuel and Burnt Ash (Mode 2)

Data of coal analysis:		Data of ash analysis:	
Wet content	25.70 %	CO2	0.40 %
Ash content	37.90 %	SO3	5.70 %
Total carbon	24.50 %	CaO	11.40 %
Total sulphur	1.90 %		
Total hydrogen	1.30 %		%
Nitrogen	0.40 %	Measured @SO2	3222 ppm
Oxygen	8.30 %	Ca/S	1.30 -
Carbonate carbon-dioxide	1.70 %		
Heat value	8.500 MJ/kg		

Theoretical dry combustion air volume	2.235 m3/kg coal
Theoretical dry flue-gas volume	2.237 m3/kg coal
Theoretical quantity of combustion steam	0.373 kg/kg coal
Max. sulphur-dioxide concentration @6%O2	4130 vpm 12106 mg/m3
Efficiency of sulphur-bonding	22.0 %
Rate of nitrogen conversion	8.2 %

Analysis and other data of solid combustion residues:

	Slag	ECO p.	LH p.	EF p.
Wet content	2.2	0.2	0.3	0.3 %
Ignition loss	1.0	2.2	2.2	1.7 %
Total carbon	0.2	1.2	2.0	1.2 %
CO2	0.5	1.5	0.7	0.9 %
SO3	2.7	3.3	2.0	2.3 %
CaO	7.2	14.7	10.0	12.2%
Ash rate	0.02	0.15	0.05	0.78

Calculated data of solid combustion residues:

	Slag	ECO p.	LH p.	EF p.	
Combustible carbon	0.0007	0.0079	0.0181	0.0098	kg/kg
CaO/S mol.	3.81	6.36	7.14	7.58	-

TABLE 7-1-3 Analysis of Fuel and Burnt Ash (Mode 3)

Data of coal analysis:		Data of ash analysis:	
Wet content	24.00 %	CO2	1.60 %
Ash content	39.80 %	SO3	5.10 %
Total carbon	23.70 %	CaO	19.30 %
Total sulphur	1.70 %	SiO_2	42.2 %
Total hydrogen	1.50 %	MgO	2.6 %
Nitrogen	0.40 %	Measured @SO2	2110 ppm
Oxygen	8.90 %	Ca/S	2.58 -
Carbonate carbon-dioxide	4.40 %		
Heat value	7.610 MJ/kg		

Theoretical dry combustion air volume	2.178 m3/kg coal
Theoretical dry flue-gas volume	2.176 m3/kg coal
Theoretical quantity of combustion steam	0.374 kg/kg coal
Max. sulphur-dioxide concentration @6%O2	3799 vpm 11135 mg/m3
Efficiency of sulphur-bonding	44.5 %
Rate of nitrogen conversion	7.7 %

Analysis and other data of solid combustion residues:

	Slag	ECO p.	LH p.	EF p.
Wet content	3.7	0.2	0.4	0.2 %
Ignition loss	2.0	2.2	2.8	3.5 %
Total carbon	0.4	1.6	1.9	1.4 %
CO2	1.0	1.4	1.3	2.7 %
SO3	4.2	2.4	2.3	4.1 %
CaO	11.8	17.2	14.7	20.0%
Ash rate	0.02	0.15	0.05	0.78

Calculated data of solid combustion residues:

	Slag	ECO p.	LH p.	EF p.
Combustible carbon	0.0013	0.0122	0.0155	0.0066 kg/kg
CaO/S mol.	4.01	10.24	9.13	6.97 -

TABLE 7-1-4 Analysis of Fuel and Burnt Ash (Mode 4)

Data of coal analysis:		Data of ash analysis:	
Wet content	24.00 %	CO2	1.60 %
Ash content	39.80 %	SO3	5.10 %
Total carbon	23.70 %	CaO	19.30 %
Total sulphur	1.70 %	SiO_2	40.10 %
Total hydrogen	1.50 %	MgO	2.10 %
Nitrogen	0.40 %	Measured @SO2	2139 ppm
Oxygen	8.90 %	Ca/S	2.58 -
Carbonate carbon-dioxide	4.40 %		
Heat value	7.610 MJ/kg		

Theoretical dry combustion air volume	2.178 m3/kg coal
Theoretical dry flue-gas volume	2.176 m3/kg coal
Theoretical quantity of combustion steam	0.374 kg/kg coal
Max. sulphur-dioxide concentration @6%O2	3799 vpm 11135 mg/m3
Efficiency of sulphur-bonding	43.7 %
Rate of nitrogen conversion	5.6 %

Analysis and other data of solid combustion residues:

	Slag	ECO p.	LH p.	EF p.
Wet content	4.3	0.2	0.3	0.4 %
Ignition loss	2.3	4.1	3.5	4.4 %
Total carbon	0.5	1.5	1.4	1.6 %
CO2	1.3	3.3	2.7	3.5 %
SO3	5.0	2.7	2.2	5.6 %
CaO	12.9	15.7	13.2	22.9%
Ash rate	0.02	0.15	0.05	0.78

Calculated data of solid combustion residues:

	Slag	ECO p.	LH p.	EF p.
Combustible carbon	0.0015	0.0060	0.0067	0.0065 kg/kg
CaO/S mol.	3.69	8.31	8.57	5.84 -

Contrast Table for Boiler Operation Parameters and Channel No. (1)

Channel number	Description	
	Flue gas temperatures [C°]	
21	after TH2	right
22		left
23	after TH3	right
24		left
25	after TH1	right
26		left
27	before ECO	right
28		left
29	after ECO	right
30		left
1	after air-heater	
	Before-mill temperatures [C°]	
5	mill no.1.	
6	mill no.2.	
7	mill no.3.	
8	mill no.4.	
	After-mill temperatures [C°]	
9	mill no.1.	
10	mill no.2.	
11	mill no.3.	
12	mill no.4.	
	Supply-water temperatures [C°]	
2	before ECO	
3	after ECO	
	Steam temperatures [C°]	
4	before TH1	
33	after TH1	
34	after first injection	
35	after TH2	
36	after second injection	
37	fresh steam	

Contrast Table for Boiler Operation Parameters and Channel No. (2)

	Water- and steam pressures [bar]
13	supply-water A
14	supply-water B
32	cylinder
31	fresh steam
	mass flows of water and steam [kg/s]
39	supply-water A
40	supply-water B
42	injection 1.
43	injection 2.
46	fresh steam
	Air pressures [Pa]
75	after air-heater
76	after fluid ventilator
77	air compartment; main layer
78	air compartment; left side secondary layer
79	air compartment; right side secondary layer
80	secondary air
45	Furnace-chamber pressure (draught) [Pa]
	RPM of raw coal feeders [1/m]
71	feeder 1.
72	feeder 1.
73	feeder 1.
74	feeder 1.
	Layer temperatures [°C]
47	T01
48	T02
49	T03
50	T04
51	T05
52	T06
53	T07
54	T08
55	T09
38	Water level of cylinder [mm]
44	total air quantity [m_N^3/S]
16	O_2 before ECO [%]

Contrast Table for Boiler Operation Parameters and Channel No. (3)

	Gas components measured after the flue-gas suction ventilator
81	O_2 [%]
100	SO_2 [ppm]
83	NO [ppm]
85	CO [ppm]
86	CO_2 [%]

	Calculated characteristics
	Components of flue gas in case of 6% O_2
96	SO_2 [ppm]
97	NO [ppm]
99	CO [ppm]
200	excess air factor [-]

TABLE 7-1-5 Boiler Operation Parameters (Average Value, Scatter) Mode 1

Operational mode No.1.

Average value

Nº	Mért	Dim.
21	697	°C
22	700	°C
23	651	°C
24	639	°C
25	594	°C
26	577	°C
27	457	°C
28	479	°C
29	343	°C
30	341	°C
1	169	°C
38	6.00	mm
71	780	1/m
72	0	1/m
73	736	1/m
74	798	1/m

Nº	Mért	Dim.
2	192	°C
3	292	°C
4	342	°C
33	446	°C
34	419	°C
35	477	°C
36	475	°C
37	496	°C
44	34.1	m3/s

Nº	Mért	Dim.
13	-3.57	bar
14	72.0	bar
32	76.7	bar
31	72.0	bar
39	0.124	kg/s
40	23.9	kg/s
42	1.04	kg/s
43	0.066	kg/s
46	23.7	kg/s
61	85.3	t/h
75	1383	P1Pa
76	6049	P2Pa
77	5403	P3Pa
78	5758	P4Pa
79	4978	P5Pa
80	1269	P6Pa
45	-117	P7Pa

Nº	Mért	Dim.
50	851	BM°C
47	805	FM°C
53	884	JM°C
51	891	BK°C
48	824	FK°C
54	892	JK°C
52	718	BH°C
49	686	FH°C
55	752	JH°C
81	12.6	O2 %
82	0	SO2p
83	146	NO p
85	35.6	CO p
86	7.46	CO2%

Nº	Mért	Dim.
5	241	°C
6	18.0	°C
7	186	°C
8	192	°C
9	116	°C
10	59.8	°C
11	61.1	°C
12	114	°C
200	2.52	°C
96	3226	SO2r
97	263	NO r
99	64.3	CO r

A0215_1.DAT

Scatter

Nº	Mért	Dim.
21	4.31	°C
22	10.7	°C
23	3.13	°C
24	7.33	°C
25	3.02	°C
26	4.30	°C
27	0.953	°C
28	2.67	°C
29	0.610	°C
30	0.939	°C
1	0.578	°C
38	8.17	mm
71	3.66	1/m
72	0	1/m
73	3.08	1/m
74	4.31	1/m

Nº	Mért	Dim.
2	0.195	°C
3	0.641	°C
4	0.592	°C
33	1.33	°C
34	1.52	°C
35	1.81	°C
36	1.84	°C
37	1.75	°C
44	0.342	m3/s

Nº	Mért	Dim.
13	0.023	bar
14	0.424	bar
32	0.426	bar
31	0.377	bar
39	0.098	kg/s
40	0.664	kg/s
42	0.016	kg/s
43	0.002	kg/s
46	0.586	kg/s
61	2.11	t/h
75	13.3	P1Pa
76	41.8	P2Pa
77	42.5	P3Pa
78	42.2	P4Pa
79	25.3	P5Pa
80	19.5	P6Pa
45	98.3	P7Pa

Nº	Mért	Dim.
50	7.54	BM°C
47	7.37	FM°C
53	12.3	JM°C
51	7.72	BK°C
48	8.05	FK°C
54	7.55	JK°C
52	9.52	BH°C
49	9.12	FH°C
55	15.5	JH°C
81	0.230	O2 %
82	0	SO2p
83	5.59	NO p
85	2.71	CO p
86	0.197	CO2%

Nº	Mért	Dim.
5	6.08	°C
6	1.60	°C
7	8.50	°C
8	5.07	°C
9	4.39	°C
10	4.06	°C
11	0.535	°C
12	1.43	°C
200	0.070	°C
96	52.7	SO2r
97	7.80	NO r
99	5.81	CO r

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TABLE 7-1-6 Boiler Operation Parameters (Minimum, Maximum) Mode 1

Operational mode No.1.

Minimum

Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.
21	689	°C	2	191	°C	13	-3.60	bar	50	834	BM°C	5	235	°C
22	671	°C	3	291	°C	14	71.1	bar	47	785	FM°C	6	15.7	°C
23	646	°C	4	341	°C	32	75.8	bar	53	849	JM°C	7	169	°C
24	620	°C	33	444	°C	31	71.4	bar	51	874	BK°C	8	184	°C
25	588	°C	34	416	°C				48	804	FK°C			
26	566	°C	35	473	°C	39	-0.05	kg/s	54	871	JK°C	9	112	°C
27	456	°C	36	471	°C	40	21.6	kg/s	52	700	BH°C	10	53.3	°C
28	472	°C	37	492	°C	42	0.996	kg/s	49	668	FH°C	11	60.2	°C
29	341	°C				43	0.061	kg/s	55	722	JH°C	12	111	°C
30	338	°C	44	33.1	m3/s	46	22.5	kg/s						
1	168	°C												
						61	81.0	t/h						
38	-11.5	mm				75	1351	P1Pa	81	12.2	O2 %	200	2.39	°C
						76	5953	P2Pa	82	0	SO2p	96	3080	SO2r
						77	5312	P3Pa	83	130	NO p	97	247	NO r
71	770	1/m				78	5662	P4Pa	85	28.8	CO p	99	53.0	CO r
72	0	1/m				79	4914	P5Pa	86	6.98	CO2%			
73	725	1/m				80	1223	P6Pa						
74	787	1/m				45	-229	P7Pa						

A0215_1/DAT

Maximum

Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.
21	707	°C	2	192	°C	13	-3.52	bar	50	868	BM°C	5	263	°C
22	725	°C	3	293	°C	14	72.7	bar	47	821	FM°C	6	21.3	°C
23	658	°C	4	343	°C	32	77.4	bar	53	909	JM°C	7	202	°C
24	655	°C	33	449	°C	31	72.7	bar	51	904	BK°C	8	202	°C
25	600	°C	34	423	°C				48	838	FK°C			
26	585	°C	35	480	°C	39	0.406	kg/s	54	906	JK°C	9	131	°C
27	459	°C	36	478	°C	40	25.0	kg/s	52	734	BH°C	10	67.3	°C
28	484	°C	37	499	°C	42	1.08	kg/s	49	704	FH°C	11	62.3	°C
29	344	°C				43	0.070	kg/s	55	782	JH°C	12	117	°C
30	342	°C	44	34.9	m3/s	46	24.6	kg/s						
1	170	°C												
						61	88.5	t/h						
38	30.3	mm				75	1424	P1Pa	81	13.2	O2 %	200	2.68	°C
						76	6141	P2Pa	82	0	SO2p	96	3367	SO2r
						77	5492	P3Pa	83	156	NO p	97	282	NO r
71	790	1/m				78	5850	P4Pa	85	42.6	CO p	99	81.0	CO r
72	0	1/m				79	5019	P5Pa	86	7.82	CO2%			
73	747	1/m				80	1328	P6Pa						
74	808	1/m				45	-0.44	P7Pa						

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TABLE 7-1-7 Boiler Operation Parameters (Average Value, Scatter) Mode 2

Operational mode No.2.

Average value

Nº	Mért	Dim.
21	616	°C
22	576	°C
23	582	°C
24	551	°C
25	525	°C
26	504	°C
27	417	°C
28	431	°C
29	325	°C
30	321	°C
1	154	°C
38	-15.5	mm
71	815	1/m
72	0	1/m
73	0	1/m
74	746	1/m

Nº	Mért	Dim.
2	191	°C
3	290	°C
4	336	°C
33	425	°C
34	422	°C
35	462	°C
36	458	°C
37	471	°C
44	34.3	m3/s

Nº	Mért	Dim.
13	-3.34	bar
14	69.4	bar
32	74.1	bar
31	71.5	bar
39	0.292	kg/s
40	17.3	kg/s
42	0	kg/s
43	0.067	kg/s
46	16.6	kg/s
61	59.7	t/h
75	1311	P1Pa
76	6272	P2Pa
77	5625	P3Pa
78	5989	P4Pa
79	5133	P5Pa
80	1202	P6Pa
45	-214	P7Pa

Nº	Mért	Dim.
50	851	BM°C
47	813	FM°C
53	870	JM°C
51	892	BK°C
48	834	FK°C
54	889	JK°C
52	739	BH°C
49	705	FH°C
55	760	JH°C
81	15.1	O2 %
82	0	SO2p
83	100	NO p
85	87.6	CO p
86	5.41	CO2%

Nº	Mért	Dim.
5	218	°C
6	11.0	°C
7	102	°C
8	181	°C
9	89.8	°C
10	37.2	°C
11	89.5	°C
12	114	°C
200	3.58	°C
96	2965	SO2r
97	259	NO r
99	226	CO r

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Scatter

Nº	Mért	Dim.
21	4.25	°C
22	2.03	°C
23	3.18	°C
24	30.2	°C
25	2.70	°C
26	1.57	°C
27	0.720	°C
28	0.853	°C
29	0.695	°C
30	0.767	°C
1	0.293	°C
38	19.2	mm
71	3.34	1/m
72	0	1/m
73	0	1/m
74	5.71	1/m

Nº	Mért	Dim.
2	0.339	°C
3	0.410	°C
4	0.732	°C
33	1.76	°C
34	1.68	°C
35	1.73	°C
36	1.74	°C
37	1.41	°C
44	0.362	m3/s

Nº	Mért	Dim.
13	0.012	bar
14	0.434	bar
32	0.459	bar
31	0.476	bar
39	0.085	kg/s
40	1.45	kg/s
42	0	kg/s
43	0.002	kg/s
46	0.319	kg/s
61	1.15	t/h
75	13.6	P1Pa
76	27.6	P2Pa
77	28.3	P3Pa
78	28.9	P4Pa
79	15.8	P5Pa
80	21.1	P6Pa
45	50.9	P7Pa

Nº	Mért	Dim.
50	10.6	BM°C
47	11.2	FM°C
53	13.4	JM°C
51	5.79	BK°C
48	7.62	FK°C
54	6.92	JK°C
52	6.93	BH°C
49	6.09	FH°C
55	7.74	JH°C
81	0.190	O2 %
82	0	SO2p
83	4.70	NO p
85	4.14	CO p
86	0.163	CO2%

Nº	Mért	Dim.
5	3.21	°C
6	0.074	°C
7	66.6	°C
8	2.34	°C
9	3.18	°C
10	0.583	°C
11	0.407	°C
12	0.833	°C
200	0.126	°C
96	40.3	SO2r
97	9.95	NO r
99	14.8	CO r

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TABLE 7-1-8 Boiler Operation Parameters (Minimum, Maximum) Mode 2

Operational mode No.2.

Minimum

Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.
21	607	°C	2	191	°C	13	-3.36	bar	50	826	BM°C	5	213	°C
22	572	°C	3	289	°C	14	68.6	bar	47	785	FM°C	6	10.9	°C
23	575	°C	4	335	°C	32	73.2	bar	53	835	JM°C	7	-195	°C
24	459	°C	33	420	°C	31	70.6	bar	51	879	BK°C	8	178	°C
25	519	°C	34	418	°C				48	818	FK°C			
26	500	°C	35	458	°C	39	0.100	kg/s	54	874	JK°C	9	84.9	°C
27	416	°C	36	454	°C	40	12.2	kg/s	52	724	BH°C	10	36.3	°C
28	429	°C	37	469	°C	42	0	kg/s	49	692	FH°C	11	88.9	°C
29	324	°C				43	0.063	kg/s	55	746	JH°C	12	113	°C
30	321	°C	44	33.5	m3/s	46	16.1	kg/s						
1	153	°C												
						61	58.0	t/h						
38	-49.6	mm				75	1284	P1Pa	81	14.9	O2 %	200	3.42	°C
						76	6213	P2Pa	82	0	SO2p	96	2865	SO2r
						77	5569	P3Pa	83	87.7	NO p	97	237	NO r
71	808	1/m				78	5928	P4Pa	85	80.4	CO p	99	204	CO r
72	0	1/m				79	5093	P5Pa	86	4.77	CO2%			
73	0	1/m				80	1155	P6Pa						
74	730	1/m				45	-229	P7Pa						

A0215_2.DAT

Maximum

Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.	Nº	Mért	Dim.
21	624	°C	2	192	°C	13	-3.32	bar	50	869	BM°C	5	222	°C
22	580	°C	3	291	°C	14	70.2	bar	47	830	FM°C	6	11.1	°C
23	587	°C	4	337	°C	32	74.8	bar	53	891	JM°C	7	239	°C
24	709	°C	33	426	°C	31	72.4	bar	51	901	BK°C	8	186	°C
25	529	°C	34	423	°C				48	845	FK°C			
26	506	°C	35	464	°C	39	0.501	kg/s	54	901	JK°C	9	94.1	°C
27	419	°C	36	459	°C	40	19.6	kg/s	52	753	BH°C	10	38.3	°C
28	432	°C	37	473	°C	42	0	kg/s	49	716	FH°C	11	90.3	°C
29	327	°C				43	0.071	kg/s	55	774	JH°C	12	116	°C
30	324	°C	44	35.1	m3/s	46	17.6	kg/s						
1	154	°C												
						61	63.3	t/h						
38	18.4	mm				75	1335	P1Pa	81	16.0	O2 %	200	4.17	°C
						76	6325	P2Pa	82	0	SO2p	96	3034	SO2r
						77	5685	P3Pa	83	108	NO p	97	286	NO r
71	824	1/m				78	6056	P4Pa	85	100	CO p	99	272	CO r
72	0	1/m				79	5158	P5Pa	86	5.63	CO2%			
73	0	1/m				80	1246	P6Pa						
74	760	1/m				45	-26.2	P7Pa						

A0215_2.DAT

TABLE 7-1-9 Boiler Operation Parameters (Average Value, Scatter) Mode 3

Operational mode No.3.

Average value

Nº	Mért	Dim.
21	684	°C
22	730	°C
23	643	°C
24	660	°C
25	590	°C
26	594	°C
27	458	°C
28	493	°C
29	344	°C
30	347	°C
1	174	°C
38	0.257	mm
71	802	1/m
72	0	1/m
73	685	1/m
74	795	1/m

Nº	Mért	Dim.
2	192	°C
3	292	°C
4	347	°C
33	457	°C
34	414	°C
35	471	°C
36	469	°C
37	491	°C
44	34.8	m3/s

Nº	Mért	Dim.
13	3.82	bar
14	72.1	bar
32	76.9	bar
31	72.7	bar
39	3.35	kg/s
40	22.7	kg/s
42	1.60	kg/s
43	0.062	kg/s
46	22.1	kg/s
61	79.6	t/h
75	2114	P1Pa
76	6206	P2Pa
77	5496	P3Pa
78	5882	P4Pa
79	5020	P5Pa
80	1540	P6Pa
45	-189	P7Pa

Nº	Mért	Dim.
50	787	BH°C
47	737	FH°C
53	788	JH°C
51	910	BK°C
48	843	FK°C
54	908	JK°C
52	749	BH°C
49	704	FH°C
55	751	JH°C
81	13.0	O2 %
82	0	SO2p
83	132	NO p
85	17.5	CO p
86	7.40	CO2%

Nº	Mért	Dim.
5	298	°C
6	53.1	°C
7	106	°C
8	248	°C
9	138	°C
10	65.9	°C
11	61.3	°C
12	134	°C
200	2.61	°C
96	2130	SO2r
97	249	NO r
99	33.0	CO r

A0216_1.DAT

Scatter

Nº	Mért	Dim.
21	7.85	°C
22	9.65	°C
23	6.07	°C
24	6.67	°C
25	6.50	°C
26	5.22	°C
27	2.42	°C
28	3.84	°C
29	1.19	°C
30	1.09	°C
1	0.707	°C
38	8.35	mm
71	5.20	1/m
72	0	1/m
73	3.80	1/m
74	3.85	1/m

Nº	Mért	Dim.
2	0.250	°C
3	0.489	°C
4	1.08	°C
33	2.88	°C
34	2.57	°C
35	2.70	°C
36	2.78	°C
37	2.60	°C
44	0.389	m3/s

Nº	Mért	Dim.
13	0.498	bar
14	0.567	bar
32	0.576	bar
31	0.461	bar
39	0.071	kg/s
40	0.903	kg/s
42	0.040	kg/s
43	0.003	kg/s
46	0.872	kg/s
61	3.14	t/h
75	16.4	P1Pa
76	26.5	P2Pa
77	27.8	P3Pa
78	26.8	P4Pa
79	13.4	P5Pa
80	0.242	P6Pa
45	80.6	P7Pa

Nº	Mért	Dim.
50	42.1	BH°C
47	40.6	FH°C
53	43.4	JH°C
51	15.2	BK°C
48	19.7	FK°C
54	15.9	JK°C
52	15.8	BH°C
49	14.0	FH°C
55	17.5	JH°C
81	0.255	O2 %
82	0	SO2p
83	6.96	NO p
85	2.29	CO p
86	0.241	CO2%

Nº	Mért	Dim.
5	12.5	°C
6	22.9	°C
7	159	°C
8	18.3	°C
9	2.97	°C
10	5.15	°C
11	4.20	°C
12	5.12	°C
200	0.082	°C
96	113	SO2r
97	10.3	NO r
99	5.16	CO r

A0216_1.DAT

TABLE 7-1-10 Boiler Operation Parameters (Minimum, Maximum) Mode 3

Operational mode No.3.

Minimum

Nº	Mért	Dim.
21	670	°C
22	713	°C
23	632	°C
24	647	°C
25	575	°C
26	585	°C
27	452	°C
28	488	°C
29	342	°C
30	346	°C
1	173	°C
38	-20.7	mm
71	787	1/m
72	0	1/m
73	676	1/m
74	786	1/m

Nº	Mért	Dim.
2	191	°C
3	291	°C
4	345	°C
33	452	°C
34	409	°C
35	466	°C
36	464	°C
37	487	°C
44	33.9	m3/s

Nº	Mért	Dim.
13	3.01	bar
14	70.8	bar
32	75.6	bar
31	71.6	bar
39	3.17	kg/s
40	20.6	kg/s
42	1.51	kg/s
43	0.056	kg/s
46	20.7	kg/s
61	74.4	t/h
75	2079	P1Pa
76	6146	P2Pa
77	5421	P3Pa
78	5808	P4Pa
79	4992	P5Pa
80	1540	P6Pa
45	-229	P7Pa

Nº	Mért	Dim.
50	707	BH°C
47	658	FH°C
53	695	JH°C
51	883	BK°C
48	809	FK°C
54	884	JK°C
52	721	BH°C
49	678	FH°C
55	719	JH°C
81	12.5	O2 %
82	0	SO2p
83	118	NO p
85	13.0	CO p
86	6.95	CO2%

Nº	Mért	Dim.
5	281	°C
6	34.8	°C
7	-237	°C
8	216	°C
9	135	°C
10	58.4	°C
11	58.7	°C
12	125	°C
200	2.46	°C
96	1900	SO2r
97	225	NO r
99	23.0	CO r

A0216_1.DAT

Maximum

Nº	Mért	Dim.
21	702	°C
22	748	°C
23	657	°C
24	673	°C
25	603	°C
26	603	°C
27	462	°C
28	500	°C
29	347	°C
30	350	°C
1	176	°C
38	16.5	mm
71	812	1/m
72	0	1/m
73	694	1/m
74	804	1/m

Nº	Mért	Dim.
2	192	°C
3	293	°C
4	349	°C
33	463	°C
34	420	°C
35	476	°C
36	474	°C
37	496	°C
44	35.9	m3/s

Nº	Mért	Dim.
13	4.68	bar
14	73.2	bar
32	78.1	bar
31	73.7	bar
39	3.50	kg/s
40	24.8	kg/s
42	1.70	kg/s
43	0.068	kg/s
46	23.8	kg/s
61	85.7	t/h
75	2160	P1Pa
76	6253	P2Pa
77	5548	P3Pa
78	5941	P4Pa
79	5061	P5Pa
80	1541	P6Pa
45	-3.32	P7Pa

Nº	Mért	Dim.
50	847	BH°C
47	795	FH°C
53	848	JH°C
51	938	BK°C
48	880	FK°C
54	938	JK°C
52	778	BH°C
49	727	FH°C
55	782	JH°C
81	13.5	O2 %
82	0	SO2p
83	145	NO p
85	22.1	CO p
86	7.86	CO2%

Nº	Mért	Dim.
5	326	°C
6	136	°C
7	320	°C
8	272	°C
9	143	°C
10	75.4	°C
11	75.7	°C
12	140	°C
200	2.78	°C
96	2380	SO2r
97	268	NO r
99	43.2	CO r

A0216_1.DAT

TABLE 7-1-11 Boiler Operation Parameters (Average Value, Scatter) Mode 4

Operational mode No.4.

Average value

Nº	Mért	Dim.
21	537	°C
22	559	°C
23	518	°C
24	522	°C
25	414	°C
26	422	°C
27	339	°C
28	416	°C
29	287	°C
30	288	°C
1	145	°C
38	-14.2	mm
71	647	1/m
72	0	1/m
73	0	1/m
74	642	1/m

Nº	Mért	Dim.
2	189	°C
3	285	°C
4	315	°C
33	415	°C
34	415	°C
35	460	°C
36	460	°C
37	470	°C
44	31.1	m3/s

Nº	Mért	Dim.
13	2.06	bar
14	60.5	bar
32	71.9	bar
31	70.1	bar
39	1.96	kg/s
40	12.5	kg/s
42	0	kg/s
43	0	kg/s
46	12.0	kg/s
61	43.3	t/h
75	808	P1Pa
76	5958	P2Pa
77	5345	P3Pa
78	5697	P4Pa
79	4863	P5Pa
80	733	P6Pa
45	-185	P7Pa

Nº	Mért	Dim.
50	716	BM°C
47	682	FM°C
53	707	JM°C
51	870	BK°C
48	819	FK°C
54	865	JK°C
52	781	BH°C
49	744	FH°C
55	778	JH°C
81	15.8	O2 %
82	0	SO2p
83	60.7	NO p
85	113	CO p
86	4.09	CO2%

Nº	Mért	Dim.
5	253	°C
6	14.5	°C
7	29.2	°C
8	131	°C
9	117	°C
10	41.2	°C
11	65.7	°C
12	102	°C
200	4.08	°C
96	1922	SO2r
97	179	NO r
99	343	CO r

A0216_2.DAT

Scatter

Nº	Mért	Dim.
21	3.63	°C
22	4.71	°C
23	2.95	°C
24	3.54	°C
25	1.01	°C
26	16.5	°C
27	14.4	°C
28	2.18	°C
29	0.808	°C
30	0.933	°C
1	0.703	°C
38	18.4	mm
71	22.2	1/m
72	0	1/m
73	0	1/m
74	14.6	1/m

Nº	Mért	Dim.
2	0.248	°C
3	0.549	°C
4	0.078	°C
33	2.72	°C
34	2.59	°C
35	3.52	°C
36	3.52	°C
37	3.28	°C
44	0.329	m3/s

Nº	Mért	Dim.
13	0.140	bar
14	0.352	bar
32	0.593	bar
31	0.567	bar
39	0.009	kg/s
40	1.57	kg/s
42	0	kg/s
43	0	kg/s
46	0.428	kg/s
61	1.54	t/h
75	19.9	P1Pa
76	76.0	P2Pa
77	71.9	P3Pa
78	73.8	P4Pa
79	54.7	P5Pa
80	28.9	P6Pa
45	79.7	P7Pa

Nº	Mért	Dim.
50	15.6	BM°C
47	14.8	FM°C
53	15.3	JM°C
51	12.1	BK°C
48	16.1	FK°C
54	14.6	JK°C
52	14.6	BH°C
49	14.4	FH°C
55	16.0	JH°C
81	0.257	O2 %
82	0	SO2p
83	7.78	NO p
85	79.8	CO p
86	0.218	CO2%

Nº	Mért	Dim.
5	14.6	°C
6	0.848	°C
7	0.133	°C
8	3.99	°C
9	3.75	°C
10	12.7	°C
11	2.82	°C
12	2.15	°C
200	0.245	°C
96	330	SO2r
97	19.6	NO r
99	306	CO r

A0216_2.DAT

TABLE 7-1-12 Boiler Operation Parameters (Minimum, Maximum) Mode 4

Operational mode No.4.

Minimum

Nº	Mért	Dim.
21	530	°C
22	545	°C
23	513	°C
24	514	°C
25	412	°C
26	416	°C
27	334	°C
28	412	°C
29	285	°C
30	286	°C
1	144	°C
38	-50.0	mm
71	627	1/m
72	0	1/m
73	0	1/m
74	627	1/m

Nº	Mért	Dim.
2	188	°C
3	284	°C
4	315	°C
33	411	°C
34	412	°C
35	456	°C
36	456	°C
37	467	°C
44	30.2	m3/s

Nº	Mért	Dim.
13	1.78	bar
14	59.7	bar
32	70.8	bar
31	69.1	bar
39	1.93	kg/s
40	7.97	kg/s
42	0	kg/s
43	0	kg/s
46	10.7	kg/s
61	38.4	t/h
75	757	P1Pa
76	5697	P2Pa
77	5083	P3Pa
78	5438	P4Pa
79	4709	P5Pa
80	653	P6Pa
45	-231	P7Pa

Nº	Mért	Dim.
50	687	BM°C
47	654	FM°C
53	676	JM°C
51	842	BK°C
48	783	FK°C
54	831	JK°C
52	748	BH°C
49	713	FH°C
55	742	JH°C
81	15.5	O2 %
82	0	SO2p
83	37.7	NO p
85	80.2	CO p
86	2.91	CO2%

Nº	Mért	Dim.
5	243	°C
6	13.2	°C
7	28.8	°C
8	122	°C
9	107	°C
10	15.7	°C
11	61.0	°C
12	96.6	°C
200	3.79	°C
96	702	SO2r
97	125	NO r
99	228	CO r

A0216_2.DAT

Maximum

Nº	Mért	Dim.
21	547	°C
22	571	°C
23	526	°C
24	532	°C
25	417	°C
26	488	°C
27	388	°C
28	422	°C
29	288	°C
30	290	°C
1	147	°C
38	12.3	mm
71	701	1/m
72	0	1/m
73	0	1/m
74	681	1/m

Nº	Mért	Dim.
2	189	°C
3	286	°C
4	316	°C
33	420	°C
34	420	°C
35	467	°C
36	467	°C
37	477	°C
44	31.8	m3/s

Nº	Mért	Dim.
13	2.24	bar
14	61.0	bar
32	72.8	bar
31	71.1	bar
39	1.98	kg/s
40	14.8	kg/s
42	0	kg/s
43	0	kg/s
46	13.2	kg/s
61	47.6	t/h
75	874	P1Pa
76	6135	P2Pa
77	5505	P3Pa
78	5863	P4Pa
79	4990	P5Pa
80	812	P6Pa
45	6.99	P7Pa

Nº	Mért	Dim.
50	737	BM°C
47	702	FM°C
53	728	JM°C
51	887	BK°C
48	840	FK°C
54	886	JK°C
52	807	BH°C
49	769	FH°C
55	809	JH°C
81	17.2	O2 %
82	0	SO2p
83	74.1	NO p
85	765	CO p
86	4.89	CO2%

Nº	Mért	Dim.
5	294	°C
6	15.8	°C
7	29.4	°C
8	136	°C
9	121	°C
10	49.8	°C
11	69.9	°C
12	105	°C
200	5.53	°C
96	2437	SO2r
97	210	NO r
99	2787	CO r

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DATA FOR CHAPTER 8

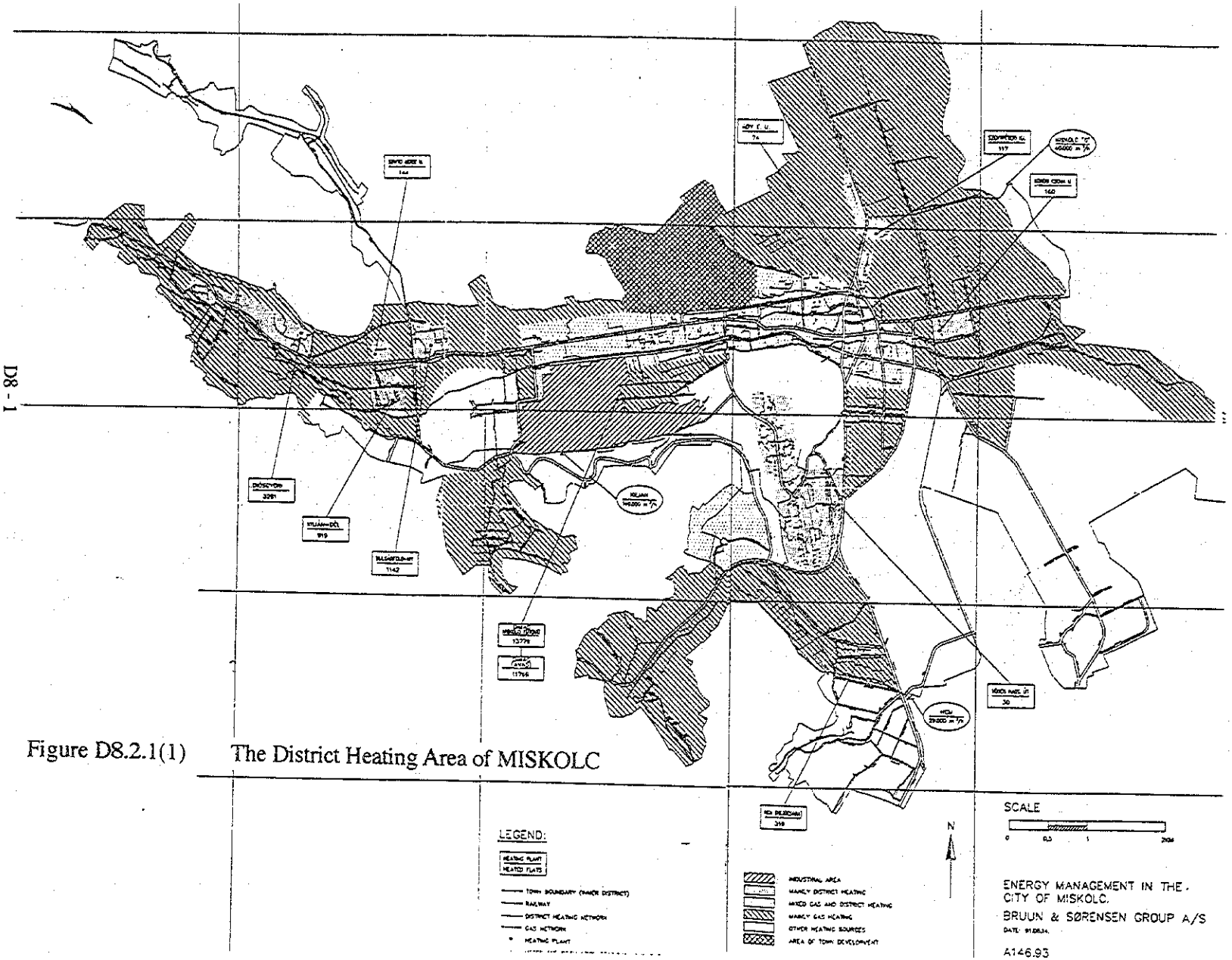

Figure D8.2.1(1) The District Heating Area of MISKOLC

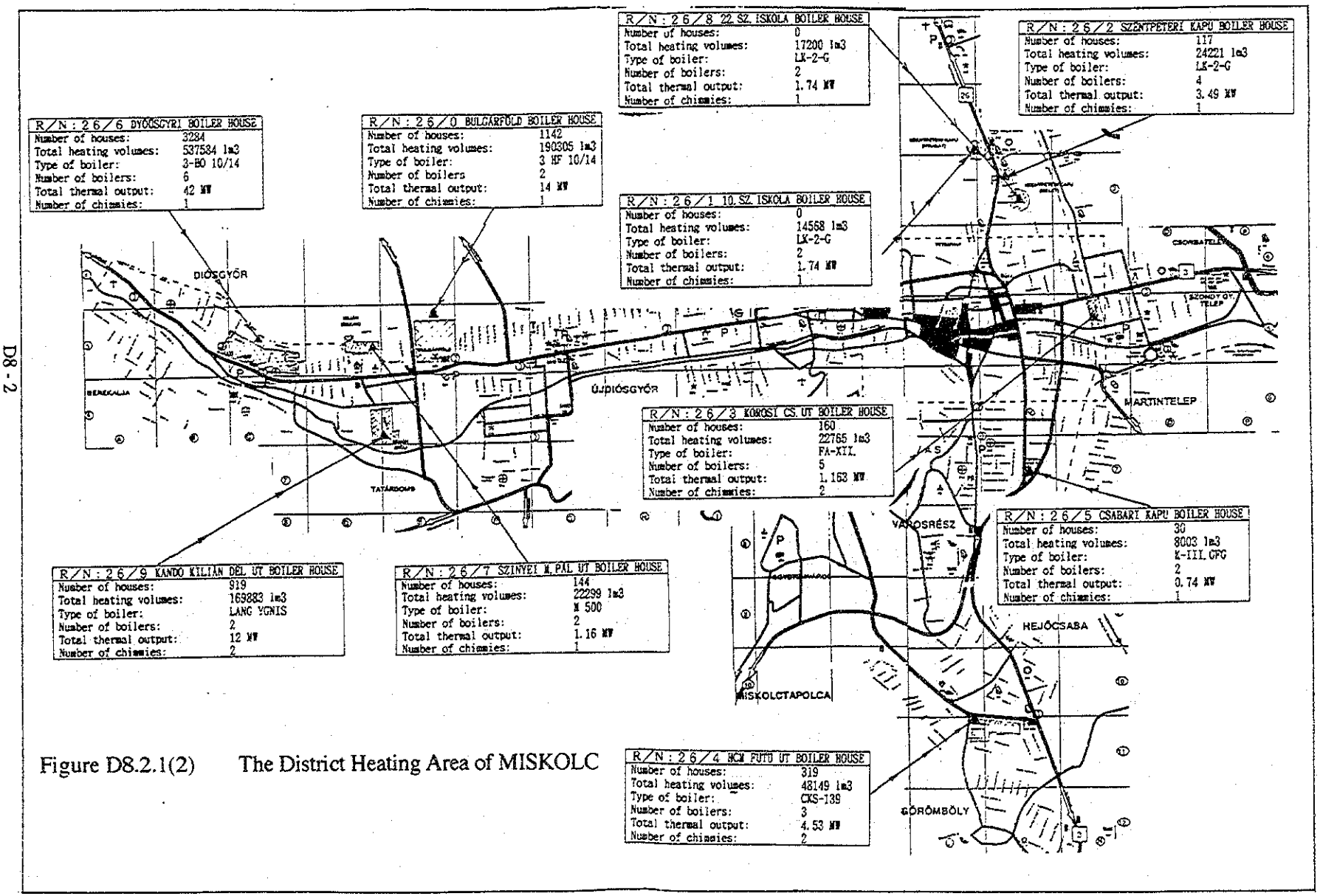

Figure D8.2.1(2) The District Heating Area of MISKOLC

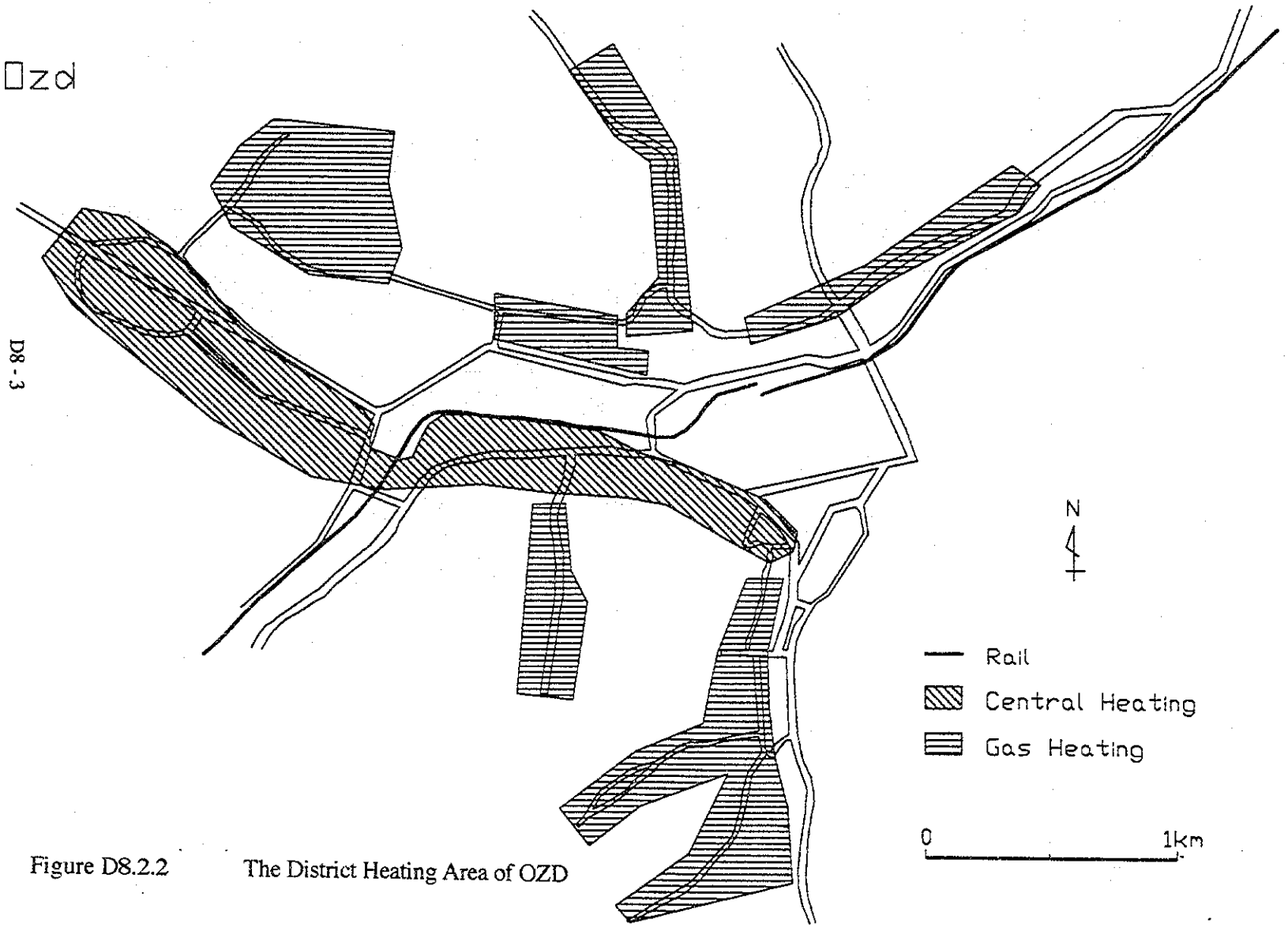

Figure D8.2.2 The District Heating Area of OZD

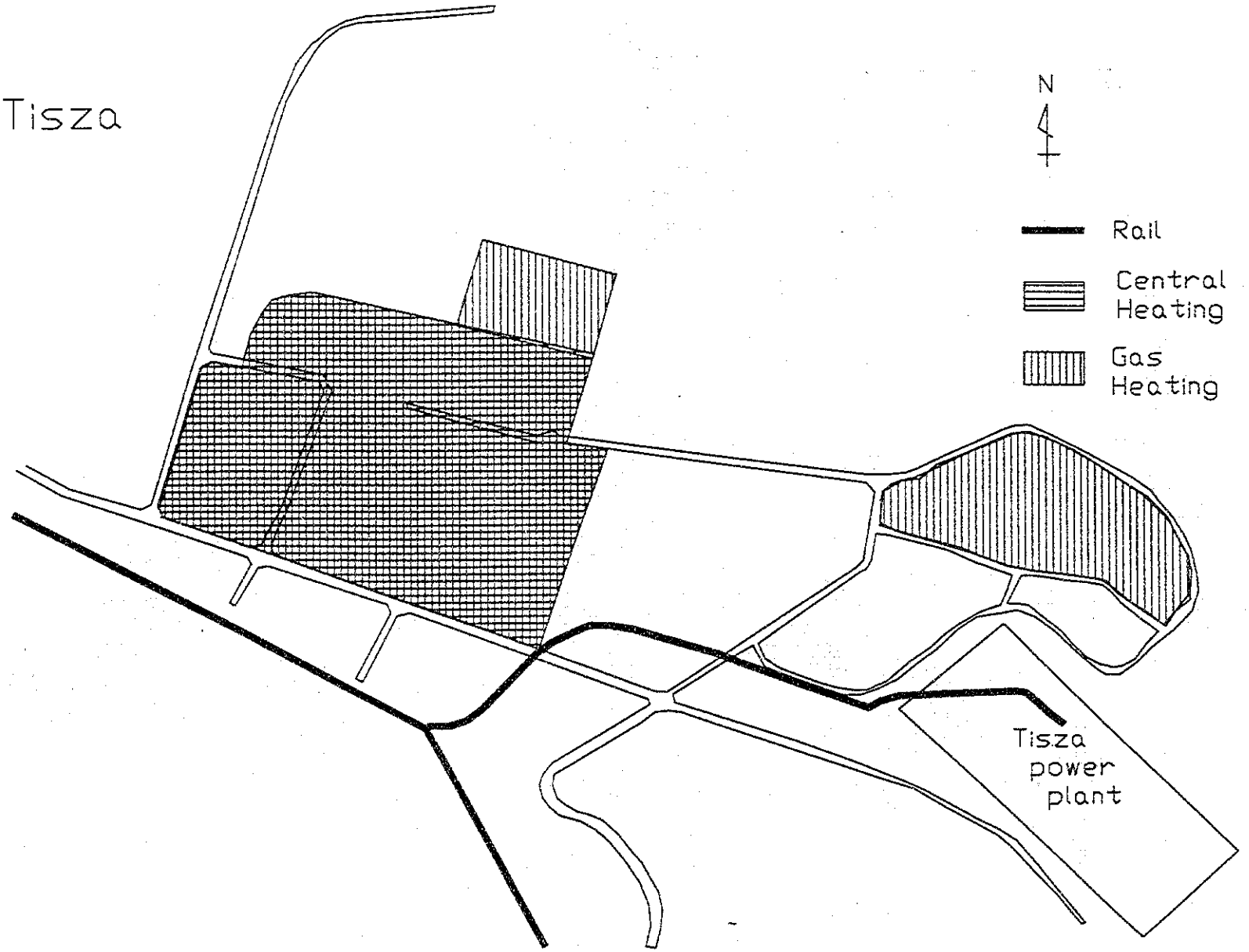

Figure D8.2.3 The District Heating Area of TISZA

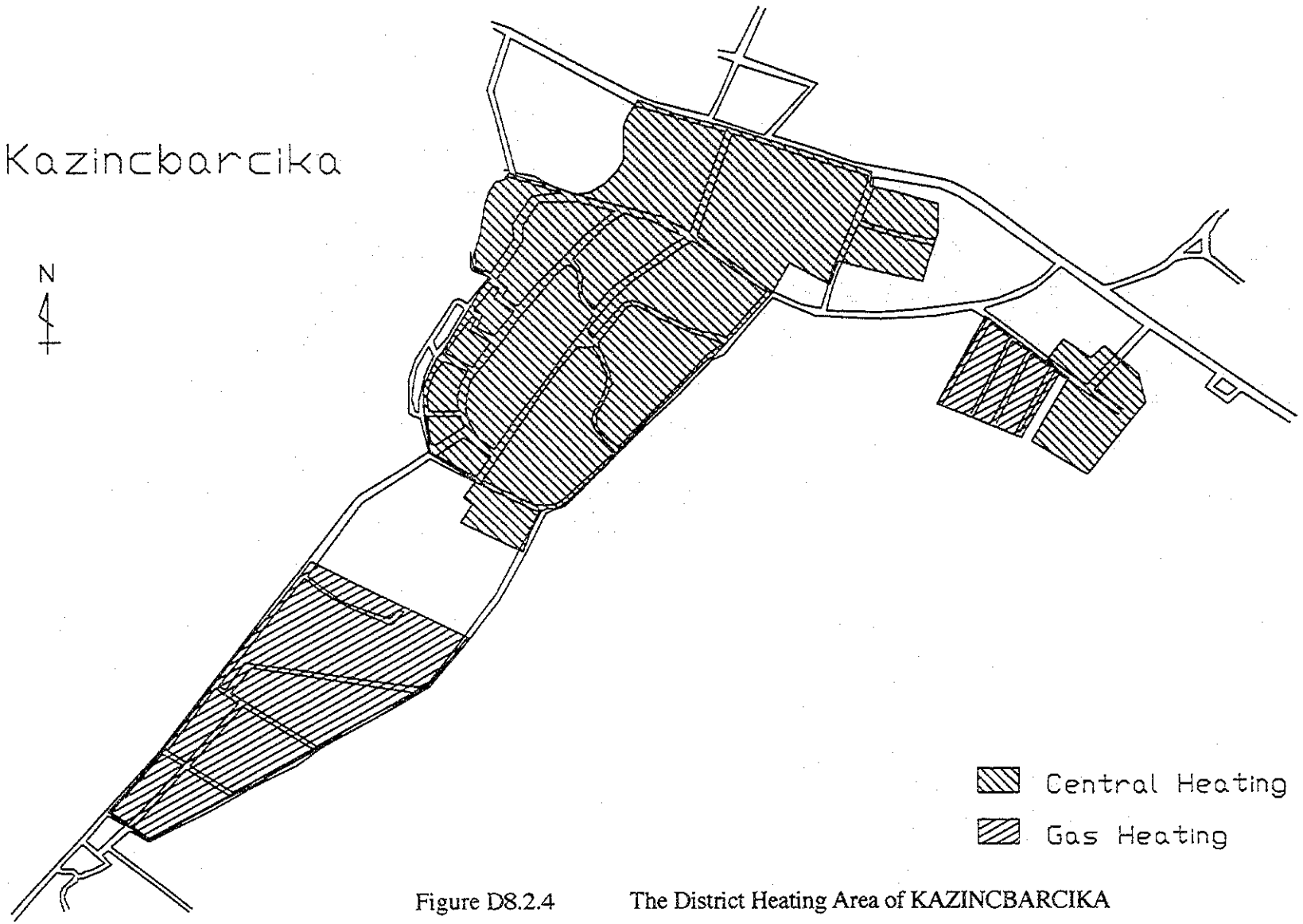

Figure D8.2.4 The District Heating Area of KAZINCBARCIKA

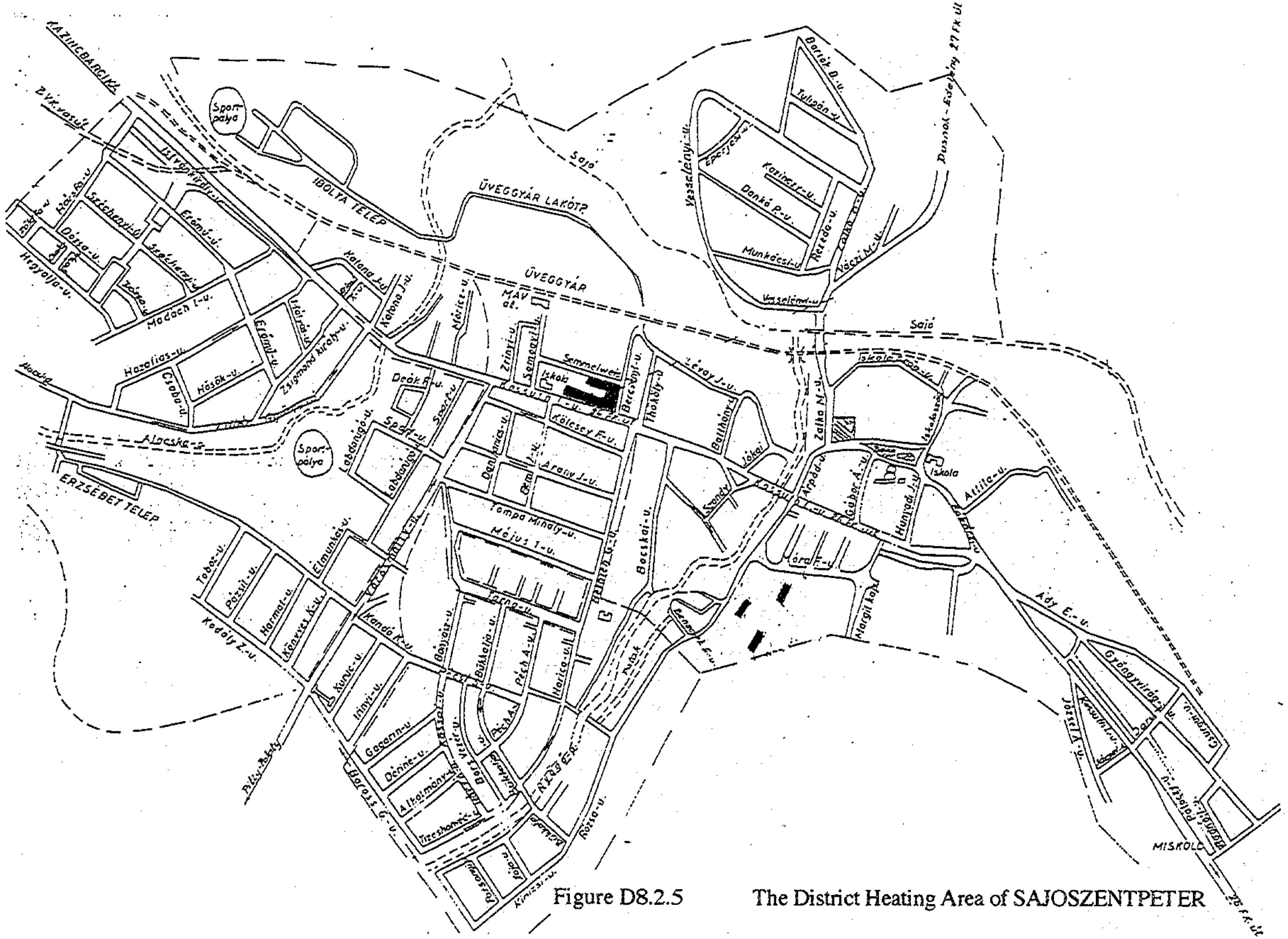

Figure D8.2.5 The District Heating Area of SAJOSZENTPETER

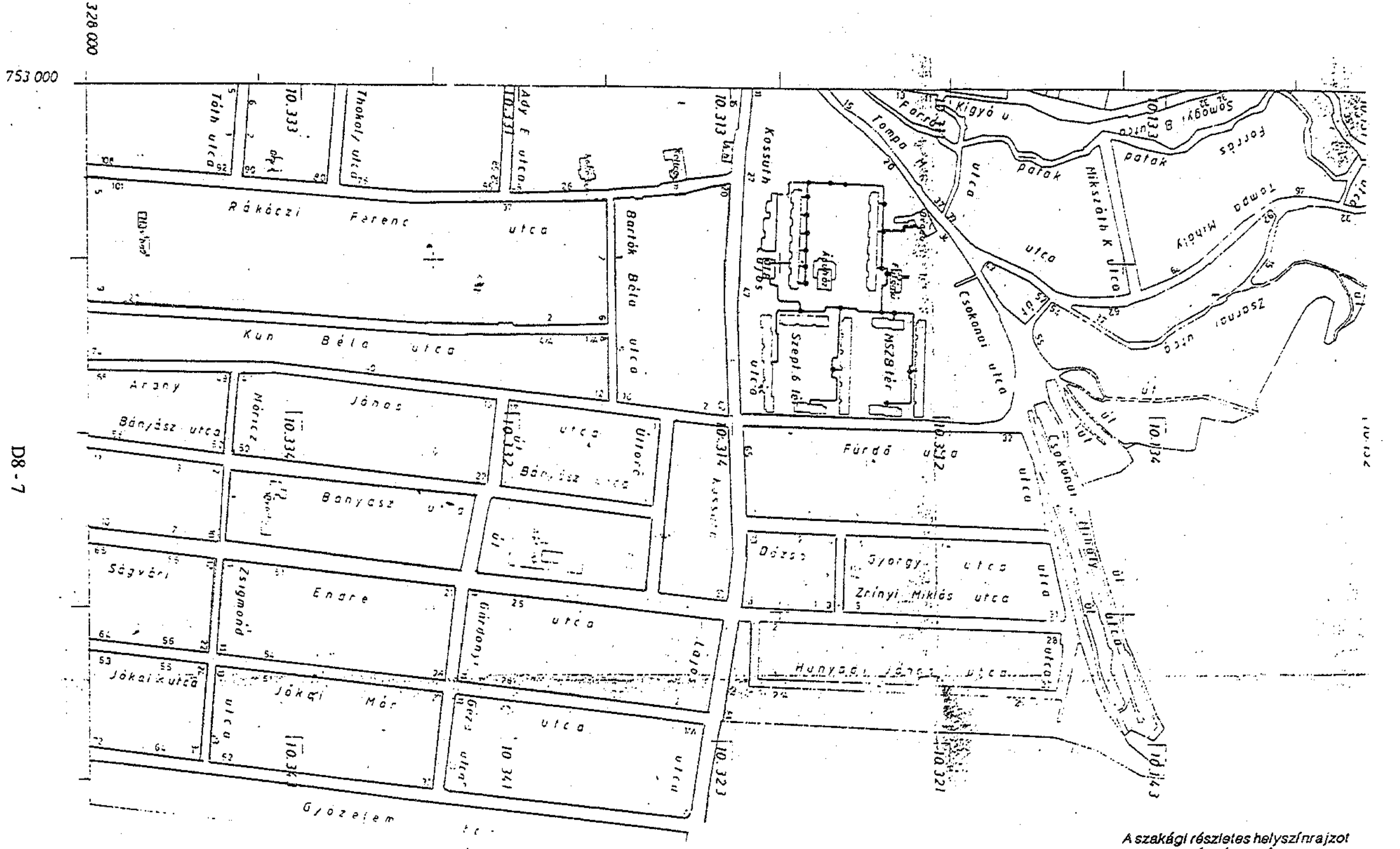

Figure D8.2.6 The District Heating Area of PUTNOK

Table D8.3.1(1) Estimation of Fuel Consumption of Major Factories in 2005 (Without energy saving)

No.	R/N	Plant name and Location	Type of Industry	Operation rate at prersent	Rising rate of fuel consumption	Main Product	Output at present	Kind of fuel	Fuels Used at present	Fuel Consumption in 2005	Remarks
1	02/1	OZDI KOHASZATI UZEMEK TORZSGYAR 3602 OZD ROMBAUER TER. 1	Iron and Steel	65 % in 1992	0.00 %	Steam Electricity Steam Hot water	394,200 t/y 4.8 GWh 855,195 GJ 176,155 GJ	Brown Coal Natural Gas	34,824.60 t/y 19,095,000 Nm3/y in 1992	35,000 t/y 19,095,000 Nm3/y	Be in bankruptcy
2	02/3	PEKO ACELIPARI MUEVK 3600 OZD GYAR U. 1. SZ.	Iron Casting	55 % in 1992 80 % in 1993	0.85 %	Hot Rolling Steel	33,700 t/y	Natural Gas	3,686,750 Nm3/y in 1992	4,573,000 Nm3/y	Private company
3	02/4	OZDI ACELMU RT. 3602 OZD	Iron Casting	<15 % in 1992	0.85 %	Martin Steel Dry ferro alloy Rod & wirer Hot water	8,201.35 t/y 25 t/y 24,901 t/y 17,822.5 GJ	Heating Oil Natural Gas Natural Gas Natural Gas	865.61 t/y 486,256 Nm3/y 1,121,327 Nm3/y 660,133 Nm3/y	1,070 t/y 603,000 Nm3/y 1,391,000 Nm3/y 819,000 Nm3/y	Be in bankruptcy
4	02/7	FINOMHENGERMU MUNKAS KFT 3601 OZD, 1.	Rolling Mill	10 % in 1992 13 % in 1993	0.85 %	Hot rolling Form Steel and Bar Steel	42,785.85 t/y	Natural Gas	3,803,795.5 Nm3/y in 1992	4,718,000 Nm3/y	
5	03/0	ESZAKMAGYARORSZAGI TEGLA ES CSEREPIPARI VALLALAT PUTNOKI TEGLAGYAR 3729 SERENYFALVA	Brick	30-35 % in 1992	0.85 %	Brick	Pre-drying Pro. 25,887,000pc/y Finished Pro. 24,573,000pc/y	Coal (Material) Wood Flour(ditto) Light Oil Coal for boilers	8,081 t/y 2,673 t/y 20 t/y 206 t/y	10,000 t/y 3,000 t/y 20 t/y 260 t/y	
6	04/1	BORSODCHEM RT. 3702 KAZINCBARCIKA BOLYAI TER 2.	Chemical	35 % in 1992	0.85 %	Vinyl chloride Polyethylen PVC MDI	146,940 t/y 454.4 t/y 177,034 t/y 5,846 t/y	Natural Gas	18,367,500 Nm3/y in 1992	22,782,000 Nm3/y	
7	05/0	BORSODI ENERGETIKAI KFT. (BOESODI HOEROMU) 3704 KAZINCBARCIKA IPARI 7	Thermal Power	45.1% in 1991 40.5% in 1992 28.4% in 1993	1.59%	Electric power Steam Hot water	599 GWh 2,512,541 GJ 655,196 GJ in 1992	Brown Coal Natural Gas Oil in 1992	1,174,307 t/y (9.184 MJ/Kg) 31,857,000 Nm3/y 118 t/y in 1992	1,557,545 t/y (8.5 MJ/Kg) 39,116,000Nm3/y 145 t/y	Electricity output 970 GWh Heat energy 2,870,000 GJ
8	06/0	YTONG BORSOD FALAZOELEM 3700 KAZINCBARCIKA IPARI U.17	Construction Materials	30 % in 1992 40 % in 1993	0.85 %	Construction materials in use of fly ash	144,190 m3/y	- Steam is provided from other company	-	0	Private company
9	07/0	PANNONGLAS IPARI RT. SAJOSZENTPETERI UVEGGYAR 3770 SAJOSZENTPETER GYARTELEP PF. 20	Glass	20 % in 1991 20 % in 1992 30 % in 1993	0.85 %	Glasses and Bottles	56,865.5 t/y	Natural Gas	19,263,000 Nm3/y in 1992	23,893,000 Nm3/y	Be in bankruptcy
10	08/0	BORSODI ERCELOKESZITO MU ZSUGORITO KFT. 3791 SAJOKERESZTUR	Ore Processing	15 % in 1992 <30 % in 1993	0.00 %	Ore prepara- tion	461,385 t/y	Natural Gas Coke & Coal	2,583,756 Nm3/y 30,913 t/y in 1992	0 Nm3/y 0 t/y	Be in bankruptcy To be closed (1996)
11	09/1	PORAN POLIURETAN GYARTO ES ERTEKESITO KFT. 3792 SAJOBABONY PF. 16	Chemical	10-20 % in 1992	1.02 %	Soft-polyure- thane	4,000 t/y	Propan + Butan	210 Kg/h (New) in 1993	270 Kg/h	
12	09/2	SAGROCHEM KFT 3792 SAJOBABONY	Chemical	20 % in 1991 20 % in 1992 20 % in 1993	0.00 %	Phenil iso- cinate Acetanilide Steam Electricity	900 t/y 6,000 t/y 172,914 t/y 3.58 GWh	Light Oil Heavy Oil	2.85 t/y 13,396.9 t/y in 1992	3.0 t/y 13,397 t/y	

round off is made for gas

Table D8.3.1(2) Estimation of Fuel Consumption of Major Factories in 2005 (Without energy saving)

No.	E/N	Plant name and Location	Type of Industry	Operation rate at prersent	Rising rate of fuel consumption	Main Product	Output at present	Kind of fuel	Fuels Used at present	Fuel Consumption in 2005	Remarks
13	09/4	INTERMED KFT 3792 SAJOBABONY	Chemical	20 % in 1991 20 % in 1992 20 % in 1993	0.00 %	Deuron Hormaldehide Desulphamine	460 t/y 9,426 t/y 8 t/y	Steam is provided from Sajrochem	-	0	
14	10/0	DECEMBER 4. DROTMUVEK 3601 MISKOLC BESENYOI U.18.SZ	Wire	35 % in 1991 30 % in 1992 20 % in 1993	0.85 %	Wire, Electric wire, Plating cables Heat energy	27,000 t/y 182,660 GJ	Natural Gas Natural Gas	1,267,306 Nm3/y 5,389,848 Nm3/y in 1992	1,572,000.0 Nm3/y 6,685,000.0 Nm3/y	Be in bankruptcy
15	11/0	MISKOLCI MEZOGEP VALLALAT changed to ---- MIHIG KFT. 3527 MISKOLC BESENYOI U.10	Mechanical Parts Farm Machine	50 % in 1992	1.28 %	Machine parts Hybride cylinders, brake valves	200,000,000FT/Y	Natural Gas	800,000 Nm3/y in 1992	1,049,000 Nm3/y	Be in bankruptcy Be in limited company as of June 01 1993
16	12/0 *	BAUMAS EARV EPITESGEPESITO ES SZOLGALTATO KFT 3527 MISKOLC TUZEE UT 12	Heavy Machine Lease	Construction Firm is under Backruptcy	-	Lease for construction machines Holding 50 large size vehicles	166	Diesel Oil	16,890 t/y in 1992	19,000 t/y	Be in bankruptcy
17	13/0	DIOSGYORI PAPIRGYAR LEANYVALLALAT 3535 MISKOLC HEGYALJA UT.203/A	Paper Mill	60 % in 1992	1.02 %	Slick Paper Steam	3000-3800 t/y 25,854 t/y	Natural Gas	2,173,000 Nm3/y in 1992	2,755,000 Nm3/y	
18	14/1	DIOSGYORI GEPGYAR I-II. TELEP 3544 MISKOLC KERPELY ANTAL U.	Machine	95% in 1987 30-40% in 1992 20-40% in 1993 90 % for Hot Rolling	0.85 %	Machine	2.2 - 2.4 billion/y	Natural Gas	17,772,000 Nm3/y in 1992	22,043,000 Nm3/y	Be in bankruptcy
19	14/2	DIOSGYORI GEPGYAR III TELEP 3544 MISKOLC TATARAROK Transfer of firm's name in the register to ARMY COOP KFT. 1993.07.01	Machine		0.85 % rolling for hot rolling			Natural Gas	1,063,200 Nm3/y in 1992	1,319,000 Nm3/y	Be in bankruptcy
20	15/1	HAMOR BESZVERNYTARSASAG 3540 MISKOLC HERCZEG FERENC 43.	Iron Casting	80 % in 1991 80 % in 1992 <50 % in 1993	1.53 %	Semi-goods Iron Wheels Shafts Heat treted M.	3,156 t/y 4,742 t/y 902 t/y 4,060 t/y	Natural Gas	4,690,000 Nm3/y in 1992	6,348,000 Nm3/y	J/V with German Co. Overage of facility. large loss in energy ?
21	15/2	DIOSGYORI ACEL ES VASONTO KFT 3540 MISKOLC HERCZEG FERENC 4143	Steel and Molding	11 % in 1992 20 % in 1993	1.02 %	Steel casting Iron casting Electrosteel Sand preparation	2,843 t/y 664 t/y 4929 t/y 4,350 t/y	Natural Gas (Blast Furnace) Gas (Electricity)	1,470,000 Nm3/y 252,000 Nm3/y in 1992	1,864,000 Nm3/y 319,000 Nm3/y	Be in bankruptcy
22	15/3	CSAVAR- ES HUZOTTAEU RT. 3520 MISKOLC HERCZEG FERENC U	Machine Screw and Wire	100 % in 1989 38 % in 1990 27 % in 1991 15 % in 1992 32 % in 1993	1.02 %	Blots Metal parts	2,231 t/y 2,103 t/y 4,764 t/y 125.7 t/y	Natural Gas	1,480,000 Nm3/y 337,100 Nm3/y in 1992	1,876,000 Nm3/y 427,000 Nm3/y	
23	15/4	DNM DIOSGYORI NEMESACEL MUVEK FA. 3540 MISKOLC VASGYAR UT 43	Iron and Steel	54 % in 1992	0.00 %	Pig iron Blast gas Iron and steel Ele. fur. steel Alloy steel Heat resist.G. Steam Hot ingot Polished steel	257,010.5 t/y 496,198,875m3/y 284,524 t/y 34,235 t/y 72,566 t/y 2,93641,549 t/y 158,383 t/y 178,343 t/y 54,457 t/y	Natural Gas Coke Blast Furnace Gas	83,810,400 Nm3/y 139,377 t/y 40,824,600 Nm3/y in 1992	83,810,400 Nm3/y 0 t/y 0 Nm3/y	Be in bankruptcy Blast furnace is not operated after 1986
24	16/0 X	CHINOIN RT. DIOSGYORI TELEP 3531 MISKOLC KISS ERNO UT. 19	Medicine	60 % in 1992	-	Medicine Diuretic Steam	30 t/y 21,830 GJ	Natural Gas	809,423 Nm3/y in 1992	0 Nm3/y	to be shoutdown

Note: X indicates that operation was to stop beyond October 1993
* indicates small scale siationary source

round off is made for gas

Table D8.3.1(3) Estimation of Fuel Consumption of Major Factories in 2005 (Without energy saving)

No.	E/N	Plant name and Location	Type of Industry	Operation rate at prersent	Rising rate of fuel consumption	Main Product	Output at present	Kind of Fuel	Fuels Used at present	Fuel Consumption in 2005	Remarks
25	17/1	HEJOCSABAI CEMENT- ES MESZIPARI RT. KOZPONTI TELEP 3508 MISKOLC FOGARASI U. 6. SZ HEJOCSABAI CEMENT- ES MESZIPARI RT. KOBANYA UZEM	Cement	50 % in 1992	1.02 %	Clinker Burned soild lime Cement Lime stone	352,173 t/y 78,180 t/y 497,481 t/y 832,880 t/y	Natural Gas Fuel Oil	39,537,972 Nm3/y 9,360,480 Nm3/y 77.64 t/y in 1992	50,127,000 Nm3/y 11,867,000 Nm3/y 100 t/y	
26	18/0	STRABAG HUNGARIA EPITO KFT 3527 MISKOLC PARTIZAN U.	Construction	60-80 % in 1993 Trial test for new facility began from July in 1993	0.00 %	Rolling Asphalt	30,000 t/y	Natural Gas	176,000 m3/y (1993.7.7--1993.10.5)	176,000 Nm3/y	
27	19/0 *	MEZOGEP VALLALAT 3561 FELSOZSOLCA ALLOMAS U. 5 SZ.	Farm Machine	30 % in 1992	1.53 %	Pump Parts for farm machine	29 t/y Volumes of aluminumu melted	Fuel Oil	135 t/y in 1992	180 t/y	
28	20/0	ALSOZSOLCAI VASBETONIPARI VALLALAT 3571 ALSOZSOLCA GYAR U. SZ.	Construction Materials Cement and Iron	30 % in 1992	1.02 %	Ferroconrete utility pole Roof panel	materi.(cement, sand ,beton) 40,000-50,000m3 Iron(10,000t)is	Fuel Oil(T20/40) Fuel Oil(F60/130) used	47 t/y 1,882 t/y in 1992	60 t/y 2,400 t/y	
29	21/0	EMO. TEGLA- ES CSEREPIPARI VALLALAT MALYI TEGLAGYARA 3434 MALYI	Brick	30 % in 1992 35 % in 1993	1.02 %	Brick	Pre-drying Pro. 39,864,000pc./y Finished Pro. 38,226,000pc./y	Natural Gas Coal Wood Flour	2,923,000 Nm3/y 121 t/y 4,770 t/y in 1992	3,706,000 Nm3/y 150 t/y 6,000 t/y	
30	22/0	MISKOLCI UTEPITO KFT NYEKI ASZFALTKEVERO 3433 NYEKLADHAZA VAGOHID U.9.	Asphalt	30 % in 1992	0.85 %	Asphalt	71.000 t/y	Natural Gas	666,600 Nm3/y in 1992	827,000 Nm3/y	
31	23/1	TISZAI VEGYI KOMBINAT RESZVENYTARSASAG 3581 TISZAUJVAOS	Chemical	75 % in 1991 90 % in 1992 90 % in 1993 30 % (Fertilizer plant)	0.46 % 0.00 %	Olefin Ethyene Propylene	250,000-280,000 t/y, 280,000t/y	Natural Gas Oil Diesel oil Pyrolysis Gas Waste(Solid, Liquid,Paint)	66,433,095 Nm3/y 44,880 t/y 125,999 t/y 196,720 t/y 4,097.9 t/y in 1992	78,353,000 Nm3/y 53,000 t/y 149,000 t/y 232,000 t/y 4,800 t/y	
32	23/2	AKZO-TVK FESTEKGYARTO ES KERESKEDELMI RT 3581 TISZAUJVAROS	Paint	35 % in 1991 30 % in 1992 25 % in 1993	1.28 %	Paint Bonding agent Solvevent	15,000 ton/y	Natural Gas	425,708 Nm3/y in 1992	558,000 Nm3/y	J/V with Holland Co.
33	24/0	MOL RT. TISZAI FINOMITO 3580 TISZAUJVAROS MEZOCSATI UT	Oil Refinery	50 % in 1984-85 31-33 % in 1991 30 % in 1992 30 % in 1993	1.53 %	Gasoline Diesel oil Fuel oil Sulfure Burned rubbish by incinerator	138,000 t/y 246,000 t/y 285,000 t/y 3,400 t/y 3,163 t/y	Natural Gas & Home generated Gas Sewage,oily sediment,solid waste Natural gas	26,910,028 Nm3/y 3,162 t/y 837,000 Nm3/y in 1992	36,425,000 Nm3/y 4,300 t/y 1,133,000 Nm3/y	
34	25/1	TISZAI EROMU RT. I. HOEROMU 3581 TISZAUJVAROS	Thermal Power	48 % in 1992	-12.33%	Electric power Steam Hot water	932.46 GWh 2,422,451 GJ	Brown Coal Natural Gas Fuel Oil	1,328,871 t/y (9.599 MJ/Kg) 39,307,400 Nm3/y 476 t/y in 1992	270,588 t/y (8.5 MJ/Kg) 7,205,000Nm3/y 125 t/y	Electricity output 35 GWh Heat energy 1,700,000 GJ in 2005
35	25/2	TISZAI EROMU RT. II HOEROMU 3581 TISZAUJVAROS	Thermal Power	58 % in 1992	-3.71%	Electric power	2,615.66 GWh	Natural Gas Inert Gas Fuel Oil	282,938,000 Nm3/y 491,794,000 Nm3/y 181,230 t/y in 1992	172,620,000Nm3/y 300,918,000Nm3/y 110,889 t/y	Electricity output 1581 GWh in 2005

Note: * indicates small scale stationary source

round off is made for gas

Table D8.3.2(1) Estimation of Fuel Consumption of Major Factories in 2005(With Energy Saving)

No.	R/N	Plant name and Location	Type of Industry	Operation rate at prersent	Rising rate of fuel consumption	Main Product	Output at present	Kind of fuel	Fuels Used at present	Fuel Consumption in 2005	Remarks
1	02/1	OZDI KOHASZATI UZEMEK TORZSGYAR 3602 OZD ROMBAUER TER. 1	Iron and Steel	65 % in 1992	0.00 %	Steam Electricity Steam Hot water	394,200 t/y 4.8 GWh 855,195 GJ 176,155 GJ	Brown Coal Natural Gas	34,824.60 t/y 19,095,000 Nm3/y in 1992	31,000 t/y 17,186,000 Nm3/y	Be in bankruptcy ‡
2	02/3	PEKO ACELIPARI MUEVK 3600 OZD GYAR U. 1. SZ.	Iron Casting	55 % in 1992 80 % in 1993	0.85 %	Hot Rolling Steel	33,700 t/y	Natural Gas	3,686,750 Nm3/y in 1992	4,116,000 Nm3/y	Private company ‡
3	02/4	OZDI ACELMU RT. 3602 OZD	Iron Casting	<15 % in 1992	0.85 %	Martin Steel Dry ferro alloy Rod & wirer Hot water	8,201.35 t/y 25 t/y 24,901 t/y 17,822.5 GJ	Heating Oil Natural Gas Natural Gas Natural Gas	865.61 t/y 486,256 Nm3/y 1,121,327 Nm3/y 660,133 Nm3/y	970 t/y 543,000 Nm3/y 1,252,000 Nm3/y 737,000 Nm3/y	Be in bankruptcy ‡
4	02/7	FINOMHENGERMU MUNKAS KFT 3601 OZD, 1.	Rolling Mill	10 % in 1992 13 % in 1993	0.85 %	Hot rolling Form Steel and Bar Steel	42,785.85 t/y	Natural Gas	3,803,795.5 Nm3/y in 1992	4,246,000 Nm3/y	‡
5	03/0	ESZAKMAGYARORSZAGI TEGLA ES CSEREPIPARI VALLALAT PUTNOKI TEGLAGYAR 3729 SERENYFALVA	Brick	30-35 % in 1992	0.85 %	Brick	Pre-drying Pro. 25,887,000pc/y Finished Pro. 24,573,000pc/y	Coal (Material) Wood Flour(ditto) Light Oil Coal for boilers	8,081 t/y 2,673 t/y 20 t/y 206 t/y	9,000 t/y 2,000 t/y 20 t/y 230 t/y	‡
6	04/1	BORSODCHEM RT. 3702 KAZINCBARCIKA BOLYAI TER 2.	Chemical	35 % in 1992	0.85 %	Vinyl chloride Polyethylen PVC MDI	146,940 t/y 454.4 t/y 177,034 t/y 5,846 t/y	Natural Gas	18,367,500 Nm3/y in 1992	22,554,000 Nm3/y	
7	05/0	BORSODI ENERGETIKAI KFT. (BORSODI HOEROMU) 3704 KAZINCBARCIKA IPARI 7	Thermal Power	45.1% in 1991 40.5% in 1992 28.4% in 1993	3.40 % from the year of 2000	Electric power Steam Hot water	599 GWh 2,512,541 GJ 655,196 GJ in 1992	Brown Coal Natural Gas Oil in 1992	1,174,307 t/y 31,857,000 Nm3/y 118 t/y in 1992 for current facilities	Brown Coal CFBC 1,108,302 t/y HFBC 212,874 t/y Total 1,321,176 t/y Natural Gas CFBC 3,942,000 Nm3/y HFBC 765,000 Nm3/y Total 4,708,000 Nm3/y Newly established	CFBC:150 MW (new) 460t/h boiler CFBC boiler efficiency: Brown coal:90% boiler load:100% HFBC:4 hybrid boilers 100t/h x4 Boiler eff.:80%, Boiler load:60%, Desulfurization rate:42-45%,
8	06/0	YTONG BORSOD FALAZOELEM 3700 KAZINCBARCIKA IPARI U.17	Construction Materials	30 % in 1992 40 % in 1993	0.85 %	Construction materials in use of fly ash	144,190 m3/y	- Steam is provided from other company	-	0	Private company
9	07/0	PANNONGLAS IPARI RT. SAJOSZENTPETERI UVEGGYAR 3770 SAJOSZENTPETER GYARTELEP PF. 20	Glass	20 % in 1991 20 % in 1992 20 % in 1993	0.85 %	Glasses and Bottles	56,865.5 t/y	Natural Gas	19,263,000 Nm3/y in 1992	23,654,000 Nm3/y	Be in bankruptcy
10	08/0	BORSODI ERCELOKESZITO MU ZSUGORITO KFT. 3791 SAJOKERESZTUR	Ore Processing	15 % in 1992 <30 % in 1993	0.00 %	Ore preparation	461,385 t/y	Natural Gas Coke & Coal	2,583,756 Nm3/y 30,913 t/y in 1992	0 Nm3/y 0 t/y	Be in bankruptcy To be closed (1995)
11	09/1	PORAN POLIURETAN GYARTO ES ERTEKESITO KFT. 3792 SAJOBABONY PF. 16	Chemical	10-20 % in 1992	1.02 %	Soft-polyurethane	4,000 t/y	Propan + Butan	210 Kg/h (New) in 1993	260 Kg/h	
12	09/2	SAGROCHEM KFT 3792 SAJOBABONY	Chemical	20 % in 1991 20 % in 1992 20 % in 1993	0.00 %	Phenil isocinate Acetanilide Steam Electricity	900 t/y 6,000 t/y 172,914 t/y 3.58 GWh	Light Oil Heavy Oil	2.85 t/y 13,396.9 t/y in 1992	2.85 t/y 13,000 t/y	‡

round off is made for gas

‡ means 10 % energy saving in factory

Table D8.3.2(2) Estimation of Fuel Consumption of Major Factories in 2005(With Energy Saving)

No.	R/N	Plant name and Location	Type of Industry	Operation rate at present	Rising rate of fuel consumption	Main Product	Output at present	Kind of fuel	Fuels Used at present	Fuel Consumption in 2005	Remarks
13	09/4	INTERMED KFT 3792 SAJOBABONY	Chemical	20 % in 1991 20 % in 1992 20 % in 1993	0.00 %	Deuron Hormaldehide Desulphamine	480 t/y 9,426 t/y 9 t/y	Steam is provided from Sagrochem	-	0	
14	10/0	DECEMBER 4. DROTMUVEK 3501 MISKOLC BESENYOI U.18.SZ	Wire	35 % in 1991 30 % in 1992 20 % in 1993	0.85 %	Wire, Electric wire, Plating cables Heat energy	27,000 t/y 182,660 GJ	Natural Gas Natural Gas	1,267,306 Nm3/y 5,389,848 Nm3/y in 1992	1,415,000.0 Nm3/y 6,017,000.0 Nm3/y	Be in bankruptcy ‡
15	11/0	MISKOLCI MEZOGEP VALLALAT changed to --- MIHIG KFT. 3527 MISKOLC BESENYOI U.10	Mechanical Parts Farm Machine	50 % in 1992	1.28 %	Machine parts Hybride cyclinders, brake valves	200,000,000FT/Y	Natural Gas	800,000 Nm3/y in 1992	944,000 Nm3/y	Be in bankruptcy Be in limited company as of June 01 1993 ‡
16	12/0 *	BAUMAS EAEV EPITESGEPESITO ES SZOLGALTATO KFT 3527 MISKOLC TUZER UT 12	Heavy Machine Lease	Construction Firm is under Backruptcy	-	Lease for construction machines Holding 50 large size vehicles	166	Diesel Oil	16,800 l/y in 1992	17,000 l/y	Be in bankruptcy
17	13/0	DIOSGYORI PAPIRGYAR LEANYVALLALAT 3535 MISKOLC HEGYALJA UT.203/A	Paper Mill	60 % in 1992	1.02 %	Slick Paper Steam	3000-3600 t/y 25,854 t/y	Natural Gas	2,173,000 Nm3/y in 1992	2,479,000 Nm3/y	‡
18	14/1	DIOSGYORI GEPGYAR I-II. TELEP 3544 MISKOLC KERPELY ANTAL U.	Machine	95% in 1987 30-40% in 1992 20-40% in 1993 90 % for Hot Rolling	0.85 %	Machine	2.2 - 2.4 billion/y	Natural Gas	17,772,000 Nm3/y in 1992	19,839,000 Nm3/y	Be in bankruptcy ‡
19	14/2	DIOSGYORI GEPGYAR III TELEP 3544 MISKOLC TATARAROK Transfer of firm's name in the register to ARMY COOP KFT. 1993.07.01	Machine		0.85 % rolling for hot rolling			Natural Gas	1,063,200 Nm3/y in 1992	1,187,000 Nm3/y	Be in bankruptcy ‡
20	15/1	HAMOR RESZVENYTARSASAG 3540 MISKOLC HERCZEG FERENC 43.	Iron Casting	80 % in 1991 60 % in 1992 <50 % in 1993	1.53 %	Semi-goods Iron Wheels Shafts Heat treted M.	3,158 t/y 4,742 t/y 902 t/y 4,060 t/y	Natural Gas	4,690,000 Nm3/y in 1992	5,713,000 Nm3/y	J/V with German Co. Overage of facility. large loss in energy ‡
21	15/2	DIOSGYORI ACEL ES VASONTO KFT 3540 MISKOLC HERCZEG FERENC 4143	Steel and Molding	11 % in 1992 20 % in 1993	1.02 %	Steel csting Iron casting Electrosteel Sand preparation	2,843 t/y 664 t/y 4929 t/y 4,350 t/y	Natural Gas (Blast Furnace) Gas (Electricity)	1,470,000 Nm3/y 252,000 Nm3/y in 1992	1,677,000 Nm3/y 288,000 Nm3/y	Be in bankruptcy ‡
22	15/3	CSAVAR- ES HUZOTTARU RT. 3520 MISKOLC HERCZEG FERENC U	Machine Screw and Wire	100 % in 1989 38 % in 1990 27 % in 1991 16 % in 1992 32 % in 1993	1.02 %	Blots Metal parts	2,231 t/y 2,103 t/y 4,784 t/y 129.7 t/y	Natural Gas	1,480,000 Nm3/y 337,100 Nm3/y in 1992	1,689,000 Nm3/y 385,000 Nm3/y	‡
23	15/4	DNM DIOSGYORI NEMESACEL MUVEK FA. 3540 MISKOLC VASGYAR UT 42	Iron and Steel	54 % in 1992	0.00 %	Pig iron Blast gas Iron and steel Ele. fur.steel Alloy steel Heat resist.G. Steam Hot ingot Polished steel	257,010.5 t/y 496,198,875m3/y 284,524 t/y 34,235 t/y 72,566 t/y 2,936+1,549 t/y 158,383 t/y 178,343 t/y 54,457 t/y	Natural Gas Coke Blast Furnace Gas	63,910,400 Nm3/y 139,377 t/y 40,824,800 Nm3/y in 1992	57,519,000 Nm3/y 0 t/y 0 Nm3/y	Be in bankruptcy Blast furnace is not operated after 1995 ‡
24	16/0 X	CHINOIN RT. DIOSGYORI TELEP 3531 MISKOLC KISS ERNO UT. 19	Medicine	60 % in 1992	-	Medicine Diuretic Steam	30 t/y 21,830 GJ	Natural Gas	809,423 Nm3/y in 1992	0 Nm3/y	to be shoutdown

Note: X indicates that operation was to stop beyond October 1993
* indicates small scale stationary source

round off is made for gas

‡ means 10 % energy saving in factory

Table D8.3.2(3) Estimation of Fuel Consumption of Major Factories in 2005(With Energy Saving)

No.	R/N	Plant name and Location	Type of Industry	Operation rate at prersent	Rising rate of fuel consumption	Main Product	Output at present	Kind of fuel	Fuels Used at present	Fuel Consumption in 2005	Remarks
25	17/1	HEJOCSABAI CEMENT- ES MESZIPARI RT. KOZPONTI TELEP 3508 MISKOLC FOGARASI U. 6. SZ HEJOCSABAI CEMENT- ES MESZIPARI RT. KOBANYA UZEM	Cement	50 % in 1992	1.02 %	Clinker Burned solid lime Cement Lime stone	352,173 t/y 78,180 t/y 497,481 t/y 832,880 t/y	Natural Gas Fuel Oil	39,537,972 Nm3/y 9,360,480 Nm3/y 77.64 t/y in 1992	45,114,000 Nm3/y 10,681,000 Nm3/y 90 t/y	∓
26	18/0	STRABAG HUNGARIA EPITO KFT 3527 MISKOLC PARTIZAN U.	Construction	60-80 % in 1993 Trial test for new facility began from July in 1993	0.00 %	Rolling Asphalt	30,000 t/y	Natural Gas	176,000 m3/y (1992.7.7--1992.10.5)	176,000 Nm3/y	
27	19/0 *	MEZOGEP VALLALAT 3561 FELSOZSOLCA ALLOMAS U. 5 SZ.	Farm Machine	30 % in 1992	1.53 %	Pump Parts for farm machine	29 t/y Volumes of aluminumu melted	Fuel Oil	135 t/y in 1992	160 t/y	∓
28	20/0	ALSOZSOLCAI VASBETONIPARI VALLALAT 3571 ALSOZSOLCA GYAR U. SZ.	Construction Materials Cement and Iron	30 % in 1992	1.02 %	Ferroconrete utility pole Roof panel	materi.(cement, sand ,beton) 40,000-50,000m3 Iron(10,000t)is used	Fuel Oil(T20/40) Fuel Oil(F60/130)	47 t/y 1,882 t/y in 1992	50 t/y 2,100 t/y	∓
29	21/0	EMO. TEGLA- ES CSEREPIPARI VALLALAT MALYI TEGLAGYARA 3434 MALYI	Brick	30 % in 1992 35 % in 1993	1.02 %	Brick	Pre-drying Pro. 39,864,000pc./y Finished Pro. 38,226,000pc./y	Natural Gas Coal Wood Flour	2,923,000 Nm3/y 121 t/y 4,770 t/y in 1992	3,335,000 Nm3/y 140 t/y 5,400 t/y	∓
30	22/0	MISKOLCI UTEPITO KFT NYEKI ASZFALTKEVERO 3433 NYEKLADHAZA VAGOHID U.9.	Asphalt	30 % in 1992	0.85 %	Asphalt	71.000 t/y	Natural Gas	666,600 Nm3/y in 1992	819,000 Nm3/y	
31	23/1	TISZAI VEGYI KOMBINAT RESZVENYTARSASAG 3581 TISZAUJVAOS	Chemical	75 % in 1991 90 % in 1992 90 % in 1993 30 % (Fertilizer plant)	0.46 % 0.00 %	Olefin Ethyene Propylene	250,000-280,000 t/y, 280,000t/y	Natural Gas Oil Diesel oil Pyrolysis Gas Waste(Solid, Liquid,Paint)	66,433,095 Nm3/y 44,880 t/y 125,999 t/y 196,720 t/y 4,097.9 t/y in 1992	70,517,000 Nm3/y 48,000 t/y 134,000 t/y 209,000 t/y 4,300 t/y	∓
32	23/2	AKZO-TVK FESTEKGYARTO ES KERESKEDELMI RT 3581 TISZAUJVAROS	Paint	35 % in 1991 30 % in 1992 25 % in 1993	1.28 %	Paint Bonding agent Solvevent	15,000 ton/y	Natural Gas	425,708 Nm3/y in 1992	502,000 Nm3/y	∓ J/V with Holland Co.
33	24/0	MOL RT. TISZAI FINOMITO 3580 TISZAUJVAROS MEZOCSATI UT	Oil Refinery	 50 % in 1984-85 31-33 % in 1991 30 % in 1992 30 % in 1993	1.53 %	Gasoline Diesel oil Fuel oil Sulfure Burned rubbish by incinerator	138,000 t/y 246,000 t/y 285,000 t/y 3,400 t/y 3,163 t/y	Natural Gas & Home generated Gas Sewage,oily sediment,solid waste Natural gas	26,910,028 Nm3/y 3,162 t/y 837,000 Nm3/y in 1992	32,782,000 Nm3/y 3,900 t/y 1,020,000 Nm3/y	∓
34	25/1	TISZAI EROMU RT. I. HOEROMU 3581 TISZAUJVAROS	Thermal Power	48 % in 1992	-12.33 %	Electric power Steam Hot water	932.46 GWh 2,422,451 GJ	Brown Coal Natural Gas Fuel Oil	1,328,871 t/y 39,307,400 Nm3/y 476 t/y in 1992	270,588 t/y 7,205,000 Nm3/y 125 t/y	Production of electricity will be reduced rapidly.
35	25/2	TISZAI EROMU RT. II HOEROMU 3581 TISZAUJVAROS	Thermal Power	58 % in 1992	-3.71 %	Electric power	2,615.66 GWh	Natural Gas Inert Gas Fuel Oil	282,938,000 Nm3/y 491,794,000 Nm3/y 181,230 t/y in 1992	172,620,000 Nm3/y 300,918,000 Nm3/y 110,889 t/y	

Note: * indicates small scale stationary source

round off is made for gas

∓ means 10 % energy saving in factory

Table D8.3.3(1) Effects of Control Measures Planned by Factories(2005)

Name of Plant	Source No.	Present (1992)				No Measures (2005)				Control Measures Alternative (2005)											
										Case 1 (Change of Fuel Quality)				Case ---				Case ---			
		Kind of Fuel	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Rising Rate of Fuel Consumption	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx
03/0 ESZAKMAGYARORSZAGI TEGLA ES CSEREPIPARI VALLALAT PUTNOKI TEGLAGYAR	P-014 P-002 Tunnel Kiln for Bricks	Coal (S:3%) (t/yr)	8,081	290.9	23.31	0.85%	9,000	324	26.01	Coal (S:1.5%) (t/yr)	9,000	162	26.01								
		Wood Flour (t/yr)	2,673				3,000			Wood Flour (t/yr)	3,000										
	Remarks	Based on the ceramics academy association. (SZILIKATIPARI TUDOMANYOS EGYESULET 1061 Budapest, Anken KOZ 1-3, Nov.1989) Fuel change from coal to natural gas is suitable measures.																			

Name of Plant	Source No.	Present (1992)				No Measures (2005)				Control Measures Alternative (2005)											
										Case 1 (Furnace Improvement, Fuel Change)				Case ---				Case ---			
		Kind of Fuel	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Rising Rate of Fuel Consumption	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx
15/1 HAMOR RESZVENY-TARSASAG	P-001 P-003~P-007 P-009 P-011	Natural Gas (1000Nm3/yr)	4,690	0	3.5 (EXF)	1.53%	5,713	0	4.3	Electricity (MWh)	53,782	0	0								
	Remarks	Case 1: Furnace improvement, fuel change from natural gas to electricity.																			

Name of Plant	Source No.	Present				No Measures (2005)				Control Measures Alternative (2005)											
										Case 1 (Retrofitting and Recuperator)				Case ---				Case ---			
		Kind of Fuel	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Rising Rate of Fuel Consumption	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx
15/2 DIOSGYORI ACEL ES VASONT KFT	P-014	Natural Gas (1000Nm3/yr)	517 (*1)	0	0.695 (*1)	1.02%	590	0	0.793	Natural Gas (1000Nm3/yr)	531	0	0.714 (*2)								
	Remarks	*1 Based on actual measurement of NOx in 1993. (0.423kg/h with consumption of natural gas of 314m3/h and assuming same operational hours of 1645h.) EXF : Fuel consumption (Natural Gas) 666 Nm3/yr in 1992. NOx emission 0.296 t/yr in 1992. *2 Retrofitting of furnace and introducing recuperator for energy saving about 10%.																			

Table D8.3.3(2) Effects of Control Measures Planned by Factories(2005)

Name of Plant	Source No.	Present (1992)				No Measures (2005)				Control Measures Alternative (2005)											
										Case 1 (Using Ammonia additive)				Case 2 (Using Pura Siv n)				Case ---			
		Kind of Fuel	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Rising Rate of Fuel Consumption	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx
23/1 TISZAI VEGYI KOMBINAT	P-002 Production of Nitric Acid	(*1)	-----	0 (EKF)	657 (EKF)	0.46%		0	697			0	(*3) 174			0	35 (*4)				

			-----	0 (*2)	1,121 (*2)			0	1,190			0	298 (*3)			0	60 (*4)				

	Remarks	*1 Emission from the reaction-process. *2 Actual measurement data of NOx in 1993: 210kg/h and assuming 5337h as well as 1992. *3 75% NOx reduction by using Ammonia additive method. *4 95% NOx reduction by using Pura Siv N method.																			

Table D8.3.4 (1) Community-Specific Gas-Diffusion of Households for the Study Area as Expected by the Year 2005

		2005(*)A Number of households that gas company is able to provide gas in 2005	Case 2 A' IF C<A THEN A'=C IF C>A THEN A'=A	Case 1 A" A"=(C-B)*.55+B IF A<A" THEN A"=A IF A>A" THEN A"=A"	Present condition 1993(*)B Households with gas supply by the year	C Number of households in 1990	Case 2 Dissimi-nation-ratio A'/C (%)	Case 1 Dissimi-nation-ratio A"/C (%)	Present condition Dissimi-nation-ratio B/C (%)
1	Miskolc	90,754	73,500	66,837	58,693	73,500	100	91	80
2	Edelény	2,411	2,411	2,411	1,917	3,934	61	61	49
3	Kazincbarcika	11,084	11,084	10,963	9,051	12,528	88	88	72
4	Aggtelek	126	126	112	0	204	62	55	0
5	Alacska	282	282	202	88	295	96	68	30
6	Alsószuha	108	108	96	0	175	62	55	0
7	Alsótelekes	82	82	48	0	87	94	55	0
8	Alsózsolca	1,177	1,177	1,177	939	1,754	67	67	54
9	Arló	180	180	180	0	1,333	14	14	0
10	Arnót	604	604	562	487	624	97	90	78
11	Bánhorváti	448	448	351	0	638	70	55	0
12	Bánréve	588	552	401	217	552	100	73	39
13	Berzék	230	230	230	184	294	78	78	63
14	Boldva	441	441	441	343	748	59	59	46
15	Borsodbóta	142	142	142	0	394	36	36	0
16	Borsodszirák	305	305	291	241	332	92	88	73
17	Bőcs	703	703	703	555	836	84	84	66
18	Bükkaranyos	267	267	223	0	405	66	55	0
19	Bükkszentkereszt	382	382	261	0	475	80	55	0
20	Csernely	160	160	160	0	463	35	35	0
21	Csokvaomány	196	196	196	0	481	41	41	0
22	Dédestapolcsány	330	330	330	0	652	51	51	0
23	Dövény	78	78	76	0	138	57	55	0
24	Dubicsány	72	72	58	0	106	68	55	0
25	Emőd	1,401	1,401	1,021	0	1,857	75	55	0
26	Égerszög	45	45	26	0	48	94	54	0
27	Felsőkelecsény	90	90	87	0	158	57	55	0
28	Felsőnyárád	222	222	222	0	433	51	51	0
29	Felsőtelekes	242	242	152	0	277	87	55	0
30	Felsőzsolca	1,778	1,778	1,778	1,422	2,228	80	80	64
31	Fony	164	164	97	0	177	93	55	0
32	Gesztely	583	583	583	466	848	69	69	55
33	Mezőcsát	1,120	1,120	1,120	0	2,416	46	46	0
34	Tiszújváros	7,196	6,250	6,072	5,854	6,250	100	97	94
35	Ózd	14,366	14,366	12,067	7,096	16,135	89	75	44
36	Girincs	183	183	131	0	239	77	55	0
37	Gömörszőlős	36	36	24	0	44	82	55	0
38	Hangony	120	120	120	0	627	19	19	0
39	Harsány	381	381	370	0	672	57	55	0
40	Hejőbába	192	192	192	0	503	38	38	0
41	Hejőkeresztúr	240	240	192	0	349	69	55	0
42	Hejőkürt	75	75	75	0	141	53	53	0
43	Hejőpapi	191	209	191	0	409	51	47	0
44	Hejőszalonta	210	210	122	0	221	95	55	0
45	Hernádkak	288	288	288	231	350	82	82	66
46	Hernádnémeti	1,014	1,014	962	812	1,084	94	89	75
47	Hét	260	260	143	63	209	124	68	30
48	Igrici	180	180	180	0	449	40	40	0
49	Imola	52	52	30	0	54	96	56	0

Case 1 : Natural gas is supplied to 55% of households not having the supply at present within the limit of A above.
Case 2 : Natural gas is supplied all households within the limit of A above.
Source : (*) Tigaz (GAS DISTRIBUTION COMPANY)

Table D8.3.4 (2) Community-Specific Gas-Diffusion of Households for the Study Area as Expected by the Year 2005

	2005(*)A Number of households that gas company is able to provide gas in 2005	Case 2 A' IF C<A THEN A'=C IF C>A THEN A'=A	Case 1 A" A"=(C-B)*.55+B IF A<A" THEN A"=A IF A>A" THEN A"=A"	Present condition 1993(*)B Households with gas supply by the year	C Number of households in 1990	Case 2 Dissimi-nation-ratio A'/C (%)	Case 1 Dissimi-nation-ratio A"/C (%)	Present condition Dissimi-nation-ratio B/C (%)
50 Izófalva	287	287	287	0	1,623	18	18	0
51 Jákfalva	78	78	78	0	151	52	52	0
52 Jósvafő	107	107	81	0	147	73	55	0
53 Kánó	79	79	48	0	88	90	55	0
54 Kelemér	60	60	60	0	178	34	34	0
55 Kesznyéten	369	369	329	0	598	62	55	0
56 Királd	161	161	161	0	401	40	40	0
57 Kiscsécs	34	34	28	0	50	68	56	0
58 Kisgyör	306	306	306	0	581	53	53	0
59 Kistokaj	522	476	449	417	476	100	94	88
60 Kondó	149	149	119	0	217	69	55	0
61 Körröm	183	183	179	0	326	56	55	0
62 Kuriyán	493	493	331	0	601	82	55	0
63 Mályi	1,158	1,064	1,002	927	1,064	100	94	87
64 Múcsony	665	665	652	0	1,186	56	55	0
65 Putnok	1,562	1,562	1,562	523	2,534	62	62	21
66 Sajószentpéter	3,636	3,636	3,636	2,918	4,629	79	79	63
67 Szikszó	1,612	1,612	1,170	0	2,128	76	55	0
68 Muhi	786	180	130	69	180	100	72	38
69 Nagybarca	280	280	204	0	370	76	55	0
70 Nagycsécs	383	298	164	0	298	100	55	0
71 Nemesbikk	153	153	153	0	333	46	46	0
72 Nyékládháza	1,537	1,524	1,387	1,220	1,524	100	91	80
73 Nyomár	102	102	66	0	120	85	55	0
74 Onga	928	928	928	731	1,298	71	71	56
75 Ónod	917	750	558	324	750	100	74	43
76 Oszlár	222	177	126	63	177	100	71	36
77 Parasznya	357	357	235	0	427	84	55	0
78 Radostyán	157	157	121	0	220	71	55	0
79 Ragály	144	144	135	0	245	59	55	0
80 Rudabánya	246	246	246	126	1,173	21	21	11
81 Sajóbábony	982	982	797	443	1,086	90	73	41
82 Sajóecseg	323	323	316	252	368	88	86	68
83 Sajógalgóc	127	120	66	0	120	100	55	0
84 Sajóhidvég	208	208	208	164	335	62	62	49
85 Sajóivánka	130	130	95	0	172	76	55	0
86 Sajókaza	706	706	567	0	1,031	68	55	0
87 Sajókápolna	183	160	109	47	160	100	68	29
88 Sajókeresztúr	471	471	440	376	492	96	89	76
89 Sajólád	512	512	512	407	912	56	56	45
90 Sajólászlófalva	150	150	101	25	164	91	62	15
91 Sajómercse	98	98	75	0	136	72	55	0
92 Sajónémeti	92	92	92	0	265	35	35	0
93 Sajóörös	308	294	162	0	294	100	55	0
94 Sajópálfala	208	208	206	167	237	88	87	70
95 Sajópetri	242	242	242	193	460	53	53	42
96 Sajópüspöki	96	96	96	0	220	44	44	0
97 Sajósenye	130	120	93	61	120	100	78	51
98 Sajószöged	608	608	369	0	670	91	55	0

Case 1 : Natural gas is supplied to 55% of households not having the supply at present within the limit of A above.
Case 2 : Natural gas is supplied all households within the limit of A above.
Source : (*) Tigaz (GAS DISTRIBUTION COMPANY)

Table D8.3.4 (3) Community-Specific Gas-Diffusion of Households for the Study Area as Expected by the Year 2005

	2005(*)A Number of households that gas company is able to provide gas in 2005	Case 2 A' IF C<A THEN A'=C IF C>A THEN A'=A	Case 1 A" A"=(C-B)*.55+B IF A<A" THEN A"=A IF A>A" THEN A"=A"	Present condition 1993(*)B Households with gas supply by the year	C Number of households in 1990	Case 2 Dissimi-nation-ratio A'/C (%)	Case 1 Dissimi-nation-ratio A"/C (%)	Present condition Dissimi-nation-ratio B/C (%)
99 Sajóvámos	658	658	567	387	715	92	79	54
100 Sajóvelezd	272	272	211	91	309	88	68	29
101 Sáta	211	211	211	0	525	40	40	0
102 Serényfalva	250	250	223	49	366	68	61	13
103 Szakáld	169	169	115	0	209	81	55	0
104 Szalonna	293	293	193	0	350	84	55	0
105 Szendrőlád	287	287	206	0	375	77	55	0
106 Szirmabesenyő	1,386	1,386	1,386	1,276	1,706	81	81	75
107 Szőlősardó	84	81	45	0	81	100	56	0
108 Szuhafő	60	60	45	0	82	73	55	0
109 Szuhakálló	299	299	214	0	389	77	55	0
110 Szuhogy	347	347	228	0	415	84	55	0
111 Tardona	236	236	226	0	411	57	55	0
112 Teresztenye	29	24	13	0	24	100	54	0
113 Tiszalúc	1,087	1,087	1,087	597	1,684	65	65	35
114 Tiszapalkonya	712	604	422	199	604	100	70	33
115 Tornakápolna	14	13	7	0	13	100	54	0
116 Trizs	66	66	58	0	105	63	55	0
117 Uppony	79	79	79	0	212	37	37	0
118 Vadna	190	190	105	0	190	100	55	0
119 Varbó	390	390	226	0	411	95	55	0
120 Zádorfalva	102	102	98	0	178	57	55	0
121 Ziliz	128	128	79	0	144	89	55	0
122 Zubogy	208	208	122	0	221	94	55	0
Total	172,583	153,138	138,339	100,711	178,180	86	78	57

Case 1 : Natural gas is supplied to 55% of households not having the supply at present within the limit of A above.
Case 2 : Natural gas is supplied all households within the limit of A above.
Source : (*) Tigaz (GAS DISTRIBUTION COMPANY)

Table D8.3.5(1) Effects of Additional Control Measures for Some Factories(2005)

Name of Plant	Source No.	Present (1992) Kind of Fuel	Present (1992) Fuel Consumption	Present (1992) SO2 Emission (t/yr)	Present (1992) NOx Emission (t/yr)	No Measures (2005) Rising Rate of Fuel Consumption	No Measures (2005) Fuel Consumption	No Measures (2005) SO2 Emission (t/yr)	No Measures (2005) NOx Emission (t/yr)	Control Measures Alternative (2005) Case 1 (Fuel Change) Kind of Fuel	Case 1 (Fuel Change) Fuel Consumption	Case 1 (Fuel Change) Emission (t/yr) SO2	Case 1 (Fuel Change) Emission (t/yr) NOx	Case --- Kind of Fuel	Case --- Fuel Consumption	Case --- Emission (t/yr) SO2	Case --- Emission (t/yr) NOx	Case --- Kind of Fuel	Case --- Fuel Consumption	Case --- Emission (t/yr) SO2	Case --- Emission (t/yr) NOx
02/1 OZD KOHASZAT	P-036	Brown Coal (t/yr)	34,560	528.8	149.6	0.0% (*1)	31,104 (60%)	457.9	134.6	Brown Coal (t/yr)	4,164 (8%)	63.7	60.0								
		Natural Gas (1000Nm3/yr)	13,824				12,442 (40%)			Natural Gas (1000Nm3/yr)	28,287 (92%)										
	Remarks	*1 Fuel consumption in 2005 considers 10% energy saving.																			

Name of Plant	Source No.	Present (1992) Kind of Fuel	Present (1992) Fuel Consumption	Present (1992) SO2 Emission (t/yr)	Present (1992) NOx Emission (t/yr)	No Measures (2005) Rising Rate of Fuel Consumption	No Measures (2005) Fuel Consumption	No Measures (2005) SO2 Emission (t/yr)	No Measures (2005) NOx Emission (t/yr)	Control Measures Alternative (2005) Case 1 (Change of Fuel Quality) Kind of Fuel	Case 1 (Change of Fuel Quality) Fuel Consumption	Case 1 (Change of Fuel Quality) Emission (t/yr) SO2	Case 1 (Change of Fuel Quality) Emission (t/yr) NOx	Case --- Kind of Fuel	Case --- Fuel Consumption	Case --- Emission (t/yr) SO2	Case --- Emission (t/yr) NOx	Case --- Kind of Fuel	Case --- Fuel Consumption	Case --- Emission (t/yr) SO2	Case --- Emission (t/yr) NOx
03/0 ESZAKMAGYARORSZAGI TEGLA ES CSEREPIPARI VALLALAT POTMOLI TEGLAGYAR	P-014 P-002 Tunnel Kiln for Bricks	Coal (S:3%) (t/yr)	8,081	290.9	23.31	0.85%	9,000	324	26.01	Coal (S:1.5%) (t/yr)	9,000	162	26.01								
		Wood Flour (t/yr)	2,673				3,000			Wood Flour (t/yr)	3,000										
	Remarks	Based on the ceramics academy association. (SZILIKATIPARI TUDOMANYOS EGYESULET 1061 Budapest, Anken KOZ 1-3, Nov.1989) Fuel change from coal to natural gas is suitable measures.																			

Name of Plant	Source No.	Present (1992) Kind of Fuel	Present (1992) Fuel Consumption	Present (1992) SO2 Emission (t/yr)	Present (1992) NOx Emission (t/yr)	No Measures (2005) Rising Rate of Fuel Consumption	No Measures (2005) Fuel Consumption	No Measures (2005) SO2 Emission (t/yr)	No Measures (2005) NOx Emission (t/yr)	Control Measures Alternative (2005) Case 1 (Two-Stage Combustion) Kind of Fuel	Case 1 (Two-Stage Combustion) Fuel Consumption	Case 1 (Two-Stage Combustion) Emission (t/yr) SO2	Case 1 (Two-Stage Combustion) Emission (t/yr) NOx	Case --- Kind of Fuel	Case --- Fuel Consumption	Case --- Emission (t/yr) SO2	Case --- Emission (t/yr) NOx	Case --- Kind of Fuel	Case --- Fuel Consumption	Case --- Emission (t/yr) SO2	Case --- Emission (t/yr) NOx
04/1 BORSODCHEM	P-061 Incinerator	Waste Solvent (t/yr)	153.1 (EKF)	0 (EKF)	2.9 (EKF)	0.85%	170.9	0	3.2	Waste Solvent (t/yr)	170.9	0	0.16 (*2)								
		Waste Solvent (t/yr)	124.6 (Actual in 1993) (*1)	0 (Actual in 1993) (*1)	16.4 (Actual in 1993) (*1)	0.85%	139.1	0	18.3	Waste Solvent (t/yr)	139.1	0	0.92 (*2)								
	Remarks	*1 Based on actual measurement in 1993 and assuming same operational hour of 3560h. *2 High NOx concentration can be reduced to reaching 150 - 200 ppm by using two-stages combustion method, and it is attainable.																			

Table D8.3.5(2) Effects of Additional Control Measures for Some Factories(2005)

Name of Plant	Source No.	Present (1992)				No Measures (2005)				Control Measures Alternative (2005)									
										Case 1 (Two-Stages Combustion)				Case ---				Case ---			
		Kind of Fuel	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Rising Rate of Fuel Consumption	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx
09/2 SAGROCHEM KFT.	P-055 Incinerator	Waste Solvent & Solid (t/yr)	103	0	0.056 (EKF)	0.0%	103	0	0.056	Waste Solvent & Solid (t/yr)	103	0	0.014 (*2)								
				0 (*1)	0.962 (*1)			0	1.80			0	0.45 (*2)								
	Remarks	*1 Based on actual measurement in 1993 and assuming same operational hour of 1872h. *2 75% NOx reduction by using two-stages combustion method.																			

Name of Plant	Source No.	Present				No Measures (2005)				Control Measures Alternative (2005)									
										Case 1 (Retrofitting and Recuperator)				Case ---				Case ---			
		Kind of Fuel	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Rising Rate of Fuel Consumption	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx
15/2 DIOSGYORI ACEL ES VASONT KFT	P-014	Natural Gas (1000Nm3/yr)	517 (*1)	0	0.695 (*1)	1.02%	590	0	0.793	Natural Gas (1000Nm3/yr)	531	0	0.714 (*2)								
	Remarks	*1 Based on actual measurement of NOx in 1993. (0.423kg/h with consumption of natural gas of 314m3/h and assuming same operational hours of 1645h.) EKF : Fuel consumption (Natural Gas) 666 Nm3/yr in 1992. NOx emission 0.296 t/yr in 1992. *2 Retrofitting of furnace and introducing recuperator for energy saving about 10%.																			

Name of Plant	Source No.	Present (1992)				No Measures (2005)				Control Measures Alternative (2005)									
										Case 1 (Using Low NOx Burner)				Case ---				Case ---			
		Kind of Fuel	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Rising Rate of Fuel Consumption	Fuel Consumption	SO2 Emission (t/yr)	NOx Emission (t/yr)	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx	Kind of Fuel	Fuel Consumption	Emission (t/yr) SO2	Emission (t/yr) NOx
17/1 HEJOCSABAI CEMENT	P-010	Natural Gas (for Clinker) (1000Nm3/yr)	18,745	0	125 (EKF)	1.02%	21,388	0	143	Natural Gas (for Clinker) (1000Nm3/yr)	21,388	0	100 (*2)								
		Waste Oil (t/yr)	706				805			Waste Oil (t/yr)	805										
				0	764 (*1)			0	871			0	609 (*2)								
	Remarks	*1 Based on actual measurement of NOx:325kg/h in 1993 and assuming same operational hours of 2352h as same as 1992. *2 30% NOx reduction by using low NOx burner. (If possible, it is better to avoid using waste oil.)																			

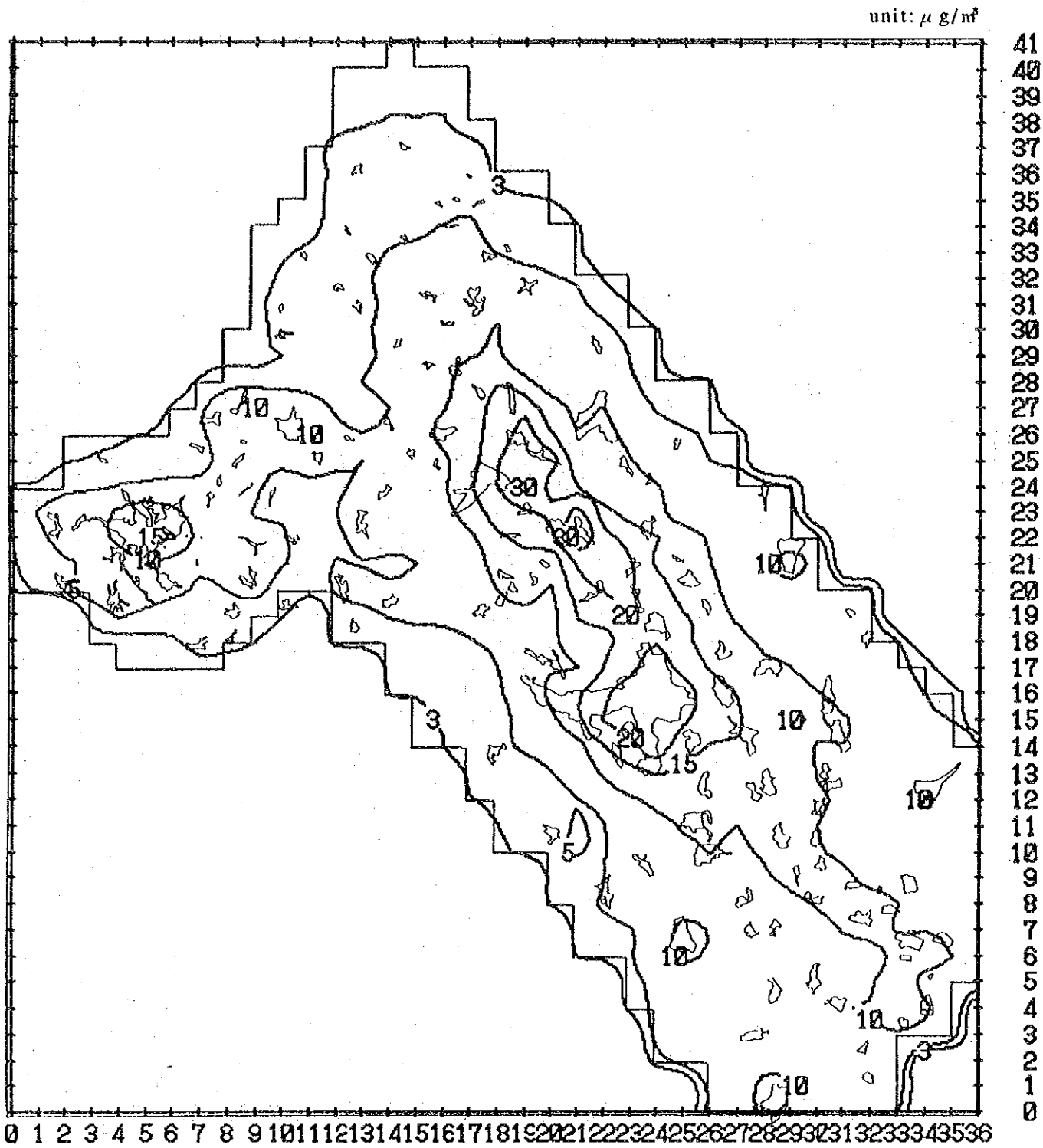

Figure D8.4.1 Average Concentration Isopleth for SO2 in Non-heating Season (2005,Case F-0,All Sources)

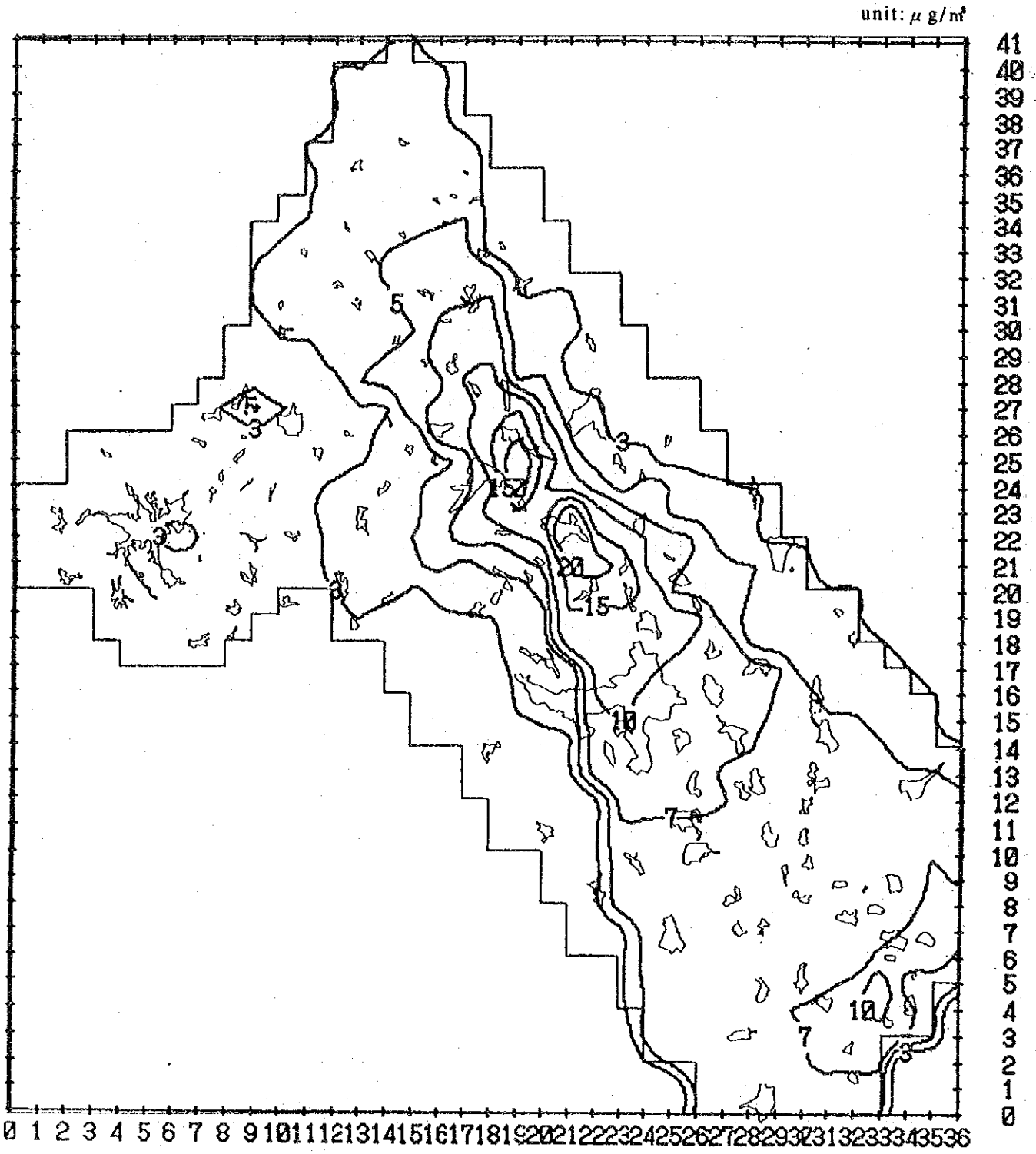

Figure D8.4.2 Annual Average Concentration Isopleth for SO2 in 2005 (Case F-0,Industries)

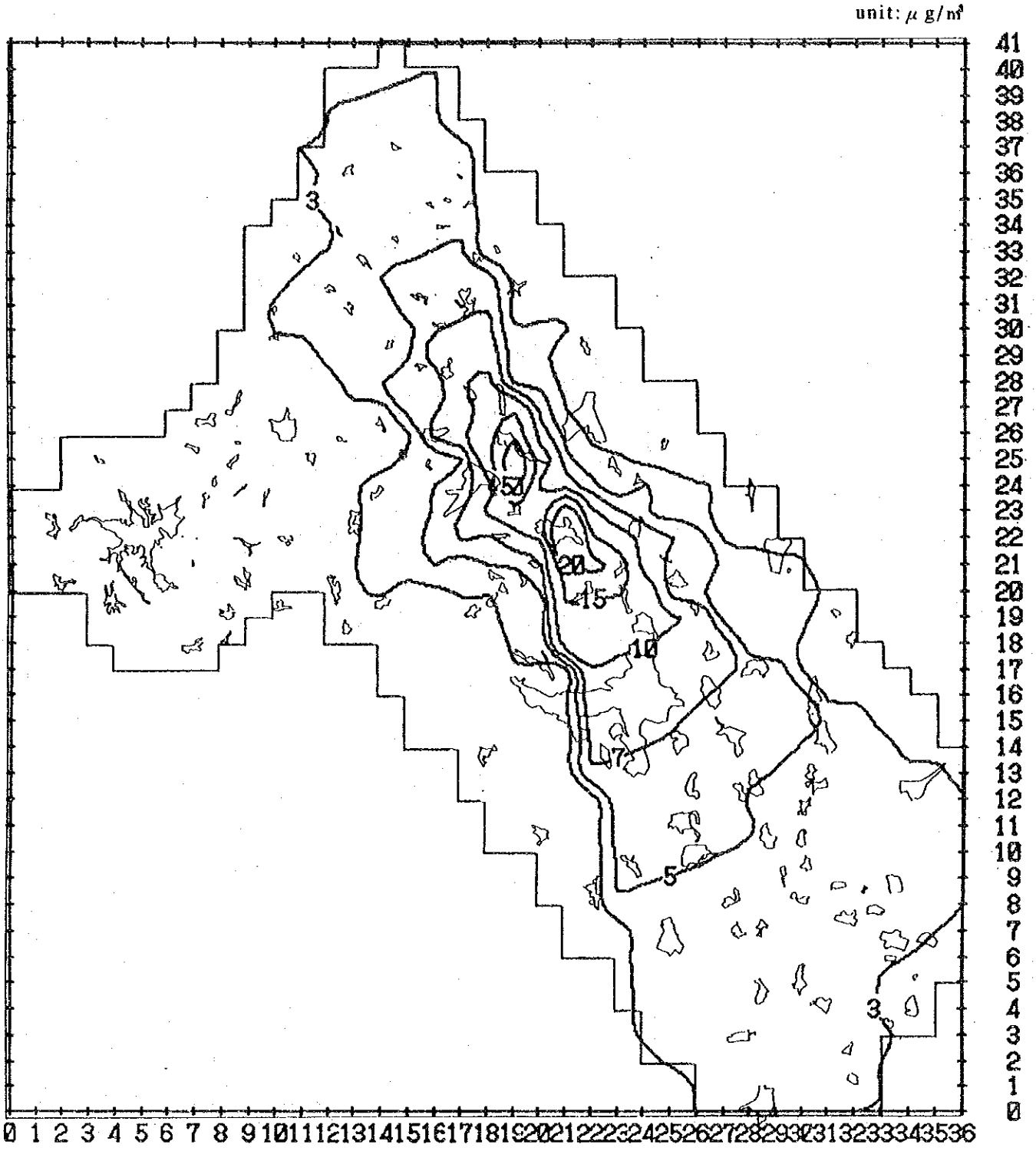

Figure D8.4.3 Annual Average Concentration Isopleth for SO2 in 2005 (Case F-0,Borsod P.S.)

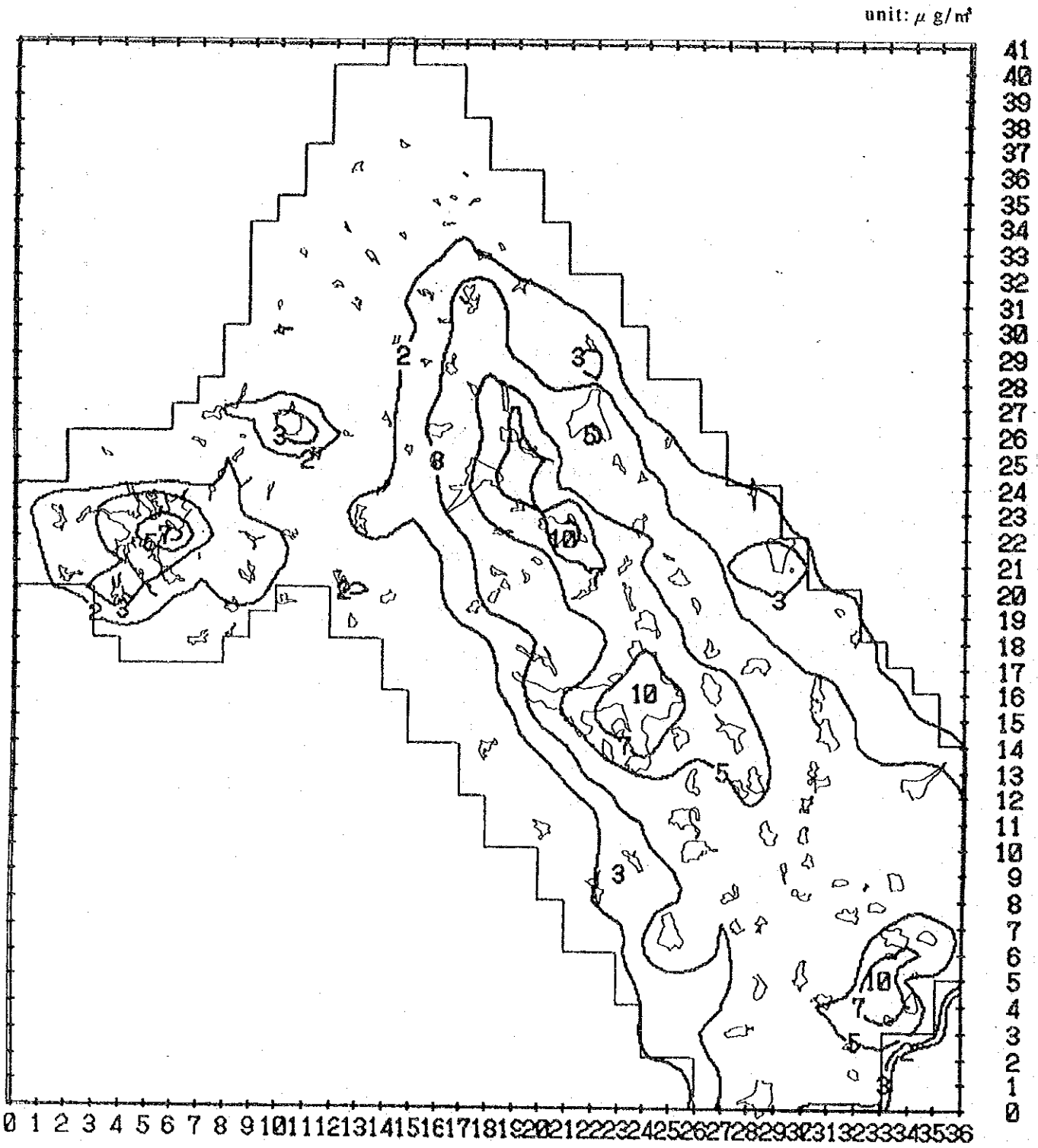

Figure D8.4.4 Average Concentration Isopleth for SO2 in Non-heating Season (2005,Case F-1,All Sources)

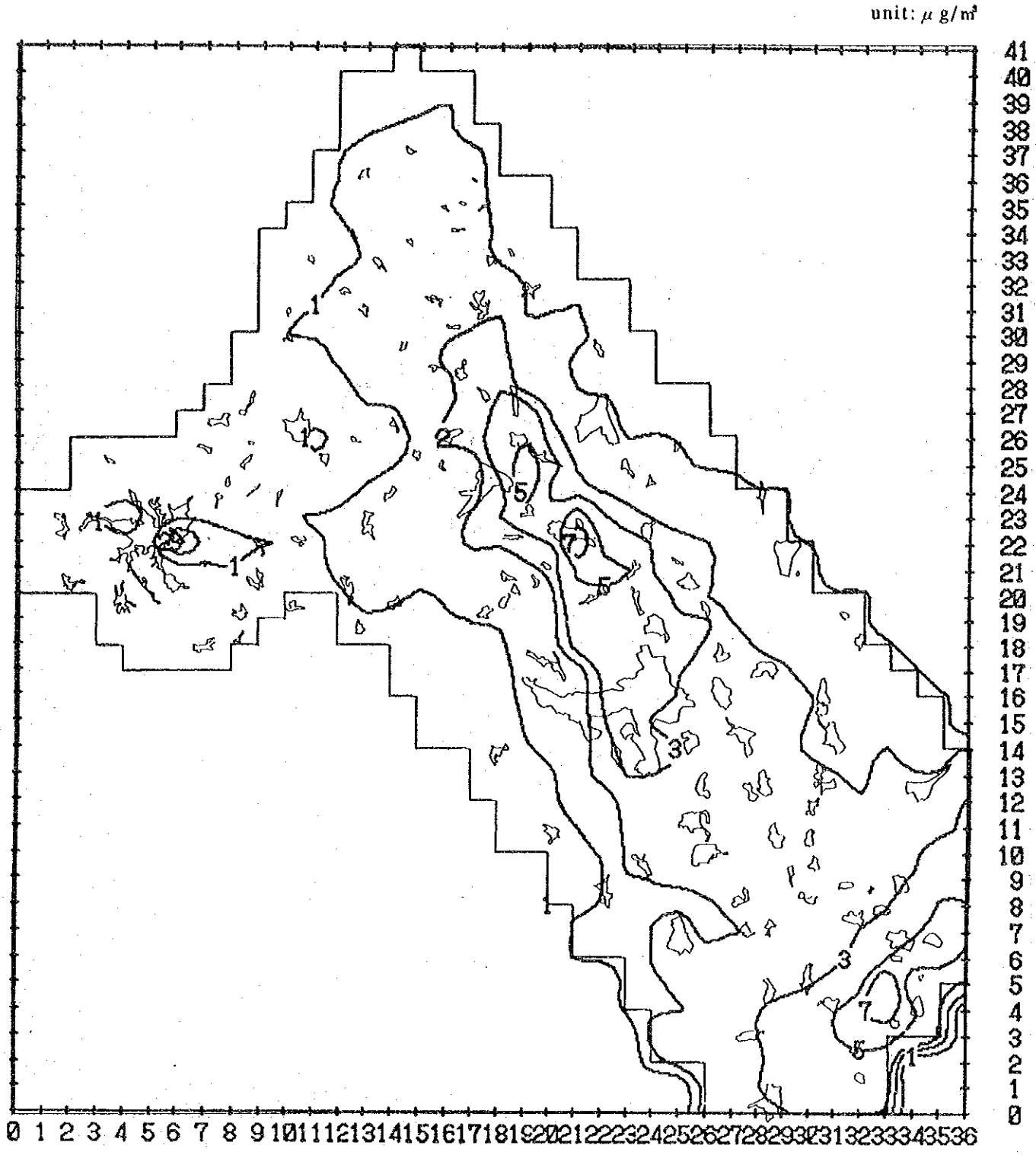

Figure D8.4.5 Annual Average Concentration Isopleth for SO2 in 2005 (Case F-1,Industries)

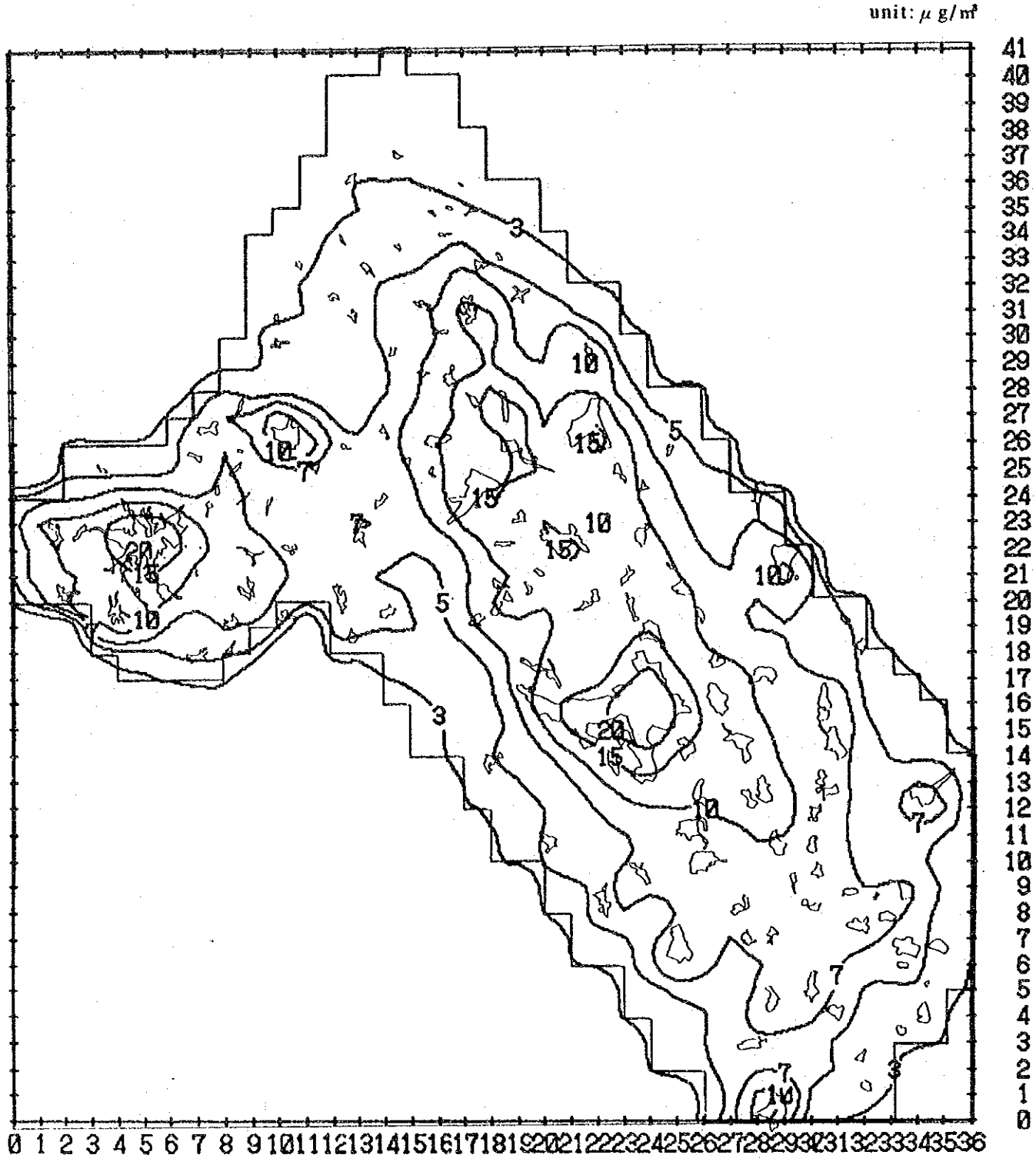

Figure D8.4.6 Annual Average Concentration Isopleth for SO2 in 2005 (Case F-1,Communal Sources)

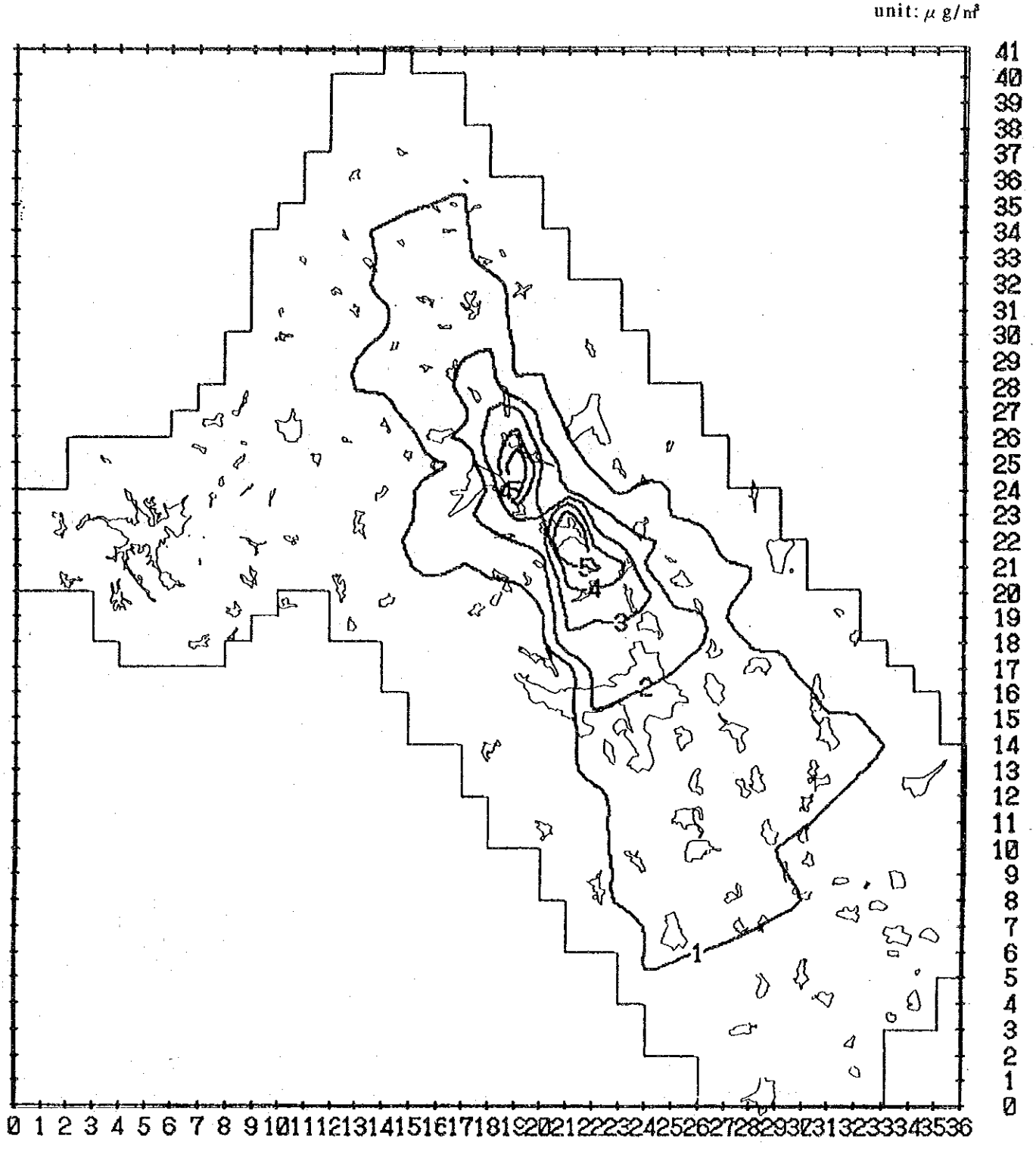

Figure D8.4.7 Annual Average Concentration Isopleth for SO2 in 2005 (Case F-1,Borsod P.S.)

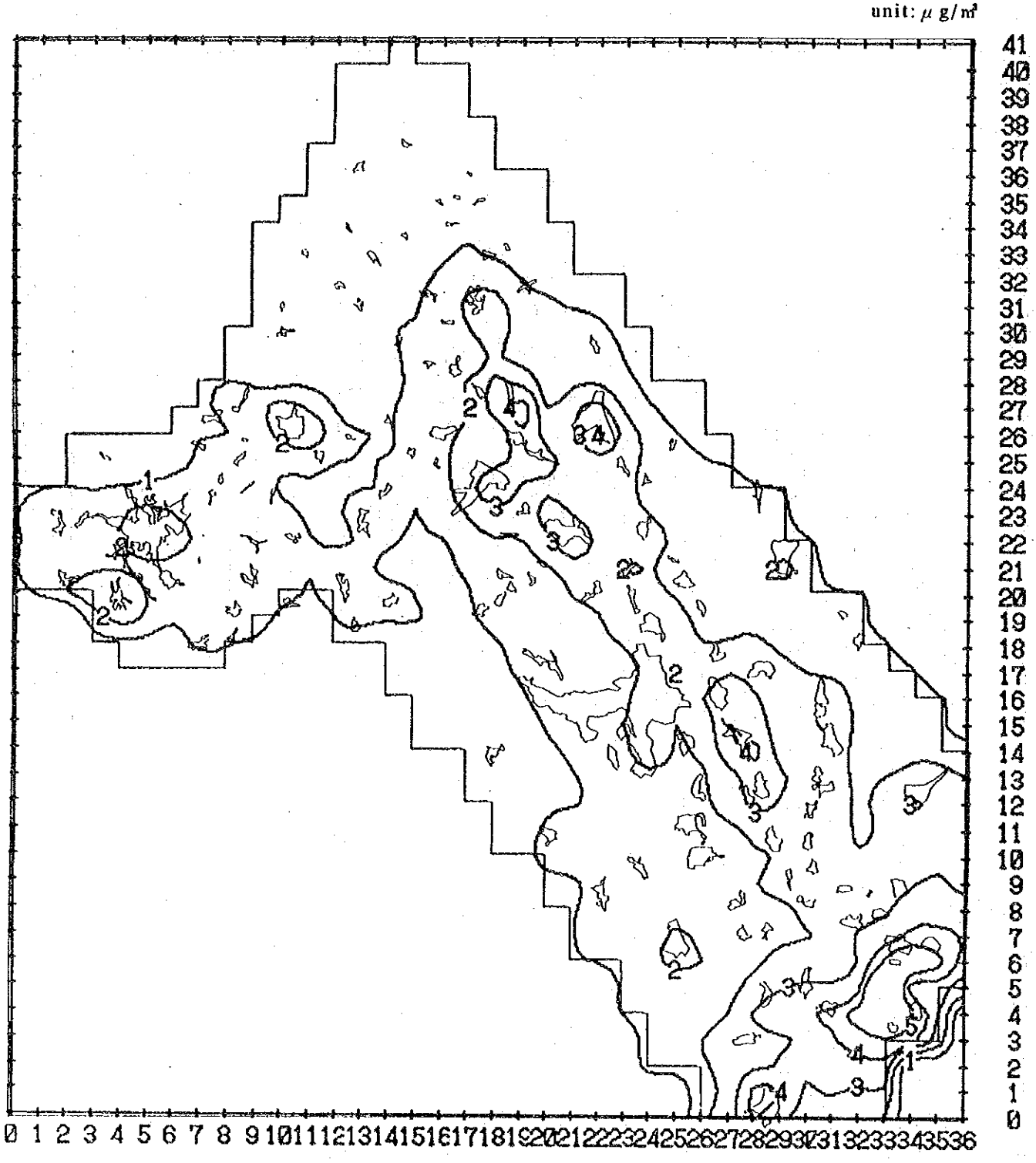

Figure D8.4.8 Average Concentration Isopleth for SO2 in Non-heating Season (2005,Case F-2,All Sources)

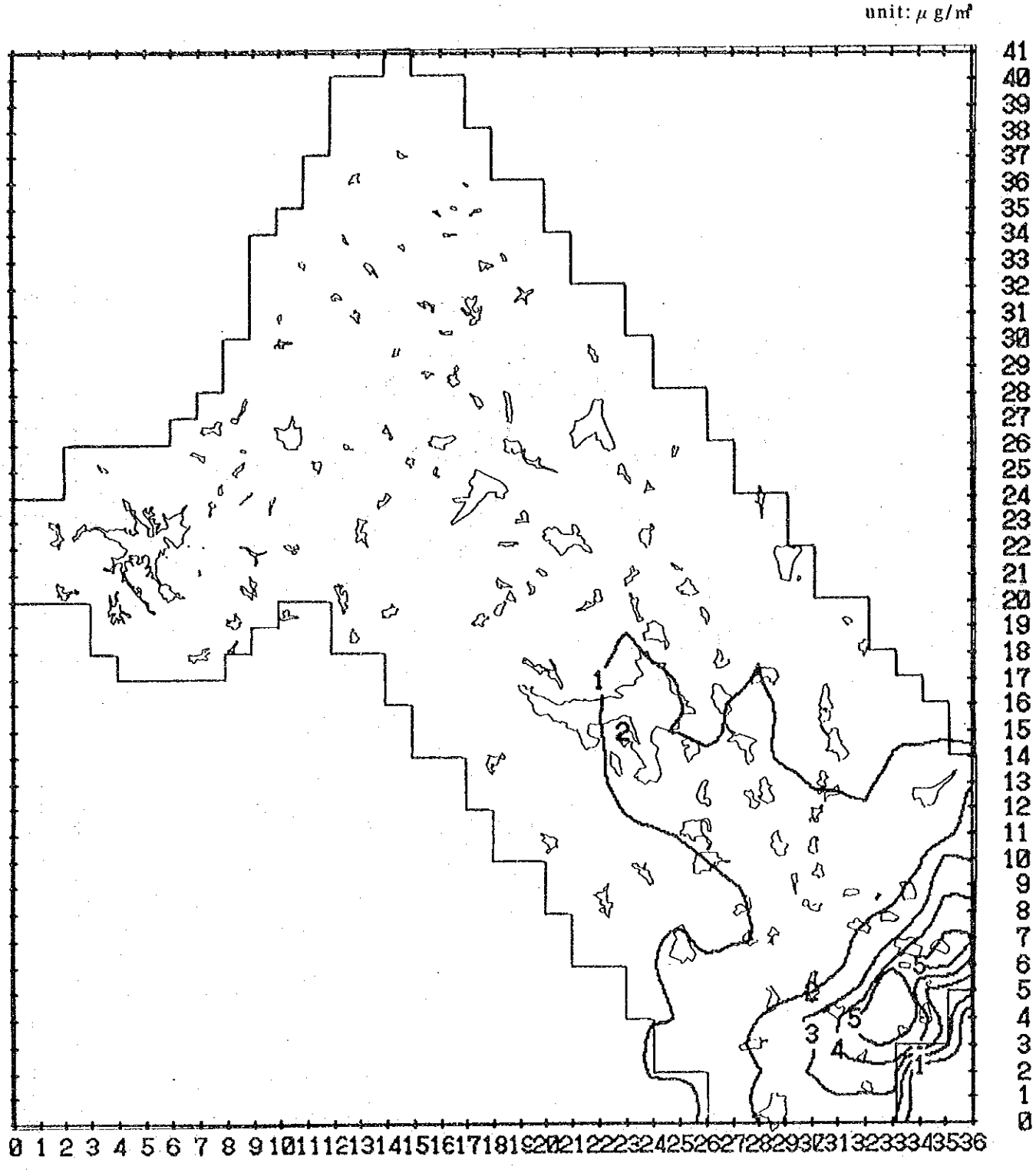

Figure D8.4.9 Annual Average Concentration Isopleth for SO2 in 2005 (Case F-2,Industries)

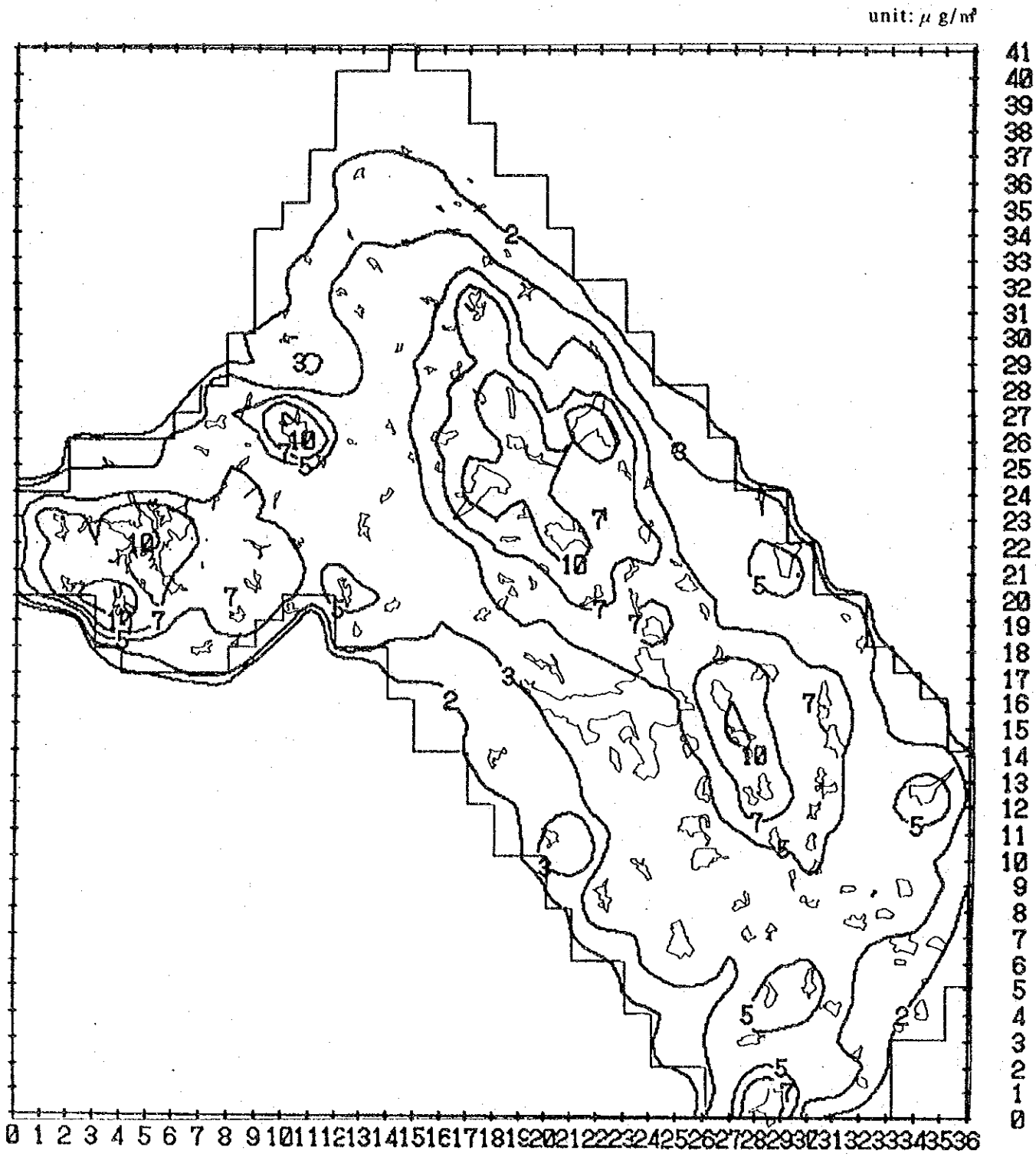

Figure D8.4.10 Annual Average Concentration Isopleth for SO2 in 2005 (Case F-2,Communal Sources)

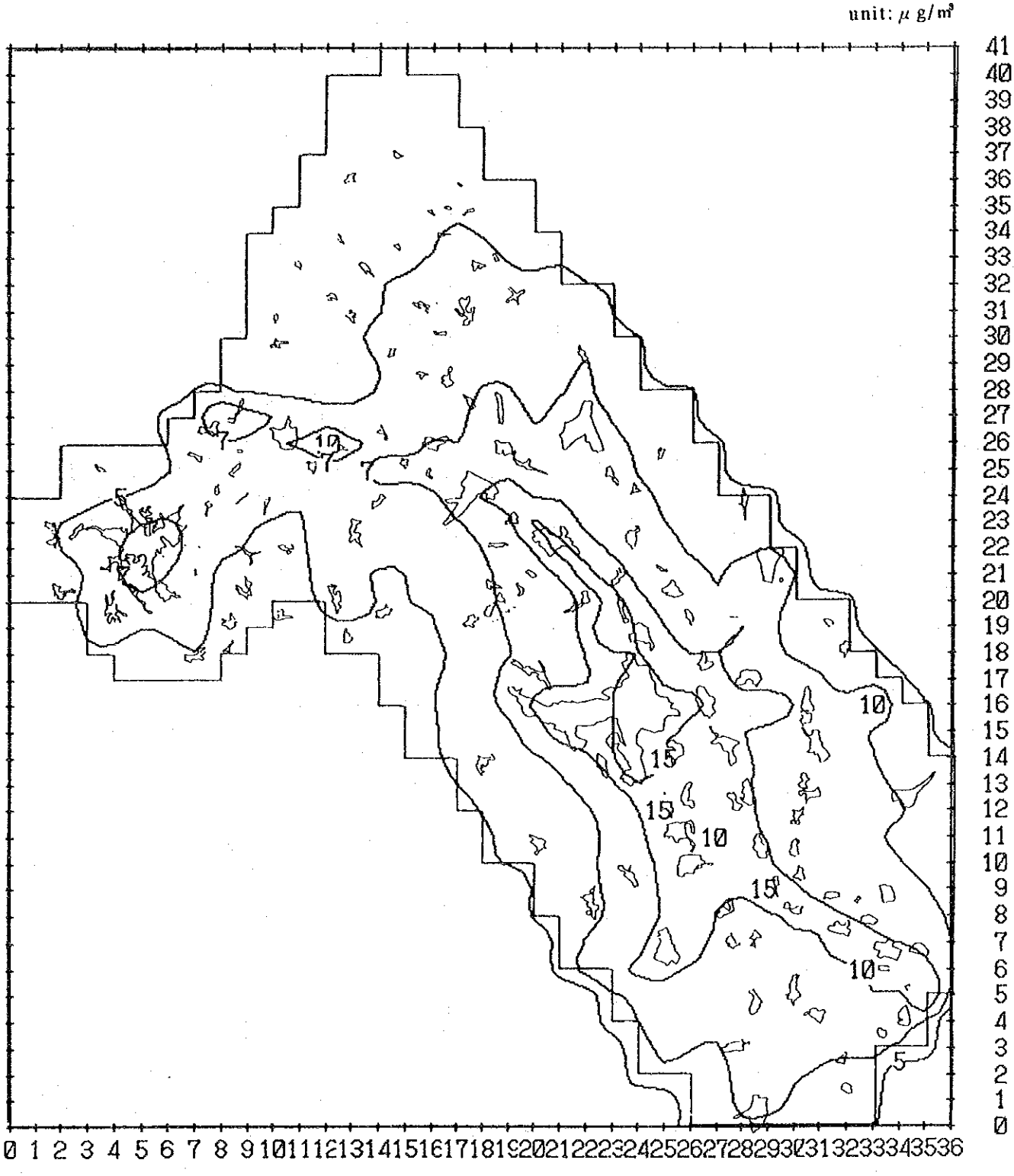

Figure D8.4.11 Average Concentration Isopleth for NO2 in Non-heating Season (2005,Case F-0,All Sources)

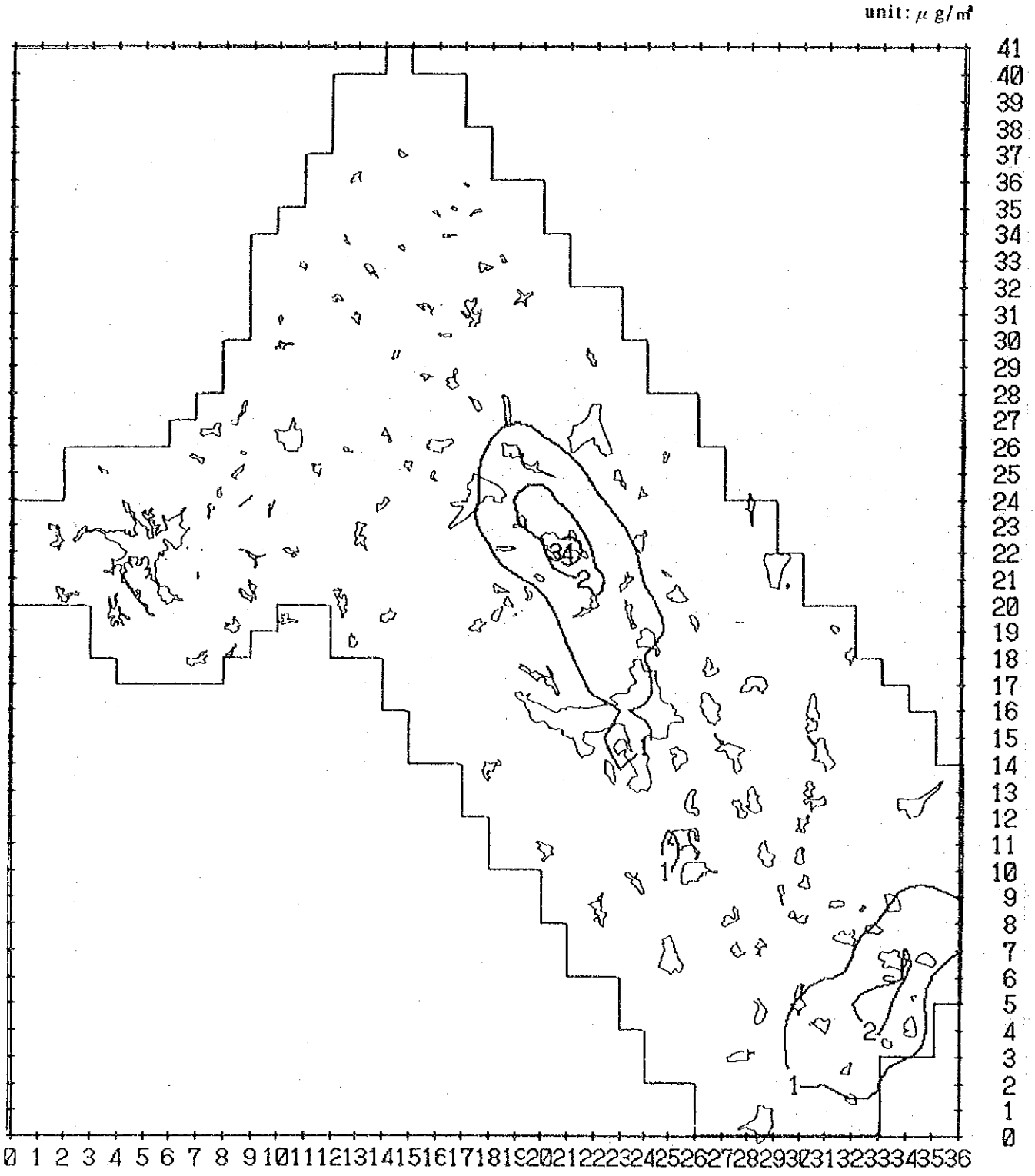

Figure D8.4.12 Annual Average Concentration Isopleth for NO2 in Non-heating Season (2005,Case F-0,Industries)

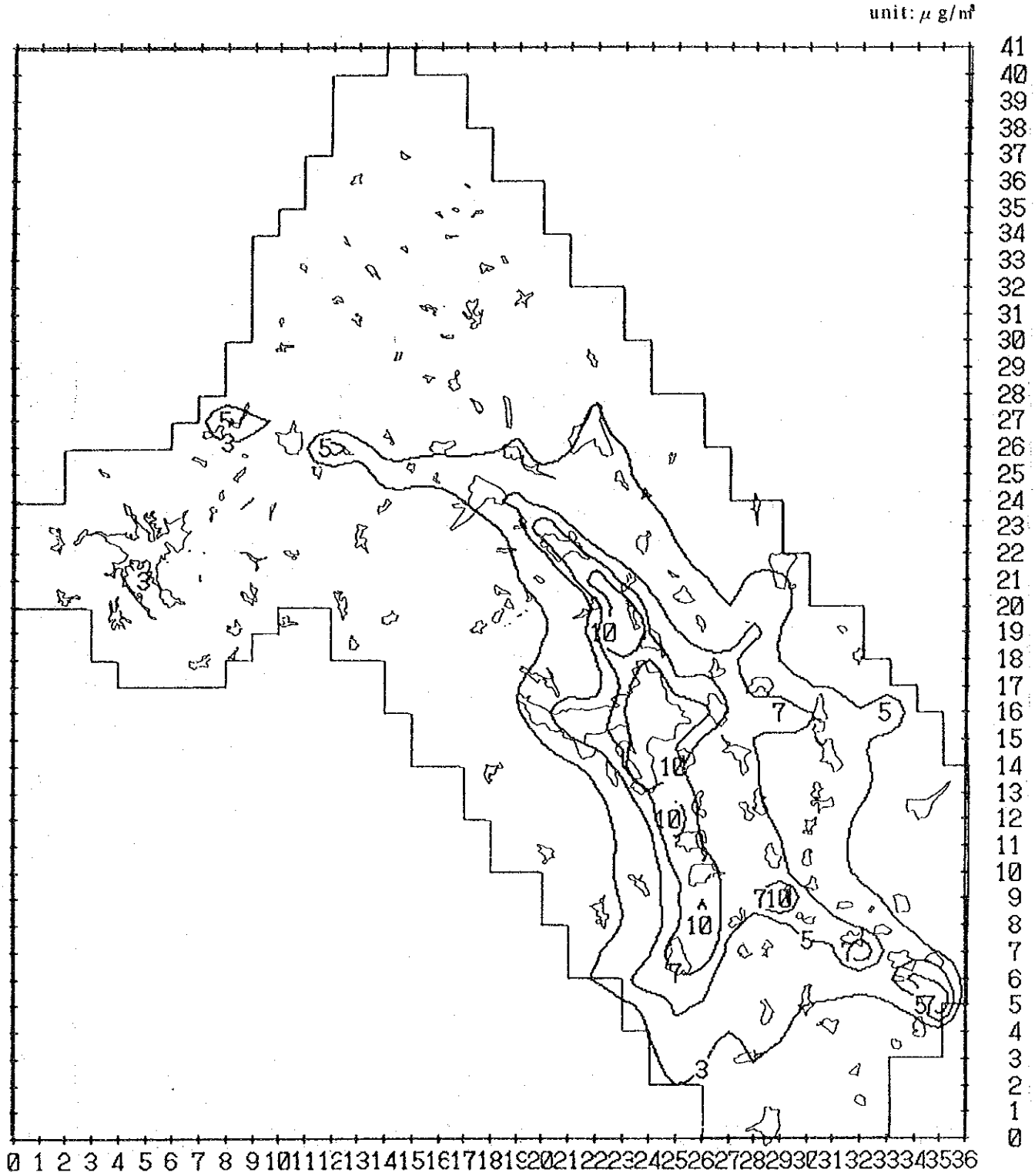

Figure D8.4.13 Annual Average Concentration Isopleth for NO2 in Non-heating Season (2005,Case F-0,Motor Vehicles)

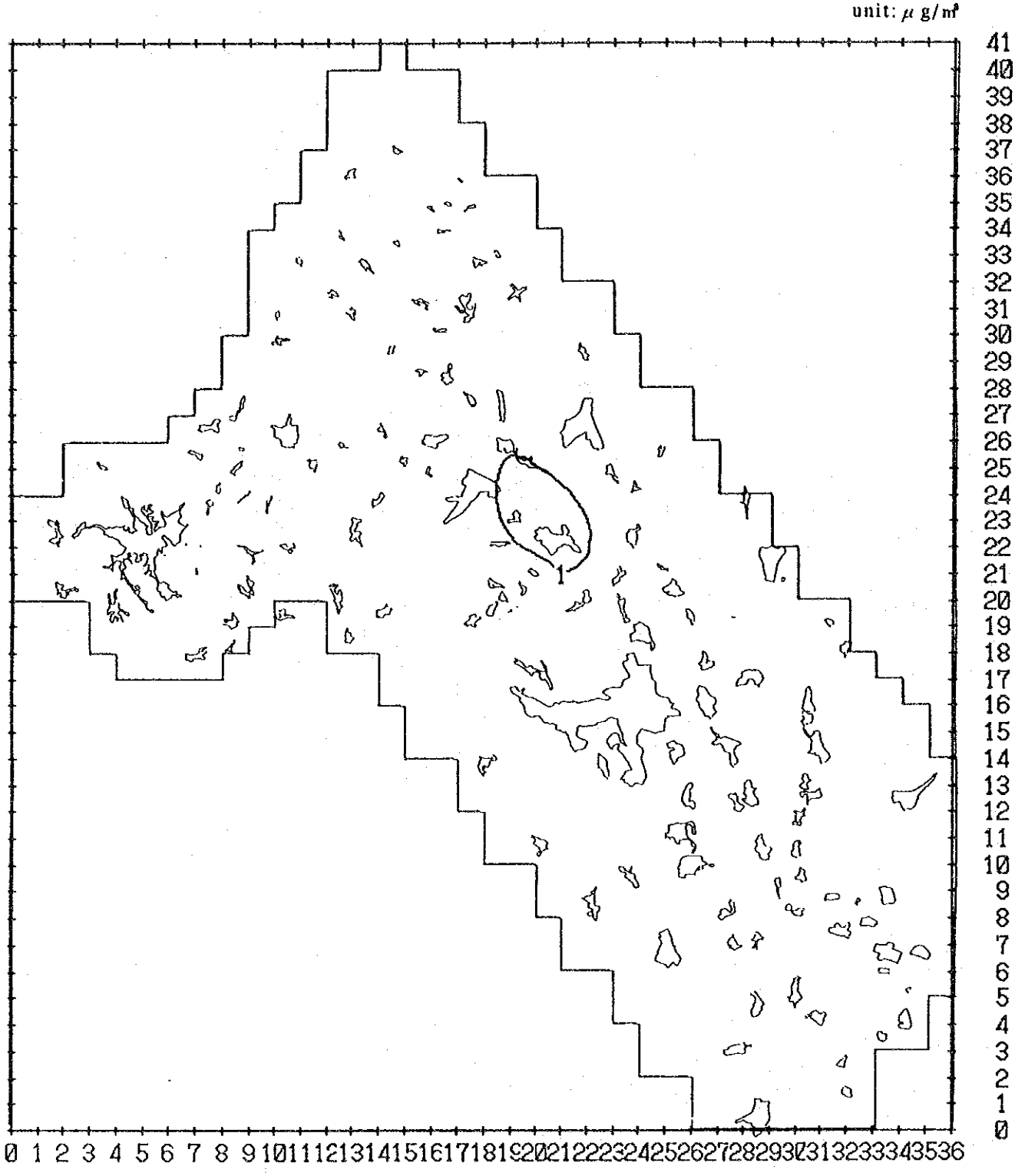

Figure D8.4.14 Annual Average Concentration Isopleth for NO2 in 2005 (Case F-0,Borsod P.S.)

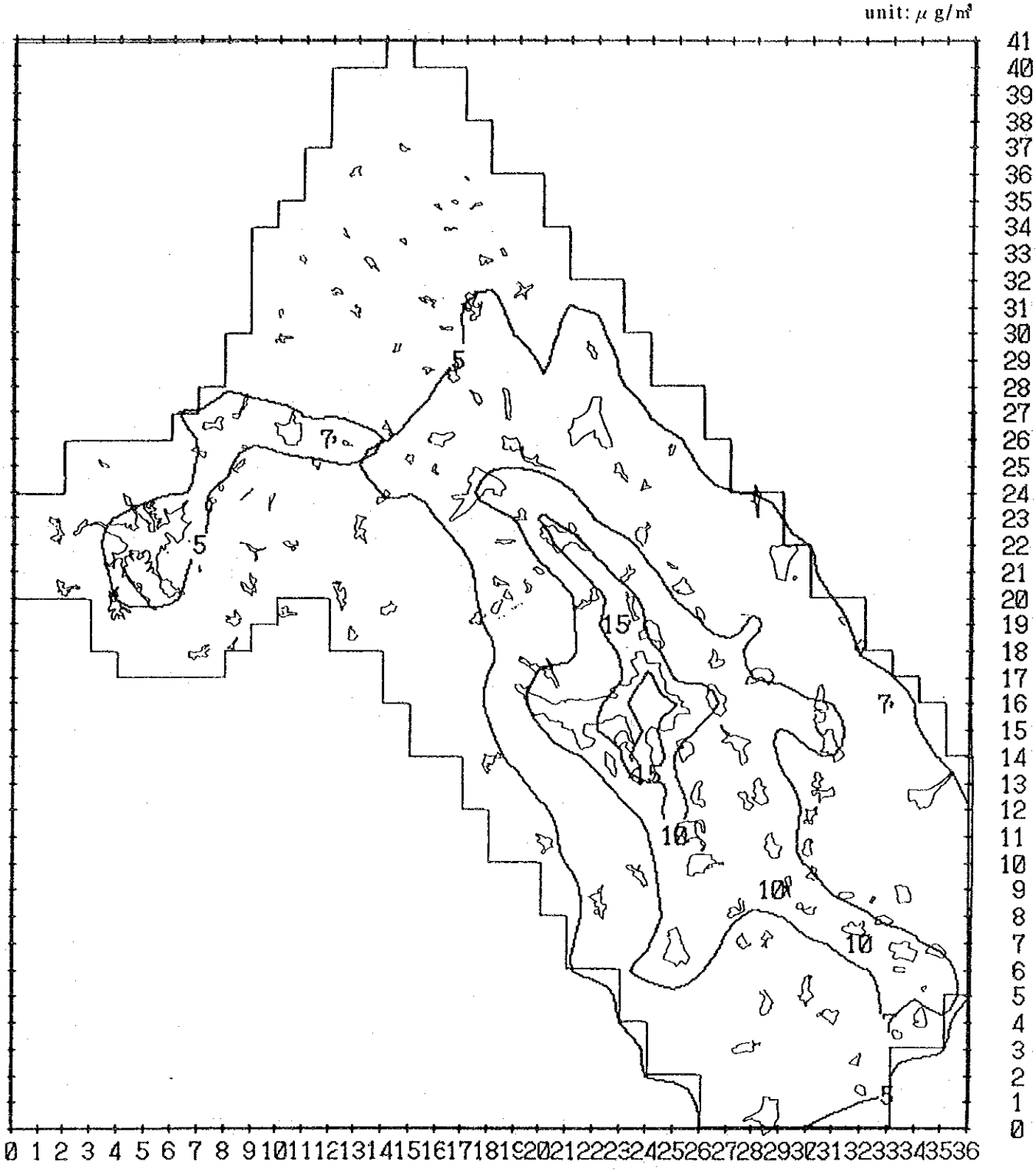

Figure D8.4.15 Average Concentration Isopleth for NO2 in Non-heating Season (2005,Case F-1,All Sources)

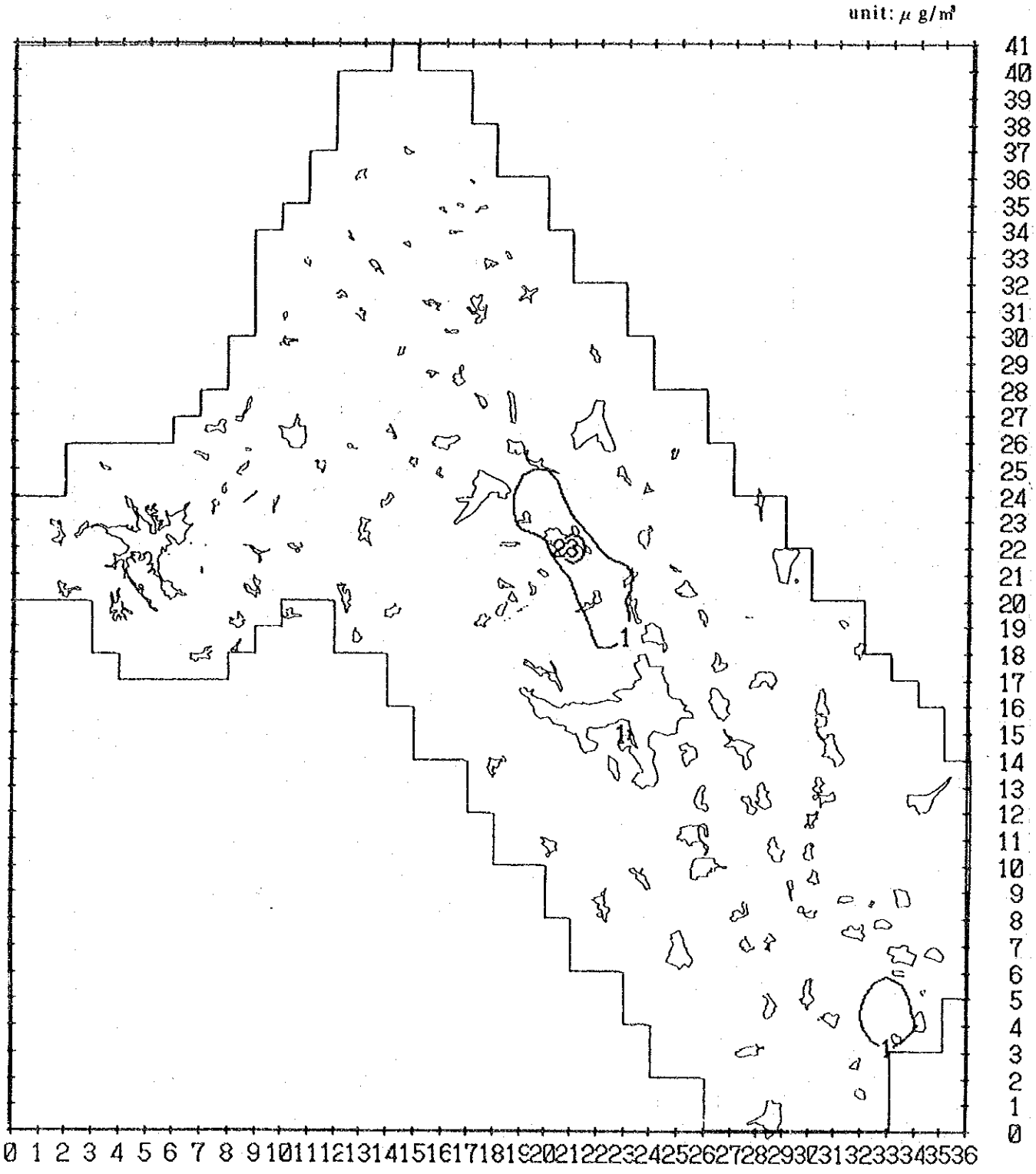

Figure D8.4.16 Annual Average Concentration Isopleth for NO2 in 2005 (Case F-1,Industries)

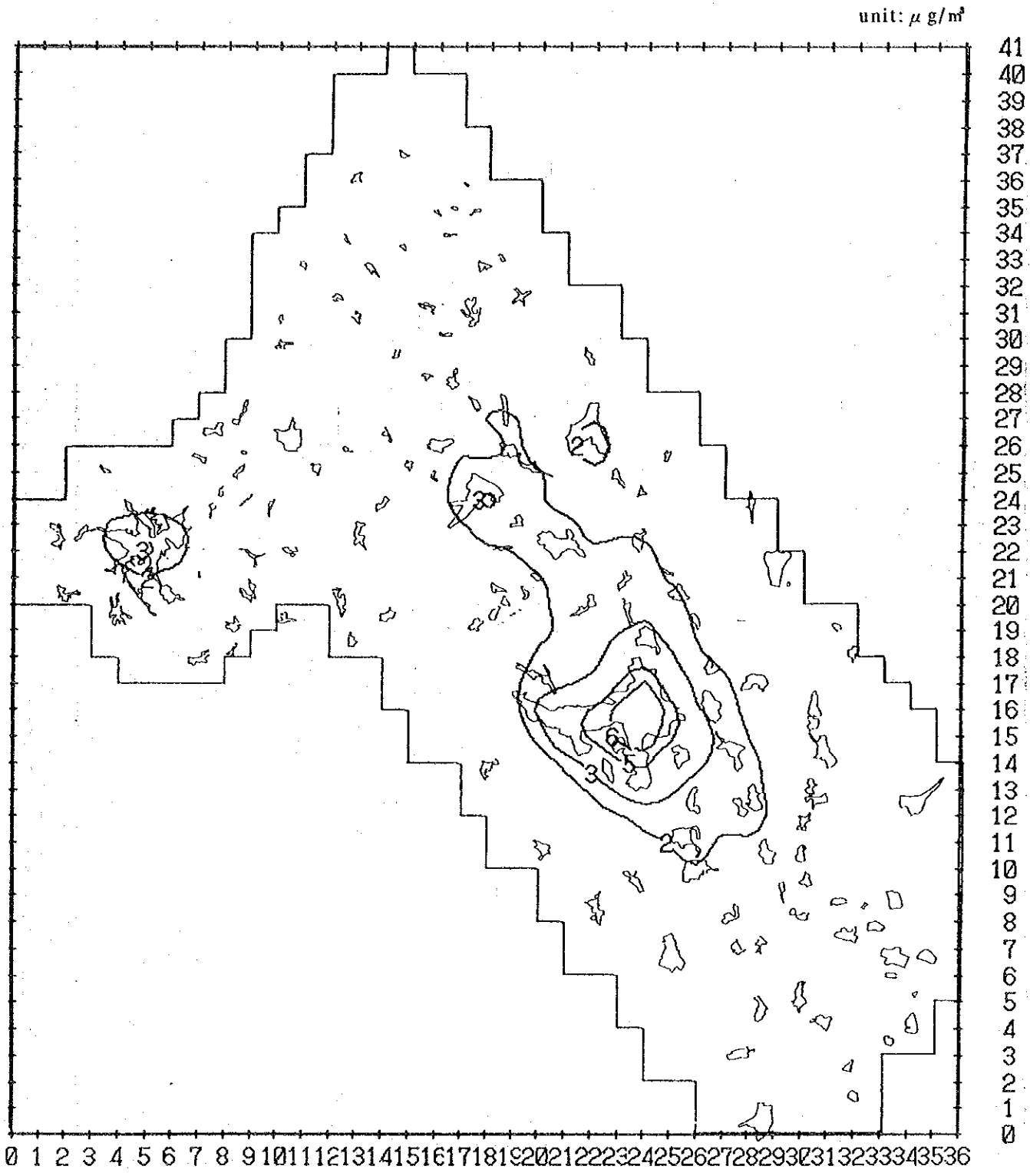

Figure D8.4.17 Annual Average Concentration Isopleth for NO2 in 2005 (Case F-1,Communal Sources)

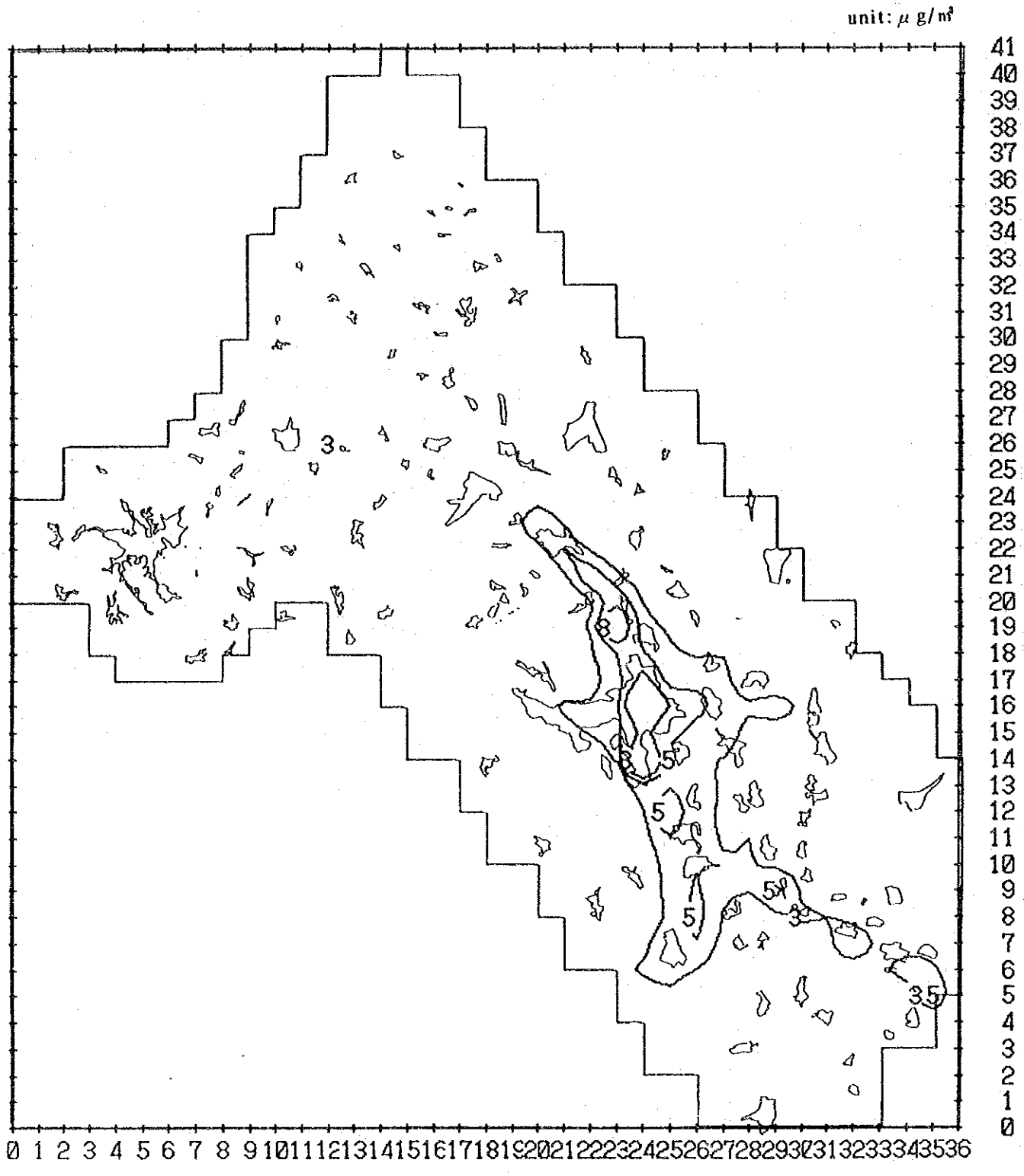

Figure D8.4.18 Annual Average Concentration Isopleth for NO2 in 2005 (Case F-1,Motor Vehicles)

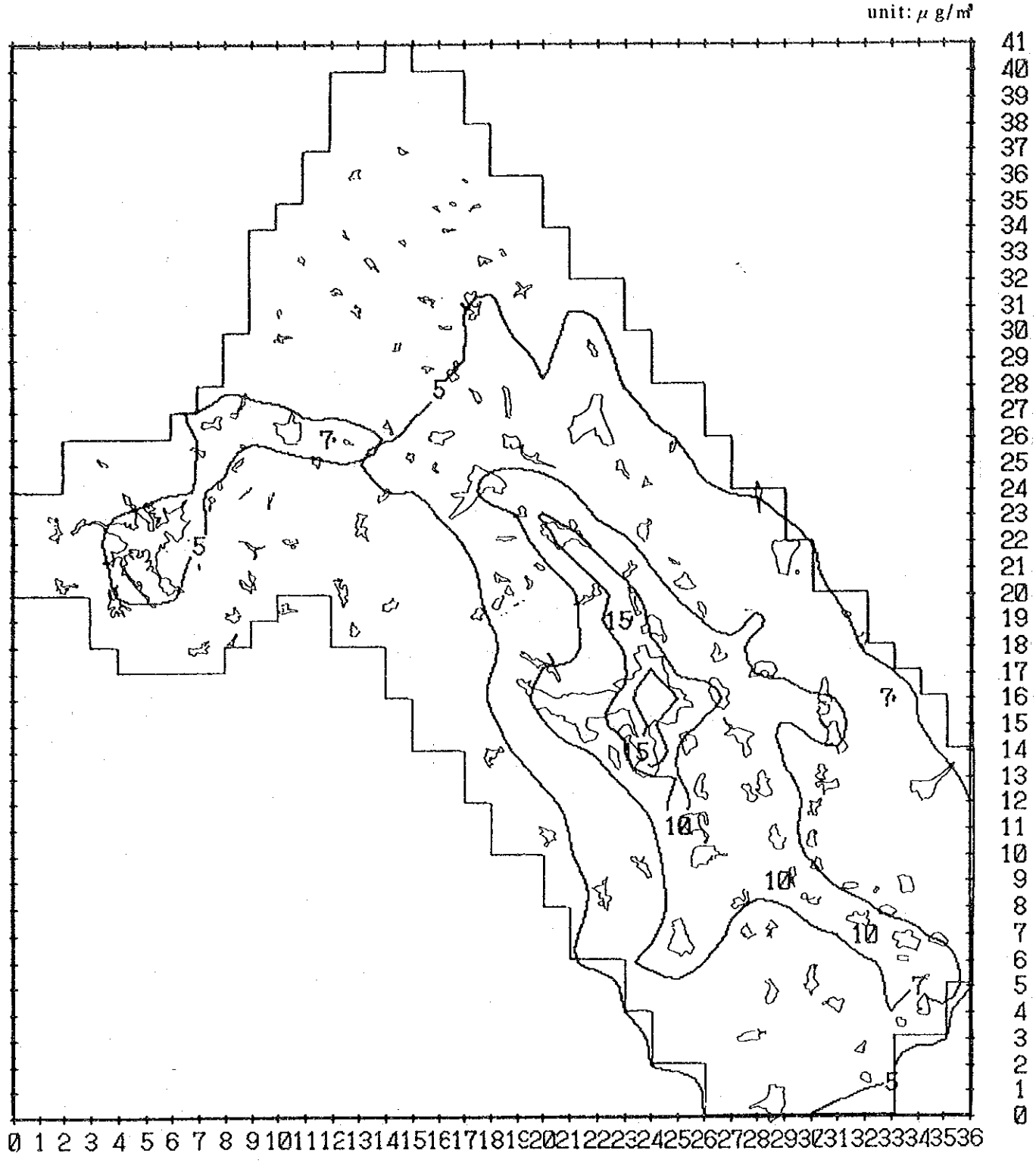

Figure D8.4.19 Average Concentration Isopleth for NO2 in Non-heating Season (2005,Case F-2,All Sources)

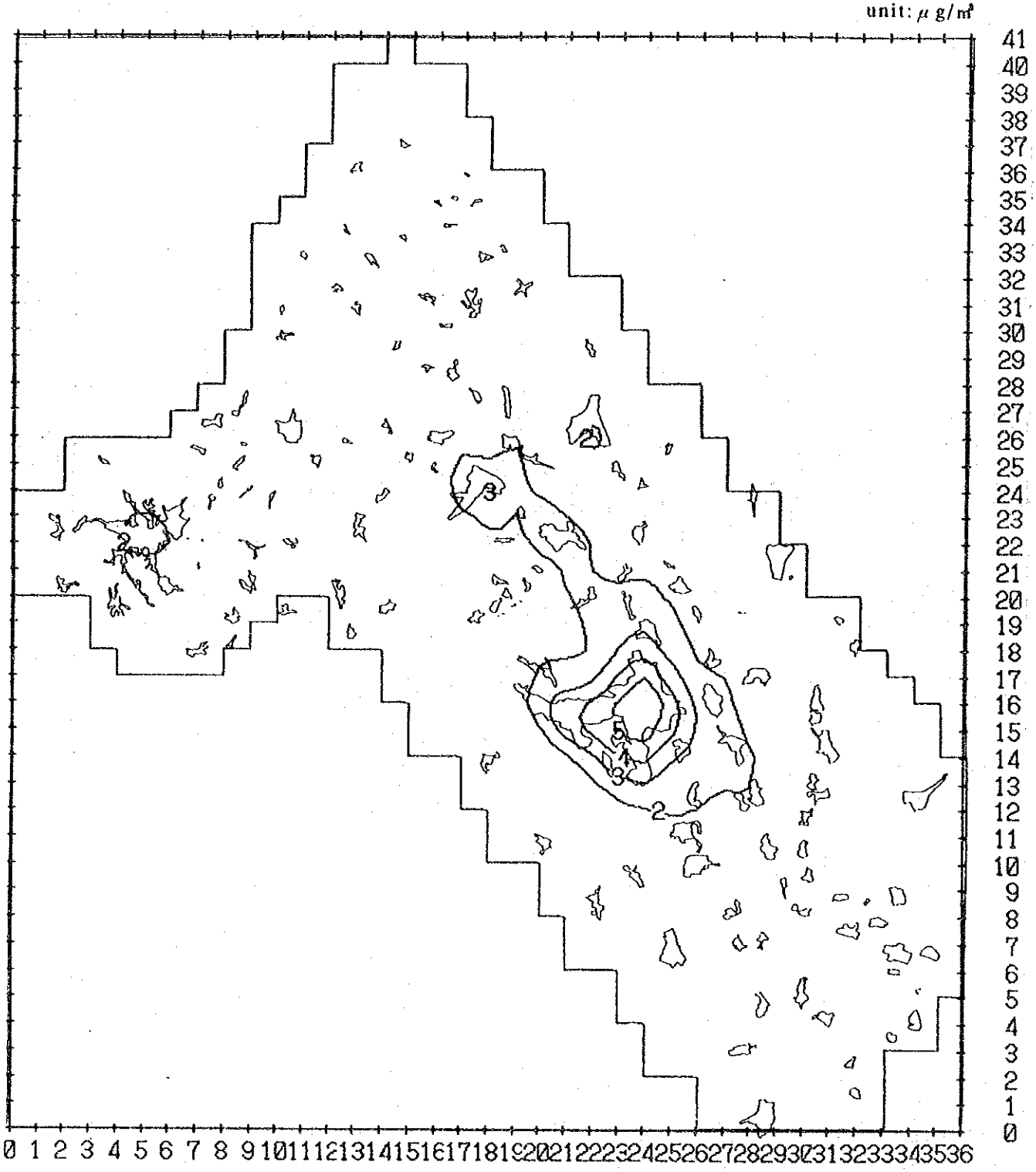

Figure D8.4.20 Annual Average Concentration Isopleth for NO2 in 2005 (Case F-2,Communal Sources)

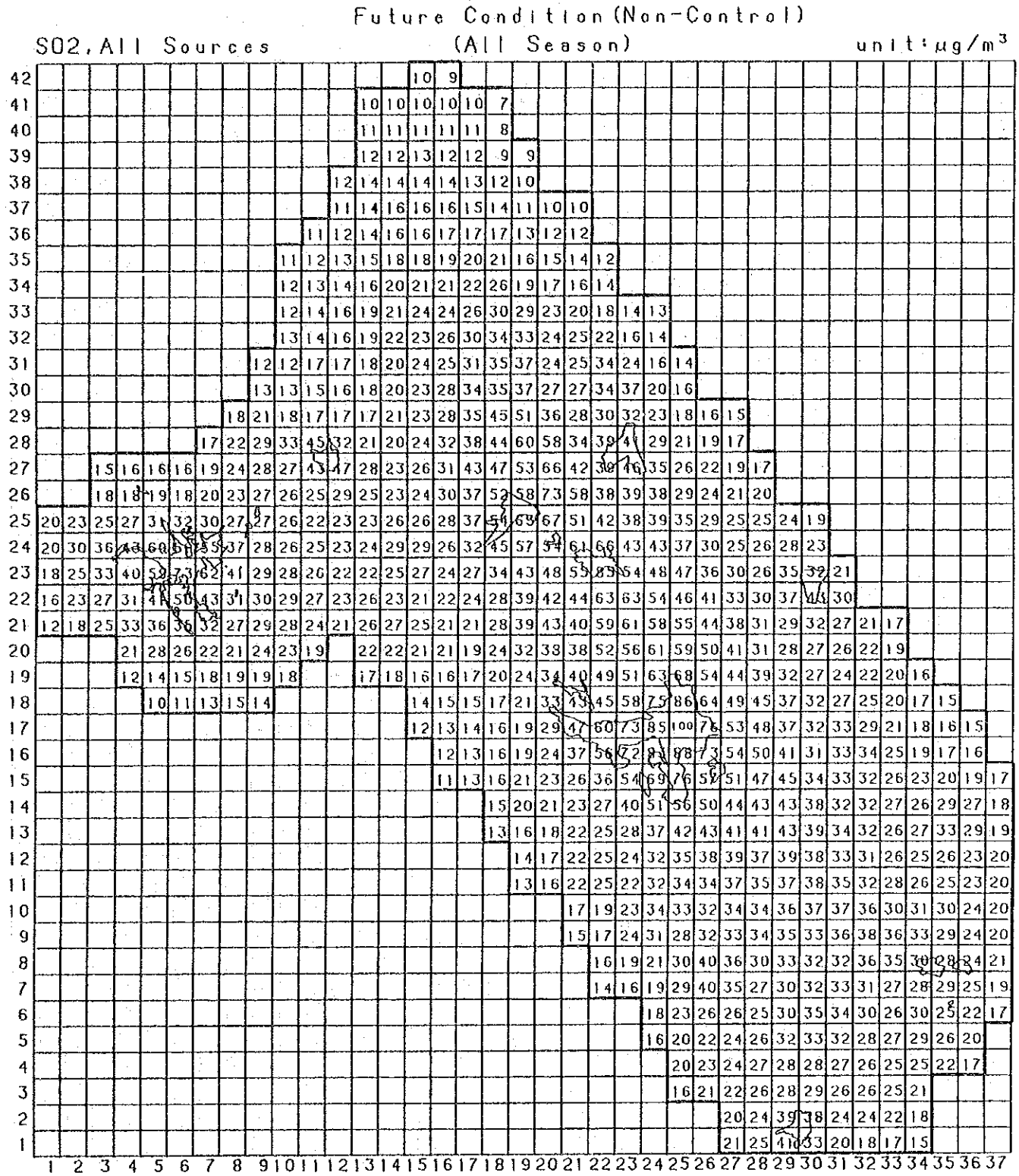

Figure D8.4.21 Annual Average Concentration for SO2 in 2005 (Case F-0,All Sources)

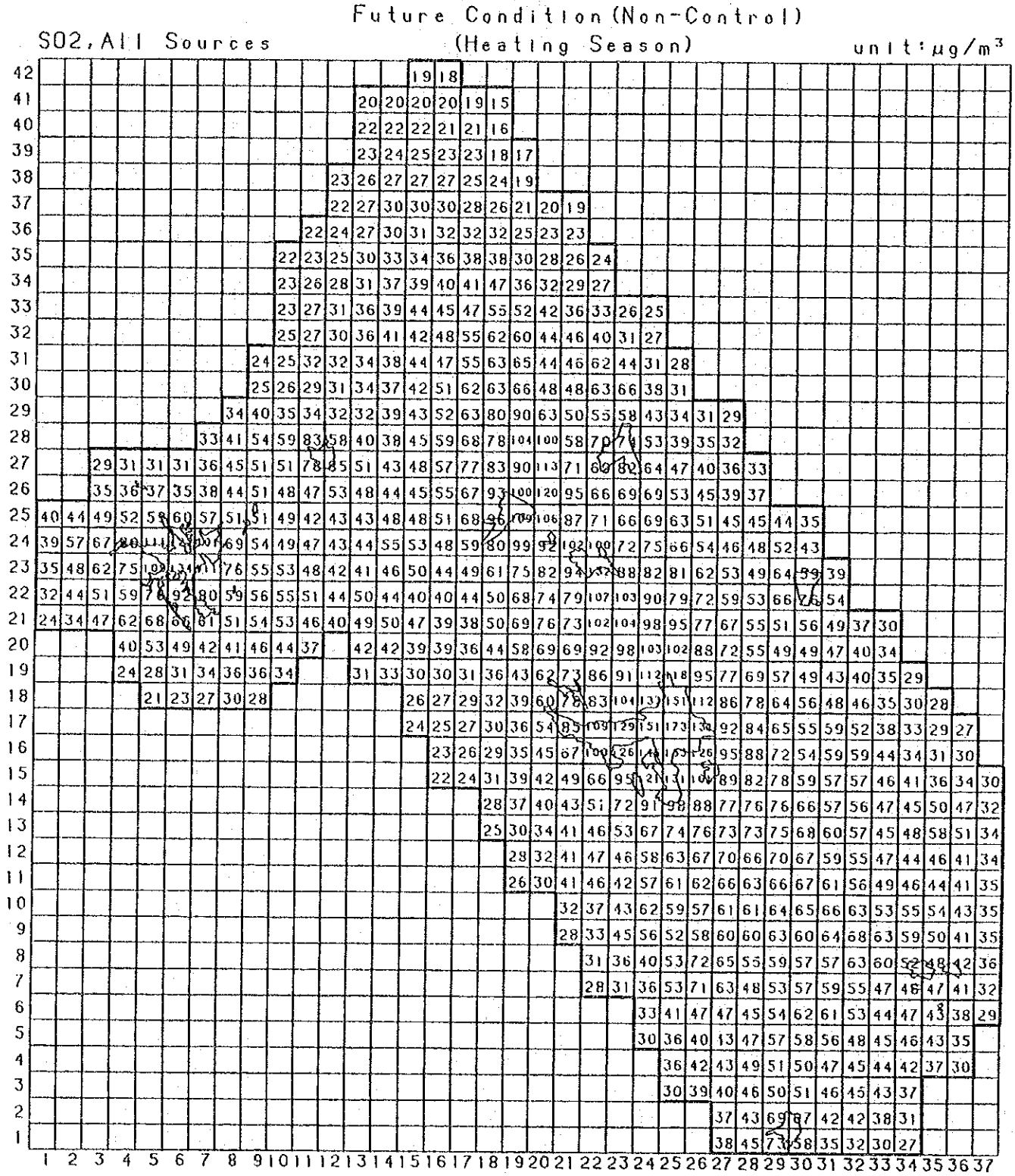

Figure D8.4.22 Average Concentration for SO2 in Heating Season (2005,Case F-0,All Sources)

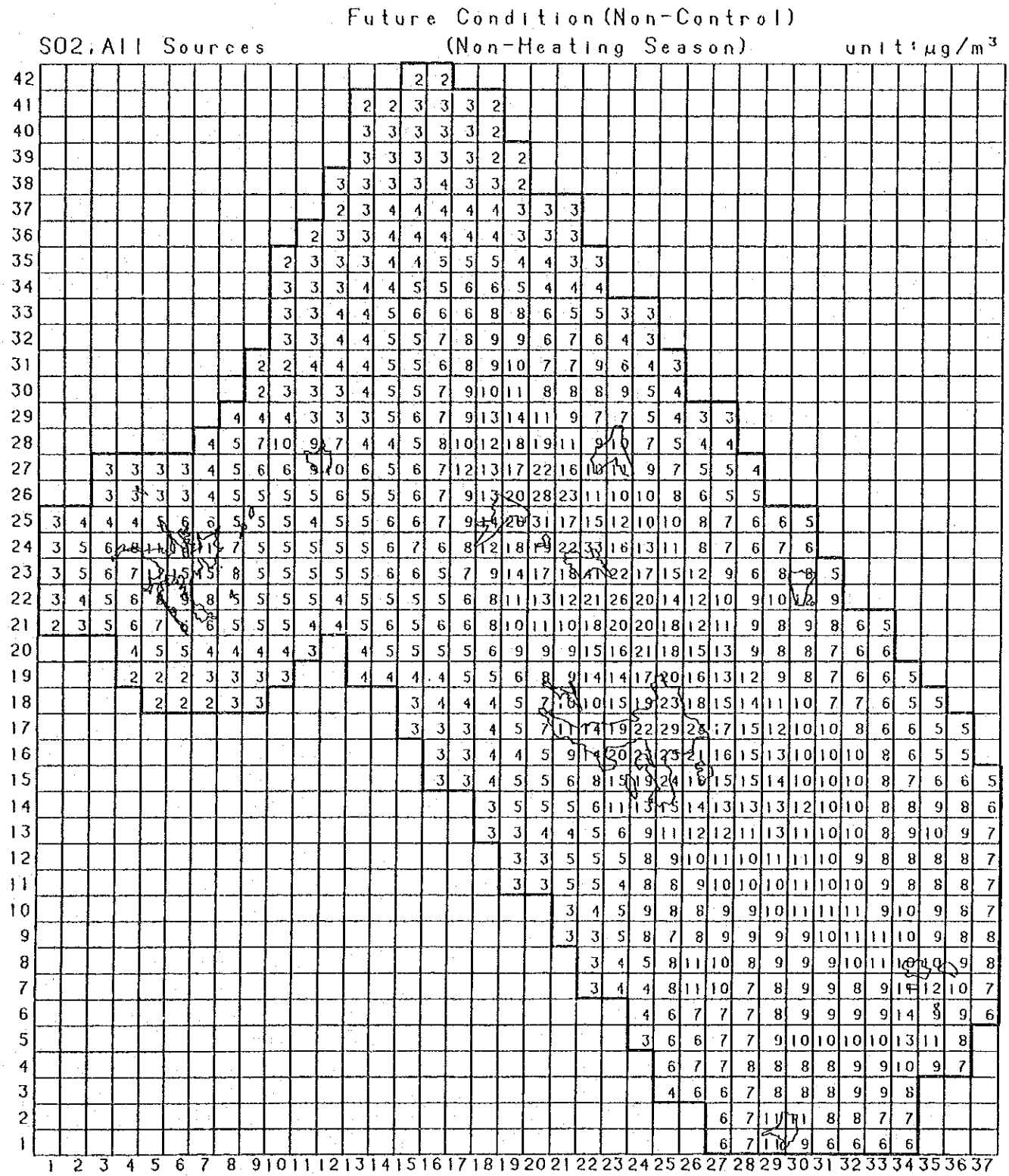

Figure D8.4.23 Average Concentration for SO2 in Non-heating Season (2005,Case F-0,All Sources)

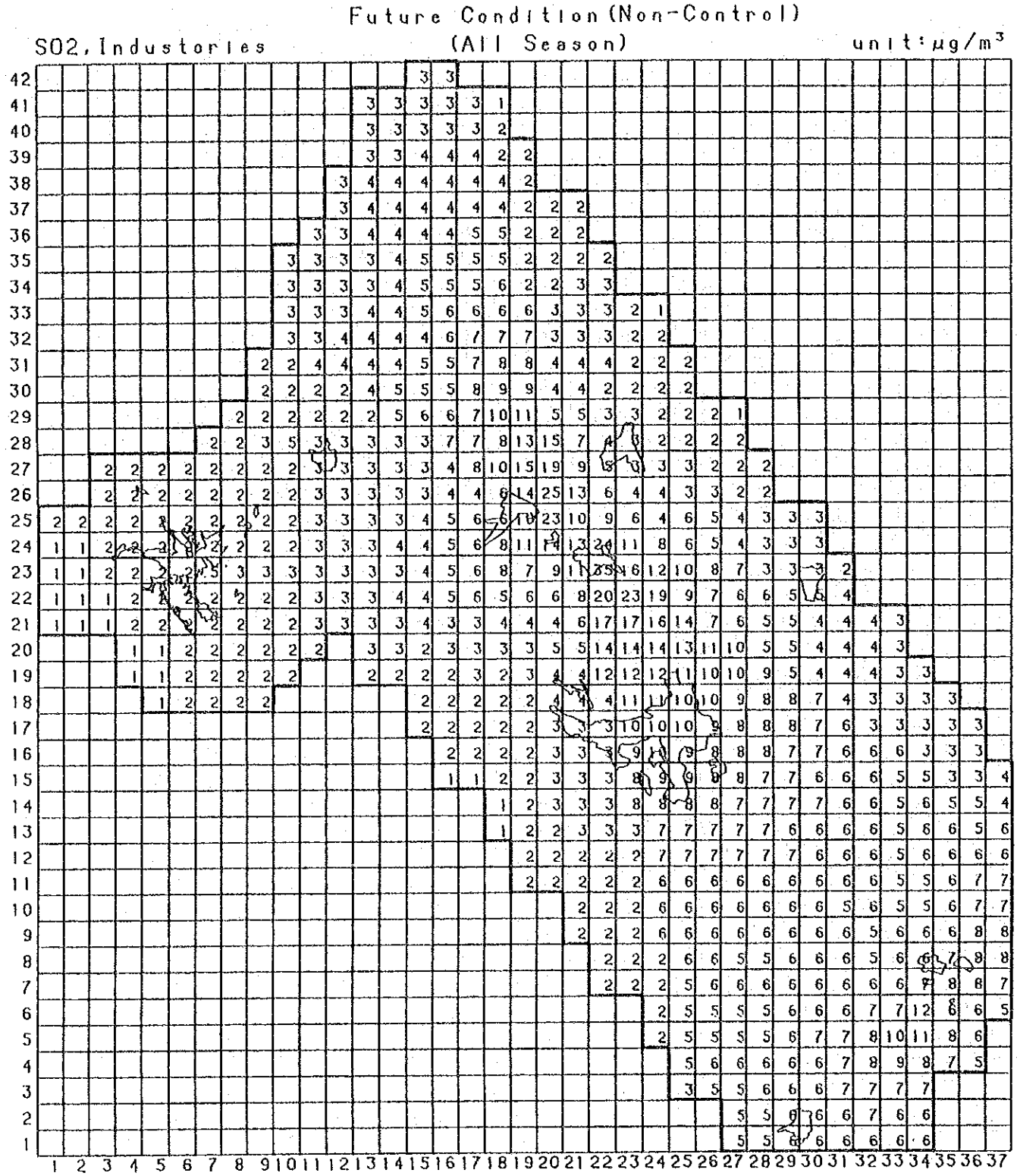

Figure D8.4.24 Annual Average Concentration for SO2 in 2005 (Case F-0,Industries)

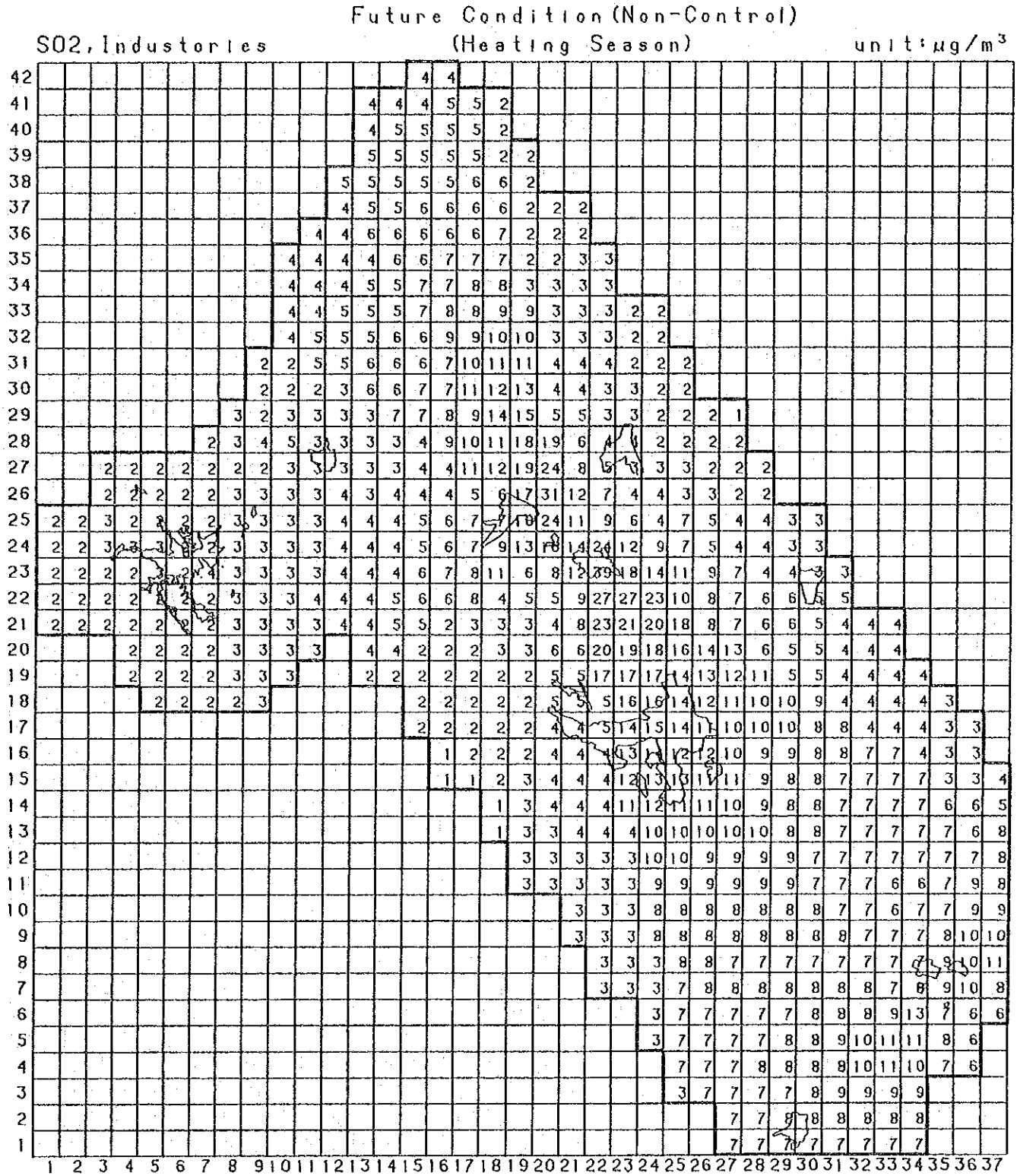

Figure D8.4.25 Average Concentration for SO2 in Heating Season (2005,Case F-0,Industries)

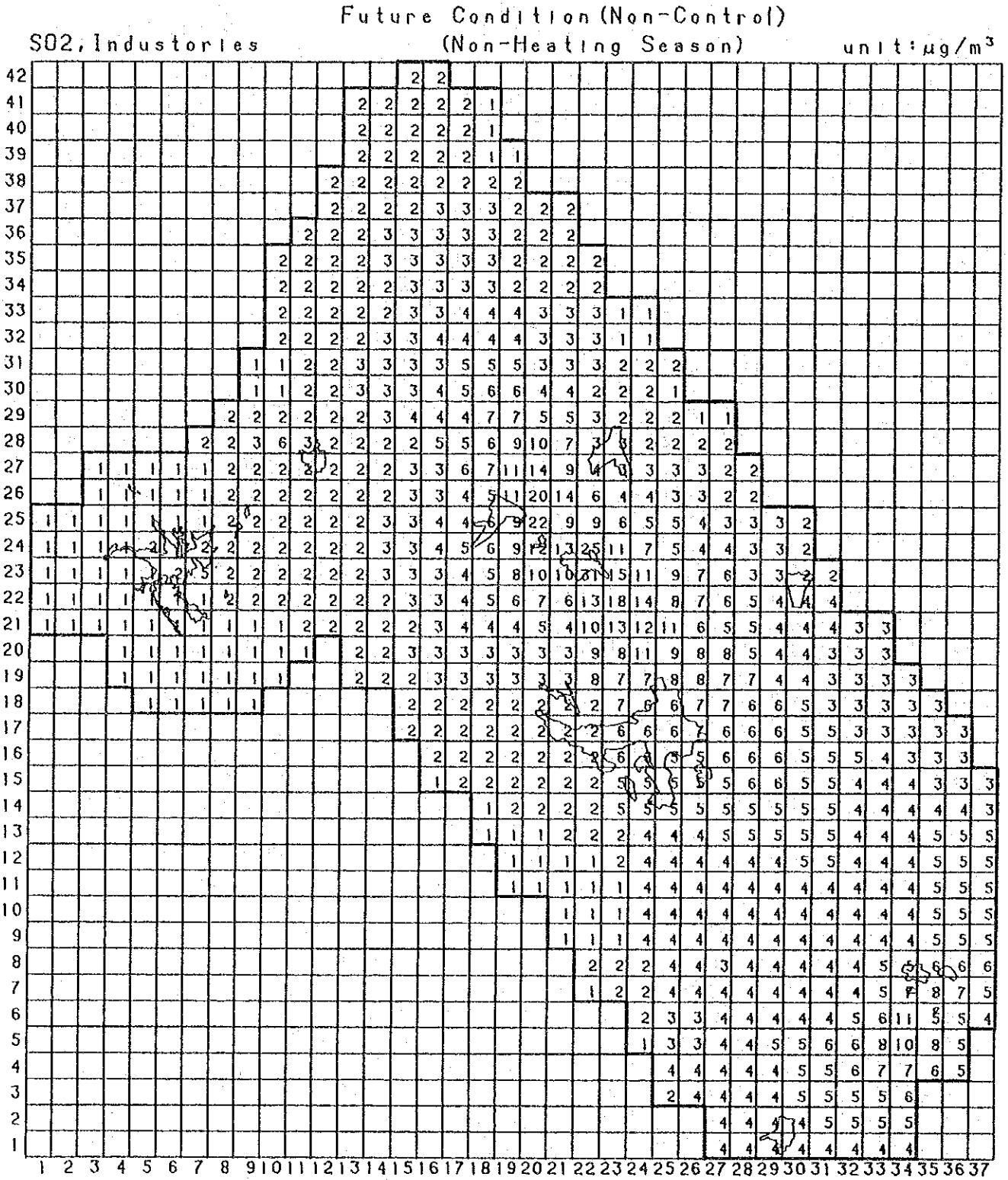

Figure D8.4.26 Average Concentration for SO2 in Non-heating Season (2005,Case F-0,Industries)

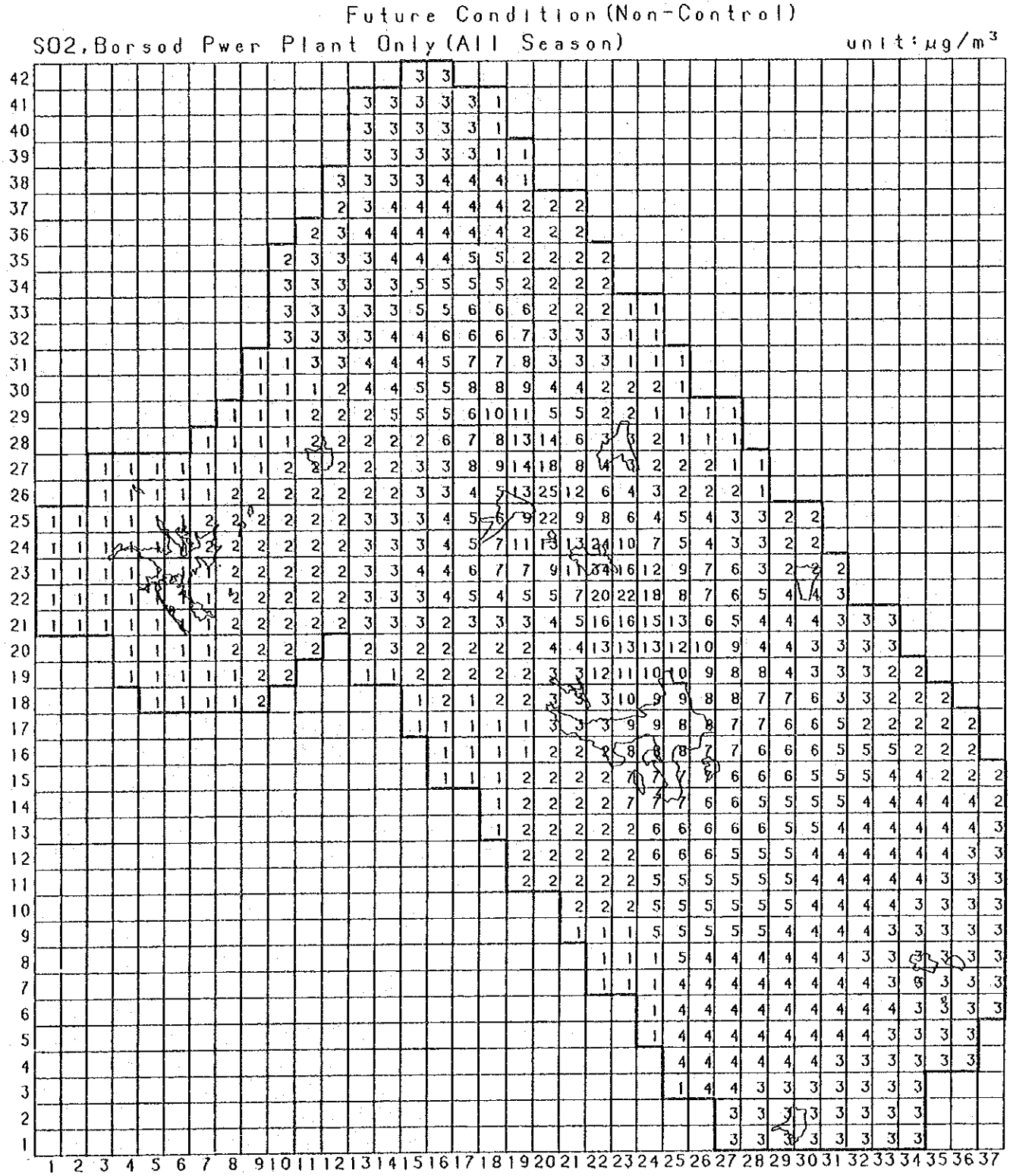

Figure D8.4.27 Annual Average Concentration for SO2 in 2005 (Case F-0,Borsod P.S.)

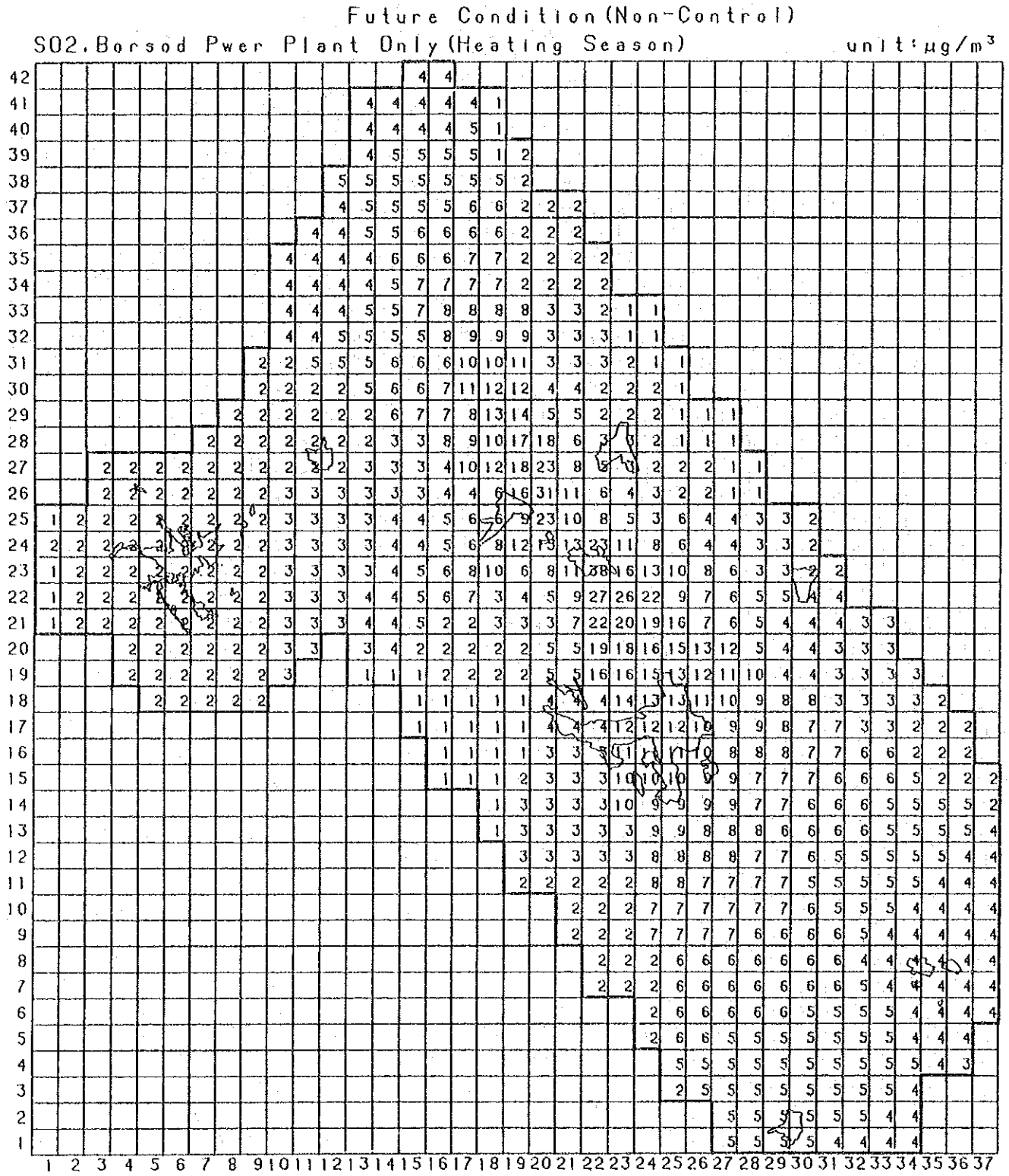

Figure D8.4.28 Average Concentration for SO2 in Heating Season (2005,Case F-0,Borsod P.S.)

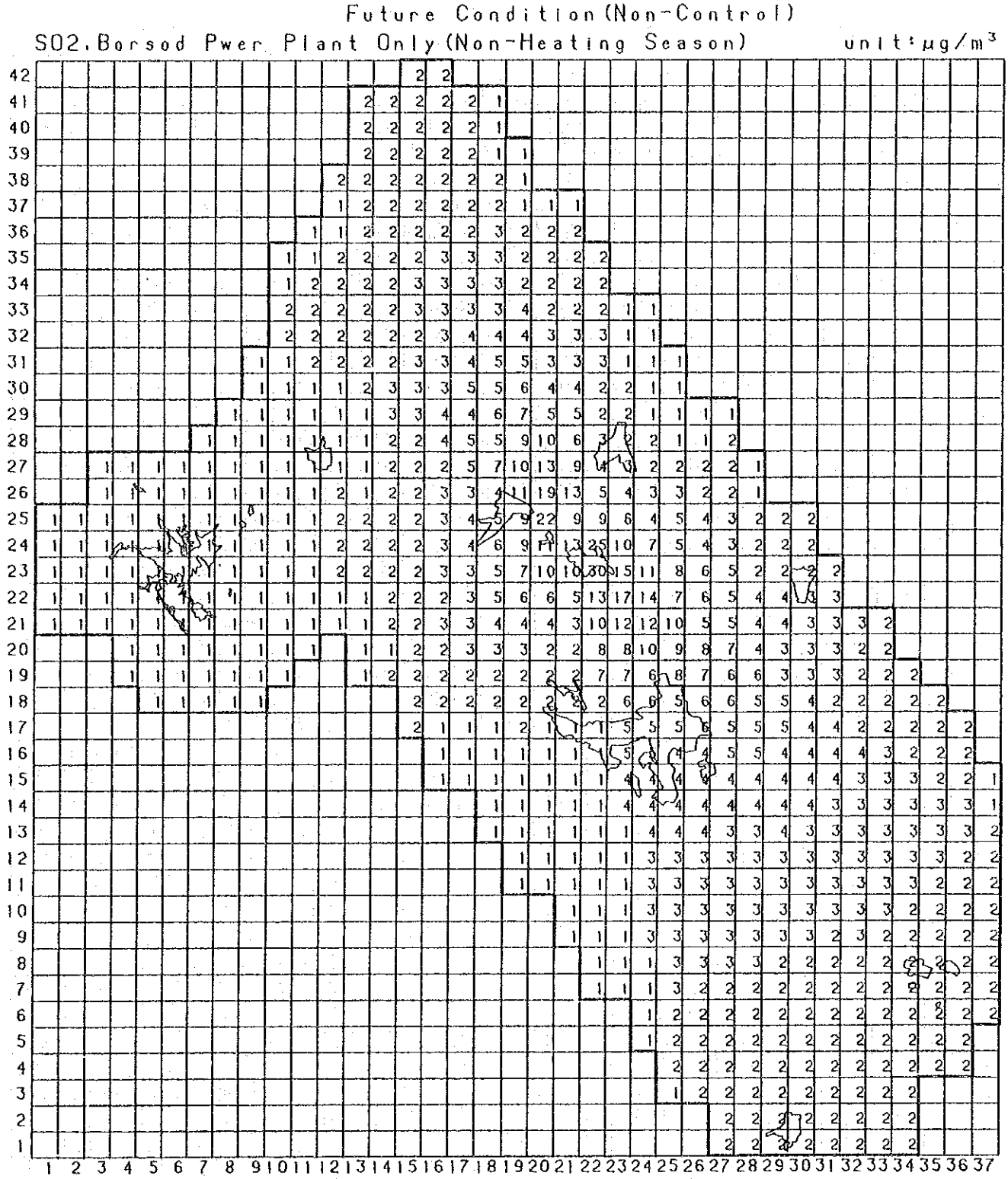

Figure D8.4.29 Average Concentration for SO2 in Non-heating Season (2005,Case F-0,Borsod P.S.)

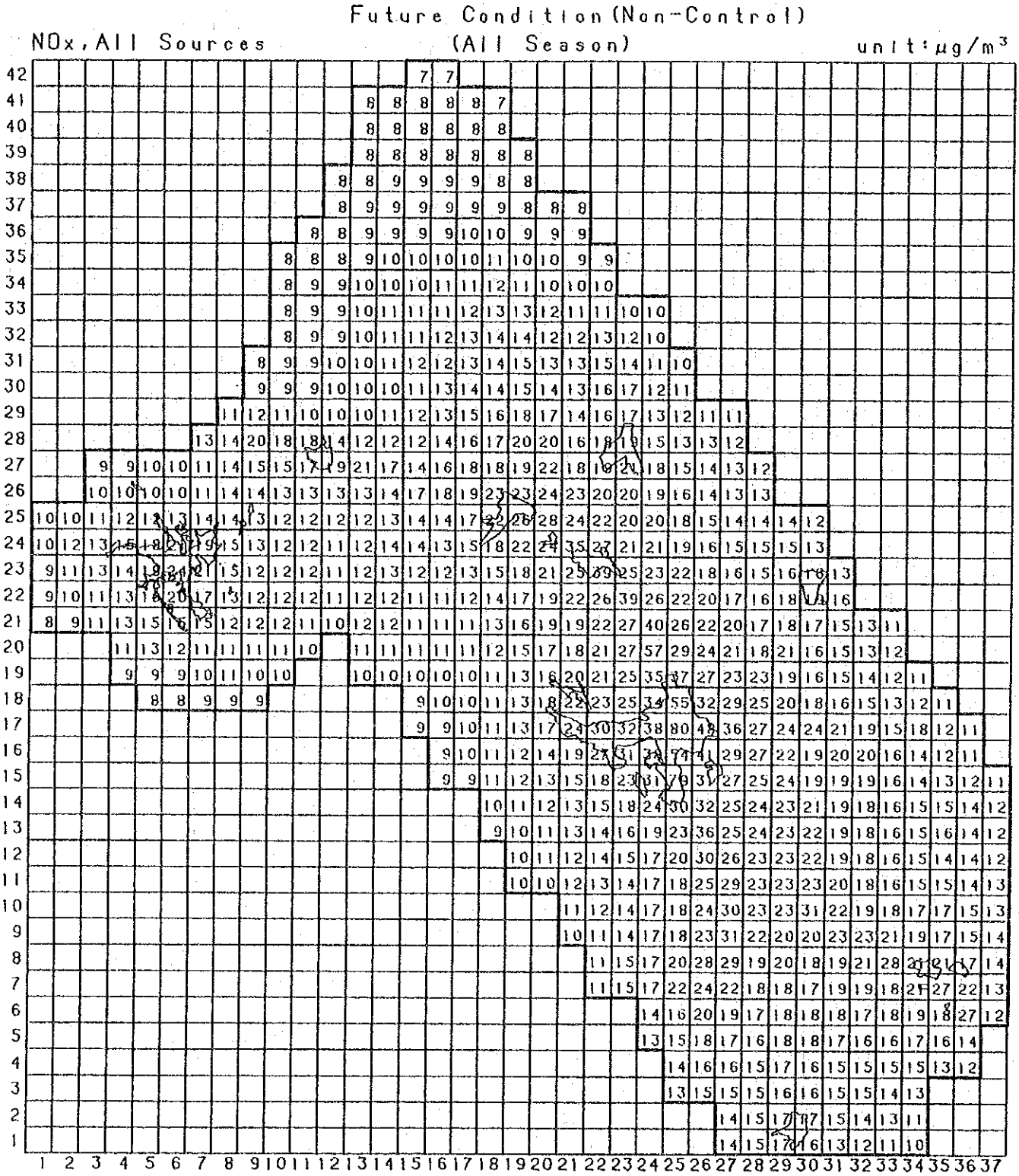

Figure D8.4.30 Annual Average Concentration for NOx in 2005 (Case F-0, All Sources)

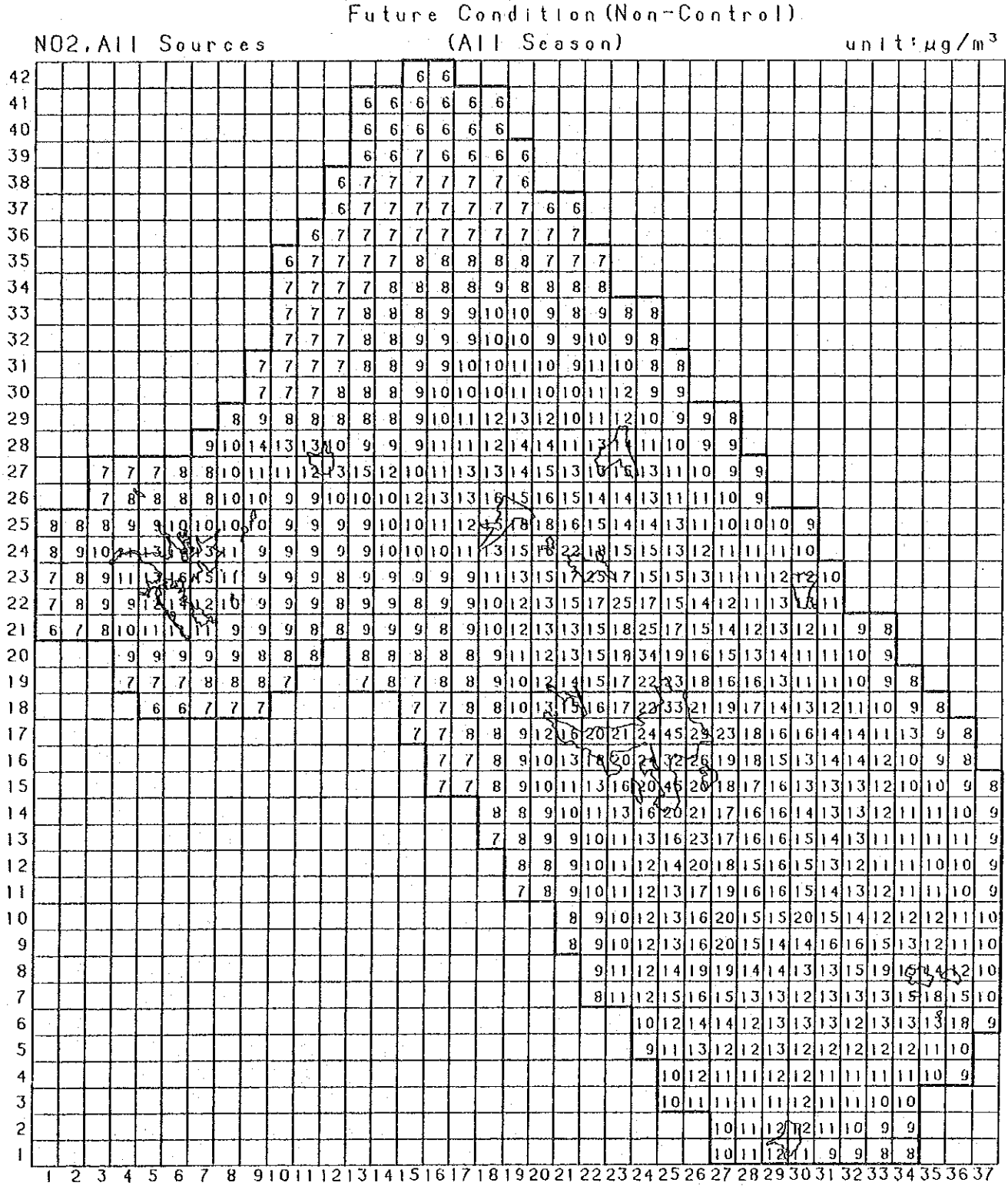

Figure D8.4.31 Annual Average Concentration for NO2 in 2005 (Case F-0,All Sources)

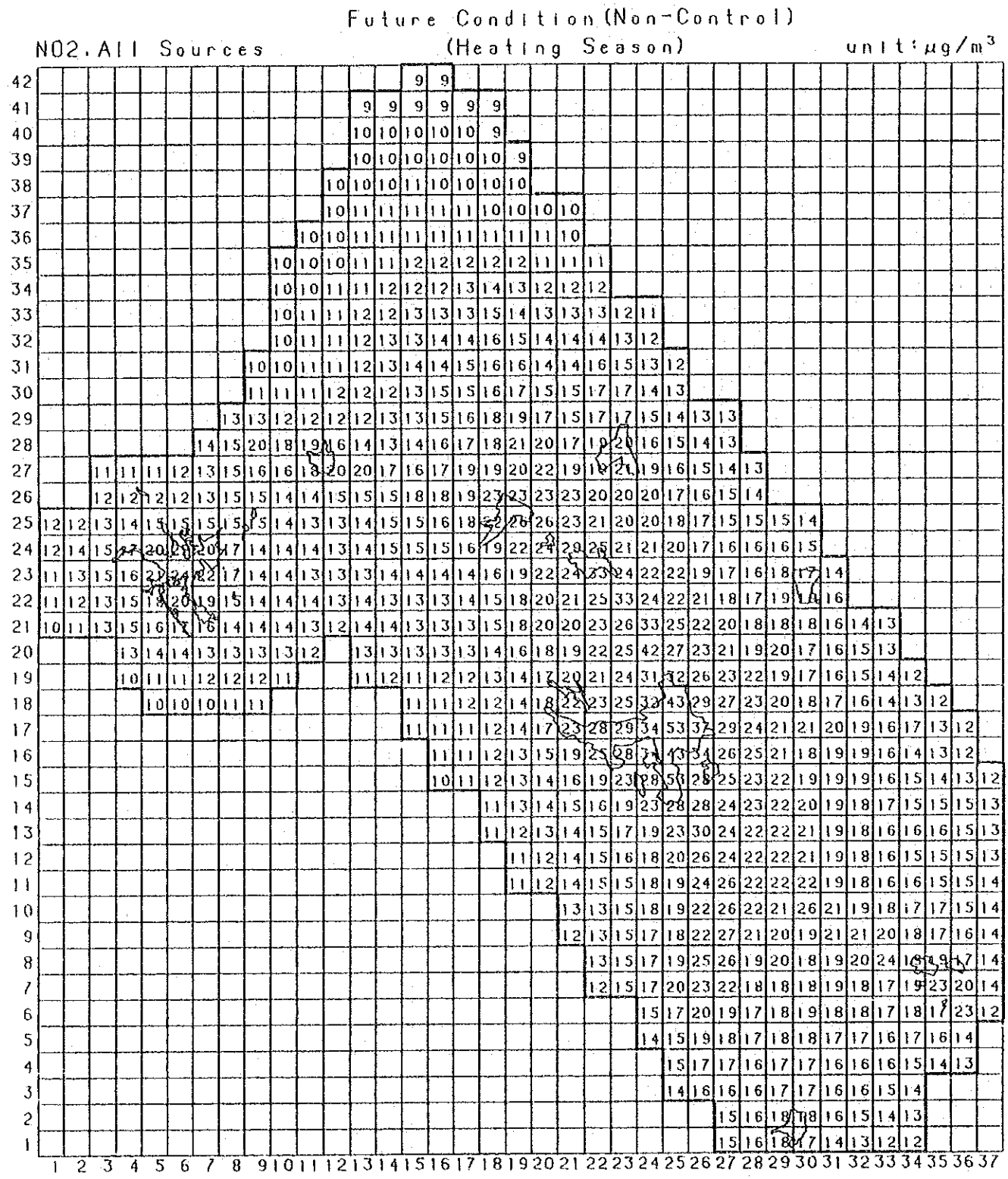

Figure D8.4.32 Average Concentration for NO2 in Heating Season (2005,Case F-0,All Sources)

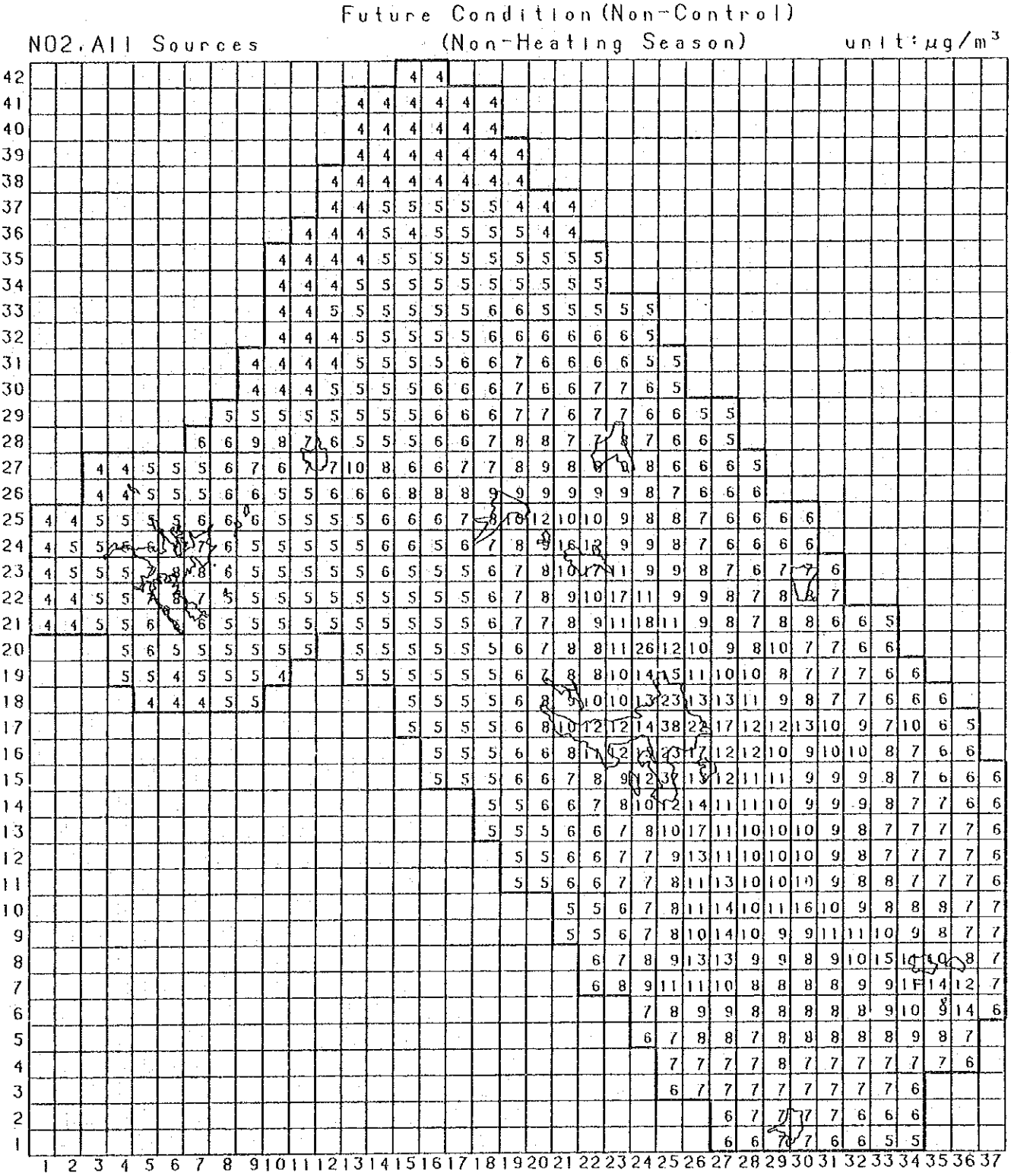

Figure D8.4.33 Average Concentration for NO2 in Non-heating Season ((2005,Case F-0,All Sources)

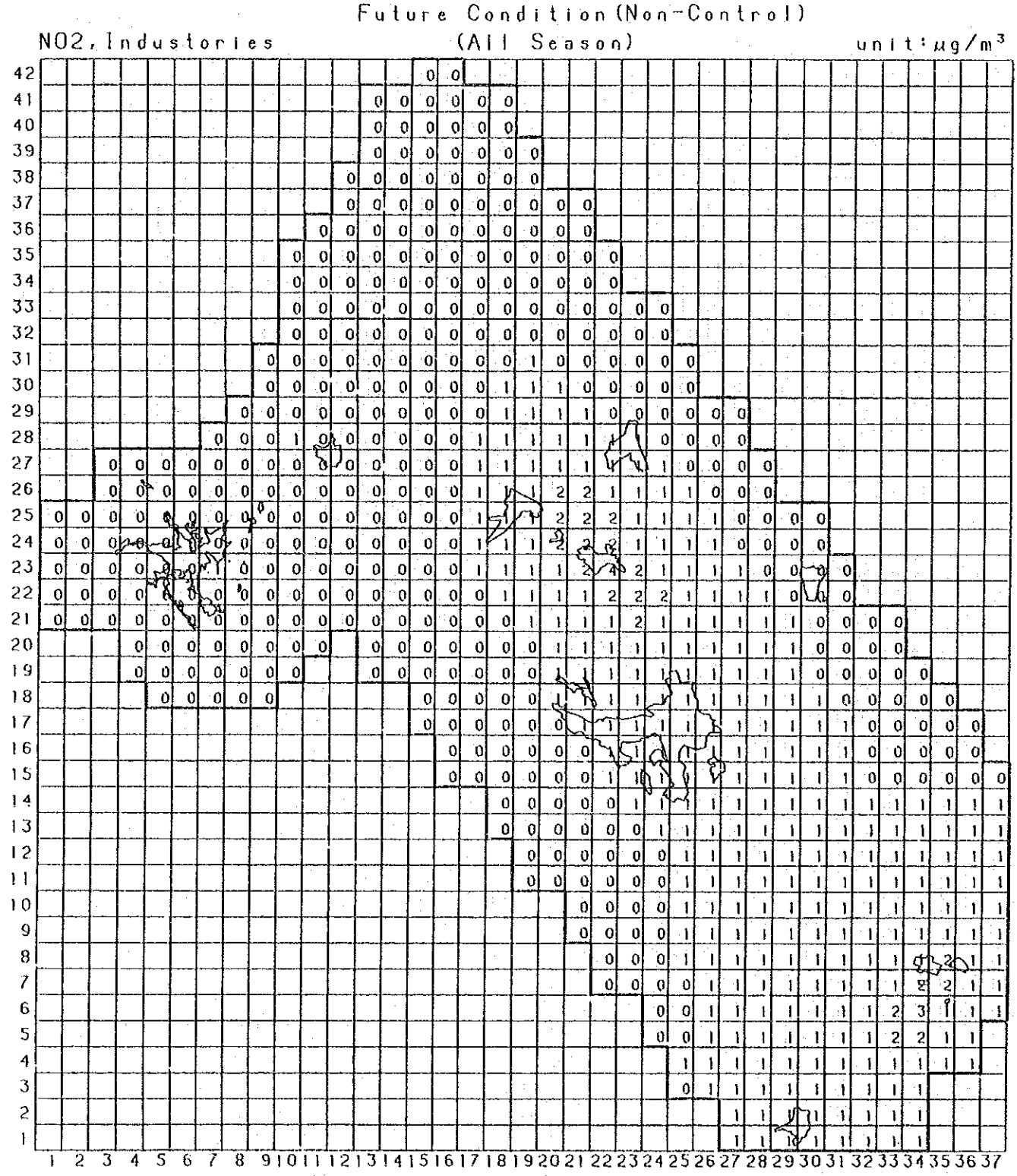

Figure D8.4.34 Annual Average Concentration for NO2 in 2005 (Case F-0,Industries)

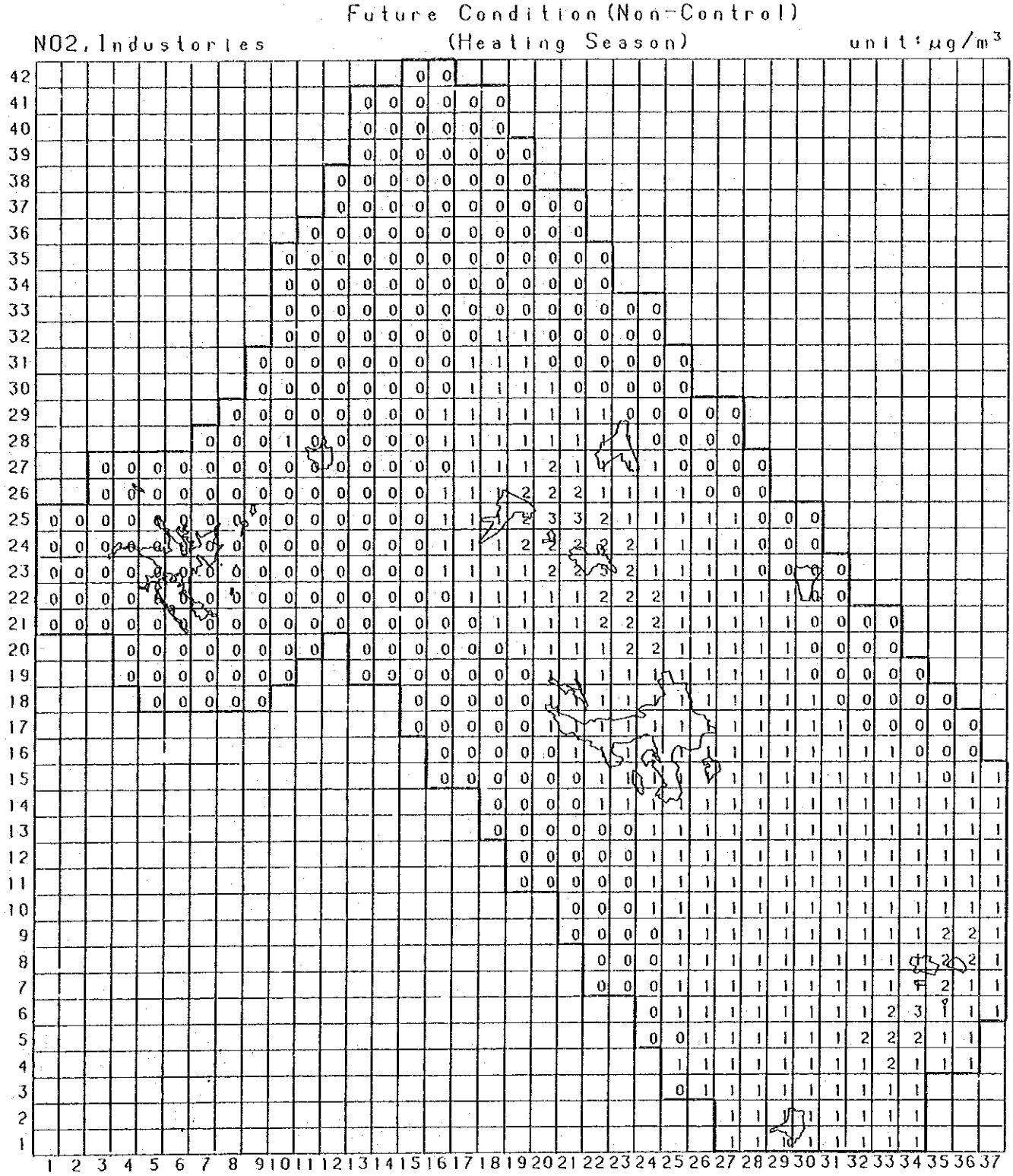

Figure D8.4.35 Average Concentration for NO2 in Heating Season (2005,Case F-0,Industries)