



Port Network Plan and Improvement  
Programme:  
Renovation of the Ferry Terminals of Baku  
and Turkmenbashi

**Environmental Analysis Report - Turkmenbashi  
September 1997**

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## 1. INTRODUCTION

As a part of the EC financed Tacis-Traceca project concerning with the rehabilitation of the ferry terminals in Baku and Turkmenbashi, this report provide an environmental impact assessment of the future development at the Turkmenbashi site.

After environmental screening, this project has been classified as B/0 according to EBRD environmental procedures, see ref. /5/. The heading B means that "Partial environmental analysis" is required. The heading 0 indicates that an environmental audit is not required.

Partial environmental analysis can vary considerably depending on the type of project, but normally it involves the specification of the environmental guidelines or standards which should be met by the project. This should be possible without undertaking any major study, although studies might be needed in certain cases. In accordance with this guidance, the environmental assessment has been written in the format required by both Turkmenistan authorities and by EBRD, se ref. /1/ and /2/.

The Environmental Impact Assessment presented in this report has to some degree been based on a general Environmental Assessment of Turkmenbashi Port prepared recently in relation with the master plan study for Turkmenbashi Port Development, see ref. /3/.

During the course of the present project, preliminary environmental evaluations have already been carried out in connection with the screening of the various layouts that have been studied before arriving at the final project proposal. These evaluations have been reported in Phase 1 report, January 1997 (environmental background conditions), see ref. /4/ and in the Phase 2, Pre-design and feasibility note, December 1996 (initial environmental evaluation), see ref. /6/. As minor dredging works are envisaged as part of the rehabilitation project, an analysis of the dredging materials has been initiated. The sampling and analysis is carried out by the East Caspian Inspectorate, Turkmenbashi. Results of the investigation are expected by the end of October, 1997 and will be reported separately.

## 2. OPERATIONAL CONTEXT

### 2.1 Purpose, Need and Development Timetable of the Project

The ferry terminals in both Baku and Turkmenbashi ports today face various and serious problems that are of major constraint to a proper and smooth use of the terminals, se ref. /4/. If not addressed in a proper way, these problems may constitute a threat to the continuation of the ferry service on the sea route linking the two ports. This ferry service is a crucial element on the Traceca transport corridor linking Europe and the Caucasus region with the Central Asian countries.

To relieve the situation of the ferry terminals, EC has committed itself under the Tacis-Traceca programme, to finance the Consultancy Services of the present project concerned with the rehabilitation of the ferry terminals in Baku and Turkmenbashi.

Design of the project is completed and tendering for construction is expected to start early 1998. EBRD is expected to provide the major part of financing through loans.

The operational and technical outline of the ferry terminal project subject of the present environmental analysis have been described in detail in reports prepared earlier, as part of the present project, see ref. /4/ and /8/.

## **2.2 Legal and Institutional Framework**

The information in this chapter follows in general ref. /3/.

### **Institutions**

The Ministry of Use of Natural Resources and Environmental Protection is responsible for the implementation of environmental legislation in Turkmenistan. The Ministry was created in 1992 and includes five departments:

1. Environmental Protection
2. Protection of Fauna and Flora
3. Forestry
4. Hydrometeorology
5. Administrative Planning

The major environmental laws consist of the Environmental Protection Law (passed in 1991) and the Law of Environmental Expertise (passed in 1995). While the Environmental Protection Law is a more general guide, the Law of Environmental Expertise provides comparatively specific instructions for the conductance of environmental investigations prior to engineering projects. Standards and monitoring systems in Turkmenistan were adopted largely unchanged from systems used in the Former Soviet Union, known as PEDECAR.

In Turkmenbashi the monitoring of coastal environmental conditions, including the port areas is the responsibility of the East Caspian Inspectorate which is reporting to the Ministry of Natural Resources and Environmental Protection. The Inspectorate has to approve, and is setting conditions for, dredging operations in ports and in shipping channels. It operates its own laboratory. Monitoring conducted by the Inspectorate includes quarterly sampling and analysis of the water and sediment along the coast line of the Gulf of Turkmenbashi.

General environmental issues of the region are the responsibility of the Environmental Committee of the Balkan Vilayat. For the port development projects these responsibilities mainly include issues related to air quality and noise. The East Caspian Inspectorate, however, is specifically responsible for all issues related to the water quality of the coastal waters and is therefore the main local agency for this project. The East Caspian Inspectorate is independent from the Environmental Committee.

The monitoring of sanitary systems and conditions is the responsibility of the Ministry of Health. In Turkmenbashi, sanitary conditions are monitored by the local Sanitary and Epidemiological Station (SES), which is part of the Ministry of Health. The station also operates its own laboratory. The responsibility of the SES includes the quality of domestic wastewater that enters coastal waters. Monitoring is sporadic: Apparently it is conducted on average two to three times a year according to the Laboratory. Monitoring parameters concentrate on relevant parameters for human health, such as coliforme bacteria.

Health and safety concerns from the construction of buildings and other structures are the responsibility of the Ministry of Construction. This issue is particularly important in a seismically active zone such as Turkmenbashi.

### **Environmental Requirements by the Government of Turkmenistan**

The Law of Turkmenistan on State Environmental Expertise (SEE) requires the compilation of a SEE document which is mandatory for most public and private projects. A SEE will be required for the proposed development of the Turkmenbashi Port. SEEs are conducted by a specially authorised state body or by an expert group. It is aimed at ensuring compliance with norms and protection of natural and socio-economic resources.

In relation to this project is expected that the SEE is conducted and reviewed by the East Caspian Inspectorate, the Sanitary and Epidemiological Station of the Ministry of Health, and the Environmental Committee of the Balkan Vilayat. The information presented in this report provide the basis for the development of the SEE for the ferry terminal rehabilitation project.

### **International Treaties**

Turkmenistan is a member, or plans to become a member, of the following international treaties:

**The MARPOL 73/78 Convention** was introduced through the International Maritime Organisation (IMO). Turkmenistan has not yet ratified this treaty, but is a member of the IMO. The goal of the MARPOL Convention is to avoid pollution of the Sea (hereby the Caspian sea). The Convention operates through five annexes:

Annex I: Regulations for the prevention of pollution by oil (e.g. dirty bilge- and ballast water, oily tank washings, fuel residues, sludge, and waste oil).

Annex II: Regulations for the control of pollution by noxious liquid substances in bulk.

Annex III: Regulations for the prevention of pollution by harmful substances carried by sea in package form, or in freight containers, portable tanks or road and rail tank wagons.

Annex IV: Regulations for the prevention of pollution by sewage from ships.

Annex V: Regulations for the prevention of pollution by garbage from ships (e.g. trash, foodstuffs, plastics, packaging material, and similar).

Annexes I, II, and V are ratified and in force in Turkmenistan. Annex III is not yet in force, but the provisions are implemented through the International Maritime Dangerous Goods Code (IMDG Code). Annex IV is not yet in force, but is expected to be implemented in the near future.

Rio Biodiversity Treaty: As of November 1996, Turkmenistan was not yet a member of this treaty, but a draft was being discussed by the Government for ratification in the near future.

### 3. DESCRIPTION OF THE PROPOSED PROJECT

The location and layout of the ferry terminal project in Turkmenistan is shown on the map in Annex 2.

With the overall objective of creating an adequate and well-functioning ferry terminal, the rehabilitation project is meant to address and solve the following main problems:

- The poor state of repair of the ferry terminal infrastructure and facilities,
- The inadequate terminal layout and insufficiency of facilities, and
- The deficiencies due to change of water level of the Caspian Sea

A terminal development plan has been prepared in this respect.

Due to the present low level of traffic, the uncertainty in the momentum of the economic growth and traffic increase, the present stop in water level increase of the Caspian Sea and the wish to maximise the financial feasibility it has been proposed to implement the Terminal Development Plan in phases according to the pace of growth in terminal activities and possible reactivating of rise in Caspian Sea water level.

#### **Phase I Works (Minimum Investment Plan with Targeted Intermediate Implementation)**

- Renovation of marine works/berths
- Renovation of ramp structures
- New vehicle reception, waiting and disembarkation areas
- New dangerous goods area
- New ticketing and border control buildings/check-points
- Modifications to passenger terminal building
- New public services building
- Renovation of passenger setting-off/picking-up area
- New passenger skywalk (partly)
- Container handling facilities and equipment (through separate project)

#### **Phase II Works (Additional Investment Plan with Targeted Implementation by or before the Year 2010, Depending on the Pace of Growth in Terminal Activities and Possible Raise in Caspian Sea Water Level)**

- raise of level of land base of ramp
- raise of level of administration area
- new container yard
- new trailer yard
- raise of level of rail yard
- additional container handling equipment

The environmental impact assessment presented in this report is only concerned with the phase I development, planned for immediate implementation.

## 4. DESCRIPTION OF THE EXISTING ENVIRONMENT

A thorough description of the existing environment of the port can be found in ref. /3/. The description presented here is partly a summary from this reference.

### Geographic Setting

The Port of Turkmenbashi lies on the north-western shore of the Gulf of Krasnovodsk. The ferry terminal is located 1 km east of the main port. The Gulf is a shallow partially enclosed basin on the eastern side of the Caspian Sea.

Ships enter the Gulf through a man-made channel in the Krasnovodsk Spit, see Figure 1. Due to long-shore drift of sand, this channel gradually fills in with sand and therefore needs to be dredged intermittently. From the cut in the spit, the access channel continues across the north-eastern part of the Gulf to the port facilities. The design depth for the channel is 6.5 m. Maintenance dredging of the channel is done by a port-owned dredge.

The port has two entrances for landbased traffic. The main entrance is located on the western side of the port. A second entrance is at its eastern end via the entrance of the ferry terminal. The ferry terminal entrance is located approximately 1 km east of the City of Turkmenbashi. Vehicles entering the port through the west entrance will first have to pass through the city; vehicles entering through the east entrance can avoid the traffic of the city.

### Climatic Conditions and Wind

The climate in Turkmenbashi is arid. The average monthly temperature ranges from 2°C to 27°C. The average number of frost days per year is 18. The average annual precipitation is 136 mm, and the average number of days with snow per year is 3.

The predominant wind direction is from the north and northwest. The average wind speed is 4.1 m/sec with gusts exceeding 20 m/sec.

### Wave and Current Regime

Wave information was made available by the Port of Turkmenbashi. The maximum wave height in the area of the port is low with only 0.5 m on average and 0.7 m as a maximum. because the port is protected from the Caspian Sea by the Krasnovodsk Spit. The maximum wave height in the Caspian Sea outside of the entrance channel across the spit is 2.6 m. Even within the entrance channel, the wave height is still 2.0 m, forcing ship traffic during stormy days to be re-routed around the tip of the Krasnovodsk Spit. Wave periods are 30 m in the Caspian Sea, 18 m in the entrance channel across the Krasnovodsk Spit, and 4 to 5 m in the port area. According to the Harbour Master the entrance channel is closed 60 days out of the year due to bad weather, usually during the fall and winter.

The water circulation in the Gulf of Krasnovodsk is counter clockwise. However, it appears that the circulation is driven by wind forces and may therefore vary at different times. Tidal effects in the Gulf of Krasnovodsk are negligible.

## **Geomorphology and Geology**

The port is located on the northern shore of the Gulf of Krasnovodsk. The land to the north of the eastern part of the port rises steeply to approximately 150 m above sea level marking the edge between a large plateau of Tertiary age to the north and uplifted older Paleozoic bedrocks to the south. Some of the older rocks consist of porphyrite which is mined as gravel near the oil port due to its hardness.

Quaternary sedimentary deposits can be found along the coastal areas up to elevation of roughly 10 m mean global sea level (i.e., 35 m above the existing water level of the Caspian Sea). These sediments were deposited as a result of the constantly changing level of the Caspian Sea in recent geologic history.

Deposits underlying the port facilities consists predominantly of recent sediments and fill materials. Soil borings conducted by the Turkmengeologija in 1989 show that the deposits vary widely from clays to gravel to mixed materials. Some of the sedimentary deposits have high salt concentrations as a result of evaporation processes in the arid climate of the region. Bedrock was encountered at depths varying between 30 and 40 m from the surface. The available data are not sufficient, however, for detailed geotechnical analyses for the purpose of engineering design of specific support structures.

Another major geologic issue relevant to this project is the high level of seismic risk of the area surrounding Turkmenbashi. In 1895, there was a large earthquake in Turkmenbashi which levered the city; the magnitude was apparently over 8 on the Richter scale. Active seismicity is suggested also by the steepness of the cliff along the fault line.

## **Air Quality**

The main source of air pollution in the city is the Oil Refinery, vehicle traffic and exhaust from train engines. No activities in the port is considered a major source of air pollution. Limited emissions are generated in winter by the two heating stations for steam heat for on-site buildings, by trucks entering and leaving the port, as well as by smaller diesel locomotives that operate in the port.

## **Noise**

In the city of Turkmenbashi the main sources of noise are road traffic and the railway located between the port and the city. The comparatively largest source of noise in the vicinity of the port is the operation of train engines in the shunting yard.

## **Ground Water Quality**

The existing port site is adjacent to the Gulf of Krasnovodsk, which is brackish. Therefore, the groundwater at the ferry terminal site is not suitable as an aquifer. Groundwater quality data from the area is not available. However, it is known that content of oil residues in the groundwater is elevated.

Attention should be paid to an area with ground-water and subsoil contamination from oil between the berth no. 16 and the ferry terminal. The contamination is reported to be due to a leak of an oil pipeline on the hillside. The port and ECI are aware of this.



## **Surface Water Quality**

The water quality of the Gulf in the vicinity of the port area was being analysed four times a year by the East Caspian Inspectorate. One of the sampling stations was at the ferry terminal. The water quality in the port is generally within the regulatory norms of Turkmenistan with the exception of the oil and phenol concentrations which are slightly above the respective norms. The Turkmenian norms (0.001 mg/1) for phenol is very low. The standards recommended by the U.S. Environmental Protection Agency for phenol is 0.006 mg/1. The norm for total hydrocarbons (THC) is comparable to other international standards. There are no Turkmenian standards to oil in the sediments.

The most likely sources of oil contamination in the water body of the port are from the oil production in the Caspian Sea, offshore from the Cheleken Peninsula. Because of the prevailing circulation pattern in the area, water from the Cheleken Peninsula is expected to enter the Gulf of Krasnovodsk.

The Sanitary and Epidemiological Station of the Ministry of Health stated that the faecal bacteria concentrations are commonly high in the coastal water adjacent to the city. The main sources are suspected to be runoff from the city, non-point sources, and the leaking city sewer system.

## **Accidental Oil Spills**

Oil spill combatting both in the port area on land and in the sea are under the jurisdiction of the Harbour Master. In the case of a spill, the Harbour Master contacts the Port Dispatcher, who then contacts a number of different agencies and special spill response services e.g. the East Caspian Inspectorate.

The port owns some type of oil spill combating equipment. Fees for the services of oil combating equipment are levied by the port.

## **Wastewater Generated on Land**

Regulatory agencies require that wastewater is to be treated to assure that no bacteria enter the coastal waters. The port generates approximately 12,000 m<sup>3</sup>/year of domestic wastewater (sewage and grey water). This wastewater is generated at the sanitary facilities building and the cafeteria. The old sewer system of the ferry terminal is based on discharge into wells in the ground. The system is ready for renovation.

## **Wastewater Generated by Ships**

The port does not have a pump-out station for wastewater for arriving ships. Incoming ships inform the dispatcher, if they require disposal services for solid waste, sewage, and bilge water. The dispatcher then sends out a service vessel. The vessel has eight holding tanks on board with a capacity of on average 4 m<sup>3</sup> each. The vessel services the oil port, ferry port, and the cargo port; the nearby fishing port has its own service vessel.

The oily bilge water is transported to the oil port terminal for processing. Sewage, is transferred to a truck and then transported to the sewage treatment lagoon for the city.

### **Solid Waste**

Solid waste containers and large metal bins are available for garbage disposal all over the port including the ferry terminal. Scrap metal are placed in different areas of the port in a somewhat unorganised way.

Solid waste generated by ferries is brought to containers ashore.

All of the solid waste are disposed of in a landfill.

### **Dangerous Cargo**

Dangerous Cargo carried on the ferries is dealt with in accordance with Turkmenistan rules, which have been taken over from the Soviet rules, similar to the International Maritime Organisations (IMO) Dangerous Goods Code. For the time being the amount of dangerous goods handled in the terminal is very limited and no dedicated area for storage of this cargo exists.

### **Dredging**

Due to continued heavy siltation in the access channel to the port, maintenance dredging is required at regular intervals. Since the break-up of the former Soviet Union, however, only minor "urgency dredging" has been carried out. The ports own dredger may be used for the operation. This dredge was built approximately in 1992/93. It has a draft of 3.5 m and can dredge up to a depth of 10 m.

As stated in section 2.2 dredging operations require approval by the East Caspian Inspectorate. Part of the approval process is an investigation of the physical and chemical characteristics of the sediments at the dredging as well as the dumping (disposal) sites. The parameters to be analysed is described in section 6.0. The area allocated for the disposal of dredge spoils from the Gulf is located in the Caspian Sea in District 117, approximately 6 km. from the Town of Awaza, just north of the entrance channel in the Krasnovodsk Spit. It is preferred that the dredging operations is conducted during winter months only, and is supposed to be done in a manner that would not endanger the ship traffic.

### **Aquatic Ecology and Resources**

Most of the Gulf of Krasnovodsk is a part of the Hazar Nature Reserve, founded in 1932. Approximately 90% of the Reserve covers water area, while 10% covers land. One of the main goals of the Reserve is the protection of migrating birds, who spend the winter here.

The migrating birds prefer the reserve and the Gulf of Krasnovodsk because of its shallowness and seagrass in the bottom are plentiful as food resource. 80% of the populations spent 5 to 6 months over the winter in the Reserve.

According to the Hazar Nature Reserve, more than 10 million specimens of migrating birds visit the reserve every year. Stationary species, living in the Reserve all-year-round, consist of approximately 500.000 individuals. More than 300 species of birds is found in the reserve, among them 18 species which are endemic to the area.

Apart from birds, 40 species of fish are found in the waters of the reserve (including 1 endemic species, the Caspian Salmon), 32 reptile species and 38 mammal species are found in the reserve (hereby 4 endemic species of reptiles and 5 endemic species of mammals).

No commercial fishing is taking place in the Gulf of Krasnovodsk, mainly due to the fact that most of the Gulf is within the borders of the Nature Reserve, where commercial fishery is forbidden. Recreational fishery from quays and jetties in the port is accepted.

### **Socio-Economic Conditions**

Turkmenbashi was founded approximately 125 years ago. Its current population is 70,000. The major employers are the refinery with approximately 3,000 to 4,000 employees, followed by the port as such with approximately 800 employees.

Besides the ferry terminal staff, only a few small private businesses, like a restaurant, are providing employment in the terminal.

Recreational resources in the area are largely confined to beaches along the Caspian Sea; there are no beaches along the Gulf of Krasnovodsk nearby the project area.

## **5. DESCRIPTION AND ASSESSMENT OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT**

### **5.1 Impact Related to Construction**

Rehabilitation of the ferry terminal will comprise the following works affecting the water area:

- Driving of sheet piles for renovation of berthing structures.
- Cleaning of sea bottom for scrap in the ferry berth area.
- Dredging of organic silt deposits in area of new embankment for reclamation area.
- Reclamation of land between ferry terminal and dry bulk berths (berth No. 16).

Land works will mainly consist in minor demolition works, filling and levelling works, followed by building and pavement works.

If carried out properly, construction activities are not expected to increase sediment loads in the harbour or in adjacent coastal waters significantly, either through excessive runoff or from earthmoving operations.

The described dredging operation shall be carried out using environmental friendly dredging methods and careful analysing of the materials to be disposed. The operation and dumping grounds shall be approved as stated in section 2.2. As part of the present project, an analysis of the dredging materials is being carried out at present. The result of the investigation is expected by the end of October 1997, and will be reported separately.

Both fill materials for reclamation and raising of site and stone/rock material for embankments will be needed for the project. Sources have not been identified but they are plen-

tiful in the greater vicinity of the port. Given the arid nature of the area, negative impact on the nature from these operations will be minimal.

During the construction phase, noise and exhaustion (and dust) from construction machinery and traffic at the construction site will be generated. This effect is not considered to be a problem both because of the remote location of the working site and since it is of short term and temporary nature anyhow.

Demolition materials, solid waste and garbage will be collected during the construction phase and dealt with in accordance with the existing practice.

## **5.2 Impact Related to the Future Operation of the Ferry Terminal**

The new layout of the renovated terminal based on a clear identification of the different traffic categories and separation of traffic flows will improve significantly to the safety of operations and the quality of services.

In addition, it will significantly improve the efficiency of operations and the capacity of the terminal.

The reclamation will eliminate an area with poor water circulation and the associated inconveniences. Otherwise no significant impacts on the hydrodynamics of the bay/port area are expected.

No area of wetlands of natural importance are lost.

As stated in section 4.0 all solid wastes generated from the terminal as well as from the ferries are collected and disposed of in a landfill.

As part of the present project, the waste water and sewerage system of the terminal will be renewed. The system will drain fluids into a new tank from which the sewage will be collected by tank wagons, taking it to the public sewerage system.

The oily bilge water from the ferries will continue to be transported to the oil port terminal for processing.

The expected increase in the traffic to the ferry terminal is not expected to create major negative impacts both because of the remote location of the terminal and the separate entrance to the terminal from the east directly connecting to the highway to Asghabad, where traffic intensity today is low.

Increase in traffic will have a positive impact on the economy both through direct payments for terminal services and indirectly through connected business activities.

A future fall in water level and increase in vessel operations may require maintenance and/or deepening dredging. Despite that deepening will have a negative influence on the sea water, this influence will be of single character and be of less harm than what might be expected from continued pollution from the berthing and sailing operations of the ferries.

## **6. ENVIRONMENTAL MONITORING**

### **6.1 Construction Phase**

During construction, environmental monitoring is recommended both in relation to the dredging operations and in relation to the land reclamation operations. The monitoring programmes, which should be outlined and agreed in co-operation with the Turkmen authorities, shall ensure that possible negative environmental impacts from the operations are minimized.

### **6.2 Operation Phase**

The project will up-grade existing facilities, regarding waste management and provide new facilities regarding traffic handling operations that will improve the present environmental situation of the terminal. Monitoring should therefore only consist in checking that the project is completed as planned.

In the longer run, environmental monitoring may become relevant in connection with an important increase in traffic and lowering of the water level, see Chapter 5.2.

## **7. CONCLUSION SAFEGUARDS AND MITIGATION MEASURES**

Compared to the present situation in the Port of Turkmenbashi, negative environmental impacts from the planned phase 1 project can be considered as negligible. This includes the reclamation and dredging operations under the condition that they are executed taking the necessary environmental friendly precautions.

In fact, in several ways the project is expected to contribute to an improvement of the environment (safer operations, better working conditions, waste management, increase to economy).

Only concern regarding long-term ferry terminal operations are due to the permanent need for maintenance dredging of access channel to port.

## **ANNEXES**

### **1. List of References**

1. Law of Turkmenistan on State Ecological Expertise, 1995.
2. European Bank for Reconstruction and Development (EBRD). Environmental Procedures. 1992.
3. Louis Berger International, Inc. Feasibility Study: Turkmenbashi Port Development. Environmental Assessment. Phase III Report. Submitted to Turkmen Sea Administration. Financed by US Evergreen Fund. April 1997.
4. Tacis. Rehabilitation of the ferry terminals in Baku and Turkmenbashi. January 1997. Phase 1, Final Report. (RAMBØLL).
5. SOFREMER. Commission of the European Communities. Caspian Sea Water Level. DG1/E/6 TACIS. 1995.
6. EBRD Project Summary Document, May 1997.
7. Phase 2, Pre-design and Feasibility Note - Turkmenbashi, December 1996 (Tacis/RAMBØLL).
8. Phase 2, Detailed Design Report - Turkmenbashi, March 1997 (Tacis/RAMBØLL).

### **2. Turkmenbashi Ferry Terminal, Location - Site Plans**

