Port of Ploce
Trade and Transport Integration Project – Additional Financing
Update of Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP)

Introduction

The Trade and Transport Integration Project was approved in 2006, with the objective to develop trade along Corridor Vc by improving the capacity, efficiency and quality of services on the southern end of the Corridor with particular focus on the port of Ploce and on coordination aspects among all corridor participants. In particular, the project supported the construction of a bulk cargo terminal with an initial capacity of 4 million tons, and a container terminal, with an initial capacity of 66,000 TEU.

After three years of implementation, the project is progressing well towards meeting its development objectives. In terms of implementation, 75 percent of contracts in number and 50 percent in value have been awarded. The container terminal construction was contracted in 2007, and the works are progressing on schedule; completion is expected by early 2010 and within the contracted amount. For the bulk terminal, preparatory works for soil consolidation are well under way and the contract for the terminal construction is scheduled to be awarded in early 2010.

While preparing the detailed design for the Bulk Terminal and Container Terminal, the Port of Ploce Authority (PPA) and the concessionaire have come to the conclusion that adjustments to size and capacity of the terminal would be warranted. This plan was devised in response to evolving commercial needs (larger vessels, emergence of transshipment, and need for further scalability) and technical parameters (final design reflecting soil conditions, price escalation). The Port Authority consequently made a request to the World Bank for additional financing, to scale up the Bulk Terminal.

The original project amount was EUR 91 million supported by a EUR 58.8 million loan from the World Bank. The additional financing for an estimated EUR 48 million would support Component 1 of the original project, the Port Infrastructure Development Component.

The proposed additional financing would: (i) finance the scaling up of the Bulk Terminal; (ii) cover the financing gap for the Container Terminal under construction; and (iii) finance additional dredging in the existing harbor basin near pier 5. The original project is co-financed with EBRD.

This document presents and annex to the existing EIA and EMP, explaining the environmental implications of the additional financing and management of the impacts.

Background

In accordance with the World Bank’s safeguard policies and procedures, the original Project has been classified as Category A according to the World Bank’s OP 4.01 for environmental assessment purposes.
For this reason full Environmental Impact Assessments with EMPs were prepared for both Bulk Cargo and Container Terminals.

The Port of Ploče Authority (hereinafter PPA) commissioned the preparation of an EA for the Container Terminal in 2003 and the Ministry of Environmental Protection, Physical Planning and Construction (hereinafter MEPPPC) after consultation with the public issued an affirmative Decision on EIA in March 2005. After further review of the EA, coverage of some aspects (like preparation of Environmental Management Plan) was expanded to meet World Bank OP 4.01 requirements. The Final EA was sent to InfoShop in February 2006. Similarly the EA for the Bulk Cargo Terminal has been finalized, presented to NGOs and sent to InfoShop. An Overarching EA was prepared to address the cumulative impacts of the port expansion and is disclosed in InfoShop and in Croatia.

For the proposed changed / upgrades it was necessary to change the original project for which Port of Ploče Authority had obtained the location permit on 8 May 2007 from MEPPPC. In accordance with the changed conditions we requested the amendments of the location permit which were obtained on 7 July 2009. The conceptual design for obtaining the amended location permit was produced by Hidroelektra-Projekt Ltd.

Prior to obtaining the location permit for bulk cargo terminal, PPA has requested an Opinion from the Directorate for Environmental Management, Sector for Environmental Assessment and Industrial Pollution of MEPPPC on need for updating EIA based on Croatian EIA legislation. The opinion states that the scaling up is not expected to result in any significant incremental change from an environmental point of view, compared to the original design for the Bulk Terminal. Thus, from the perspective of the permitting authority, the PPA is obliged to implement measures of environmental protection and monitoring already established in approved EIAs / EMPs on all activities covered by additional financing.

In a spirit of creating clear, unambiguous safeguards documentation the World Bank has requested PPA to prepare an addendum to EIA/EMP, outlining context, identifying environmentally relevant activities as well as their diligent management under World Bank safeguards policies.

**Proposed physical/spatial intervention**

The proposed design changes affect the planned bulk cargo terminal and container terminal. An overview design drawing is attached as Annex 1.

**Bulk cargo terminal**

1) Change of quay structure dimensions to 420 x 30/35 m from original design (350 x 28 m). The quay/berth will be constructed at the northern bank near the mouth of Vlaška canal, extending into the sea as an open quay connected to the land by an access structure (about 56 x 23) in the berth’s longitudinal access. The original design envisaged berth dimensions of 350 x 28 m which would have been capable of receiving ships for bulk cargo transport with load capacity up to 80 000 DWT and 15 meter draught. The original berth could have received only one ship at a time of the above mentioned load capacity, or two ships with half the capacity.
The additional financing will enable construction of a 420 m long and 30-35 m wide berth (including access structure). Such a berth will enable receiving of cape size ships up to 180 000 DWT maximum with 18 meter draught, LOA 290 m, width 45.9 m, height above sea 56.5 m and handy size ships for transhipment of cargo and shorter distance transport /hand size ships with maximum load capacity of 35 000 DWT with 10.5 meter draught, LOA 182.3 m width 25.6 m and height above sea 37.5 m. The berth will be able to receive two ships simultaneously of appropriate load capacity and dimensions.

2) The upgraded design envisages construction of an access structure (about 56 x 23 m) in the berth’s longitudinal axis to ensure access to the 365 m long quay. In the original design solution the access was enabled from the storage area behind the quay. The access structure will not affect channel width or current, as it will bridge mainly the rock-armored channel slope between berth and storage area.

3) To accommodate ships of 180 000 DWT and 18 m draughts additional dredging is planned. Compared to the original design with a dredged channel of 16 m depth and 120 m width (plus 15 m slope on each side) the new channel will be 20 m deep and 120 m wide (plus 30 m of slope on each side). This has resulted in a widening of the dredged area by 30 m from 150 m (original design) to 180 m (revised design for AF) and an increase in the quantity of the dredged material from 600,000 to 1,100,000 m³. All dredged material will be disposed in previously approved zones (area 3 and 4) which are situated within the territory of Port of Ploce (Decision of establishment of the Port Authority of Ploce)(see figure 1-2 in Bulk terminal EIA). The deepening of the channel and widening the slopes will physically only affect the right (northern) side of the Vlaska channel (i.e. future bulk terminal side). For the southern bank of Vlaska channel the original design remains valid, which will not impact the proposed Parila Lagoon protected area.

Container terminal area

4) As part of the CT construction contract, additional dredging is envisaged in the existing harbor basin near pier 5 (adjacent to and facing the CT). To be able to accommodate PANAMAX vessels along the whole length of pier 5, the draft in the eastern part of marine area of Pier 5 will be increased from 12 to 15 m on an area measuring about 170 x 85 m. This would produce additional 59,000 m³ of dredging spoils, which will be deposited in the already identified zones within the Port territory, which has sufficient additional capacity.

Baseline data

The original EIA for the Bulk cargo terminal presented detailed baseline data on biological land characteristics of the surrounding area, a review of protected natural components and areas specified for protection (Chapter 3.1), a description of marine communities in the narrower area of Project location (Chapter 3.2), climatic characteristics (Chapter 3.3), air quality (Chapter 3.4.), characteristics of marine sediment (Chapter 3.5), and development plans of the town of Ploce (Chapter 3.6.).

During the three years of project implementation PPA implemented baseline monitoring, and collected additional data on ornithological fauna, ichthiofauna and state of marine biocenosis. The results of
ornithological studies were mainstreamed the berth and yard designs (e.g. relating to lighting, noise and dust control).

The most important potential environmental impact associated with the additional financing is related to the additional dredging of sediment. During the preparation of the original EIA sediment samples were taken on two locations of the seabed. One sample was taken in the proximity of the Bulk Cargo Terminal at 10 m depth, and the other at 20 m depth at a distance of some 800 meters towards the open sea (Figure 3-17 of original EIA). Samples have been divided to 5 parts: 0-5cm, 5-10 cm, 10-15 cm, 15-20 cm and 20 - 25 cm) and have been chemically analyzed in a certified laboratory for a total of forty one (41) parameters. All results indicate clean, uncontaminated sediments reflecting local natural conditions.

The original EIA for Container terminal covers also sediment characteristics. A chemical analysis for potential contaminants was conducted at two sampling points within the envisaged area during an investigation campaign in 2005 as baseline data for the EIA. Sediment at the port of Ploce was classified as second class sediment, i.e. slightly polluted sediment. The leachate test also indicated that the concentrations of hazardous substances in sediment eluat are low. The EIA for CT defines mitigation measures and practices for disposal / handling of dredged material, and the same measures would be followed for the handling of additional dredged material (deposition within zones 3 and 4 within Port territory).

Environmental impacts associated with the physical intervention

The potential impacts associated with the BT facility during construction would be (i) emissions of light, noise, noxious gases and dust during construction, (ii) disturbance of benthic species by underwater construction (such as piling) and dredging, (iii) accidental spills of fuels and other hazardous substances, potentially contaminating coastal waters, (iv) disturbance of bird habitats, (vi) unregulated waste deposition and wastewater discharge. During operation the main impacts are expected to result from emissions of light, noise, exhaust fumes and dust. For all these impacts, mitigation measures were designed under the original project and mainstreamed into the implementation designs for the BT.

The incremental activities resulting from the currently planned project up-scaling will not have significant additional environmental impacts. There would be increased dredging works (in terms of dredged volume and to a lesser extent in area) in the coastal waters and river channels adjacent to the port, but largely in the same locations as originally foreseen. Also the dredged material would be deposited in the same area as originally foreseen, which is an existing reclamation area on the port perimeter with sufficient storage capacity. The higher length of the planned pier would mainly affect the coastal waters in front of the reclamation area and along Vlaska channel, which are characterized by existing anthropogenic impacts consisting of regular dredging (every 3-5 years) and marine construction. The redesigned, wider dredging cross-section in the Vlaska Channel area will remain well within the limits of the already existing technologically maintained channel.

Both in Vlaska Channel as well as in the open water, the pre-project biodiversity conditions are characterized by generally sparse benthic fauna, typical for sandy coastal shallow flats. The original EA
contained results from a benthic survey executed by divers. While rare and protected species were found (e.g. benthic shells), their habitats will not be significantly impacted by dredging and construction, which will to the largest part remain within already impacted areas (the existing approach channel). Moreover, the provisions in the EMP restrict dredging in seasons of enhanced spawning / migration activity of sensitive marine species. The situation was reconfirmed by a recent repeated benthic survey in May 2009.

In terms of impacts on local residents the enlargement of the port facilities takes place on the far side of the port in relation to the city center, and at a distance of at least 2 km from the next settlements, which is considered sufficient to buffer and diminish the impacts of the enlarged project. Also, neither the enlargement of the pier, nor the additional dredging works will affect a protected area to the South of the planned pier area, which is earmarked as future bird sanctuary. A project review including was carried out in April 2009 and concluded that (i) there would only be minor additional areas affected by civil works and future port layout; (ii) there would be no expansion of civil works into sensitive habitats or protected areas to be converted into port operational areas; (iii) there would be no additional connectivity construction such as roads, railway links or bridges.

In line with the assessment for the original project, the enlargement of the pier planned under the additional financing project is not expected to result in any substantial indirect and long term impacts. The expansion of the pier in relation to the original design would only be 15 m in length and 2-7 m in width. The increased width and additional dredging works would, as in the original design, only affect Vlaska Channel and the coastal waters within the existing approach route to a nearby oil terminal. From the incremental impacts of the enlarged pier structure and additional dredging works, no contribution to indirect or long term future impacts are expected.

In the original design the berth (pier) for the bulk cargo terminal was placed in a manner to minimize any physical impact on the future protected area South of Vlaska Channel, i.e. its axis was moved northwards from the channel by about 40 m. Five alternative locations were studied during the preparation, and the final location chosen is the one with least impact on both the aquatic life and the protected site. The dredging works in Vlaska channel to enable the access of large vessels still lie within the technologically created and maintained zone of the Channel and do not touch or extend into the future protected area. Thus the project will create no additional physical impacts on the future protected site.

**Mitigation measures and monitoring plan**

The mitigation measures for the original project were defined in EMPs. The updated additional financing design does not envisage any new type of works or activities, but solely the scaling up of the existing ones. Thus the mitigation measures already identified in EMP remain applicable, as well as the responsibility for implementing mitigation measures and monitoring plan. This implies that all mitigation measures will be identified in the terms of reference (TOR) and bill of quantities (BOQ) and as such become contractor’s contractual obligation. PPA will remain responsible for control and supervision of implementation of the Contractor’s environmental obligations, most probably through a supervising
engineer / residential engineer on site. The implementation of monitoring plan remains responsibility of PPA.

The specific measures are as follows:

**Mitigation measure related to dredging of access channel to bulk cargo terminal**

Mitigation measures for protection of sea marine communities (biocenosis)

1. Dredged material shall only be disposed in the area of the zone 3 and zone 4 which are within the area of the Port of Ploce - Ploce basin according to the Decision of establishment of the Port Authority of Ploce. Area of the zone 3 and zone 4 are given on Figure 1 in Annex of the original EMP.

2. Dredging: To prevent dispersion of the disposed material into the sea and to allow leakage of water from the material piled in the zone 3, it is necessary to manage dewatering and control turbidity by: a) peripheral stone fills covered with geotextile and sand; b) a drainage system consisting of drain pipes protected with geotextile and sand. Moreover, the entire deposition area for dredged materials is equipped with sedimentation basins for turbidity control, the waters discharged into the sea have minimal or no turbidity.

3. To prevent dispersion of the disposed material into the sea a protection dike was constructed on the sea side of the zone 4 (and zone 3) made of stone fill and covered with geotextile on its landward side.

4. During dredging process, economically justified BATNEEC technologies should be used to mitigate excessive turbidity in the in the seawater.

5. This phase of the Project construction should be scheduled in the period of the least effect on fishes e.g. fish migration period should be avoided. This corresponds to the time period from July 1st to September 15th.

**Noise mitigation measures**

6. During dredging, economically justified BATNEEC technologies should be used to mitigate noise emission.

7. To maintain current noise emission, regular maintenance of dredgers is required.

8. Rate of excavation should be limited thus reducing the power required and the noise emitted.

9. Working hours of dredging operation should be limited in area long side Ploce - Parila.

**Ornitofauna mitigation measures**

10. This phase of Project construction will scheduled in the period of the least effect on birds, which will be detailed in consultation with ornithological specialists.
Mitigation measure related to extension of berth

Mitigation measures for protection of sea marine communities (biocenosis)

11. To mitigate the impact of wastewater generated during the Project usage on the seawater quality and indirectly on marine communities (biocenosis), it is necessary to build, a) a system for drainage and treatment of rainfall (storm waters) from the terminal area to achieve the quality of water for discharge into the sea stipulated by the Water License; b) a system for collection and treatment of sanitary wastewater from the terminal area; c) impermeable sealing of storage areas, and d) recirculation / reuse of process water.

Mitigation measures for air protection

To reduce emission of particulates to air during the construction works, it is necessary:

12. to comply with national vehicle emission standards, maintain all vehicles diligently to prevent excessive emissions, especially of particulates (soot), prohibit the unnecessary idling of construction machinery, and limit the vehicle speed at the building site to 25 km/h;

13. to spray water onto the area of construction machinery operation to reduce dust raising from ground.

To reduce particulate emission to air due to bulk cargo handling and dispersion of bulk cargo by wind during the Project usage, it is necessary:

14. to build a system for spraying/wetting bulk cargo and unloading/reloading places (transfer points);

15. to design enclosed unloading/reloading places (transfer points) on the belt conveyor line;

16. to plant vegetation and make a green belt on all places that will not interfere with the terminal operation.

Noise mitigation measures

17. Low-noise-emission machinery should be used for construction of the terminal.

18. During the terminal construction, economically justified BATNEEC technologies should be used to reduce noise emission. Possible technological measures whose capabilities should be appraised in the main design are: A) For mitigating underwater noise at piling: i) use of air-bubble curtains, ii) use of acoustic curtains; B) For mitigating noise emitted to air: i) use of shock absorbers, ii) fit a shroud around the pile; the pile shroud is constructed from rings of polythene bellows, with each section typically 1.5 m long. These rings are connected to the piling hammer at the bottom of the noise-reducing casing and reach down to water or ground level depending on the environment. They are connected to each other by special flanges, and as the pile is driven, the rings concertina together.
19. Regular maintenance of machinery and equipment used for construction for the onshore part of the terminal;

Waste minimization / management measures

20. An adequate area shall be provided for temporary dumping of waste generated during construction. The waste currently deposited illegally in the BT area shall be removed and deposited at a licensed facility, at the cost of the entity that generated the waste.

21. Waste generated during construction shall be collected separately by its type.

22. Transport of waste and its disposal shall be organized according to the Project construction schedule.

23. Building waste such as, concrete, stones, and excavation soil that cannot be used during construction and for site development, shall be taken to an adequate waste disposal site.

24. Metal waste generated during construction shall be used as secondary raw material.

25. Hazardous waste generated during construction shall be taken care of on a contract bases with legal entities licensed for collection, transport and handling of hazardous waste.

26. To provide for proper waste management during the terminal operation, at this stage of the Project it is necessary to made a Plan for reception and handling of waste and cargo residue from waterborne crafts according to the Addendum 1 to the By-law on Port Operation (Gazette 110/04).

27. To provide for proper waste management during the terminal operation, before the start of the terminal operation adequate waste facility shall be installed for reception of all types of waste from ships.

Accidents

To mitigate possible accidents in the Port area during the terminal operation and to limit the consequences of such an accident, at this stage of the Project development it is necessary

28. to provide means and equipment for prevention of sea pollution and remedy of the sea pollution consequences (e.g. floating oil barriers kept on site for containment of accidental fuel spills);

29. to make a Maritime Study, which is main document regulating maritime safety during regulating entering the port, approaching the pier, berthing, staying and unberthing according to the contents set out in the Article 5 of the By-law on Port Operation (Gazette 110/04);

30. that the facilities and equipment to be used for unloading bulk cargos have adequate certificates.

31. A concession holder for unloading bulk cargo must have a quality system established, applied and maintained pursuant to the standard ISO 9001:2000 or other adequate system satisfying its
minimum standards. The system operation shall be verified and demonstrated in accordance with the Guidelines ISO 10011:1991 or any other adequate standard satisfying the minimum conditions of those guidelines.

General mitigation measures

32. Regular implementation of the environmental monitoring program set out in the original EMP.

Monitoring

Up to date, PPA has conducted baseline monitoring which includes: monitoring of the total deposited matter (TDM) and composition of TDM, chemical and geotechnical analysis of sediment, biocenosis monitoring and annual monitoring of ornithofauna.

The monitoring for the construction phase for the BCT should be performed as envisaged in the original EIA. And laid out in the table below. For the dredging near CT, TSM should be monitored at the discharge from sedimentation basins.

<table>
<thead>
<tr>
<th>What</th>
<th>Where</th>
<th>How</th>
<th>When</th>
<th>Why</th>
<th>Install Operate</th>
<th>Install Operate</th>
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<tbody>
<tr>
<td>Total deposit matter (TDM) and composition of TDM</td>
<td>5 stations (Figure 2)</td>
<td>Once a month throughout the year</td>
<td>Air quality</td>
<td>7000 a year</td>
<td>- It depends on contractual obligations of contractors (some parts of the monitoring program can be included under the contractual obligations of some contractors thus making them responsible for their implementation).</td>
<td>- The Port Authority of Ploče will be responsible for implementation of some parts of the monitoring program not contractually assigned to the contractors of some parts of construction.</td>
</tr>
<tr>
<td>Total suspended matter (Suspended particles in sea)</td>
<td>Check points close to the zone 4 and zone 3 if in use</td>
<td>Once a month throughout the year</td>
<td>Seawater quality</td>
<td>6000 a year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>Check points</td>
<td>Once every six month</td>
<td>Identification of actual noise level during construction</td>
<td>4000</td>
<td>- Inspection office with the MEPPPC will control the implementation of the monitoring program determined during the environmental impact assessment process.</td>
<td>- Qualified Institutions will conduct monitoring plan Supervising engineer will follow the implementation of the monitoring conducted by contractor</td>
</tr>
<tr>
<td>Ornithofauna</td>
<td>Ploče - Parila</td>
<td>During construction</td>
<td>Monitoring the impact of construction on ornithofauna</td>
<td>13000</td>
<td></td>
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</tbody>
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Reporting
PPA should inform the Bank on the progress of implementation of mitigation measures and monitoring in regular project progress reports.

Data on the baseline monitoring program should be sent to the competent authority for environmental protection in the Dubrovacko-Neretvanska County by PPA, while the data on the monitoring program during the Project construction should be sent to the same authority by contractor or PPA entity competent for implementation of the monitoring program during construction.

The data on waste collection should be submitted annually to relevant authority in the County.

**Public disclosure**

This addendum to the EIAs for TTI project will be disclosed on the website of PPA. In addition all projects environmental due diligence documents would be re-disclosed.
Annex 1: Overview Design Drawing of Enlarged Berth Structure
Annex 2: Overview Additional Dredging Areas in CT Area

*Figure above:* Dredging scheme for approach route to pier 5 in existing harbor basin.
Figure above: Dredging scheme for berthing zone of pier 5 in existing harbor basin.