4.2

ENVIRONMENTAL MANAGEMENT PLAN

4.2 Environmental Management Plan

This sub-section presents an environmental management plan in and around the three priority towns of Pazardjik, Dimitrovgrad and Stara Zagora. Environmental sensitive area and sensitive spots are presented and points for management including monitoring are described below.

4.2.1 Environmental Sensitive Area

(1) Natural Environment

Fig. 4.2.1 to 4.2.3 shows important areas of natural environment such as national parks, strict reserve areas, projects and proposed areas for future protection and important wetlands. These figures also show forest area, which is important for natural environment in general as well as for water resources.

Around Pazardjik

There is a proposed future protection area in the Right Bank of the Matitza River near Stamboliyski, which includes natural monument and protected site. There is another future protection area in the Yadenitza River Basin near Belovo, which is a right tributary of the Maritza River.

As for the wetlands, there are 3 important wetlands along the Maritza River. The biggest one is located just upstream of the junction of Maritza River with the Topolnitza River, which is currently, used as large fishponds under extensive utilization.

Forest area in MU1, CPI and STA are identified as the forest area with high priority for conservation (Class I) for water resources in the M/P.

Around Dimitrovgrad

There are 5 important wetlands around Dimitrovgrad. Among them Rozov Kladenetz Reservoir, which is the cooling water reservoir for Maritza East I TPP in Galabovo is identified as an important wetland as well as future protection area.

Forest area in MD is identified as high priority area for conservation (Class I) and those in MM3, HAR and SAZ are identified as medium priority area for conservation (Class II) for water resources.

Around Stara Zagora

There are no important areas for natural environment in this area. Forest area is identified as medium priority area for conservation (Class II) for water resources. According to the analysis of erosion potential, the forest area in the mountain contains the area with high potential of erosion.

(2) Soil Contamination and Mining

Soil contamination is investigated in a part of region around Pazardjik. There are many mines in the region (Fig. 4.2.4). It is expected soil is contaminated with the effect of mining activity. Around Stara Zagora, Radnevo/Galabovo producing coal is significant mining activity (Fig 4.2.5). Mines and their relating facilities are summarized in Table 4.2.1.

Around Pazardjik

Upstream of Luda Yana is significant area for mining especially Assarel mine. The Asserel produces Cu. As well as the Assarel, Medet mine is important. The Medet is already mined out. However, the waste has to be treated properly. The mines and relating facilities are digitized from satellite picture (S= 1:250,000) taken on Jan 28, 1997.

MoAFAR investigated soil contamination in a part of area. As shown in Fig. 4.2.4, soil contamination area is identified in the downstream Topolnitza and Luda Yana. This area

has many mines. Therefore, it is expected pollution is from these mines. In the downstream of Topolnitza and Luda Yana, it is expected that polluted water from Elshitsa mine is carried by Topolnitza, and taken by irrigation canals. Therefore, the contaminated area is spread to downstream of irrigation canals. In the north of Panagyurishte, the large area is identified as the contamination. The area has effect from Pirdop copper smelter.

Accidental disaster from mining gives severe damages to surrounding area. As environmental sensitive area, mining and soil contamination should be investigated and managed.

Around Dimitrovgrad

There are several mines boundary between Harmanliyska and Banska river basin. The main production is Pb, Zn, Ag, and Au. Closed uranium mine is located in the west of Haskovo.

Around Stara Zagora

There are several mines near Stara Zagora. The most important mine is Maritza East coal basin. The huge open area is used for mine and relating facilities. The area is digitized from the satellite picture (S= 1:250,000) taken on Jul 29, 1996. Uranium deposit and mines, which may cause severe problem, are located in south of Galabovo.

4.2.2 Environmental Sensitive Spots

(1) Water Intakes

Around Pazardjik

Fig. 4.2.6 shows the irrigation area and river intakes around Pazardjik. Along the Maritza Main Stream, there are two gated intake weirs between Pazardjik and Septemvri of Pasha Arc Intake and Zlokutchene Intake and one overflow closing dike made by concrete blocks at the starting point of Eni Arc Canal near Stamboliyski. Along the tributaries there are

two gated intake weirs of Lissichevo Intake in Topolnitza River and Vetren Dol Intake in Chepinska River. There is one temporary intake weir and two temporary closing dikes in the Topolnitza River during dry season.

In addition to the water from the hydropower station of Momina Klisura HPP and Aleko HPP, water is very much taken from these intakes between spring and beginning of autumn for irrigation. However, as there are no water level and discharge gauges at the river side neither canal side at the intakes, monitoring of intake water volume is said to be conducted manually sometimes.

Around Dimitrovgrad

Fig. 4.2.7 shows irrigation area and intake around Dimitrovgrad. There is one temporary closing dike made by rocks called Yabaikovo Intake in the upstream of Dimitrovgrad. Maritza River is completely closed during dry period by this temporary closing dike. Water is taken from here and sent to Progress and Garvanovo Reservoirs by using pumps.

Water level and discharge gauge is not installed at the temporary intake site neither for the river and the canal.

Around Stara Zagora

Water sources for Stara Zagora IS and Nova Zagora IS are Koprinka Reservoir and Jrebchevo Reservoir in the Tundza River Basin as shown in Fig. 4.2.8. Water from Koprinka Reservoir is sent through open canal and gravity waterway tunnel to the higher compensating basin above Stara Zagora Town. From here, water is sent to Stara Zagora IS through Stara Zagora HPP. There are two manual water level gauges along the inter-basin water transfer canal and measurement is conducted sometimes. Water transfer volume can be estimated from the back-calculated data of Stara Zagora HPP from the electric power generation. Along the canals of Stara Zagora IS, water level gauging stations including manual and telemetric gauges are installed.

Water is sent from Jrebchevo Reservoir to Nova Zagora IS through gravity waterway tunnel. Water is monitored by the automatic water level and discharge gauge at the starting point of the waterway near Jrebchevo Dam.

Future Consideration of Water Abstraction

Estimated net surface water demand and water volume from HPPs including inter-basin water from the Tundza River in Year 1994 and Year 1995 are accumulated in the upstream basins of Jct. 2 and Jct.5. Then, these are compared as shown in Fig. 4.2.9. From this figure, it can be understood that water volume from HPPs is bigger than the net surface water demand at Jct.5 and about half at Jct.2.

However, not only conducting inner-basin water transfer from the HPPs to irrigation systems of Topolnitza IS, Aleko Pazardjik IS and others, but also water abstraction is very much conducted from the river intakes in the present. Therefore if the operation of river intakes as well as inner-basin water transfer from HPPs will be improved for conducting more efficient water use, there will be a big possibility to reduce water abstraction volume from the river intakes. This will create another possibility for sustainable water use considering balance with natural environment.

(2) Industry

Many industries are located in industrial estate with other industries, shown in Fig. 4.2.10 to Fig. 4.2.12, summarized in Table 4.2.2. Most of industrial wastewater does not flow through residential area. Top 20 industries surrounding towns are also shown in these figures.

Around Pazardjik

Main industrial estate is located in south part of the town. Two industries among the top 20 is in the town:

- Maritza KK

- Trakia papir

Above two industries emit 81% and 13% of BOD and TN, respectively from industry in Pazardjik.

Around Dimitrovgrad

Industries are located in the northwest and east of Dimitrovgrad. SC Neohim is only one industry among top 20 located in the town.

BOD and TN load from SC Neohim is 93% and 100%, respectively as industrial pollution in Dimitrovgrad.

Between Dimitrovgrad and Haskovo, industrial WWTP, ranked top 8, is located. This WWTP emits high pollution load because of overloaded.

Around Stara Zagora

Southern part of town is the big industrial estate. Three industries among top 20 high pollution emitting industries to Maritza River basin are found in the estate:

- Agrobiohim
- Zagorka Brewery
- Meat factory
- Galiyja Zagoretz
- Biser Oliva

Pollution from above five industries is 74% and 99% of BOD and TN, respectively among industries in Stara Zagora.

In the outside of the town, there are two industries ranked top 20:

- TEPS "Maritza East" 1
- Stoianovi Brothers Maenad 1901

4.2.3 Required Monitoring

(1) Land Use and Natural Environment

In order to conserve the important areas for natural environment such as natural monument, future protection area and wetlands, periodical investigation including control for illegal activities is necessary to be carried out by MoEW.

In order to keep and enhance important forest area for water sources, also periodical inspection including control for illegal activities is necessary to be carried out by the proposed river basin authority.

(2) Water Use

Water abstraction as well as inter-basin and inner-basin water transfer are necessary to be monitored throughout a year. Monitoring of discharge should be conducted by installing automatic water level and discharge gauges at outlet points of HPPs, permanent intakes and water transfer points of inter-basin and inner-basin water transfers as described in the M/P. Monitoring gauges should also to be installed at the temporary intakes. However, considering the impact on environment, it is recommendable to assess the necessity of the permanent closing dike and temporary closing dikes. If there is a necessity, it is highly recommendable to change these closing dikes to headworks or gated weirs.

The gauges should be installed by the water user and the monitored records should be reported to the proposed river basin authority accurately and periodically.

(3) Pollution Sources and Water Quality

The monitoring system in river is mentioned in the water quality management of the Master Plan. In addition, water quality should be managed by the proposed in the Master

Plan. The following is applied the environmental management of three priority towns and their river basin.

Domestic

Proposed municipal WWTP is designed to include only domestic wastewater, except some small industry located in town. Therefore, wastewater quality should be monitored whether acceptable level of wastewater flows in or not.

Fig. 4.2.13 to Fig. 4.2.15 shows overflow problem of sewerage in three towns. This result is from questionnaire survey (50 people in each town) by JICA. It tends to have problem in sewerage connected to main collectors. This matter should be monitored carefully with wastewater quality.

Industry

Industrial wastewater from industrial estate is recommended not to combine with municipal wastewater. Industries declare the effluent quality and how to store and treat raw materials. The industries have to report correctly. Simultaneously the wastewater quality needs to be monitored. As mentioned in above, top 20 industries contribute high percentage of industrial pollution in the towns. Therefore, monitoring should be strictly to the high pollution loading industries such as the top 20. The sampling should make directly outflow from industry.

Some industries use heavy metal, which may not be the top 20. These industries should be monitored strictly as well as top 20.

Mining

Mining activity makes serious influence to surrounding environment. Although mines are closed, severe impact may occur from the waste disposal site or others. Therefore, it is necessary to be monitored both active and close mines. Before doing so, the investigation for mining is necessary as mention in the Master Plan.

TABLE 4.2.1 LIST OF MINES AND RELATING FACILITIES (1/2)

Pazardjik

No on map	Name (Company)	Status	Products	
			main	others
1	Medet mine, ("Assarel-Medet" Corp.)	mined out	Cu, Mo	
1a	Medet floatation plant	closed	Cu, Mo	
10	Assarel mine, ("Assarel-Medet" Corp.)	active	Cu	Au, As, Pb, Zn, Mn, Fe
10a	Orlovo Gnezdo deposit	unassimilated	Cu, Au, Ag	Mo, Pb, Zn
11	Assarel floatation plant	active	Cu	pyrite etc.
12	WWTP Assarel	active	Cu, As	Pb, Zn, Mn, Fe, Al, S
13	Lyulyakovitsa tailings pond – slimes from Assarel floatation plant	active	Cu, As	Pb, Zn, Mn, Fe, Al, S
14 14a	Mechka (Oborishte vill.)	closed (small extraction before 1944)	Mn	Fe
15	Milkina Cheshma and Tangur (Panagyurishte)	closed (small extraction before 1944)	Mn	Fe
16	Strelcha pegmatite field – 8 deposits	closed	feldspar	beryl (Be)
16a	Panagyurishte pegmatite field – 3 deposits	closed	feldspar	
17	Byalata prast	closed (small extraction before 1944)	Cu	pyrite
18	Krassen mine, ("Panagyurski mini" Corp.), mine dump	closed	Cu, Au	pyrite
19	Petelovo gold deposit – geological exploration	unassimilated	Au	Cu, Fe
19a	Kominsko Chukarche deposit	unassimilated	Cu	
20	Chervena Mogila (Engl.: "Red Hill") mine	closed (small extraction before 1944)	Cu, Au	pyrite
21	Radka mine, ("Panagyurski mini" Corp.)	mined out (extraction 1928 – 1996)	Cu, Au, Ag	pyrite, Pb, Zn
22	Radka floatation plant ("Panagyurski mini" Corp.)	closed	Cu, pyrite	As, Pb, Zn, Fe etc.
23	Radka tailings pond	closed	Cu, Fe, S, As	Pb, Zn, Au etc.
24	Tcar Assen 1 mine, ("Panagyurski mini" Corp.)	active	Cu	Au
24a	Tcar Assen 2 mine	active	Cu	Au
25	Momin Skok manganese deposit	closed (small extraction before 1944)	Mn	Fe
25a	Toplika manganese deposit	closed (small extraction before 1944)	Mn	Fe
25b	Goliya Vrah manganese deposit	closed (small extraction before 1944)	Mn	Fe
26	Elshitsa mine, ("Panagyurski mini" Corp.)	active	Cu, Au	pyrite, Ag
27	Elshitsa floatation plant – ores from Elshitsa, Tcar Asen, Radka and Vlaikov Vrah ("Panagyurski mini" Corp.)	active	Cu, Au	pyrite, Ag
28	Vlaikov Vrah mine, ("Panagyurski mini" Corp.), huge mine dump	mined out	Cu	
28a	Popovo Dere deposit, geological exploration	unassimilated	Cu	Au
58a	Ognyanovo deposit	active	lime	

TABLE 4.2.1 LIST OF MINES AND RELATING FACILITIES (2/2)

Dimitrovgrad

No on map	Name (Company)	Status	Products	
			main	others
39	Spahievo ore field	active	Pb, Zn, Ag, Au	Mo, Cu, ±U
41	Krepost iron deposit, small	closed	Fe	
54	West Maritza coal basin ("Maritza basin" Corp.)	active	lignite coal	
Uranium deposits				
88	Haskovo	closed	U	

Stara Zagora

No on map	Name (Company)	Status	Products	
			main	others
47	Ruda molybdenum deposits	closed (Small extraction in the past)	Mo	Cu, Pb, Zn, Au
48	Stara Zagora barite deposit	mined out	barite	Au
49	Stara Zagora ore field	closed (small copper deposits)	Cu	Ba, Fe, Au, Pb, Zn
52	Radnevo gypsum deposits ($CaSO_4.2H_2O$)	unassimilated	gypsum	
53	Maritza East coal basin – 7 deposits, ("Maritza-East" Corp.)	active	lignite coal	
60	Sarnevets deposit	closed	Fe, Au	Pb, Zn
Uranium deposits				
89	Navassen	closed	U	
90	Maritza	closed	U	
91	Troyan	closed	U	

TABLE 4.2.2 MAIN INDUSTRY IN THREE PRIORITY TOWNS

PAZARDJIK

MOEW Ref. No	Institution	Business	Main Product	Main Raw Materials*1	Discharge to	LWWTP	Working days pr year	Quantity (m3/d)	BOD5 (mg/L)	TN (mg/L)	BOD5 (kg/d) *2	TN (kg/d) *2	Ranking*3
1	"Maritza" KK Ltd.	Food processing	fruit and vegetable canning	masout, ammonia	TS	Y	260	15297	120	10	1308	109	Top 6
2	"Kautchuk"Ltd.	Chemical	transport belts, hoses, motor and other types	raw rubber, textile, sulfur, masout, oil	Pismanka	Y	260	1000	25	4	18	3	
3	"Trakia papir" Ltd.	Pulp and paper	Paper, cardboard, corrugated cardboard and packing	Waste paper, cellulose, semi-cellulose, aluminum sulfate, natural gas and all lubrication materials	Pismanka	Y	260	10000	50	3	356	23	Top 16
4	"Infirmatzionni nosisteli" Ltd.	Electronic	Diskettes production	-	Topolnitca	Y	260	620	60	2	26	1	
5	"Metalik" Ltd.	Machinery	Machine-tool	ferrous and non-ferrous metals, industrial gas oil	Maritsa	Y	260	17	60	1	1	0	
6	"M7M - 90" Ltd.	Food processing	meat and meat products	meat, masout, salt	TS	Y	260	693	120	25	59	12	
7	"Mletchana promislenost" Ltd.	Food processing	Milk and milk products	milk, diesel oil, masout	TS	Y	260	1096	360	40	281	31	
8	"SOMAT" Ltd.	Transport	automobile transport	fuel, lubrication and cooling fluids	TS	Y	260	966	11	2	8	1	
	Total							29689			2057	181	

DIMITROVGRAD

MOEW Ref. No	Institution	Business	Main Product	Main Raw Materials*1	Discharge to	LWWTP	Working days pr year	Quantity (m3/d)	BOD5 (mg/L)	TN (mg/L)	BOD5 (kg/d) *2	TN (kg/d) *2	Ranking*3
8	Trikon	Textile	textile materials, yarn processing	yarn, cotton, paints, diesel, water	TS	Y	260	1800	20	1	26	1	
9	Railway Sausage	Food processing	meat processing	meat and electricity	Maritza	Y	330	10	200	10	2	0	
10	Rakovski (Can Factory) Ltd	Food processing	fruit and meat-vegetable canning	fruit and vegetables	TS	Y	30	1200	150	10	15	1	
25	TEPS: Maritza 3	Power Plant	Workshop - boiler and emergency. - electricity	coal, masout, natural gas, NaOH, H2SO4, NaCl	Maritsa	Y	365	5000	15	2	75	8	
26	Maritza Basin: Smirnenski mini	Coal Mine	lignite coal mining	-	TS		0				0	0	
27	Maritza Basin:G.Gospodinov	Coal Mine	lignite coal mining	-			0	0	0	0	0	0	
28	Maritza Basin: Minjor mine	Coal Mine	lignite coal mining	-	Martinka		0				0	0	
29	SC Neohim	Chemicals	chemicals	natural gas, methanol	Maritza	Y	365	45100	38	103	1698	4645	Top 4
30	Vulkan Cement	Cement Manufacture	cement	limestone, clay, sand, gypsum, pyrite,	TS	Y	260	890	20	3	13	2	
	Total							54000			1828	4638	

STARA ZAGORA

MOEW Ref. No	Institution	Business	Main Product	Main Raw Materials*1	Discharge to	LWWTP	Working days per year	Quantity (m3/d)	BOD5 (mg/L)	TN (mg/L)	BOD5 (kg/d) *2	TN (kg/d) *2	Ranking*3
1	DZU	Machinery	electrical systems, audio compact-disks, electrical devices, locking systems, etc.	metals, polymers, natural gas, masout, hydraulic oils, cooling liquids	TS	Y	260	1500	5	1	5	1	
3	"Zagorka" Brewery Ltd	Food processing	beer	masout	TS	Y	365	4200	600	20	2520	84	Top 3
8	"Petko Enev" [Can Factory]Ltd	Food processing	fruit and vegetable canning	gas	TS		260	1500	150	10	160	11	
22	"Borui"Ltd.	Prefabricated concrete	reinforced concrete, constr. mixtures, reinforcement steel, profile	cement, inert materials, steel,	TS	Y	260	415	20	15	6	4	
30	Bulgarian State Railway	Transport	Locomotive repair and exploitation	lubrication materials, gas oil, masout,	TS	Y	0	0	0	0	0	0	
32	"Bus transport" Ltd	Transport	transport	diesel, petrol, motor oil	TS	Y	260	250	25	5	4	1	
43	"T.Daskalov" Ltd.	Machinery	food-processing machines	metals, masout, diesel oil	open channel	Y	260	90	50	5	3	0	
66	"Splav Comers"	Trade	buying, storage and selling of scrabs	-	TS		0	0	0	0	0	0	
67	"Progres" Ltd.	Machinery	cast-iron products	cast-iron and metals, diesel	TS		260	80	50	5	3	0	
68	"Preskov"	Machinery	steel products	steel	Bedetchka	Y	260	1120	10	2	8	2	
76	"Cheryeno Zname"	Machinery	food-processing machines	metals	TS	Y	260	190	50	5	7	1	
77	"Galiyja Zagoretz" Ltd.	Food processing	poultry slaughterhouse	poultry	TS	Y	260	1167	500	50	446	42	Top 14
78	Meat Factory Ltd.	Food processing	meat processing	fuel, lubricants, chemicals,	TS	Y	260	1281	500	50	456	46	Top 11
79	"Serdika"Ltd.	Food processing	milk and milk products	milk, masout and diesel oil	TS	Y	260	770	300	40	165	22	
80	"Stroikombinat" Ltd.	Readymix Concrete	concrete mixtures, cement mixtures	cement, inert materials	TS	Y	365	90	0	0	0	0	
82	"Beroe" Company	Machinery	Automation tools	diesel oil, masout, metals	TS	Y	260	1130	10	5	8	4	
83	"Svedgest" Ltd.	Service	laundry	washing chemicals, fuel, masout, gas oil,	TS		260	73	70	10	4	1	
84	"Domostroitel" Ltd.	Readymix Concrete	concrete mixtures, inert materials, reinforcement steel	cement, inert materials, steel,	Dry Gully	Y	260	169	10	1	1	0	
85	"Natalia" Ltd.	Textile	cotton knitwear	cotton yarn	TS		260	630	25	5	11	2	
86	"Tonika SZ" Ltd.	Food processing	soft-drinks bottling	sugar, acids, CO2, ammonia,	TS	Y	260	423	50	5	15	2	
87	"Svetlina" Ltd.	Machinery	Illuminates	steel and aluminum sheet	TS	Y	260	617	10	0	4	0	
88	"Biser Oliva" Ltd.	Food processing	vegetable oil	masout, gas oil, petrol, lubricants	TS	Y	260	6000	80	20	342	85	Top 19
89	"Agrobiohim"	Chemical	ammonium nitrate	natural gas, phenol, coal, oil	Bedetcka	Y	365	69120	105	125	7258	8640	Top 2
	Total							90815			11396	8947	

*1: Main Raw Material includes fuel, chemical, oil, and heating fluids
*2: Average daily load per year
*3: Ranking of pollution emission to the Maritza River basin

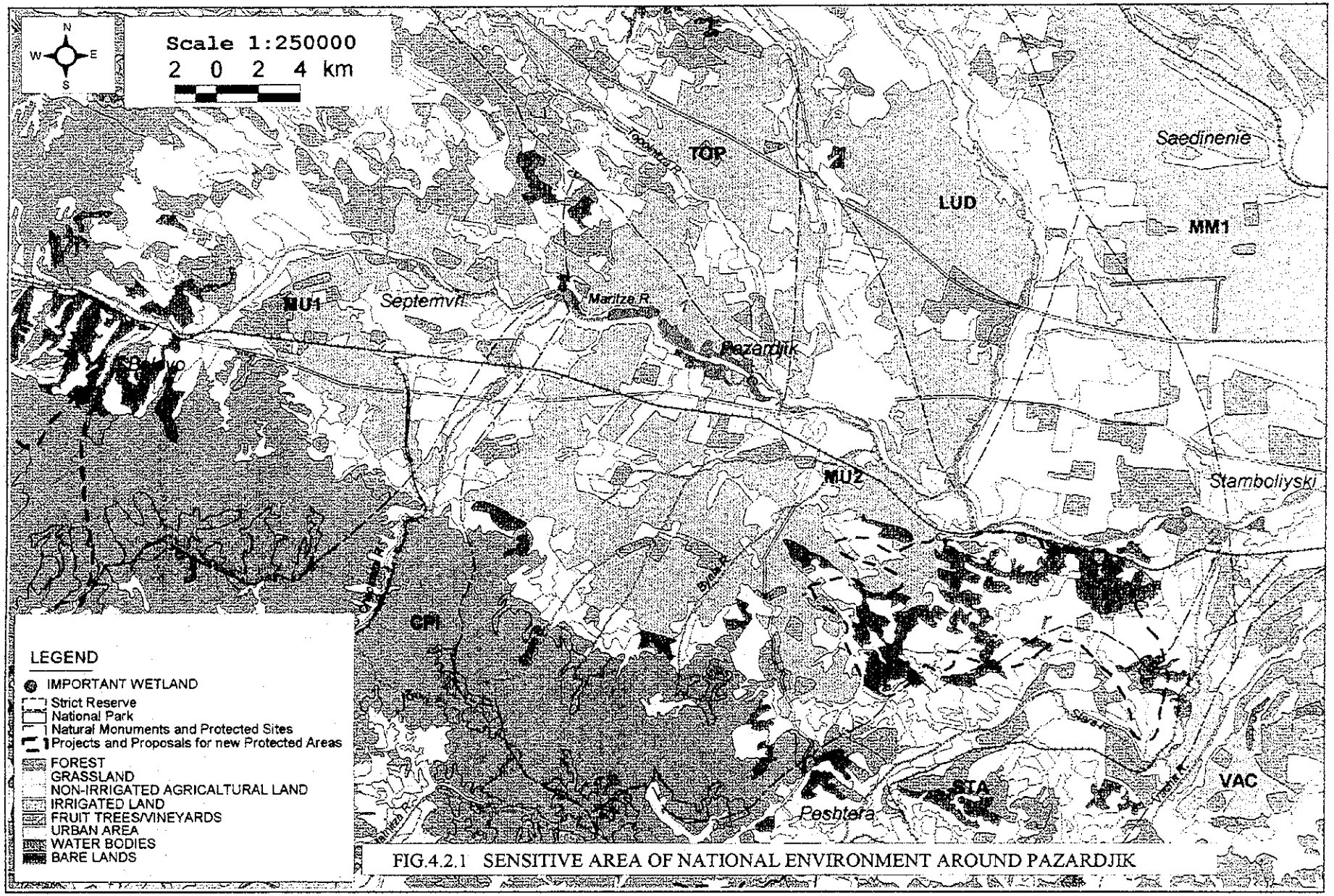
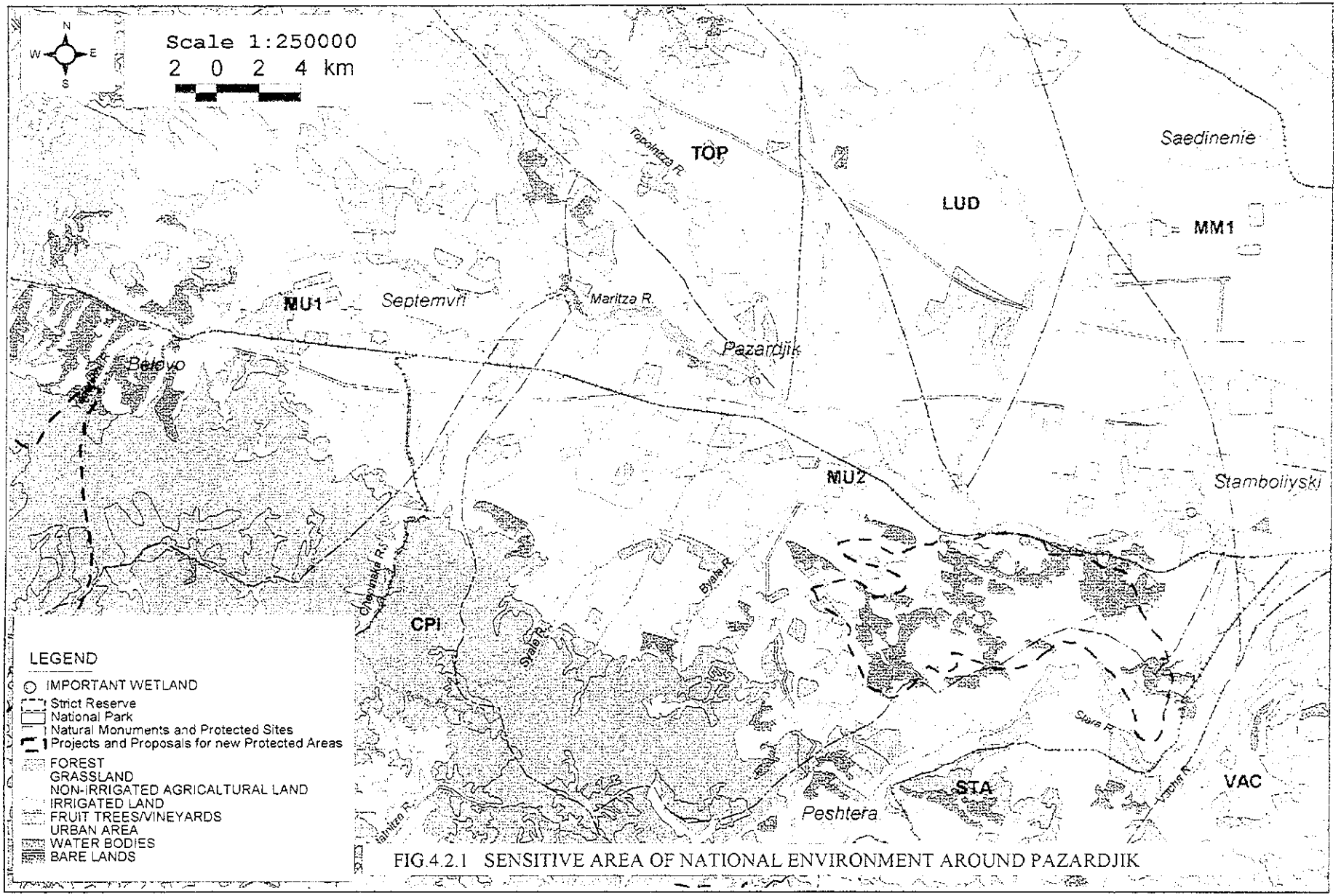


FIG.4.2.1 SENSITIVE AREA OF NATIONAL ENVIRONMENT AROUND PAZARDJIK



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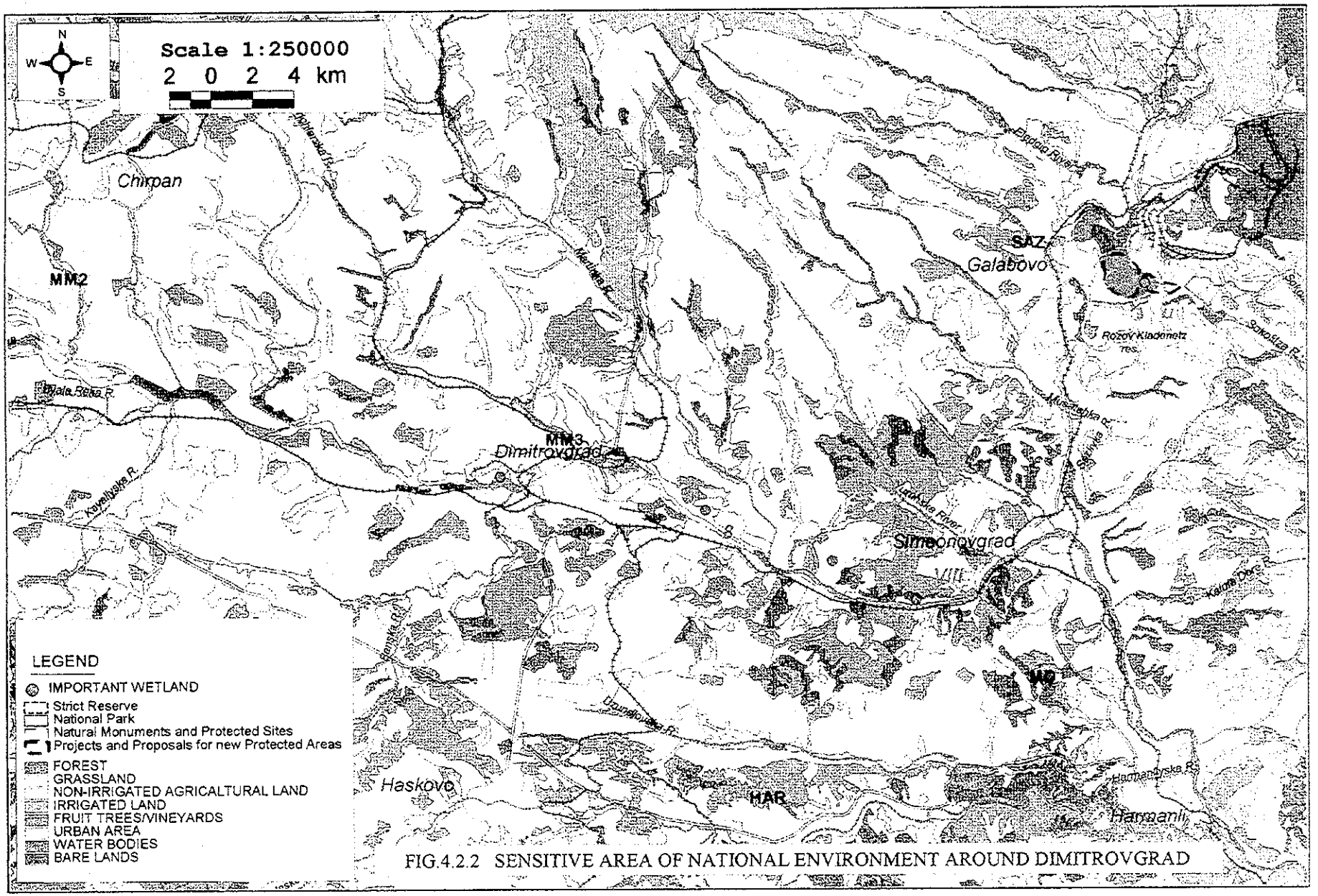


FIG.4.2.2 SENSITIVE AREA OF NATIONAL ENVIRONMENT AROUND DIMITROVGRAD

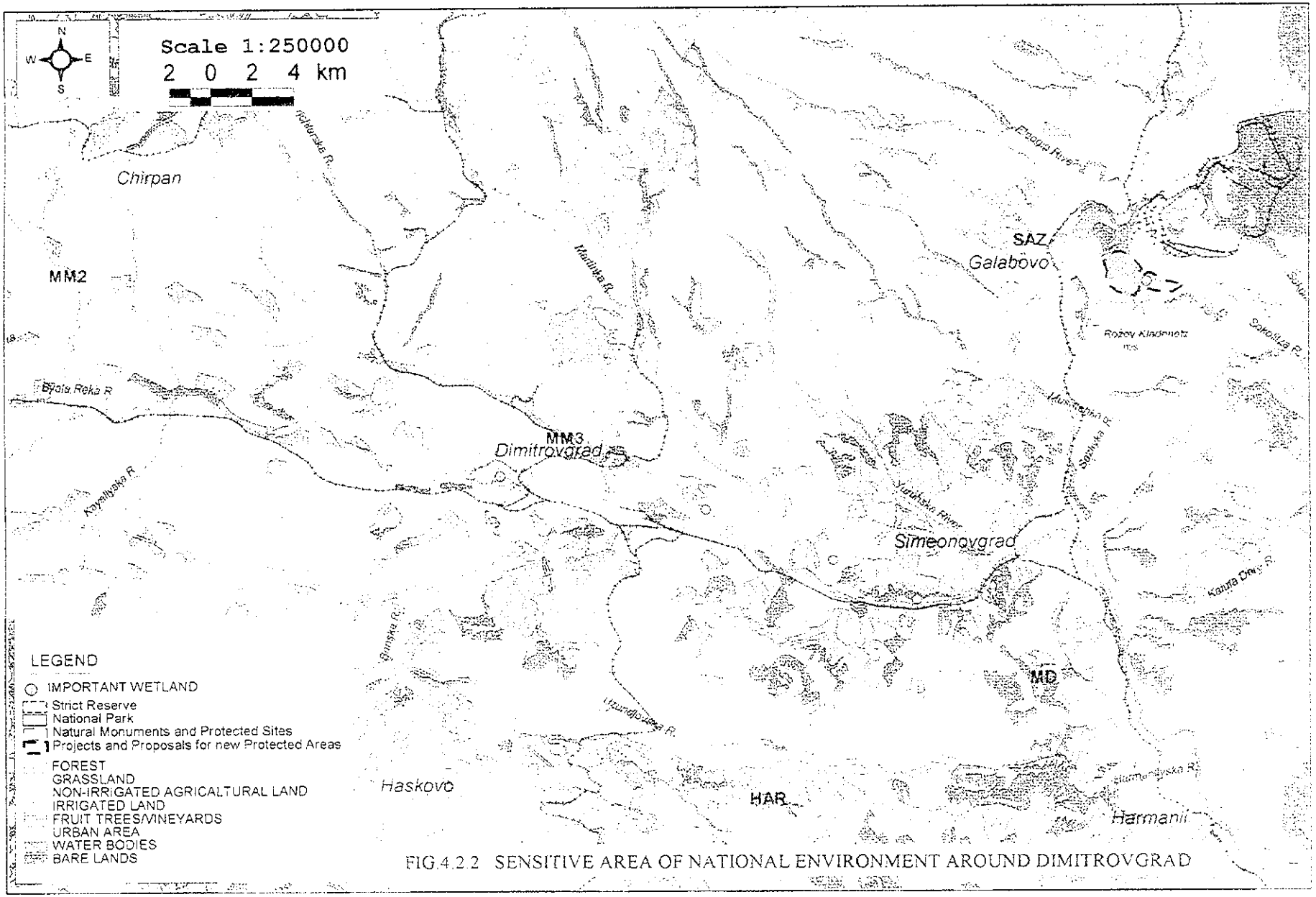


FIG.4.2.2 SENSITIVE AREA OF NATIONAL ENVIRONMENT AROUND DIMITROVGRAD

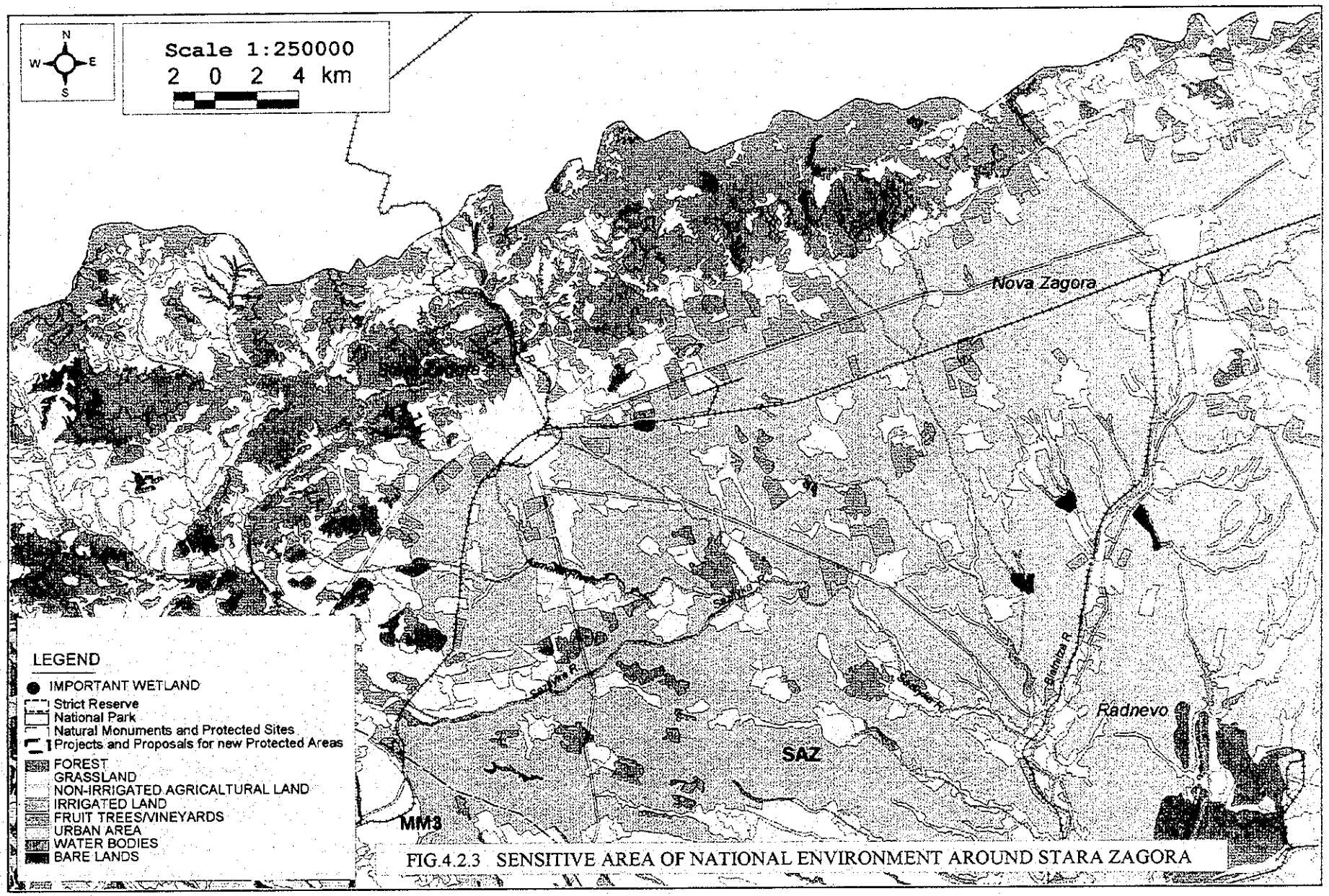


FIG.4.2.3 SENSITIVE AREA OF NATIONAL ENVIRONMENT AROUND STARA ZAGORA

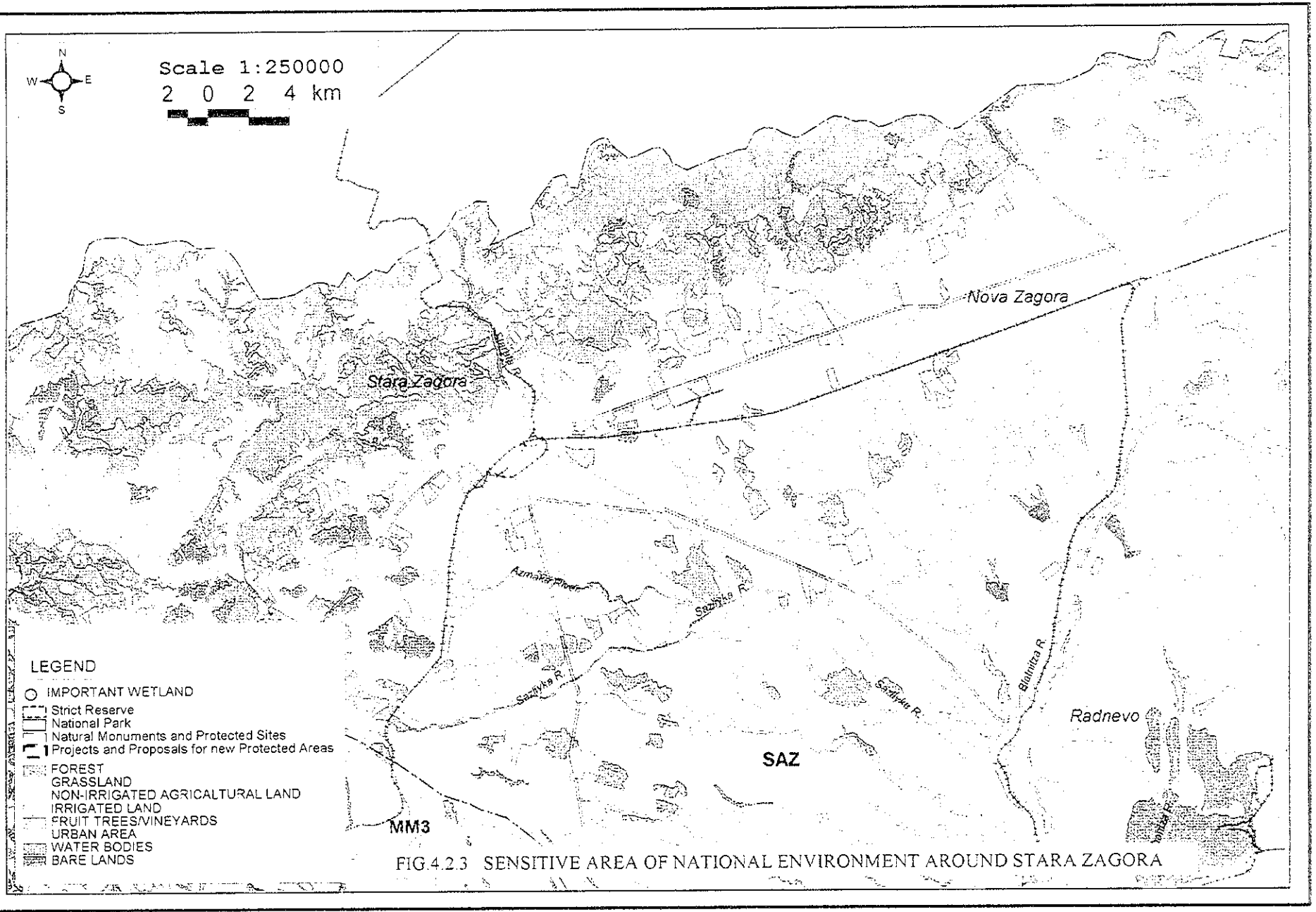


FIG.4.2.3 SENSITIVE AREA OF NATIONAL ENVIRONMENT AROUND STARA ZAGORA

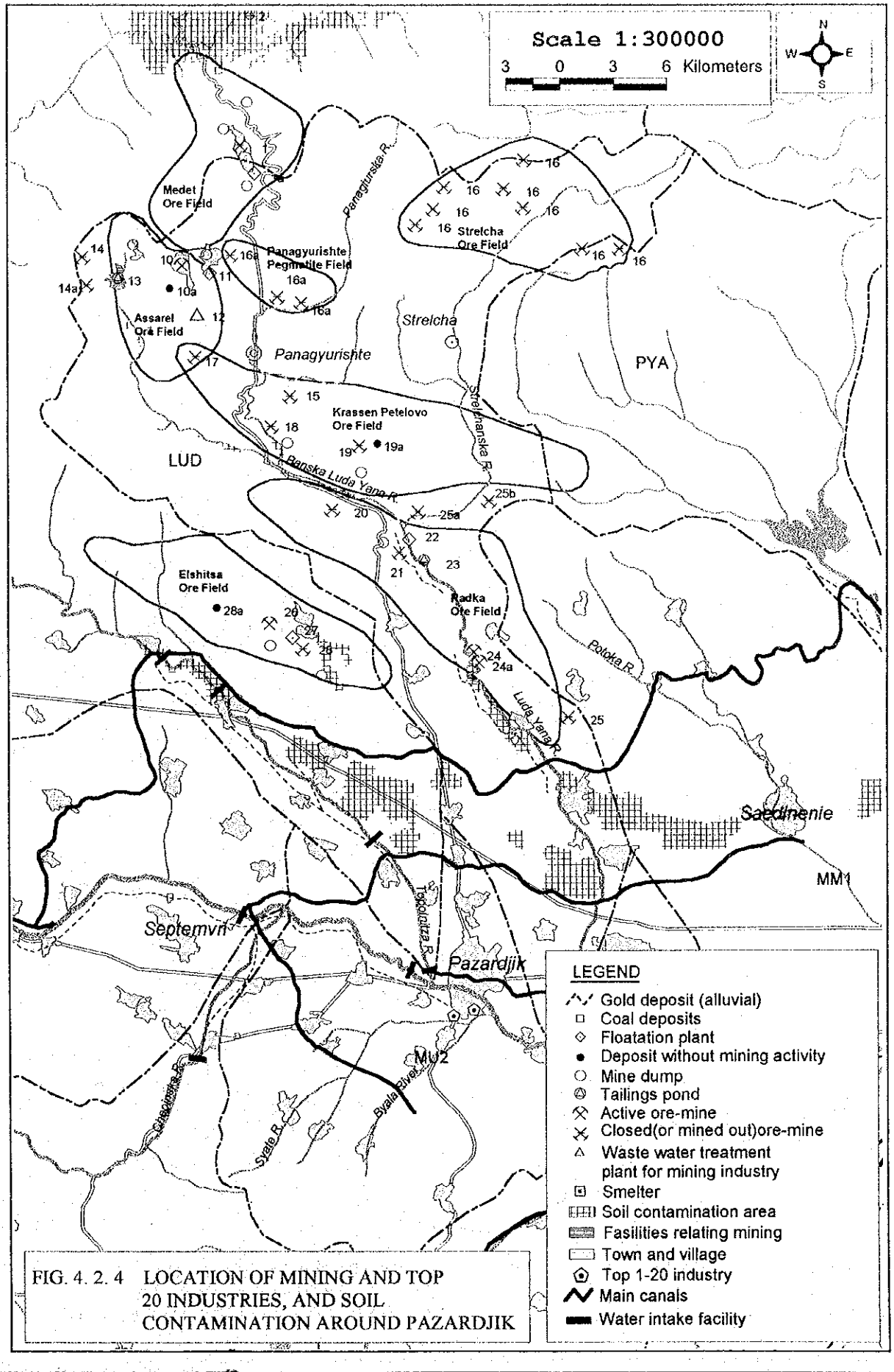


FIG. 4. 2. 4 LOCATION OF MINING AND TOP 20 INDUSTRIES, AND SOIL CONTAMINATION AROUND PAZARDJIK

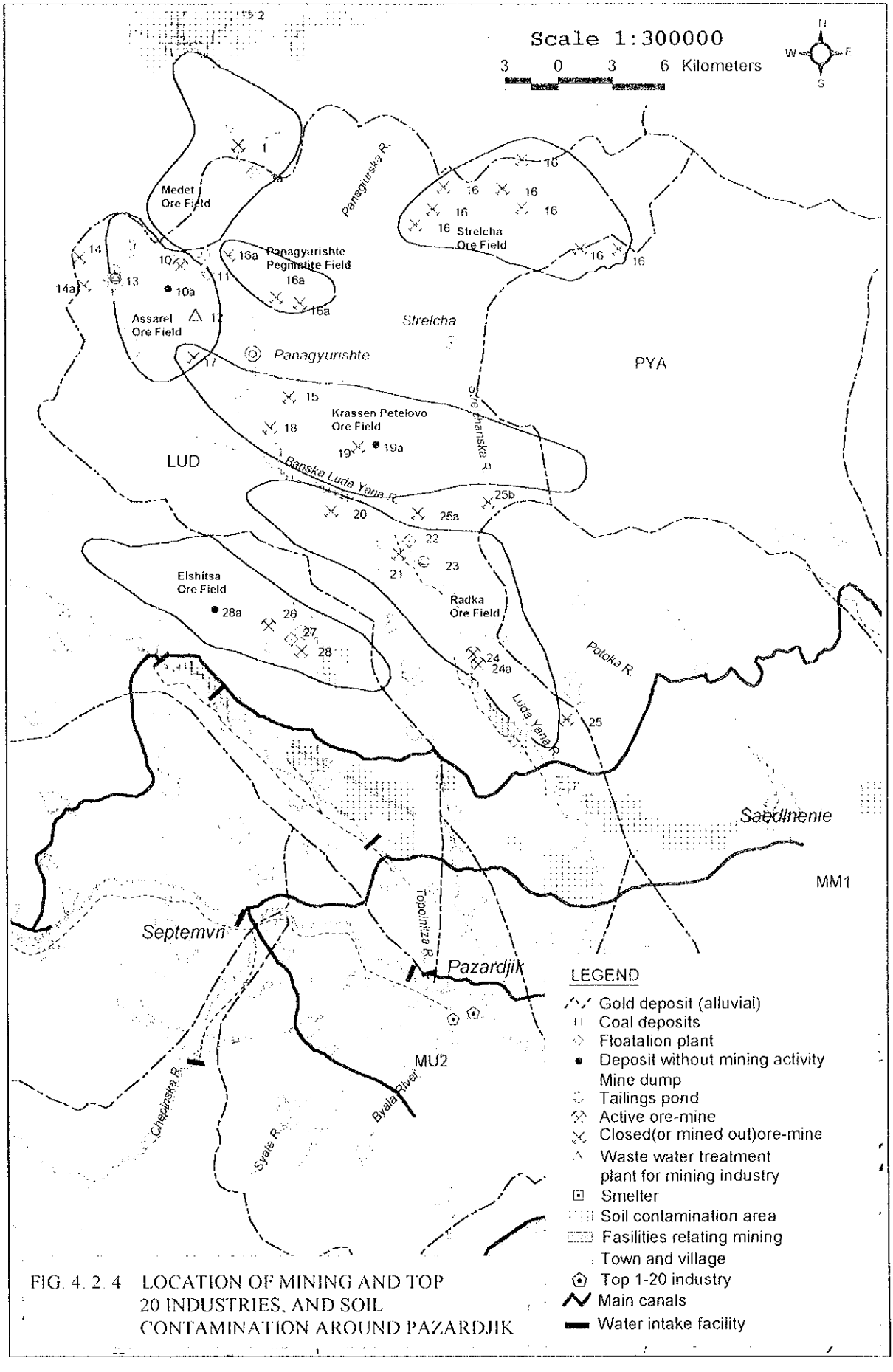


FIG. 4. 2. 4 LOCATION OF MINING AND TOP 20 INDUSTRIES, AND SOIL CONTAMINATION AROUND PAZARDJIK

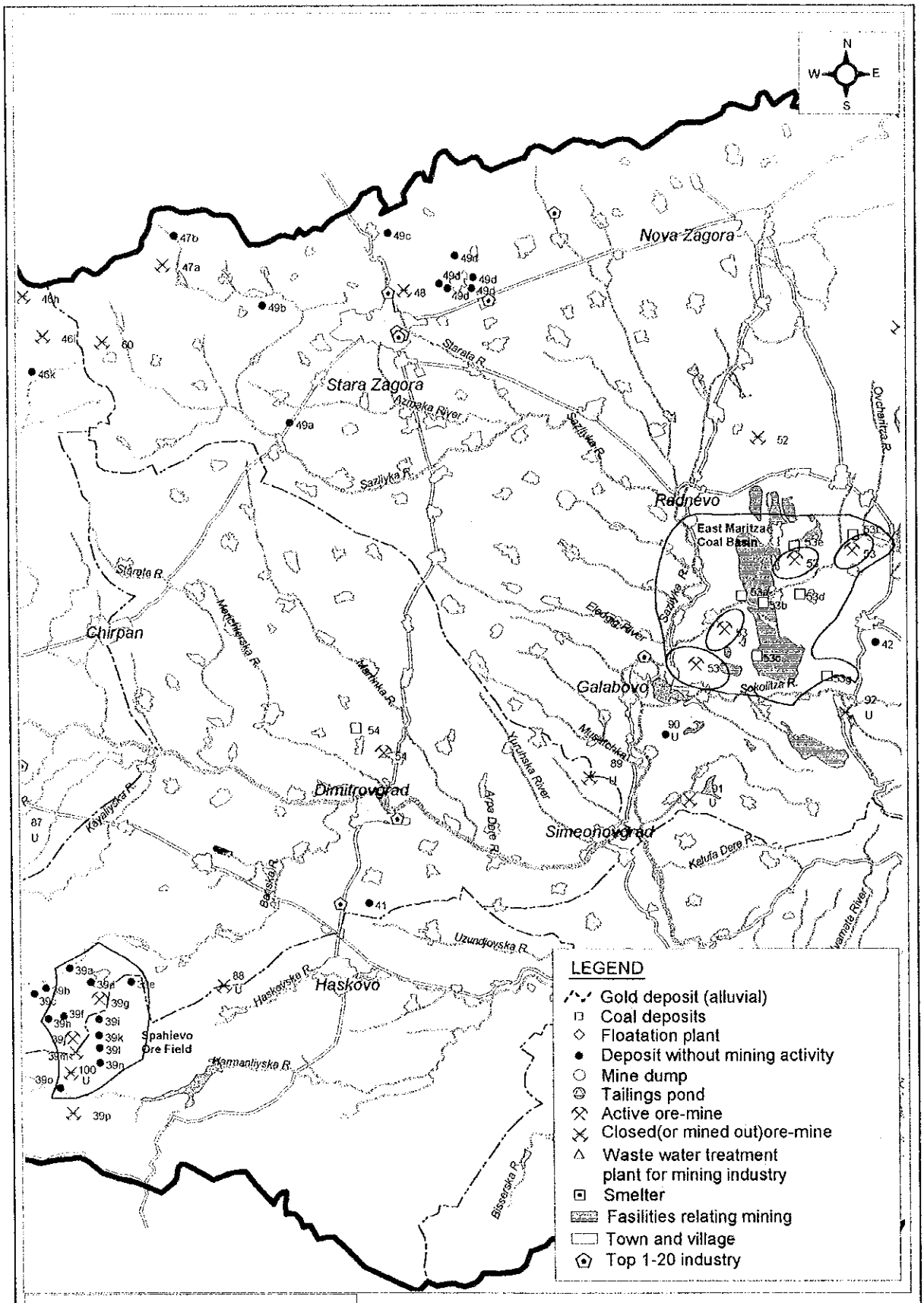


FIG. 4. 2. 5 LOCATION OF MINING AND TOP 20 INDUSTRIES AROUND STARA ZAGORA AND DIMITROVGRAD

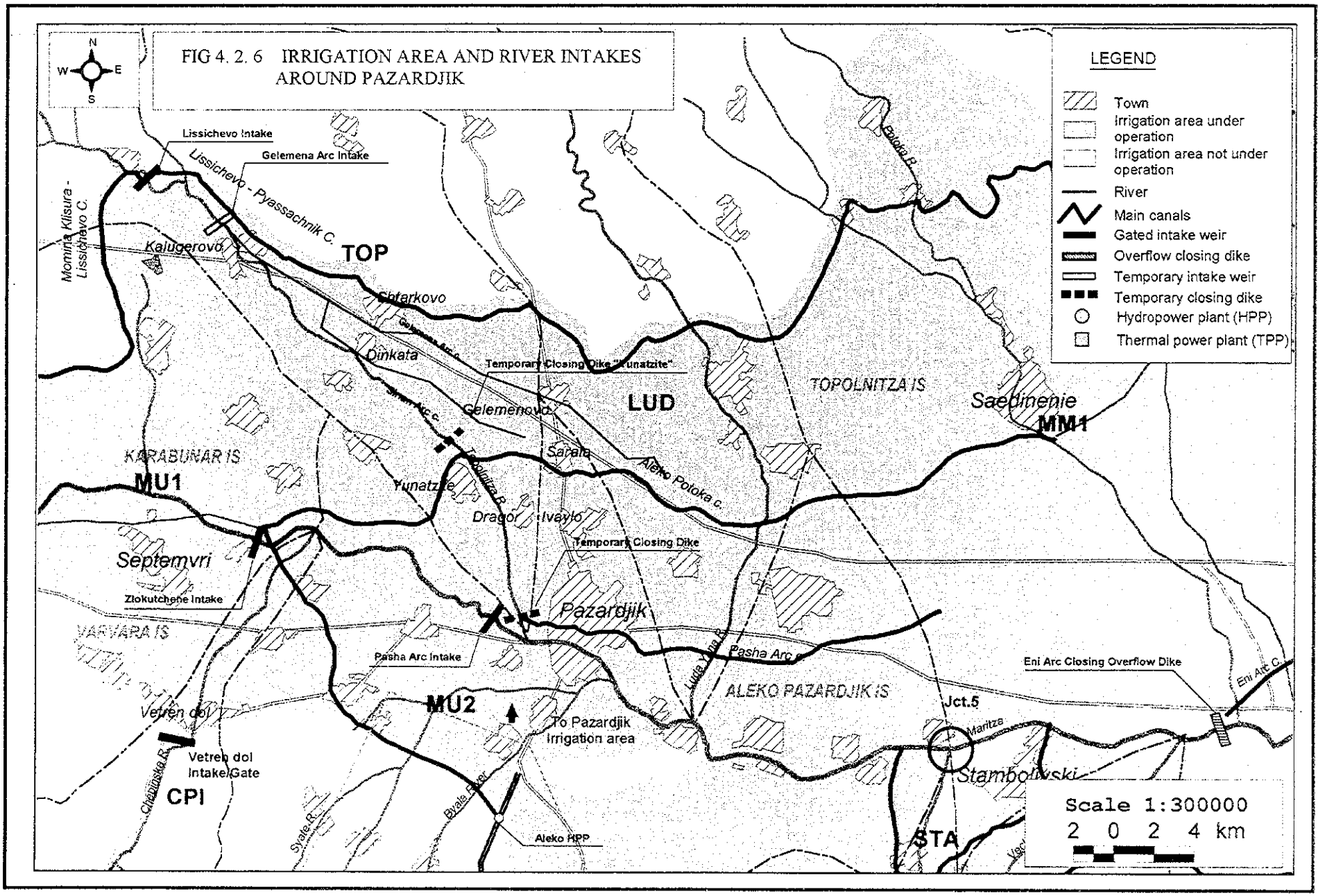
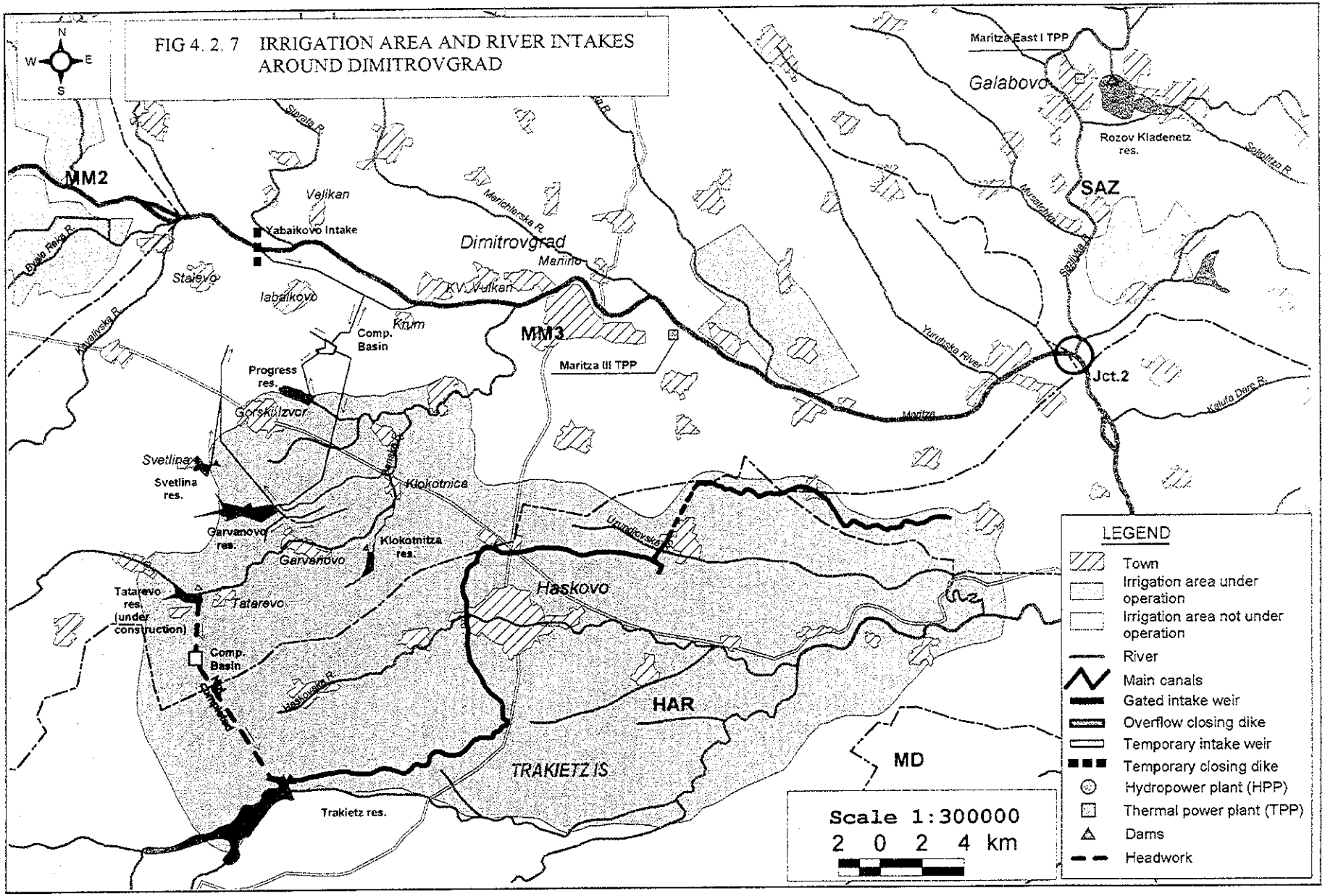


FIG 4. 2. 6 IRRIGATION AREA AND RIVER INTAKES AROUND PAZARDJIK
N
W
E
S
LEGEND
Town
Irrigation area under operation
Irrigation area not under operation
River
Main canals
Gated intake weir
Overflow closing dike
Temporary intake weir
Temporary closing dike
Hydropower plant (HPP)
Thermal power plant (TPP)
Lissichevo Intake
Gelemena Arc Intake
Lissichevo - Pyassachnik C.
Momina Klisura - Lissichevo C.
Kalugerovo
TOP
Chterkovo
Dinkata
Temporary Closing Dike "Yunatzite"
LUD
Gelemenovo
Sarata
Aleko Potoka c.
TOPOLNITZA IS
Saedinenie
MM1
KARABUNAR IS
MU1
Yunatzite
Dragor
Ivaylo
Temporary Closing Dike
Septemvri
Zlokutchene Intake
Pazardjik
VARVARA IS
Pasha Arc Intake
Pasha Arc c.
Eni Arc Closing Overflow Dike
Eni Arc C.
ALEKO PAZARDJIK IS
MU2
Jct.5
Maritza
To Pazardjik irrigation area
Vetren dol
Vetren dol Intake/Gate
CPI
Chepinska R.
Byala River
Aleko HPP
Stambolivski
STA
Scale 1:300000
2 0 2 4 km



JICA-Maritza River Study

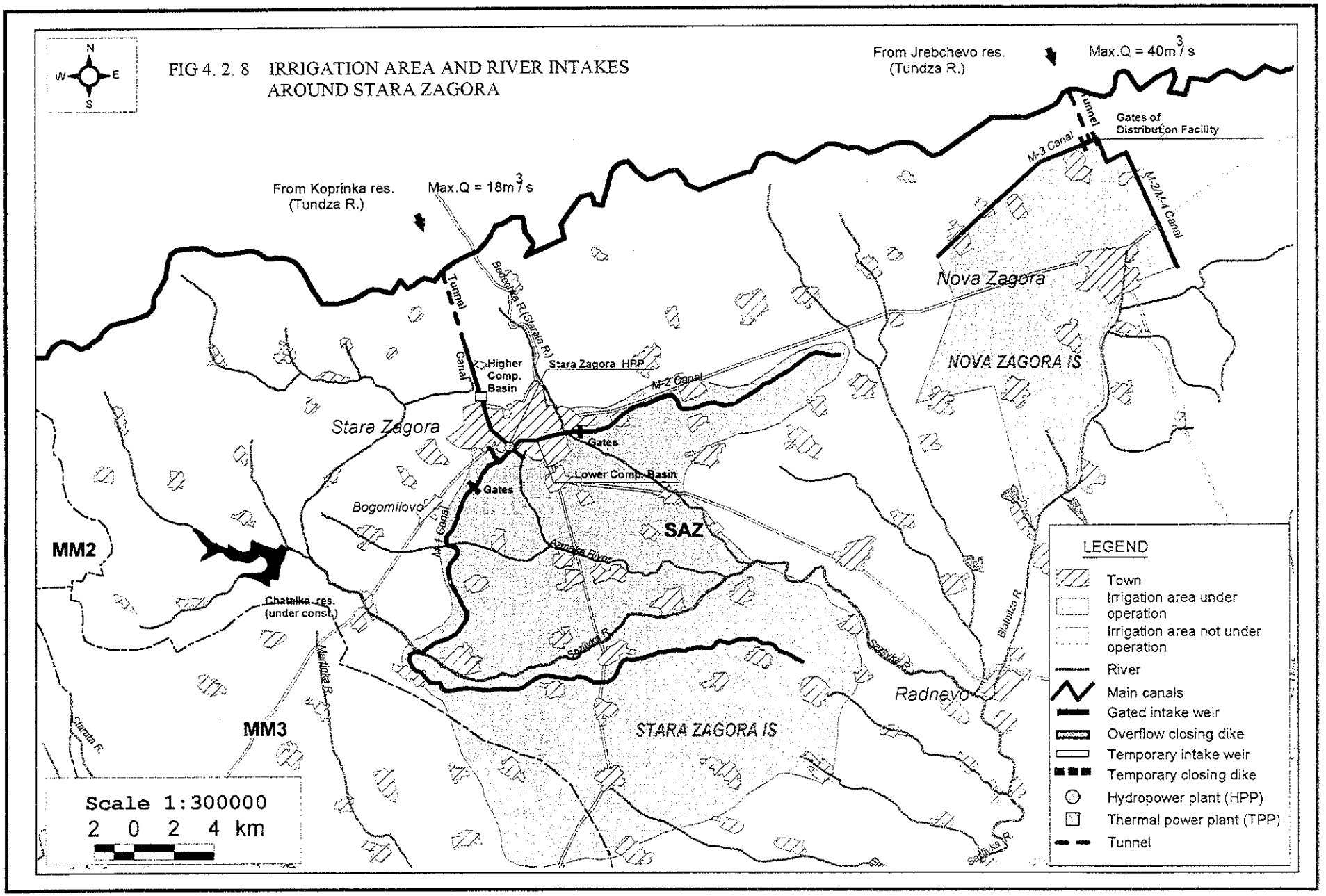
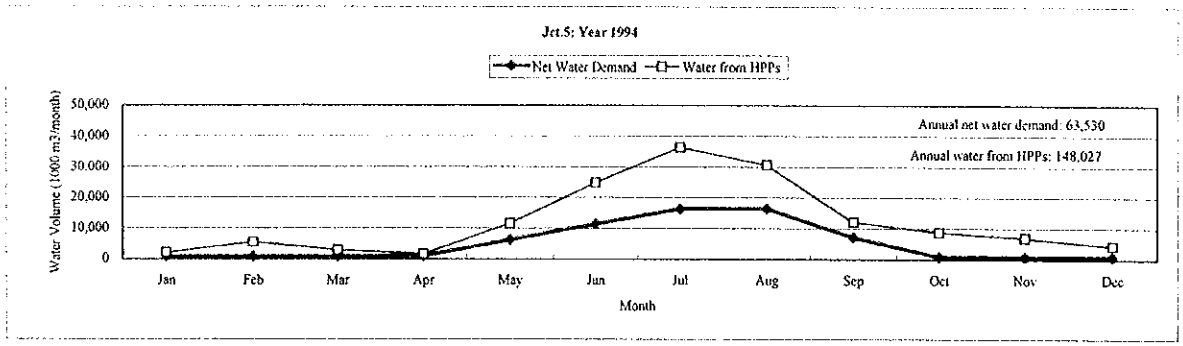
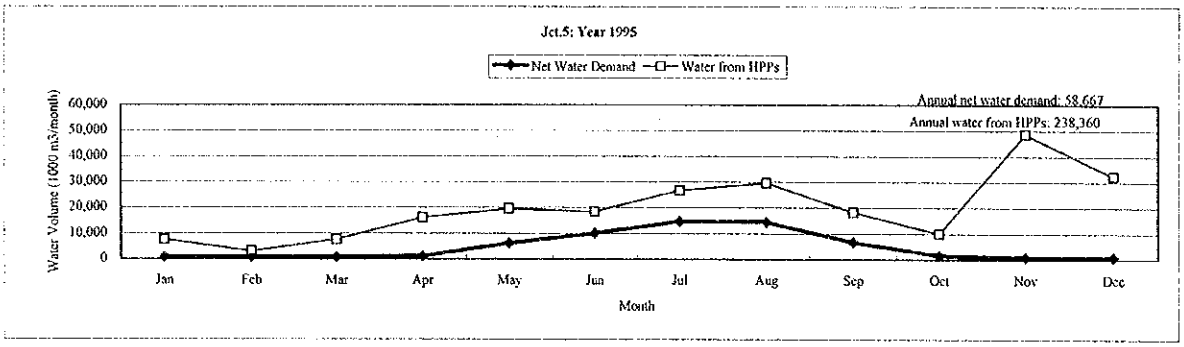
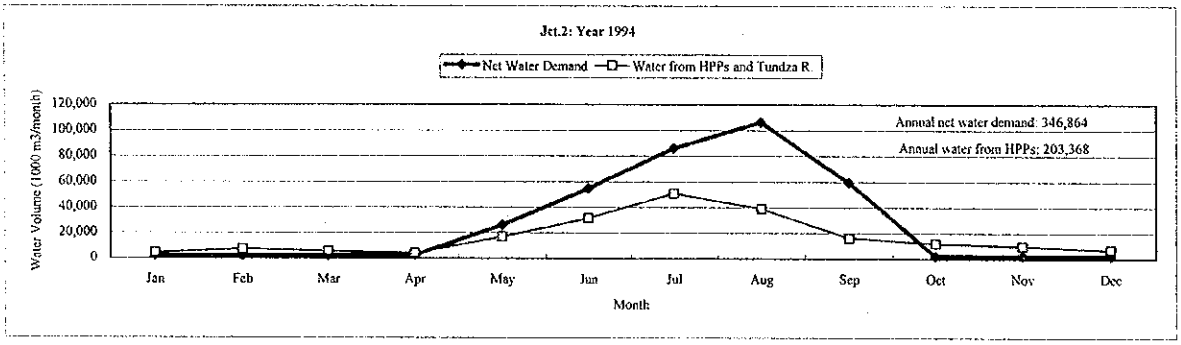


FIG 4. 2. 8 IRRIGATION AREA AND RIVER INTAKES AROUND STARA ZAGORA
N
W
E
S
From Jrebchevo res. (Tundza R.)
Max.Q = 40m3/s
Tunnel
Gates of Distribution Facility
M-3 Canal
M-2/M-4 Canal
From Koprinka res. (Tundza R.)
Max.Q = 18m3/s
Tunnel
Bedechka R.(Starata R.)
Higher Comp. Basin
Stara Zagora HPP
M-2 Canal
Nova Zagora
NOVA ZAGORA IS
Stara Zagora
Gates
Lower Comp. Basin
Gates
Bogomilovo
M-1 Canal
SAZ
Arnauta River
MM2
Chatalka res. (under const.)
Maritska R.
Sazlika R.
Sazlika R.
Biabiritza R.
Radnevo
MM3
STARA ZAGORA IS
Starata R.
Sazlika R.
LEGEND
Town
Irrigation area under operation
Irrigation area not under operation
River
Main canals
Gated intake weir
Overflow closing dike
Temporary intake weir
Temporary closing dike
Hydropower plant (HPP)
Thermal power plant (TPP)
Tunnel
Scale 1:300000
2 0 2 4 km







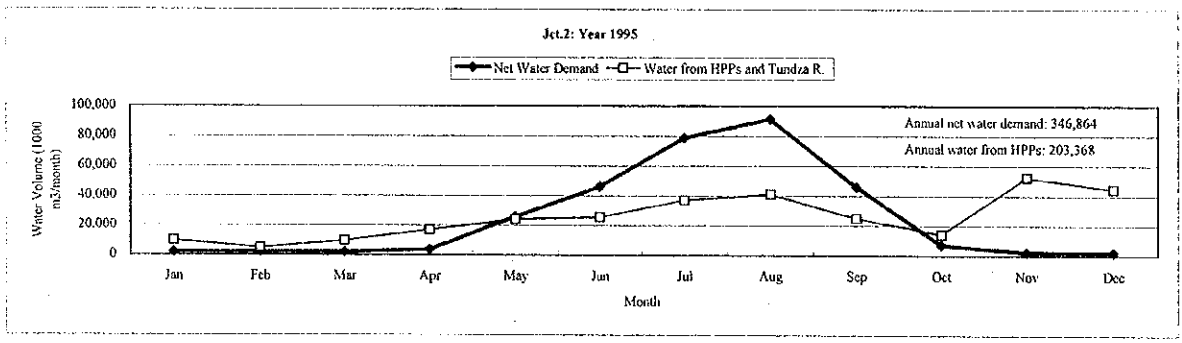


FIG. 4.2.9 COMPARISON BETWEEN ESTIMATED NET SURFACE WATER DEMAND AND WATER FROM HPP AT JCT. 2 AND JCT.5

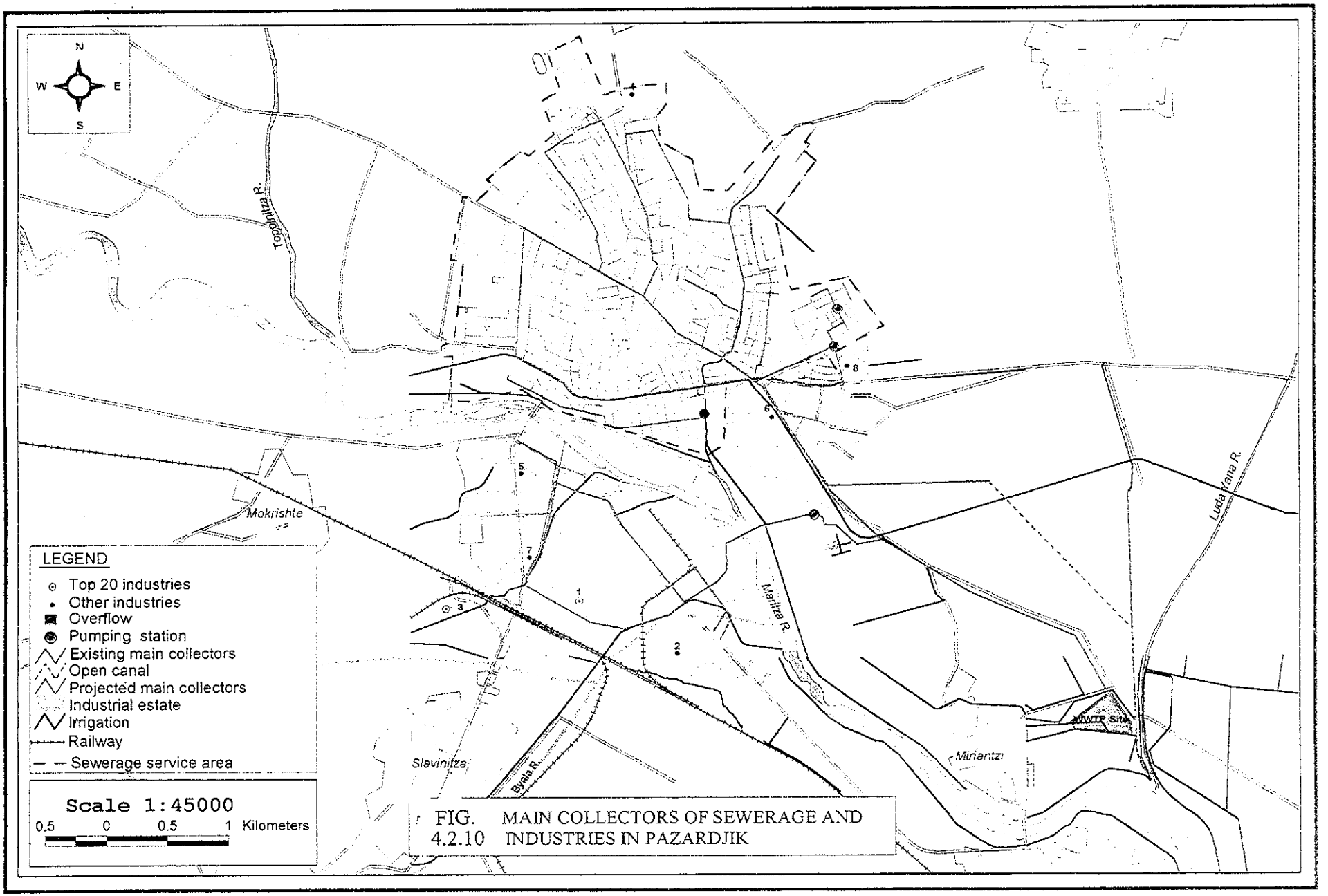


FIG. 4.2.10 MAIN COLLECTORS OF SEWERAGE AND INDUSTRIES IN PAZARDJIK

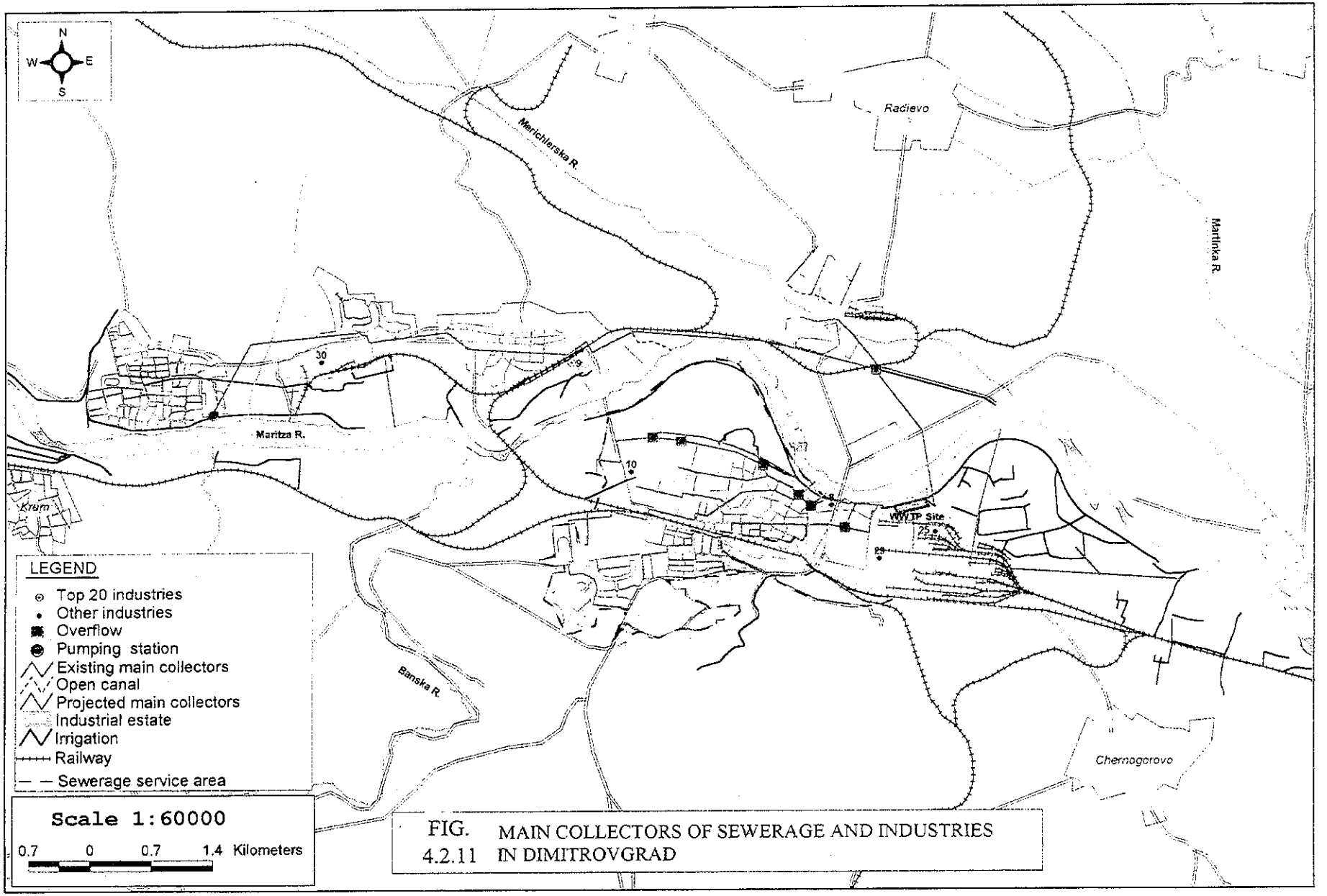


FIG. 4.2.11 MAIN COLLECTORS OF SEWERAGE AND INDUSTRIES IN DIMITROVGRAD

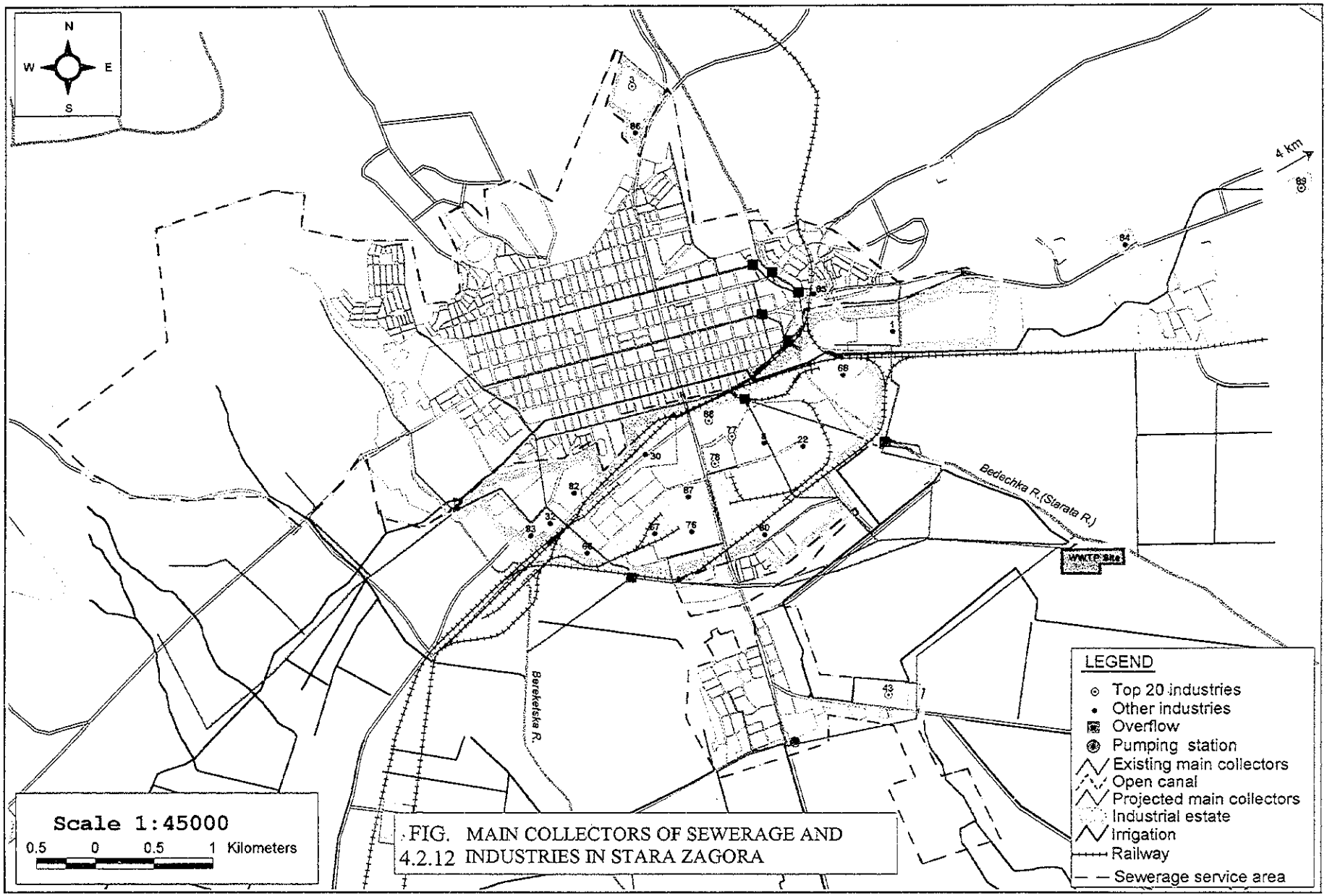


FIG. 4.2.12 MAIN COLLECTORS OF SEWERAGE AND INDUSTRIES IN STARA ZAGORA

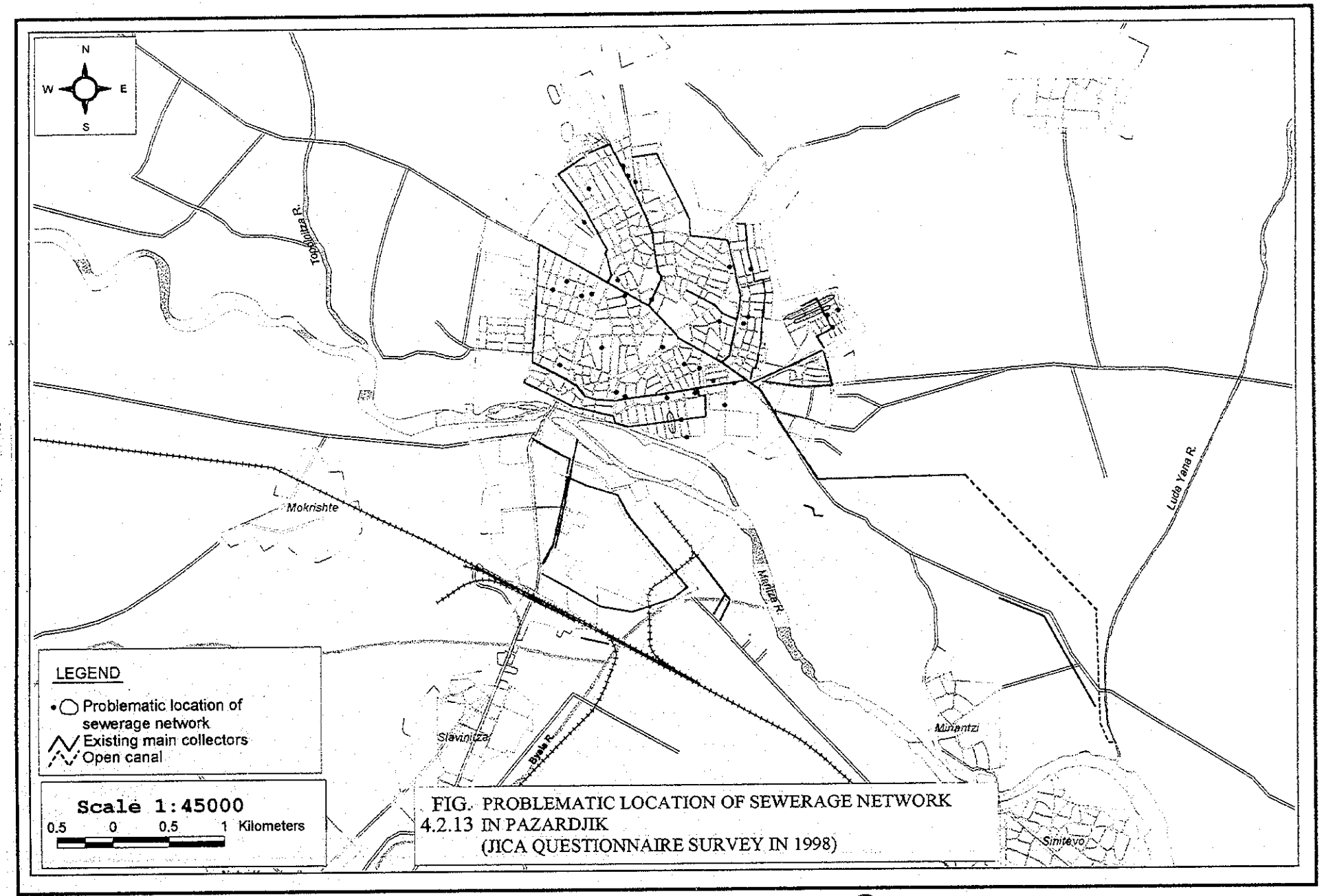


FIG. 4.2.13 PROBLEMATIC LOCATION OF SEWERAGE NETWORK IN PAZARDJIK (JICA QUESTIONNAIRE SURVEY IN 1998)

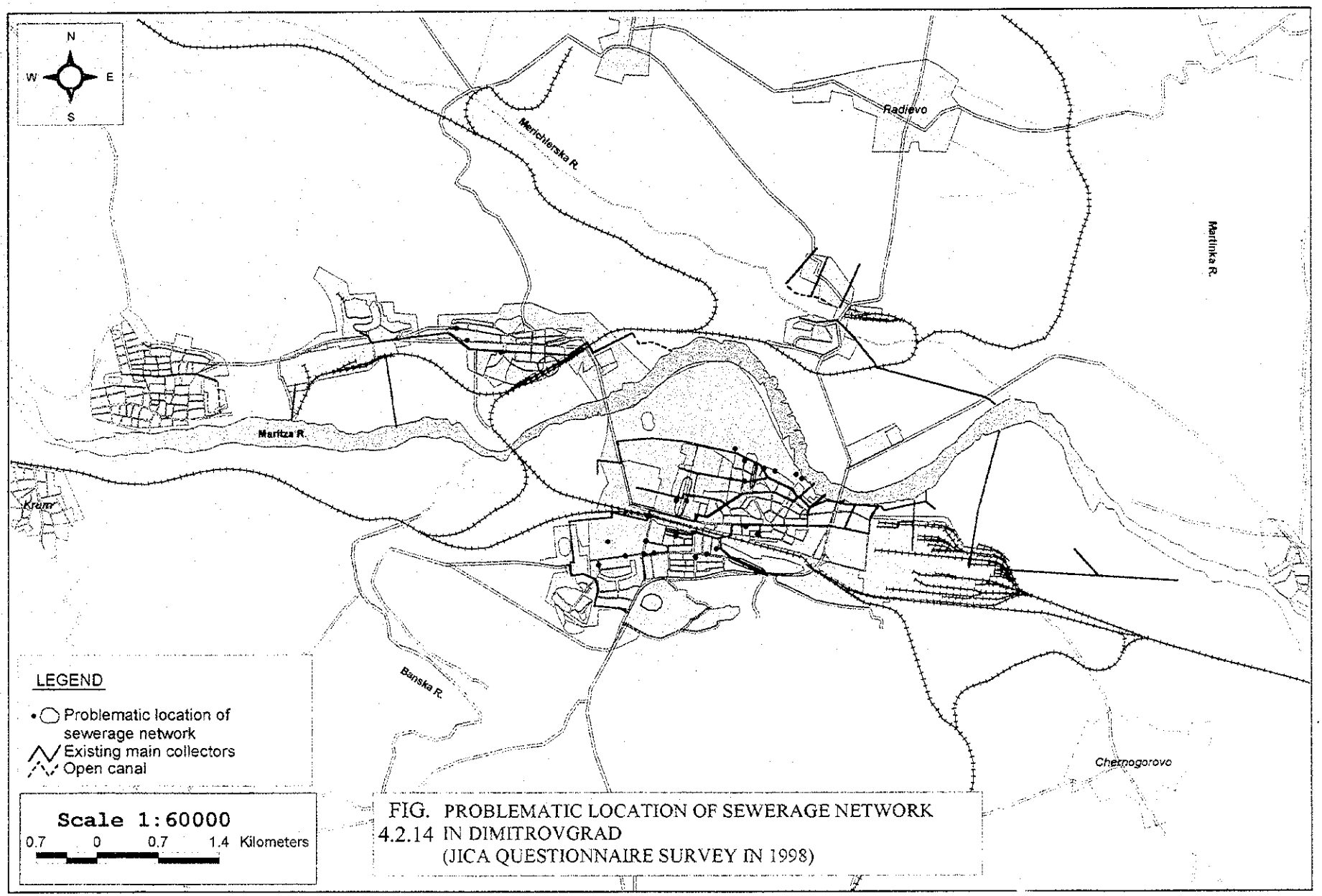


FIG. 4.2.14 PROBLEMATIC LOCATION OF SEWERAGE NETWORK IN DIMITROVGRAD (JICA QUESTIONNAIRE SURVEY IN 1998)

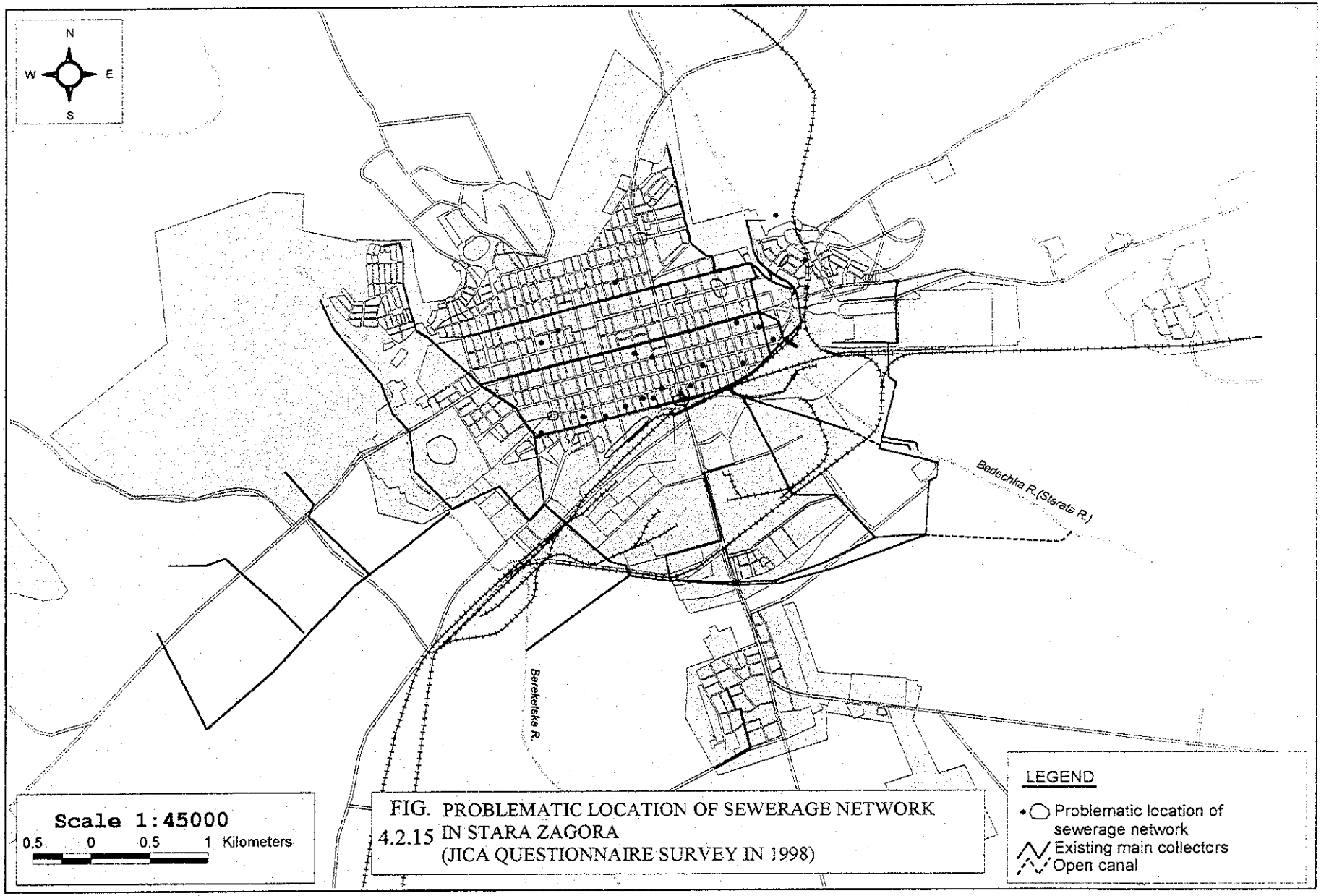


FIG. 4.2.15 PROBLEMATIC LOCATION OF SEWERAGE NETWORK IN STARA ZAGORA (JICA QUESTIONNAIRE SURVEY IN 1998)