

Figure D8.4.36 Annual Average Concentration for NO2 in 2005 (Case F-0, Motor Vehicles)

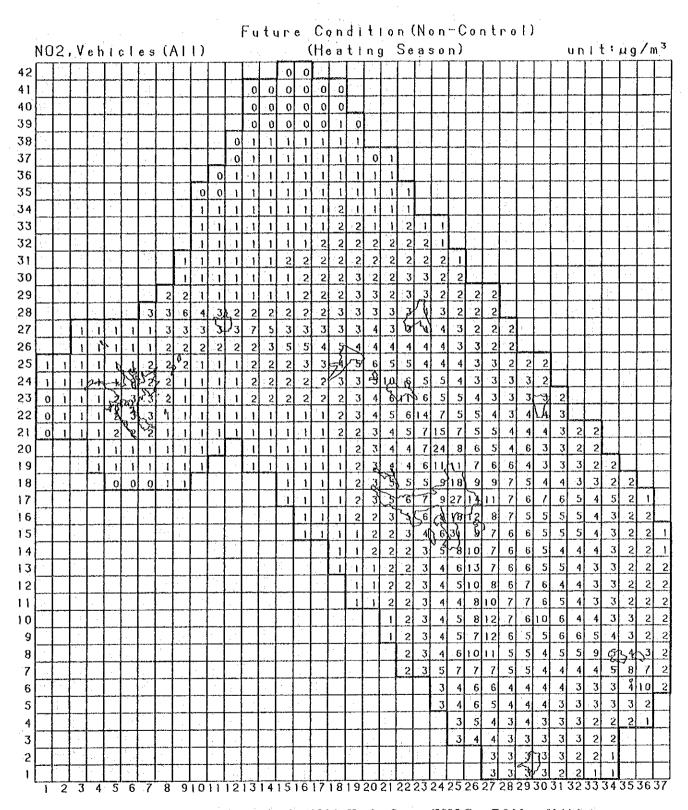


Figure D8.4.37 Average Concentration for NO2 in Heating Season (2005, Case F-0, Motor Vehicles)

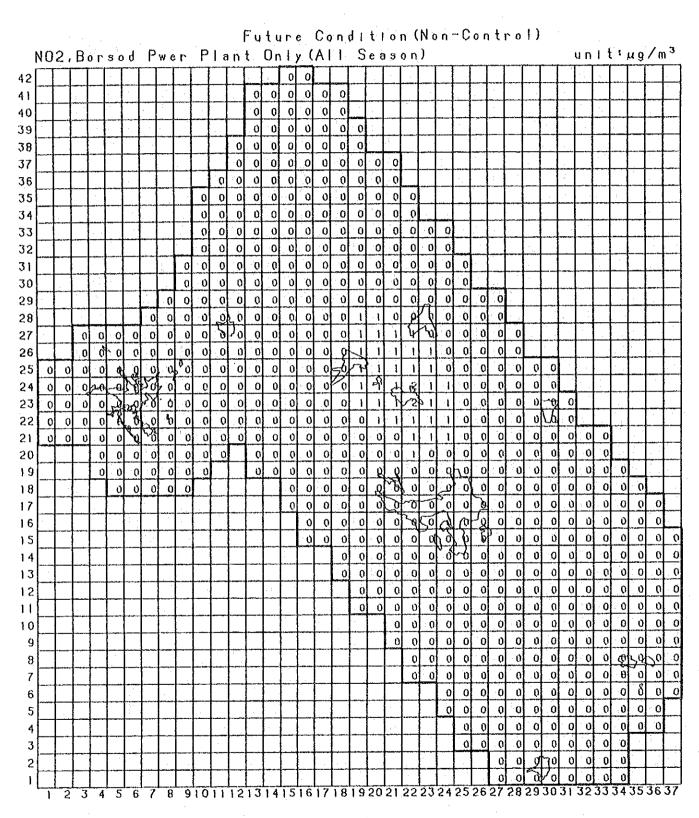


Figure D8.4.38 Annual Average Concentration for NO2 in 2005 (Case F-0, Borsod P.S.)

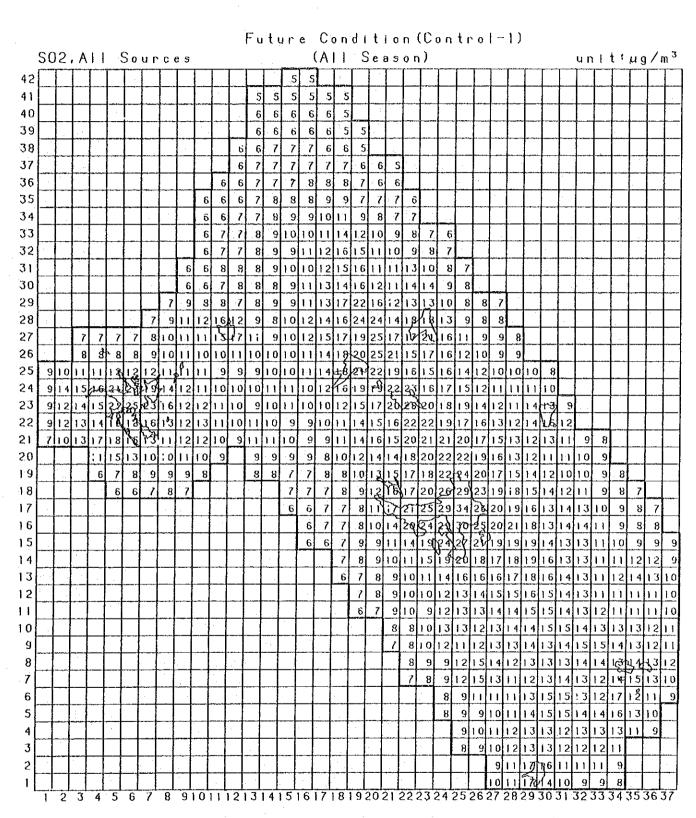


Figure D8.4.39 Annual Average Concentration for SO2 in 2005 (Case F-1, All Sources)

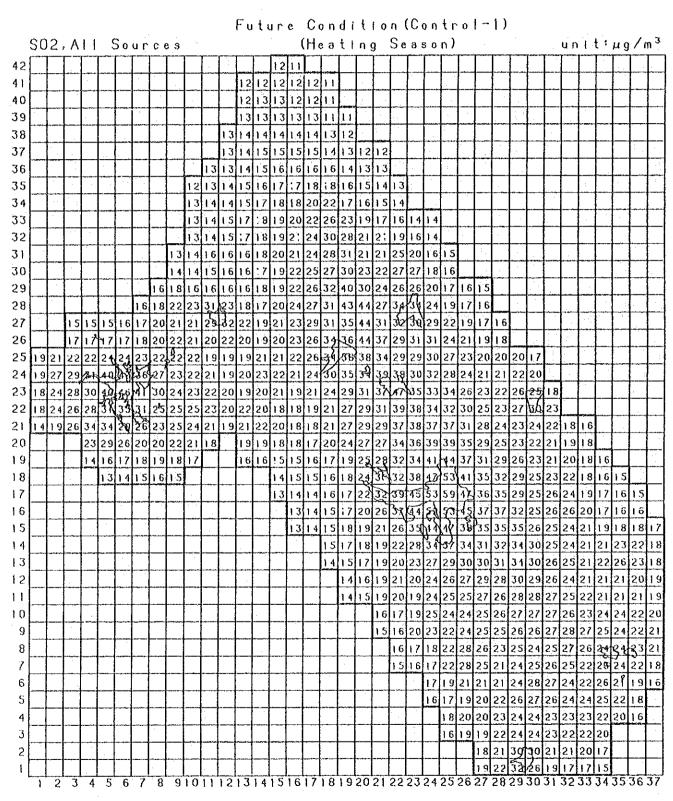


Figure D8.4.40 Average Concentration for SO2 in Heating Season (2005, Case F-1, All Sources)

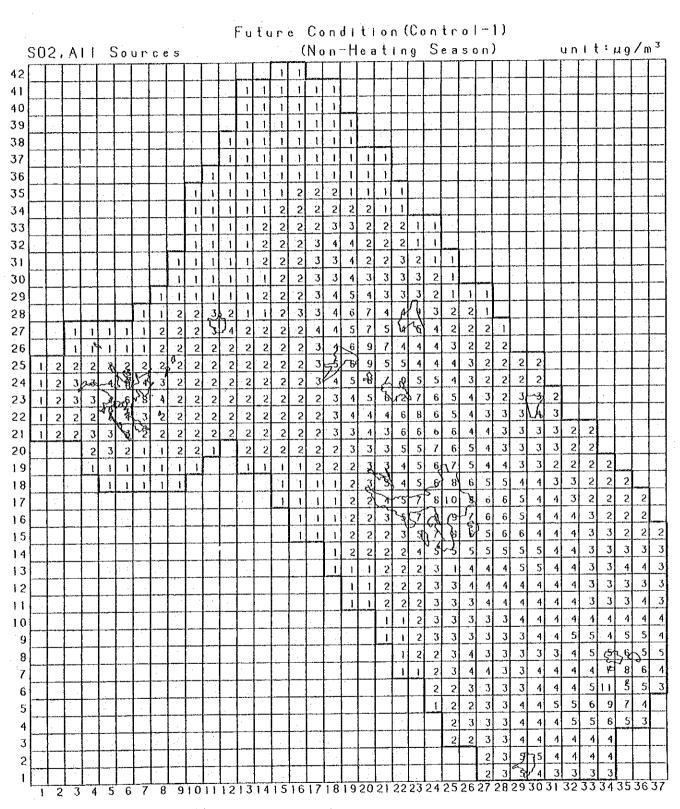


Figure D8.4.41 Average Concentration for SO2 in Non-heating Season (2005, Case F-1, All Sources)

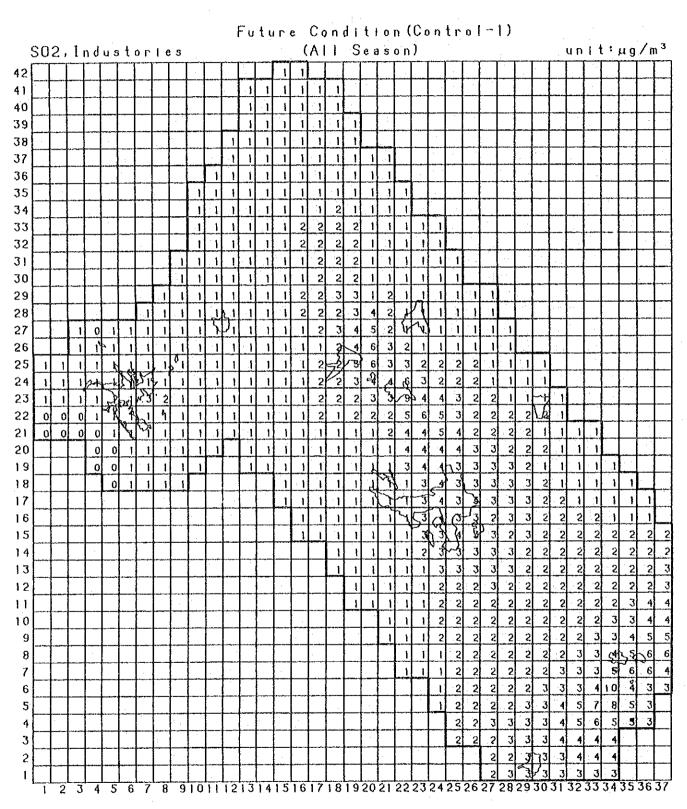


Figure D8.4.42 Annual Average Concentration for SO2 in 2005 (Case F-1, Industries)

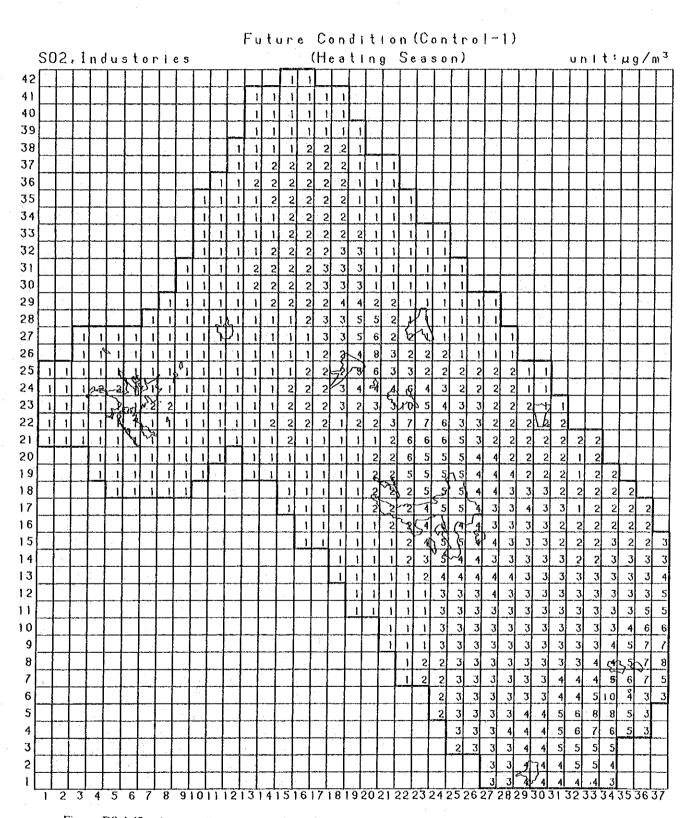


Figure D8.4.43 Average Concentration for SO2 in Heating Season (2005,Case F-1,Industries)

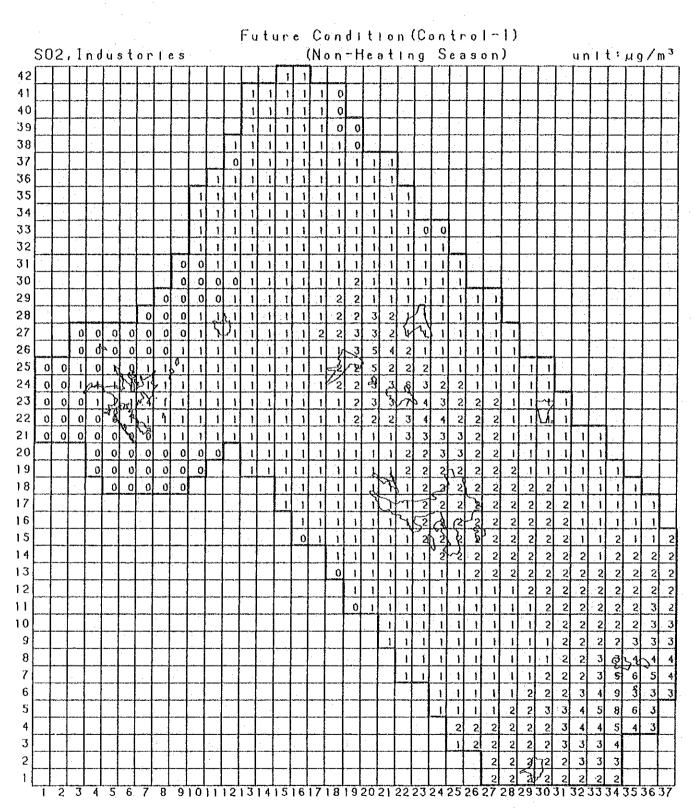


Figure D8.4.44 Average Concentration for SO2 in Non-heating Season (2005, Case F-1, Industries)

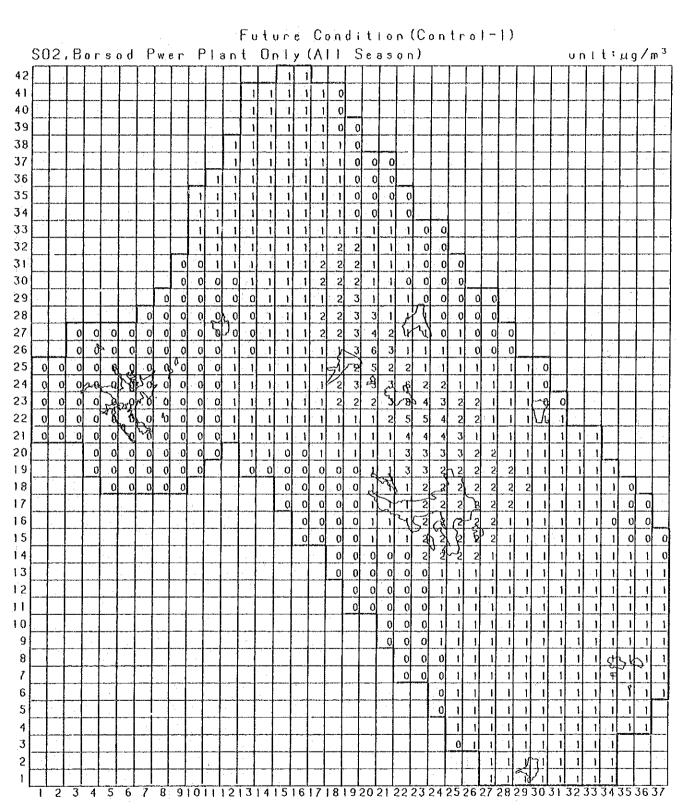


Figure D8.4.45 Annual Average Concentration for SO2 in 2005 (Case F-1, Borsod P.S.)

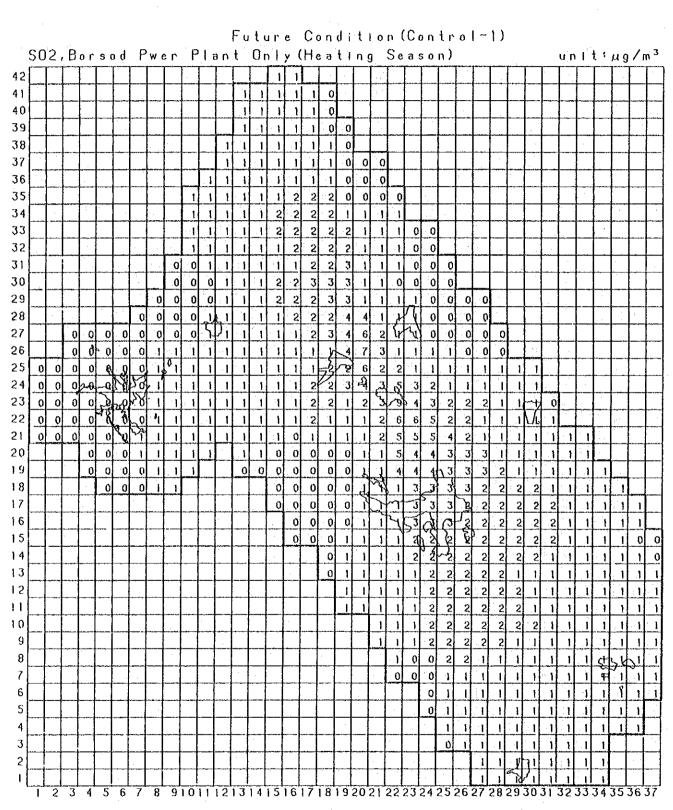


Figure D8.4.46 Average Concentration for SO2 in Heating Season (2005, Case F-1, Borsod P.S.)

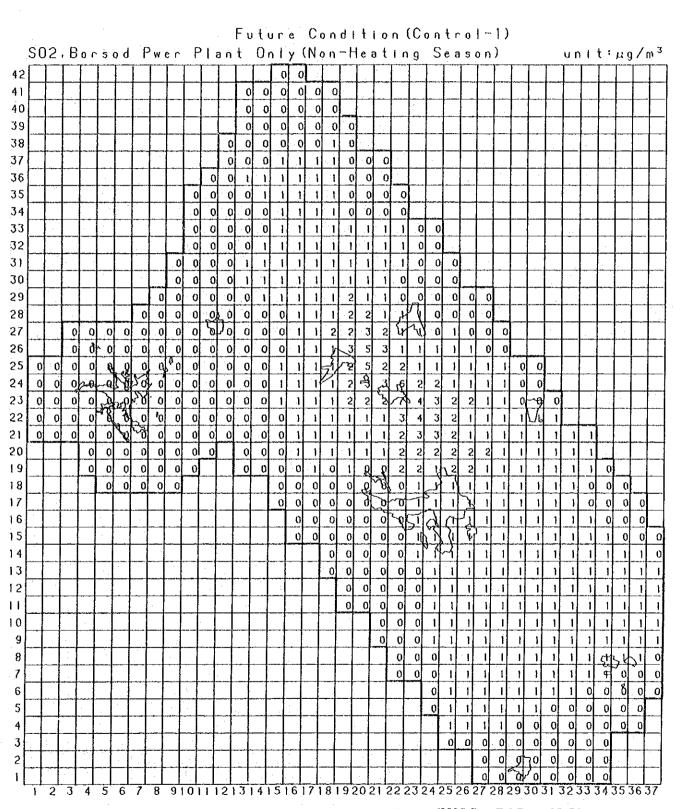


Figure D8.4.47 Average Concentration for SO2 in Non-heating Season (2005, Case F-1, Borsod P.S.)

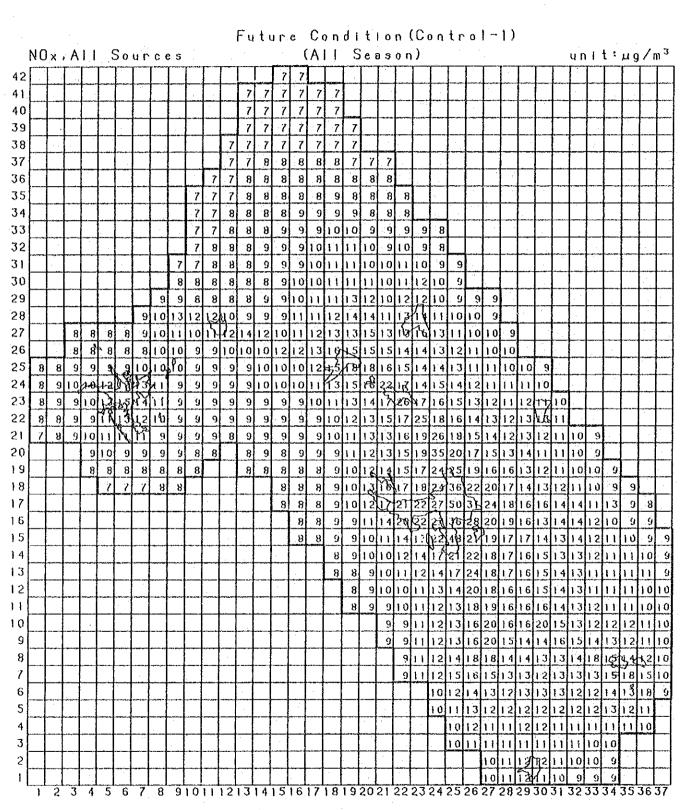


Figure D8.4.48 Annual Average Concentration for NOx in 2005 (Case F-1,All Sources)

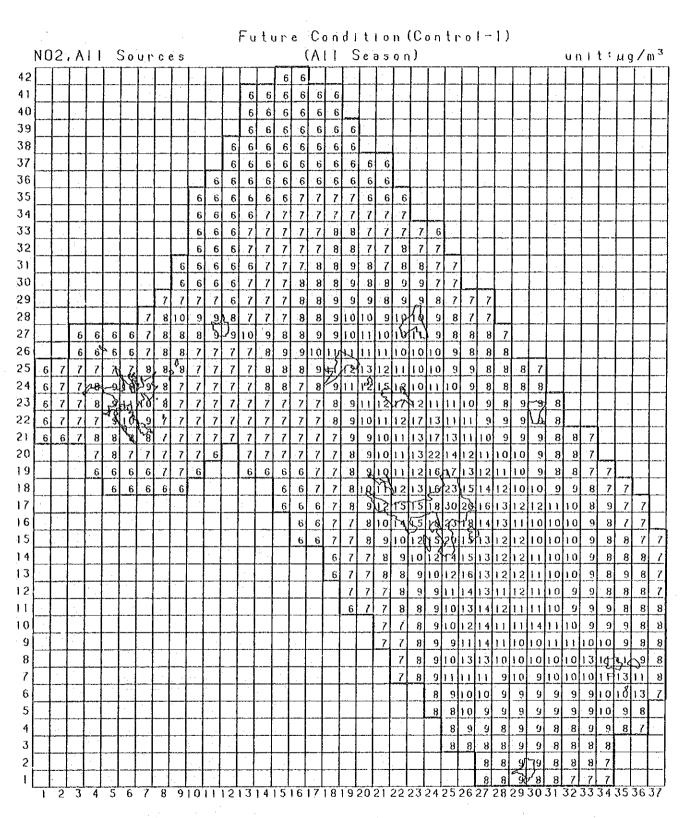


Figure D8.4.49 Annual Average Concentration for NO2 in 2005 (Case F-1, All Sources)

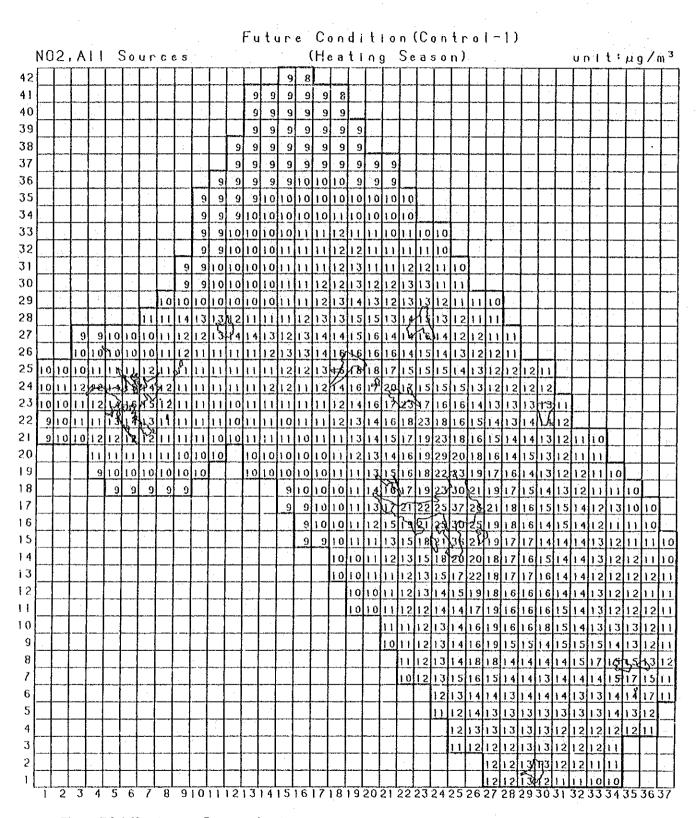


Figure D8.4.50 Average Concentration for NO2 in Heating Season (2005, Case F-1, All Sources)

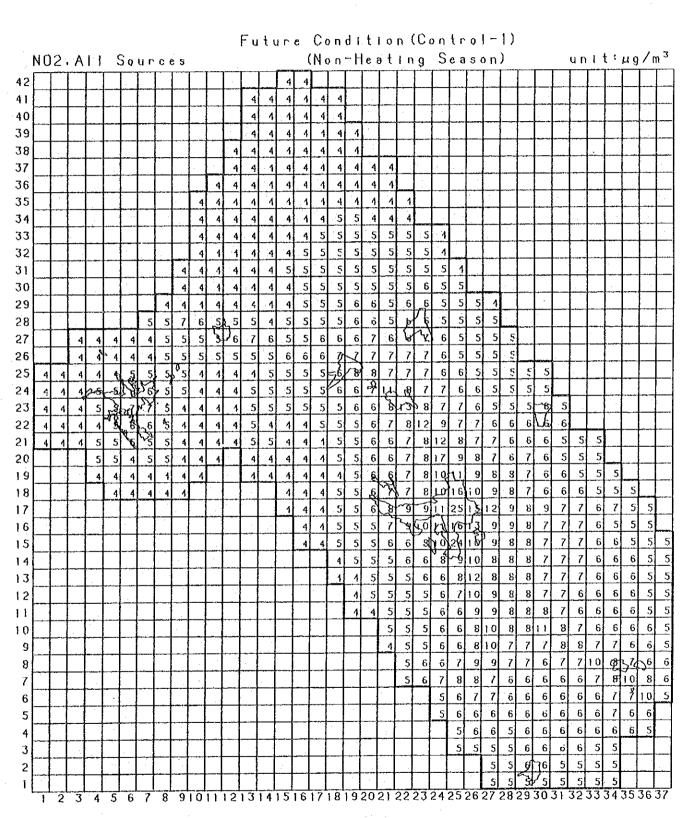


Figure D8.4.51 Average Concentration for NO2 in Non-heating Season (2005, Case F-1, All Sources)

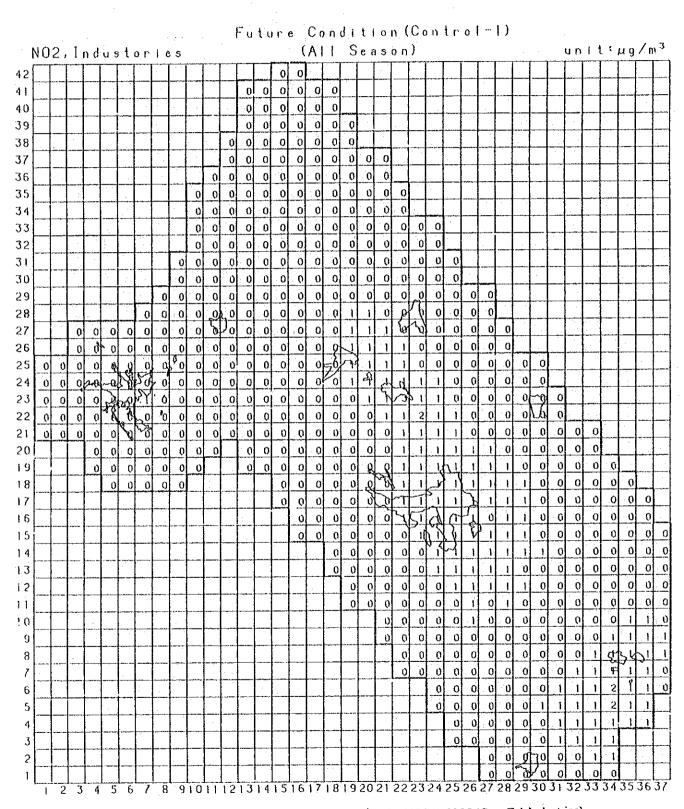


Figure D8.4.52 Annual Average Concentration for NO2 in 2005 (Case F-1, Industries)

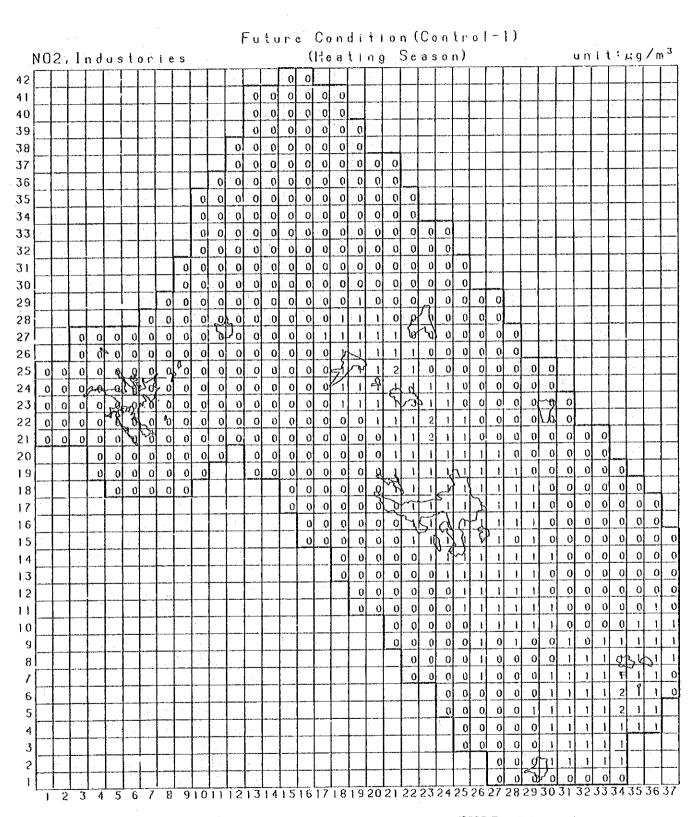


Figure D8.4.53 Average Concentration for NO2 in Heating Season (2005, Case F-1, Industries)

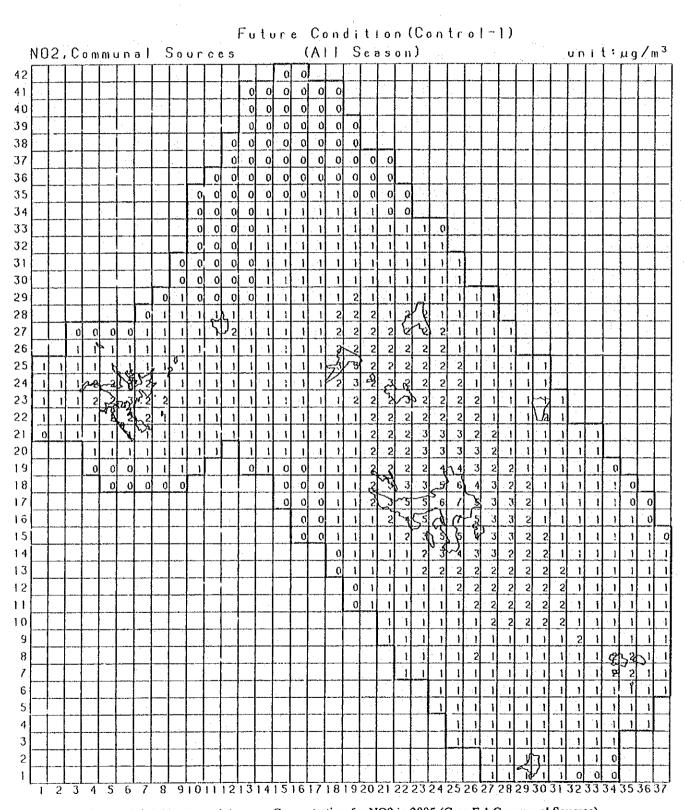


Figure D8.4.54 Annual Average Concentration for NO2 in 2005 (Case F-1, Communal Sources)

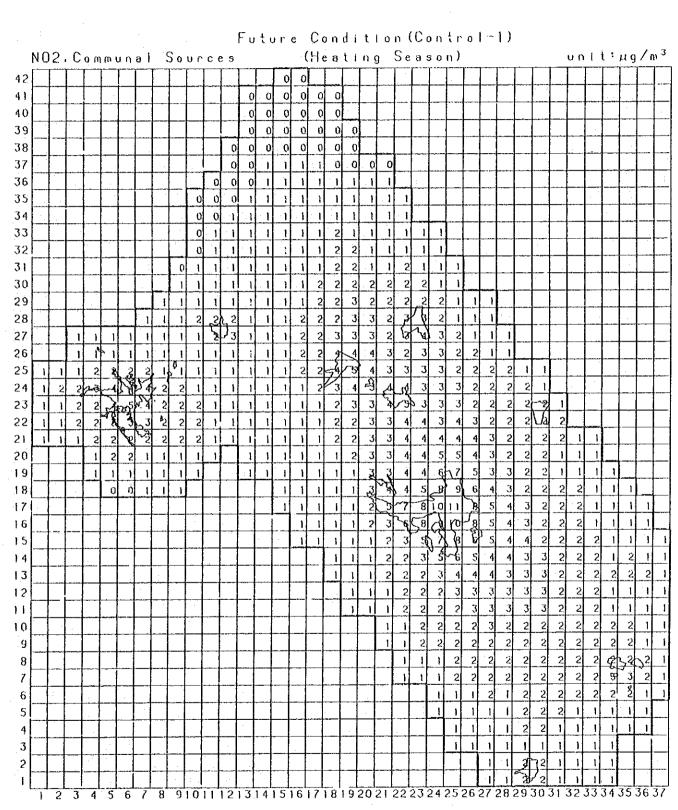


Figure D8.4.55 Average Concentration for NO2 in Heating Season (2005, Case F-1, Communal Sources)

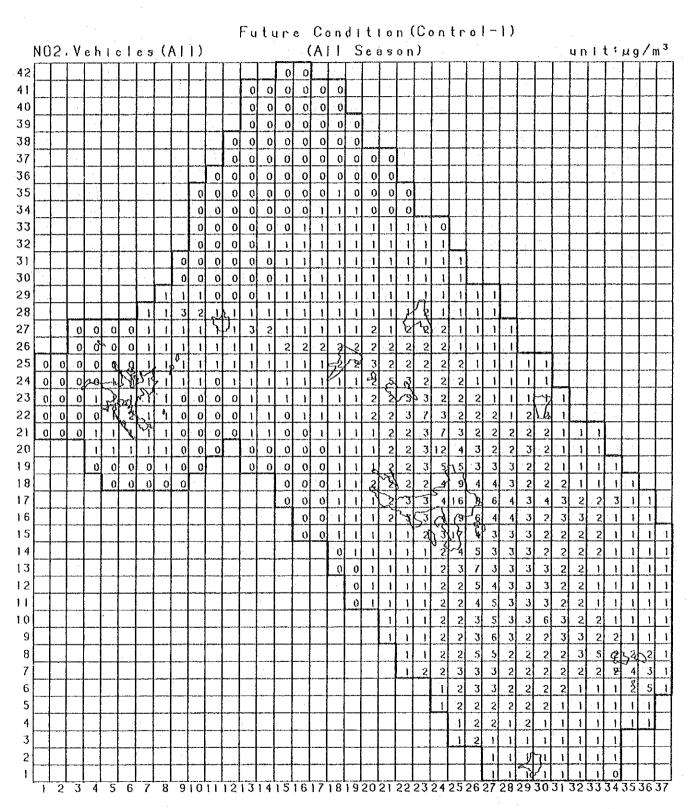


Figure D8.4.56 Annual Average Concentration for NO2 in 2005 (Case F-1, Motor Vehicles)

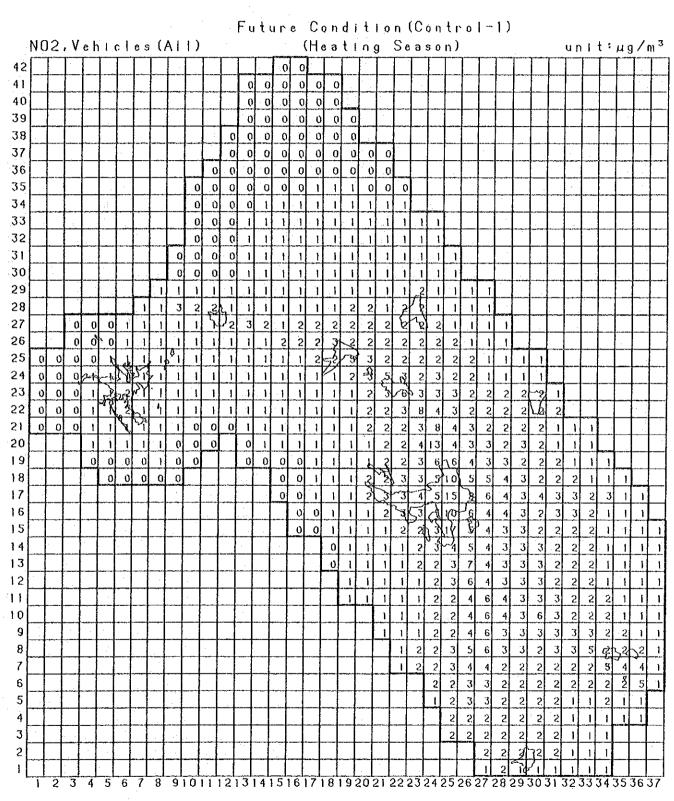


Figure D8.4.57 Average Concentration for NO2 in Heating Season (2005, Case F-1, Motor Vehicles)

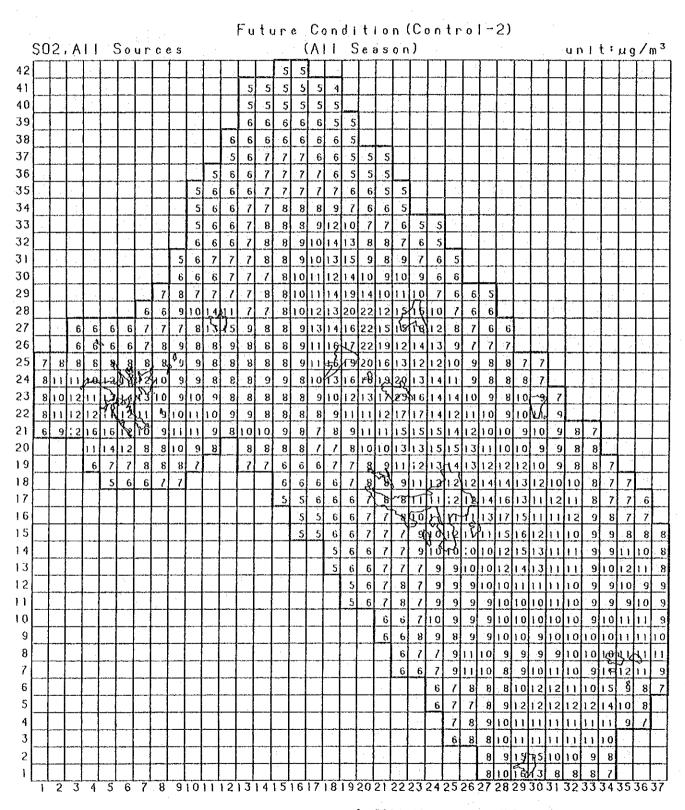


Figure D8.4.58 Annual Average Concentration for SO2 in 2005(Case F-2,All Sources)

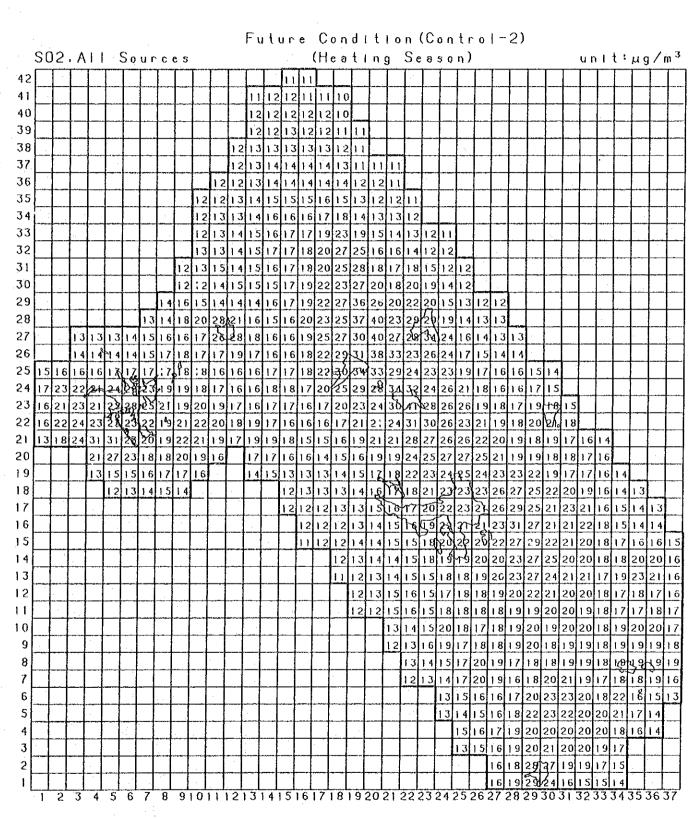


Figure D8.4.59 Average Concentration for SO2 in Heating Season (2005, Case F-2, All Sources)

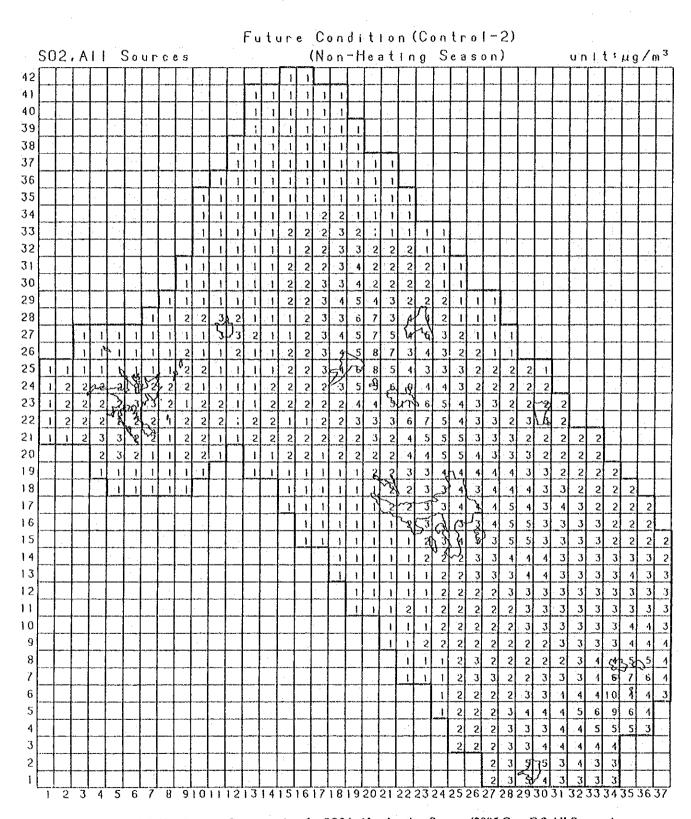


Figure D8.4.60 Average Concentration for SO2 in Non-heating Season (2005, Case F-2, All Sources)

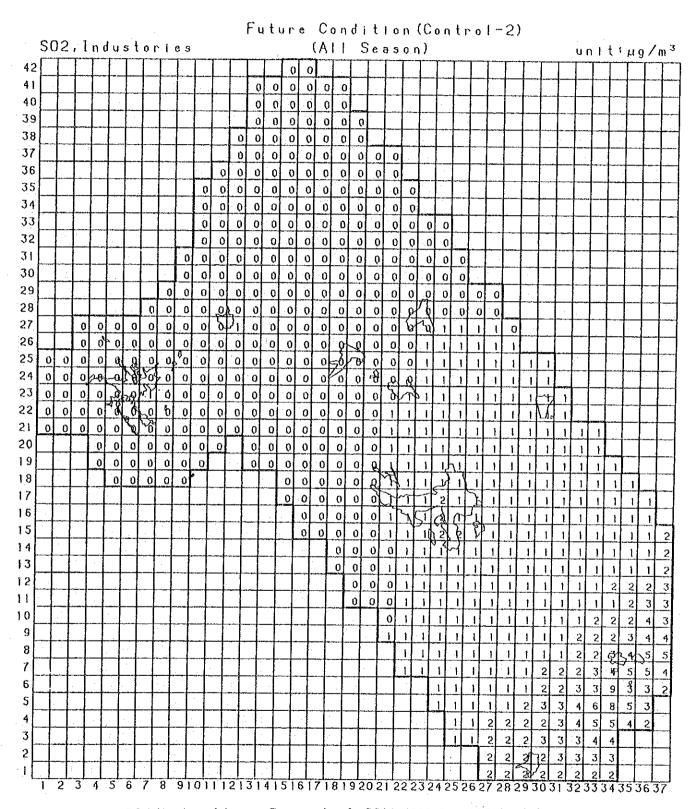


Figure D8.4.61 Annual Average Concentration for SO2 in 2005 (Case F-2, Industries)

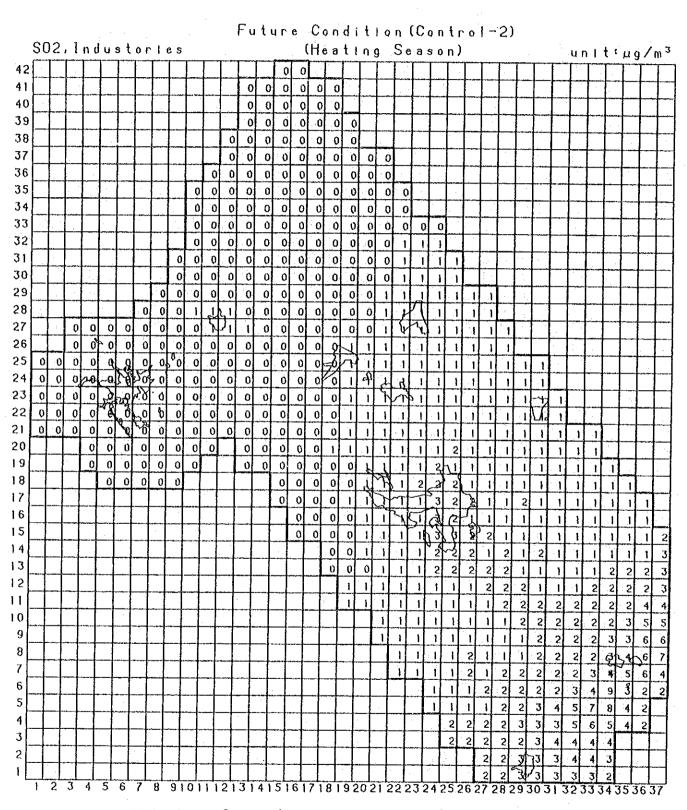


Figure D8.4.62 Average Concentration for SO2 in Heating Season (2005, Case F-2, Industries)

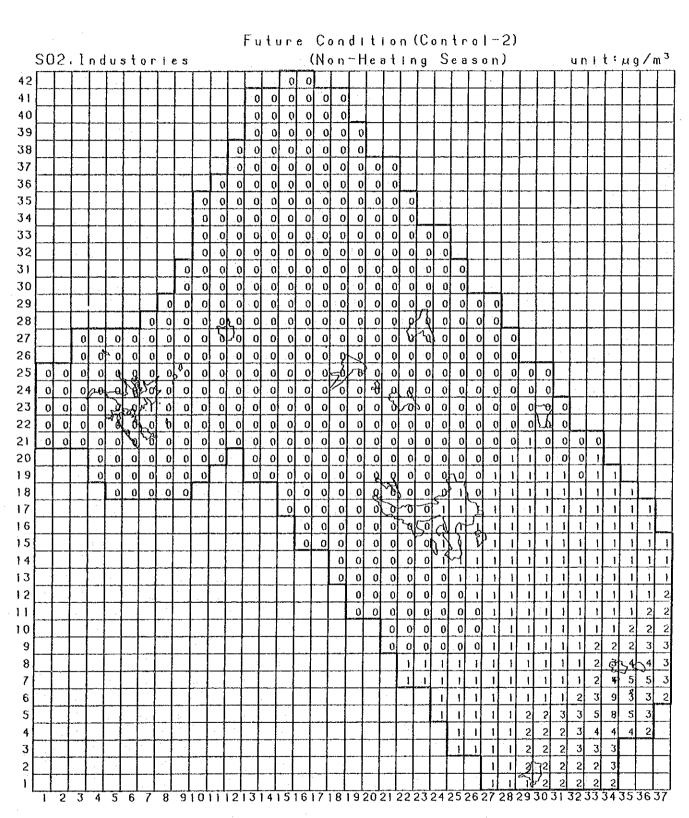


Figure D8.4.63 Average Concentration for NO2 in Non-heating Season (2005, Case F-2, Industries)

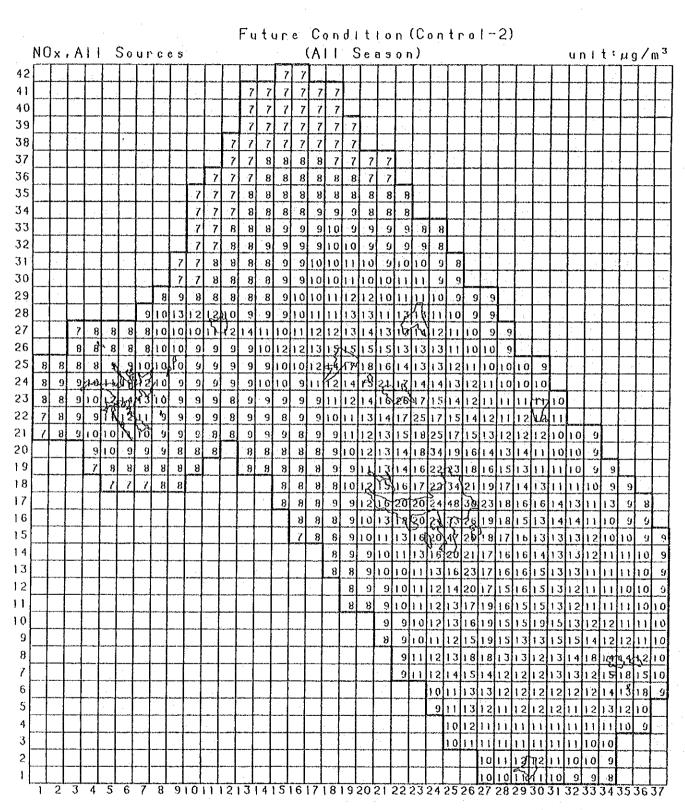


Figure D8.4.64 Annual Average Concentration for NOx in 2005 (Case F-2,All Sources)

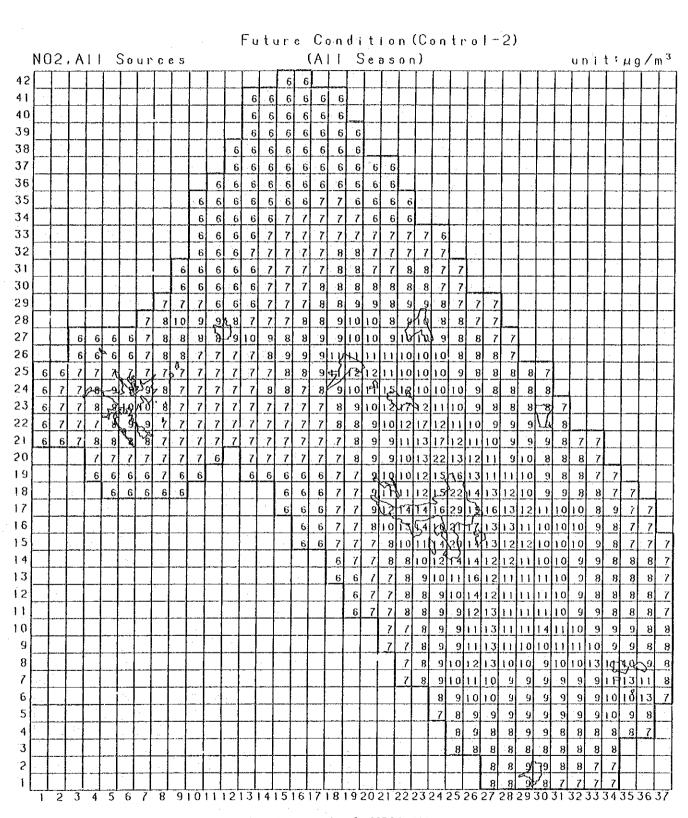


Figure D8.4.65 Annual Average Concentration for NO2 in 2005 (Case F-2, All Sources)

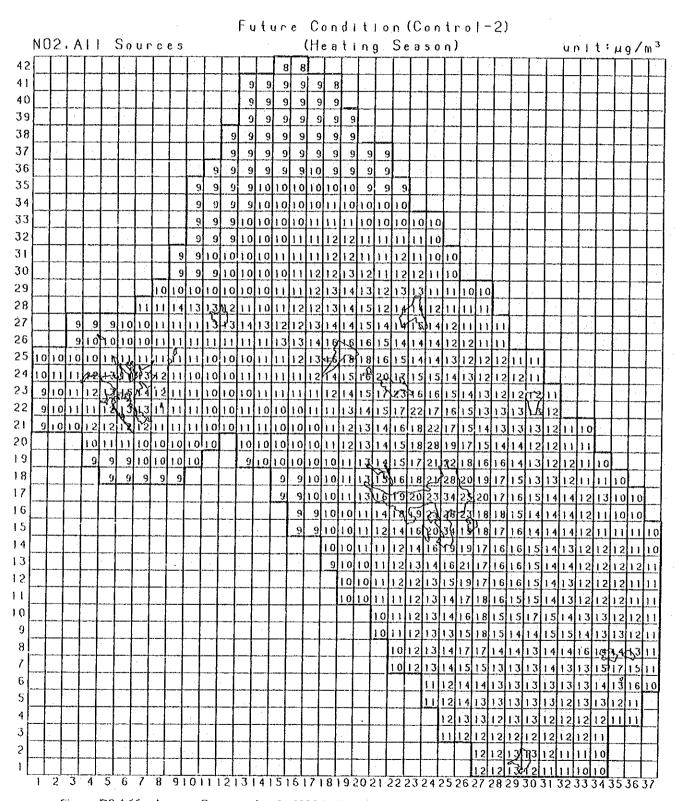


Figure D8.4.66 Average Concentration for NO2 in Heating Season (2005, Case F-2, All Sources)

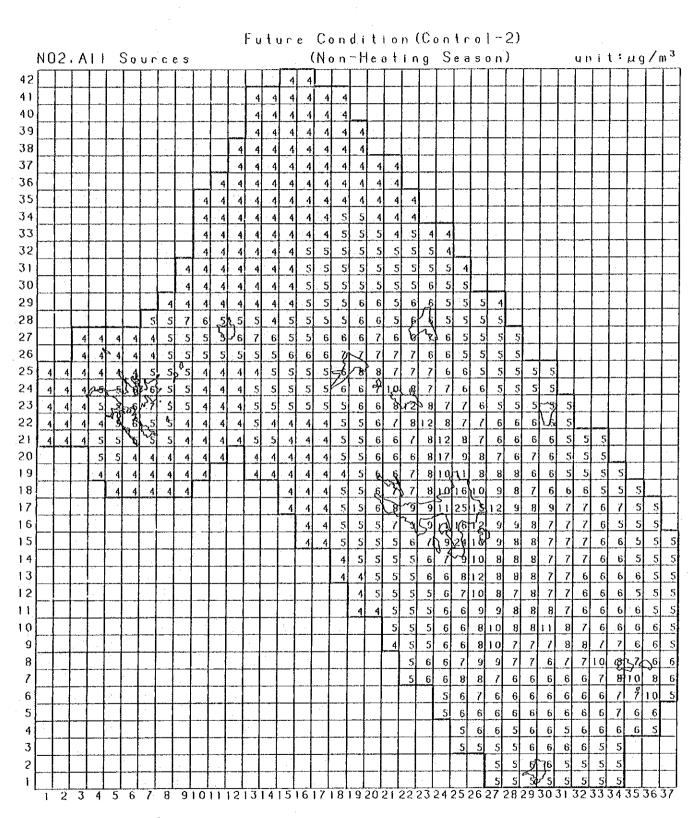


Figure D8.4.67 Average Concentration for NO2 in Non-heating Season (2005, Case F-2, All Sources)

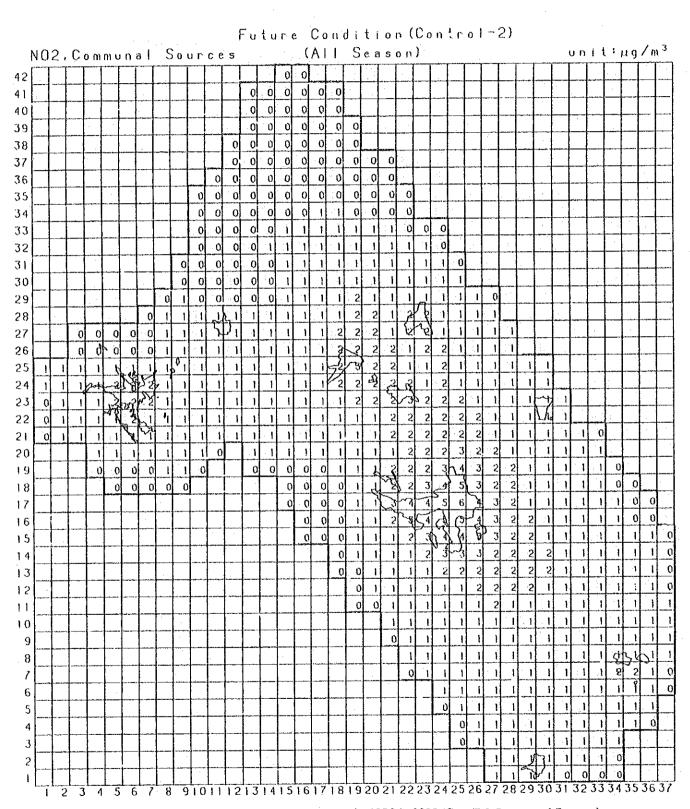


Figure D8.4.68 Annual Average Concentration for NO2 in 2005 (Case F-2, Communal Sources)

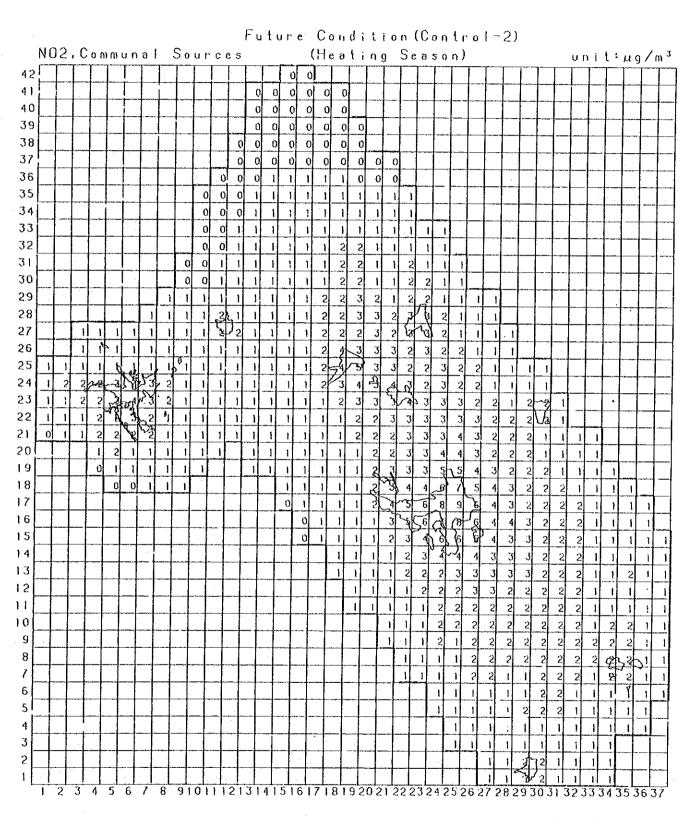


Figure D8.4.69 Average Concentration for NO2 in Heating Season (2005, Case F-2, Communal Sources)

DATA FOR CHAPTER 9

Table D9.1.1 Cost Estimation for CFBC in Borsod Power Station

2.20% 0.62% 2.32% 8.30%

Cost estimation for Circulation Fluidized Bed Combustion method(CFBC) (150NW power generation, boiler 460t/h)

| Design condition | D | (130mm power generation, po | orrer apprivati | |
|--|----------|------------------------------|-----------------|-----------------|
| Total carbon 27.52% Nitrogen Ash 34.68% Hydrogen Noisture 24.80% Oxygen Volatile matter 22.56% Net calorific value(MJ/kg) 8.50 Facility scale Boiler 460t/h Coal consumption(t/h) 160 S02 emission(kg/h) 6,336 Exhaust gas(Nm3/h) 721,000 Flue gas temperature(°C) 150 Desulfurization method: CFBC Cac03 purity(%) 95% Ca/S 2.6 Desulfurization rate(%) 90% Cost Price(Ft) Consumption(/h) Electric power (KWH) 3.96 Water (m3) 27.61 Wages (/month) 50,000 Number of labor 2 Annual hours of operation 6,920 Investment in plant and equipment Cost of equipment(Ft) 5,740,000,000 Offsite(Ft) 9,000,000,000 Annual operating cost Cac03(Ft) 250,783,568 Electric power(Ft) 438,451,200 Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | vesign | · · | | |
| Ash Moisture 24.80% Volatile matter 22.56% Net calorific value(MJ/kg) 8.50 Facility scale Boiler 460t/h Coal consumption(t/h) 160 SO2 emission(kg/h) 6.336 Exhaust gas(Nm3/h) 721,000 Flue gas temperature(°C) 150 Desulfurization method : CFBC CaCO3 purity(%) 95% Ca/S 2.6 Desulfurization rate(%) 90% Cost Price(Ft) Consumption(/h) 3.96 16,000 Number of labor 2 2 Annual hours of operation 6,920 Investment in plant and equipment Cost of equipment(Ft) 9,000,000,000 Mater(Ft) 9,000,000,000 Hater(Ft) 1,200,000 Number of labor 2 2 Annual hours of operation 6,920 Annual operating cost CaCO3(Ft) 250,783,568 Electric power(Ft) 438,451,200 Nater(Ft) 9,5306 Labor(Ft) 1,200,000 Nater(Ft) | | | | |
| Moisture | | | | Nitrogen |
| Volatile matter | | | 34.68% | Hydrogen |
| Volatile matter | | Moisture | 24.80% | 0xygen |
| Net calorific value(MJ/kg) 8.50 | | Volatile matter | | |
| Coal consumption(t/h) 160 S02 emission(kg/h) 6,336 Exhaust gas(Nm3/h) 721,000 Flue gas temperature(°C) 150 | | | | |
| SO2 emission(kg/h) | | Facility scale | Boiler 460t/h | |
| SO2 emission(kg/h) | | Coal consumption(t/h) | 160 | |
| Exhaust gas(Nm3/h) 721,000 Flue gas temperature(°C) 150 Desulfurization method : CFBC CaC03 purity(%) 95% Ca/S 2.6 Desulfurization rate(%) 90% Cost Price(Ft) Consumption(/h) CaC03(t) 1,204 30.10 Electric power (KWH) 3.96 16,000 Water (m3) 27.61 5.00 Wages (/month) 50,000 Number of labor 2 Annual hours of operation 6,920 Investment in plant and equipment Cost of equipment(Ft) 5,740,000,000 Offsite(Ft) 9,000,000,000 Annual operating cost CaC03(ft) 250,783,568 Electric power(Ft) 438,451,200 Water(ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | | SO2 emission(kg/h) | | |
| Flue gas temperature(°C) 150 | | | | |
| CaC03 purity(%) 95% Ca/S 2.6 Desulfurization rate(%) 90% Cost Price(Ft) Consumption(/h) | | | | |
| Ca/S Desulfurization rate(%) Cost Price(Ft) Cac03(t) Electric power (KWH) Super (Mult) Number of labor Annual hours of operation Annual operating cost Cac03(Ft) Electric power(Ft) Cac03(Ft) Superating Cost Electric power(Ft) Superating Cost Electric power(Ft) Superating Cost Superation Cost Superat | | Desulfurization method : CFB | c | |
| Ca/S Desulfurization rate(%) Cost Price(Ft) Cac03(t) Electric power (KWH) Nater (m3) Nages (/month) Number of labor Annual hours of operation Cost of equipment Cost of equipment(Ft) Offsite(Ft) Silectric power(Ft) Silectric power(Ft) Annual operating cost Electric power(Ft) Labor(Ft) Silectric power(Ft) Annual operation Annual operation Cac03(Ft) Silectric power(Ft) Assays (Joon Annual operation (10%) Annual operation Annual interest rate (%) Evaluation Annual SO2 removal(t) Signal Consumption(/h) Consumption(/h) Signal Silectric power Silectr | | CaCO3 purity(%) | 95% | |
| Desulfurization rate(%) 90% | | | | |
| CaCO3(t) 1,204 30.10 Electric power (KWH) 3.96 16,000 Water (m3) 27.61 5.00 Wages (/month) 50,000 Number of labor 2 Annual hours of operation 6,920 Investment in plant and equipment | | Desulfurization rate(%) | | |
| CaCO3(t) | Cost | | Price(Ft) | Consumption(/h) |
| Electric power (KWH) 3.96 16,000 Water (m3) 27.61 5.00 Wages (/month) 50,000 Number of labor 2 Annual hours of operation 6,920 Investment in plant and equipment | | CaCO3(t) | | = |
| Water (m3) 27.61 5.00 Wages (/month) 50,000 Number of labor 2 Annual hours of operation 6,920 Investment in plant and equipment Cost of equipment(Ft) 5,740,000,000 Offsite(Ft) 9,000,000,000 14,740,000,000 Annual operating cost CaC03(Ft) 250,783,568 Electric power(Ft) 438,451,200 Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual S02 removal(t) 39,461 | | Electric power (KWH) | | |
| Wages (/month) 50,000 Number of labor 2 Annual hours of operation 6,920 Investment in plant and equipment Cost of equipment(Ft) 5,740,000,000 Offsite(Ft) 9,000,000,000 Annual operating cost CaC03(Ft) 250,783,568 Electric power(Ft) 438,451,200 Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | | | | |
| Number of labor 2 Annual hours of operation 6,920 Investment in plant and equipment | | | | 0100 |
| Annual hours of operation 6,920 Investment in plant and equipment | | | · | |
| Cost of equipment(Ft) 5,740,000,000 Offsite(Ft) 9,000,000,000 14,740,000,000 Annual operating cost CaC03(Ft) 250,783,568 Electric power(Ft) 438,451,200 Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | | | | |
| Cost of equipment(Ft) 5,740,000,000 Offsite(Ft) 9,000,000,000 14,740,000,000 Annual operating cost CaC03(Ft) 250,783,568 Electric power(Ft) 438,451,200 Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual S02 removal(t) 39,461 | Investme | ent in plant and equipment | | |
| Offsite(Ft) 9,000,000,000 14,740,000,000 Annual operating cost | | | 5,740,000,000 | |
| Annual operating cost CaC03(Ft) Electric power(Ft) Water(Ft) Labor(Ft) Maintenance(Ft) Interest(Ft) Depreciation (10%) Annual interest rate (%) Evaluation Annual S02 removal(t) Annual operating cost 250,783,568 250,783,568 438,451,200 955,306 1,200,000 221,100,000 1,200,000 2,976,090,000 2,976,090,074 39,461 | | | | |
| CaCO3(Ft) 250,783,568 Electric power(Ft) 438,451,200 Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | | | | |
| CaCO3(Ft) 250,783,568 Electric power(Ft) 438,451,200 Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | Annual o | operating cost | | |
| Electric power(Ft) 438,451,200 Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual S02 removal(t) 39,461 | | | 250,783,568 | |
| Water(Ft) 955,306 Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual S02 removal(t) 39,461 | | · · | | |
| Labor(Ft) 1,200,000 Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual S02 removal(t) 39,461 | | | | • |
| Maintenance(Ft) 221,100,000 Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | | | | |
| Interest(Ft) 737,000,000 Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | | | | |
| Depreciation (10%) 1,326,600,000 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | | | | • |
| 2,976,090,074 Annual interest rate (%) 5% Evaluation Annual SO2 removal(t) 39,461 | | | | |
| Evaluation Annual SO2 removal(t) 39,461 | | Dopi ociación (108) | | |
| | | Annual interest rate (%) | 5% | |
| | Evaluati | on Annual SO2 removal(t) | 39,461 | |
| | | SO2 treatment cost(Ft/t) | 75,419 | |

Note) Cooling water for turbine are excluded.

Table D9.1.2 Establishment Costs for CFBC in Borsod Power Station
Unit: Million HUF

| | | 1. | | | | | | | وذالا المنسطحة ويجودونها | lillion HUF |
|-----------|----------------|-----------|---|---|--|---------------------------------------|--------------|----------|--|--------------------|
| T | Items | Construc- | Domestic | Import | Cus- | Installa- | Invest- | Invest- | Others | Gross |
| | | tion | product | - | toms | tion | ment | ment | | Invest- |
| | · | | | | | | (others) | (total) | | ment |
| 01 | Design | | | | | | 600.00 | 600.00 | | 600.00 |
| 02 | Moves | 58.00 | 16.00 | | | | | 74.00 | | 74.00 |
| 03 | Site | 9.00 | | | | | | 9.00 | | 9.00 |
| | preparation | | | AND CONTRACTOR OF THE PARTY OF | | | | 1000 | | 10.00 |
| 04 | Road | 12.00 | | | | | • | 12.00 | | 12.00 |
| | construction | | | | | | | | | 70.10 |
| 05 | Rail way | 45.00 | 12.50 | | | 22.00 | | 79.60 | | 79.60 |
| 06 | Fence | 6.0 | | | | | | 6.0 | | 6.0 |
| 08 | Dismantling | 23.00 | 11.00 | | | | | 34.80 | | 34.80 |
| 91 | Main building | 930.00 | Complete the same of the same | | | | | 930.00 | | 930.00 |
| 92 | Chimney | 202.00 | | | | | | 202.00 | <u> </u> | 202.00 |
| 93 | Boiler 1 | 45.00 | ************ | 3006.60 | 300.60 | 590.00 | 131.41 | 4073.60 | | 4073.60 |
| | combustion eq. | | | | | | | | <u> </u> | |
| 94 | Steam turbine | 75.00 | 940.00 | | - Committee of the Comm | | | 1015.00 | | 1015.00 |
| 95 | Block trans. | 67.00 | 195.50 | ALEX MINERAL INC. (41 | | 4.50 | | 267.00 | | 267.00 |
| 96 | Supply house | | 87.00 | 518.60 | 57.60 | 157.00 | 27.00 | 847.20 | | 847.20 |
| 97 | Main bldg. | | 80.00 | | | · · · · · · · · · · · · · · · · · · · | | 80.00 | I | 80.00 |
| <i>31</i> | crane | | | | | 1 | | | 1 | |
| 98 | Main bldg. | | 281.50 | 273.51 | | 85.64 | | 640.65 | <u> </u> | 640.65 |
| 70 | electric eq. | | 201.50 | 2.5.5 | | | · · | | | 5 |
| 99 | Control unit | | 112.44 | 394.82 | 27.64 | 130.00 | 10.02 | 674.92 | 101.54 | 776.46 |
| 10 | Fuel transport | 249.00 | 631.20 | 58.00 | 9.10 | 117.90 | 3.00 | 1068.20 | <u> </u> | 1068.20 |
| | | 29.00 | 75.00 | 28.00 | 3.00 | 37.00 | 1.40 | 173.40 | 45.00 | 218.40 |
| 11 | Slag arrange | 84.00 | 183.69 | 54.91 | 6.04 | 55.10 | 3.00 | 386.74 | | 386.74 |
| 12 | Water supply | 84.00 | 163.09 | 34.71 | 0,04 | 33.10 | 3.00 | 500 | | 33311 |
| | system | 103.00 | 172.70 | 47.00 | 5.17 | 68.00 | 1.80 | 397.67 | | 397.67 |
| 13 | Pre-water | 103.00 | 172.70 | 47.00 |] 3.17 | 08.00 | 1.00 |] 337.01 | 1 | D 7 1 1 0 1 |
| | treatment | 11.50 | 21.00 | | | 2.50 | | 35.00 | | 35.00 |
| 14 | Out door | 11.50 | 21.00 | | <u> </u> | 2.50 | | 33,00 | | |
| | trans-housing | 18.00 | 24.00 | | | | | 42.00 | | 42.00 |
| 15 | Plant recon- | 18.00 | 24.00 | | 1 | 1 | | 72.00 | | |
| | struction | 1 | | | | | | 4.00 | - | 4.00 |
| 16 | Office | 4.00 | 3.00 | 3.00 | 0.40 | 1.50 | 0.15 | 9.05 | | 9.05 |
| 18 | Security | 1.00 | 3.00 | 3.00 | 0.40 | 1.50 | 0.13 | 7.03 | 1 | 7.00 |
| | (labor, asset) | 17.00 | 29.00 | ļ | <u> </u> | | | 46.00 | | 46.00 |
| 19 | Pollution | 17.00 | 29.00 | | | | 1 | 1 40.00 | | ,,,,, |
| 1 1 | control eq. | | 1 | | | | | | | |
| 20 | (water, air) | 14.00 | | | 1 | | | 14.00 | | 14.00 |
| 20 | Lights | 14.00 | 28.00 | 2.00 | 0.40 | 5.00 | 0.15 | 45.05 | | 45.05 |
| 21 | Hydrant | 8.50 | 28.00 | 3.00 | 0.40 | 3.00 | 1 0.13 | 34.40 | | 34.40 |
| 22 | Process | 34.40 | | | |] | | 34.40 | • | 34.40 |
| | wiring | | <u></u> | ļ | | | | 39.20 | | 39.20 |
| 23 | Waste pipe | 39.20 | <u> </u> | | | | | 5.50 | } | 5.50 |
| 25 | Test room | ļ | 5.50 | | | | 000.00 | | | 280.00 |
| 26 | Test run | | | <u> </u> | | <u> </u> | 280.00 | 280.00 | ļ | |
| 29 | Traffic, | | 12.00 | | | | | 12.00 | 1 | 12.00 |
| | transport | <u> </u> | | <u> </u> | | | 1 | 170 60 | | 178.60 |
| 30 | Communi- | 23.00 | 109.50 | 17.50 | 2.10 | 26.50 | | 178.60 | 1 | 1/8.00 |
| | cation, fire | İ | | | | | 1 | | | 1 |
| | alarm | | | | | | | 152.00 | | 152.00 |
| 32 | | 31.00 | 110.00 | | 1 | 11.00 | | 152.00 | | 132.00 |
| | system | | | | | } | | 30.00 | | 30.00 |
| 33 | Other costs | 30.00 | | | | | | · | Annual Association of the Control of | 196.00 |
| 34 | Fixed assets | | 75,00 | 110.00 | 11.00 | | | 196.00 | | 190.00 |
| 35 | promoting | | j | 1 | ļ | | 1 | 1 | ! | |
| | investment | <u> </u> | | <u> </u> | ļ | | 1.600.00 | 1000.00 | | 1000.00 |
| 36 | Reserve | | | <u> </u> | | | 1000.00 | 1000.00 | | 1000.00 |
| | Total 01-36 | 2169.50 | 3215.53 | | 423.05 | 1313.64 | 2057.92 | 13694.58 | 146.54 | 13841.12 |
| | Electricity, | | | 500.00 | 50.00 | 1 | 1 |] | | 1 |
| L | gas, etc. | | | | <u> </u> | | | ļ | ļ | 000.40 |
| | 6.5% of the | | | | | | | | 1 | 899.69 |
| L | total | | | <u> </u> | <u> </u> | <u> </u> | <u> </u> | | | 1.0.00 |
| | Gross Total | | | | 1 | <u> </u> | | 1 | <u> </u> | 14740.79 |
| NIOL | | | | pher 15 10 | 00 | | | | | |

Note: 1USD = 100.19 HUF as of December 15, 1993.

Table D9.1.3 Investment Schedule for CFBC in Borsod Power Station

| | | | | 7 | | | |
|-------------------|-----------------------------|------------|--------|---------|---------|----------------|-------------------|
| Unit: Million HUF | Gross Total | Investment | 850.00 | 2186.50 | 8420.69 | 3283.60 | 14740.79 |
| Unit: M | Others | | | | - | 146.54 | 146.54 |
| | Investment | (Total) | 850.00 | 2186.50 | 8420.69 | 3137.06 146.54 | 14594.25 146.54 |
| | Investment | (Others) | 850.00 | 70.00 | 1000.00 | 1037.59 | 2957.59 |
| | Installation | | | 68.00 | 745.64 | 200.00 | 1313.64 |
| | Customs Tariff Installation | (Import) | | | 343.05 | 80.00 | 423.05 |
| | Import | | | | 4014.00 | 500.94 | 4514.94 |
| | Domestic | Product | | 227.00 | 2000.00 | 988.53 | 3215.53 |
| | Year Construction | | | 1821.50 | 318.00 | 30.00 | 2169.50 |
| | Year | | 1994 | 1995 | 1996 | 1997 | Total |

Note: 1USD = 100.19 HUF as of December 15, 1993.

Table D9.1.4 Cost Estimation for HFBC in Borsod Power Station

Cost estimation for Hybrid Fluidized Bed Combustion method(HFBC) (Boiler $100t/h \times 4$)

| | (Boiler $100t/h \times 4$) | | | |
|------------|-----------------------------|----------------------------|-----------------|------------|
| Design c | | | | |
| | Coal | Ryuko | Sulfur | 2.20% |
| | Total carbon | 27.52% | Nitrogen | 0.62% |
| | Ash | 34.68% | Hydrogen | 2.32% |
| | Moisture | 24.80% | 0xygen | 8.30% |
| | Volatile matter | 22.56% | | |
| | Net calorific value(MJ/kg) | 8.5 | | |
| | Facility scale | Boiler(100t/h×4 |) | |
| | Coal consumption(t/h) | | (60% load) | |
| | SO2 emission(kg/h) | 3,802 | | |
| | Exhaust gas(Nm3/h) | 432,000 | | |
| • | Flue gas temperature (°C) | 150 | | |
| | | | | |
| | Desulfurization method: HFI | | | |
| | CaCO3 purity(%) | 95% | | |
| | Ca/S | 2.6 | | |
| | Desulfurization rate(%) | 43% | | |
| Cost | | Price(Ft) | Consumption | ı(/h) |
| | CaCO3(t) | 1,204 | | 18.06 |
| | Electric power (KWH) | 3.96 | | 3,000 |
| | Water (m3) | 27.61 | | 5 |
| | Wages (/month) | 50,000 | | |
| | Number of labor | 2 | • | |
| | Annual hours of operation | 2,210 | | |
| Invactman | nt in plant and equipment | | i i | |
| 1114030201 | Cost of retrofitting(Ft) | 1,330,000,000 | 4 | |
| | Elecric precipitator(Ft) | | (Using existing | equipment) |
| | Offsite(Ft) | | (Using existing | |
| | 0110100(14) | 1,330,000,000 | Corns curouis | 01151107 |
| t 1 | | | | |
| Annual of | perating cost | 40 DE 4 EED | | |
| | CaCO3(Ft) | 48,054,770 | | • |
| | Electric power(Ft) | 26,254,800 | | |
| | Water(Ft) | 305,091 | • | |
| | Labor(Ft) | 1,200,000 | | • |
| | Maintenance(Ft) | 19,950,000 | • | |
| | Interest(Ft) | 66,500,000 | | |
| | Depreciation (10%) | 119,700,000 281,964,661 | | |
| | | 701,304,001 | | |
| | Annual interest rate (%) | 5% | | · |
| Evaluatio | on Annual SO2 removal(t) | 3,613 | • | |
| | SO2 treatment cost(Ft/t) | 78,042 | | |
| | | · · · · · - | | |

Note) Turbine are excluded.

Cost Estimation of Control Measures Planned by Enterprises Table D9.1.5

| | 61,160,000 | 31,000,000 |
|--------|---|--|
| Case 1 | Installation of Valuum/Dust Collectors For Two 17.5t Electric are Furnaces One 2.5t Electric are Furnaces (USD): (HUF): | Using Ammonia Additive For NOx reduction by using Ammonia additive method (HUF) |
| Plant | 15/2 DIOSGYORI ACEL ES VASONT KFT | 23/1 TISZAI VEGYI KOMBINAT |
| | | 160,000,000 |
| Case 1 | Change of Fuel Quality Uncountable due to shortage of low sulfur coal for bricks. | Furnace Improvement and Fuel Change 8 furnaces to be improved by Rath type furnace (HUF) |
| Plant | 03/0 ESZAKMAGYARO- RSZAGI TEGRA ES CSEREPIPARI VALIALATA PUTNOKI TEGRAGYAR | 15/1 HAMOR RESZVENY- TARSASAG |

Table D9.1.6 Cost Estimation of Suction Dust Control System Installation in DAV

The cost for three suction system:

| (a) | Dust collector: | USD 191,500 |
|------|---|-------------------|
| (b) | Fan: | 35,000 |
| (c) | Duct: | 35,500 |
| (d) | Bell-shaped suction (heat-proof steel): | 3,000 |
| (e) | Bell-shaped structure: | 7,100 |
| (f) | Mechanism to move bell-shaped suction | 1 |
| | Caterpillar structure: 3 machines total: | 12,200 |
| (g) | Stack | |
| | Diameter: 1.5 m, height: 35 m: | 55,000 |
| (h) | Steel structures | |
| | Dust filter, steps, ladder, handrail: | 10,500 |
| (i) | Six containers: | 7,700 |
| (j) | Noise shield: | 10,900 |
| (k) | Foundations | • |
| | Filter, fan, stack: | 36,700 |
| (l) | Installation (40%): | 154,000 |
| (m) | Practical design | 44,700 |
| | (Geological features, site investigation, | static strength, |
| | civil engineering, steel structure, mach control) | ine, electricity, |
| Tota | | USD 610,400 |
| | | F 61.16 million |

Note: 1USD = 100.19 HUF as of December 15, 1993. Freight charges are not included.

Table D9.1.7 Cost Estimation of Additional Measures for Factories

| p ant | (ase) | | Plant | Case 1 | |
|---|---|------------|--|---|---|
| 1 | Fuel Change | | Š | Retrofitting and Recuperator | |
| 0Z/1 0ZD KOHASZATI UZEMEM | For fuel change (HUF): | 44,064,000 | 15/2 DIOSGYORI ACEL ES VASONT KFT | <pre>I/A, I - II car type kilns (heating furnace)</pre> | 60,000,000 |
| 03/0 ESZAKMAGYARO- | Change of Fuel Quality | | | Introducing recuperator for energy saving about 10%. Cost of equipment(HUF) : Excluded cost for the following | 1,650,000 |
| RSZAGI TEGRA ES CSEREPIPARI VALLALATA PUTNOKI | Uncountable due to shortage of low sulfur coal for bricks. | | | Incidental works: Retrofitting flue duct Air duct construction Reping warm air system | <u>managang jagong pangking</u> kingkila saminis 1842 |
| TEGRAGYAR | | | | · Air control values · Control measures for high temperature above 200°C | |
| 04/1 | Two-Stage Combustion | | 17/1 | Using Low NOX Burner | |
| BORSODCHEM | Cost of equipment for two-stage combustion | 250 | HEJOCSABA DEMENT-ES | Low NOx burner cost of equipment (HUF) : | 32,076,000 |
| | DULLING (COAE) II) (1101) . | | RT. | sp. Cement electric static kilns precipitators maintenance for all of factories. | |
| 00 / 00 | Two-Stage Combustion | | | | MINI CO. NOSCO-100-100- |
| SAGROCHEM KFT. | Cost of equipment for two-stage combustion burner(60kg/h)(HUF): | 2,200,000 | | | |

