



REPUBLIC OF SERBIA
 MINISTRY OF EUROPEAN INTEGRATION
 MINISTRY OF FINANCE
 Department for Contracting and Financing of
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Sokobanja wastewater collection and treatment project

TD Lot 1 and Lot 2: Site visit – 24.01.2024



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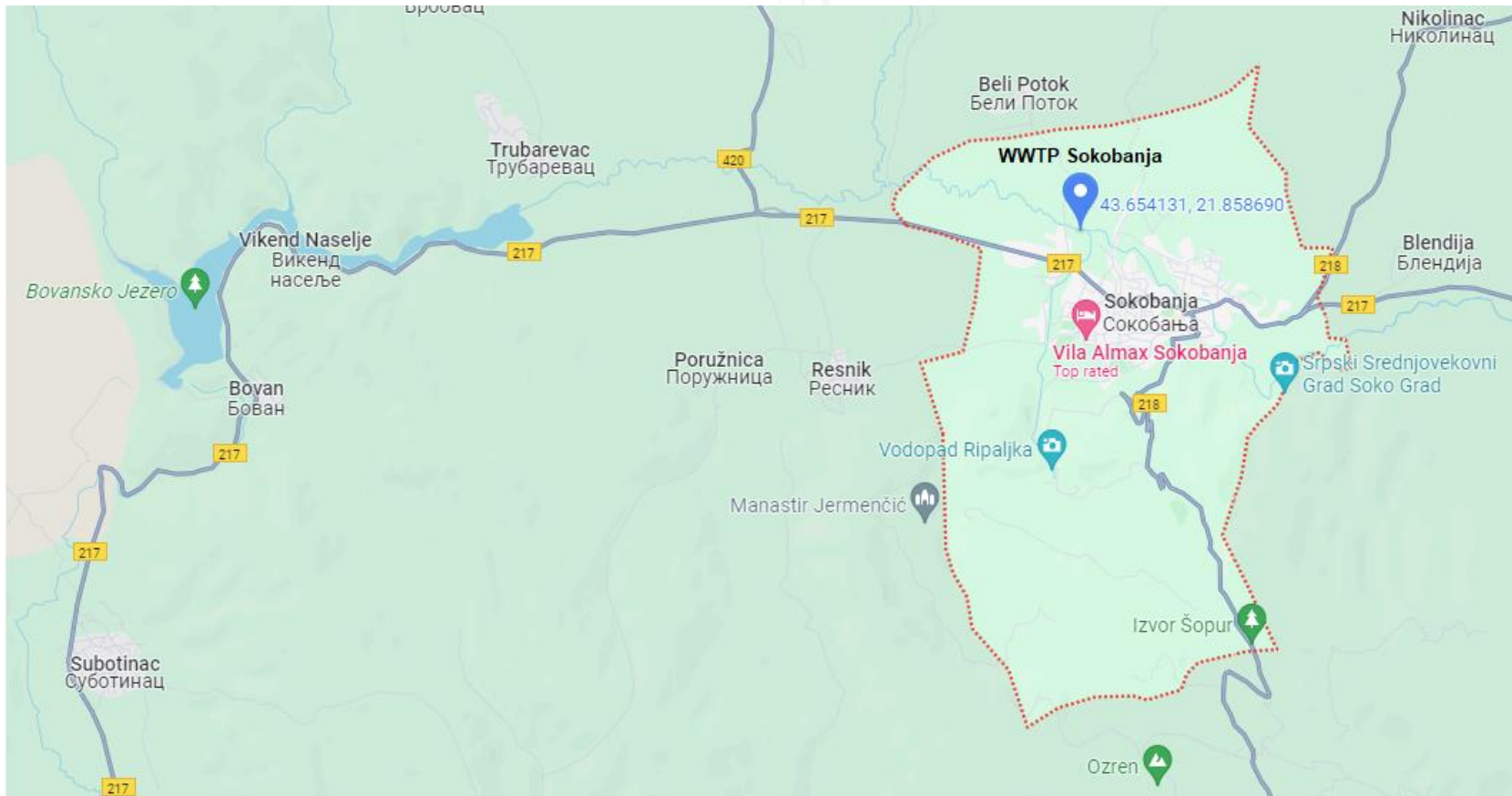
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Project location

Sokobanja - well known spa and tourist resort



Demography and tourism analysis

- Population per Census 2022 - 7,188
- Total estimated number of beds – 14.000
- Beds in hotels -1,300
- Specialized hospitals (Ozren and Sokobanja) – 700
- Private accommodation – 8.000 categorized + 4.000 non-categorized

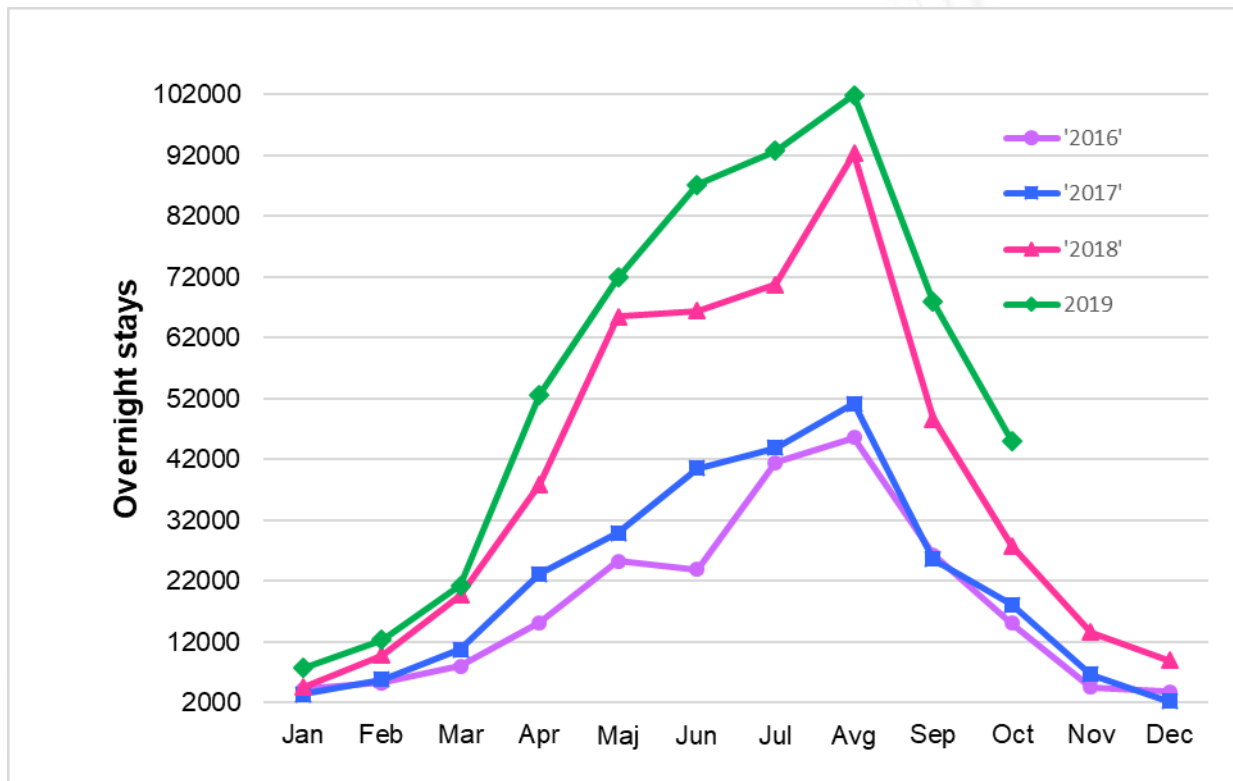


Table 8. Overnight stays in Sokobanja

Overnight stays 2019	
Reported tourists	600,000
Non-reported tourists*	200,000
Patients in specialized hospitals*	160,000
Total	960,000

* Estimate

WWTP design parameters

Parameter	Unit	Winter	Summer
Population	P.E.	7,500	7,500
Tourism/commercial/institutional	P.E.	2,500	14,500
Total Population equivalents	P.E.	10,000	22,000

Parameter	Unit	Winter	Summer
Average daily dry weather flow	m ³ /d	4,520	6,421
Peak dry weather flow	m ³ /h	293	432
	l/s	81	120
Peak wet weather flow (for treatment)	m ³ /h	432	673
	l/s	120	187
Extraordinary peak wet weather flow	l/s	510	510

Mass balance: sampling campaign 23.08-30.08.2019

Table 3. Minimum and maximum daily pollution load at sampling points (23 – 30.08.2019)

Parameter	SP1 – WWTP inlet		SP2 – Carina	
	Min	Max	Min	Max
Daily flow, L/s	49.1	62.0	4.9	5.8
PE (COD)	10,060	18,843	1,133	1,404
PE (BOD)	9,106	21,534	771	1,340

Table 4. Average daily pollution load in Sokobanja (23 – 30.08.2019)

Parameter	SP1 WWTP inlet	SP2 Carina	SP1 + SP2 Total <u>Sokobanja</u>
Average daily flow, L/s	55.9	5.44	61.29
PE (COD)	13,400	1,256	14,657
PE (BOD)	12,619	1,034	13,653

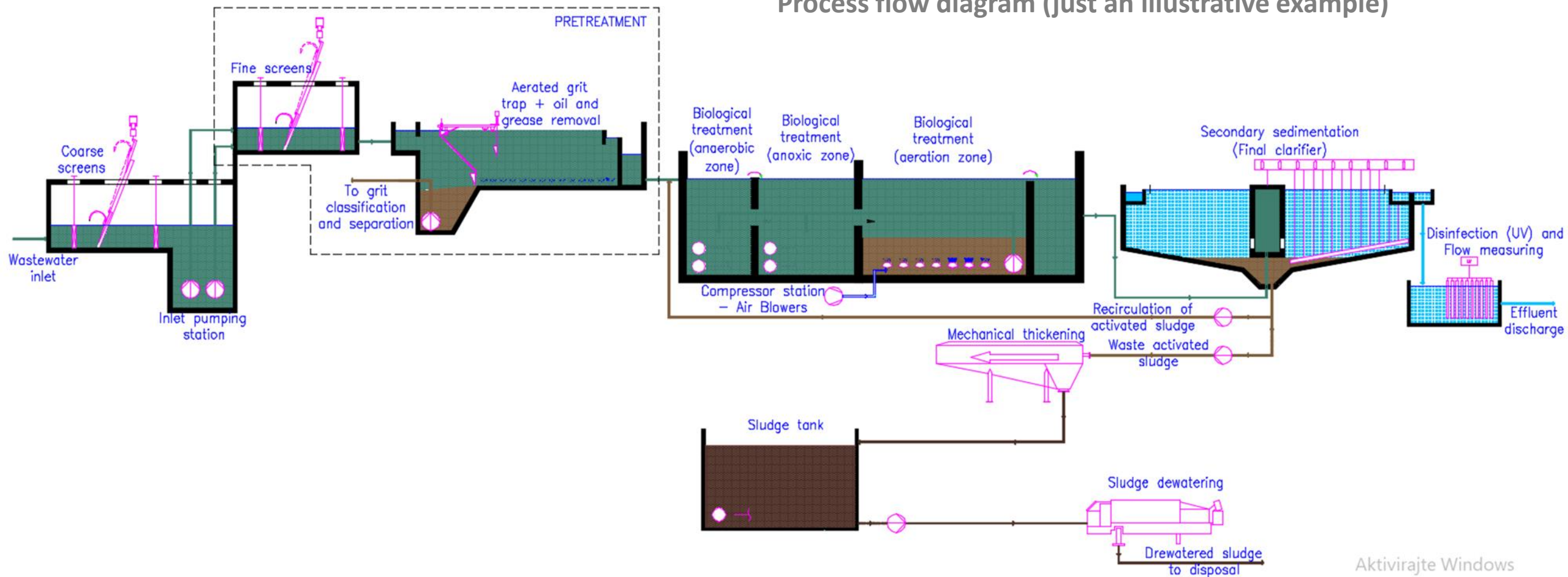
Effluent requirements

Parameter	Unit	Winter	Summer
Design capacity	P.E. ³	10,000	22,000
Treatment level		Tertiary	Tertiary
BOD ₅ (20°C, test with nitrification inhibitor)	mg O ₂ /l	25	25
COD	mg O ₂ /l	125	125
TSS	mg/l	35	35
Total Phosphorous	mg/l	2	2
Total Nitrogen	mg/l	15	15

Parameter	Unit	Value
Total coliforms	cfu/100 ml	10,000
Faecal coliforms	cfu/100 ml	2,000
Faecal streptococci	cfu/100 ml	400

Process based on activated sludge - Extended Aeration

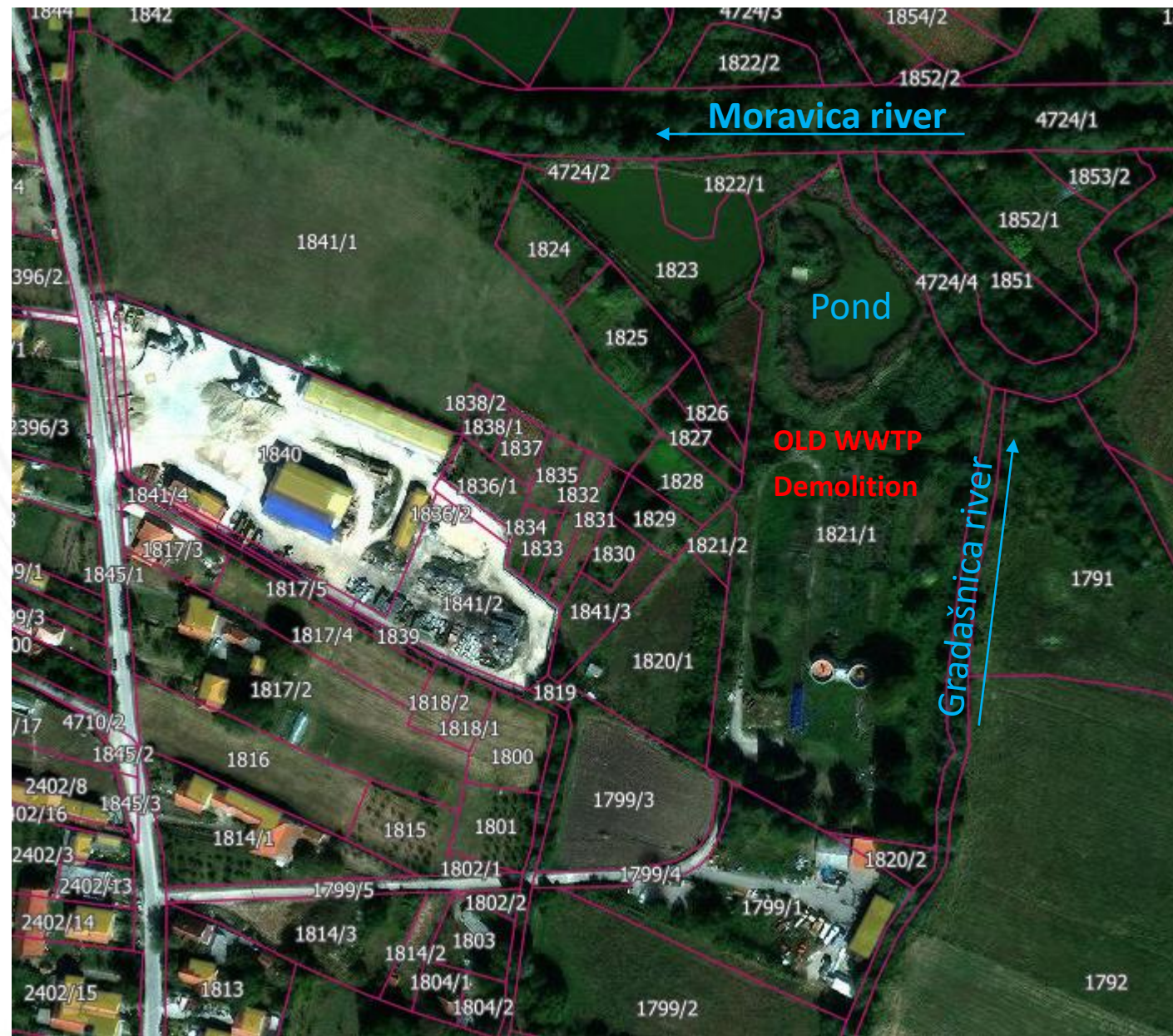
Process flow diagram (just an illustrative example)



Aktivirajte Windows

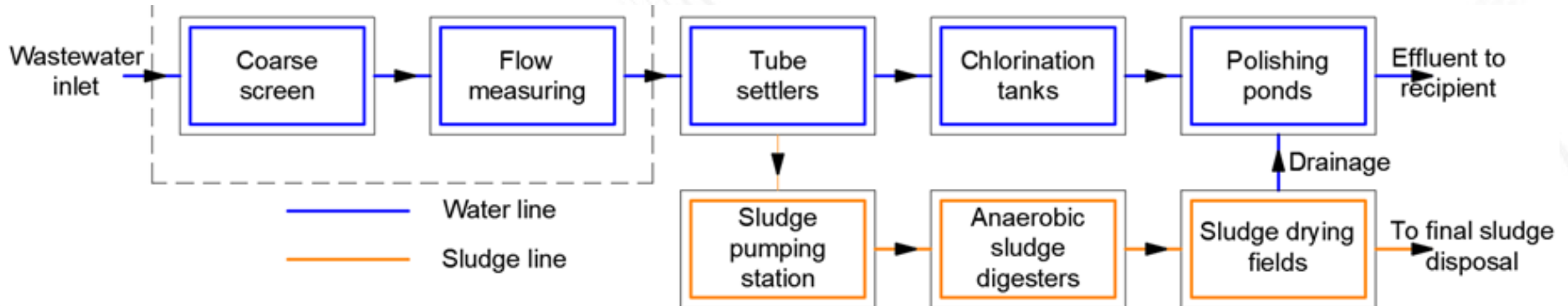
WWTP Location

- Plot no. 1821/1
- A = 2,09 ha
- Recipient body: Gradašnica by reconstruction of the existing outlet structure.
- Road connection: from local road on parcels no. 1799/5 and 1799/4.
- Administrative building planned for reconstruction.
- Pond on the plot is not in the scope of project.



Existing WWTP

- Plant constructed in 1970s
- Wastewater treatment principle is outdated
- Treatment effect is minor
- Concrete structures are damaged and in bad condition



Priority Investments for Upgrade of Sewer System- Planned Measures

Priority measures are required for the Sokobanja sewer system due to:

1. Operation problems (existing PS Carina not in function, main sewer DN400 with insufficient capacity, bottlenecks in the system)
2. Undeveloped network

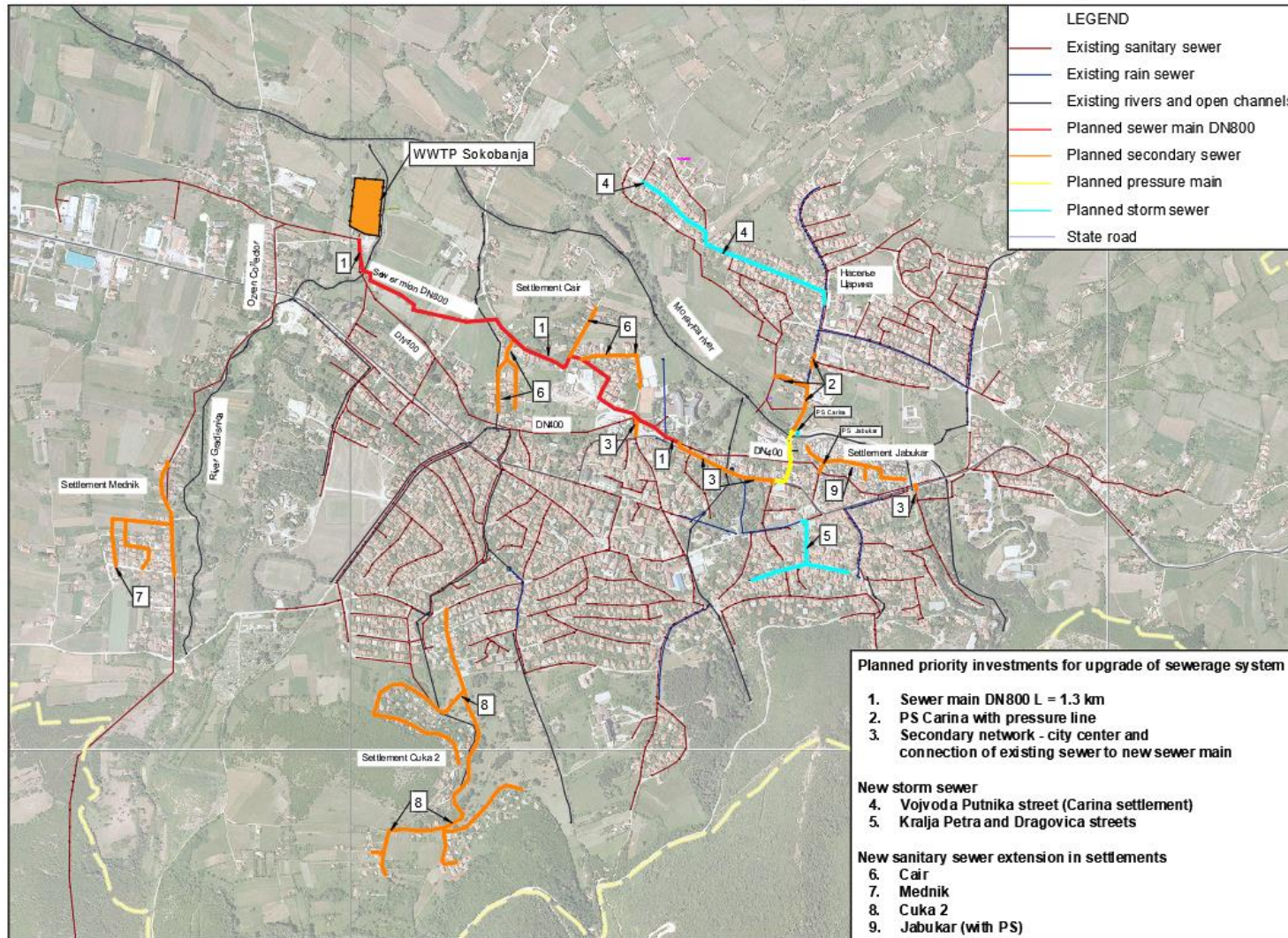
1. Priority measures for enabling efficient operation of the wastewater collection system:

- Construction of a new main trunk DN800 L = 1.3 km with connection pipes;
- New wastewater PS Carina with pressure line;
- Reconstruction of bottlenecks in the system;

2. Priority measures for extension of the secondary sanitary sewer and storm water network:

- Construction of the sanitary wastewater collection network in settlements Čair, Mednik, Čuka2 and Jabukar;
- Construction of the storm sewer network in Vojvode Putnika, Kralja Petra and Dragovica streets.

Priority Investments for Upgrade of Sewer System- Layout



1. Sewer main DN800 L = 1.3 km
2. Two prefabricated sewer PS with pressure lines L= 0.25 km
3. Secondary sanitary sewer (L = 5.1 km DN ≤400mm)
4. Storm sewer (L = 1.1 km, DN ≤ 400mm)

Thank you for your attention!



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