Fővárosi
Csatornázási Művek Zrt.

VERIFIED ENVIRONMENTAL
MANAGEMENT
REG.NO. HU-000025

ANGYALFÖLD PUMP STATION

ENVIRONMENTAL DECLARATION

2020

Approved by:

György Palkó
CEO

Budapest, April 2020

“Only when the last tree has been cut down; only when the last River has been poisoned; only when the last fish has been caught; only then will you find that money cannot be eaten.”

Data sheet according to Annex VI of the Decree 1221/2009/EC

Organisation	Budapest Sewage Works Ltd.		
Address:	H-1087 Budapest, Asztalos Sándor str. 4.		
EMAS member units	Angyalföld Pump Station		
Address:	1139 Budapest, Vizafogó street 6.		
Plant manager	László Ambrus		
Number of employees	20 persons		
Corporate environmental officer	Magdolna Makó	Telephone:	1-455-41-28
		Fax:	1-455-41-95
		e-mail:	makom@fcsm.hu
EMAS member corporate units	Department of Environmental Protection Directorate of Elevator Pump Stations Department of Investment Economic Directorate Legal Department		
Other data	Activity	wastewater canalisation and purification	
	TEÁOR activity code / NACE code	3700 Wastewater collection and treatment	
	Date of certification	21th May 2017	
Official website	www.fcsm.hu		
Date of registration	21st December 2011		
Registration number	HU-000025		
Expected date of next updated environmental declaration	May 2021		
Mode of public access to the Environmental Declaration	electronic		
Request for deviation as per Article 7	NONE		
Certified by:	Florian Mitterauer	accreditation document no.:	AT-V-0022
		areas for which the accreditation applies:	
		Address:	Opernring 1/R/741-744, 1010 Vienna Austria
Notified body	Lloyd's Register EMEA Niederlassung Wien		
Signature of the organisation's representative:			

Contents

Introduction of Budapest Sewage Works Ltd.

The legal predecessor of Budapest Sewage Works Ltd. was Budapest Székesfővárosi Csatornázási Művek (Budapest Capital City Sewage Works) was established on 1st April 1946 and became a corporation on 1st December 1993 and a close corporation on 16th May 2006.

Our company strives to implement a safe service, minimising the possibility of service outages and breakdowns and their fast and interruption free elimination, should they still occur while ensuring the observation of the system of requirements laid down in the various legal regulations, standards, technical descriptions and licenses issued by the authorities.

The scope of activities of Budapest Sewage Works Ltd. comprises the collection, purification and forwarding of the sewage and precipitation water of the capital city and its surrounding agglomeration areas to the receivers up to the capacity of the existing sewage utility facilities; the operation of the facilities and equipment serving the above purposes and the control of the sewage water released into the public sewerage grid.

Budapest's sewage and precipitation water system are served by a number of pump stations and automatic elevator pump plants, of which the most significant are: Békásmegyer, Pók Street, Zsigmond Square, Kelenföld, Albertfalva, Angyalföld, Ferencváros and the Vas Gereben Street stations.

The precipitation water and sewage generated in the capital is collected by a sewage grid of several thousands of kilometres in total length. In order to maintain safe operability of the grid, the technical status and operational conditions of the sewers are regularly examined using modern industrial television equipment. Defects are repaired in consideration of the technical parameters of the piping in question by conventional open or modern technology without opening the system. To serve uninterrupted ducting of sewage and precipitation water high capacity cleaning equipment are used to clean the public sewerage grid and the drain traps.

Reconstruction of the sewerage system is increasingly often carried out using pipe lining technologies that do not require the opening of the road surface as urban traffic has greatly

increased over the recent period. The volume of new grid construction is also significant in order to close the public utility scissors.

Organising the safe operation of the sewerage grids requires the knowledge of the technical status of the sewers and the expected quality of the sewage water flowing in them; therefore, the Budapest Sewage Works Ltd. regularly checks the sewers and equipment under its management. Maintenance includes regular cleaning according to a prefixed schedule and the occasional removal of blockages and repairs.

For the modern reception of sewage collected by vacuum trucks from the uncanalised areas, closed trucked sewage reception stations have been set up and operated at several locations in Budapest.

45% of the dry season sewage water is purified at the North-Pest and South-Pest wastewater treatment plants, whose total nominal capacity is 235,000m^3/d. Both plants have biological purification and nutrient removal rating as well.

Both the North-Pest and the South-Pest Wastewater Treatment Plants are capable of processing wastes of high organic material content in connection with the sludge treatment technology.

Gas motors and gas boilers utilise the biogas generated upon the breakdown of organic materials in the sludge at the two wastewater treatment plants.

Since the establishment of the Budapest Sewage Works Ltd. in 1946 it has been also undertaking flood and internal water protection activities as well, since the company's reorganisation in 1998 these activities have been forming part of its core activities. As the final recipient of the content of the sewerage system and the small water courses is the River Danube it is no coincidence that our company has been tasked with the above.

According to the contract concluded with the Local Government of Budapest the company's task is operative protection against floods and the operation of the flood protection facilities and the small water courses to the extent of the "state of technical completion". This means that no flooding may occur at the areas protected by the flood protection facilities until the load exerted on them is below the limit to which they had been technically dimensioned.

The General Assembly of Budapest resolved in May 2009 to assign the operation of Budapest's public convenience facilities to Budapest Sewage Works Ltd.

The Budapest Sewage Works Ltd., as the greatest environment management company, considers its mission to lead the establishment of environment friendly technologies and developments, notably the production of biogas through its activities and apart from its wastewater collection and treatment core activities.

All employees of the company wish to serve the needs and requirements of the communities they serve in compliance with the technical, social and human requirements of the 21st century, at high level, in a customer friendly and innovative way.

Organisation and legal status of the company

The major owner of Budapest Sewage Works Ltd. is the Municipality of Budapest. During the privatisation of the public service companies the General Assembly of Budapest gave the share package worth 25%+1 votes based on the company's authorised capital to the consortium of Berliner Wasser Betriebe (B.W.B.) and Compagnie Générale des Eaux (C.G.E.) for 25 years.

The contract did not tie the profit and the profit interest of the new partners to the increase of turnover or price increase but – uniquely in domestic practice – to the increase of the effectiveness of the company and cost reduction. The contract signed on 19th November 1997 disposed of yielding the defined operational and professional management rights. Using the opportunity fixed in the Share Purchase Agreement, C.G.E. and B.W.B. established Csatorna Üzemeltetési Holding Rt. at the end of 1998, which was later renamed as Csatorna Holding Zrt. On 6th June 2000, B.W.B. transferred the proprietary rights of its shares to Berlinwasser Holding AG, which was renamed as Berlinwasser Holding Gmbh on 3rd September 2015.

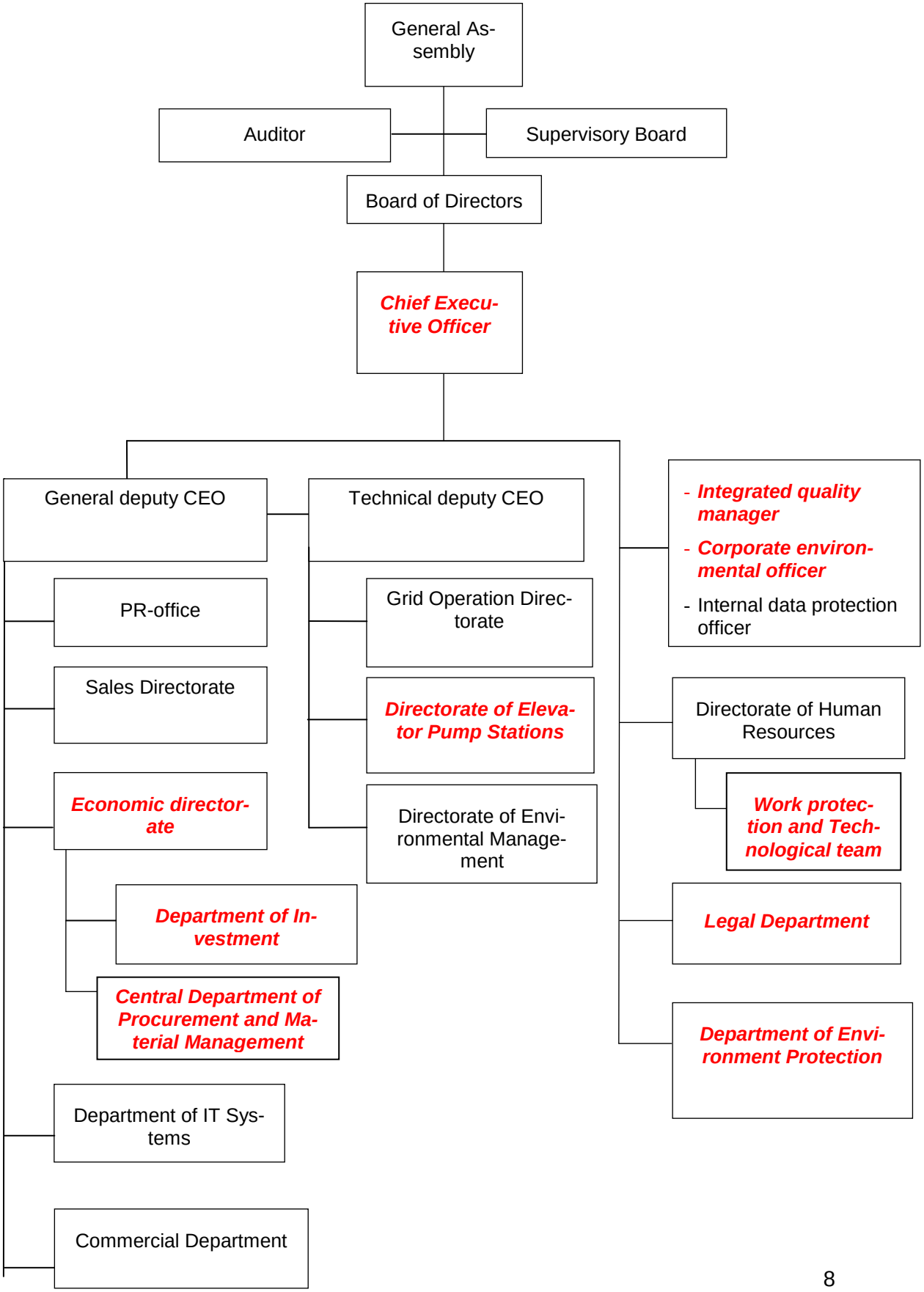
In the meantime, the name of C.G.E. had changed and on 26th March 2002 it transferred its shares to Vivendi Environnement, the new name of which was Veolia Environnement S.A. On 26th November 2015 Veolia Central & Eastern Europe S. A. purchased the shares of Berlinwasser Holding Gmbh.

Owners:

Local Government of Budapest,
Csatorna Holding Vagyonkezelő Zrt.,
Veolia Environnement SA,
Veolia Central & Eastern Europe S. A.,
Budapest Sewage Works Ltd (own shares).

Name of the company : Budapest Sewage Works Ltd.
Address : 1087 Budapest, Asztalos Sándor utca 4.
Correspondence address : 1426 Budapest 72. Pf. 114.
Telephone : 455-4100
Fax : 455-4232
E-mail : vezig@fcsm.hu

Organisational structure



Management Systems

In order to render its core activity more efficient and to serve a broader scope of the needs of its consumers, Budapest Sewage Works Pte Ltd. established its Quality Management System (QMS) and Environmental Management System (EMS) in 2001, in accordance with the MSZ EN ISO 9001:2000 and the MSZ EN ISO 14001:1997 standards, certified by Lloyd's auditing organisation, the certificate being effective as of 11 June 2001.

The system was re-certified in 2004 and in 2005, the Environmental Management System (EMS) was amended in accordance with the ISO 14001:2004 standard.

The Environmental Management System has been implemented in 2001 at the South Pest and North Pest Wastewater Treatment Plants. The EMS was extended to the Angyalföld Pump Station in 2008, followed by those at Békásmegyer and Pók Street in 2009, and in 2010, the Csomád Sludge Storage Facility.

The Company's Integrated Management System was extended in 2010 by the Workplace Health and Safety Management System, designed in accordance with the MSZ 28001:2008 standard, and by the Energy Management System in 2016.

The Integrated Management System's fields of application are the following:

- Operation of sewage facilities.
- Flood and inland water protection activities.
- Environmental management.
- Investment administration activity in the areas of canalisation, wastewater treatment, flood and inland water control activities.
- Operation of the Environmental Management System in the North Pest and South Pest Wastewater Treatment Plants, as well as the Angyalföld, Békásmegyer and Pók Street Pump Stations and at the Csomád Sludge Storage Facility.

The current certification of the Integrated Management System is valid from 4 June 2019 until 11 March 2021, according to the following standards:

- Quality management according to ISO 9001:2015,
- Environmental management according to ISO 14001:2015,
- Energy management according to ISO 50001:2011,
- and occupational health protection and safety management system according to OHSAS 18001:2007.

In 2020, the key objective of the company is to renew the systems of energy management as well as occupational health protection and safety management in accordance with the requirements of the ISO 50001:2018 and the ISO 45001:2018 standards.

In 2014, the Company established the HACCP system compliant with the provisions of the Codex Alimentarius Annex CAC/RPC 1-1969, 2009 food safety standard at the South Pest and North Pest Wastewater Treatment Plants. In 2018, the HACCP area was extended to include the Small Biogas Plant at Dömsöd.

In the second half of 2010, as a step of continuing the development of the EMS, our Company began integrating the Angyalföld Pump Station into the EMAS Eco-Management and Audit Scheme in accordance with the provisions of Regulation 1221/2009/EC of the European Parliament and of the Council. The notified body, i.e. the auditing organisation of Lloyd's Austria certified the system as compliant; the certification issued upon re-certification is valid until 8 May 2020. It has been entered into the member state (Hungary) registration of the international registry system of EMAS under registration number HU-000025.

The Sampling Group, registered by the National Accreditation Authority under registration number NAH-7-0016/2019, and the Central Laboratory Group registered under NAH-1-1333/2019, perform their work in accordance with the MSZ EN ISO/IEC 17025:2018 standard and the related accreditation provisions. The accreditation statuses issued by the National Accreditation Authority are valid until 3 October 2024.

EMAS
Hitelesített környezetvédelmi vezetési rendszer
REG. NO. HU-000025

OKIRAT A KÖZÖSSÉG KÖRNYEZETVÉDELMI VEZETÉSI ÉS HITELESÍTÉSI RENDSZERE (EMAS) SZERINTI NYILVÁNTARTÁSBA VÉTELRŐL

CERTIFICATE OF EMAS REGISTRATION

A szervezet Organization	Fővárosi Csatornázási Művek Zártkörűen Működő Részvénytársaság
Telephely Site	1138 Budapest, Vizafogó u 6.
TEÁOR szám NACE code	37.00
Nyilvántartási szám Registration number	HU-000025
Első nyilvántartásba vétel dátuma Date of first registration	2011. december 21.
Az okirat érvényes This certification is valid until	2020. december 21.

E szervezet az 1221/2009/EK európai parlamenti és tanácsi rendelet szerinti olyan környezetvédelmi vezetési rendszert vezetett be, amellyel mindenkor betartja a hatályos környezetvédelmi jogszabályokat, hozzájárul környezeti teljesítményének folyamatos javításához, hitelesítette környezetvédelmi vezetési rendszerét, rendszeresen érvényesítteti és közzéteszi környezeti nyilatkozatát, szerepel az EMAS nyilvántartásban, ezért jogosult az EMAS-logó használatára.

This organisation has established an environmental management system according to the Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 complies with the current environmental legislation at any time, promotes the continual improvement of environmental performance, publishes, an environmental statement, has the environmental management system verified and the environmental statement validated by a verifier, is registered under EMAS and therefore is entitled to use the EMAS logo.

Budapest, 2019.01.31

Pest Megyei Kormányhivatal
P.H.

Főosztályvezető
Head of Department

Környezetvédelmi és Természetvédelmi Főosztály
1016 Budapest, Mészáros utca 58/a.
Telefon: (06-1) 224-9100 Fax: (06-1) 224-9163,
E-mail: orszagoszuldhatosag@pest.gov.hu Web: http://www.kormanyhivatal.hu/hu/pest

ENVIRONMENTAL VERIFIER'S DECLARATION ON VERIFICATION AND VALIDATION ACTIVITIES

Lloyd's Register Quality Assurance Ltd., with EMAS environmental verifier registration number AT-V-0022 and accredited for the scope:

Wastewater collection and treatment activities, sludge treatment

NACE Code: 37.00 Sewerage

declares to have verified:

Fővárosi Csatornázási Művek Zrt.
Angyalföld Pump Station
1138 Budapest, Vizafogó utca 4.
Hungary

meets all requirements of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community Eco-Management and Audit Scheme (EMAS) amended by commission regulation (EU) 2017/1505.

By signing this declaration, LRQA declares that:

- the verification and validation has been carried out in full compliance with the requirements of Regulation (EC) No 1221/2009,
- the outcome of the verification and validation confirms that there is no evidence of non-compliance with applicable legal requirements relating to the environment,
- the data and information presented in the Environmental Statement of the organisation reflect a reliable, credible and correct image of all the organisation's activities within the scope mentioned in the environmental statement

This document is not equivalent to EMAS registration. EMAS registration can only be granted by a Competent Body under Regulation (EC) No 1221/2009. This document shall not be used as a stand-alone piece of public communication.

LRQA Ref No: BUD0005278

Date of verification:	21 May 2017
Verification Expiry:	20 May 2020
Date of validation:	26 April 2019
Validation Expiry:	25 April 2020

Mag Florian Mitterauer, Lead Verifier
Lloyd's Register EMEA, Niederlassung Wien
1010 Wien, Opernring 1/R/741-744, Österreich
on behalf of Lloyd's Register Quality Assurance Limited

Lloyd's Register EMEA Niederlassung Wien, Opernring 1/R/741-744, 1010 Wien, Österreich, FN 239257 Z
Die Gültigkeitserklärung gilt zusammen mit der Validierung als Nachweis über die Verifizierung und Validierung. Sie werden bei der Beantragung auf Eintrag bei der zuständigen Stelle nach Artikel 3 der Verordnung benötigt. Der Text dieser Erklärung muss vollständig in der Umwelterklärung der Firma abgedruckt werden.

Integrated Management Policy

Budapest Sewage Works Pte Ltd. is one of the country's largest public utility water companies, and its activity also makes it one of the largest environmental service providers. Our fundamental task is the drainage and treatment of the precipitation and sewage water of Budapest Capital City and the surrounding municipalities, the protection of these latter against flood and internal waters, conducted at all times with respect to the effective legal regulations and the instructions of the respective authorities.

Our fundamental goal is the continuous development of the level of service, increasing the number of customers served by the services of drainage and purification of sewage and precipitation water, in a way to prevent environmental pollution, aiming for the highest possible degree of energy efficiency, in observance of the workers' health protection and work safety requirements.

In order to achieve the above, we are committed to conduct our activities according to the

ISO 9001:2015 quality control standard,

the ISO 14001:2015 environment-oriented management standard,

the OHSAS 18001:2007 occupational health and work safety management,

the ISO 50001:2011 energy management, the

food security management system implemented according to the Codex Alimentarius Annex CAC/RPC 1-1969, 2009 and

EMAS – certified environmental management system as per the 1221/2009/EC decree at the Angyalföld Wastewater treatment plant.

The management and all employees of Budapest Sewage Works Pte Ltd are committed to continuously improve the level of quality of their services.

In order to achieve the above goals, the management of our company sees the following as most important:

The management of Budapest Sewage Works Pte Ltd has taken an exemplary and initiating role in organising the Integrated Management System and considers it its task to present and explain the Integrated Management Policy to the employees.

The management of Budapest Sewage Works Pte Ltd undertakes the following tasks, in order to ensure the process of fully meeting the requirements:

- compliance with the appropriate laws and official regulations;
- correct business behaviour, establishing mutual trust with the interested parties;
- quick, punctual and flexible service;
- recognition of consumer needs and their immediate satisfaction in case of justified observations;
- ensuring the necessary technical and personal conditions to conduct the activities, and their continuous development;
- reduction of the amount of natural resources consumed, prevention of environmental pollution, enhancing environmental performance;
- continuous development in every field of activity of the Company.

Our Company expects from its subcontractors and suppliers to guarantee meeting the requirements concerning the services and materials they supply.

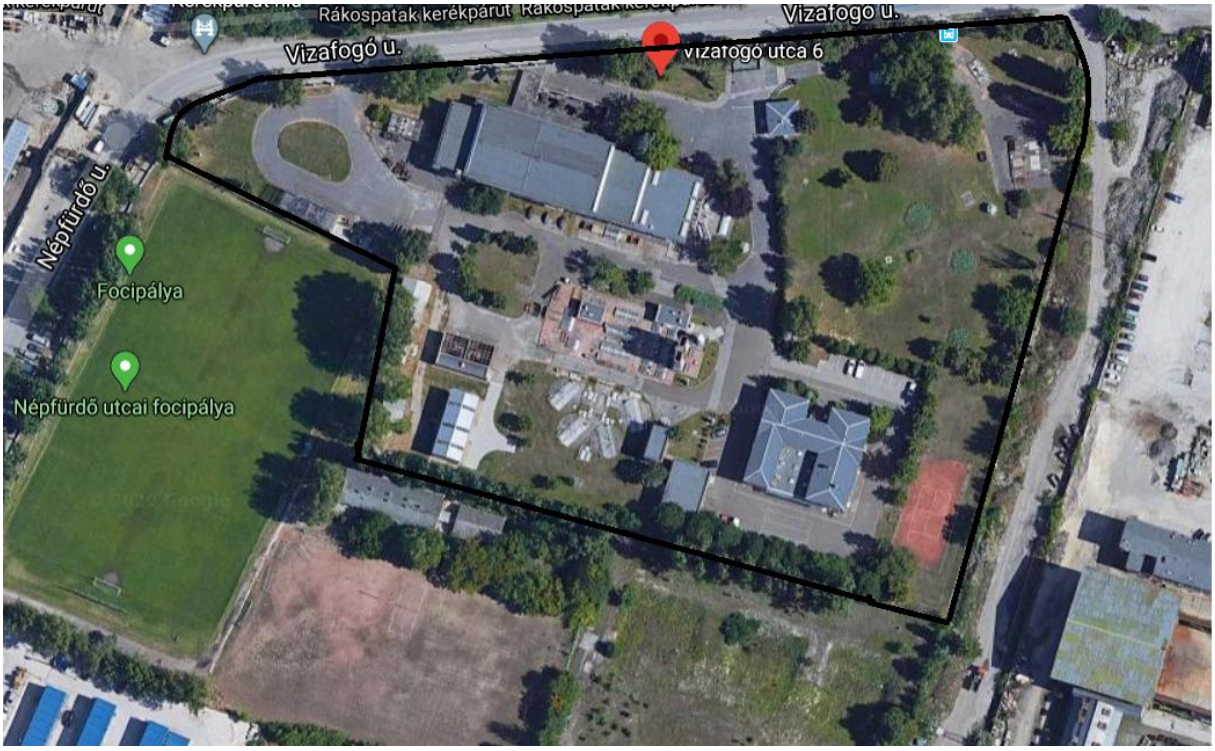
Budapest Sewage Works Pte Ltd strives to develop the quality of its service activity by creating a unified service environment to achieve the satisfaction of its consumers, employees as well as the residents of Budapest Capital City and the surrounding municipalities, faithful to the Company's new motto: "In service of Man and the Environment".

Budapest, 2nd January 2020.

György Palkó
Chief Executive Officer

Angyalföld Pump Station

Address:	Budapest XIII., Vizafogó utca 6.	
Lot number:	25884/4	
Boundaries:	North and West side	Bp. XIII. Vizafogó út
	South side	Budapest Sewage Works Ltd. sports facility and housing estate unbuilt area
	East side	TÁRÉRT Rt. access road
Facility area:	4 ha / 4.889 m^2	
Construction rate:	19.7%	
Site environment	Industrial area	



The pumps station was built in the period 1936-1944. Its present level of construction was achieved by the year 2011 via several former reconstructions. Until 1998, the pump station functioned as an end point pump station, and as of 1998 it forwards the water to be purified through a twin pressure pipe to the North-Pest Wastewater Treatment Plant.

The pump station handles wastewater arriving from the main collectors at Rákos-völgy (Rozsnyai Street), Újpest (Cserhalom Street and Váci Street North and South) and from the Jakab József Street main collector.

The function of the pump station is to forward the waste water to the North-Pest Wastewater Treatment Plant to the capacity of the dry season wastewater peak volume, the diluted waters above this volume into the streamline and precipitation water into the River Danube by

gravitational means or by elevator pumps depending on the water level by riverbank discharge.

Under ordinary conditions, the plant operates in automatic mode with the help of the local automatics and the plant's monitoring control system. Furthermore, resulting from the plant's sewage treatment and other general tasks, and to cater for rapid and efficient alleviation of the occasionally emerging exceptional events the plant is staffed with personnel employed in a continuous work schedule.

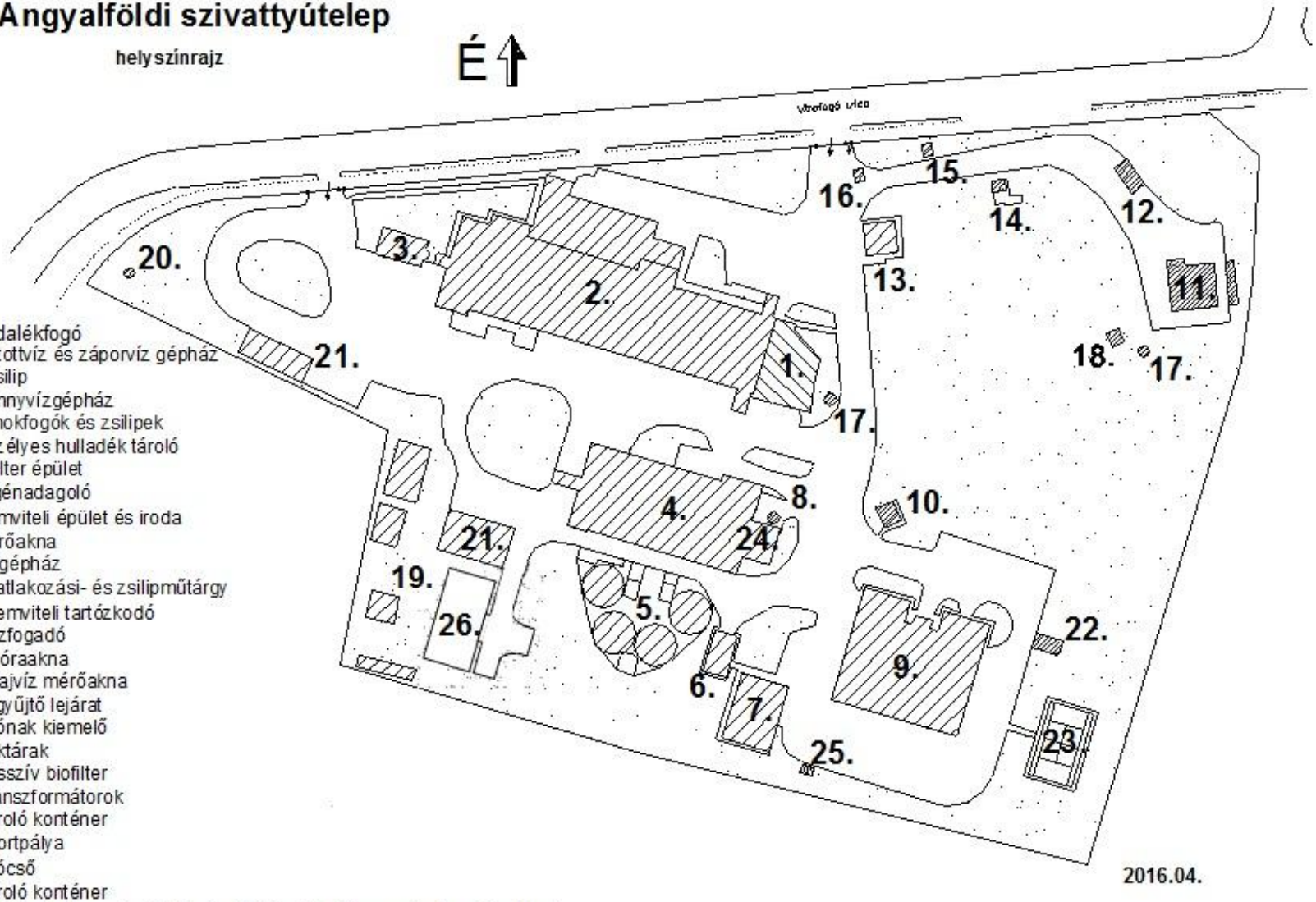
In dry season an average of 70 – 80,000 m^3/d sewage water arrives to the plant.

Our Company is committed towards the observance and enforcement of the effective legal regulations.

Angyalföld Pump Station has no environmental non-conformity at all, and neither have we had any information on any case where the authorities resolved to put the Company in the wrong in relation to the plant or any verdict of any court stating that the plant failed to carry out any of its environmental and nature conservation obligations.

Angyalföldi szivattyútelep

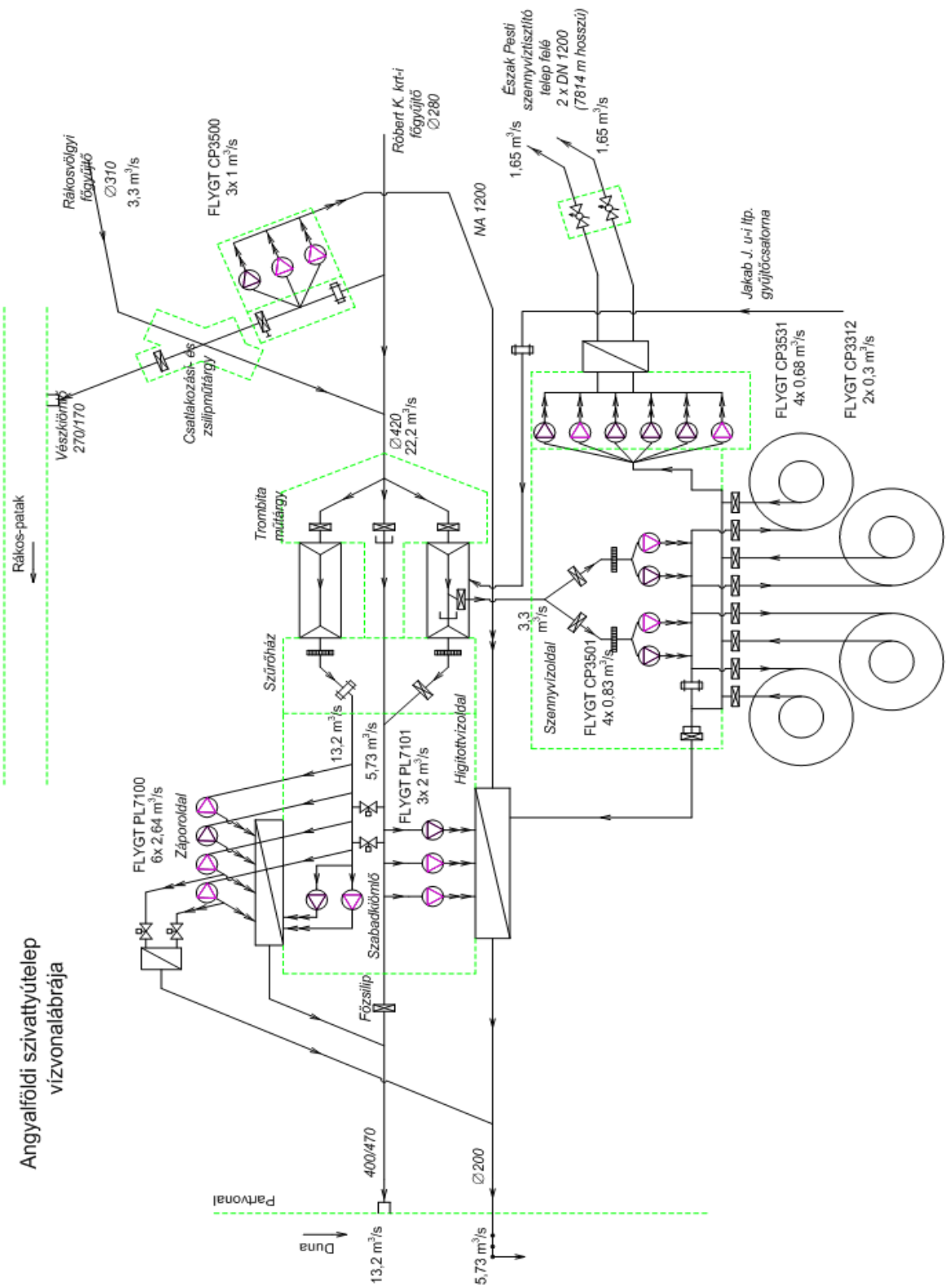
helyszínrajz



1. Hordalékfogó
2. Higítottvíz és záporvíz gépház
3. Főzsilip
4. Szennyvízgépház
5. Homokfogók és zsilipek
6. Veszélyes hulladék tároló
7. Biofilter épület
8. Oxigénadagoló
9. Üzemviteli épület és iroda
10. Mérőakna
11. Kisgépház
12. Csatlakozási- és zsilipműtárgy
13. Üzemviteli tartózkodó
14. Gázfogadó
15. Vízóraakna
16. Talajvíz mérőakna
17. Főgyűjtő lejárat
18. Csónak kiemelő
19. Raktárak
20. Passzív biofilter
21. Transzformátorok
22. Tároló konténer
23. Sportpálya
24. Állócső
25. Tároló konténer
26. Mobil gátelem tároló (Ár- és Belvízvédelmi osztály kezelésében)

The technology of the Angyalföld Pump Station

The signs of the water level drawing were used for the plant's technological description.



The sewage and precipitation water enter the plant through a pipe of diameter 4.3 m of half Paris sewer section at its end (4).

The main collection canal of Jakab József Street (3) connects from the South directly into the sewage side drift trap with a diameter of 100 cm.

The arriving waters are distributed by the distributor facility (6).

The Northern branch connects via the ZS2 sluice to the precipitation side sand trap (11.1), onto the R5 and R6 filter grills and via the B2 board into the precipitation side suction area (11.3 and 11.4).

The Southern branch connects via the ZS1 sluice to the sewage and diluted water drift trap (7) and via the diluted water check dam onto the R3 and R4 filter grills, then via the ZS18 sluice into the diluted water suction area (10.2). The sewage waters are guided to the sewage side by the weir.

The sediments are removed from the sand trap facilities by an excavator. The excavated material is introduced into the containers through the sludge condenser press (E4). A vibrator platform container helps the matter take up its final position for transport. The vibrator table serves to float and separate the wet fraction.

A canal of cross section 2 x 2 m is branched out of the diluted water side drift trap (7). The canal is closed by the hydraulic sluice ZS6 to prevent the facility from being flooded.

The canal is fitted with a water throughput quantity measurement unit.

The canal is divided into two identical (twin) branches. Following B3-B4 insertion board closure and ZS7-ZS-8 sluices, R1-R2 filter grills and, B5-B6 insertion board closure the water enters the suction area (9.3). Solid wastes caught by grills R1 and R2 are carried by transport screws to the washing press, after which – following washing and compaction – it if put into the transport containers. The filtered wastewater is elevated by pumps SZ1-SZ4 to the distribution canal (9.4) via the pressure pipes and end clacks V10-V13. From the distribution canal (9.4) the water is fed into the circular sand trap (9.6), then into the lower canal (9.4) and the suction area of the second pump group (9.7). Pumps SZ5-SZ10 are connected to the collector pipes. The clack valves V1-V6 have been fitted to the pressure side pipes of the pumps. Sectioning gate valves on the collector pipes ensure the alternate operation of the pair of pressure pipes leading to the purification facility (9.12). Stationary pipes have been fitted to the pressure pipes in order to eliminate water impacts (9.8). After the stationary pipes along the section of the pressure pipes until the bridge over the Rákos Creek (9.12.1) discharge wells fitted with gate valves to let the water down and close the pressure pipes (9.12.2 and 9.12.5).

Double level distribution canal (9.4)

Upper canal (9.4): dives the water to the sand traps (9.6). If necessary, by lifting the insertion board B9 at the end point the water may enter the riverbed pressure pipe via the side weir. The side weir also functions as an emergency discharge flow unit.

Lower canal (9.4): drives the water coming from the sand traps (9.6) to the suction area of the II/A. pump group (9.7). If necessary, by opening the ZS17 sluice at the end point, the water may be discharged into the riverbed pressure pipe.

Sand traps (9.6)

Following removal of the grill wastes the wastewater enters one of the four circular sand traps (9.6), where gravitational sedimentation takes place.

The sedimented material accumulating in the sump of the traps is fed into a sand fractioning device with the help of pumps.

Diluted water machinery building (10)

The diluted water coming through the weir in the southern drift trap (7) enters the diluted water suction area via the machine-cleaned R3-R4 filtering grills and the ZS18 sluice (10.2), from where it is lifted by the SZ11-SZ13 pumps into the pressure well (10.3), after which it enters the streamline of the Danube via the riverbed pressure pipe (10.7).

Precipitation water machinery building (11)

Water enters the precipitation suction area (11.3 and 11.4) via the northern drift trap (11.1) and the R5-R6 filter grills through the B2 insertion board closure from where the SZ14-SZ19 pumps forward it to the rainwater pressure well (11.8), then it is introduced into the Danube River through the free discharge canal (12) with a riverbank discharge hole (12.2). 2 pumps are capable of forwarding the water towards the riverbed pressure pipe too (10.7) if necessary. The diluted and rainwater suction area are linked together via two gate valves (T1-T2).

Solid grill waste is removed with a common transport screw on both the diluted water and rainwater sides.

Small machinery building pump plant (13)

This was constructed for temporary water movement before the plant reconstruction was carried out. It may be used upon the occasional breakdowns of the functioning facilities. Its pressure pipe is linked into the diluted water pressure well (10.3).

Free discharge options

Meder Street sluice:

At the collector canal of Cserhalom Street it is possible to discharge water by closing the canal and opening the free discharge hole.

Dimensions: 1400 mm (Towards the plant)
2000 mm (Towards the Danube River)
Operation: remote, mechanised

Tatai Street closure

By closing the canal on the main collector of Rákos-völgy and opening the free discharger it is possible to discharge over the weir into the Rákos Creek with the help of insertion boards.

Dimension: 1400 mm diameter
Insertion: by mobile crane

Discharge unit of the temporary pump house

Dimensions: 2830x1800 mm
Operation: manual

Twin pressure pipe leading to the wastewater treatment plant (9.12)

The size of the pipes until the mixing well is 1,140 mm Rocla, and from there to the purification plant it is 1,650 mm Rocla. The total length of the pressure pipe is 4,129 m of which the length to the mixing well is 3,465 m. Starting from the plant, it crosses the Rákos Creek and the Bay of Újpest on pipe bridges. There are automatic air release points on the pipe bridges as these are the highest points of the system (9.12.1).

The pressure pipes of the plant can be discharged in the gate valve and discharge wells (9.9), and at the Csavargyár Street and at the mixing wells by gravitational means (9.12.7), while at the bay with the help of pumps in the well specifically built for this purpose (9.12.5). This requires temporary energy supply and the suction and washing vehicles must also be used.

At the plant, every pressure pipe is fitted with an induction water quantity meter (9.11).

Oxygen dosage system (9.10)

Oxygen is introduced into the North-Pest Wastewater Treatment Plant to prevent further generation of putrid gases in the wastewater and to reduce the quantity of these.

Oxygen is dissolved in the water in the pressure pipes leading to the purification plant.

Liquid oxygen is evaporated through the vaporiser; a redactor reduces the pressure of the gas to the desired dosage pressure and then with the help of a regulatory valve the necessary quantity is fed in.

(Automatic regulation of the valve is adjusted according to the H_2S concentration of the wastewater and its throughput volume.)

/The dosage can also be adjusted manually/

Deodorisation (Biofilter)

The polluted air of the wastewater reception, distribution, drift trap, filer house, external sand trap and grease collection facilities is collected in an aeration piping system and carried away.

The polluted air is sucked away by two ventilators and forwards it into the deodorisation biofilter unit from where it is released to the environment. The volume of polluted air carried away by the ventilators is 24,000 m^3/h.

The activity of the biofilter layer is ensured by the nutrient containing liquid continuously dosed into the filters by spraying.

At the start the nutrient liquid is a dilute aqueous solution of potassium-hydroxide and phosphoric acid, and diluted aqueous solution of phosphoric acid upon continuous operation. Softened water is used to prepare the solution in order to prevent the build-up of gypsum in the filters.

The spraying pump's operation is controlled by the relative moisture content meters and the thermometers of the biofilters.

The generation of soft water is provided by a double column water softening device.

The air exchange of the parts of the facility below ground level is solved using an aeration system made of blow and suction heads, air ducts, internal circulation and fresh air mixing units. The capacity of the air suction is 3000 m^3/h.

The polluted air sucked away from the plant is released into the atmosphere through a biologically active filter layer after humidification.

Dosage of chemicals

In order to treat the wastes of the canalisation of the plant, chemicals are added to the solid grill wastes and the sediments at four points on the sewage water and the rainwater side. Dosage is done by means of automatically operated twin tank equipment fitted with a salvage unit. The dosage pump starts upon operation of the machinery unit in question.

The chemical used is sodium hypochlorite.

Plant control system

The monitoring and control system at the plant covers the entire technological process and allows remote intervention for the purpose of controlling. The display PC unit displays the characteristic technical parameters on the monitor and constantly logs the data and the events.

Operation of the EMAS system at Angyalföld

At our company, compliance with the EMAS Decree is ensured by the Integrated Control Manual and the related process descriptions and regulations. The operation of the EMAS system is regulated by the process description titled: “The planning and operation of the authenticated environmental management system”.

While elaborating EMAS, our Company identified and evaluated all environmental factors resulting from the earlier, the current and the planned or new and modified activities.

The environmental factors and effects are revised at least once annually by the managers of the units concerned, following managerial overview, with the help of the environmental coordination officer. When introducing new or modified technologies or activities and the course of planning and implementation, the (expected) environmental factors and effects are identified and evaluated. The environmental factors and effects are recorded in the documents titled “Environmental factors”.

Depending on the results of the evaluation, the environmental management officer will implement the required amendments in the environmentally focused management system, and, in compliance with the requirements of the EMAS and the legal regulations concerning significant environmental effects, and in order to constantly improve environmental performance, (further) objectives and environmental programmes are set out.

The objectives, prospects and the environmental programmes required for their implementation are recorded in the document titled “Environmental objectives, prospects and programmes”. The programmes’ implementation is monitored in a predefined manner by the Company’s management and evaluates the efficiency of the former according to the process description titled “Measurement and process evaluation”.

If any deviations are observed from programmes or action plans, corrective activities are initiated, these being likewise regulated by the process description titled “Measurement and process evaluation”.

For any events of force majeure, damage avoidance plans have been prepared.

The processes and rules of internal and external communications (Interested external parties, media) follow the currently effective regulation titled “Communication – Public Relations”.

For documents that require annual revision, amendments are prepared by the management of the plant. The environmental declaration updated annually shall be made publicly available on our website. Documents no longer effective are kept for the period set out in the corresponding regulations.

Legal compliance

The most important legal acts influencing the operation of the Angyalföld Pump Station:

1995. LIII. Act on General Rules for the Protection of the Environment

1995 LVII. Act on Water Management

2011 CCIX. Act on Water Utilities

2012 CLXXXV. Waste Act

306/2010. (XII.23.) Government Decree on air protection

2015 LVII. Act on Energy Efficiency

1996 LIII. Act on the Protection of Nature

The Angyalföld Pump Station has the necessary permits. Our company prepared the data required by law and submitted it to the authorities on time.

Decrees and other requirements and all effective environmental legal regulations are fully adhered to and ensure their observance.

For the sake of compliance with the legal and other requirements, our Company carries out regular internal controls, promoting the continuous improvement of the environmental factor, educating its employees. All employees are obliged to participate in the continuous operation and development in this system.

The environmental performance of the Angyalföld Pump Station continuously meets the expectations, the legal compliance is certified.

Significant environmental effects and their determination

Whenever necessary, but at least once annually, under coordination of the corporate environmental officer the overview of the environmental factors and impacts takes place. The environmental effects and expected impacts upon the introduction of new or modified technologies or activities or upon new investments are identified and evaluated in the planning as well as the implementation phases.

To evaluate the environmental factors and to determine the significant factors the actual and the potentially emerging effect of the factors on the environment are taken into consideration. The environmental factors are determined to enable unambiguous identification of the materials and energy released into the environment and the risk of possible average can be estimated.

Environmental effects are evaluated based on five key aspects:

1. Conformity with legal and other regulations
2. Risks: probability of occurrence, significance of possible consequences
3. Aspects of the parties involved
4. Corporate philosophy/image
5. Lack of information

Two documents are prepared on the evaluation of the environmental effects and impacts: the "List of Environmental Factors" and the "Environmental Impact Registry".

Significant environmental effects on the plant:

Environmental impact		***Prevention***
Bad smelling gases released into the atmosphere	direct	Usage of biofilters and plantation of bordering tree line.
Diluted waters polluting the Danube during heavy rains if the plant works into the streamline.	direct	Mechanical cleaning of the diluted waters
Polluting effects of wastewater and precipitation water drained from the unified canalisation system without mechanical pre-treatment to the Danube.	direct	It may occur under exceptional conditions or emergency operation.
Noise pollution of the operating equipment	direct	Closure of the doors and windows of the machinery housing, usage of individual noise protection gear
Hazardous and non-hazardous wastes generated during the plant's operation.	direct	Observance of handling instructions. Removal and disposal of the waste generated is undertaken by a licensed firm.

Environmental impact		***Prevention***
Electricity consumption of the plant	direct	Following instructions in the operation manuals of the equipment
Combustion products of boilers emitted into the air	direct	Operated by specialist firms in observance of the operational instructions.
Management of technological wastes	direct	Observance of handling instructions
Handling hazardous wastes	direct	Observance of handling instructions
Handling hazardous material stored in barrels and cans and their air and ground pollution when discharged from one container to another	direct	Observance of handling instructions
Polluting effects of the materials, tools and their packaging materials stored.	direct	Observance of handling instructions. Removal and disposal of the waste generated is undertaken by a licensed firm.
Air pollution during transportation of wastes (CO_2 emission)	indirect	

Basic indicators 2019

The basic indicators at the Angyalföld Pump Station have been determined in relation to the sewage and rainwater treated at the plant. Exceptions from this are the quantities of the communal and selectively collected wastes, projected onto the number of employees at the plant.

Basic indicators	***"A" number***		***"B" number***	***"R" number***
Energy consumption	***10,942.035 GJ***		***28,188,070 m^3***	***0.00039 GJ/m^3***
Electricity	2,820,904 kWh	10,155.254 GJ		
Natural gas	22,418 Nm3	781.001 GJ		
Diesel	170 l	5.78 GJ		
Water	***2,024 m^3***		***28,188,070 m^3***	***0,0001 m^3/m^3***
Wastes	***8.54 t***		***20 persons***	***0,43 t/person***
selectively collected+	8.54 m^3			
technological	***1,011.54 t***		***28,188,070 m^3***	***3.59 x 10^{-5} t/m^3***
grill waste	429.885 t			
sand trap	581.57 t			
hazardous waste	0.088 t			
Material consumption	***95.262 t***		***28,188,070 m^3***	***3.38 x 10^{-6} t/m^3***
Oxygen	88.88 t			
Industrial salt	0.15 t			
Sodium-hypochlorite	5.583 t			
Zeolite	0.65 t			
CO_2 emission coming from the use of energy sources*	**848.65 t CO_2**		***28,188,070 m^3***	***3.0 x 10^{-5} t/m^3***
Electricity	789.85 t CO2			
Natural gas	52.07 t CO_2			
Diesel	0.65 t CO_2			
Transport**	6.08 t CO_2			
NO_X emission coming from the use of energy sources	**0.247 t NO_X**		***28,188,070 m^3***	***8.76 x 10^{-9} t/m^3***

*The data concerning CO_2 emissions in the table above have been calculated using reference literature and the method found on the following website: www.climateaustria.at

**Estimated data containing transport of the wastes and materials. The table does not contain the CO_2 emission released upon the employees commuting to work.

The company's own vehicles as well as those used in transport of wastes and other materials possess the appropriate green cards.

A structural reorganisation took place at the Directorate of Elevator Pump Stations; the Angyalföld Pump station ceased to exist as an organisational unit. As of 1 May 2013, the Angyalföld Pump station became the central facility of the Northern Pump stations' Group. The Group operates three Pump stations, i.e. Angyalföld and the Békásmegyer and Pók Street Pump stations. Permanent daytime staff increased at the facility from a staff of 11 to 20 persons.

Our company is a member of the Hungarian Water Utility Association. Thanks to the developments ongoing at our Company, it can be deduced from communication conducted with several MAVÍZ member companies that our environmental indicators are at the level of similar indicators of other water utility providers, or above average.

Basic indicators	**2017**	**2018**	**2019**
Energy efficiency	0.00040 GJ/m^3	0.00039 GJ/m^3	0.00038 GJ/m^3
Water	0.0001 m^3/m^3	0.0001 m^3/m^3	0.0001 m^3/m^3
Technological wastes	4.79 x 10^{-5} t/m^3	3.67 x 10^{-5} t/m^3	3.59 x 10^{-5} t/m^3
Material consumption	1.72 x 10^{-6} t/m^3	1.53 x 10^{-6} t/m^3	3.38 x 10^{-6} t/m^3
CO_2 equivalent of the use of energy sources	4.0 x 10^{-5} t/m^3	3.78 x 10^{-5} t/m^3	3.0 x 10^{-5} t/m^3

Basic indicators	***2017***	***2018***	***2019***
Energy consumption	***12,645.257 GJ***	***12,143.1461 GJ***	***10,942.035 GJ***
Electricity	11,112.3108 GJ	11,221.005 GJ	10,155.254 GJ
Natural gas	1,519.0817 GJ	916.645 GJ	781.001 GJ
Diesel	8.0 GJ	5.5 GJ	5.78 GJ
Water	***2,954 m^3***	***2.307 m^3***	***2,024 m^3***
Wastes^{+}	***13.779 t***	***7.007 t***	***8.54 t***
selectively collected^{+}	5.606 t	7.007 t	8.54 t
technological	***1,453.103 t***	***1,153.31 t***	***1,011.54 t***
grill waste	532.8 t	783.15 t	429.885 t
sand trap	920.23 t	370.14 t	581.57 t
hazardous waste	0.073 t	0.030 t	0.088 t
Material consumption	***52.252 t***	***48.111 t***	***95.262 t***
Oxygen	45.697 t	44.241 t	88.88 t
Industrial salt	0.225 t	0 t	0.15 t
Zeolite	0.9 t	0.6 t	0.65 t
Sodium-hypochlorite	5.43 t	3.27 t	5.58 t
CO_2 emission coming from the use of energy sources	**1,215.44 t CO_2**	**1,187.81 t CO_2**	**848.65 t CO_2**
Electricity	1,117.4 t CO_2	1,128.33 t CO_2	789.85 CO_2
Natural gas	83.89 t CO_2	50.61 t CO_2	52.07 t CO_2
Diesel	0.5 t CO_2	0.41 t CO_2	0.65 t CO_2
Transport**	13.65 t CO_2	8.64 t CO_2	6.08 t CO_2

The mechanised cleaning of the sand traps was omitted in 2018, and it was carried out in early 2019. Because of this, the quantity in 2019 in comparison to the previous year showed an increase of nearly 60%.

Apart from the carbon-dioxide emission resulting from the energy consumption of the Angyalföld Pump Station and the movement of the vehicle stock, no other forms of significant forms of greenhouse gas emissions are present.

Due to the malfunction of the oxygen dosing pump, oxygen dosage took place via the auxiliary system, but the oxygen input via this system cannot be regulated with adequate precision, which resulted in an increase of 100%.

Water discharge

In case of rainfall, diluted waters and rainwater exceeding 1.6 m^3/s in volume are pumped via the riverbed pressure pipe into the streamline of the Danube following mechanical cleaning.

For diluted waters the extent of dilution is ~3.5 – 4.

	Wastewater forwarded to North-Pest Wastewater Treatment Plant	Diluted water discharged into the Danube	Total
	m^3		
January	2,365,632	11,000	2,376,632
February	2,098,314	16,000	2,114,314
March	2,345,652	0	2,345,652
April	2,190,834	0	2,190,834
May	2,808,252	1,396,000	4,204,252
June	2,431,962	461,000	2,892,962
July	2,262,708	883,000	3,145,708
August	2,129,760	101,000	2,230,760
September	2,239,038	106,000	2,345,038
October	2,177,622	13,000	2,190,622
November	2,440,024	449,000	2,889,024
December	2,698,272	367,000	3,065,272
	28,188,070	3,803,000	31,991,070

In 2019, the volume of diluted water and stormwater released in the Danube was: 3,803,000 m^3.

The volume of diluted water and stormwater released in the Danube increased in 2019. In the year 2019, a total of 512 mm of precipitation fell in the capital city, while the corresponding figure for 2018 was 493 mm. The month of May was extremely rainy in the capital city; 2,5 times the average monthly precipitation quantity fell. November and December of 2019 were also wetter than the long-term average.

(Source: http://www.ksh.hu/docs/hun/xstadat/xstadat_evkozi/e_met001.html?lang=hu,)

No pollution has taken place upon discharge into the Danube.

The Middle Metropolitan Directorate of Disaster Management, Deputy's Organisation, Disaster Management Authority Division did not set limit values for the diluted waters and rainwater released into the Danube.

The electricity consumption of the discharge of the diluted and rainwater can be found in the total electricity consumption of the plant.

Waste management

One of the most characteristic features of human existence is the continuous generation of wastes. Budapest Sewage Works Ltd. strives to minimise waste generation throughout its activities and to carry out its waste management obligations in conformity with the respective legal regulations and those set forth by the authorities.

A new waste management system has been in operation at the Company since 2009 in order to maintain the environmental status with higher efficiency at a lower cost. This system covers all organizational units of the Company and almost all segments of waste generation.

Selective wastes

The communal wastes generated at Angyalföld Pump Station are identical in terms of its composition to general office communal waste. The entire quantity of waste is deposited.

Our Company introduced the selective collection of paper and plastic wastes in 2006 at its Asztalos Sándor Street and Kerepesi Street facilities and in 2009 at all its sites, including the Angyalföld Pump Station.

Name of waste	***HAK-code***	***Quantity***	
		m^3/year	***(t/year)***
Selectively collected wastes*	15 01 01	6.7	8.442
	15 01 02	6.7	0.094

The increasing volume of selectively collected waste, year after year is indicative of the employees becoming increasingly conscious about selective waste collection.

Technological wastes

Production wastes generated upon wastewater treatment (canal sludge, grill waste, drift from the stone and sand traps, etc.) are deposited following appropriate treatment.

The sand trap waste delivered to the North-Pest Wastewater Treatment Plant will be partially reused.

Name of waste	***HAK-code***	***Quantity***	
		m^3	***(t/year)***
Grill waste	19 08 01	901.5	429.885
Sand trap drift	19 08 02	597	581.57

The mechanised cleaning of the sand traps was omitted in 2018, and it was carried out in early 2019. Because of this, the quantity in 2019 in comparison to the previous year showed an increase of nearly 60%.

The grill waste press that broke down in 2018 was repaired in 2019, which allowed grill waste to be transported in compressed form. The volume of grill waste transported in 2019 showed a decrease of approximately 40% in comparison to the previous year.

Hazardous wastes

Throughout its activity, our Company contracts appropriately licensed companies to carry away and neutralise part of the wastes generated. The other part of the hazardous wastes (e.g. used ink cartridges, toners, batteries, etc.) is returned for recycling.

Collection sites have been set up at the plant for hazardous wastes.

The total quantity of hazardous wastes collected at the plant in 2019 was 88 kg, 25% of which was made up of fluorescent tubes scrapped as part of the light source replacements determined in the environmental programme for 2019.

Energy consumption

Electricity

Electricity is used directly or indirectly to operate the technological equipment of the pump station.

The electricity supply of the plant is provided by ELMŰ's Angyalföld and Kárpát Street sub-stations, from two independent, looped 10 kV networks.

The electricity consumption of the plant in 2019 was 2,820,904 Wh.

Gas consumption

The heating of the plant is ensured by 2 units of 225 kW Viessmann Triplex RN and 2 units of 130 kW Viessmann Triplex TN-022 fanless type gravitational natural gas fired boilers.

The natural gas consumption of the plant in 2019 was 22,418 m^3.

Water consumption

The Angyalföld Pump Station is connected to the potable water grid of Budapest Waterworks. Technological and social water supply is provided from the potable water grid.

The total water consumption in 2019 was 2,024 m^3.

Clean air protection

Treatment and purification of the waste waters inevitable releases bad smelling gases into the atmosphere because of the high content of organic materials. Several technologies are available to deodorise the polluted air. At the Angyalföld Pump Station the polluted air is cleaned using biofilters.

The task of biological deodorisation is the removal of the pollutants in the polluted air (Mercaptans, ammonia and hydrogen-sulphide).

Our Company aims to provide the residents of the plant's surrounding areas with regular air quality evaluations and actions if necessary.

In the Angyalföld station, the air of the reception, distribution, drift traps, filter houses and the external sand traps and grease separators is collected and ducted away by a pipe network.

The polluted air is sucked away by two ventilators and forwards it into the deodorisation biofilter unit from where it is released to the environment. The volume of polluted air carried away by the ventilators is 24,000 m^3/h.

The activity of the biofilter layer is ensured by the nutrient containing liquid continuously dosed into the filters by spraying. At the start the nutrient liquid is a dilute aqueous solution of potassium-hydroxide and phosphoric acid, and diluted aqueous solution of phosphoric acid upon continuous operation. Softened water is used to prepare the solution in order to prevent the build-up of gypsum in the filters.

The spraying pump's operation is controlled by the relative moisture content meters and the thermometers of the biofilters.

The generation of soft water is provided by a double column volume-controlled water softening device.

The air exchange of the parts of the facility below ground level is solved using an aeration system made of blow and suction heads, air ducts, internal circulation and fresh air mixing units. The capacity of the air suction is 3,000 m^3/h.

The polluted air sucked away from the plant is released into the atmosphere through a biologically active filter layer after humidification.

Heating of the plant is done by means of two units of 225 kW Viessmann Triplex RN and two units of 130 kW Viessmann Triplex TN-022 gravitational, natural gas fired boilers without ventilators.

No complaints or reports have been sent to the plant regarding bad odours.

Based on the air quality evaluations conducted in 2014, the plant's emission of pollutants has been established as detailed below:

Point sources

Based on the operating license PE-06/KTF/9642-2/2019 issued for the fixed air polluting point sources operating at the Angyalföld Pump Station, the emissions must be verified every 5 years.

Based on the air purity measurements performed in 2019, the plant's emission of air pollutants was the following.

Point sources: P1 gas boiler chimney (machinery housing boiler) – out of order at the time of measurement

P2 gas boiler chimney

P4 Biofilter flue 1

P5 Biofilter flue 2

P6 Biofilter flue 3

	Pollutant	**concentration for 3 v/v% O_2 (mg/Nm^3)**	**limit value for 3 v/v% O_2 (mg/Nm^3)**	**excess of limit value (mg/Nm^3)**
P2	carbon-monoxide	161	100	0
P2	nitrogen-oxides	51.8	350	0

	Pollutant	**concentration for 3 v/v% O_2 (mg/Nm^3)**	**limit value for 3 v/v% O_2 (mg/Nm^3)**	**excess of limit value (mg/Nm^3)**
P4	hydrogen-sulphide	1.4	5	0
P5	hydrogen-sulphide	<1.2	5	0
P6	hydrogen-sulphide	<1.2	5	0

No excess of limit values has taken place at the plant in relation to air pollutants.

The forthcoming air quality checks will be conducted according to the corresponding legal regulations in 2024.

Olfactometry

The determination of the olfactometry examination-based separation efficiency of the biofilters has been carried out once annually as well as odour checks in the proximity of the plant.

In 2019, the ALIZAIR I. biofilter was examined. The ALIZAIR I. biofilter, the ALIZAIR II. biofilter and the FOBA biofilter operated without load, as both the inbound and outlet odour concentrations were low. The results of the test were:

Alizair biofilter (branch 1):

- The separation efficiency of the biofilter cannot be defined as the biofilter operated without load in the period examined. Both inbound (78 Odour Units/m^3) and outbound (15 Odour Units/m^3) odour concentration values were compliant. The filtration efficiency of the biofilter is 90.9 %, which is compliant.

Alizair biofilter (branch 2):

- The separation efficiency of the biofilter cannot be defined as the biofilter operated without load in the period examined. Both inbound (24 Odour Units/m^3) and outbound (17 Odour Units/m^3) odour concentration values were very small.

FOBA biofilter:

- The separation efficiency of the biofilter cannot be defined as the biofilter operated without load in the period examined. Both inbound (16 Odour Units/m^3), and outbound (14 Odour Units/m^3) odour concentration values were very small.

In 2019, the investigation conducted in the proximity of the plant provided the following results:

- At all the designated sampling points in the proximity of the plant, no odour effects characteristic of the plant could be detected.

No complaints or reports have been sent to the plant regarding bad odours in the year 2019.

Transport

The facility's own vehicles, as well as those used for waste and material transport all have their green cards.

We constantly strive to plan optimal routes when using motor vehicles.

Air conditioning equipment

In the switch areas of the pump station, air conditioners are used to prevent overheating of the equipment. According to the leakage tests conducted on 12th October 2011 the air conditioning equipment are airtight.

The energy consumption of the air conditioning equipment can be found in the plant's total consumption; the consumption of the air conditioners is not measured separately.

Noise effect

Partly as a result of the technology applied, partly because of the inbound and outbound deliveries and because of the movement of the employees, the operation of the pump station results in noise emission.

In 2018 – as in the previous years – worksite noise exposure examinations, environmental noise emission/load and noise protection impact area determination were carried out at the plant.

Based on the expert's opinion the following have been concluded:

"The noise emission and environmental noise load generated by the plant comply with the relevant regulations."

"The noise exposure and noise load the employees are subjected to even without ear protection gear is in conformity with the requirements regarding noise exposure as the noise exposure of $L_{EX,8h}$ and the L_{max} maximum sound pressure level is more than 3 dB less than the noise exposure requirements."

Besides compliance, in order to avoid subsequent problems, the workers of the shift must be provided individual hearing protection devices, primarily at the sand handling structure, the container room, the biofilter machinery room and the metalworking workshops, and their use is recommended, as the $L_{EX,8h}$ noise exposure exceeds the lower intervention limit /$L_{EX,8h}$=80 dB(A)/

Over the past 7 years, no reports have been sent to our Company regarding noise effects of the plant. The Angyalföld Pump Station is in full conformity with the legal regulations regarding noise and vibration protection; the Middle-Danube-Valley Inspectorate for Environmental Protection and Nature Conservation did not request noise load measurement of the plant.

Dosage of chemicals

Sodium-hypochlorite

In order to treat the wastes of the canalisation of the plant, chemicals are added to the solid grill wastes and the sediments at four points on the sewage water and the rainwater side. Dosage is done by means of automatically operated twin tank equipment fitted with a salvage unit.

	2018		2019	
		Calculated for 1 ton of waste material		Calculated for 1 ton of waste material
Sodium-hypochlorite	3,270 kg	4.175 kg/t	5,583 kg	12.987 kg/t

In 2014, following reconciliations with the deposition facility, a dosage of sodium-hypochlorite of 25l/container has been determined to prevent potential germ propagation.

In 2019, deliveries of sodium hypochlorite returned to normal schedule, and the volume of grill waste also decreased in comparison to the previous year. The volume of sodium hypochlorite used in 2019 corresponded to normal dosage.

Oxygen dosage

Oxygen dosage at the plant took place until 2008 according to quantitative parameters by manual adjustment. In 2008, an environmental programme was launched to optimise oxygen dosage, based on the quantitative and qualitative parameters of the water inbound to North-Pest Wastewater Treatment Plant.

The quantity of oxygen to be dosed depends on the sulfide content of the wastewater. To determine this, following trial measurements at several locations, the most appropriate measurement point proved to be the suction space of the pumps ensuring the water supply of the North-Pest Wastewater Treatment Plant. Here, using a hydrogen sulfide meter, sulfide content is determined from the gaseous phase. The sulfide value of the gaseous phase, according to experience obtained so far, fully correlates with that of the aqueous phase. The continuous quantitative regulation of automatic oxygen dosage takes place based on these measured values.

Since these measurements have been put to operation in 2008, oxygen dosage has been performed as described above.

In 2015, a change took place in oxygen dosage; it took place in continuous operation during the day. Before the year 2015, no oxygen was added to the minimal early morning water quantities.

In 2019, due to the malfunction of the circulating pump, oxygen dosage took place via the auxiliary system, which cannot be regulated with adequate precision, therefore oxygen input increased significantly.

Biodiversity, soil conservation

The built-in-rate of the Angyalföld Pump Station is 19.7 %.

A well-managed park can be found at the plant. A protective band of thujas has been planted at the southern fence of the premises. No protected animals or plants have been discovered at the plant.

During operation of the plant, soil contamination can be avoided by adhering to technological instructions.

All transport routes at the plant are paved.

In 2015, a storage facility in connection with the flood protection system of the Dagály Swimming Complex has been built at the site. Operation of this facility is not the task of the pump station, but our Company's Flood and Inland Water Protection Department.

In the course of our activity, we strive to mitigate environmental effects using all possible means.

Environmental programmes

In order to implement the environmental policy, the Company sets goals and targets and environmental programmes for the sake of executing the policy.

The determination of the significant environmental factors serves to evaluate the environmental capacity, to draw up important environmental goals, targets and programmes; the implementation and achievement of these latter contributing to the continuous improvement of the environmental capacity.

The determination of the environmental goals and targets is done in consideration of the following:

- environmental policy,
- decisions originating from the business planning,
- investment plans,
- results of the evaluation of environmental effects and impacts,
- legal and other requirements,
- observations and requirements of the parties involved (e.g. proprietors, authorities, residents, etc.).

The environmental goals and targets ensure for every effect:

- the complete fulfilment of the legal obligations of the Company,
- the handling of a particular problem corresponding to its actual significance,
- monitoring their actual extent in order to increase the efficiency of the supervisions.

The Company's management works out programmes in order to implement the environmental goals and targets that contain the following broken down to employees or organisational units:

- the tasks to be carried out,
- the target to achieve,
- the scheduling of the task (if necessary) and its deadline,
- the method and people in charge of the intermediate and end checks and reports (i.e. the determination of the process parameters).

Environmental programmes for the year 2019

Environmental programme no. 1

Aim: Examination of reducing the plant's electricity consumption

Thanks to the implementation of the system permanently installed in 2017 – capable of monitoring the components – the base year measurements have taken place in the year 2018. Evaluation and elaboration of the proposals have been prepared according to the scheduling of the programme. Based on the results, the modernisation of the spatial lighting can achieve a few thousand kW of energy savings.

Environmental programme no. 2

Aim: **Modernisation of the lighting of the office building.**

The energy consumption of lighting will be reduced by 30% with the introduction of the LED tubes and LED light sources.

The LED tubes contain no mercury or any gas and have longer service lives, thereby reducing the volume of hazardous waste generated.

In accordance with the programme's schedule, the assessment of the office building and the collection of data have been performed. In 2018, the lighting has already been converted in one office, enabling the experimental measurement for the actual comparison.

Based on the experimental measurement performed, the conversion of the light sources of the offices to modern LED lighting began in 2019. Conversion is progressing continuously according to schedule and is due to be completed by the end of the year 2020.

Environmental programmes for the year 2020

Environmental programme no. 1

Aim	***Modernisation of the lighting of the office building.***		
	Task	Responsible person	Deadline
	Modernisation of the lighting of the office building. Continuous replacement of the old lighting system using fluorescent tubes by modern LED tubes (~30% energy savings may be achieved, based on the test consumption of the two types of tubes).	László Ambrus József Vincze László Varjas	31st December 2019

Environmental programme no. 2

Aim	***Modernisation of the lighting of the wastewater side treatment areas.***		
	Task	Responsible person	Deadline
	Modernisation of the lighting of the wastewater side treatment areas. Continuous replacement of the old lighting system using fluorescent tubes by modern LED tubes (~30% energy savings may be achieved, based on the test consumption of the two types of tubes).	László Ambrus József Vincze László Varjas	31st December 2019

Management of emergencies

Since the introduction of the Environment Oriented Control System no environmental emergency occurred at the Angyalföld Pump Station. The plant possesses the Operational Water Quality Damage Avoidance Plan prepared according to the effective legal regulations, approved by the Government Office for Pest County, Department of Environmental protection and Nature Conservation, District Office of Érd under no. PE-06/KTF/9223-5/2018. The materials and assets for damage avoidance are available at the plant.

The plant has Fire Protection Regulations.

Trainings are regularly held in relation to emergency avoidance with special focus on work protection, fire protection and avoidance techniques.

No forms of average happened at the plant in 2019.

Contact with the parties involved

Budapest Sewage Works Ltd. considers the economical operation, continuous development of the property under its management and the establishment of good and correct contacts with the proprietors, its consumers and the authorities a key priority.

Our Company puts special emphasis on the strengthening of client relations and to fulfil the ever-increasing consumer expectations. The significant developments of the recent years served this purpose after which the consumer service activity became visibly more efficient and faster.

To ensure quick repair of the operational defects of the public canal network or outside the buildings (canal blockages), the Central Nonstop Service is at the disposal of the consumers 24/7.

Budapest Sewage Works Ltd. as well as its professional investor, Veolia consider it their important task and part of their social responsibility to teach the forthcoming generations to appreciate the value and importance of clean water and to understand the importance of environmental management and to support it. From year to year our gates open for school children and show them how sewage water is recycled into clean water that can be reintroduced into the rivers. With the help of the open days at the wastewater treatment plant linked to the

science lessons in school we help the schools in raising an environment conscious next generation.

The Company aims to proactively protect one of our most precious natural treasures, i.e. clean water by introducing an environment conscious outlook into the minds of the next generation.

Our Company has been regularly participating since 2014 at the EMAS Roundtable meetings organised by the KÖVET Association.

The host of the 8th. EMAS Roundtable is Budapest Sewage Works Ltd. and the venue of the event will be the North-Pest Wastewater Treatment Plant.

Our Partners

Residents

Law creators

- Hungarian Government
- Ministry of Agriculture
- Ministry of Interior

Authorities

The activity of Budapest Sewage Works Ltd. is controlled and supervised by regional and municipal authorities. The authorities monitoring the activity of the Company are listed below:

- Government Office for Pest County, Department of Environmental protection and Nature Conservation
- National Directorate General for Disaster Management
- Metropolitan Directorate of Disaster Management
- Metropolitan Directorate of Disaster Management, Deputy's Organisation, Disaster Management Authority Division
- Government Office of the Capital City Budapest
- Government Office for Pest County, Department of Environmental protection, Nature Conservation and Mining
- Middle Danube Valley Water Management Authority
- Pest County Directorate of Disaster Management
- Hungarian Energy and Public Utility Regulatory Authority
- Government Office of Pest County, Authority for Consumer Protection
- National Accreditation Authority.

Proprietors

- Local Government of Budapest
- Csatorna Holding Vagyonkezelő Zrt.,
- Veolia Environnement SA,
- Veolia Central & Eastern Europe S. A.,
- Budapest Sewage Works Ltd. (own shares).