There are so little clean places on Earth…

ЛОС БЕЛ

Construction

of wastewater treatment systems

Purpose of the presentation:

to show the possibility of building compact treatment facilities of block and modular types, constructed made in the same technical and aesthetic style.

- Power of 1 module is up to 40m3 / day;
- Facility capacity is up to 240m3 / day (up to 6 modules);
- 100% factory readiness;
- Quick installation;
- Standard equipment;
- Phased launch;
- Convenience of design;
- Convenience of installation.

Modular
Wastewater treatment

Bioreactor:

Consists of a polypropylene tank, specifically divided into compartments and has 4 main zones: an anaerobic, an anoxic, and an aeration zone as well as secondary settling tanks. Inside are aeration elements, airlifts, drainage trays and distribution combs.

Additional equipment:

- Station to account imported effluents;
- The giving SPS (Sewage Pump Station);
- Distribution chamber;
- Sludge dewatering basin;
- Aftertreatment filter;
- UV disinfection unit;
- Flow meter;
- SPS of pure water;
- Flocculant dosing unit.

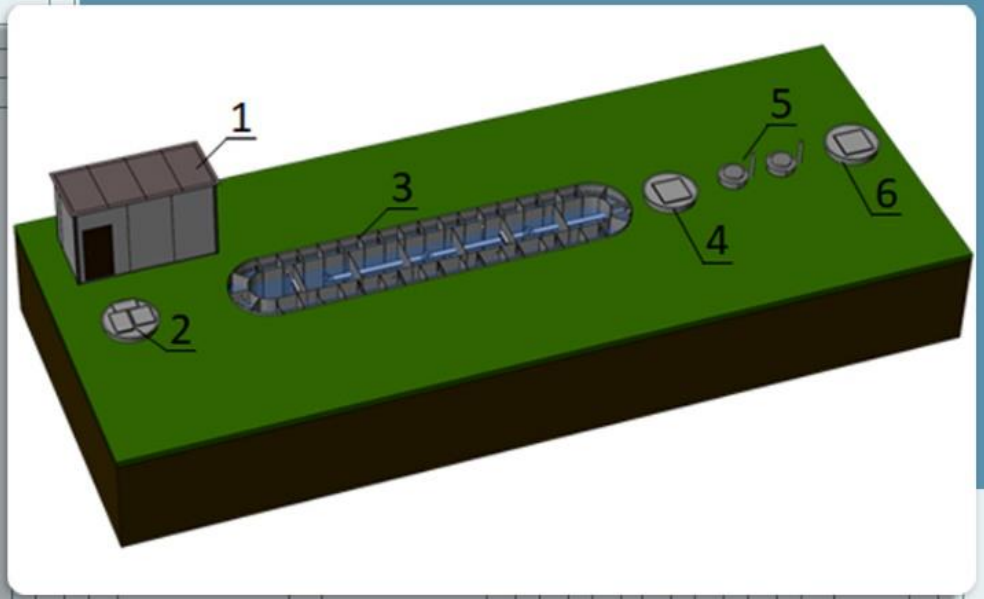
Modular

Wastewater treatment

Facility Complex for cleaning 40 m3/ day

1.Pavilion for technological equipment (inside there is a blower and control cabinets);
2.The feeding SPS;
3.Wastewater treatment plant for 40m3 / day;
4. Sludge dewatering basin;
5. Aftertreatment filter;
6. UV disinfection unit.

The equipment delivery set is determined based on the customer requirements and the required wastewater treatment parameters.

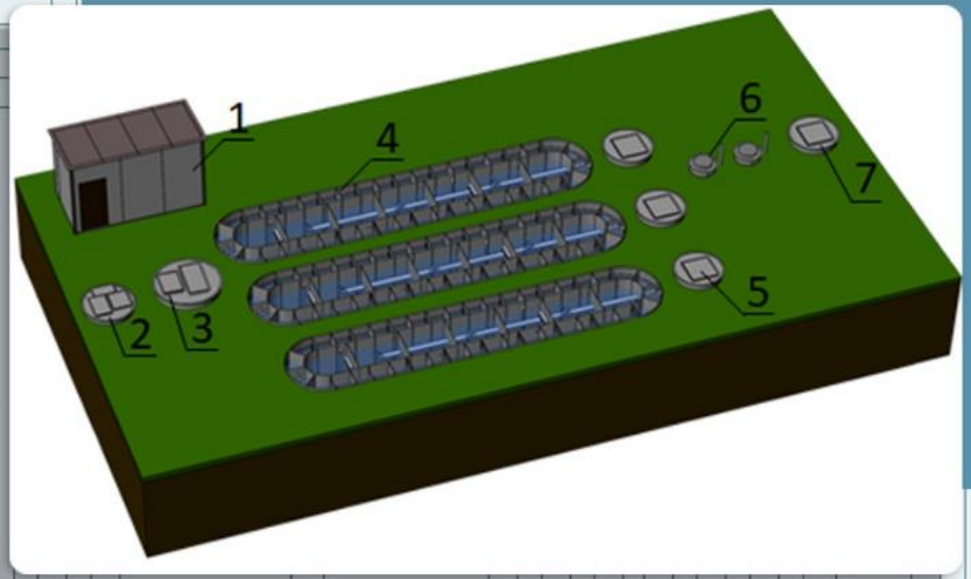


Modular
Wastewater treatment

Facility Complex for cleaning 120 m3/ day

1.Pavilion for technological equipment (inside there is a blower and control cabinets);
2.The feeding SPS;
3.Distribution chamber;
4.Wastewater treatment plant for 120 m3 / day;
5. Sludge dewatering basin;
6. Aftertreatment filter;
7. UV disinfection unit.

The equipment delivery set is determined based on the customer requirements and the required wastewater treatment parameters.



Modular
Wastewater treatment

Based on the technical requirements of the customer, we can design and implement treatment plants with a daily volume of up to 50 000 m3. We can provide a complete package of works: beginning from the formulation of specific project targets and finishing with the installation of the finished product.

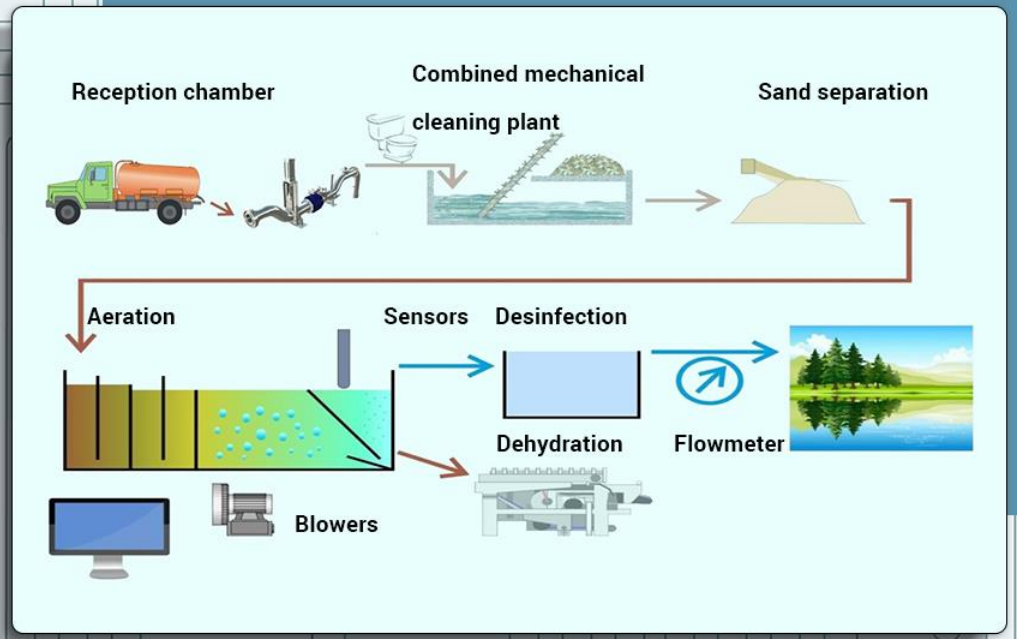
Wastewater treatment

for urban areas

250 - 50 000м^3/ day

Within the treatment plant, wastewater is treated via preliminary and biological purification. The construction of the biological treatment consists of one container with separate wastewater treatment lines, with anaerobic and aeration chambers well as secondary sedimentation tanks installed inside.

In each section specific conditions are met ensuring the process of nitrification and denitrification . Activated sludge from the treated effluent is separated in settling tanks which are installed next to the aeration chamber. A well-known technique is offered for the removal of nitrogen and phosphorus, which involves nitrification and denitrification as well biological phosphorus removal.



Technological
scheme

The bioreactor consists of standard building blocks;

The bioreactor body is made of reinforced concrete;

The building is made of modular prefabricated structures;

Standard technological equipment.

Wastewater treatment

for urban areas

250 - 50 000м^3/ day

Specifications:
Productivity:
from 1 to 100m3 / hour;
Power consumption up to 7.5 kW;
Dimensions of the pavilion:
2400x1400x2400mm;
Weight: 600kg.

The equipment includes:

- Receiving branch pipe;
- Pneumatic valve;
- Pipeline;
- Electromagnetic flow meter;
- Measuring module with pH sensor;
- Outlet pipe;
- The pavilion of sandwich panels;
- Convector;
- Electronic key cards;
- Identification device;
- Software;
- Printer.

Reception Chamber

The equipment includes:

- Rake grate for trash;
- Sand trap;
- Screw for garbage discharge;
- Sand auger;
- Control cabinet.

Specifications:

- Productivity is from 30 to 720 m3 / hour;
- Gaps in the gratings 2 ... 6mm;
- Power consumption: 2.2 ... 8.4 kW;
- Material - stainless steel.

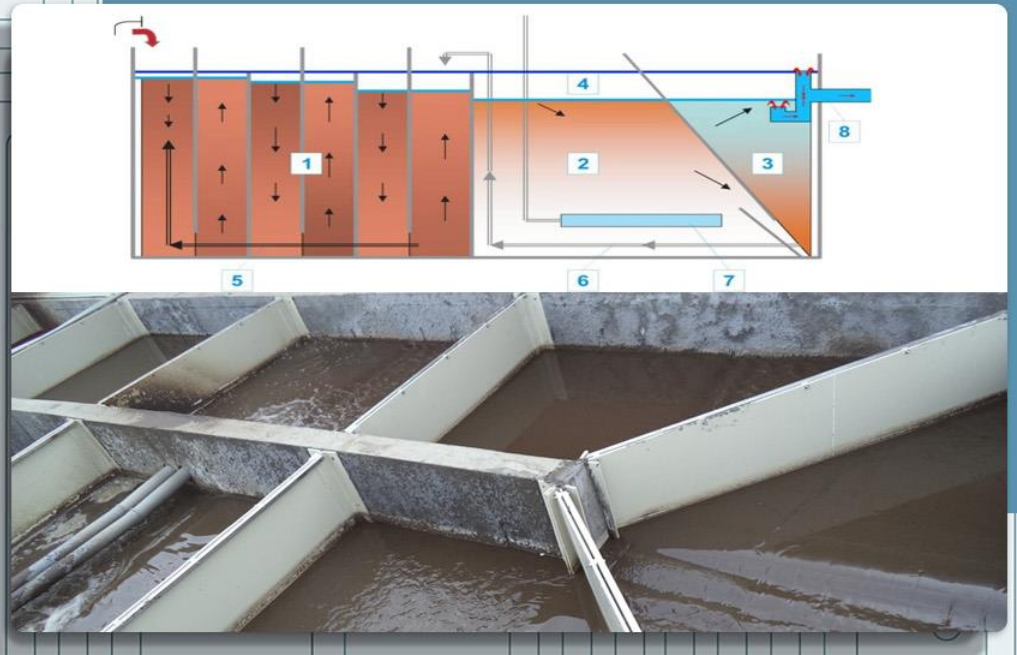
Combined mechanical cleaning plant

The equipment includes:

- Reinforced concrete tank;
- Polypropylene and reinforced concrete partitions;
- Airlifts.

Description:

The design of the denitrification zone in the form of a vertical labyrinth provides upward and downward movement of wastewater, which ensures thorough mixing with activated sludge without the use of stirrers. Airlifts provide circulation of activated sludge in the denitrification zone and allow maintaining the fluid velocity even in the absence of incoming effluents.



Anaerobic
and anoxic zones

The equipment includes:

- Reinforced concrete tank;
- Tubular aerators;
- Distribution combs;
- Airlifts.

Description:

At the bottom of the aeration chamber, tubular aerators are installed from a high-strength polyurethane film with a laser notch, through which air is supplied. Aerators are divided into groups and can be turned off using cranes on the distribution comb. Also, airlifts are installed in the aeration chamber for pumping excess activated sludge from the secondary sumps.

Aeration chamber

The equipment includes:

- Partitions made of reinforced concrete;
- Partitions made of polypropylene;
- Airlifts;
- Catchment tray;
- PVC piping.

Description:

The walls of the secondary sumps are made of reinforced concrete and polypropylene. The lower part is divided into 2 sections in the form of inverted pyramids, where activated sludge settles, and then is pumped out using airlifts. At the top is a stainless steel drain pan.

Secondary
sedimentation tanks

The structure of the building includes:

- Room with blowers;
- Pre-installation room; mechanical cleaning;
- The room for mechanical dewatering of sludge;
- Household facilities.

Description:

In the building of the administrative-domestic facility (ADF) there is technological equipment for removing sand and garbage located in the incoming wastewater, as well as air blowing equipment. Also in the ADF building there are sludge dewatering rooms, rooms for staff, bathrooms and other technical rooms.

Administrative building

The equipment may include:

- Drum type micro strainer;
- Ultraviolet disinfection units self-cleaning with ultrasound;
- Membrane Cleaning Systems

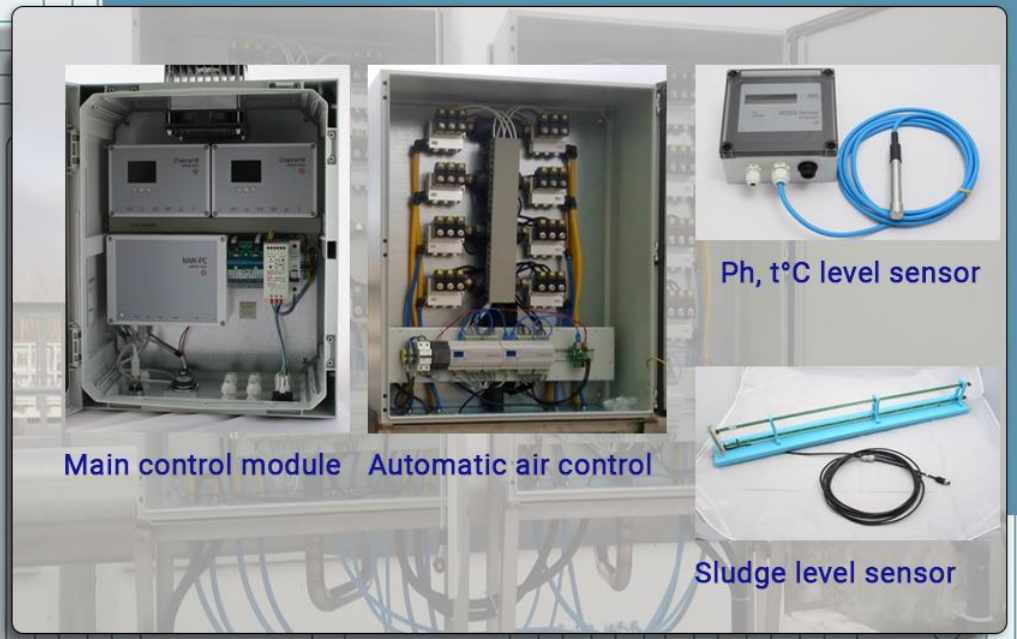
Description:

A drum microfilter allows you to achieve the parameters of a fishery pond, and the installation of ultraviolet disinfection neutralizes viruses and bacteria. As an alternative, a membrane cleaning unit can be used, which allows to achieve higher cleaning parameters and does not require further disinfection.

Post-treatment
and disinfection unit

Information on the operating modes of equipment, readings from sensors and analyzers are accumulated in the database and analyzed. Based on the data obtained, patterns are determined by the maximum and minimum values of the incoming flow, by pollution, etc. Based on the obtained patterns, the system predicts the operation of the equipment in the near future. For example, at night or on a weekend, the equipment is used for 30% of the total capacity, and by the time of peak discharge, the system increases air supply and recirculation to maintain water purification.

However, if the current situation differs from the predicted one (for example, a sudden night peak discharge), then adjustments are immediately made to the equipment based on data from analyzers and measuring instruments. To operate at 100%, all that is needed is data on the PH, ORP and temperature.



Control system based on artificial intelligence

Time	0:00-6:00	6:00-12:00	12:00-18:00	18:00-0:00
Wastewater Consumption, m3 / hour	83	340	250	158
Peak Flow, m3 / hour	130	500	300	230
Total consumption, m3	500	2050	1500	950
Number of working blowers, pcs	2	4	4	2
Working frequency, Hz	35	60	45	60
Work mode (work/simple), minutes	5/15	10/10	10/10	10/10
Total spent electric power, kWh	54	432	324	216

This is an example of a sewage treatment

plant with a capacity of 5000m3/day

Summary	
Sewage taken per day, m3	5000
Electricity spent, kWh	1026

The specific energy consumption was achieved: ~ 0.2 kW * h / 1m3, which is 3 times less than in any other technology used.

This is an example of a sewage treatment

plant with a capacity of 5000m3/day

Open type

Closed type

Options for sewage treatment plants

The use of a single concept in the design and construction of treatment facilities, as well as the use of standardized standard equipment and modular structures allows you to:

- Create model projects for quick examination;
- Build wastewater treatment plants without maintenance staff;
- Create a single centralized control room to control all facilities;
- Reduce operating costs.

UCT-type treatment
facilities map

When implementing sewage treatment plants according to a single concept, we obtain the following advantages:

- The ability to adjust the capacity of the treatment plant;
- Fast implementation time;
- Long term of operation;
- Design reliability;
- High parameters of biological treatment;
- Purification by phosphorus without the use of reagents up to 90%;
- The use of corrosion-resistant materials;
- Low operational costs.

LOSBEL successfully passed certification in Prüf- und Entwicklungsinstitut
für Abwassertechnik an der RWTH Aachen (PIA) -- Testing and Development Institute for Wastewater Technology
at RWTH Aachen E.V.
The parameters are presented without additional treatment.

Parameter	Efficiency	
BOD5	4 mg/l	98,9%
COD	30 mg/l	96,6%
NH4-N	0,6 mg/l	98,4%
N(tot)	10 mg/l	85,1%
P(tot)	3,7mg/l	55,4%
SS	6 mg/l	98,5%

PIA

Certificate

345.01C01.L02

LOSBEL LLC.

Minsk region, Logoisk city, Minskaya st. 2G, office 1-2, Republic of Belarus

EN 12566-3, Annex B

Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system WR 10

Continual system in one PP tank

Test report PIA2020-345B46

This certificate is valid until 5 August 2023.

Nominal organic daily load (influent)	0.048 kg BOD_5/d*PT		
Nominal hydraulic daily load	1.2 m³/d		
Material	Polypropylene		
Treatment efficiency		Efficiency	Effluent
(nominal sequences)	COD	96.6 %	30 mg/l
	BOD_5	98.9 %	4 mg/l
	N_{tot}	85.1 %	10 mg/l
	NH_4-N	98.4 %	0.6 mg/l
	P_{tot}	55.4 %	3.7 mg/l
	SS	98.5 %	6 mg/l
Electrical consumption (entire test period)	1.52 kWh/d		
Number of desludging	0		

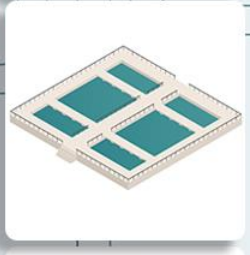
Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Martina Wermter August 2020

Equipment from leading world manufacturers



Purification by phosphorus without the use of reagents up to 90%

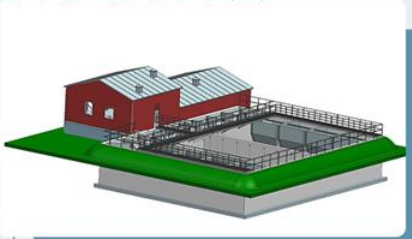
The ability to adjust the capacity of the treatment plant

Low energy consumption 0,2-0,5 kW*h/m3

Control system based on artificial intelligence

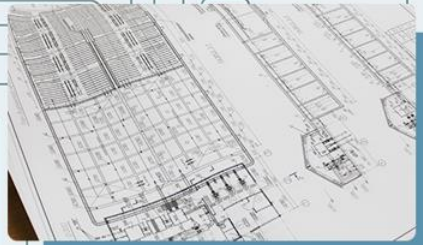
Build wastewater treatment plants without maintenance staff

Advantages of our equipment



Development of the engineering solution and pricing strategy:

1. Tank volume and site area calculation.
2. Technological equipment selection.
3. Task-setting for the design stage.



Development of the project documentation,
budgeting and certification assessment.

Construction and installation works:

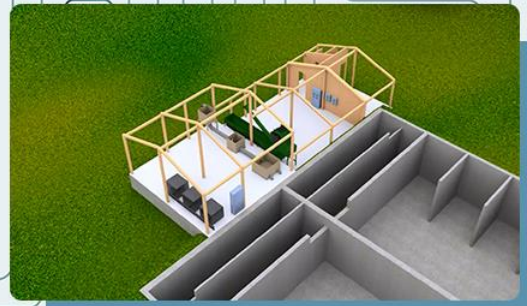
1. Concrete tank construction.
2. Installation of technological equipment.

Commissioning works:
Setting up equipment, setting up the SCADA system, launching of the activated sludge

The main stages of work
for the construction of treatment facilities

Construction stages

Excavation stage

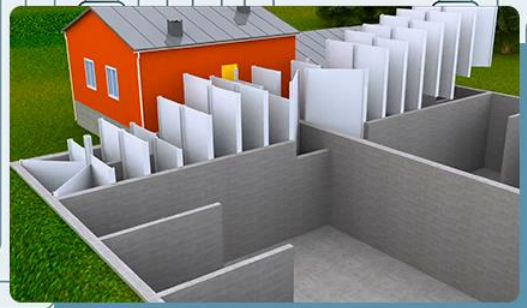


Installation of large equipment

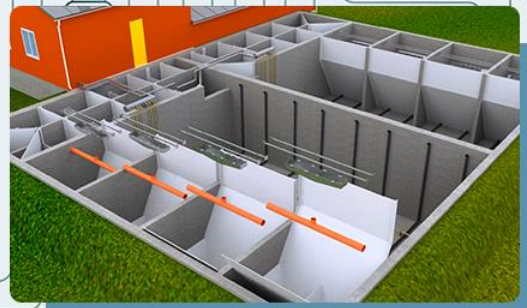
Concrete tank construction

Construction of the administrative building

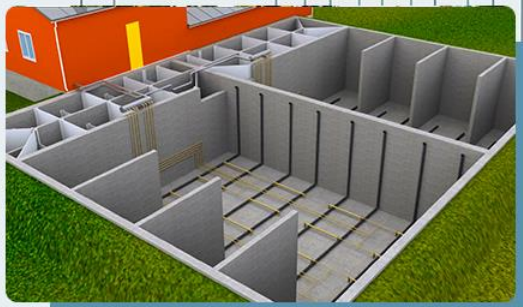
Construction stages



Installation of partitions for the anoxic and anaerobic zones



Installation of secondary sedimentation tanks and clean water trays



Pipe routing and installation of aerators

Installation of ladders and fences

Our partners

	Completed Wastewater treatment plants all over the world	Capacity, m3/day
1	Stroitel, Russian Federation	10000
2	Rogachev, Belarus	9300
3	Smolevichi, Belarus	7100
4	Berezino, Belarus	5000
5	Drogichin, Belarus	4000
6	Ilinskoe-Usovo, Russian Federation	2500
7	Korocha, Russian Federation	2500
8	Svisloch, Belarus	2000
9	Novy Oskol, Russian Federation	1500
10	Voronovo, Belarus	1500
11	Malinovka, Ukraine	1500
12	Gorodnya, Russian Federation	1500

Featured projects

	Completed Wastewater treatment plants all over the world	Capacity, m3/day
13	Shpitki, Ukraine	1500
14	Oktyabrsky, Russian Federation	1500
15	Cherikov, Belarus	1200
16	Proletarskiy, Russian Federation	1200
17	Raubichi, Belarus	800
18	Tavrovo, Russian Federation	800
19	Halch, Belarus	660
20	Veydelevka, Russian Federation	600
21	Grayvoron, Belgorod region	600
22	Politotdelsky, Russian Federation	600
23	Kozelsk, Russian Federation	500

Featured projects

	Completed Wastewater treatment plants all over the world	Capacity, m3/day
24	Pyatnitskoye, Russian Federation	400
25	Uborki, Belarus	323
26	Ivnya, Russian Federation	300
27	Khvastovichi, Russian Federation	200
28	Kartsova, Russian Federation	200
29	Lenino, Russian Federation	200
30	Shipilovichi, Belarus	160
31	Bolshetroitskoye, Russian Federation	120
32	Kutuzovskoe, Russian Federation	120
33	Holiday resort, Belarus	105
34	Military Unit Vornyany, Belarus	105

Featured projects

There is no civilization without sewage!

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