

ANNEX II

STUDY

ENVIRONMENTAL IMPACT ASSESSMENT

INVESTOR: BERANE MUNICIPALITY

**BUILDING: WASTE WATER TREATMENT PLANT
(WWTP)**

LOCATION: BERANE

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November 2013.

INVESTOR: BERANE MUNICIPALITY

**STUDY ON THE ENVIRONMENTAL IMPACT ASSESSMENT OF THE WASTE
WATER TREATMENT PLANT
(WWTP)**

- A N N E X II -

Location: Berane

Annex of the Study on environmental impact assessment of the Waste Water Treatment Plant (WWTP) in Berane, includes Lim-flow regulation within the subject area

This issue from, the ecological aspect, or considering protection level of the WWTP location against possible floods, has not been elaborated in the Annex I of this Study, since the Lim –Flow Regulation Project was not finished.

Study on Environmental Impact Assessment of the Waste Water Treatment Plant (WWTP) in Berane

- Annex -

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After the section **3.2.1. Description of the Road Route**, a new section **3.2.A. Lim-Flow Regulation Within the Subject Area** is added.

3.2.A. Lim-Flow Regulation Within the Subject Area

The plateau on which Waste Water Treatment Plant is located, from all sides is threatened by waters, both from River Lim and Stream Makva, as well as from occasional water stream, which are all to be regulated, and the very plateau raised to an elevation of 662,50 m above sea level in order to be protected from Lim great waters.

Material required for filling activities and plateau lifting up to the intended level, is provided from the excavations at Lim riverbed and streambed and, in the same time necessary vertical alignment of those water stream beds is formed.

Absolute maximums are of importance for protection against floods, the value of which in this case is 835 m³/s for hundred-year waters, according to Main Design on Lim-Flow Regulation from 2011, from which the data on water levels for a given cross-section, have been taken.

- **River Lim, section D**, On section (section D) right next to the treatment plant, the projected flow decline is kept on 3‰ which has been given for the section C in the Main Design on Lim – Flow Regulation from 2011, on which this section proceeds. Also, geometry of the river flow cross-section maintains trapezoidal shape of 60,00m width, with the riverbed transverse slope 20‰ and slopes inclinations 1:2. Large water spills onto the riparian zones are prevented by embankments.

Embankments on the left river bank are separated from the main riverbed line, forming the inundations which would improve conditions in the riverbed for great water flow, while embankment and bank fortification formed according to the Main Design on Sewerage System in Berane Municipality dated from 2014, are on the right bank. Sewerage system collector is within the fortification, and through the riverbed it conducts wastewater further toward the treatment plant on the left river bank.

To stabilize Lim riverbed, a retaining wall is planned to be constructed of quarry stone and concrete on the stretch where waste water treatment plant is located, i.e. on the area between Makva stream inlet and WWTP location from the other side. Retaining wall ends with reinforced concrete horizontal beam at the level of WWTP plateau, on a constant height level of 661,85 m above sea level, as well as in 6.0 m long access path which is going to be used for technical interventions in the regulating buildings and, in the riverbed.

- **Makva Stream,** The Design anticipates the inflow of Makva stream into Lim, right next to Waste Water Treatment Plant. Designed is longitudinal decline of 5‰, and 8,0 m wide riverbed cross-section and, riverbed slope inclinations 1:2.

To stabilize Makva streambed, a retaining wall is planned to be constructed of quarry stone and concrete on the interventional stretch toward WWTP. Retaining wall ends with reinforced concrete horizontal beam and inundation canal of 4,0 m width which can be used during medium and small waters season and, as an access around the Plant or during any works on the riverbed.

Embankment height on the left river bank ends with the beginning of the plateau at a constant height level of 661,85 m above sea level, while on right river bank works are not anticipated, except fitting into the terrain in order to waters freely overflow toward Lim.

- **Occasional water stream,** During heavy rainfall riparian waters form the stream on the stretch around WWTP plateau, the regulation of which has also been anticipated, as well as the inflow into Lim next to the Waste Water Treatment Plant.

Designed is this stream longitudinal decline of 6‰, of 4,0 m wide cross-section, with slope inclinations 1:2. Minor riverbed is designed at a height of 3,50 m on which begins 4,0 m wide inundation canal which can be used during medium and small waters season and, as an access around the Plant or during any works on the riverbed.

Embankment height on the left river bank ends with the beginning of the plateau at a constant height level of 661,85 m above sea level, while on the right river bank works are not anticipated, but only fitting into the terrain

- **River Lim, section E,** Since the plateau peak elevation is to be raised at 662,5 MASL for the reason of Waste Water Treatment Plant protection against floods and great waters of a hundred- year probability, it is necessary to bring the appropriate material for the plateau filling. This is why gravel material excavations have began from the unregulated Lim riverbed, between the regulated sections A and C from the Main Design on Lim – Flow Regulation from 2011. In that section a sandbar had already been formed, which could be used as borrow pit. So removing of the sandbar would provide more favourable river flow in that section.

The obtained 5,6‰ decline of the vertical alignment is lowered for 1,0 m in relation to designed sections A and C, in order to be provided the material for plateau filling, while River Lim itself will eventually deposit the material and, fill the “hole”.

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The last paragraph under **Filling activities** subtitle is erased, and the new one is added:

Average peak elevation of the location terrain is 659 masl, while according to Design on planning the location of Waste Water Treatment Plant in Berane, the leveling of the terrain for setting of the WWTP was anticipated at the peak elevation of 662,5 masl, or the average elevation of location terrain is 2,5 m.

Note: This paragraph is changed even in Annex I.

In Graphical Documentation a new appendix is added:

- **Appendix II: SITUATION WWTP (horizontal and vertical cross-section)**

Multidisciplinary team,

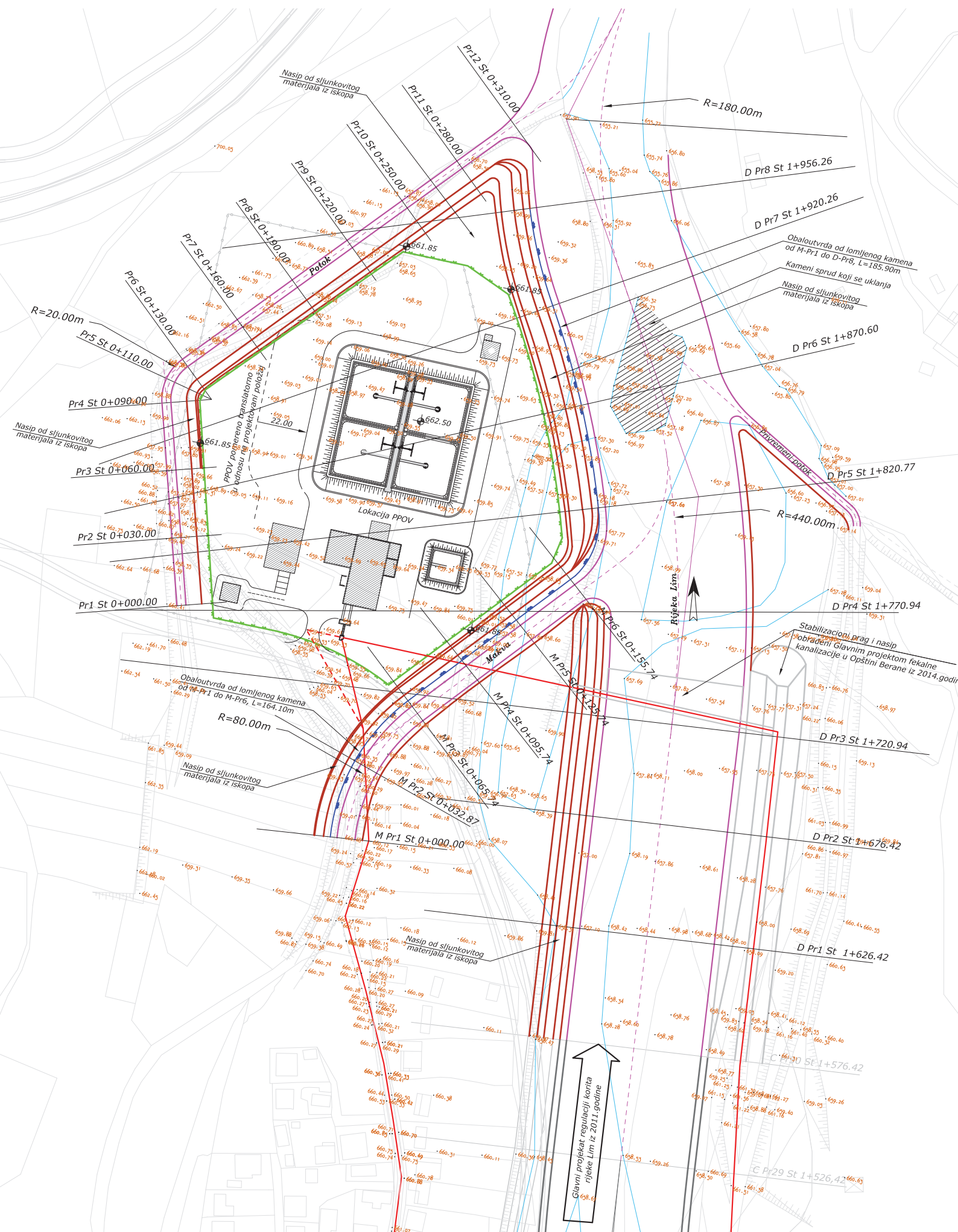
PhD Dragoljub Blečić, BScMetE

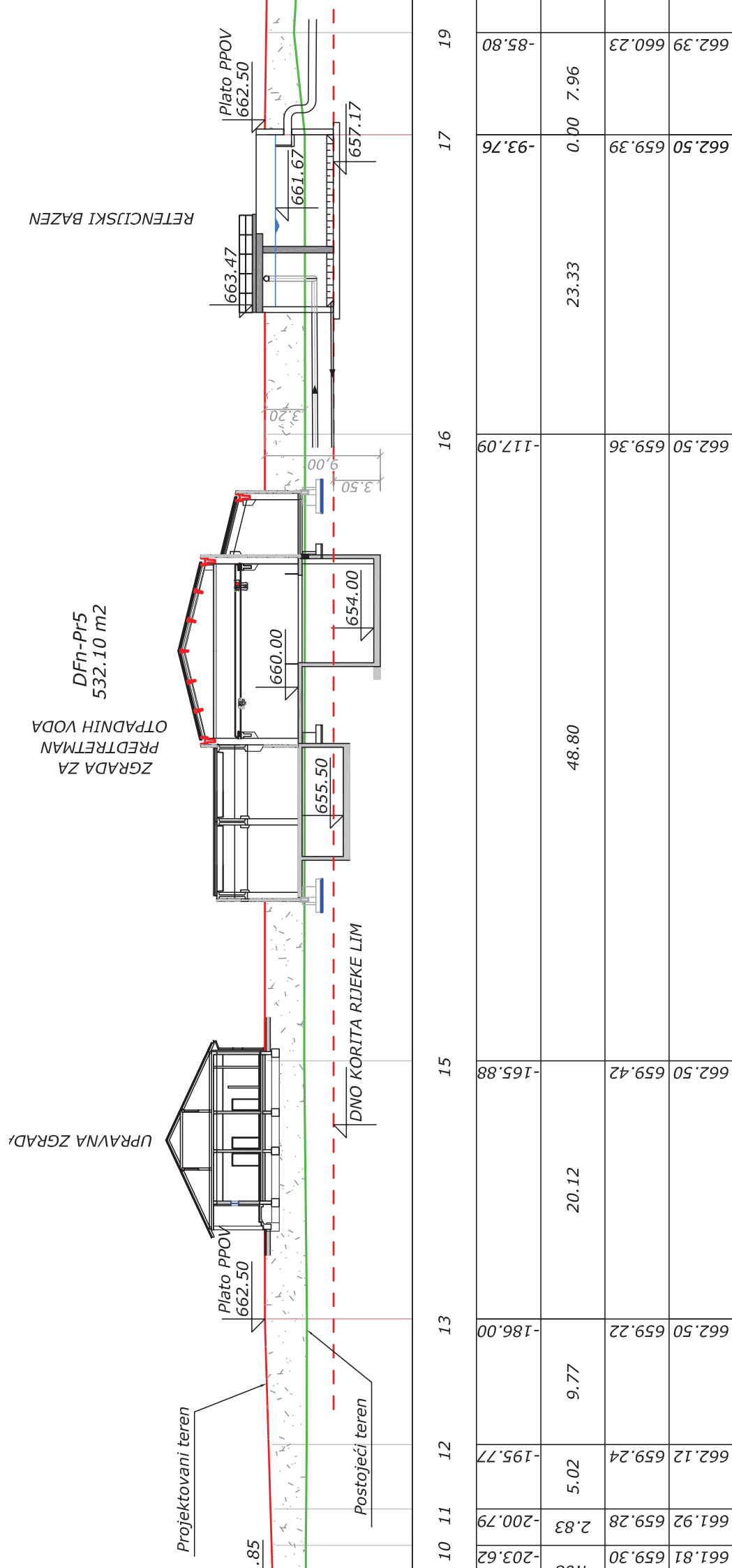
PhD Radinko Kostić, BScMetE

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662.39	662.50	662.50	662.50	662.12	662.50	662.50	662.39
660.23	659.39	659.36	659.42	659.24	659.22	659.28	660.23
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-85.80	-93.76	-117.09	-165.88	-195.77	-186.00	-200.79	-85.80