

Introductory Note for the Construction of Cazin WWTP

Introduction

The water and wastewater utility company of Cazin ("Vodovod"), together with the Municipality of Cazin approached the European Bank for Reconstruction and Development ("EBRD") with a request for a loan in the amount of up to EUR 5 million with sovereign guarantees from Bosnia and Herzegovina ("BiH"), as well as counter guarantees from the Federation of Bosnia and Herzegovina ("Federation") and the Municipality Cazin, towards financing part of the costs related to development of a wastewater collection and treatment system.

Current water services

The Company's consumer area includes the City of Cazin and the 54 surrounding settlements covering a total of around 16,000 connections (of which 15,000 are households and 1,000 commercial customers). This represents 95% of the population of the Municipality. The remaining 5 % is supplied from several small local systems that are not operated by the Company.

Chemical and bacteriological water quality tests of the urban water supply system are conducted on water samples from 23 locations in all areas and systems in accordance with the current legal regulations. The raw water is supplied from six springs through a combination of gravitational flow and pumping stations. The combined yield of these sources is in the range between 300 and 330 l/s. According to the Company's latest annual business report the non-revenue water amounted to over 50% of the water supplied to the system. This significantly complicates the Company's operations. Therefore, it is necessary to prepare a plan to reduce losses in the water supply network, which in turn would reduce operating costs and improve the management capacity of the Company.

Current wastewater services

The primary source of wastewater is sanitary wastewater from households and commercial customers. Only a small number of households are connected to the sewerage network. 10 % of the population and 23 % of the companies in the Municipality are connected to the sewage network in some way. The majority of the population and of the companies (estimated at 58 %) uses septic tanks. Most of these tanks are not constructed to meet relevant engineering standards, many are damaged and obsolete. The remaining 32 % of the households, which do not have septic tanks, discharge wastewater directly into the nearest watercourses, open canals or karst sinkholes. Accordingly, the quantity of untreated wastewater that pollutes the underground aquifers and surface watercourses is significant.

The main recipient of collected wastewater and surface water in the central part of the Municipality is the stream CajinPotok. This stream is part of the Danube watershed area (through the rivers Korana, Kupa and Sava). Untreated wastewaters from Cazin represent a continuous health hazard for the downstream population in Croatia, which is supplied from the wells located in Korana River basin (SlunjCetingrad and Karlovac). The existing sewage system is of a combined type (the same sewer transports both wastewater and surface water) with a total length of approximately 8,000 meters. The system is made of concrete pipes with a diameter range between 200 mm and 300 mm. Occasionally, the capacity of the system is not sufficient to evacuate both wastewater and surface water at the same time.

Consultant's services

According to the Contract signed at 28 May 2015, the overall objective of the Consultant is to prepare:

- ❖ Task 1: Design of sewerage system of urban area
- ❖ Task 2: Design of wastewater treatment plant (WWTP)
- ❖ Task 3: Preparation of a plan for decrease of unaccounted water in water supply system Mutnik, design for reconstruction of gravitational water supply system Mutnik including definition of priority phases
- ❖ Task 4: Energy efficiency project for water sources Mutnik and Tahirovici

Under Task 2, an ESIA has to be prepared.

Project horizon and phasing

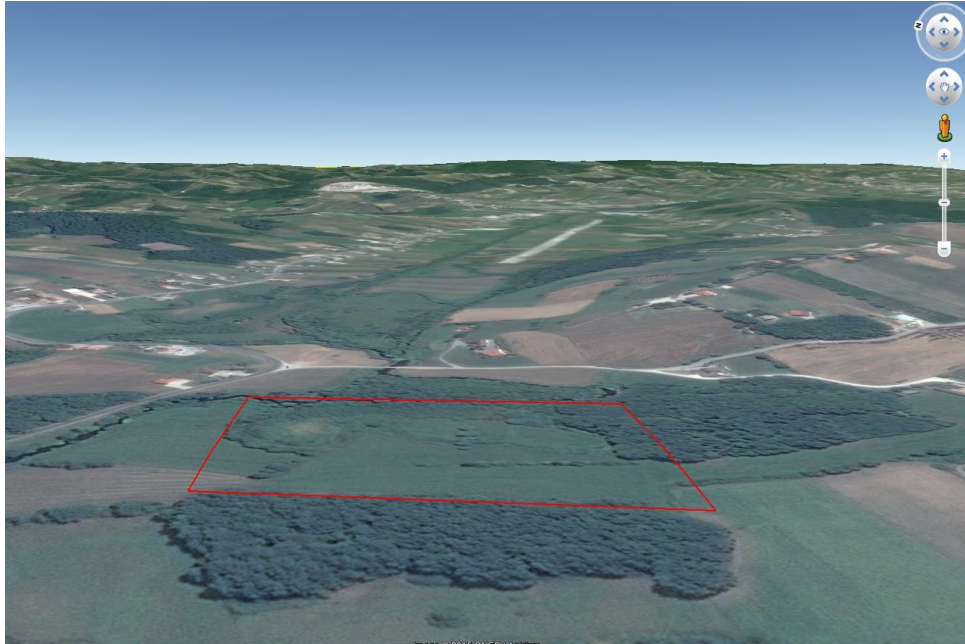
The project will be designed for two phases:

- 1st Phase: first year of operation 2018, design year 2030 (12 year of operation)
- 2nd phase first year of operation 2031, design year 2045 (15 year of operation)

The 1st Phase will serve 24.312 inhabitants, while in 2nd Phase 32.839. The equivalent population of 1st Phase will be 27.500 and 2nd Phase 36.540.

Site and layout of the plant

The area of the site is around 68.000 m², yet the WWTP works will cover an area of 20.000 m² approximately. The site is located in the left bank of Mutnica River. The terrain is plain and the altitude is about +267 m in average. The construction of an access road to the WWTP is required of a total length of about 150 m, connecting the eastern part of the site to the main road. To ensure that the WWTP is protected by flood, it is proposed that all units, as well as the access road will be constructed on a new compacted, backfilled level, at +269,70 elevation, higher than Mutnica River maximum water level in natural conditions as well as after the planned river regulation.



In the north part of the site covered sludge storage area for more than 7 months is provided. Also, adequate space is provided for possible future advanced sludge treatment units in case it is required. The intention is that sludge would be used for agricultural services in the neighbouring farms.

In all sides of the Site a buffer zone of 5,0 m is provided, where trees and plants shall be planted for an aesthetic outcome and limit visibility of the WWTP. The location of the units provides easy and comfortable access to them with limited disturbances. The inlet works, the preliminary treatment and the septage reception and pretreatment unit are located near the entrance of the facility, so firstly to reduce unnecessary trafficking of byproducts collection vehicles (screenings, sand), but also to ensure easy and safe access to these units without requiring manoeuvres and unnecessary movements.

Plan of land use, including the boundaries of the land plots at the wider area of the Cazin WWTP site

