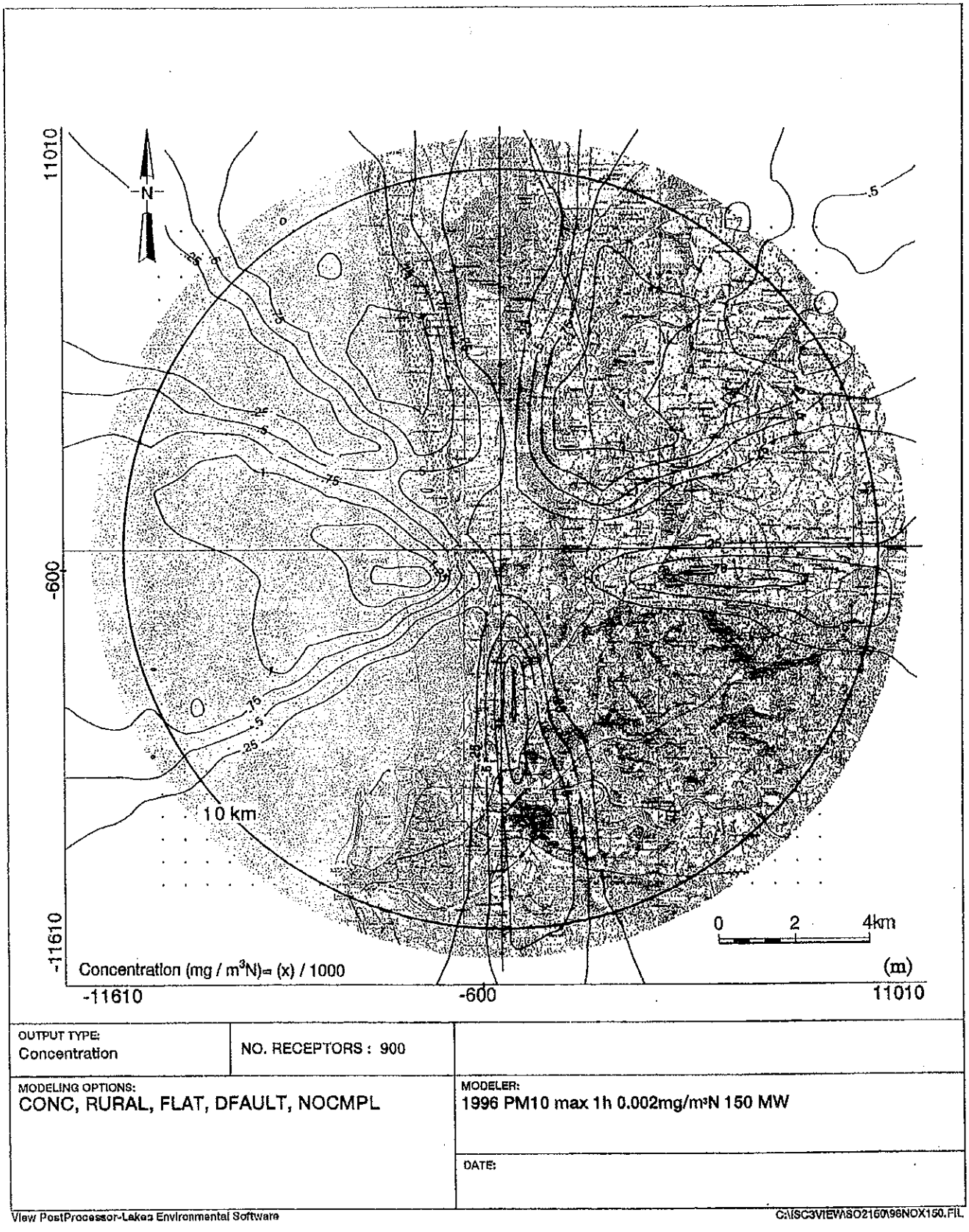
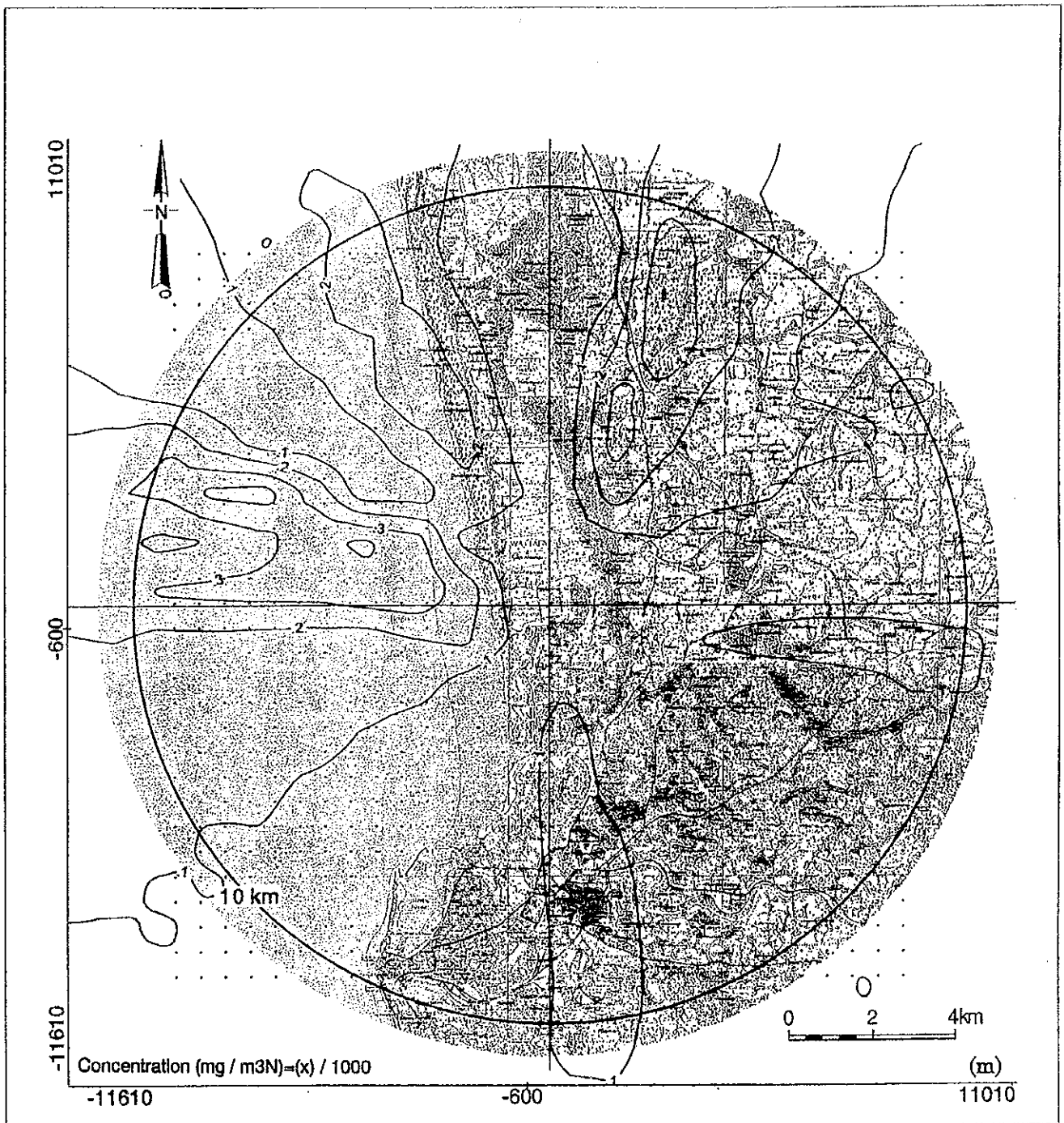


Figure 4.11 (1) Predicted Spatial Dispersion of SPM (1hr) 150MW 1996
SPM = 13 mg³/mN



OUTPUT TYPE: Concentration	NO. RECEPTORS : 900	
MODELING OPTIONS: CONC, RURAL, FLAT, DFAULT, NOCMPL		MODELER: 1996 PM10 max 8h 0.0008mg/m³N 150 MW
		DATE:

View PostProcessor-Lakes Environmental Software C:\ISC3VIEW\SO2150\96NOX150.PIL

Figure 4.11 (2) Predicted Spatial Dispersion of SPM (8hr) 150MW 1996
SPM = 13 mg^3/mN

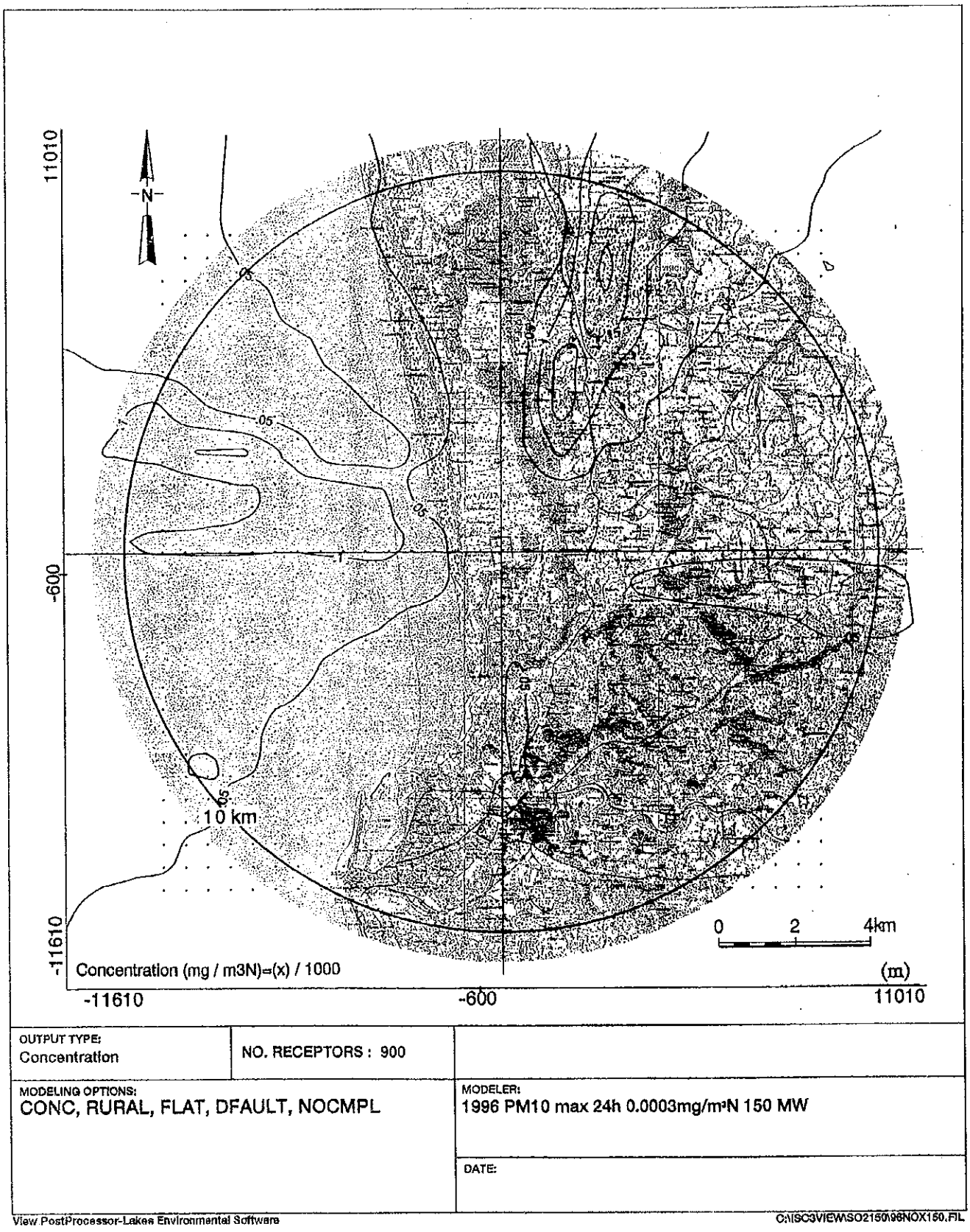


Figure 4.11 (3) Predicted Spatial Dispersion of SPM (24hr) 150MW 1996
SPM = 13 mg^3/mN

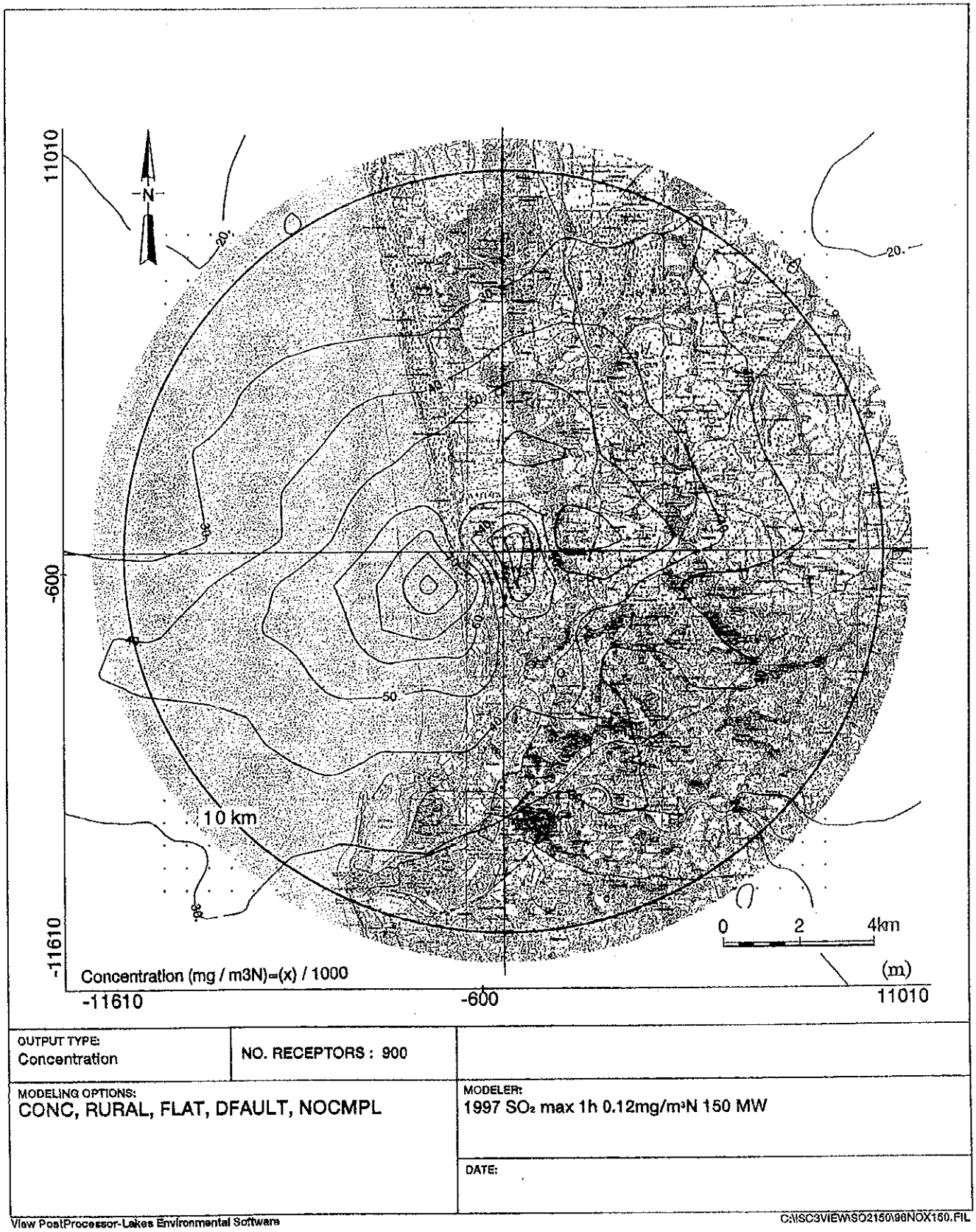


Figure 4.12 (1) Predicted Spatial Dispersion of SO_2 (1hr) 150MW 1997
S = 0.5 %

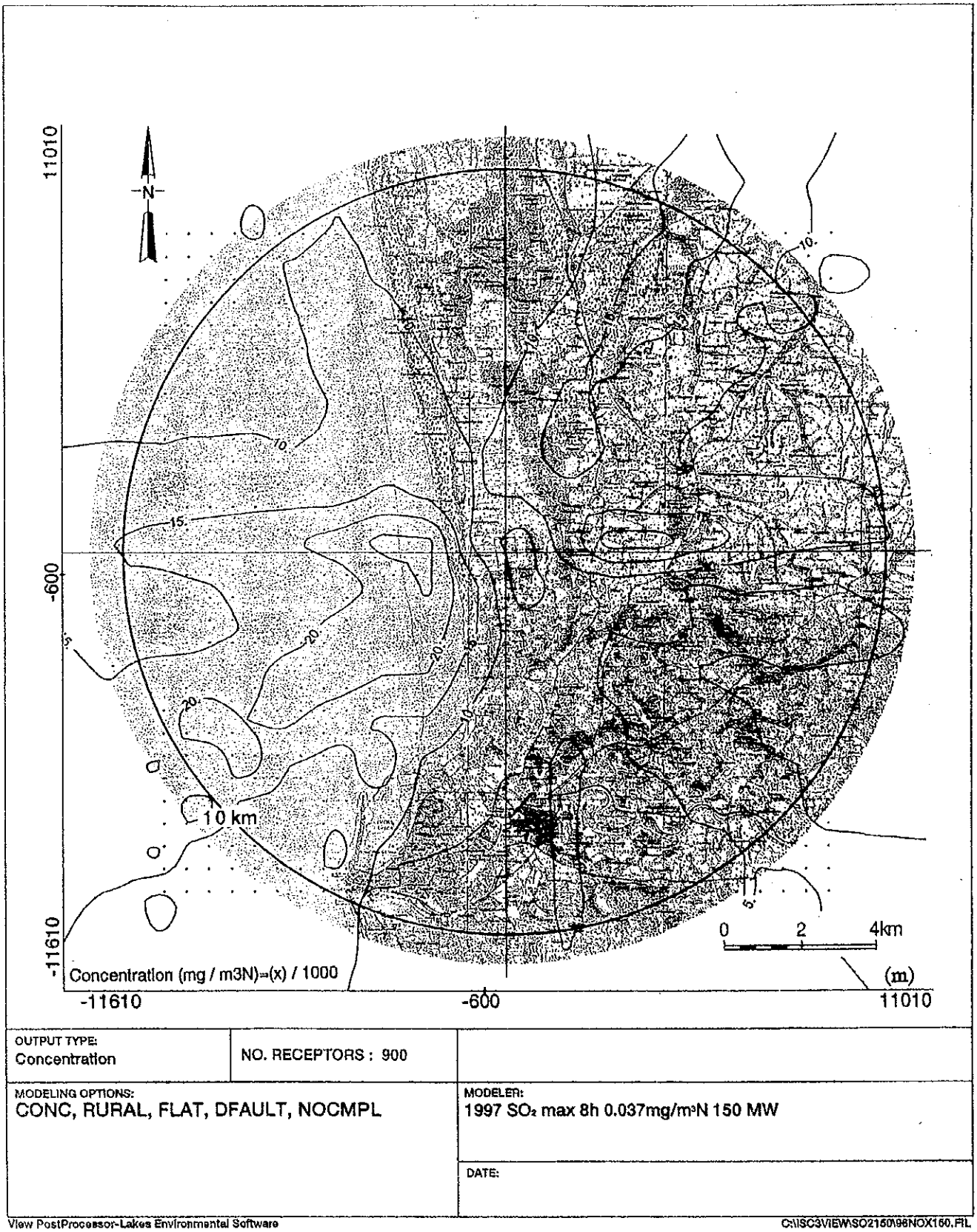
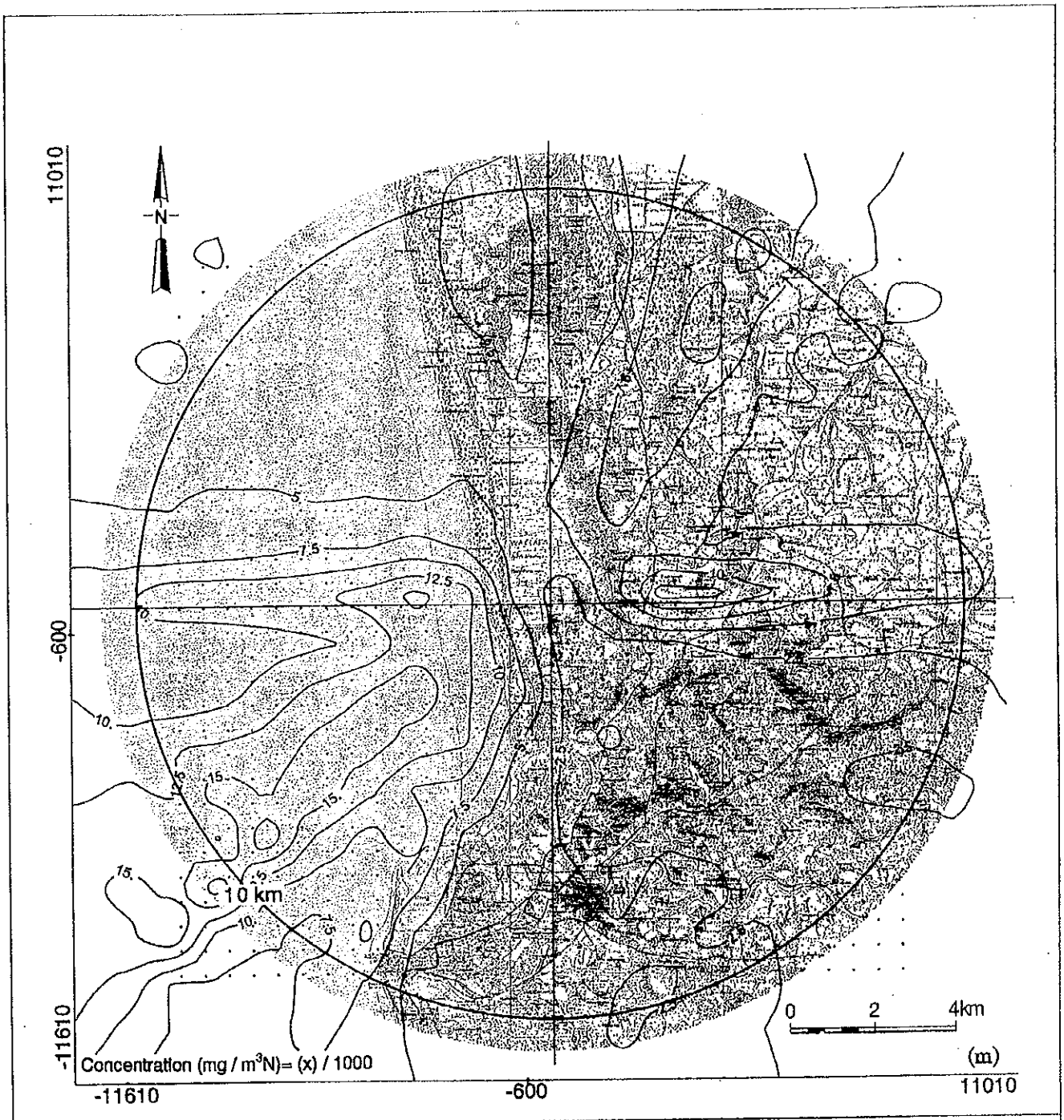


Figure 4.12 (2) Predicted Spatial Dispersion of SO_2 (8hr) 150MW 1997
S = 0.5 %



OUTPUT TYPE: Concentration	NO. RECEPTORS : 900	
MODELING OPTIONS: CONC, RURAL, FLAT, DFAULT, NOCMPL		MODELER: 1997 SO_2 max 24h 0.023mg/m³N 150 MW
		DATE:

View Post Processor-Lakes Environmental Software

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Figure 4.12 (3) Predicted Spatial Dispersion of SO_2 (24hr) 150MW 1997
S = 0.5 %

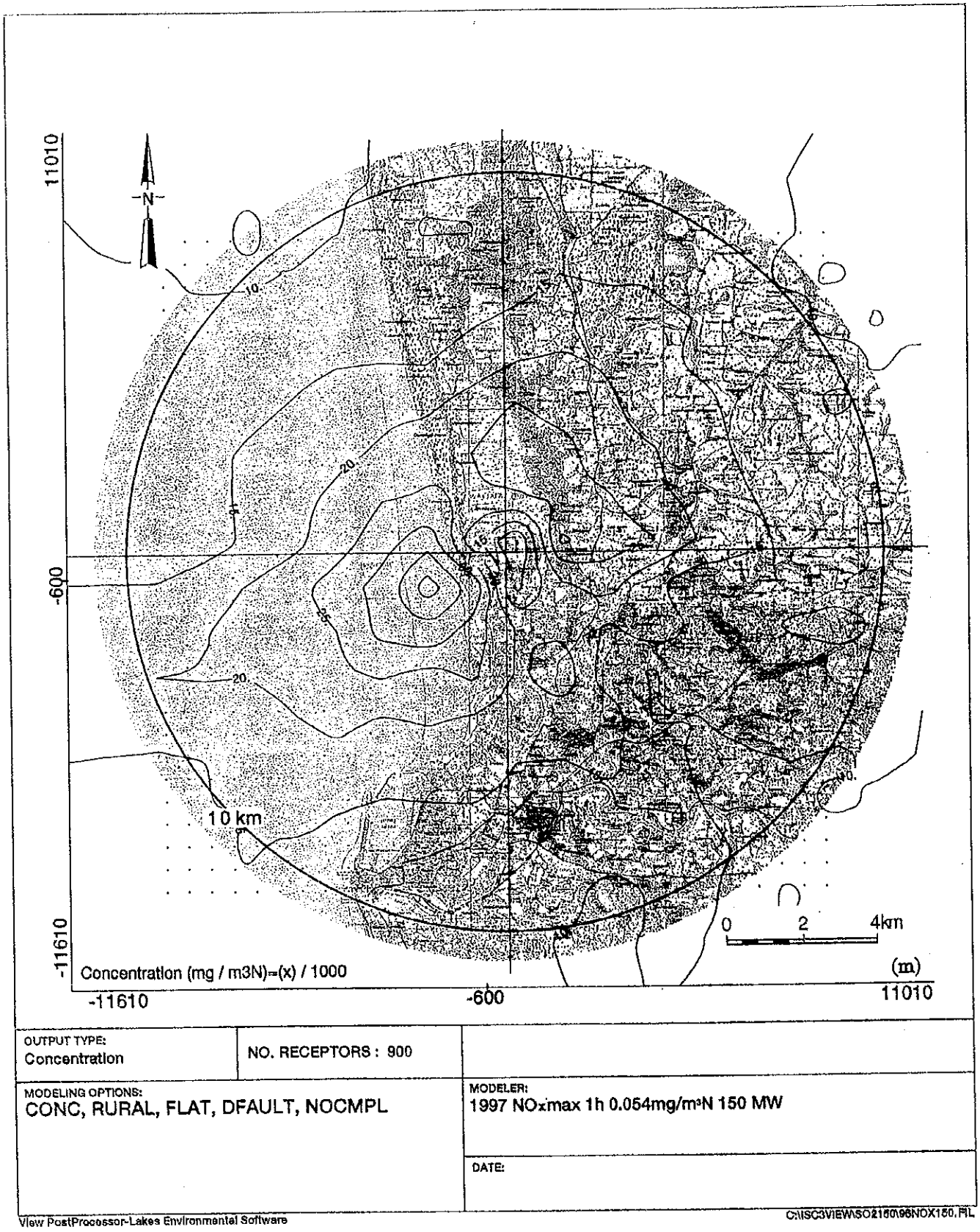


Figure 4.13 (1) Predicted Spatial Dispersion of NO_X (1hr) 150MW 1997
NO_X = 61 ppm

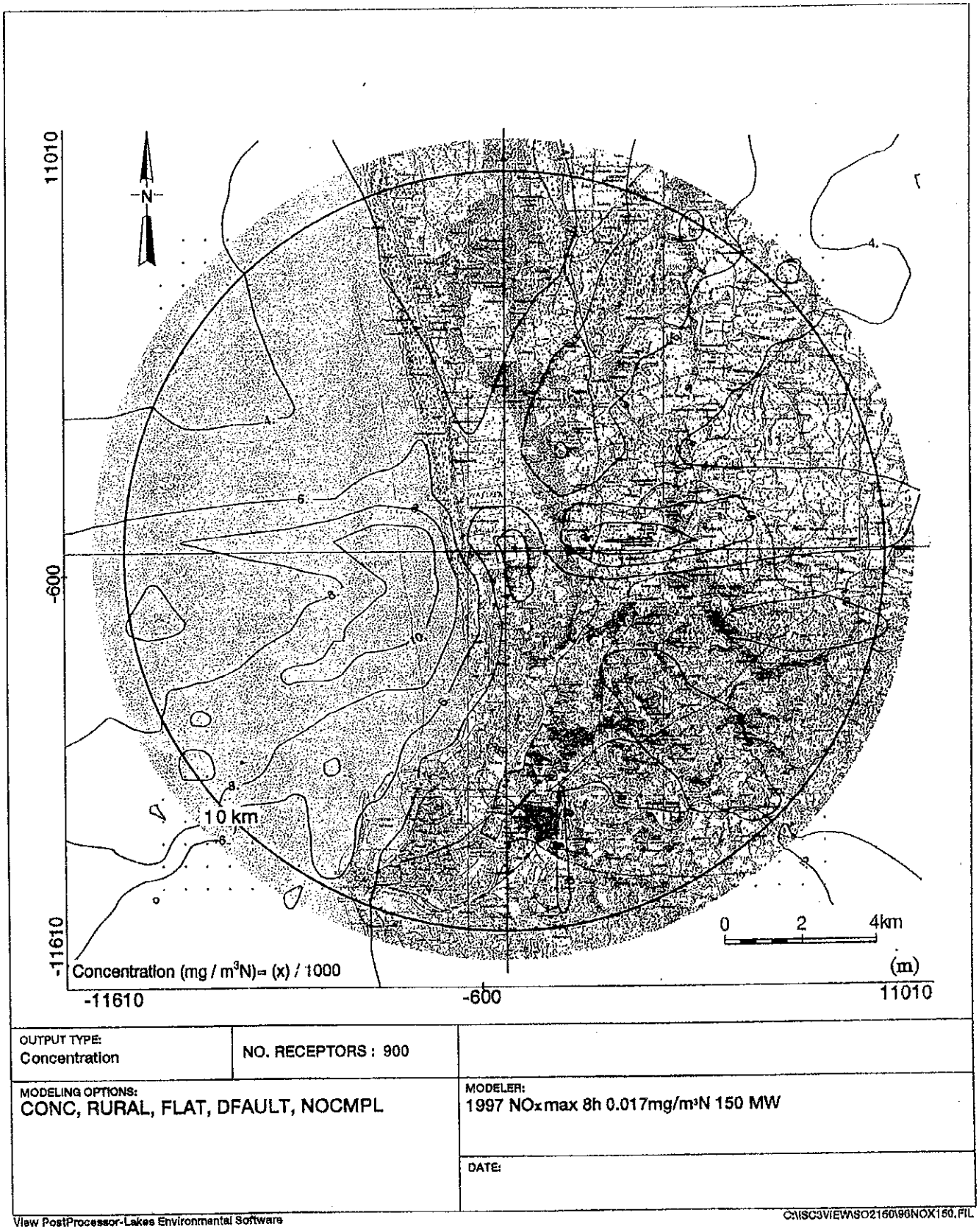


Figure 4.13 (2) Predicted Spatial Dispersion of NO_X (8hr) 150MW 1997
NO_X = 61 ppm

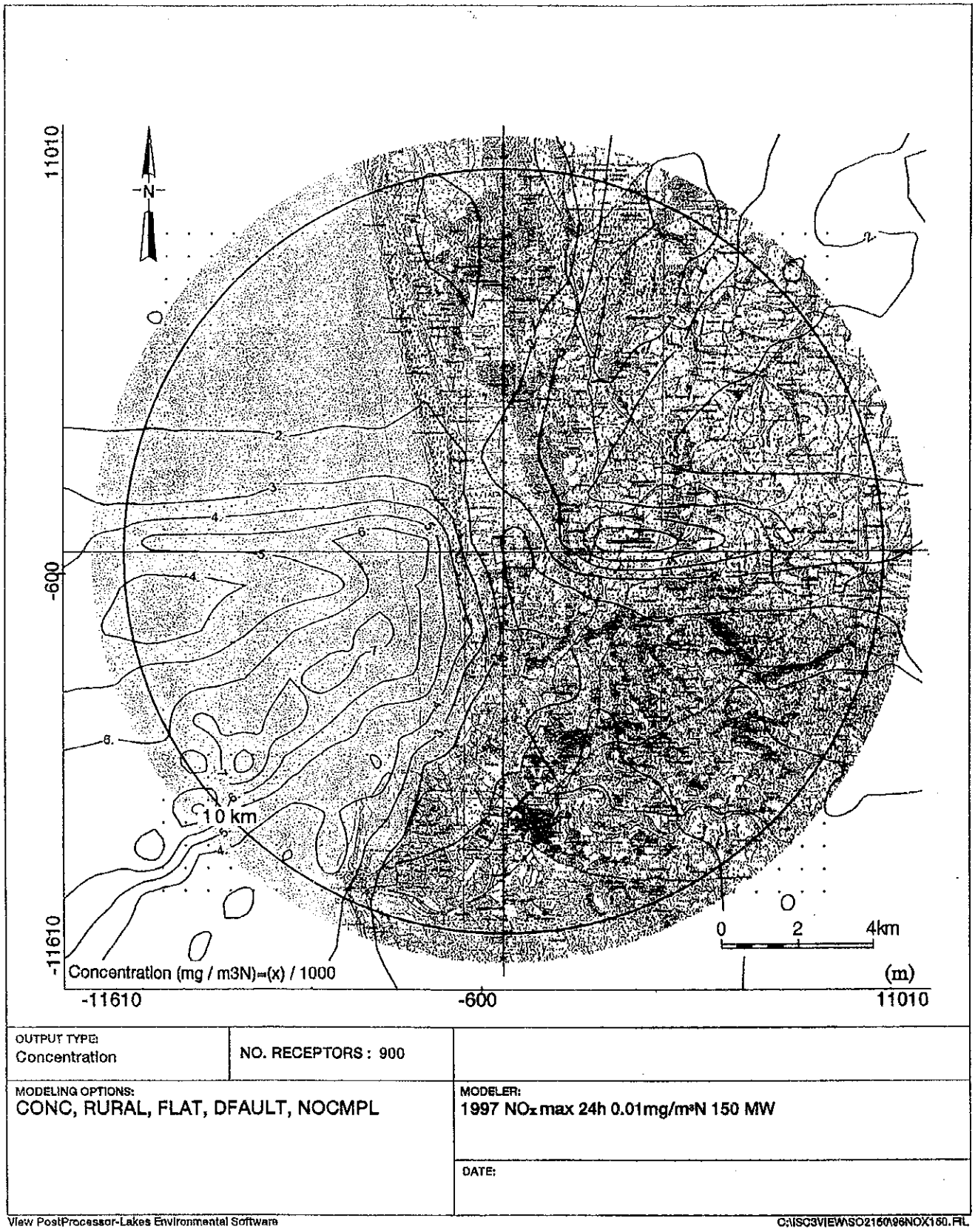
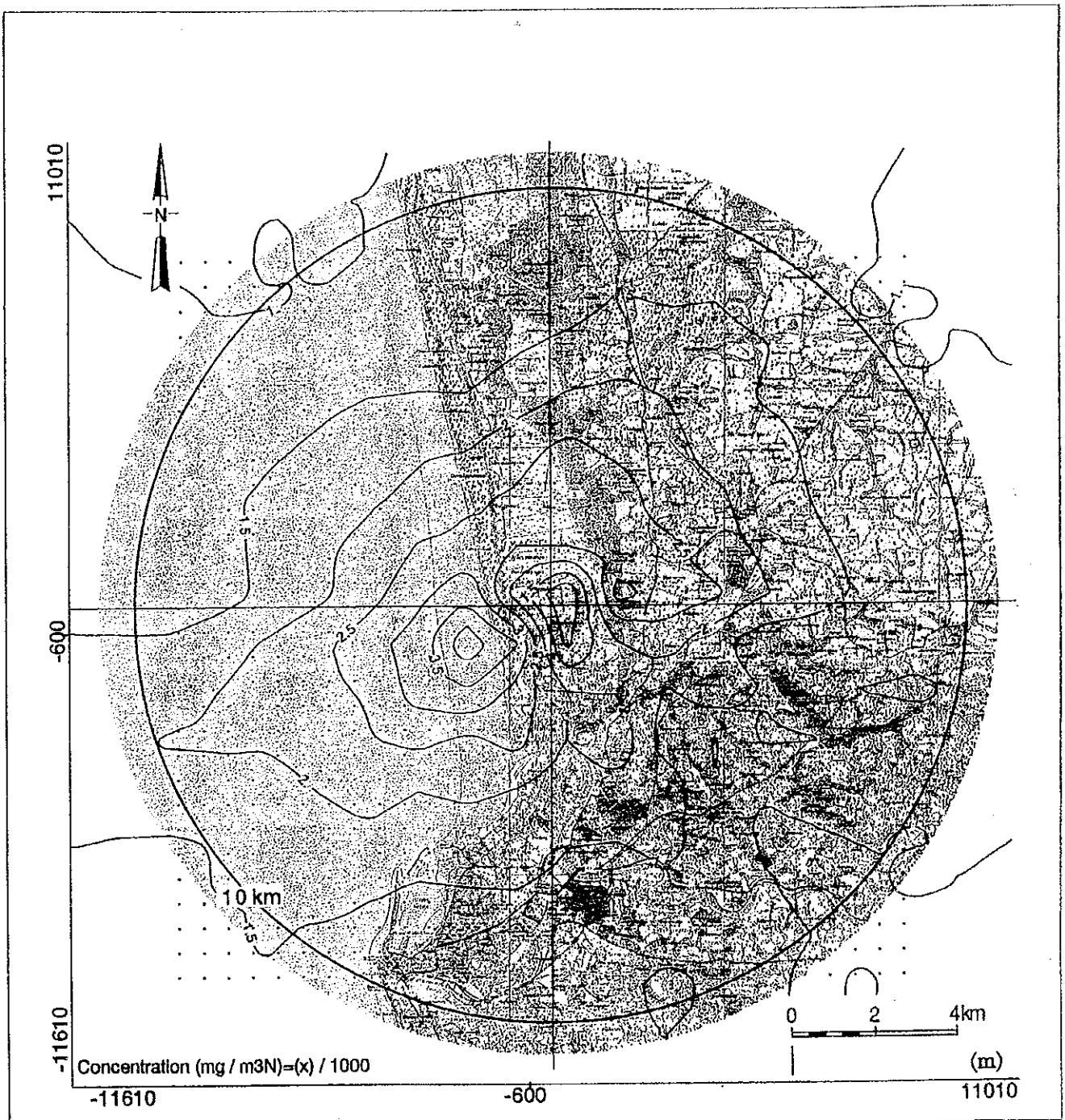


Figure 4.13 (3) Predicted Spatial Dispersion of NO_X (24hr) 150MW 1997
NO_X = 61 ppm

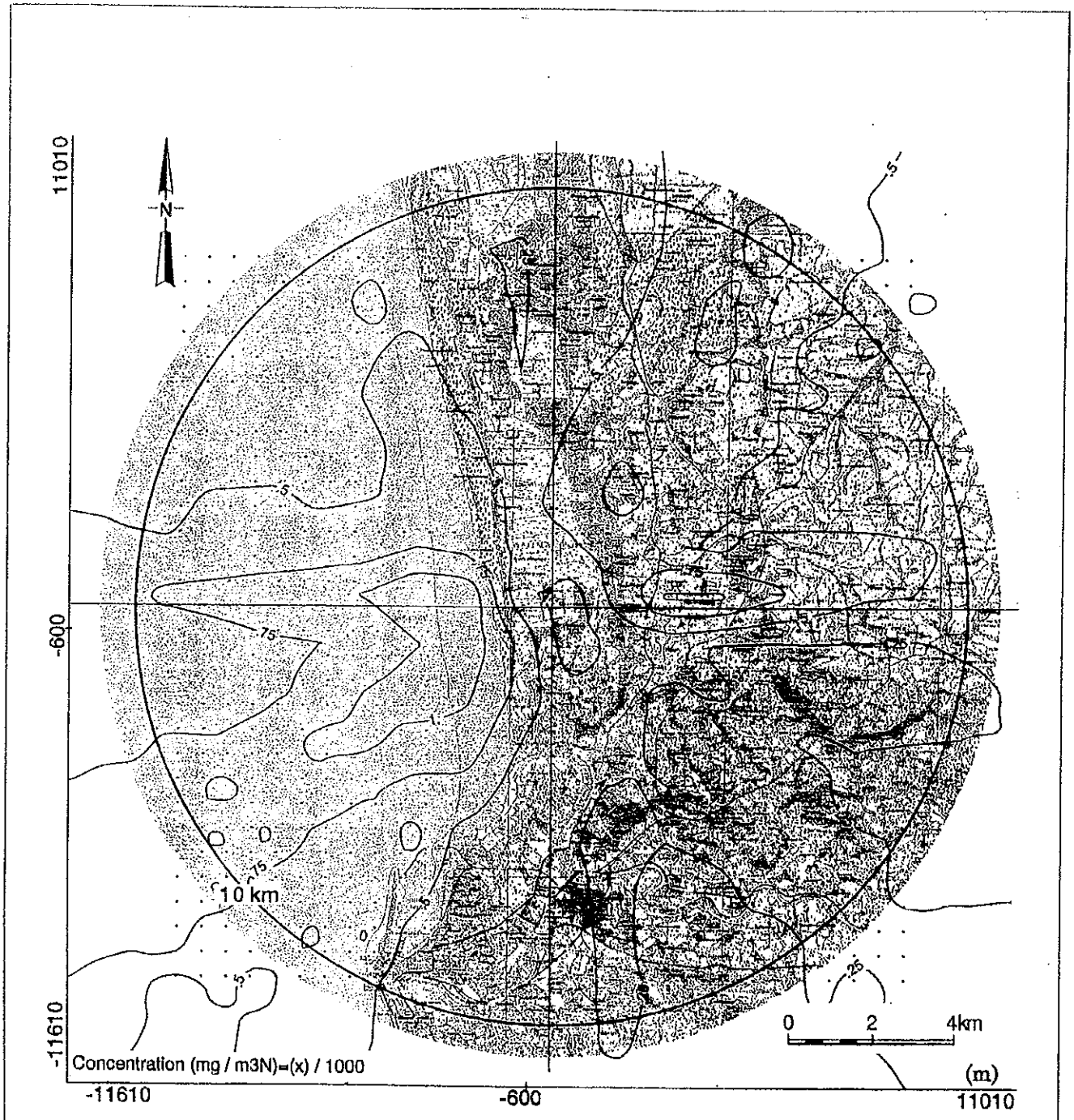


OUTPUT TYPE: Concentration	NO. RECEPTORS : 900	
MODELING OPTIONS: CONC, RURAL, FLAT, DFAULT, NOCMPL		MODELER: 1997 PM10 max 1h 0.006mg/m³N 150 MW
		DATE:

View PostProcessor-Lakes Environmental Software

C:\ISC3VIEW\SO2150\96NOX150.FIL

Figure 4.14 (1) Predicted Spatial Dispersion of SPM (1hr) 150MW 1997
SPM = 13 mg^3/mN



OUTPUT TYPE: Concentration	NO. RECEPTORS : 900	
MODELING OPTIONS: CONC, RURAL, FLAT, DFAULT, NOCMPL		MODELER: 1997 PM10 max 8h 0.002mg/m³N 150 MW
		DATE:

View PostProcessor-Lakes Environmental Software

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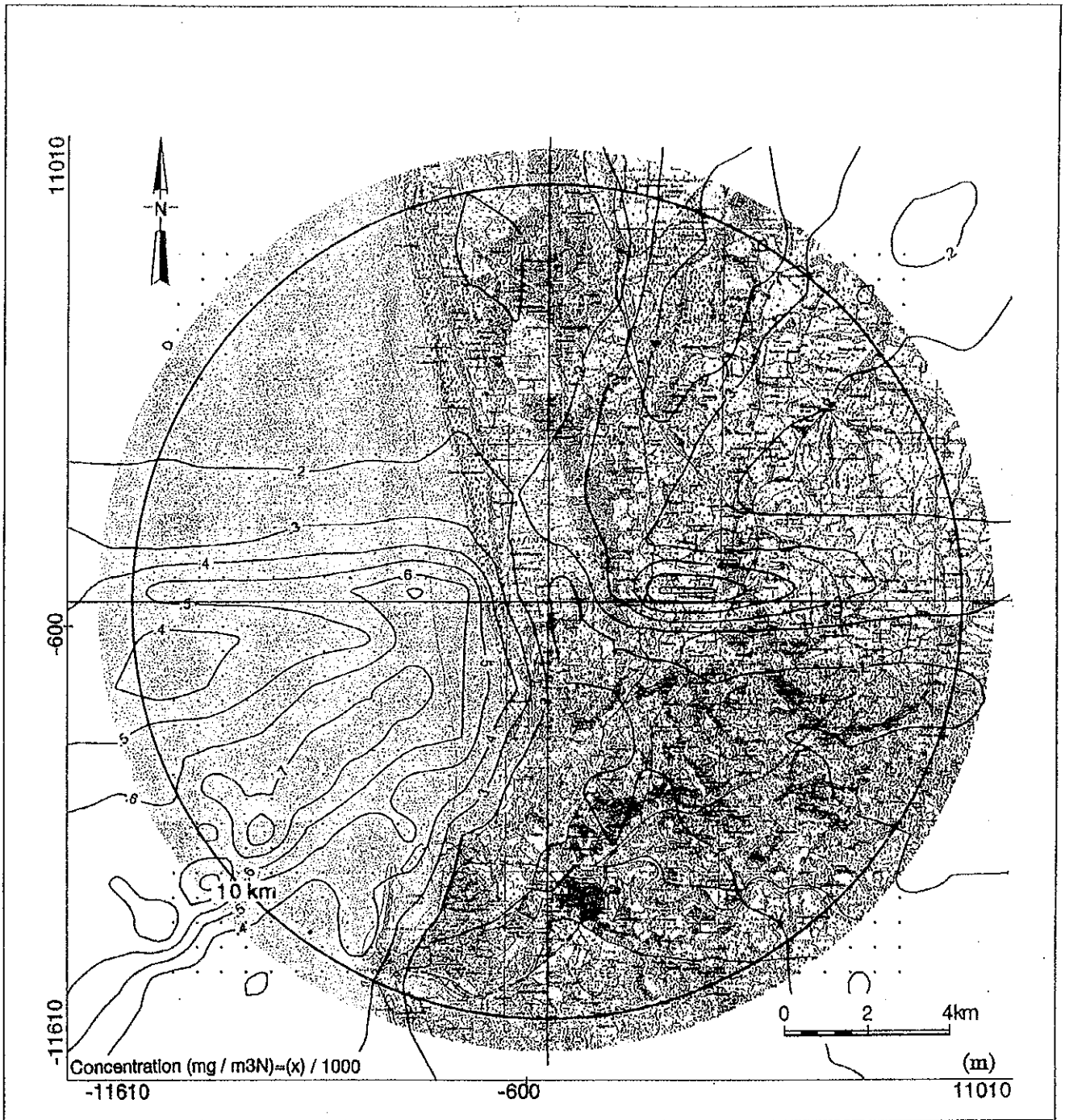
Figure 4.14 (2) Predicted Spatial Dispersion of SPM (8hr) 150MW 1997
SPM = 13 mg^3/mN



OUTPUT TYPE: Concentration	NO. RECEPTORS : 900	
MODELING OPTIONS: CONC, RURAL, FLAT, DFAULT, NOCMPL		MODELER: 1997 PM10 max 24h 0.001mg/m³N 150 MW
		DATE:

View PostProcessor-Lakes Environmental Software C:\ISC3VIEW\SO2150\98NOX150.FIL

Figure 4.14 (3) Predicted Spatial Dispersion of SPM (24hr) 150MW 1997
SPM = 13 mg^3/mN

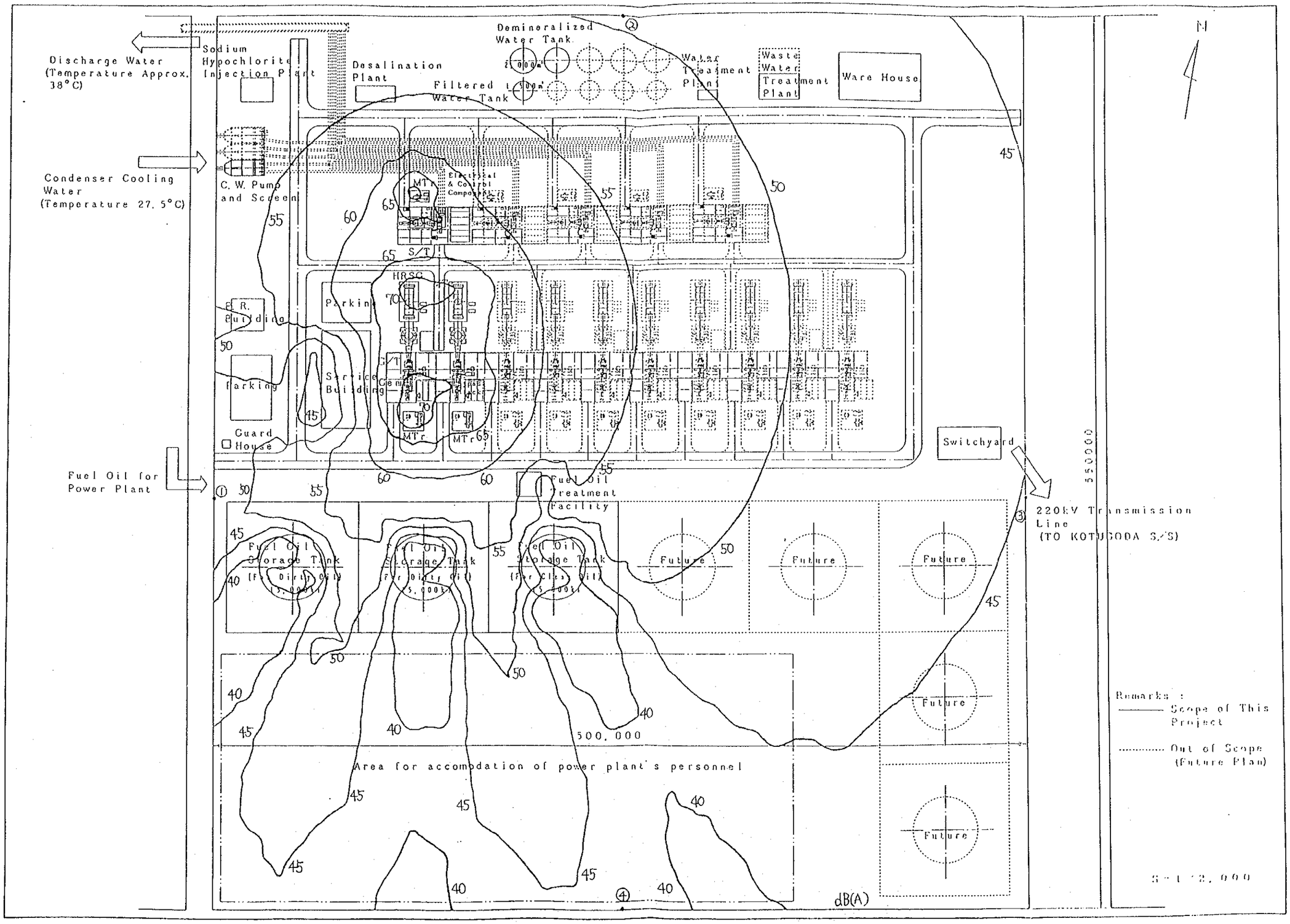


Figure 4.15 Estimation of Noise Level from Main Facilities During Operational Phase

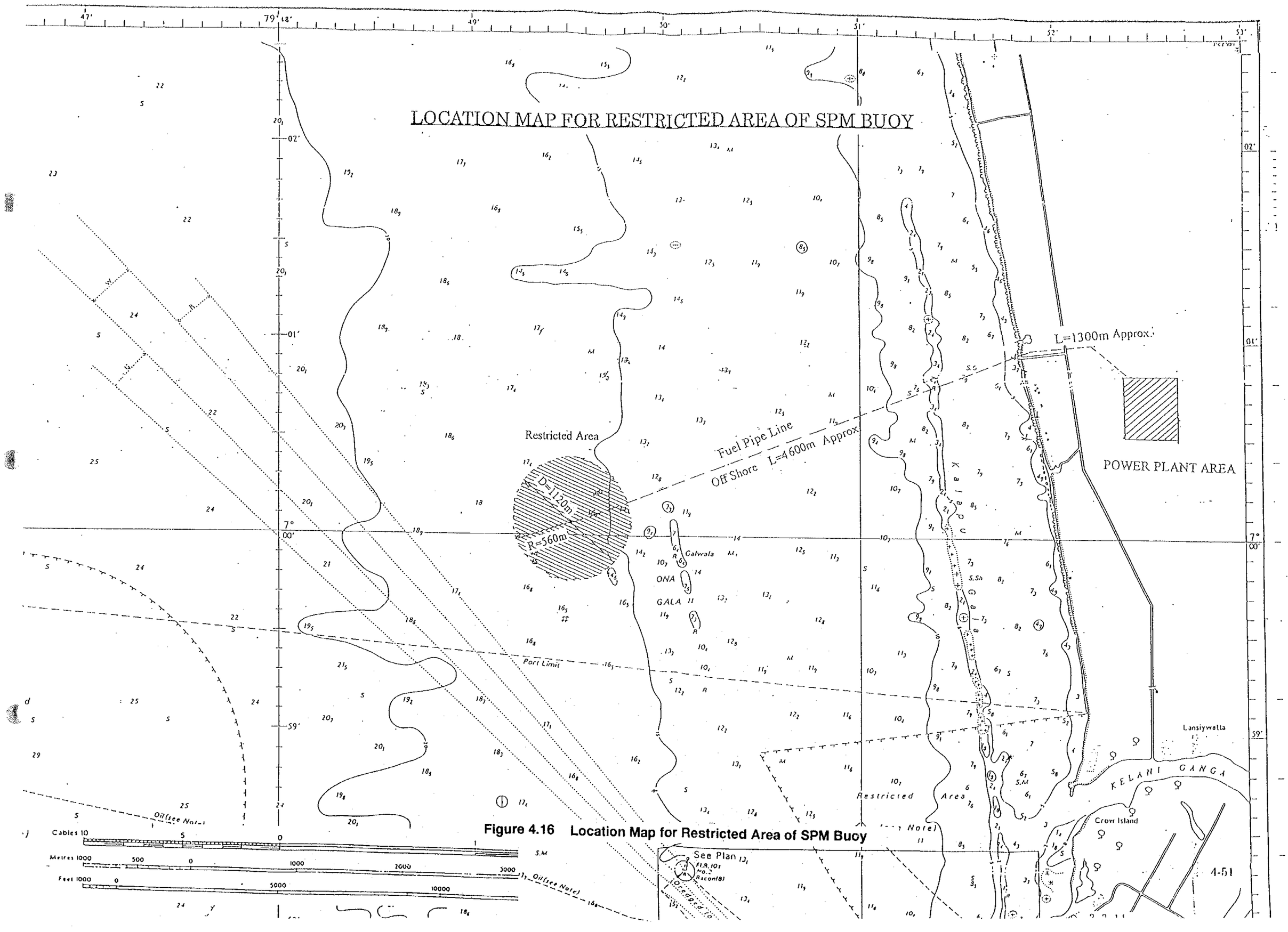


Figure 4.16 Location Map for Restricted Area of SPM Buoy

LOCATION MAP FOR RESTRICTED AREA OF INTAKE TOWER

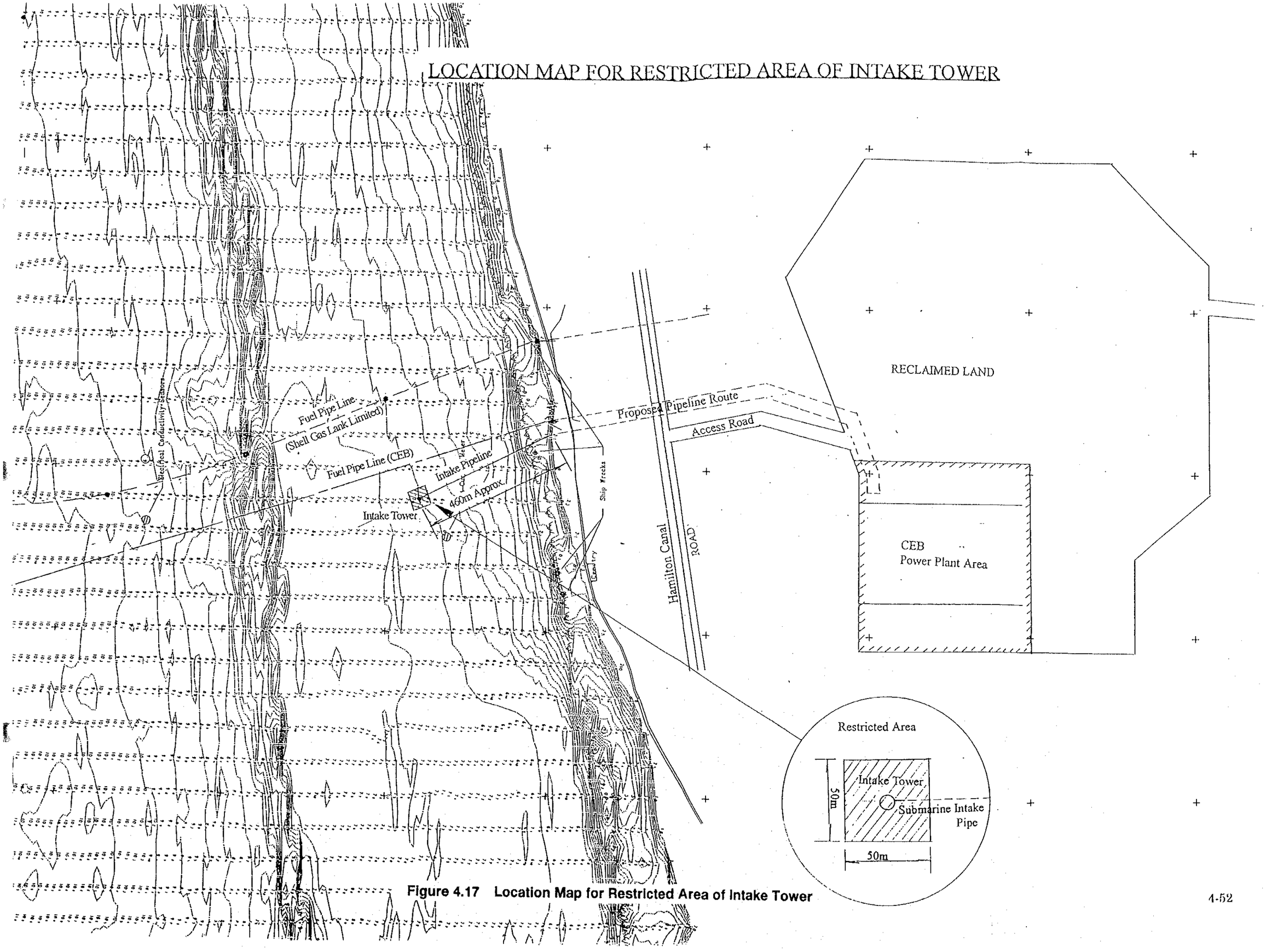


Figure 4.17 Location Map for Restricted Area of Intake Tower

CHAPTER 5 MITIGATION OF SIGNIFICANT ENVIRONMENTAL IMPACTS

CHAPTER 5: MITIGATION OF SIGNIFICANT ENVIRONMENTAL IMPACTS

This chapter describes the ways and means of eliminating, minimizing or reducing adverse impacts on various environmental components as far as possible by incorporating appropriate mitigatory measures into the plant concept, design and operations.

5.1 Proposed Mitigatory Measures

5.1.1 Air Quality

5.1.1.1 Construction Phase

There will be no significant impact on the air quality is estimated during construction phase. The dust generated at the site would be controlled by frequent watering of the area, a minimum of once in every three hours and more frequently, if required.

5.1.1.2 Operational Phase

Since the dispersion model output predicts no adverse impact on ambient air quality, no special mitigatory measures would be necessary.

The exhaust pollutants are dispersed by the use of effective stack arrangements which facilitate good plume dispersion.

5.1.2 Noise

5.1.2.1 Construction Phase

Since the estimation of noise level during the construction phase predicts it will be maintained within the standard, no special mitigatory measures would be necessary.

It is proposed to limit the construction activities during night in order to minimize the noise generation.

5.1.2.2 Operational Phase

It is proposed to carry out a regular plant inspection and maintenance program to prevent generation of noise due to wear and tear, alignment fault, etc.

The CEB has undertaken the responsibility to conform with the occupational health requirements by providing ear plugs/muffs to contain any impairment of hearing to the employees when exposed to high level of noise.

5.1.3 Water Quality

5.1.3.1 Construction Phase

It is proposed to appropriate water quality control measures such as construction of a siltation pond in order to avoid suspended solid running directly into the canal water.

5.1.3.2 Operational Phase

It is proposed to install waste water treatment system which include a neutralizing, hardening and sedimentation system and an oil separator system in order to keep water from the site below the water quality standard of Sri Lanka.

5.2 Contingency Plan

Fire protection equipment and facilities will be available at strategic locations within the power station. These equipment and facilities will be designed taking into account the predictable features and causes of fire accident, occupation conditions of individual buildings and facilities and other factors based on the following standards and criteria.

1) NFPA standards
2) Criteria according to the Fire Service Law of Sri Lanka
3) Other applicable standards and criteria

It is also proposed to install banking type oil dike and tank partition dike which height are 1.1 m and 0.3 m respectively around oil tanks in order to prevent running out oils to the outside of plant site in case of accident, etc.

5.3 Extended Benefit Cost Analysis

A Guideline to Incorporate Environmental Economics into Terms of Reference for EIA says that "use the financial analysis as a basis to conduct the Extended Benefit Cost Analysis". However, it should substitute "the economic analysis" for the said "financial analysis" because that the words "financial analysis" does not correspond with the "environmental economics". Usually, a cost burdened by people living in and around the area of any project due to its environmental impact is called as the external cost or damageable cost, and this cost does not belong to the financial category but belongs to the economic category.

Therefore, an economic analysis is made as the said extended benefit cost analysis hereunder.

5.3.1. Economic Costs

A Project cost including net construction cost, a cost for preparatory works for approach road and so forth, a cost for compensation, and a cost for engineering services for supervision is estimated as mentioned in the main report. The Project cost consists of foreign currency portion and local currency portion. Based on this project cost, an economic cost is estimated for evaluation of the Project. In this case, the cost for compensation means a cost for removal of buildings and houses including a cost for land for people living in and around the Project area along planned pipe-line for fuel transportation and so forth and along the transmission line from the power plant to the nearest sub-station, so it might be called as the cost for countermeasure for living environment.

In estimation of the economic costs, following assumptions are set as general conditions based on the result of discussion with CEB;

(1) Price escalation rate of the costs:
- For foreign currency portion: 1 % per annum.
- For local currency portion : 10 % per annum.

(2) Exchange rate:
- US$ 1.00 = Rs. 63.80
- Japanese \100 = Rs.47.80

Each in terms of mid-rate as of May 15, 1998.

(3) Equipment and materials to be brought into Sri Lanka from abroad should be exempted from taxation, so that their CIF prices represent a border price.

Foreign currency portion

The foreign currency portion of the costs is estimated in either Cost Insurance Freight (CIF) price as a border price as mentioned above. Therefore, these international prices are assumed to reflect economic cost directly.

Local currency portion

Because it is presumed that local markets in developing countries are distorted by price controls and other regulations, prices in the domestic markets do not reflect economic scarcity of goods and services. This means that the prices can not be used to evaluate economic costs of local procurement and have to be converted into economic prices.

In economic analysis of a project, conversion factors are used to convert the costs in domestic markets into economic costs of a project.

Using export and import statistics, a standard conversion factor (SCF) was estimated at a rate of 0.9485. This SCF converts the domestic commodity prices into the economic prices that can be assumed to reflect the economic scarcity of the local goods and services in domestic markets.

However, the SCF is applied to only tradable goods. The economic cost of non-tradable goods and services have to be separately evaluated. Conversion factors of land, skilled and non-skilled labors, and local works are respectively estimated. They were estimated at 1.000 for land, 0.700 for unskilled labour considering the similar projects in developing countries, and 0.875 for local construction works including transportation considering the Goods and Services Tax (GST). Then, the weighted average of the conversion factors was calculated at 0.853 based on the work value and apply it to the financial cost to convert into the economic cost.

Calculation process is mentioned in the main report in detail, summarized below. In this case, the proposed power plant is for 150 MW with one (1) unit but the plant should be developed up to 750 MW with 5 units along with the CEB's long term program. Therefore, the Project cost is estimated in two (2) cases as (1) the cost for one unit only as Case-1, and (2) the total cost for plural units considering the said future development as Case-2. Price escalation should be excluded because that the evaluation of the Project is made by comparison of present values of cost and benefit in economic analysis.

Summary of Economic Costs of the Project

(Unit:US$1,000)

Year	2000	2001	2002	2003	2004	Total
Case-1						
Economic cost	1,537	37,213	74,690	8,484	332	122,257
Case-2						
Economic cost	1,537	56,760	84,687	11,540	342	154,866

5.3.2. Economic Benefit

In the case of without-Project, CEB should pay additional capacity cost (power cost) and energy cost for construction of facilities as an alternative power plant to cover electricity demand so that customers may be supplied necessary electricity without any trouble. If the Project is executed, these additional costs will be saved. These saved costs are given as economic benefit in the case of this kind of project.

In this Project, an oil fired conventional boiler-turbine power generation system is set as the said alternative plant. For estimation of the power benefit and energy benefit, the power value (KW-value) and energy value (kWh-value) for the alternative plant should be estimated. In this case, because technical characteristics of the oil fired conventional boiler-turbine power generation system and planned combined cycle power plant are different, adjustment factors consisting of KW-value adjustment factor and kWh-value adjustment factor are to be estimated. Then, these adjustment factors are incorporated in the analysis, so that the benefits of the planned combined cycle power plant derived from saved costs of the alternative oil fired conventional boiler-turbine power generation system should be identical. In this case, applied rates on power own use and force outage are based on the data keeping in JICA Study Team, and periodical overhaul and inspection will made during one month a year.

The annualized power value and the energy value of the alternative oil fired conventional boiler-turbine power generation system are resulted at US$141.66 per kW and at US$28.18 per MWh respectively as mentioned in the main report. In this case, the construction cost per kW as a base of kW value is based on the total Project cost. And, the applied fixed O/M cost and variable O/M cost is based on the data keeping in JICA Study Team. The plant life is assumed at 20 years for both the planned plant and the alternative plant, and the fuel prices are average ones during these 3 years for both the auto diesel oil for planned plant and heavy oil for alternative plant. The high heating value is the planned one for planned plant, and based on the data keeping in JICA Study Team for alternative plant.

In this Project, the external cost burdened by the people living in and around the Project area caused by air pollution due to emission of NO_x and SO_x should also be considered. If the emitted volume of NO_x and SO_x will be lower in the case of the planned combined cycle power plant than in the alternative oil fired conventional boiler-turbine power generation system, the Project will get an additional economic benefit from an environmental viewpoint as an external cost saving. In the contrary case, a negative benefit will be derived from the same viewpoint.

In this case, the emission volume of NO_x for the proposed plant is the planned one. But for the alternative plant, a reasonable volume to be reached without any denitrification facilities. The emission volume of SO_x from the alternative plant is assumed at the same one from the proposed plant in order to equalize the impact to the air quality with the case of proposed plant. Therefore, the desulfurization efficiency of alternative plant will be 80 %.

Unit damage costs of NO_x and SO_x are given as US$446.6 per ton and US$180.4 per ton respectively in terms of 1990-price level in "Incorporating Environmental Concerns into Power

Sector Decision-making -A Case Study of Sri Lanka-" issued by the World Bank as a World Bank environment paper No.6. Those unit damage costs of NO_x and SO_x are for estimating the additional economic benefit as the external cost saving, estimated at US$1,158/ton and US$468/ton as of 1998 based on consumer price index of General Item in Colombo.

The economic benefits are resulted at US$21,986 x 10^3 in the annual power benefit, at US$26,819 x 10^3 in annual energy benefit and US$110 x 10^3 in external cost saving as studied in the main report. As a result, the planned combined cycle power plant will emit lower volume of NO_x and SO_x as a whole than the alternative power generation system. So that an additional benefit will be derived due to completion of the Project.

5.3.3. Result of Economic Evaluation of Project

The economic evaluation of the Project is made by using cash flows of the said economic costs and economic benefits as shown in Tables 5.3.1 and 5.3.2. The results are summarized below. In this case, B/C ratios are comparison of benefit and cost in present value of them, and B-C means net cash flow between benefits and costs also expressed by their present value. For calculation of present value, a discount rate of 10 % is applied according to a result of discussion with CEB used in similar projects in Sri Lanka.

Result of Economic Evaluation

Case	EIRR (%)	B/C ratio	B-C(US$1,000)
Case-1	11.50	1.05	11,383
Case-2	8.99	0.97	-9,323

As mentioned in previous clause, the planned power plant is for 150 MW with one (1) generation unit but the plant should be developed up to 750 MW with plural generation units along with the CEB's long term program. In these kind of cases, some of the facilities should be prepared previously at the first stage of the construction works of the plant. Therefore, the economic costs in Case-2 might be the nearest economic cost to the actual one. On the other hand, economic benefit can be estimated for one (1) generation unit only because that the planned power plant for one (1) generation unit. To compare the economic benefits for one generation unit with the costs for plural generation units may be unfair from the general viewpoint.

From the viewpoint of above mentioned reason, the economic evaluation is made in 2 cases, i.e. Case-1 is for comparing the economic benefits for one generation unit with the economic costs for one generation unit and, Case-2 is for comparing the economic benefits for one generation unit with economic costs for plural generation units.

As indicating in the above Table, EIRR in Case-1 is resulted at 11.50 % meaning that the Project is economically feasible. On the other hand, EIRR in Case-2 is resulted at 8.99 % meaning that the Project is not sound economically reflecting a burden of economic costs for plural generation units on economic benefit for one generation unit.

5.3.4. Sensitivity Analysis in Economic Aspect

There are constant fluctuation in prices of construction materials for these kind of projects as a reflection of economy in the state.

It also gives an impact to the economic benefit because that the said benefit is estimated based on construction cost and fuel cost for the oil fired conventional boiler-turbine power generation system as an alternative plant for generation of electricity to cover the electricity demand as mentioned in previous clause.

Considering those situation, a sensitivity analysis is made for 8 combined cases in addition to base case for Case-1 under the conditions that the benefit will be decreased as -5 % and -10 %, and the cost will be increased as +5 % and +10 %. The result of this sensitivity analysis is summarized below:

Result of Sensitivity Test for EIRR

(%)

Cost	Benefit		
	Base case	-5%	-10%
Base case	11.50	9.77	7.90
+5%	9.85	8.09	6.16
+10%	8.26	6.43	4.39

As shown in the above Table, the EIRR under both the benefit and the cost in the base case is resulted at 11.50 % as already mentioned that is economically sound indicating enough higher rate than the discount rate of 10 %. On the other hand, (1) under the condition of -5 % of benefit and base case of cost and (2) under the condition of base of benefit and +5 % of cost, the EIRR became slightly lower than 10 % of discount rate as 9.77 % and 9.85 % respectively. It means that the Project is quite sensible against the said price fluctuation, but is economically feasible when the price fluctuation ranges within 5 % both in benefit and cost.

5.4 Resettlement Issues

5.4.1 Introduction

5.4.1.1 Background

The cooling water intake and discharge pipelines and fuel pipes are sited on a 50 m wide stretch of land located in the west side of the proposed power plant site. The people living in this area, called the Intake Area have to be resettled in a new area. The resettlement of 25 families is required.

Fundamental resettlement and reconstruction plans of new settlement are shown in Sections 5.3.5. The plans may require some adjustments based on increases in the number of families residing in and implementation of the project. Formulation of the resettlement / reconstruction plan will be guided by certain important principles that are upheld by all major international donor agencies, as well as by the Government of Sri Lanka.

5.4.1.2 Socio-economical Status of the Area

Socio-economical status of residents to be resettled is shown as summary in Section 4.1.6. EIA Compensation Related Study for the site was carried out by the TEAMS(Pvt.)LTD entrusted by CEB in 1998.

5.4.2 Principle and Guideline

The principle on which the resettlement/reconstruction plans based on guidelines of governments and international donor agencies is to manage impacts on human resources resulting from development projects. These principles include the following :

1) Resettlement should be avoided or minimized wherever feasible ;

2) Affected peoples should be involved in the decision-marking process to the extent possible. They should be consulted on and given options for resettlement and compensation, if possible within the laws of the land ;

3) Behavioral distinctions and specific activities associated with gender should be considered in the development of the resettlement plan in order to guarantee that both men and women are involved in decision making and share equitably in project benefits.

4) Social and economic standards of the affected peoples should be at least as good, and preferably better, with the projects as they would have been without the project ;

5) The people in areas affected by the project should be, to the greatest extent possible, recipients of the benefits of the project ;

6) The full costs of resettlement and compensation should be included as an integral part of project costs and considered in rate of return calculations.

Based on above principle, resettlement and compensation plans are guided by the laws, regulations, and principles or practices of the Government of Sri Lanka. In some cases, application of principles and practices are improved. In addition, the compensation payments required by law are amounted for rehabilitation, that is, for compensation on amenities, infrastructure, and social services. Compulsory evacuees may also require assistance in development at new settlement sites and this assistance will be considered a political and moral obligation to compulsory evacuees.

5.4.3 Land Acquisition and Resettlement Plan

5.4.3.1 Compensation Study

The CEB supported by the TEAMS estimated the amount of land required for (a) Intake / Discharge Area and new land for resettlers, (b) Access Road from A3 Road to the site and (c) transmission line route. According to the inspection for the transmission line route, no necessity of resettlement can be found. Compensation study was carried out by following steps.

1. Inspection and identification for the intake/discharge area, access road route and transmission line route.
2. Meeting with Divisional Secretary of Wattara and the member of the area in view of the sensitivity of issues concerning displacement of people.
3. Design of questionnaire for the survey and administration of survey to households (a) within 150 m wide Intake / Discharge Area from the beach to the Hamilton Canal traversing the western boundary and (b) access road route on the either side of the Gunasekera Mawatha.
4. Continuous interviews for the people living in the area to be altered and local officers in the area by the socio-economist. Inspection of suitable area for settlement and gaining any in-depth understanding of the local political forces and activities in granting of state land.
5. Reviews of publications in laws, regulations and guideline related to land acquisition and compensation policy.

5.4.3 2 Land acquisition and Resettlement Cost Estimation

1. Land Acquisition

1) Land Required for Intake / Discharge Area

1.18 ha of land living 25 families within the intake/discharge area to be required for resettling, where across Dickowita and Awarakotuwa Villages、 is listed in Table.4.6. Cost estimation was done in two parts, (1) for Land Area East of Hamilton Canal and (2) for Land Area West of Hamilton Canal. Estimation of compensation cost was followed the basis of acquisition under the Land acquisition Act. The balance land to be taken over for the 50m wide reservation for intake/discharge pipe lines is marshy land belonging to the state, and the Divisional Secretary, Wattala may be addressed in obtaining this land. Totally 1.27ha will be acquired. In the area there are 3 permanent houses, 11 semi-permanent houses and 11 temporary houses and no special structure such as schools, religious buildings and community holes.

2) Access Road

9,200m^2 of area will be newly acquired to widen the original local road for the new access road. No buildings are involved in the widened space, though a few parapet walls may affected. These land will be acquired under the Land Acquisition Act. Only 50 families answered for the compensation study though 90 families are concerned in this area.

2. Alternative Land

1) Land to be acquired

The land required to be purchased for resettlement on the basis of giving land to land is 1.18 ha. This land locates at 1 km north side from the original land and coconut land is buildable on the sea side of the area. Environmental condition of new land is quite similar to the Intake / Discharge Area. Hamilton canal, which is used as the traffic route of fishing boat runs in the east side together with local road and the area is being opened to the sea. The consultants have spoken to several families to be displaced and they had no objections to be resettled in this land. This land is owned by Mr. Tony Rodrigo (Baby Mahat taya), aluth Akkare, Usswetakeiyawa.

2) Land Acquisition and Resettlement Cost

Following cost are appropriated in this feasibility study stage by Land Acquisition Act.

a. Cost for land acquisition for the Intake / Discharge Area

i) Land

ii) Houses

b. Cost for land acquisition for the access road as an extension of the road

i) Land

ii) Damages to parapet walls and other structure

c. Cost for construction of new settlement

i) Cost for construction of alternative houses

ii) Cost for construction of infrastructure

Surveying and blocking out cost

Construction cost of access road and paths

Cost for provision of water supply, distribution system

Cost for provision of electricity supply, distribution line

d. Other cost

i) Structures

The TEAM conducted a compensation study in order to note any other structure or items for which compensation should be paid. Permanent structures are valued on replacement basis at current costs and cost per square foot for materials and labour for reconstruction at current market prices, depreciated according to age and condition. Rate follow those used by the Building Department.

ii) Loss of Business

Business of people to be resettled consist of fishery and labour. Loss of business time during resettlement process will be considered. Loss of business is not currently expected.

iii) Injurious Affection

The maximum amount of 20% of land value permitted by the Land Acquisition Act was used.

iv) Machinery

Compensation for machinery was not calculated. Mobile machine as a fishing boat can move and fix at Hamilton Canal. Any special machinery is not sited in the area.

v) Maintenance Allowance

An appropriate maintenance allowance will be given to resettlers to cover loss of income and other disruptions occurring during the transfer period and to help them through a short adjustment period immediately after resettlement. The maintenance allowance is based on incomes and costs for food and other incidentals for a period of one month.

vi) Land Preparation

No costs are included in the resettlement cost for earthwork needed to reclaim land or for demolishing buildings at existing sites. Earthwork will be a part of the main works of the project. There should be no cost for demolishing buildings in areas to be reclaimed for

new settlement. This work can be awarded to a local contractor in return for salvage material.

vii) Community facilities

Community facilities, such as playgrounds, community meeting rooms, and libraries, are based on the number of families in each new settlement. Religious structures of similar sizes to existing structures will be constructed at new set elements. Decorative objects will be relocated. Costs for other kinds of community facilities, such as churches and the theater, are based on floor area of the existing structure.

viii) Education

Educational facility will be given according to the request of resettlers based on the discussion with regional educational institutions.

5.4.4 Community Participation

5.4.4.1 Resettlement Preferences

Community participation is one of the most important aspects of an effective resettlement .People living in the area and local and urban organizations will be involved to provide various kinds of assistance to resettlers. This system has the mechanisms to involve all affected communities in decision making, implementation, and monitoring of resettlement activities. These methods include survey questions, discussions with key informants from the resettlement communities, community meetings with resettlers, and discussions with representatives from the larger area.

In order to develop a suitable community involvement plan, followings are to be identified. In the detailed design stage, detailed study will be carried out.

i) Resettlement preference of people concerned
ii) Ways existing organizational and decision making structures which can be built upon to form a community participation organization.
iii) People and organization which should be involved
iv) Group which should actually perform.

5.4.4.2 Survey

The survey uses multiple choice question to elicit responses to a number of question related to preferences for resettlement. The issues to be investigated include the followings.

i) Where and with whom would the family like to be resettled.
ii) Dose the family prefer to self-settle or to be resettled by the project.

iii) What kind of assistance does the family want for construction of housing.

iv) What kind of compensation is desired

There are, maybe, a little differences between resettlement preferences of urban and rural workers. The main observation will be investigated from the survey results include the followings.

i) Relocation Site

Where does families prefer to be relocated together with their current community to be a location close to their current one.

ii) By themselves or Project resettlement

Who prefers by the Project Resettlement or self-settlement .

iii) Reconstruction

Who prefer that the project constructs new house and other structure.

iv) Compensation

Who prefers Project Housing rather than cash compensation. The resettlement plan proposes to construct appropriate housing for each resettlers.

5.4.4.3 Community Meeting and Participation

All potential resettlers have many opportunities during the survey process to discuss their preferences, anxieties, and idea through the meetings in relation to the proposed fundamental resettlement and reconstruction plan. CEB will propose the communities meeting in order to request the community participation to the resettlement plan.

CEB will also assist that the resettlement communities and area community representatives establish the Wattala Resettlement Committee(WRC). The WRC would be a kind of non-government organization to organize and guarantee community participation in design, implementation and monitoring of resettlement activities urban communities and representatives from males and females with demonstrated organization ability, can assist resettlement communities who have little organizational tradition. Community members, who already have demonstrated they can work with resettlers, can provide assistance in more complex tasks. In addition they can help to organize the effort and lend it the influence needed to assure appropriate treatment of resettlers.

The WRC will have a steering committee with members who have some demonstrated organization skills. The steering committee would lead the WRC and would develop an organization skills. The steering committee would lead the WRC and would develop an organization strategy, work plan and select members for task forces to deal with specific kinds

of issues. The complaint / grievance task force will consist of people with some understanding of experience matters.

The WRC membership will include the following members.

i) Elected representatives of resettlement communities concerned.
ii) Representatives of large community
iii) Superintendents of land in the resettlement area
iv) Owners/managers/representatives of commercial establishments in the area
v) Selected Government Offices who are not directly involved in resettlement implementation.
vi) Local attorney
vii) Local medical practitioner
viii) Mass communication
ix) Religious official
x) Educational officer

Table 5.1 Calculation of Economic Internal Rate of Return in Case-1

(US$1,000)

Year order	Year	Cost					Sending end output	Energy to be sent	Benefit				Cash balance
		Construction cost F/C	Construction cost L/C	O/M & R cost	Fuel cost	Total			Power benefit	Energy benefit	External cost saving	Total	
		(US$10^3)	(US$10^3)	(US$10^3)	(US$10^3)	(US$10^3)	(MW)	(GWh)	(US$10^3)	(US$10^3)	(US$10^3)	(US$10^3)	(US$10^3)
1	1998	0	0	0		0			0	0		0	0
2	1999	0	0	0		0			0	0		0	0
3	2000	1,313	224	0		1,537			0	0		0	-1,537
4	2001	25,516	11,356	0		36,872			0	0		0	-36,872
5	2002	64,066	10,283	0		74,349			0	0		0	-74,349
6	2003	5,137	3,006	0		8,143			0	0		0	-8,143
7	2004	292	40	1,051	31,548	32,931	157.0	962.7	22,241	27,130	111	49,482	16,550
8	2005			1,051	31,548	32,599	157.0	962.7	22,241	27,130	111	49,482	16,882
9	2006			1,051	31,548	32,599	157.0	962.7	22,241	27,130	111	49,482	16,882
10	2007			1,051	31,548	32,599	157.0	962.7	22,241	27,130	111	49,482	16,882
11	2008			1,051	31,548	32,599	157.0	962.7	22,241	27,130	111	49,482	16,882
12	2009			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
13	2010			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
14	2011			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
15	2012			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
16	2013			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
17	2014			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
18	2015			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
19	2016			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
20	2017			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
21	2018			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
22	2019			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
23	2020			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
24	2021			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
25	2022			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
26	2023			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
27	2024			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
28	2025			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
29	2026			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
30	2027			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
31	2028			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
32	2029			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
33	2030			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
34	2031			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
35	2032			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
36	2033			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
37	2034			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
38	2035			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
39	2036			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
40	2037			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
41	2038			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
42	2039			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
43	2040			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
44	2041			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
45	2042			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
46	2043			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
47	2044			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
48	2045			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
49	2046			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
50	2047			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
51	2048			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
52	2049			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
53	2050			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
54	2051			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
55	2052			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
56	2053			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
Total						1,735,728						2,449,815	714,087
In the condition of discount rate at 10 %:													
Present value:						258,661						275,274	16,613
Internal rate of return (EIRR):													11.94%
B/C													1.06

Table 5.2 Calculation of Economic Internal Rate of Return in Case-2

(US$1,000)

Year order	Year	Cost: Construction cost F/C (US$10³)	Cost: Construction cost L/C (US$10³)	Cost: O/M & R cost (US$10³)	Cost: Fuel cost (US$10³)	Cost: Total (US$10³)	Sending end output (MW)	Energy to be sent (GWh)	Benefit: Power benefit (US$10³)	Benefit: Energy benefit (US$10³)	Benefit: External cost saving (US$10³)	Benefit: Total (US$10³)	Cash balance (US$10³)
1	1998	0	0	0		0			0	0		0	0
2	1999	0	0	0		0			0	0		0	0
3	2000	1,313	224	0		1,537			0	0		0	-1,537
4	2001	28,554	27,353	0		55,907			0	0		0	-55,907
5	2002	69,253	14,581	0		83,834			0	0		0	-83,834
6	2003	5,572	5,115	0		10,687			0	0		0	-10,687
7	2004	292	50	1,051	31,548	32,941	157.0	962.7	22,241	27,130	111	49,482	16,540
8	2005			1,051	31,548	32,599	157.0	962.7	22,241	27,130	111	49,482	16,882
9	2006			1,051	31,548	32,599	157.0	962.7	22,241	27,130	111	49,482	16,882
10	2007			1,051	31,548	32,599	157.0	962.7	22,241	27,130	111	49,482	16,882
11	2008			1,051	31,548	32,599	157.0	962.7	22,241	27,130	111	49,482	16,882
12	2009			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
13	2010			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
14	2011			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
15	2012			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
16	2013			1,051	31,307	32,358	155.8	955.4	22,071	26,922	111	49,103	16,745
17	2014			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
18	2015			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
19	2016			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
20	2017			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
21	2018			1,051	31,227	32,278	155.4	952.9	22,014	26,853	110	48,977	16,700
22	2019			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
23	2020			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
24	2021			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
25	2022			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
26	2023			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
27	2024			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
28	2025			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
29	2026			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
30	2027			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
31	2028			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
32	2029			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
33	2030			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
34	2031			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
35	2032			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
36	2033			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
37	2034			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
38	2035			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
39	2036			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
40	2037			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
41	2038			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
42	2039			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
43	2040			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
44	2041			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
45	2042			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
46	2043			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
47	2044			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
48	2045			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
49	2046			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
50	2047			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
51	2048			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
52	2049			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
53	2050			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
54	2051			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
55	2052			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
56	2053			1,051	31,187	32,238	155.2	951.7	21,986	26,819	110	48,914	16,677
Total						1,766,802						2,449,815	683,013
In the condition of discount rate at 10 %:													
Present value:						278,993						275,274	-3,719
Internal rate of return (EIRR):													9.65%
B/C													0.99

CHAPTER 6 MONITORING PROGRAMME