CHAPTER 7 ENVIRONMENTAL CONDITIONS IN AND AROUND THE PORT

7.1 Environment of Constantza

(1) General

The port of Constantza, the largest among all Black Sea ports, and Constantza city located adjacent to the northern area of the port (refer to Fig. 7.3.1), the second largest in Romania, is located in the Dobruja region of the country. The port is essentially sandwiched between the most famous summertime beach resorts in the country: toward the north (Mamaia resort area) and the south (Eforie Nord resort area and others further south). This southern coastal area of the port also comprises, in addition to the economically important beach resort of Eforie Nord, unique lake of Techirghiol and the sand dune reservation area (Borcea Reservation Area).

The modern port of Constantza has been developed since 1897 and hence has a history of more than 100 years.

(2) Peculiarity of the Black Sea

The Black Sea, forming the only seacoast of Romania including the port city of Constantza, is very unique due to its closed nature caused by the single connection to the Mediterranean Sea via the Bosporus Strait. This feature in conjunction with high fresh water input, principally from the Danube River, results in low salinity of water that is only half of open ocean seawater. Moreover, the tidal effect is insignificant and sea level variation is principally influenced by wind force.

In effect Black Sea, a closed sea, could be categorized as a vast saline lake rather than a sea. This condition leads to its unique and specific marine ecology. This closed nature of the sea also makes it vulnerable to pollutant accumulation and water quality deterioration due to anthropogenic activity including shipping, which affects the delicate marine ecology of the sea. Degradation of the Black Sea water environment due to increased pollution discharge of anthropogenic origin is well documented and a variety of regional efforts have been undertaken to mitigate the degradation. In this respect it is worth noting that all of the 6 countries bordering the Black Sea, including Romania, adopted the “Strategic Action Plan for the Rehabilitation and Protection of the Black Sea” at the Ministerial Conference held in Istanbul, Turkey in 1996. This Strategic Action Plan, among a variety of pollution control measures, also covers control of pollution due to shipping and maritime activities.

(3) Historic and cultural assets

Constantza City as well as the port has a very ancient and rich history ranging from the Greek era, during which the City was named as Tomis, the Roman era and recently the Otoman era and others. Most ancient and important historical and cultural assets were destroyed during the transition turbulence of these eras.

The significant historical assets in the immediate vicinity of the port area include Genoese Lighthouse and Mihai Eminescu Statue, both located along the northern boundary of the port. Other historical assets in the city of Constantza, quite far beyond the port area, include the remains of Roman Baths, Roman Mosaic and Roman City Wall.

(4) Environment infrastructure of the city

1) Water supply

More than 90% of population of the city of Constantza (the population is estimated at about 350,000) is served with piped potable water supply by RAJA. RAJA is The Autonomous Administration of Waters, Constantza County, which could be considered as the Water Supply and Sewerage Authority of Constantza County. The water source is a combination of surface water (60%) and groundwater (40%). The surface water source extraction is from the Midia-Navodari Canal of the Danube River. The total potable water supply of Constantza city is estimated at about 380,000 m3/day. Since conventional water treatment is used for the surface water including chlorination disinfection for all water, the supplied water by RAJA is considered as safe to drink, potable water.

2) Sewerage

About 80% of Constantza City population are also provided with wastewater sewerage service by RAJA. There is a plan by RAJA for the construction of new sewage collectors for population without sewerage service. The city sewerage system is a combined system. The collected sewage is conveyed for treatment at two independent sewage treatment plants located in the north (south of Mamaia) and south of Constantza City and referred to respectively as NSTP (north sewage treatment plant) and SSTP (south sewage treatment plant).

NSTP provides only primary treatment with gravity sedimentation (treatment efficiency is only 30%) whereas SSTP provides conventional secondary biological treatment with activated sludge process (treatment efficiency is generally more than 90%). Still the current treatment capacity of both treatment plants is inadequate resulting in untreated/inadequately treated sewage being discharged to receiving waters, the coastal water of the Black Sea.

There are three (3) outlet sewer pipes from SSTP, all in fact discharging into the port waters, a very significant source of port water pollution since they currently discharge untreated/inadequately treated sewage as well. NSTP has the option of either direct discharge via single outlet sewer pipe into the coastal waters at south Mamaia (out and beyond the northern boundary of the port area) or conveyance to SSTP for further treatment/disposal into the port waters. Since Mamaia is a summertime tourism resort area, NSTP outlet into the Mamaia coastal waters is used only during non-tourist winter season. During other times Constantza city sewage (entirely treated, inadequately treated and untreated) of is disposed into the port waters via the 3 outlet pipes of SSTP.

The treatment capacity and efficiency of both NSTP and SSTP needs to be increased. This is particularly important for NSTP (which has only primary treatment) so that only properly treated wastewater (sewage) is discharged into the coastal waters, including port waters. In fact the necessary plans for the improvement of both NSTP and SSTP have already been formulated by RAJA and the construction work for the upgrading of SSTP is in progress.

3) Solid waste management

Solid waste generated in Constantza city is well managed except that no effort is being made on waste segregation, reuse and recycling as the means of resource recovery and optimization of the quantity of waste requiring final disposal. The solid waste collection and transportation to the final disposal site (a sanitary landfill site located in Ovidue) is outsourced to a private company by the local government of Constantza. This Ovidue sanitary landfill site is about 8 km away from Constantza and serves as a common final disposal site for the towns of Ovidue and Navodari in addition to Constantza. A private company has managed the sanitary landfill since 1995.

7.2 Environmental Issues of Constantza Port

The environmental issues of Constantza port are very complex and affect both direct port operation activity and well as indirect and predominantly Constantza City (land) based non-port activities. It is noted that the Danube-Black Sea canal (refer to Fig.7.3.1) linking the port with the Danube River could also be a significant non-port pollution source of port waters (land based, but not Constantza city based). Still this canal discharges into the port water only intermittently when it is opened to allow the passage of vessels across the canal and the port. At all other times the canal remains closed with navigation lock at the entrance to the port located in the southern area of the port. Moreover, in a broader context the entire Danube River Basin encompassing many central and east European countries, including most of Romania, is the most significant land based pollution source of the Black Sea as a whole rather than the port waters. Accordingly, control of pollution load runoff via Danube River including its canals is considered as well beyond the management capability of either the port or the city of Constantza and not considered any further in this study.

Still, a variety of programs and projects are being planned and executed with foreign, international, EU (European Union) and UN (United Nations) initiatives in various countries of Danube River Basin to control the pollution load runoff to Danube and hence into the Black Sea., They have the means to deal with this complex multinational issue.

7.2.1 Direct Port Operational Issues

(1) International and Regional Conventions

Romania is a signatory of MARPOL convention of IMO (International Maritime Organization) and hence committed to the implementation of Annexes I and II that are mandatory. These two annexes are respectively concerned with prevention of pollution by ship generated oily waste and control of pollution by noxious liquid substance (NLS) carried in bulk. In addition to these 2 annexes Romania has also signed Annex V for prevention of pollution by garbage from ships. It is noted that the two unsigned annexes of MARPOL by Romania, Annex III and Annex IV, are respectively concerned with prevention of pollution by harmful substances in package form and prevention of pollution by sewage from ships.

Moreover, the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea signed by all the 6 countries bordering the Black Sea, including Romania as part of regional co-operation in 1996, committed all 6 countries, among others, to coordinate and effectively manage wastes arising from shipping activities (refer to Section 7.1).

It is further noted that IMO has long ago designated a number of "closed seas", including that of Black Sea, as special areas requiring strict vessel originated pollution control measures. In order to protect these closed seas from vessel-originated environmental pollution, it is also requested that the port administrations in these special areas provide "adequate waste reception facilities." Accordingly, in the case of Constantza Port, the responsibility of providing adequate waste reception facilities rests with CPA, as the representative port administration.

The special area status for a closed sea area will become effective only after the provision of adequate waste reception facilities for ship waste. In this respect due to the lack of adequate waste reception facilities, the special area status for the Black Sea is yet to be implemented. Hence, the most important task of the above regional strategic action plan for the rehabilitation and protection of Black Sea, with respect to shipping activity related pollution control, is to provide the required waste reception facilities as appropriate in all of the 6 country ports in a cooperative and coordinated manner. Then the special area status of Black Sea could become a reality.

(2) Waste Management in the Port

The Environment Department of CPA and the Oil Terminal provide waste reception services to ships requiring them free of charge (indirect charging system). The services provided (even though Romania has not yet signed Annex IV on prevention of pollution by sewage from ships) include waste oil including bilge waste, ballast waste and other liquid chemicals waste (noxious liquid substance/NLS) reception, garbage reception and also the reception of sewage. It is noted that the Oil Terminal specifically provides service for the collection of ballast and NLS wastes.

Even though this reception service provision looks impressive, there remain very significant environmental issues concerned with treatment and final disposal of received wastes. Moreover there remain other significant environmental issues concerning to cargo handling, in particular dry-bulk cargo, and other shipping related activities like ship repair works in dock.

(3) Environmental issues of direct port operation

1) Inadequate waste management

The CPA has only a temporary storage tank for oily waste collected from ships and other clean-up operations conducted in harbor waters. This could only be considered as a simple gravity oil separator. The water fraction is disposed to the sea and the separated portion containing most of oil is sent to the separator in Oil Terminal for further treatment together with other oil terminal liquid wastes as delineated below.

The wash water and dirty ballast from oil tankers, as well as wash waters from vessels that transport noxious liquid substance (NLS), including the separated oily wastes of above, are collected at the Oil Terminal and treated only with simple gravitational separator and the water fraction is discharged in the port basin. Treatment carried out through gravitational separation does not ensure adequate treated effluent quality. The reported oil content in the treated effluent of the separator of Oil Terminal is 20 mg/l, which exceeds the national effluent standard limitation of 5 mg/l.

Domestic (putreceable) solid wastes of vessel origin and solid wastes from the port basin are collected by the Technical Ship Port Department of CPA and "control burned" in a special area within the area reserved for solid waste deposition in the newly developing southern berth area of the port near Gate 6. The ash and the remains following burning are sprayed with disinfecting solution and covered with soil layer.

It is noted that the vessel-originated wastes are collected in plastic bags and port basin wastes are collected with specialized type motorboats. Also the waste generated by port operators, as well as street waste and waste resulting from green spots and maintenance of harbour access ways, are collected, transported and stored by Salport S.A. Waste, collection and storage is performed without any previous sorting or recovery of recyclable materials. Regardless of their type, all port wastes are essentially deposited at the deposition area mentioned above, near Gate 6. This deposition area near Gate 6 is a 12 ha open area and separated from shore with concrete wave breakers. Practically, this solid waste deposition site is an open garbage dump with scavengers and does not meet even the basic sanitary and environmental protection requirements of final solid waste disposal.

2) Cargo handling and other shipping related issues

Dry bulk cargo handling in the port utilizes environmentally inadequate technologies. This leads directly to ambient air pollution due to dispersed particulate matter (fugitive emission) and indirectly to port water pollution caused by particulate matter that is deposited on the platform and quays being carried due to wind and rain action into the port water basin, in addition to direct deposition into the port waters. This phenomenon is prevalent in areas where companies handle dry-bulk cargo like cereals (berths 17, 18, 24, 31-33), ore, coke, coal, bauxite (berths 64-67, 80-85, 94, 95, 109-113), cement (berth 68), solid chemical products and phosphates (berth 62) and fertilizers, urea (berths 61, 63). Moreover, this fugitive emission is also an occupational health issue for workers involved in handling such dry-bulk cargoes.

Moreover, ship repair operations executed within shipyard area and floating docks represent an important water pollution source of the port basin from oil sludge, rust, heavy metals and toxic compounds.

7.2.2 Non-port Issues

Due to inadequate capacity of both of the Constantza city sewage treatment plants of NSTP (north sewage treatment plant) and SSTP (south sewage treatment plant), as dealt with in Section 7.1, untreated and /or inadequately treated wastewater is discharged into the Constantza port basin at berths 34 and 84 via outlet sewer pipes. There were also cases of oil products (crude oil) from the city’s oil product warehouse being discharged through these sewer pipes. This disposal of untreated wastewater resulting from the miscellaneous city activity is the most significant non-port environmental issue causing port water quality deterioration.

In fact in total 3 sewer outlet pipes discharge into the port water environment. The remaining outlet pipe that discharges in berth no. 86 essentially carries treated wastewater from SSTP.

7.2.3 Environmental Improvement Measures

(1) Port waste management

CPA under the Romanian-Dutch Project, "Improvement of Waste Management System in the Port of Constantza" formulated the improvement of the waste management system in the Constantza Port. The project is financed by the Dutch Ministry of Economic Affairs. The project, started in February 1998, is expected to be completed in the second half of 2001. The project has the following objectives:

I. Formulation of Waste Management Strategic Plan for Constantza Port
II. Implementation of a demonstrative project employing Dutch technology for bilge (waste oil) water treatment.

The first objective of waste management strategic plan for the port was achieved in 1999. The construction of oil waste treatment plant for the oil wastes collected from ships, especially bilge water and hydrocarbon wastes is expected to be accomplished by 2001.
Moreover, CPA conducted an Ecolization Project (Including Waste Disposal Facilities). IPTANA SA carried out the Project in September 1999 with assistance from the IWACO consultancy of Netherlands, as a part of the documentation necessary to obtain a non-reimbursable financing from ISPA (Instrument for Structural Policies for Pre-Accession) funds of EU.

The project sets the following objectives for improvement in the environmental conditions of Constantza Port:

- Incinerator for ship wastes, solid wastes collected from the basin surface area and sanitary wastes;
- Construction of an ecological landfill for port waste disposal
- Purchasing of a vessel for de-pollution operations and liquid waste collection from ships;
- Realization of physical-chemical and biological treatment upgrade for the existing simple gravitational separator at the Oil Terminal

(2) Fugitive emission due to dry-bulk cargo handling

Modernization of existing dry bulk handling system of the port, so as to mitigate fugitive emission, is the most important environmental improvement requirement of the port operational improvement. Accordingly, closed belt conveyor system is recommended as the standard to be applied by all relevant dry-bulk cargo handling operators. In this respect CPA is recommended to adopt a step-wise improvement program so as to realize closed handling of dry-bulk cargo within a predetermined time frame.

(3) City sewerage system

Improvement plans for the Constantza city sewerage system, principally targeting treatment capacity, processing and efficiency enhancement of both NSTP and SSTP, has already been formulated by RAJA as dealt with in section 7.1. In fact the upgrading construction works for SSTP is ongoing with financial assistance from PHARE and EBRD. It is understood that financial constraint is the major factor inhibiting the implementation of the sewerage system improvement works.

7.3 Field Surveys on Environmental Condition

The field surveys on environmental condition of the existing Constantza port area and its vicinity targeted principally the port water and ambient air environmental aspects. The water environmental condition covered both the port seawater and seabed material aspects including biological status. These field surveys were aimed at primary data collection to define the baseline environmental condition of the port for subsequent environmental impact assessment (EIA) and evaluation.

The field survey on port environmental conditions was conducted two times, once each during the master plan and feasibility study stages. The field survey of the master plan stage, conducted in November 2000, is referred to as Initial Field Survey, and that of feasibility study stage, conducted in June 2001, as Supplemental Field Survey. These field surveys and their results are dealt with separately in subsequent sections of 7.3.1 and 7.3.2.

7.3.1 Initial Field Survey

The initial environmental field survey of November 2000, representing the beginning of winter season, targeted overall aspects of port seawater quality, port seabed material quality and ambient air quality of port area.

All sampling locations of this initial field survey are shown in Fig. 7.3.1. A brief description of each of the above three (3) field surveys and their results are dealt with below.

(1) Port seawater quality

Water quality survey in the port water environment was conducted at 11 locations (ref. Fig. 7.3.1). The sampling for the determination of water quality parameters both at site as well as in laboratory as appropriate were conducted one time and at three different depths at each location resulting in a total of 33 samples. The three seawater depths of sampling were just below the water surface, mid water depth and just above the seabed (bottom).

The major water quality parameters analyzed included, DO (dissolved oxygen), COD (chemical oxygen demand), SS (suspended solids) and inorganic nitrogen. The results of analysis are shown in Table 7.3.1.

Based on one time sampling, the results of analysis no chronic deterioration in the port water quality was noted. However, this has to be put in perspective with due consideration to being simply based on one time sampling results. Still both based on visual appearance as well the results of analysis, the water quality of the port is assessed as not significantly deteriorated as of the beginning of winter season of November 2000. This basically clean state of port water quality is represented by high DO levels, mostly exceeding 6mg/l, and low COD levels, basically not exceeding 3 mg/l, measured in all sampling locations, including the seabed areas.

Even the total oil (hydrocarbon) content measured was basically did not exceed 0.3 mg/l in all sampling locations. The highest oil content (0.3 mg/l) was measured in Location 1 (ref. Fig. 7.3.1), the innermost area of the port confined by the Northern Breakwater, with least water exchange. However, it is noted that the oil content measured in the Southern Breakwater area of the port (Constantza south port), near the planned new container terminal (Pier II S) by the EIA study for the project in February 2000 (acute winter condition), was very high and mostly in the range of 7-10 mg/l (more than 20 times of the maximum value of 0.3 mg/l measured by this study in November 2000). This further illustrates the variable nature of the port water quality as well as limitation of assessing the water quality based on one time sampling results.

Finally it is emphasized that Black Sea is a peculiar water body as illustrated in section 7.1. The water quality deterioration noted by many available studies were made based on the progressing eutrophication in the coastal waters and the resultant marine ecological deterioration. This is a well-documented phenomenon requiring control of pollution load runoff to the Black Sea by all relevant agents, including port of Constantza.

It is further noted that in order to account for this ecological deterioration of seawater quality, the measurement of biological parameters were also conducted in the supplemental field survey as dealt with in the subsequent section 7.3.2. In fact, this supplemental field survey results confirmed the progressing eutrophication in port waters, represented by high density and biomass of measured phytoplankton.

(2) Port seabed material quality

The seabed material sampling was conducted at the seabed areas where the 11 seawater samplings were carried out as delineated above. The seabed material sampling was conducted concurrently with seawater sampling work resulting in total of 11 samples for subsequent laboratory sample preparation, pretreatment and analysis.

The major seabed material parameters analyzed included, COD, inorganic nitrogen and T-P (total phosphorus). The results of analysis are shown in Table 7.3.2. It is noted that no sampling was conducted at Location No. 6 due to rocky nature of the seabed.

The seabed material parameters measured are indicative of chronic overall pollution. Based on the results of analysis no chronic deterioration in the port seabed material quality was noted. All measured parameters were within the range typical/acceptable for port seabed.

(3) Ambient air quality of port area

The ambient air quality survey was conducted simultaneously at three (3) locations in the immediate road vicinity of the port hub area (ref. Fig. 7.3.1). The sampling for air quality determination was conducted continuously for 5 days (120 hrs) on a 12 hr break basis to account for the potential difference between daytime (7 am to 7 pm) and nighttime (7 pm to 7 am) in each of the 3 sampling locations. The 5 continuous sampling days included 3 working days and 2 weekend days (Saturday and Sunday). Automatic real time air quality sampler was used in Location 1 at Gate No. 5, whereas manual (semi automated) sampling was used in the other 2 locations.

The meteorological condition during the continuous 5-day sampling period varied widely and composed of all conceivable forms of weather pattern, namely, clear, cloudy, rain, drizzle and fog.

The major ambient air quality parameters measured included, SPM (suspended particulate matter/dust), CO (carbon monoxide), NO2 (nitrogen dioxide), SO2 (sulfur dioxide) and selected metallic contents in SPM.

The results of analysis, indicating the measured range of 12-hr average values of all 5 day sampling results, as distinguished between the daytime (7am to 7pm) and nighttime (7pm to 7am) averages, are summarized respectively in Table 7.3.3(1) Table 7.3.3(2) and Table 7.3.3(3) for each of the three sampling locations of Gate 5 (No. 1), Gate 6 (No. 2) and Gate 9 (No. 3).

Since all three sampling locations were at (No. 1 and No.2) or near (No. 3) road access points to the port, vehicular emission and particulate matter suspended from road surface due to vehicular movement (in addition to wind force) should be the major sources of ambient air pollution. In overall, as could be visualized from Table 7.3.3, the ranking of measured ambient air pollution level of the 3 stations in descending order was No. 2 (Gate 6), No 1 (Gate 5) and No 3 (Gate 9).

This ranking of ambient air pollution level among the 3 locations is in agreement with their site characteristics. The locations No.1 and No.2 are major entry and exit points of cargo trucks and other port related traffic to the hub of the north port area and are also located in the vicinity of Constantza city center. On the other hand, location No 3 is on the road vicinity of Gate 9 in the newly developing Constantza South Port in Agigia town, a small town of less traffic intensity and vast open space. The peculiar site condition of Gate 6 (No.2) with high wall barriers along both sides of the gate, that mitigates effective dispersion of air pollutants, is considered as the major reason for the highest air pollution level measured at Gate 6. Nevertheless, in overall, the ambient air pollution level with respect to all major parameters, other than for CO (carbon monoxide) measured at Gate 6, is well within the Romanian national ambient air quality standards for a protected area as stipulated by STAS 12574/1987. Even with respect to CO level at Gate 6 still the computed 24-hr average value only slightly exceeded the maximum permissible standard limitation of 2 mg/m3.

Concerning the metallic content in SPM of the 7 constituents measured, only the 4 elements of Cu (copper), Fe (iron), Zn (zinc) and Pb (lead) were detected in measurable and significant quantity as evident from Table 7.3.3. The other 3 elements were mostly undetected as indicated by BDL (below detection limit).

Of the 4 measured elements the lead (Pb) content, which is regulated by the STAS 12574/1987 to a maximum allowable 24-hr average limit value of 0.0007mg/m3, exceeded the maximum allowable limit in 2 locations: Gate 6 (No. 2) and Gate 9 (No. 3). In particular the lead content measured in Gate 9 was conspicuously the highest even though this location recorded the best overall air quality. This indicates that the source of lead may be of multiple origins and not just from that of SPM (suspended particulate matter) attributed to vehicular emission. In fact lead has been widely used, until recently, in a variety of products of anthropogenic origin, including water supply pipes, and its remnants should be present in particulate matters, dust/SPM, in general. This aspect of multiple sources of lead is considered as the reason for its conspicuously high value recorded in Gate 9.

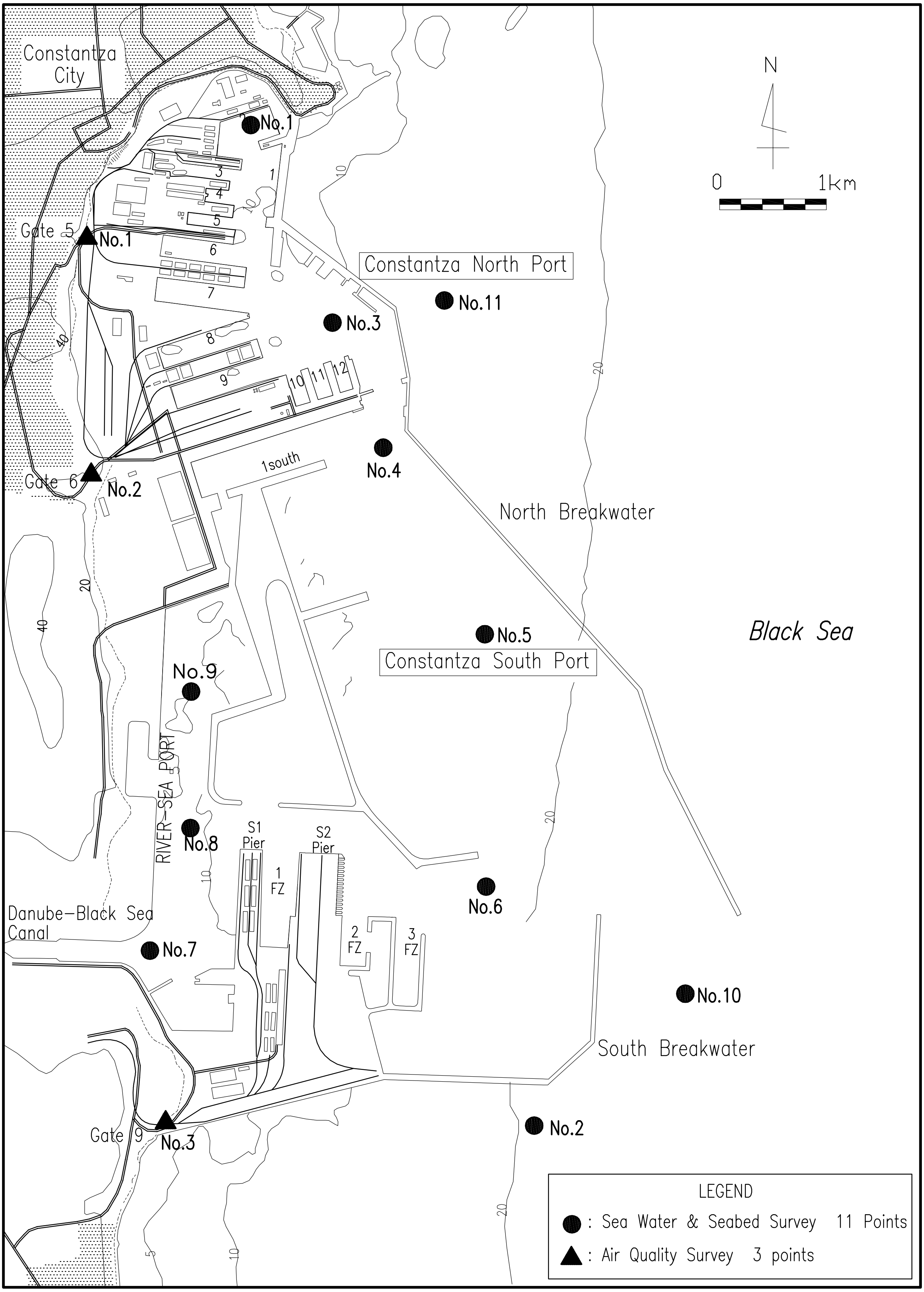

Figure 7.3.1 Locations of Environmental Quality Survey (November 2000)

Table 7.3.1 Results of Port Seawater Quality (November 2000)

Location	Depth (m)	Temp. (℃)	Cl (g/l)	pH*	pH**	O2* (mg/l)	O2** (mg/l)	COD (O_2mg/l)	SS (mg/l)	Sulfide (μg/l)	Total Hydrocarbon (μg/l)	Inorganic Nitrogen (μg/l)
Station 1	0	14.4	8.6	8.4	8.2	9.7	10.0	3.0	13.2	0.57	326.0	172.5
	4	14.5	8.9	8.3	8.2	6.3	7.0	1.5	15.0	0.03	113.0	144.7
	8	14.7	9.0	8.2	8.1	6.1	4.8	1.1	19.0	0.20	232.0	145.0
Station 2	0	14.4	9.3	8.6	8.5	7.8	7.9	2.1	20.8	<0.02	118.2	45.9
	8	14.5	9.6	8.5	8.3	6.5	7.1	0.8	8.0	<0.02	56.8	57.7
	16	14.6	9.8	8.4	8.3	5.6	6.2	0.9	9.1	0.04	57.7	63.2
Station 3	0	14.3	9.0	8.5	8.2	7.4	8.9	2.4	17.1	<0.02	71.0	142.5
	6	14.4	9.0	8.4	8.2	7.2	8.2	2.0	11.3	<0.02	89.9	171.1
	12	14.8	9.1	8.4	8.1	7.5	6.3	1.3	16.6	<0.02	71.0	138.0
Station 4	0	14.4	9.2	8.4	8.2	8.2	6.2	1.9	18.3	<0.02	132.6	162.5
	9	14.5	9.7	8.5	8.2	6.0	5.9	0.8	12.6	<0.02	61.5	88.8
	18	14.8	10.0	8.4	8.2	5.4	5.3	0.4	6.5	<0.02	56.8	132.5
Station 5	0	14.6	9.5	8.7	8.5	8.3	8.3	2.0	8.9	<0.02	85.2	64.4
	7.5	14.5	9.7	8.5	8.3	6.6	6.9	0.6	10.7	<0.02	81.3	100.2
	15	14.8	9.7	8.4	8.3	5.8	6.5	1.2	10.2	<0.02	99.4	73.3
Station 6	0	14.4	8.6	8.8	8.6	11.4	10.8	3.2	20.7	<0.02	94.7	53.0
	5	14.4	9.0	8.4	8.3	7.5	7.3	1.1	17.0	0.02	104.2	59.7
	10	14.5	9.5	8.4	8.3	6.4	6.2	0.9	15.8	0.35	66.3	67.8
Station 7	0	14.5	8.9	8.3	8.1	5.5	5.0	1.4	15.6	<0.02	75.7	155.1
	3	14.6	9.1	8.3	8.2	5.3	5.5	0.8	13.1	<0.02	94.7	122.3
	6	14.8	9.2	8.4	8.2	5.5	5.6	3.0	11.0	<0.02	104.2	106.1
Station 8	0	14.4	8.7	8.4	8.2	6.2	6.6	0.9	12.3	<0.02	61.5	210.0
	4.5	14.6	9.2	8.3	8.2	5.4	5.7	0.8	11.7	<0.02	66.3	132.7
	9	14.7	9.6	8.4	8.2	6.2	6.2	0.9	11.3	<0.02	94.7	71.7
Station 9	0	14.4	8.9	8.3	8.2	7.6	8.2	1.2	11.3	<0.02	75.7	123.7
	2.5	14.6	8.9	8.3	8.2	6.2	7.0	1.3	11.3	<0.02	104.2	135.0
	5	14.7	9.3	8.3	8.2	6.1	6.5	0.7	2.4	<0.02	61.5	119.3
Station 10	0	14.5	9.5	8.7	8.6	9.0	9.8	2.6	16.9	<0.02	108.9	47.9
	11	14.3	9.6	8.6	8.5	6.6	7.5	1.5	5.6	0.21	61.5	44.2
	22	14.8	9.6	8.6	8.5	7.0	6.5	0.9	5.4	0.05	58.5	70.4
Station 11	0	14.1	9.7	8.7	8.6	8.2	9.0	1.3	15.2	0.59	122.0	51.6
	9	14.1	9.9	8.6	8.5	7.3	9.0	1.0	4.9	0.03	78.5	41.2
	18	14.4	9.7	8.6	8.4	7.5	6.8	1.2	11.1	0.32	158.0	43.9

* - Values obtained on board   ** - Values obtained in the Lab

Table 7.3.2 Results of Port Seabed Material Quality (November 2000)

Location	COD (O_2mg/100g D.W.)	LOI (g/100g D.W.)	Sulfide (μg/100g D.W.)	Total Hydrocarbons (μg/100g D.W.)	Inorganic Nitrogen (μg/100g D.W)	Total Phosphorus (μg/100g D.W.)
Station 1	45.6	5.9	23.0	28890	9446	5004
Station 2	47.8	4.9	<0.02	4320	8526	1852
Station 3	24.1	3.9	<0.02	57540	3624	1331
Station 4	39.5	8.0	3.50	27270	8575	2735
Station 5	24.2	4.9	<0.02	16875	4436	1151
Station 6	Rocky bottom					
Station 7	57.5	8.0	22.0	5197	7349	1538
Station 8	31.3	8.0	0.20	6817	5751	1254
Station 9	38.4	10.6	<0.02	28080	6266	1167
Station 10	44.7	4.3	<0.02	4725	4538	1099
Station 11	33.2	7.0	<0.02	25650	6513	1781

Table 7.3.3 (1) Measured Range of Ambient Air Pollutants (Gate 5)

Pollutant	Range of the measured pollutant	
	for 7.00 pm to 7.00 am 12 h averaging period	for 7.00 am to 7.00 pm 12 h averaging period
SO_2	0.0014 - 0.0045 mg/m^3	0.0015 - 0.018 mg/m^3
NO_2	0.012 - 0.014 mg/m^3	0.013 - 0.014 mg/m^3
NO	0.008 - 0.01 mg/m^3	0.008 - 0.011 mg/m^3
CO	1.02 - 1.47 mg/m^3	0.600 - 1.46 mg/m^3
CO (determined using detector tubes)	1.04 - 2.08 mg/m^3	0.520 - 1.56 mg/m^3
Suspended particulate matters (SPM)	0.014 - 0.087 mg/m^3	BDL - 0.209 mg/m^3
Cd	BDL	BDL
Cr	BDL	BDL
Co	BDL - 0.007 μg/m^3	BDL - 0.179 μg/m^3
Cu	0.086 - 0.565 μg/m^3	BDL - 2.135 μg/m^3
Fe	0.044 - 1.813 μg/m^3	BDL - 3.049 μg/m^3
Zn	0.025 - 0.682 μg/m^3	BDL - 1.435 μg/m^3
Pb	0.027 - 0.413 μg/m^3	BDL - 0.695 μg/m^3

Table 7.3.3 (2) Measured Range of Ambient Air Pollutants (Gate 6)

Pollutant	Range of the measured pollutant	
	for 7.00 pm to 7.00 am 12 h averaging period	for 7.00 am to 7.00 pm 12 h averaging period
SO_2	0.001 - 0.015 mg/m^3	0.0015 - 0.018 mg/m^3
NO_2	BDL - 0.026 mg/m^3	0.007 - 0.016 mg/m^3
CO	BDL - 3.12 mg/m^3	0.83 - 1.04 mg/m^3
Suspended particulate matters (SPM)	0.006 - 0.105 mg/m^3	BDL - 0.126 mg/m^3
Cd	BDL	BDL
Cr	BDL	BDL
Co	BDL	BDL
Cu	0.046 - 1.48 $\mu g/m^3$	BDL - 0.306 $\mu g/m^3$
Fe	0.713 - 4.115 $\mu g/m^3$	BDL - 2.276 $\mu g/m^3$
Zn	0.039 - 1.372$\mu g/m^3$	BDL - 0.446 $\mu g/m^3$
Pb	0.187 - 0.908$\mu g/m^3$	BDL - 0.697 $\mu g/m^3$

Table 7.3.3 (3) Measured Range of Ambient Air Pollutants (Gate 9)

Pollutant	Range of the measured pollutant	
	for 7.00 pm to 7.00 am 12 h averaging period	for 7.00 am to 7.00 pm 12 h averaging period
SO_2	BDL - 0.003 mg/m^3	BDL - 0.014 mg/m^3
NO_2	BDL - 0.008 mg/m^3	BDL - 0.008 mg/m^3
CO	BDL - 0.42 mg/m^3	BDL - 0.84 mg/m^3
Suspended particulate matters (SPM)	0.015 - 0.075 mg/m^3	0.034 - 0.081 mg/m^3
Cd	BDL	BDL
Cr	BDL	BDL
Co	BDL	BDL
Cu	0.023 - 0.294 $\mu g/m^3$	0.125 - 0.39 $\mu g/m^3$
Fe	0.185 - 0.791 $\mu g/m^3$	0.72 - 1.652 $\mu g/m^3$
Zn	0.099 - 0.221 $\mu g/m^3$	0.084 - 0.486 $\mu g/m^3$
Pb	0.088 - 0.708 $\mu g/m^3$	0.091 - 1.362 $\mu g/m^3$

Note : BDL - Below detection limit

7.3.2 Supplemental Field Survey

The supplemental environmental field survey of June 2001, representing the beginning of summer season, targeted specific aspects of port seawater and seabed material qualities in details, including biological elements of marine ecology. This field survey was conducted as an integral part of primary baseline data collection for the conduct of the EIA (environmental impact assessment) study for the feasibility study projects of port development until the year 2010.

The entire sampling locations of this survey are shown in Fig. 7.3.2. A brief description of these two (2) field surveys and their results are dealt with below.

(1) Port seawater quality

Water quality survey in the port water environment was conducted at 8 locations (ref. Fig. 7.3.2). The sampling for the determination of water quality parameters both at site as well as in laboratory as appropriate were conducted one time and at two different depths at each location resulting in a total of 16 samples. The two seawater depths of sampling were just below the water surface and just above the seabed (bottom).

The major water quality parameters analyzed included, in addition to conventional bio-chemical and physical parameters of DO (dissolved oxygen), COD (chemical oxygen demand), T-P (total phosphorus), SS (suspended solids) and total hydrocarbon, seven (7) important heavy metallic elements and also biological components of phytoplankton and zooplankton. The results of analysis of bio-chemical and physical parameters including those of 7 heavy metals are shown in Table 7.3.4. The results of biological sampling of phytoplankton and zooplankton in water column are given, respectively, in Table 1 and Table 2 of Appendix IC.

Based on the results of analysis of Table 7.3.4, similar to the results of initial sampling dealt with under item (1) of foregone section 7.3.1, no chronic deterioration in the port water quality even with respect to heavy metal constituents was noted. However, the high density and biomass of phytoplankton measured indicated progressing eutrophication in the port waters. This proliferation of phytoplankton is attributed to accumulation of nutrients in the port waters in particular, and in the Black Sea as a whole in general, as documented by various studies. (Also refer to item (2) of section 7.1 on Peculiarity of Black Sea) Moreover, based on visual appearance, the water quality of the port is assessed as significantly deteriorated, under the condition of the beginning of summer season (June 2001), in comparison to that of previous time, during the beginning of winter season (Initial field survey period of November 2000).

(2) Port seabed material quality

The seabed material sampling was conducted at the seabed areas where the 8 seawater sampling were carried out as delineated above. The seabed material sampling was conducted concurrently with seawater sampling work resulting in total of 8 samples for subsequent laboratory analysis. The seabed sampling was also included the biological sampling of macrobenthos inhabiting the seabed surface.

The major seabed material parameters analyzed included, in addition to conventional bio-chemical and physical parameters of COD, T-P (total phosphorus) and total hydrocarbon, the same seven (7) important heavy metallic elements as measured in seawater sampling of above item (1). The results of analysis of bio-chemical and physical parameters including those of 7 heavy metals are shown in Table 7.3.5. The results of biological sampling of macrobenthos in seabed surface are given in Table 3 of Appendix IC.

Based on the results of analysis of Table 7.3.5, similar to the results of initial sampling dealt with under item (2) of foregone section 7.3.1, no chronic deterioration in the port seabed material quality with respect to the conventional parameters was noted. All of these parameters measured were within the range typical/acceptable for port seabed.

However, progressing accumulation of heavy metals in seabed, in particular at the three (3) stations of 3, 4 and 5 located well within the hub of the port (ref. Fig.7.3.2), was noted. These three (3) stations recorded relatively high seabed accumulation of all of the 7 heavy metallic elements measured in comparison to the other stations. Still, in overall, the heavy metallic contamination in port seabed is assessed as not of chronic level. Still, the contamination level of Cu (copper), Cd (cadmium) and Ni (nickel) in all of these 3 stations of 3, 4 and 5 exceeded somewhat the allowable limit of contamination for beneficial use of dredged materials as per the Netherlands Standards (Referred to in Environmental Considerations for Port and Harbor Developments published by World Bank).

Moreover, the low density and biomass of macrobenthic species that inhabit the seabed, measured in the biological sampling represented the ecologically degraded state of these 3 stations of 3, 4 and 5 in comparison to others. In fact no macobenthic species was measured at Station 4 (ref. Table 3 of Appendix IC), the only case, further demonstrating the polluted nature of the hub of the port area in terms of marine ecology as well in addition that of heavy metal contamination in seabed. It is noted that Station 4 is located adjacent to ore handling and oil terminal area of the port.

(3) Overall environmental evaluation

In overall progressing port water environmental degradation, in particular within the port hub area in comparison to the surroundings, became evident based on the results of supplemental field survey. The conventional pollution indicator parameters such as COD and DO alone are found to be inadequate to account for this progressing port seawater environmental degradation. This could be attributed to the peculiarity of Black Sea, which is in fact a vast saline lake, as illustrated under Item (2) of Section 7.1. Port seawater environmental degradation was essentially indicated by heavy metal accumulation in seabed and also by the results of biological sampling represented by high density and biomass of phytoplankton in seawater and low density and biomass of macrobenthos in the seabed.

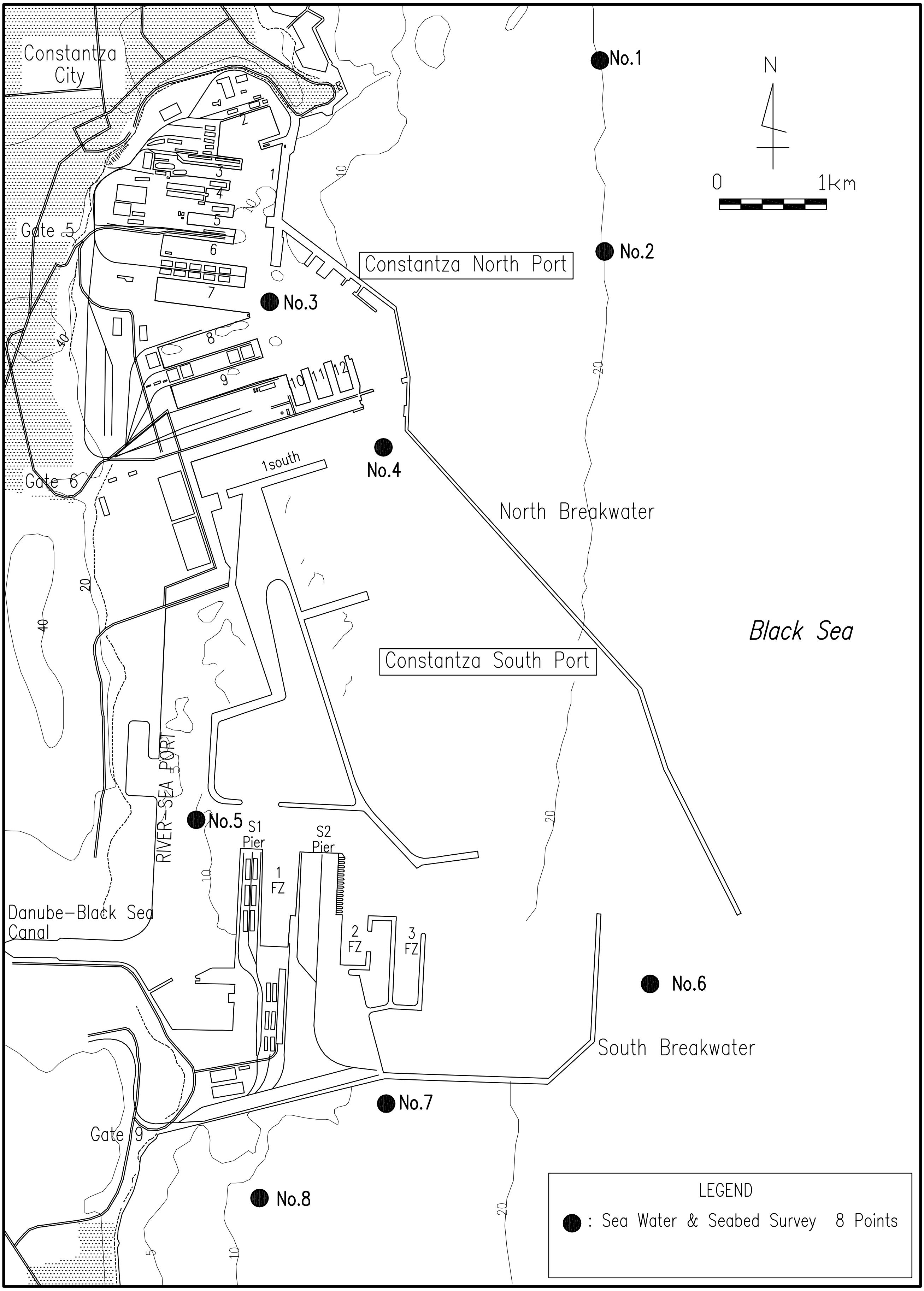

Figure 7.3.2 Locations of Water Environmental Quality Survey (June 2001)

Table 7.3.4 Results of Port Seawater Quality (June 2001)

Location	Depth (m)	Temp. (℃)	Cl (g/l)	pH*	pH**	O2* (mg/l)	O2** (mg/l)	COD (O_2mg/l)	Total P (μg/l)	Total hidrocarb. (μg/l)	SS (mg/l)	Cu (μg/l)	Cd (μg/l)	Ni (μg/l)	Pb (μg/l)	Zn (μg/l)	Cr (μg/l)	Hg (μg/l)
Station 1	0	13.1	9.6	8.5	8.3	9.7	10.0	3.33	32.40	57.0	16.0	4.8	1.94	2.74	13.09	9.50	0.86	0.088
	22	8.1	10.3	8.4	8.2	8.8	8.8	3.00	24.80	153.0	36.2	5.7	1.87	3.14	14.12	11.06	0.90	0.090
Station 2	0	13.2	9.7	8.4	8.3	10.6	10.7	3.33	23.56	64.0	10.8	4.1	1.32	2.05	13.55	11.25	1.13	0.049
	20	8.3	9.7	8.3	8.3	10.4	10.5	3.33	19.22	144.0	9.2	5.1	1.87	2.98	15.89	12.50	1.20	0.055
Station 3	0	13.2	9.3	8.5	8.4	12.0	12.2	4.83	47.74	53.9	21.7	15.3	3.84	9.25	14.25	13.25	3.67	0.092
	12	8.4	10.0	8.2	8.1	8.4	8.4	2.00	14.26	239.0	10.4	18.7	3.87	18.27	17.24	19.60	4.50	0.115
Station 4	0	13.3	9.3	8.6	8.4	13.1	13.6	5.17	60.76	100.7	28.4	9.9	3.89	10.21	18.75	31.50	3.37	0.080
	18	8.1	9.7	8.5	8.4	9.5	10.0	5.17	38.44	68.9	13.1	14.3	3.50	12.27	2.90	36.80	3.70	0.100
Station 5	0	12.9	8.6	8.6	8.4	13.5	13.7	5.00	53.32	83.4	23.2	19.5	0.98	6.92	12.24	21.59	2.97	0.100
	8	8.4	9.0	8.6	8.3	12.5	12.8	4.50	43.40	91.0	19.6	22.3	1.87	7.04	19.47	24.56	3.02	0.125
Station 6	0	12.6	9.4	8.5	8.4	10.7	11.0	4.00	27.90	404.7	14.0	4.5	1.25	20.14	12.47	2.37	1.15	0.073
	22	8.2	10.2	8.3	8.2	8.3	8.2	1.83	18.60	156.0	10.8	10.2	3.01	25.20	15.24	1.86	1.37	0.085
Station 7	0	12.5	9.6	8.4	8.4	11.5	11.9	3.50	26.66	317.0	11.6	6.3	1.75	3.69	12.98	2.66	2.13	0.033
	16	8.4	9.7	8.3	8.3	10.7	10.8	2.50	21.70	139.0	10.1	7.0	1.89	4.05	13.47	4.33	2.88	0.055
Station 8	0	12.7	9.4	8.4	8.2	11.0	11.3	5.17	311.24	344.7	14.4	5.0	2.01	3.07	13.21	5.08	0.85	0.037
	12	8.4	9.5	8.2	8.2	8.5	8.5	2.33	24.18	664.0	14.0	6.2	1.98	5.40	13.52	7.61	0.98	0.045

* - Values obtained on board   ** - Values obtained in the Lab

Table 7.3.5 Results of Port Seabed Material Quality (June 2001)

Location	LOI (g/100g D.W.)	COD (O2mg/100g D.W.)	Total P (µg/100g D.W.)	Total hydrocarb. (µg/100g D.W.)	Cu (mg/kg)	Cd (mg/kg)	Ni (mg/kg)	Pb (mg/kg)	Zn (mg/kg)	Cr (mg/kg)	Hg (mg/kg)
Station 1	5.3	39.8	1,361.0	10,070	78.25	3.47	88.15	76.26	72.20	29.60	0.079
Station 2	2.6	34.5	1,274.4	16,210	81.35	3.21	81.98	79.47	88.82	38.70	0.092
Station 3	4.2	30.9	839.2	19,390	132.24	12.32	94.40	115.88	173.40	86.30	0.128
Station 4	5.6	36.2	958.6	41,540	127.47	15.47	86.25	120.12	180.30	72.20	0.421
Station 5	3.4	31.1	820.6	98,950	115.49	17.21	139.24	150.27	114.50	62.90	0.122
Station 6	5.8	30.6	1,205.6	48,090	69.21	10.21	62.15	90.24	91.36	58.40	0.059
Station 7	3.6	32.5	688.9	91,150	72.14	5.21	65.12	84.21	56.30	36.30	0.038
Station 8	2.9	30.4	823.2	18,630	67.32	4.37	70.89	80.17	67.65	23.20	0.046

7.4 Environmental Laws and Regulations

(1) Present legislative environment of Romania

The Present legislation on environmental protection can be structured into the following six (6) categorical areas:

- Inter-sectorial legislation for environmental protection
- Waters
- Maritime zones
- Toxic substances
- Wastes
- Human environment

1) The Inter-Sectorial Legislation for environment protection

The Inter-Sectorial Legislation for environment protection and environmental assessment consists of the following:

1. Law No. 137/1995- The Law for Environmental Protection
2. The MWFEP (Ministry of Waters, Forests and Environment Protection) Order No. 125/1996 on approval of the procedure regulating economic and social activities with impact on environment, which includes the EIA elaboration methodology
3. The MWFEP Order No. 756/1997 on approval of the Regulation on environment pollution assessment
4. The MWFEP Order No. 184/1997 on the approval of the procedure of environmental balance realization
5. The MWFEP Order No. 462/1993 on the approval of the technical conditions regarding atmospheric protection and the methodological norms on determination of the atmospheric pollution emission produced by stationary sources

2) Waters:

1. Law no. 107/1996- Law of Waters
2. The MWFEP Order No. 645/I.O./1997 on the approval of the norm regarding conditions of wastewater discharge into local sewerage networks-NTPA 002/1997
3. Governmental Decision 730/1997 on approval of the norm with regard to establishing pollution limits for wastewater discharges into water resources- NTPA 001
4. The MWFEP Order No. 699/1999 on the approval of the Procedure and capacities for issuing water management authorizations and permits
5. The MWFEP Order No. 277/1997 on the General Methodology for elaboration of plans regarding prevention and combating of accidental pollution.

3) Maritime Areas:

1. Law no. 17/1990- on the legal regime of interior maritime waters of the territorial sea and contiguous areas of Romania
2. Law no. 98/1992 on the ratification of the convention regarding Black Sea protection against pollution
3. Law no. 6/1993 on Romania's adhesion to the International Maritime Organization (IMO) Convention of 1973 regarding vessel pollution prevention
4. Gov. Ordinance no. 14/2000 on Romania's adhesion to the International Convention regarding preparation, response and co-operation in case of hydrocarbon pollution, adopted in London on November 30, 1990
5. Gov. Ordinance no. 15/2000 on Romania's adhesion to the 1992 Protocol

4) Toxic Substances:

1. Gov. Decision no. 466/1979 on toxic product and toxic substance regime
2. Health Ministry's Ordinance no. 43/1990 on approval of the list with toxic substances and plants that contain toxic substances

5) Wastes:

1. Gov. Decision no. 340/1992 on the import regime applied to wastes of any kind and to commodities dangerous for environment and public health.
2. Gov. Decision no. 347/1992 on modification and enforcing GD no. 340/1979
3. Gov. Decision no. 511/1994 on adopting measures for preventing and combating environmental pollution by commercial companies whose activities generate polluting wastes.
4. Emergency Ordinance no. 78/2000 on waste regime.

6) Human Environment:

1. Order of Ministry of Health no. 536/1997 on the approval of the sanitary norms and of the recommendations on population living environment.
2. Law no. 98/1994 on sanitary norms and public health
3. Sanitary-Veterinary Law no. 60/1974

(2) Environmental standards

The major environmental quality norms and standards promulgated are as follows:

- STAS 12574/1987- Air Quality conditions in protected areas
- STAS 4706/1988 on surface water quality including Black Sea coastal waters
- STAS 1342/1991 on potable water quality

(3) Environmental impact assessment (EIA)

The Law No.137/1995 on Environmental Protection and the subsequent MWFEP Order No. 125/1996 as given under Item (1) of above, and their various appendices, comprehensively define and stipulate the requirement of environmental impact assessment (EIA) and environmental authorization process of Romania. The project schemes subjected to mandatory EIA are delineated in Appendix II of the above Law No. 137/1995, which includes all transportation infrastructure projects like roads, rails, ports and airports. Accordingly, conduct of EIA is mandatory for the feasibility study projects (short-term development plan) of this master plan. The EIA study conducted for the feasibility study projects until the year 2010 is summarized in Chapter 12 of PART III.

Chapter 8 Issues Facing the Port of Constantza

8.1 Issues on Port Facilities and Layout

The Port of Constantza handled cargo of 23 million ton in 1999, while the existing cargo handling capability of the Port is said in about 80 million ton per year. At present the Port has a sufficient handling capacity of cargo in calculated figures.
However, there are two issues about handling capacity of the port and layout of port facilities, and the future Master Plan of the Port based on these issues should be examined.

(1) Handling capacity of the port

In the Port of Constantza, the main cargo was conventional bulk cargo such as oil, coals and ores before. With change of the industry and trade structure of Rumania, it will be expected that general cargo, especially container, will increase.
It is necessary to forecast change of such demand structure and to develop the facility corresponding to the volume and type of cargo change in the future.

Today, it is required that the port has international competitiveness against surrounding ports, which means that efficient cargo handling and smooth intermodal operation are expected. It is necessary to renew the facilities at suitable time so that the port may not loose international competitiveness due to superannuated facilities or inefficient operation.

(2) Layout of the port facilities

At present, general cargoes are handled by various operators on the dispersed terminals in the port. Moreover, this port is divided into Old North Port, North Port and newly developed South Port. With foreseeing future cargo demand, it is necessary to examine facility layout in order to perform the efficient operation as a whole port.

Furthermore, while the Central Island and the South Port, where deep sea berth and Free Zone are located, has large future development room, the development scale and time should be determined, after examining development strategy of the Port.

8.2 Issues on Port Management and Operation

The EU Commission, recognizing that the export competitiveness of Europe depends upon an efficient and cost effective transport and port system, expressed its basic port policy to the Community in its "Green Paper on Sea Ports and Maritime Infrastructure" in December, 1997. In the Green Paper, the EU Commission stated its three major objectives of port policies as follows:

(1) To make proper investment in port infrastructure and port-access infrastructure in order to integrate ports into the multimodal trans-European transport network.

(2) To improve port efficiency through such means as streamlining procedures in ports, introducing innovative information systems, etc.

(3) To ensure free and fair competition in the port sector, including a more systematic liberalization of the port services market.

The above objectives, which are requested to the Member States, can be applied to the Pre-accession States, including Romania.

Taking the above objective into consideration, there are several issues on Port Management and Operation as follows.

(A) Ambiguousness on legal framework of Port Administration.

(a) Public Port assets

For the present time, all the shares of the National Company (CMPA-S.A) are owned by the state, exercising its rights and obligations through the Ministry of Public Works, Transport and Housing (MPWTH) (art. 3(1) GD no. 517/1998).

Art. 15(3) of the G.O. no. 22/1999: MPWTH has to approve all new buildings and installations and any modification of the existing hydro-technical buildings or port capacities and their destination.

Also, the main landlord function - to conclude lease and concession agreements for port assets and port public services is presently prohibited for CMPA by Law no. 219/1998 on the concessions regime. So, the concession contract between MPWTH and CMPA provides for the interdiction to grant sub-concessions and also the interdiction to transfer any right obtained over these assets. Practically, there is no legal possibility up to now to give the port operators a sound right to stay and use the port land.

(b) Port Planning

There are not extensive legal provisions or procedures regulating the port planning except some basic principles. But some regulations have contradictory provisions. For example, as follows;

Art. 15(1) GO no. 22/1999:
"The development of each port is carried on according to the Port Development Plan which elaboration constitutes an obligation of the port administration." (In Constantza the port administration is CMPA.)
"The Port Development Plan has to be created in conformity with the policy and development programmes established by MPWTH."

Thus one of the issues is that the main body in charge of port planning is not clear.

The port planning should be done by CMPA which is well versed in the port of Constantza and is suitable for the coordination of various interests among port users. MPWTH should bear the responsibility of approving the port plan.

Free Zone

Regarding the administrative authority of CMPA, since a part of land close to quays in the South Port belongs to the Free Zone, it is conceivable in the future that port planning by CMPA which affects a part of the Free Zone will be opposed by concessionaires of the Free Zone.

From a port planning viewpoint, it is desirable that CMPA reserves a certain regulatory authority over the land-side of the Free Zone close to quays.

(B) Port Investment Financing and Charging Policy

It is necessary for CMPA to properly carry out investment in port infrastructure, such as maintenance and improvement of breakwaters, quays and roads, dredging of channels, etc. However, at present such investment has not been adequately carried out because of insufficient CMPA revenues. The only solution would be to increase their revenue and minimize their expenses, and CMPA should take any countermeasures immediately. .

In the port almost tariffs are set up adequately, but the tariff for port domain using (590 Lei/sq.m./month) is extremely low. The reason seems to be CMPA hasn't had legal rights over the state owned Port land up to now.

Therefore, it is necessary for CMPA to get appropriate legal rights and raise the lease fee level gradually in order to secure the amount of revenue necessary for the investment in port infrastructure.

(C) Implementation of Competitive Policy

(a) Liberalization of Port Services Market

Concerning the cost structure of the terminal operators in the Port of Constantza, the lease fee level is almost nominal and, generally speaking, the depreciation cost is low because of the relatively old cargo handling equipment. The labor cost is also low because of the low wage level.

These factors help the operators to survive in spite of their small annual handling volume.

Once the normalization of the lease fee level is carried out, however, those operators who cannot raise enough revenue to cover the increased cost will be obliged to cut down their business scale or withdraw from their business.

Such operators will be replaced by other more efficient and productive operators or entrepreneurs of other business types through ensuring free and fair competition and ensuring open access to the port services market.

(D) Streamlining of Procedures and Introduction of Information System

Time-consuming and complicated customs control which is at present carried out on board by customs officers should be abolished. Instead, the whole port area should be designated as a Free Port, where transit cargoes will be free from customs inspection and imported cargoes will be subject to customs inspection only after being unloaded onto the landside area.

And concerning the introduction of innovative information systems, CMPA has been introducing an Information System on a step-by-step basis. CMPA completed the First Stage in April, 2001 and has established a database covering such areas as calling ships, cargo handling volume, cargo handling operators and major shippers/consignees. It is expected that CMPA will follow its plan and steadily proceed to the final Third Stage.

8.3 Issues of Inland Transportation in the Port

8.3.1 Issues of Road

(1) North Port Area

The north port area has several issues for related to road conditions. The most serious issue is the condition of Gate 5.

Loaded trucks should enter to the port through Gate 5 and then they should leave through Gate 6 in general.

Traffic at Gate 5 is very heavy in the mornings, with loaded trucks which are only able to enter through this gate, passenger cars and other vehicles crowding at the port entrance. Table 8.3.1 shows the degree to which entering vehicles concentrate at each Gate. In addition, the trucks, after passing through Gate 5, must reduce speed to negotiate the acute-angled curve on their way to Moles 3, 4 or 5. This results in long queue and unsafe traffic conditions. The situation is likely to be aggravated in the future if cargo traffic in the north port increases.

Table 8.3.1 Ratio of Vehicles at each Gate to Total Vehicles in the North Port

(Unit: %)

Name of Gate	Ratio of cargo vehicles at each gate to total cargo vehicles	Ratio of all vehicles at each gate to total cargo vehicles
Gate 1	16.0	32.2
Gate 3	7.7	13.5
Gate 5	71.0	49.0
Gate 6	5.3	5.3
Total	100.0	100.0

Sufficient capacity of the main roads should be maintained in the target years. Therefore, the capacity of main roads has to be checked because the cargo handling volume at North Port area is forecast to increase.

(2) South Port Area

The handling cargo volume of South Port area is forecast to rapidly increase. Therefore, the capacities of present main roads and the new elevated road with overpass the railway under feasibility study by CMPA should be checked based on the cargo handling volume at South Port in the target years.

8.3.2 Issues of Railway

The main issues of Railway at the Port of Constantza are the flooding around Gate 4 and landslip at the entrance near Gate 6.

CFR has taken the countermeasures for these issues such as increasing the drainage capacity and strengthening the sheathing. However, attention to these issues will be necessary in future.

Traffic volume of Railway to/from Constantza Port is approximately 11.5million tons in 2000 which is approximately 40% of the cargo handling volume of Constantza Port. Therefore, the capacity of Railway should be checked to ensure that can cope the cargo handling volume forecast in the target year.