EMAS

HITELESÍTETT KÖRNYEZETVÉDELMI
VEZETÉSI RENDSZER
REG.NO. HU-000025

ANGYALFÖLD PUMP STATION

ENVIRONMENTAL DECLARATION 2016

Approved by:

György Palkó
CEO

Budapest, April 2016

"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 u. 4.		
EMAS member units	Angyalföld Pump Station		
Address:	1139 Budapest, Vizafogó utca 4.		
Plant manager	László Ambrus		
Number of employees	17 persons		
Corporate environmental officer	Magdolna Makó	Telefon:	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	25th April 2016	
Official website	www.fcsm.hu		
Date of registration	21st Deecember 2011		
Registration number	HU-000025		
Expected date of next updated environmental declaration	21st July 2017		
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:	1010 Vienna, Opernring 1/E/620, Austria
Notified body	Lloyd's Register Quality Assurance Ltd., Austria		
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 is 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 us-

ing 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 up 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 snifted sewage from the uncanalised areas closed snifted 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.

Description	Unit	2009	2010	2011	2012	2013	2014	2015
Capacity data as at 31st December								
Total sewage grid length	km	5,352	5,383	5,400	5,423	5,520	5,657	6,026
Number of grid connections	units	177,905	178,725	179,342	180,313	184,432	185,970	199,355
Biological purification capacity	th m^3/d	280	280	280	280	280	280	280
* *South-Pest plant*	th m^3/d	80	80	80	80	80	80	80
* *North-Pest plant*	th m^3/d	200	200	200	200	200	200	200
Nutrient removal capacity	th m^3/d	80	80	280	280	280	280	280
Annual capacity data								
Sewage and precipitation water forwarded	th m^3	209,928	204,204	165,603	153,456	175,013	174,494	173,803
* *free discharge holes*	th m^3	22,382	2,023	888	1,135	2,387	1,090	823
* *pump and purification stations*	th m^3	173,055	136,309	80,069	71,715	83,685	87,453	85,895
* *Handed over to Budapest Central Wastewater Treatment Plant*	th m^3	14,491	101,872	84,646	80,606	88,942	85,951	87,085
Sewage water invoiced								
Total	th m^3	123,316	116,070	115,118	111,770	111,808	110,160	112,772
* *residential*	th m^3	83,099	80,709	81,090	77,105	77,502	76,221	77,918
* *industrial, public and others*	th m^3	38,099	33,780	29,249	29,970	29,666	28,443	29,255

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 General Assembly of the City of Budapest has ceded for a period of 25 years a 25% plus 1 vote share of the Company's registered capital to the consortium formed by the companies Berliner Wasser Betriebe (B.W.B.) and Compagnie Générale des Eaux (C.G.E.) as well as the right to exercise certain operation and control measures. The contract of the above was signed on 19th November 1997. Using the opportunities in the Contract of Purchase of Shares the companies C.G.E. and B.W.B. established Csatorna Üzemeltetési Holding Rt (Sewerage Operation Holding Co.) at the end of 1998.

In the meantime, the name of C.G.E. was changed to Vivendi. On 6th June 2000 the proprietorship of the shares of B.W.B. were transferred to Berlinwasser Holding AG.

On 26th March 2002, Vivendi transferred – indicating intermediate proprietorship by Vivendi Universal – the proprietorship of its shares to the company Vivendi Environnement whose present name is Veolia Environnement S.A.

Proprietors:

Local Government of Budapest

Berlinwasser Holding AG

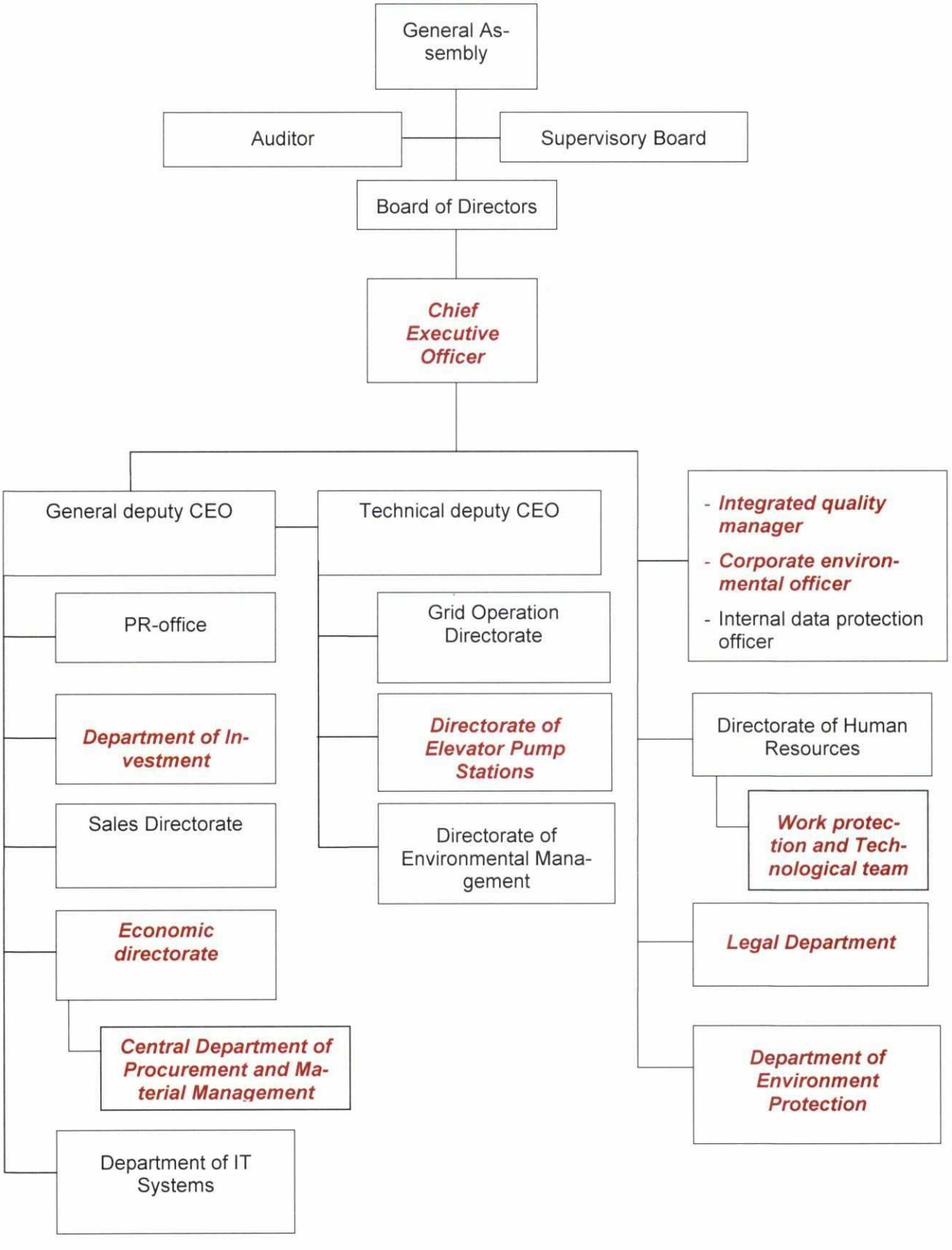
Veolia Environnement S.A.

Csatorna Holding Vagyonkezelő Zrt.

3 small investors

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



Control Systems

A Budapest Sewage Works Ltd. implemented its Quality and Environment Oriented Control System in order to render its core activity more efficient and provide a better service to its consumers in 2001 according to the MSZ EN ISO 9001:2000 and the MSZ EN ISO 14001:1997 standards, which was certified by Lloyd's auditing organisation, the document being valid as of 11th July 2001.

In 2004 the system was certified again and in 2005 the Environment Oriented Control System was amended according to the ISO 14001:2004 standard.

The Environment Oriented Control System was implemented in 2001 at the South-Pest and the North-Pest Wastewater Treatment Plants. The expansion of the Environment Oriented Control System took place in 2008 with the inclusion of the Angyalföld Pump Station, and in 2009 with the Békásmegyer and the Pók Street Pump Stations and the Csomád Sludge Depositing Plant.

A Company's Integrated Control System was extended in 2010 with the Workplace Health Protection and Safety Control System according to the MSZ 28001:2008 standard.

The areas of application of the Integrated Control System are the following:

- Operation of sewerage facilities,
- Flood and internal water protection activities,
- Environmental Management. Investment administration activity in the fields of sewerage, wastewater treatment and flood and internal water protection,
- Operation of the Environment Oriented Control System at the South-Pest and the North-Pest Wastewater Treatment Plants, the Angyalföld, the Békásmegyer and the Pók Street Pump Stations and the Csomád Sludge Depositing Plant.

The accreditation certificates issued in 2013 are valid until 2016.

At the South-Pest and the North-Pest Wastewater Treatment Plants, our Company introduced a food safety management system in compliance with Codex Alimentarius Annex CAC/RPC 1-1969, 2009 to handle bi-products of animal origin and to generate biogas. The HACCP system's certification audit has been successful and the auditing body issued a vertificate valid until 18 June 2018.

The Sampling Team and the Central Laboratory Teams registered by the National Accreditation Authority under registration numbers NAT-7-0016/20115 and NAT-1-1333/2015 respectively conduct their work according to the standard MSZ EN ISO/IEC 17025:2005 and the related accreditation requirements. The National Accreditation Authority maintains the accreditation statuses until 17th November 2019.

As development of its Environment Oriented Control System, our Company started in the second half of 2010 the integration of the Angyalföld Pump Station into the Eco-Management and Audit Scheme (EMAS) according to the decree 1221/2009/EC . The auditing body, i.e. Lloyds' Austria certified the system as adequate and issued a certificate valid until 14th July 2017 upon re-certification. It has been registered into the International EMAS member state (Hungary) registry under no. HU-000025.

Lloyd's Register
LRQA

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
Angyalföldi Pump Station
1139 Budapest
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).

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 2013of 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: VNA0005278	Date of verification:	22nd July 2014
	Verification Expiry:	21st July 2017
	Date of validation:	8th May 2015
	Validation Expiry:	9th May 2016

Mag Florian Mitterauer, Lead Verifier
Lloyd's Register EMEA, Niederlassung Wien
1010 Vienna, Opernring 1/E/620, Austria
on behalf of Lloyd's Register Quality Assurance Ltd.

Lloyd's Register EMEA Niederlassung Wien, Opernring 1/E/620, 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.

Lloyd's Register Group Limited, its affiliates and subsidiaries, including Lloyd's Register Quality Assurance Limited (LRQA), and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless

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

EMAS
Hitelesített környezetvédelmi vezetési rendszer

CERTIFICATE OF EMAS REGISTRATION

A szervezet Organization	Fővárosi Csatornázási Művek Zrt. Angyalföldi Szivattyútelep
Telephely Site	1138 Budapest, Vizafogó utca 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	2017. 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, 2014. december 21. p.h.

Főigazgató
General Director

Országos Környezetvédelmi és Természetvédelmi Főfelügyelőség
1016 Budapest, Mészáros utca 58/a. 1539 Bp. Pf. 675 +36 1 224-9198 Fax: +36 1 224-9263

Integrated Control Policy

Budapest Sewage Works Ltd. is one of the country's largest public utility water company and with its precipitation and sewage water canalisation, wastewater treatment and flood and internal water protection services it is also one of the largest environmental service providers too. Our fundamental task is the canalisation (removal) of the precipitation and sewage water of Budapest Capital City and the surrounding municipalities, their protection 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 avoiding environmental pollution with respect to the workers' health protection and work safety requirements, the canalisation (removal) of precipitation and sewage water and increasing the number of consumers included in the service. In order to achieve the above, we are committed to conduct our activities according to the

ISO 9001:2008 quality control standard,

the ISO 14001:2004 environmental control standard,

the Certified environmental control of the Eco-Management and Audit Scheme by the 1221/2009/EC decree,

workplace health protection and safety control systems implemented according to the standard MSZ 28001:2008,

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

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

In order to achieve the above goals, our company puts key emphasis on the following:

1. Implementation of the environmental and quality oriented solutions upon cleaning and reconstruction of the grid in cooperation with the owners.
2. Continuous operation is ensured by the work of the employees; therefore the avoidance and prevention of the workers' injuries and their health deterioration is of key importance. Workplace health protection and safety control are constantly analysed and developed. Our aim is to establish the conditions of safe work and minimise the occupational risks. The hazards related to our activity have therefore been determined and the risks of their occurrence have been analysed. Technical and organisation actions are taken to avoid emergencies and accidents and the observance of work protection standards is constantly monitored.
3. Corporate environmental responsibility is being increased at every level.
4. We aim to minimise the environmental impact of waste water removal and treatment and to avoid the pollution of the environment. Wastewater treatment technologies are constantly being optimised to minimise the polluting effect of the water released. According to the EU's environmental regulations, we aim to increase the quantity of biologically purified water as well as the efficiency of purification.
5. Upon purification of waste water – under laboratory quality control – the environmental effects are constantly monitored and actions are taken to reduce the environmental impact and to reduce and avoid pollution.

6. The effect of every new technology to be introduced in terms of environmental, work safety and workers' health is examined and evaluated in advance. We aim to replace the existing technologies with more environment friendly, safer and less health hazardous new ones.
7. Cooperation with the respective authorities is ensured on a broad scale.
8. Upon the development, operation and installation of equipment the aspects of efficient energy and material utilisation and work safety are taken into consideration.
9. Our suppliers and sub-contractors are required to acknowledge and accept our quality, environment, workplace health and work safety policy; the respective contracts are concluded in consideration of these.
10. By the application of modern canal cleaning technologies, the undisturbed living environment of the residents at the worksites is ensured.
11. We maintain a modern relationship with our consumers using a well established system and consumer satisfaction is improved with the help of surveys.

In order to achieve the above goals, the management of Budapest Sewage Works Ltd. is committed to fulfil the requirements of the related legal and other regulations and to constantly develop the efficiency of the control system applied.

Budapest Sewage Works Ltd. strives to develop the level of its service activity in terms of quality and quantity 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.

Budapest, 1st April 2016.

György Palkó
Chief Executive Officer

LRQA
Business Assurance

CERTIFICATE

This is to certify that the Quality, Environmental and Occupational Health & Safety Integrated Management System of:

Fővárosi Csatornázási Művek Zrt.
1087 Budapest, Asztalos S. u. 4., Hungary

has been approved by Lloyd's Register Quality Assurance to the following Quality, Environmental and Occupational Health & Safety Management System Standards:

ISO 9001:2008, MSZ EN ISO 9001:2009
ISO 14001:2004, MSZ EN ISO 14001:2005
OHSAS 18001:2007, MSZ 28001:2009

The Quality, Environmental and Occupational Health & Safety Integrated Management System are applicable to:

Operation of sewage works. Flood and excess water control activities. Environmental management. Project management of sewer systems, waste water treatment and control. Operation of Environmental Management System at the Észak-Pest and Dél-Pest Waste Water Treatment Plants, the Angyalföld Pump Station, Békásmegyer Pump Station and the Pók utca Pump Station and the Csomád Sludge Depony.

Approval
Certificate No: VNA0005278

Original QMS, EMS Approval: 11th June 2001
Original OHSAS Approval: 04th June 2010

Current Certificate: 04th June 2013

Certificate Expiry: 03rd June 2016

Issued by: Lloyd's Register EMEA Mft. for and on behalf of Lloyd's Register Quality Assurance Limited

UKAS
231

This document is subject to the provision on the reverse.
Váci út 95., Budapest, H-1139 Hungary. Registration number: 01-17-000250
For and on behalf of: 71, Fenchurch Street, London EC3M 4BS United Kingdom. Registration number: 1879172

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:	11,4%	
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 waste water 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.

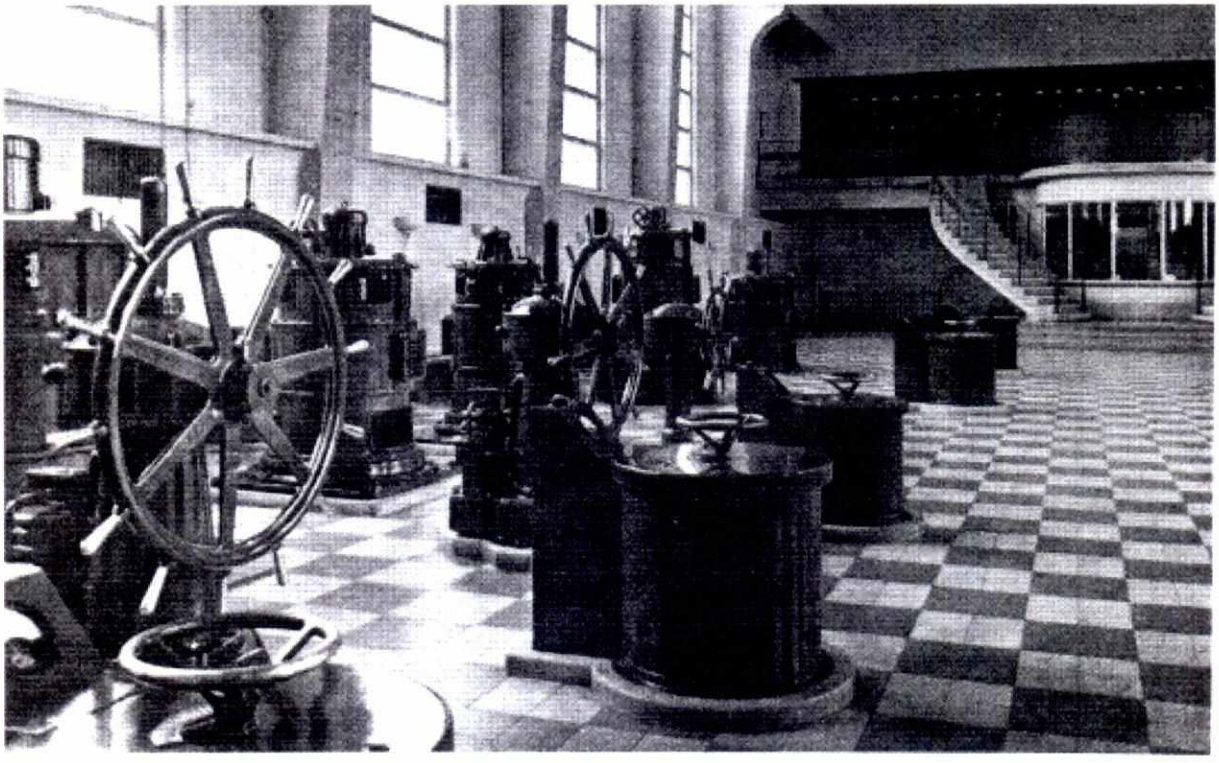
The function of the pump station is to forward the waste water to the North-Pest Wastewater Treatment Plant to the capacity of the dry season wastewater peak volume, the diluted waters above this volume into the streamline and precipitation water into the River Danube by gravitational means or by elevator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

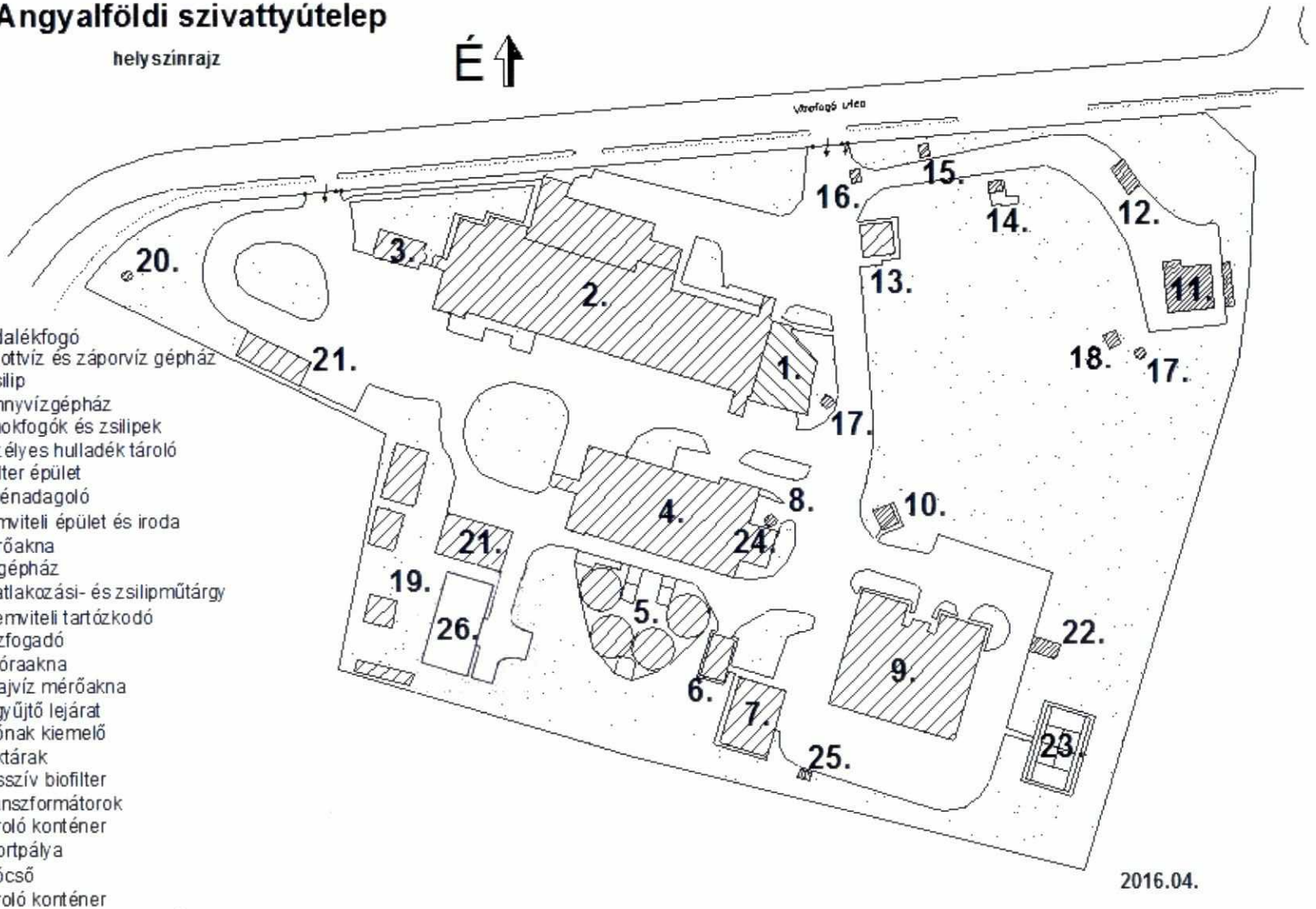
Our Company is committed towards the observance and enforcement of the effective legal regulations.

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

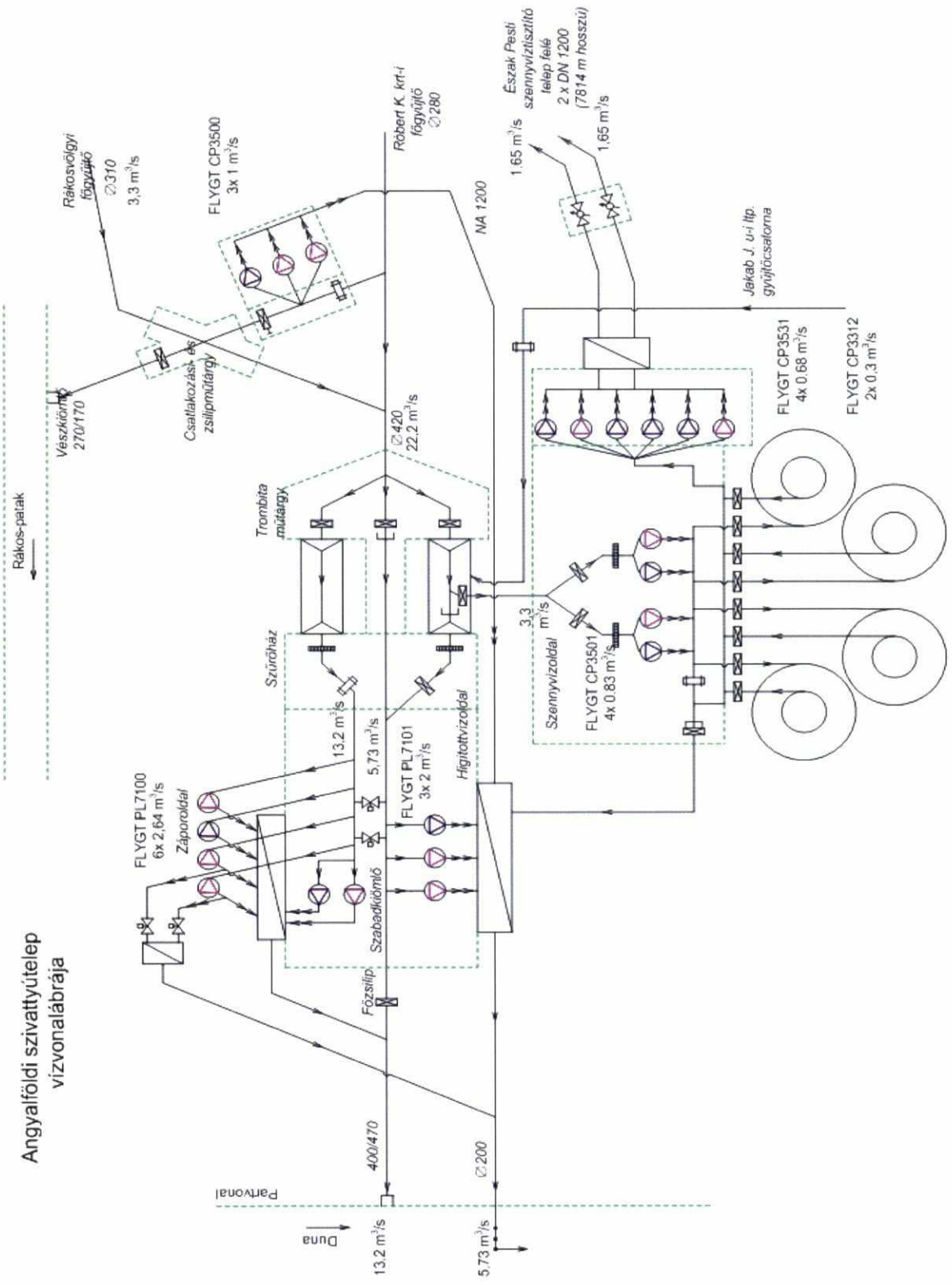
helyszínrajz



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 4.3m 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 overfall dam.

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 flowthrough 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 overfall dam. The side overfall 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 overfall dam 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

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 overfall dam 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 flowthrough 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. Sof-

tened 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".

In the course of 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 managerst 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 enviromnetal 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.

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.

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

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 pretreatment 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 in the course of the plant's operation.	direct	Observance of handling instructions. Removal and disposal of the waste generated is undertaken by a licensed firm.
Electricity consumption of the plant	direct	Following instructions in the operation manuals of the equipment

Environmental impact		***Prevention***
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 2015

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 efficiency	***11,483.178 GJ***		***27,646,585 m^3***	***0.00042 GJ/m^3***
Electricity	2,866,248 kWh	10,318.493 GJ		
Natural gas	33,503 m^3	1,164.678 GJ		
Diesel	201.7 l	7.2 GJ		
Water	***2,848 m^3***		***27,646,585 m^3***	***0.0001 m^3/m^3***
Wastes	***15.945 t***		***20 person***	***0.80 t/person***
communal	8.173 t			
selectively collected+	7.772 t			
technological	***1,558.069 t***		***27,646,585 m^3***	***5.64 x 10^{-5} t/m^3***
grill waste	532.94 t			
sand trap	1,024.87 t			
mixture of grease and oil	0 t			
hazardous waste	0,.259 t			
Material consumption	***86.205 t***		***27,646,585 m^3***	***3.12 x 10^{-6} t/m^3***
Oxygen	75.479 t			
Industrial salt	2,.7 t			
Road salt	0 t			
Sodium-hypochlorite	0,.45 t			
Zeolite	7,.5 t			
Industrial cleaning agent	0.014 t			
Odoriser (Odorstroyer)	0 t			
Phosphoric acid	0 t			
Thinner (Calculated with a density of 0.8 kg/dm^3)	0.008 t			
Paints (Calculated with a density of 0.75 -1.6 g/cm^3)	0.036 t			
Deep undercoat	0.006 t			
Machinery grease	0 t			
Engine oil (Calculated with a density of 0.87 g/cm^3)	0.005 t			
Paper+	0.007 t			
CO_2 emission coming from the use of energy sources*	**1,120.73 t CO_2**		***27,646,585 m^3***	***4.05 x 10^{-5} t/m^3***
Electricity	1,037.58 t CO_2			
Natural gas	64.22 t CO_2			
Diesel	0.54 t CO_2			
Transport**	18.39 t CO_2			
NO_X emission coming from the use of energy sources	**0.122 t NO_X**		***27,646,585 m^3***	***4.42 x 10^{-6} t/m^3***

+ Estimated data

*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.noco2.hu

The controlling authority of the website is the Prime Minister's Office.

**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 Békármegyer and Pók Street Pump stations. Permanent daytime staff increased at the facility from a personnel of 11 to 20 persons.

During the year 2015, the volume of diluted wastewater and precipitation water released into the decreased significantly. In the autumn of 2014, about 125-175% of precipitation fell in comparison to the long-term average Danube (Source: www.met.hu).

Our company is a member of the Hungarian Water Utility Association. Thanks to the developments under way at the company at present, it can be deduced from the communication with the other members that our indicators are either at identical levels to other water utility companies or at higher levels exceeding the average.

Basic indicators	**2013.**	**2014.**	**2015.**
Energy efficiency	0.00045 GJ/m^3	0.00042 GJ/m^3	0.00042 GJ/m^3
Water	0.0005 m^3/m^3	0.0005 m^3/m^3	0.0001 m^3/m^3
Wastes	0.69 t/fő	0.58 t/fő	0.80 t/fő
Technological wastes	7.39×10^{-5} t/m^3	6.27×10^{-5} t/m^3	5.64×10^{-5} t/m^3
Material consumption	2.5×10^{-6} t/m^3	2.2×10^{-6} t/m^3	3.12×10^{-6} t/m^3
CO_2 equivalent of the use of energy sources	4.2×10^{-5} tCO_2/m^3	4.2×10^{-5} tCO_2/m^3	4.5×10^{-5} tCO_2/m^3

With the exception of the communal wastes, the basic indicators have been given based on the total volume of sewage and precipitation water treated at the plant.

Basic indicators	***2013.***	***2014.***	***2015.***
Energy efficiency	***12,551.207 GJ***	***11,313.055 GJ***	***11,483.178 GJ***
Electricity	10,356.4 GJ	10,238.5 GJ	10,318.493 GJ
Natural gas	2,188.7 GJ	1,066.8 GJ	1,164.678 GJ
Diesel	8 GJ	7.7 GJ	7.2 GJ
Water	***13,639 m^3***	***8.306 m^3***	***2,848 m^3***
Wastes	***13.779 t***	***11.607 t***	***15.945 t***
communal	8.173 t	8.173 t	8.173 t
selectively collected	5.606 t	3.434 t	7.772 t
technological	***2,083.488 t***	***1,678.004 t***	***1,558.069 t***
grill waste	479.35 t	473.83 t	532.94 t
sand trap	1,204.29 t	911.53 t	1,024.87 t
mixture of grease and oil	399.82 t	292.47 t	0 t
hazardous waste	0.028 t	0.174 t	0,.259 t
Material consumption	***69.319 t***	***59.94 t***	***86.205 t***
Oxygen	60.078 t	49.772 t	75.479 t
Industrial salt	2.8 t	1.9 t	2,.7 t
Road salt	0.5 t	0.15 t	0 t
Zeolite	0.85 t	0.55 t	0,.45 t
Sodium-hypochlorite	4.938 t	7.5 t	7,.5 t
Industrial cleaning agent	0.029 t	0.015 t	0.014 t
Odour binder (Odorstroyer)	0 t	0 t	0 t
Phosphoric acid	0 t	0 t	0 t
Thinner	0.004 t	0.002 t	0.008 t
Paints	0.105 t	0.027 t	0.036 t
Deep undercoat	0 t	0 t	0.006 t
Machinery grease	0.008 t	0.002 t	0 t
Engine oil	0.002 t	0.005 t	0.005 t
Paper[+]	0.007 t	0.007 t	0.007 t
CO_2 emission coming from the use of energy sources	**1,188.55 t CO_2**	**1,115.01 t CO_2**	**1,120.73 t CO_2**
Electricity	1,041.38 t CO_2	1,029.53 t CO_2	1,037.58 t CO_2
Natural gas	121.58 t CO_2	59.21 t CO_2	64.22 t CO_2
Diesel	0.61 t CO_2	0.58 t CO_2	0.54 t CO_2
Transport	24.98 t CO_2	25.69 t CO_2	18.39 t CO_2

The consumption of industrial salt in the year 2014 was caused by the temporary limitation imposed on orders; in 2015, industrial salt consumption was similart to that of the year 2014.

In 2015, a change took place in oxygen dosage at the plant; during the day, dosage is now continuous throughout, but there was no addition of oxygen to the minimal early morning waterflows before the year 2015.

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

Water usage

Angyalföld Pump Station connects to the potable water network of the Waterworks of Budapest. Industrial-technological and social water consumption is provided from the potable water grid.

In the year 2015, the volume of water consumption was 2,848 m3. Consumption in 2015 was 76% lower in comparison to 2014. In 2015, the operation of the filtered wastewater backwash system commissioned in 2014 was stable, therefore there was no need for the grid water to be used as industrial water.

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	2,531,322	235,124	2,766,446
February	2,205,864	22,454	2,228,318
March	2,401,686	0	2,401,686
April	2,162,358	0	2,162,358
May	2,666,642	188,222	2,478,420
June	2,170,386	236,574	2,406,960
July	2,138,292	371,747	2,510,039
August	2,270,556	1,036,320	3,306,876
September	2,283,516	540,460	2,823,976
October	2,669,346	575,968	3,245,314
November	2,201,498	0	2,201,498
December	2,133,342	0	2,133,342
	27,646,586	3,206,869	30,853,455

The quantity of diluted water and rainwater released into the Danube in 2015 was 27,646,586 m^3.

2015 shows a 3% drop in comparison to 2014 in terms of the volume of sewage and precipitation water arriving to the plant, but the volume of diluted wastewater and precipitation water released into the Danube also decreased by 3%.

No pollution has taken place upon discharge into the Danube.

The Middle-Danube-Valley Inspectorate for Environmental Protection and Nature Conservation 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.

Communal 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 of its sites, including the Angyalföld Pump Station.

Name of waste	EWC code	Quantity	
		m3/year	(t/year)
Communal waste	20 03 01	28	8.17
Selectively collected wastes*	15 01 01 20 01 01	6.1	7.68
	15 01 02	6.6	0.092

*estimated data

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	EWC code	Quantity	
		m3	(t/year)
Grill waste	19 08 01	1,166.5	532.94
Sand trap drift	19 08 02	1,044	1,024.87

In the year 2015, the grill waste press broke down at the plant, bringing about a lack of dewatering solutions at hand for the grill waste. After the necessary reconstruction works, the press was commissioned in October 2015. Due to the breakdown of the press, the volume of grill wate transported increased by 12.5 %.

In December 2015, the sand traps at the plant were cleaned using special machinery, as a result of which the sand trap drift volume in 2015 was 12.4% more than in 2014.

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.

Types and volumes of hazardous wastes generated at the Angyalföld Pump Station

Name of waste	***Quantity (kg/year)***	***EWC code***
Office waste	*9*	*08 03 17*
Oily clothes	*1*	*15 02 02*
Waste oil	*30*	*13 02 05*
Battery	*4*	*16 06 01*
Dry cell batteries	*10,4*	*16 06 03*
Empty paint cans	*40.5*	*15 01 10*

Name of waste	Quantity (kg/year)	EWC code
Empty oil cans	125.5	15 01 10
Packaging of chemicals	4.5	15 01 10
Spray cans	1	15 01 11
Pesticid	2	20 01 08
Neon tubes	25	20 01 21
Electronical wastes	6	20 01 35

Energy consumption

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

Electricity is supplied to the plant from the Angyalföld and Kárpát Street sub-stations of ELMŰ from two independent, looped 10 kV grids.

The electricity consumption of the plant was 2,866,248 kWh in the year 2015.

Gas consumption

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.

The natural gas consumption of the plant was 33,503 m^3 in the year 2015.

The freezing temperatures in January 2015 contributed to the increase in natural gas consumption.

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:

Measured point sources: P1 gas boiler chimney (machinery housing boiler)
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)
P1	carbon-monoxide	13.1	100	0
P1	nitrogen-oxides	102.1	350	0
P2	carbon-monoxide	16.2	100	0
P2	nitrogen-oxides	99.,2	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	0.4	5	0
P5	hydrogen-sulphide	0.5	5	0
P6	hydrogen-sulphide	0.5	5	0

The concentration of SO2 and dust (PM10) is not detectable.

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 2019.

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.

Based on the measurement times in 2015, the ALIZAIR I. biofilter, the ALIZAIR II. biofilter and the FOBA biofilter operated without load, as both the inbound and outlet odour concentrations were very low.

Results of the investigations carried out in 2015 in the plant's proximity yielded the following results:

- In the proximity of the plant, under the outlet openings of the Alizair biofilters, the odour concentration values determined ta the lot boundary are "expressed" (13.17 Odour Units/m^3), i.e. when these odours appear, they bring about clearly uncomfortable effects for the local residents and the people at the site;
- near the plant, on the top of the balancing tower, the odour concentration values determined upon arrival of the wastewater are "weak" (10 Odour Units/m^3), i.e. when these odours appear, they do not bring about clearly uncomfortable effects for the local residents and the people at the site;

in the surroundings of the plant, at the other designated sampling points, no characteristic odours were detected at the time of measurement.

According to the expert report, the sources of odours examined at the pump station may only produce a sensible odour in the immediate proximity of the pump station, given average conditions of diffusion.

No complaints or reports have been sent to the plant regarding bad odours in the year 2015.

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 also because of the movement of the employees, the operation of the pump station results in noise emission.

In 2015 – 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."

Over the past 6 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 regard-

ing 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

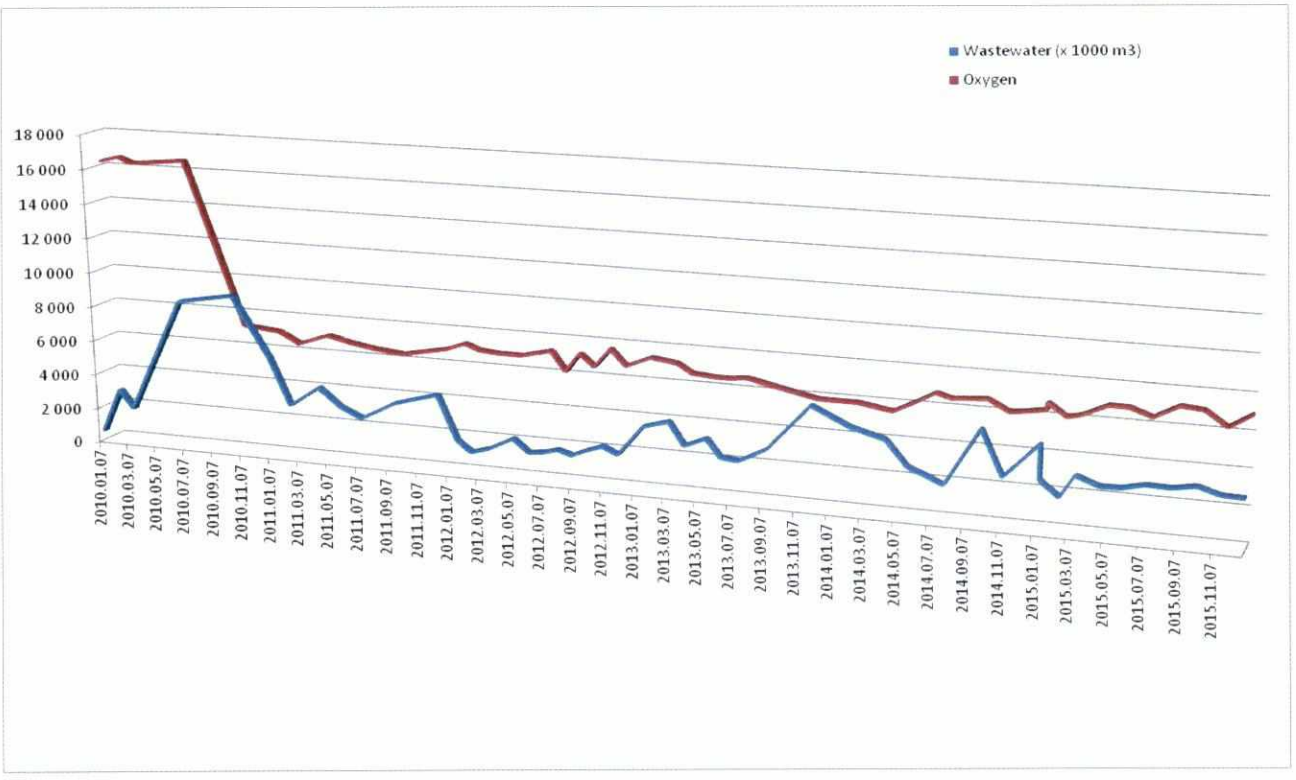
In order to treat the wastes of the canalisation of the plant, chemicals are added to the solid grill wastes and the sediments at four points on the sewage water and the rainwater side. Dosage is done by means of automatically operated twin tank equipment fitted with a salvage unit.

	2014.		2015.	
		Calculated for 1 ton of waste material		Calculated for 1 ton of waste material
Sodium-hypochlorite	7,500 kg	15.8 kg/t	7,500 kg	14.1 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.

Oxygen dosage

Dosage of oxygen at the plant was carried out manually until 2008 based on the volume parameters. In 2008 an environmental programme was launched to optimise the dosage of oxygen based on the quantity and quality parameters of the water ducted to the North-Pest Wastewater Treatment Plant.



The quantity of oxygen to add depends on the sulphide content of the wastewater. For its determination – after a number of measurement trials at various spots, the air space of the suction area of the pumps ducting the sewage to the North-Pest Wastewater Treatment Plant turned out to be most suitable. Here, with the help of hydrogen-sulphide meters, the sulphide content is established from the gaseous phase. According to experience to date, the sulphide content of the gaseous phase is in perfect correlation with the sulphide content of the aqueous phase. The continuous regulation of the quantity of the oxygen added by the automatic dosage system is based on these measurements.

After commissioning of the measurement unit at the end of 2008, dosage of oxygen has been carried out as described above, whose efficiency is well demonstrated by the corresponding diagram.

In 2015, a change took place in oxygen dosage at the plant; during the day, dosage is now continuous throughout, but there was no addition of oxygen to the minimal early morning waterflows before the year 2015.

Materials and chemicals used

Name of material	Unit of quantity	2013	2014	2015
Industrial salt	kg	2,800	1,900	2,700
Road salt	kg	500	150	0
Zeolite	kg	850	550	450
Sodium-hypochlorite	kg	4,938	7,500	7,500
Industrial cleaning agent	kg	28.66	29.36	14
Odour binder (Odorstroyer)	kg	0	0	0
Phosphoric acid (Calculated with a density of 1.58 g/cm3)	kg	0	0	0
Thinner (Calculated with a density of 0.8 kg/dm^3)	kg	3.8	2.88	8.8
Paints (Calculated with densities of 1.18, 1.20 and 1.30 g/cm^3)	kg	105,4	26,844*	36.0
Deep undercoat	kg	0	0	6.5
Engine oil	l	2.2	4.2	6.3
Diesel	l	230	216.6	201.7
Machinery grease	kg	7.76	2	0
Paper**	lap	1,500	1,500	1,500
Oxygen consumption (Calculated with a density of 1.14 kg/Nm^3)	kg	60,078	49,772	75,479

* Preservative painting of the fence

** Estimated data

The consumption of industrial salt in the year 2014 was caused by the temporary limitation imposed on orders; in 2015, industrial salt consumption was similart to that of the year 2014.

In the year 2014, the preservatory repainting of the fence of the facility started and continued into the year 2015.

Biodiversity

The built-in-rate of the Angyalföld Pump Station is 11,4%.

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.

One venue of the 2017 World Aquatics Championships — 17th FINA swimming, diving, synchronized swimming, water polo and open water World Aquatics Championships held in Budapest will be the Dagály Swimming Complex. (H-1138 Budapest, Népfürdő utca 36. Lot number: 25879)

Construction works also concern the site of the Angyalföld Pump station. In 2015, construction of the strage facility I connection with the flood protection system of the Dagály Swimming Complex began at the site. Operation of this facility will not be the task of the pump station, but our Company's Flood and Inland Water Protection Department.

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 serve 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).

The implementation of the environmental programmes for the year 2015

Environmental programme no. 1

Reduction of electricity consumption

The evaluation of the electricity consumption of the independent technological units and the determination of the points of delivery of the separated consumption units have been carried out in 2013.

In the year 2014, technical consultations were conducted regarding the instrument to procure and a new Diris measuring instrument has been built into the site system for testing purposes. As a result of the successful testing, the necessary measuring instruments at the measuring points were installed along with other auxiliary components in December and measurement at these designated points is already continuous.

Reading of the meters in 2015 took place on a daily basis and the data have been recorded. The scheduled measurements with respect to the base year have been performed.

Environmental programme no. 2

Target: reducing the water consumption

In 2015 the filtered backwash sewage system which was put in use in 2014 had functioned stable. Because of this, it was not needed to use mains water as industrial water. Thanks to this filtered backwash sewage system, the water consumption at the site had been reduced with 76% compared to the consumption of 2014.

Environmental programmes for the year 2016

Environmental programme no. 1

Aim	***Reduction of electricity consumption***		
	Task	Responsible person	Deadline
	Assessment of the energy consumption of the separate technological units and reduction of the site's electricity consumption by 3%.	László Ambrus József Vincze László Varjas	To be implemented by: 31st December 2018
1st Phase	Determination of the site's measuring points		31st December 2013
2nd Phase	Establishment of the technical conditions of installation at the designated points of measurement. Establishment of the measuring point and incorporation into the system.		31st December 2014
3rd Phase	Performance of base year measurements. Determination of the base value from complete annual measuring results, analysis of measurement results.		31st December 2015
4th Phase	Determination of possible points of economy. Determination and establishment of the required system of criteria.		31st December 2016
5th Phase	Operational application of the recommended possibilities of saving.		31st December 2018

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 Middle-Danube-Valley Inspectorate for Environmental Protection and Nature Conservation under no. KTVF: KTVF: 36747-2/2014. The materials and assets for damage avoidance are available at the plant.

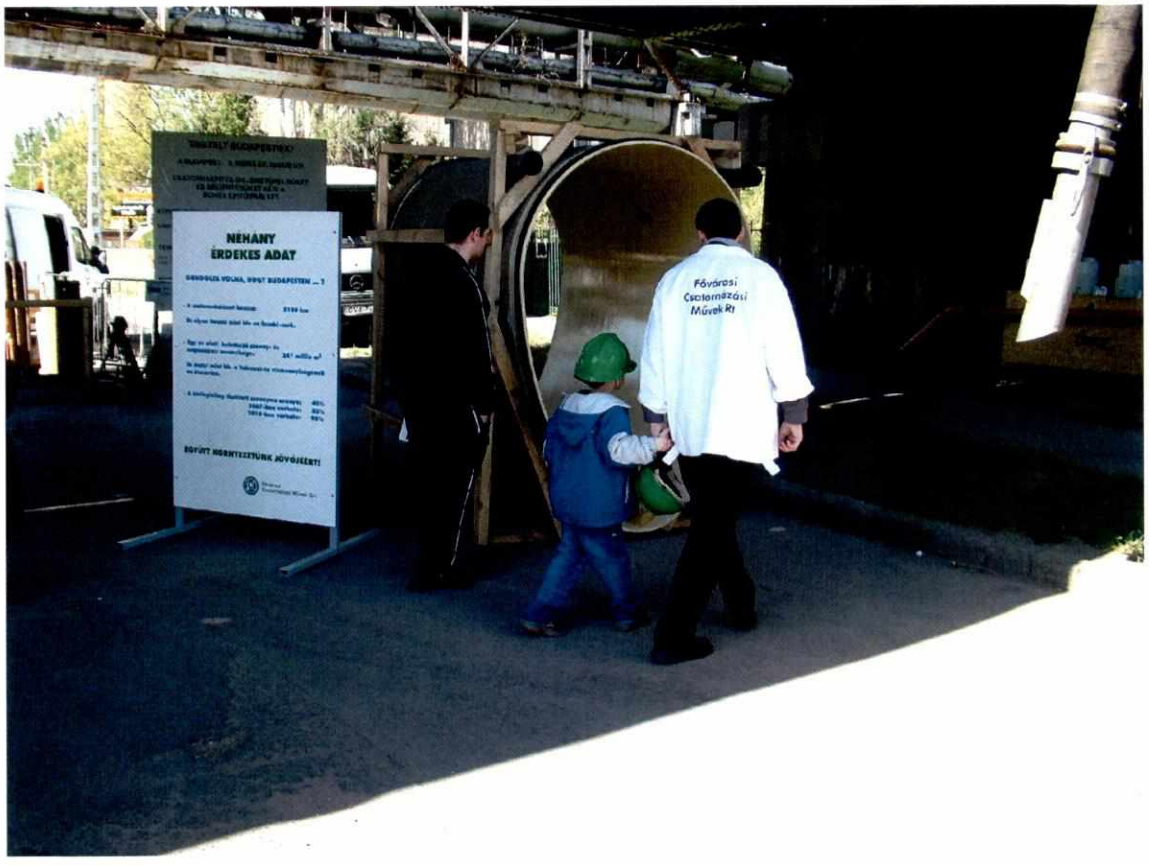
The plant has Fire Protection Regulations.

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 2015.

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 up 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.

Our Partners

Residents

Law creators

- The Government of the Republic of Hungary
- 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:

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

Proprietors

- Local Government of Budapest
- Berlinwasser Holding AG
- Veolia Environnement S.A.
- Csatorna Holding Vagyonkezelő Zrt.
- 3 small investors