Preparation of studies (FS, EIA, CBA), design documentation and tender dossiers for wastewater collection and treatment investment projects in the municipalities of Strumica, Bitola and Tetovo.
Introduction

Overview
For several years now, the European Union provides significant investments to support improvements in the environmental sector.

In order to support implementation of the necessary wastewater investments, the European Union allocated over Euro 3.2 million to the project „Preparation of studies (FS, EIA, CBA), design documentation and tender dossiers for wastewater collection and treatment investment projects in the municipalities of Strumica, Bitola and Tetovo”.

The goal of this project was to provide contribution to improvement of wastewater infrastructure and living conditions as well as protection of environment in the Municipalities of Bitola, Strumica and Tetovo.

The project was implemented by NIRAS A/S and its consortium partners.

Challenge
With regard to the extent of the constructed sewerage network and waste water treatment facilities, the country lags behind in comparison with the water supply infrastructure. Only 65% of the population are connected to a public sewerage system.

The existing sewerage systems are in an unsatisfactory condition.

The substantial age and lack of regular maintenance and repair has resulted in a sewerage networks with numerous breakdowns and leakages.

At present, there is no treatment of wastewaters in the Municipalities of Bitola, Strumica and Tetovo, resulting in the discharge of untreated wastewater into rivers.

The lack of ready-made project documentation was causing considerable delays in the implementation of necessary investments.

Project Numbers
Overall, the design and consultancy services provided during the preparation of this project can be summarised with the following numbers:

- 3 Municipalities supported
- More than 240,000 inhabitants serviced by the investments
- 3 Wastewater Treatment Plants designed with a total capacity of 260,000 P.E.
- 80 km of new sewer networks designed
- Investments of 62.7 million Euro with design and tender documents ready for construction
- EU contribution to wastewater investments in the amount of 52 million Euro

Results
In the course of the implementation of this EU project, the Consultant completed Master Plans and Feasibility Studies, outline design and tender documents for the Wastewater Treatment Plants for the Municipalities of Bitola, Strumica and Tetovo and detailed designs and tender documents for the rehabilitation and extension of the sewerage networks in Bitola and Tetovo.

Based on the completed project documentation, the construction of the Wastewater Treatment Plant in Strumica has commenced in 2016. The construction of the other projects will start soon.

Partners
EU has strong partnerships with other key development partners on national and municipal level in the country. Implementation support missions coordinate regularly with other donors, such as the KfW Development Bank (KfW), the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD), the World Bank (WB) etc.
Introduction

The work developed

At first, the Consultant prepared a Master Plan, identifying the required investment needs in the water supply and wastewater infrastructure of Strumica. Thorough investigations (CCTV camera inspection, wastewater flow measurements, and hydraulic) were carried out to assess the condition of the sewerage network. After that, the Consultant developed the Feasibility Study for the proposed wastewater investment project in Strumica, i.e. for the construction of a new Wastewater Treatment Plant (WWTP). Relevant studies were prepared to assess the impact of the WWTP on the environment. Finally, completed were the outline design and tender documents for the construction of the Wastewater Treatment Plant in the Municipality of Strumica.

Status – Comparison: before and after

Before

The agglomeration area includes the Town of Strumica and the villages Banica, Gradsko, Baldovci, Dable, Dobrejci, Murtino, Prosenikovo, and Sachevo. From the total population of 48,500 in the agglomeration area, the majority, about 42,500 inhabitants, lives in the Town of Strumica. A percentage of about 84% of the population in the agglomeration area is currently connected to sewerage networks. Since a wastewater treatment plant previously had not been constructed, the entire domestic and industrial wastewater was discharged untreated into Trkajna River, a tributary of the Strumica River.

After

Based on the completed project documentation, in 2016 began the construction of a modern wastewater treatment plant with a capacity of 53,419 p.e. and a design flow of 9,458 m³/d near the village Dabile east of Strumica. After completion of the works, the wastewater from about 84% of the population and from nearly 100% of the industries will be treated in accordance to the European Union Urban Wastewater Treatment Directive (UWWD, 91/271) and the Water Framework Directive (WFD, 60/2000) before discharge into Trkajna River. Operating with extended aeration technology, the new WWTP can be extended in the future for phosphorous removal. Considering the ongoing and planned construction of sewerage networks in the municipality, it is expected that until 2039 about 97% of the wastewater from the agglomeration area will be treated at the new WWTP.

Allocated investment budget

The investment costs for the construction of the WWTP Strumica were estimated as 8,372,595 Euro.

Benefits

- Improved water quality of Trkajna River and Strumica River as largest tributary to the transboundary Struma/Strymonas River in Bulgaria and Greece
- Positive impact on regional economic development, tourism and recreational activities
- Increased protection of water sources
- Positive impact on flora and fauna
- Reduced health hazards
Municipality of Bitola

Introduction

The work developed

At first, the Consultant prepared a Master Plan, identifying the required investment needs in the water supply and wastewater infrastructure of Bitola. Through investigations (CCTV camera inspection, wastewater flow measurements, and hydraulic modelling) were carried out to assess the condition of the sewerage network. After that, the Consultant developed the Feasibility Study for the proposed wastewater investment project in Bitola, i.e. for the construction of a new Wastewater Treatment Plant (WWTP), for the reconstruction of the primary collectors in the Town of Bitola, for the extension of sewerage networks in the villages Gorno and Dolno Orizari, and connection of the village Kravari to the new WWTP. Relevant studies were prepared to assess the impact of the WWTP and the other wastewater investment measures on the environment. Finally, completed were the outline design and tender documents for the construction of the Wastewater Treatment Plant as well as the detailed designs and tender documents for the rehabilitation and extension of the sewerage networks in the Municipality of Bitola.

Status – Comparison: before and after

Before

The agglomeration area includes the Town of Bitola and the villages Brusnik, Bukovo, Dolno Orizari, Gorno Orizari, Karamani, Kravari and Lavci. From the total population of 81,821 in the agglomeration area, the majority, about 71,932 inhabitants, lives in the Town of Bitola. A percentage of about 96% of the population in the agglomeration area is currently connected to sewerage networks. Since a wastewater treatment plant previously had not been constructed, the entire domestic and industrial wastewater was discharged untreated into Drago River, a tributary of River Crna Reka.

The pipe diameters of many sections of the primary collectors in the combined sewer system of Bitola are too small especially considering the large quantities of storm water during rain.

After

Based on the completed project documentation, a modern wastewater treatment plant with a capacity of 112,476 p.e. and a design flow of 27,090 m³/d will be constructed near the village Dolno Orizari northeast of Bitola.

Designed as an activated sludge plant with primary clarifiers and sludge digesters, the new WWTP can be extended in the future for nitrogen and phosphorous removal.

A total length of about 28 km of new sewer main collectors and sewerage networks will be constructed.

Primary collectors in the Town of Bitola will be redirected and replaced with bigger pipe diameters to prevent floodings in the existing sewer network.

By extending the primary collectors and constructing a new main collector, nearly the entire wastewater from the Town of Bitola will be conveyed to the location of the new WWTP.

With the extension of the sewer networks in the villages Gorno and Dolno Orizari, nearly 100% of the population in these villages will be connected to the municipal wastewater system.

New gravity mains, sewage pumping stations and pressure mains will be constructed to connect the villages Gorno Orizari, Dolno Orizari and Kravari to the new WWTP.

After completion of the works, the wastewater from about 97% of the population and from about 90% of the industries in the agglomeration area of Bitola will be treated in accordance to the European Union Urban Wastewater Treatment Directive (UWWD, 91/271) and the Water Framework Directive (WFD, 60/2000) before discharge into Drago River.

Considering the ongoing and planned construction of sewerage networks in the municipality, it is expected that until 2039 about 99% of the wastewater from the agglomeration area will be treated at the new WWTP.
Allocated investment budget

The investment costs for the construction of the WWTP and for the rehabilitation and extension of the sewerage networks in the Municipality of Bitola were estimated as 26,570,984 Euro.

Benefits

- Increased population connected to sewer networks and to the new WWTP
- Reduction of problems, such as floodings, in the existing wastewater system in the Town of Bitola
- Improved water quality of Dragor River and River Crna Reka
- Positive impact on regional economic development, tourism and recreational activities
- Increased protection of water sources
- Positive impact on flora and fauna
- Reduced health hazards

Municipality of Tetovo

Introduction

The work developed

At first, the Consultant prepared a Master Plan, identifying the required investment needs in the water supply and wastewater infrastructure of Tetovo. Thorough investigations (CCTV camera inspection, wastewater flow measurements, and hydraulic modelling) were carried out to assess the condition of the sewerage network. After that, the Consultant developed the Feasibility Study for the proposed wastewater investment project in Tetovo, i.e. for the construction of a new Wastewater Treatment Plant (WWTP), for the construction of main collectors in the Municipality of Tetovo, and for the extension of sewerage networks in the villages Falish, Dzepchishte, Poroj, Golema and Mala Rechica. Relevant studies were prepared to assess the impact of the WWTP and the other wastewater investment measures on the environment. Finally, completed were the outline design and tender documents for the construction of the Wastewater Treatment Plant as well as the detailed designs and tender documents for the construction of main collectors and sewerage networks in the Municipality of Tetovo.

Status – Comparison: before and after

Before

The agglomeration area includes the Town of Tetovo, the villages of the Municipality of Tetovo (Mala Rechica, Golema Rechica, Poroj, Dzepchishte, and Falish) and villages in the municipalities Bogovinje, Brvenica, and Zhelino. A total population of 125,481 inhabitants lives in the agglomeration area. A percentage of about 95% of the population in the Town of Tetovo and about 62% in the total agglomeration area is currently connected to sewerage networks. Since a wastewater treatment plant previously had not been constructed, the entire domestic and industrial wastewater was discharged untreated into Vardar River.

The existing main sewers in the Town of Tetovo are insufficient in diameter to collect the wastewater. Large parts of the sewer network are overloaded especially during rain. The main collector discharging to Vardar is damaged in several places and too small in diameter.
After

Based on the completed project documentation, a modern wastewater treatment plant with a capacity of 95,152 p.e. and a design flow of 20,866 m³/d will be constructed near the village Falish southeast of the Town of Tetovo.

Designed as an activated sludge plant with primary clarifiers and sludge digesters, the new WWTP can be extended in the future to a capacity of 157,160 p.e. and a design flow of 28,885 m³/d and for nitrogen and phosphorous removal.

A total length of 19 km of new sewer main collectors and of 32.4 km sewerage networks will be constructed.

With the extension of the sewer networks in the villages Mala Rechica, Golema Rechica, Poroj, Dzepchishte, and Falish, nearly 100% of the population in these villages will be connected to the municipal wastewater system.

New main collectors will connect these villages to the new main collectors for the northern and southern part of the sewer network in the Town of Tetovo, which will improve the situation of the sewer network significantly especially during rain and will convey the entire wastewater to the new WWTP.

After completion of the works, the wastewater from about 98% of the population and from about 90% of the industries in the agglomeration area of Tetovo will be treated in accordance to the European Union Urban Wastewater Treatment Directive (UWWD, 91/271) and the Water Framework Directive (WFD, 60/2000) before discharge into Dragor River.

Considering the ongoing and planned construction of sewerage networks in the municipality, it is expected that until 2039 about 99% of the wastewater from the agglomeration area will be treated at the new WWTP.

Allocated investment budget

The investment costs for the construction of the WWTP and for the construction of main sewer collectors and extension of secondary sewerage networks in the Municipality of Tetovo were estimated as 27,773,428 Euro.

Benefits

- Increased population connected to sewer networks and to the new WWTP
- Reduction of problems, such as floodings, in the existing wastewater system in the Town of Tetovo
- Improved water quality of Vardar River
- Positive impact on regional economic development, tourism and recreational activities
- Increased protection of water sources
- Positive impact on flora and fauna
- Reduced health hazards

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For more information:
EU-funded Project
“Preparation of studies (FS, EIA, CBA), design documentation and tender dossiers for wastewater collection and treatment investment projects in the municipalities of Strumica, Bitola and Tetovo”
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