

# Environmental Report 2015



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## 1. Chairman's Statement

As a water utility company, we have a significant interface with the surrounding environment and local communities. Therefore, we work tirelessly to ensure the needs and expectations of our various stakeholders are being constantly met. AS Tallinna Vesi has its own internal workforce of more than 300 employees, and throughout the year, considerable focus was placed on ensuring their continued safety, commitment and development.

Testament to our employees' hard work was the excellent feedback received in the customer satisfaction survey and several external awards related to safety, corporate social responsibility and stakeholder relations. Results of the employee opinion survey were also very good when compared to similar companies and European norms.

2015 was a year of exceptional performance for AS Tallinna Vesi. As in previous years, we managed to deliver yet further improvements with respect to our operational results and the quality of services that we provide to our customers in Tallinn and its surrounding areas. The quality of drinking water and the level of leakages in the network have both surpassed previous performance levels, and are amongst the best in class when compared to other European water utilities.

As a listed company, we are accountable to shareholders, customers and a variety of external stakeholders, with whom we interact on a daily basis. Our focus remains on creating consistency, transparency and balance between the various elements of our operations and we constantly ensure AS Tallinna Vesi operates with the highest standards of corporate governance.

I would like to thank my colleagues in AS Tallinna Vesi, Watercom OÜ and United Utilities, and all our clients, suppliers and business partners for their continued support in helping the company to deliver an exceptional performance during 2015.

Sincerely,

Karl Heino Brookes

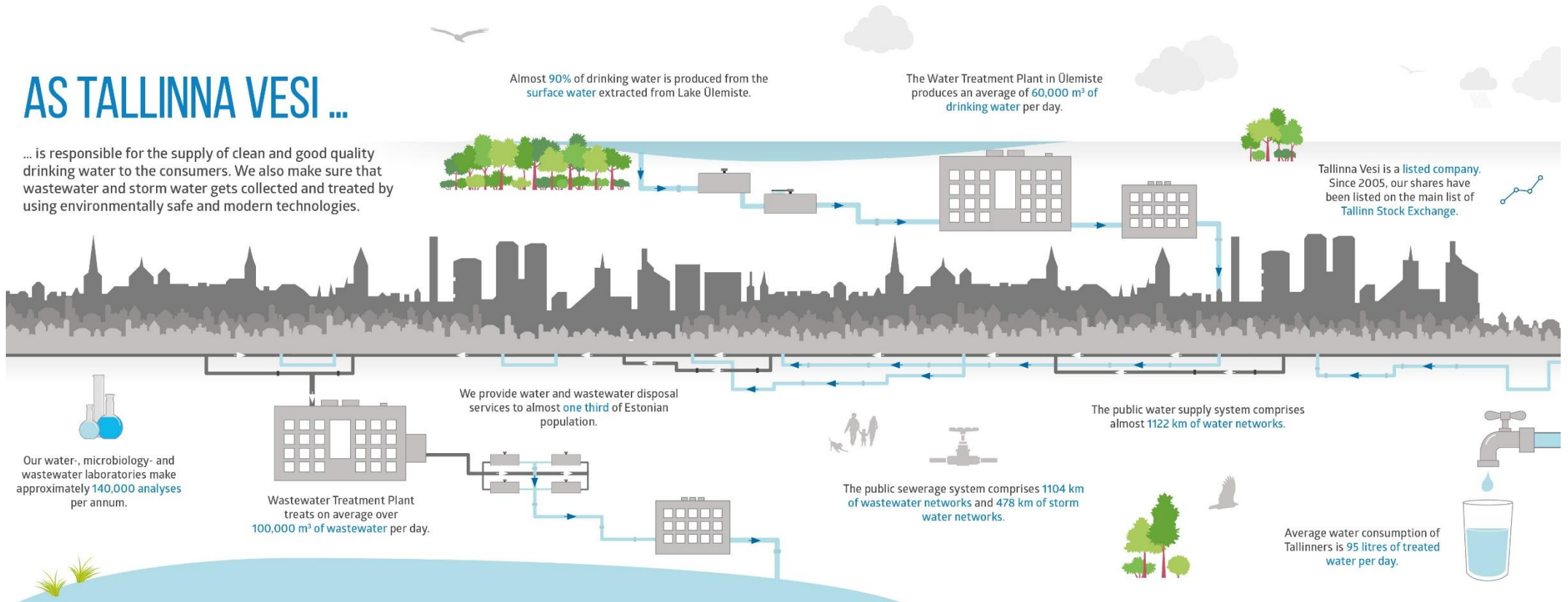


*Karl Heino Brookes,  
Chairman of the Management Board*

## 2. AS Tallinna Vesi in brief

### AS TALLINNA VESI ...

... is responsible for the supply of clean and good quality drinking water to the consumers. We also make sure that wastewater and storm water gets collected and treated by using environmentally safe and modern technologies.



## OPERATIONAL SITES

- Head office, customer service, support services and OÜ Watercom are located in Ädala 10, Tallinn.
- Ülemiste Water Treatment Plant, water and microbiological laboratory are located in Järvevana road 3, Tallinn.
- Paljassaare Wastewater Treatment Plant, composting fields and wastewater laboratory are located in Paljassaare cross 14, Tallinn.
- Sludge composting and experimental site is located in Liikva village, Harju county.
- The catchment area of ca 1,800 square kilometres is located in Harju and Järva counties.

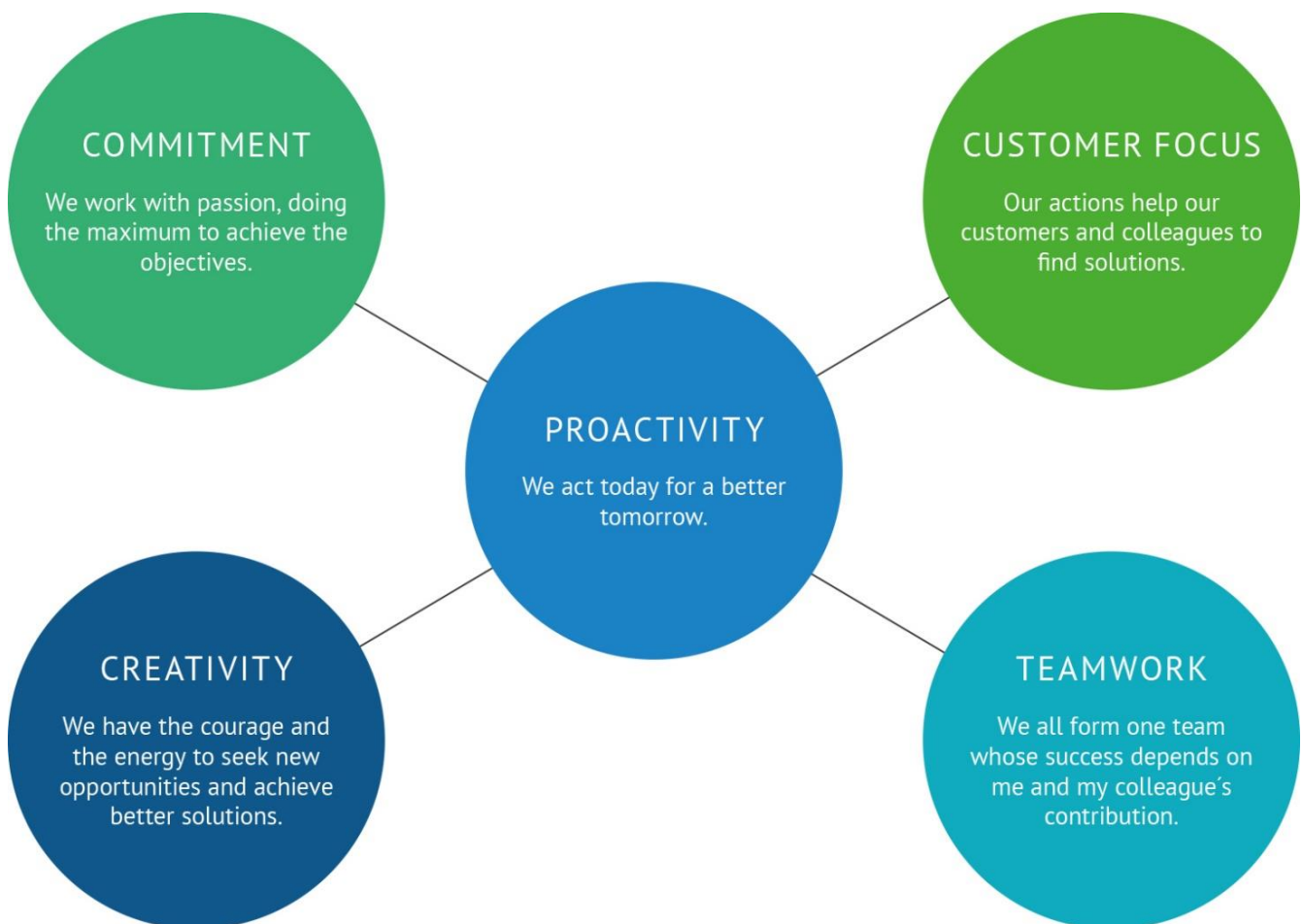
## MISSION

We create a better life with pure water!

## VISION

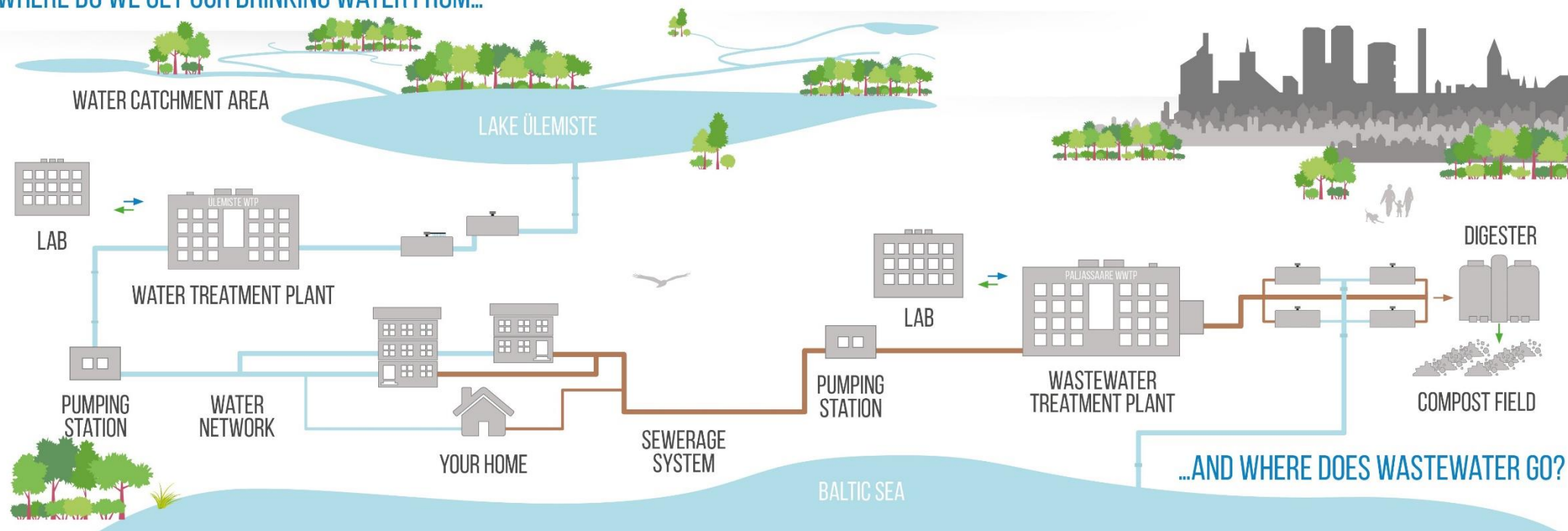
Everyone wants to be our customer, employee and partner, because we are the leading company providing water services in the Baltics.

## OUR VALUES



## SUMMARY OF OUR OPERATIONS

### WHERE DO WE GET OUR DRINKING WATER FROM...



### 3. Environmental and Community Policy

We are the largest water company in Estonia. Our activity influences nearly one third of Estonia's population. We acknowledge that by providing service compliant with all requirements, we influence the quality of life of the citizens of Tallinn, neighbouring municipalities, as well as the Baltic Sea natural habitat and its surrounding areas. Therefore we take into account the impact we have on surrounding living environment, and association with the different stakeholder interests.

- We act responsibly – we take into consideration our impact on the natural habitat, health and quality of life of the residents as well as interests of different stakeholders.
- We fulfil all legal requirements, but we are dedicated to doing more than required.
- We value the natural environment we operate in and therefore use natural resources sparingly and continuously seek ways for a more sustainable consumption. In order to help shaping an environmentally conscious way of thinking in our community, we encourage and support others accordingly.
- We wish to give our contribution to those who need more help and attention in the community to experience the joy of success.
- We strive to be a good neighbour in the community by supporting and encouraging activities related with environmental awareness and healthy life style.

### 4. Environmental Management System

We have implemented an integrated management system that meets the relevant quality, environment and safety standards. Our Company's environmental activity is in compliance with the requirements of the international environmental management standard ISO 14001 and EU Eco Management and Audit Scheme (EMAS) Regulation.

The environmental management system forms a part of the Company's management system, as we strive to make the links between the Company and the environment part of our strategy and to take them into account in our everyday operation.

The basis for the environmental management system is the identification of significant environmental aspects and impacts, which form the basis for determining the Company's environmental objectives and tasks for improving the performance. Significant environmental aspects are such activities which, in contact with the surrounding environment, most influence the nature, quality of services, co-operation between stakeholders, health and life quality of the residents, and our business performance.

Management of the environmental system has been established in accordance with the Company's structure. The main responsibility for ensuring and improving the functioning of the environmental management system lies with the senior management and the heads of structural units. Unit managers involve their employees in setting and fulfilling environmental objectives and tasks. We measure, monitor and assess the indicators of our environmental activities at least once a quarter, on the basis of which we annually compile an environmental report available for the public.

## 5. Environmental Aspects and Objectives

Table 1: IMPORTANT ENVIRONMENTAL ASPECTS

Environmental aspect	Environmental impact from the aspect	Direction of the impact*	Further actions
Use of heat energy	Heat energy produced from biogas that emerges in the sludge digesting process reduces ecological footprint and dependence on non-renewable sources of energy	+	Maximise the use of produced biogas
Water leakages	Big leakages may cause large losses of clean water, damages on soil, waste of material and resources	-	Active monitoring of processes, reconstruction works and continue with the current actions
Emerge of construction waste	Waste that has a low potential of reuse, large quantities of waste, damages on soil etc	-	Wider use of closed methods in pipeline reconstruction
Emerge of waste (screenings) in the mechanical treatment of wastewater	Large quantities of waste, soil contamination, low potential of reuse. Screenings are wet, therefore cannot be burnt	-	Continue public/media campaigns
Emerge and handling of sludge	If the sludge is not reused, amount of waste that needs to be handled increases, and this is complicated due to its large quantities	-	Further actions waiting for the court decision
Ground water extraction	Extensive ground water extraction causes damages on ground water resources and soil. It may cause collapse funnels and reduce the usable ground water resources	-	Preferring the use of surface water, transfer to the use of surface water, if possible
Discharge of partially treated wastewater into the sea	Non-compliant treated wastewater has a negative impact on sea-life and -environment. Negative impact on fish and via that also on the food we eat	-	Reconstruction of treatment process
Use of land	Very scattered locations of activity spread over large territory is an ineffective use of space and has a negative impact on biological diversity	-	Continue optimizing the use of land
Discharge of untreated sewerage into the environment	Environment pollution, negative impact on sea-life and -environment. Impairment of living environment and smell problem	-	Reconstruction of treatment process

\*Positive or negative environmental impact of the aspect



Table 2: ENVIRONMENTAL OBJECTIVES AND RESULTS IN 2015

Objective	Indicator	Result by the end of 2015
Compliance with all legal standards, environmental permits and requirements of the Services Agreement	0 non-compliances (except for LoS WS7)	0 non-compliances
Reduced number of clean water leakages	≤ 17.0 %	14.68%
Compliance of pollution parameters is achieved at the Wastewater Treatment Plant outlet	0 non-compliances	0 non-compliances
Improve the energy efficiency of technological processes	WWTP MWh per 1 unit < 2014	0,48 kWh/m <sup>3</sup> (2015) < 0,5 kWh/m <sup>3</sup> (2014)
Improved water quality in rivers of Ülemiste catchment area and better condition of fish	All fish passes are built by due date	All fish passes are built by due date
Increase the environment and Company's activity related awareness of various stakeholders (employees, after-growth, consumers and community), in order to increase and maintain Company's good reputation (image)	1. ≥2 doors open days/yr 2. ≥25 guided tours/yr 3. ≥ 1500 children/yr have participated in kindergarten visits 4. ≥1 water campaign	1. 2 doors open days 2. at least 150 guided tours 3. 1482 children participated in waterclasses 4. 1 extensive consumer campaign and several smaller projects
Coagulant unit cost and concentration of total phosphorus (P <sub>Tot</sub> ) in the wastewater discharged to the outlet is reduced by the end of 2016	2016 coagulant unit cost < 2014 (Fe <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> kg/ influent P <sub>Tot</sub> (kg). 2014 average unit cost was 9,5 kg Fe <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> / P <sub>Tot</sub> )	Project is completed but the possible reduction of concentrations cannot be assessed before the new system has been working for at least 1 yr
By the end of 2018 the evitable sudden discharge of untreated wastewater to the sea is minimized	Amount of untreated wastewater discharged to the sea in 2018 (th m <sup>3</sup> /yr) < 125 th m <sup>3</sup> /yr (2010-2014 average)	Project is ongoing

\*In 2014 environmental report was a wrong objective for environmental non-conformities by sub-contractors. It was there by mistake, but according to the results of health and safety inspections the result of this indicator was 0 in 2015.

Table 3: ENVIRONMENTAL OBJECTIVES 2016

Objective	Indicator	Due date
Compliance with all legal standards, environmental permits and requirements of the Services Agreement	0 non-compliances (except for LoS WS7)	2016
Replacing the air cooling devices using substances that reduce the ozone layer with new, more environment-friendly devices	hazardous cooling devices have been replaced	2016
Reduced number of clean water leakages	≤ 15 %	2016
Compliance of pollution parameters is achieved at the Wastewater Treatment Plant outlet	0 non-compliances	2016
Coagulant unit cost and concentration of total phosphorus (P <sub>Tot</sub> ) in the wastewater discharged to the outlet is reduced by the end of 2016	2016 coagulant unit cost < 2014 (Fe <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> kg/ influent P <sub>Tot</sub> (kg). 2014 average unit cost was 9,5 kg Fe <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> / P <sub>Tot</sub> )	2016
By the end of 2018 the evitable sudden discharge of untreated wastewater to the sea is minimized	Amount of untreated wastewater discharged to the sea in 2018 (th m <sup>3</sup> /yr) < 125 th m <sup>3</sup> /yr (2010-2014 average)	2018
Re-organising the waste management system	Volume of mixed municipal waste in 2018 is <2015 (67 t). More correct waste collecting and sorting	2018
Increase the environment and Company's activity related awareness of various stakeholders (employees, after-growth, consumers and community), in order to increase and maintain Company's good reputation (image)	1. ≥2 doors open days/yr 2. ≥25 guided tours/yr 3. ≥750 children have participated in kindergarten visits 4. ≥1 water campaign	2016

## 6. Compliance of the Activities with Environmental Requirements

### Environmental legislation

To a large extent the Company's environmental activities are regulated by requirements arising from the EU as well as national legislation and the legal acts issued by local governments.

At the EU level, this means compliance with the EU Water Framework Directive (2000/60/EC). At the national level, compliance with the Water Act, Public Water Supply and Sewerage Act, Waste Act, Chemicals Act, Ambient Air Protection Act, and subordinate acts based on these acts must be ensured. At the local level, we are obliged to comply with different rules and requirements applicable in Tallinn and its surrounding municipalities.

Amendments to the requirements and legislation are being constantly monitored and reported to the managers and specialists of a respective area who then assess the impact of the amendments to our activity.

In co-operation with the Estonian Water Works Association, we continue to participate in the approvals of the new draft acts concerning water economy and environment by submitting our opinions and making amendment proposals with regard to the draft legislation under discussion. Together with the Estonian Water Works Association we have participated in the working groups for developing legislation related to water economy and environment and expressed our opinions with regard to draft legislation directly to the relevant ministries. One of the highlights in 2015 was participating in the preparatory activities of the new Public Water Supply and Sewerage Act, a process that will actively continue in 2016. We also worked on the amendments to the Water Act and many other draft acts relevant to us.

### Environmental permits

We act in accordance with the terms and conditions set out in the environmental permits issued to the Company, and observe the precepts set out by authorities. The main licensing authority for us is the Environmental Board's Harju-Järva-Rapla regional department, who has issued the following environmental permits to us:

- 4 permits for a special use of water and 1 temporary permit for a special use of water (11.2015-03.2016) (details on page 18);
- 2 waste permits (details on page 35);
- 2 ambient air pollution permits (details on page 39).

### Requirements of the Services Agreement

On 12 January 2001 we concluded a tripartite Services Agreement with the City of Tallinn and investors, which, among other things, obliges us to comply with 97 Levels of Service. This makes us the most regulated water undertaking in Estonia. Our activities and levels of services are assessed once a year by an impartial inspection body – Supervisory Foundation for the Water Companies in Tallinn – to whom the Company annually, i.e. by the end of the first quarter, submits a report on compliance with the levels of service.

We met all the levels of service in 2015 and in some levels, achieved the best results of all times. For example, the Services Agreement requires from us a leakage rate that would not be higher than 26%, and the result achieved in 2015 – 14.68% - was the lowest in the Company's history. At least 95% of

the drinking water samples taken must be compliant with the requirements, our result in 2015 – 99.86% - was, once again, the best ever.

#### **Requirements to contractual partners**

As strict requirements apply to our activities, we consider it to be very important that our suppliers and contractors meet the environmental and occupational safety requirements, too. We have established several criteria in our procedures which enable us to make sure that our partners meet our expectations. Among other things, the providers of construction works must confirm that they comply with occupational safety and environmental protection requirements at our construction sites. Our specialists monitor the activity of suppliers/contractors with regard to the safety and environment at sites on a daily basis.

#### **Management system control and audit**

In spring 2015, a recertification audit was carried out in the Company by an accredited certifier Det Norske Veritas in order to evaluate the compliance of the management system with the requirements of ISO 9001, ISO 14001, OHSAS 18001 standards and with the Regulation (EC) No 1221/2009 (EMAS). The auditors did not find any non-conformities and, instead, highlighted several positive observations regarding Company's activity. Among other things, the audit report pointed out a positive fact that the Company has achieved high level of compliance with its objectives (the best ever in several areas) plus significant cost savings.

Internal audits monitored the Company's compliance with environmental legislation and Services Agreement requirements, as well as with the Company's own internal requirements. As a result of internal audits carried out in 2015, our internal auditors put forward a total of 6 non-conformities and 39 improvement proposals, which provide a good input to managers for improving the management system. All the non-conformities were rectified immediately.

The compliance of the activity and management system of Company's laboratories against the requirements of ISO 17025 standard were audited by the Estonian Accreditation Centre in spring 2015. The auditor did not find any non-conformities.

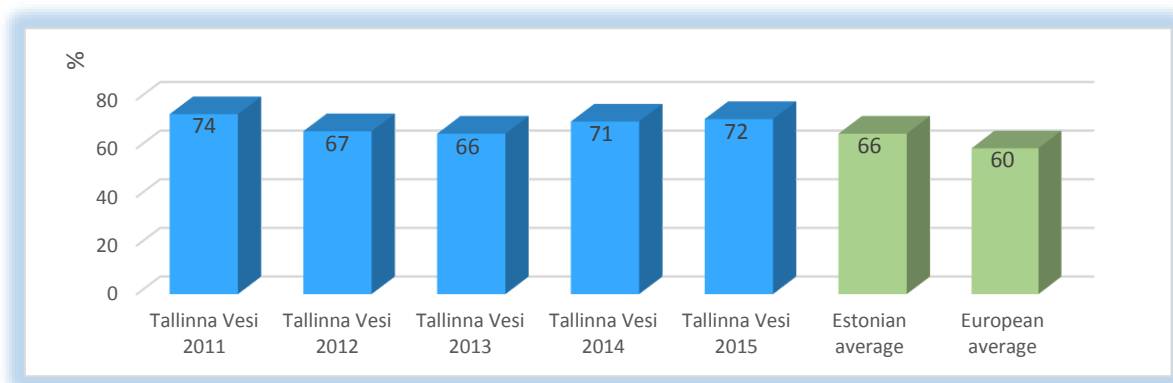
## 7. Our Employees

As of the end of 2015, the company employed a total number of 262 people.

### Employee Commitment

Each year we carry out an employee commitment survey. The results of the 2015 survey were positive and we have managed to maintain high employee commitment level, which is higher than the Estonian average. This year, a record of 93% of all our employees participated in the survey. Results from the survey are separately discussed in every team, and as a result of this specific action plans are prepared.

Diagram 1: EMPLOYEE COMMITMENT COMPARED TO THE ESTONIAN AND EUROPEAN AVERAGE IN 2015



To make our employees feel committed and motivated we have created an employer's benefit package. Within this package, we provide our employees with an additional 7-days leave in winter time, and an opportunity to get massage procedures and use two gyms at company's disposal for sports activities. In addition, the company organizes several traditional events and team initiatives throughout the year.

We deem important to involve our employees in the decision-making process, to inform them regularly and treat them equally. Main internal communication channels are Executive Team's meetings with the employees, a quarterly internal newsletter and a monthly newsletter issued by the management. In 2015, we renewed our intranet, which gives good information about the news, benefits, instruction materials, events, etc. Equally, it is important for us to celebrate the company's good results and new developments with our employees.

### Employee Development and New Generations

The average age of our employees is high (47 years) and in larger operational units considerable number of employees have reached the age of 50 years and more. This is the reason we started a new systematic trainee project and a young specialist program in 2015.

In addition, we took a big step in 2015 towards turning the training process more systematic (performance interview, training plans for company and department, training feedback, etc.). The total number of training days in 2015 was 570, which is a big jump compared to 2014 (365 days in 2014). All our new employees receive an introduction program, which also includes a presentation on company's environmental policy. Other environment-related trainings in 2015 included e.g. a training exercise at the Water Treatment Plant (chemical safety and protection of raw water resource), seminars on fire safety and safety at excavation works, and trainings organized for the water sample takers.

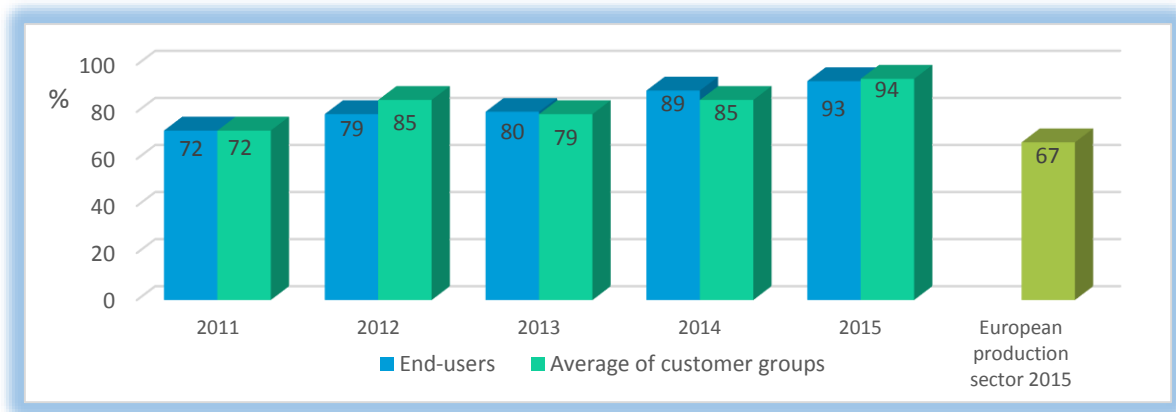
## 8. Our Customers

We provide water supply and sewerage services to more than 22,000 contractual customers and approximately 435,000 end-users in Tallinn and its surrounding areas.

Our wish is to provide an uninterrupted and high quality service to our customers. Therefore, we continued to make our best efforts in 2015 to maintain the very good quality of drinking water and to further improve the service reliability. The main focus was on providing information to customers and improving the quality of resolving customer contacts.

### Customer Feedback

Diagram 3: OUR CUSTOMERS' AND END USERS' SATISFACTION IN 2011-2015, IN COMPARISON WITH EUROPEAN PRODUCTION SECTOR IN 2015



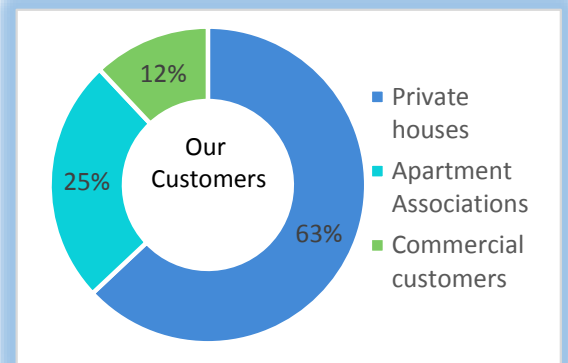
For the eighth year in a row, an independent market research company TNS Emor carried out a survey among our customers and end-users (a total of 900 customers and end users were surveyed), which showed that the average satisfaction indicator TRI\*M index among our customers in 2015 was 94 points. This is the best result we have had in all times.

The biggest progress has been in the assessment given by the housing associations who have been slightly more critical than the others in previous years. Customers encountered less problems with failures and interruptions, and were more satisfied with the level of being informed about the interruptions. Broadly speaking, preventing problems is the positive change. Reason behind the high satisfaction is the stability and good quality of water and water supply service.

Strong customer relations also rely on the positive shift in the company's media image, which has taken place in recent years. People are more and more interested in the topics that define our activity (service quality, environmental activity, educating children and young people). Media messages have a wider resonance: commercial customers notice more than ever various campaigns of the company and our activity in protecting the environment and educating the consumers. Number of people who trust to drink tap water has been increasing, both among private and commercial customers.

In 2016, problem-solving process will continue to be the place to improve ourselves. Although the number of customer complaints has dropped year by year, fixing the problems fast and in the manner that meets the customer expectations is still important.

Diagram 2: OUR CUSTOMERS



## 9. Our Community

We understand the impact of our business on the surrounding environment and therefore deem it important that our activities engage with the interests of different stakeholders. We give our best to do more than required and expected from us in order to cast a positive impact both on the natural environment and on the quality of people's life. Therefore, we support and encourage people to actively participate in the community activities outside the company, as well as within our team.

### Cooperation and Attention

- High quality drinking water was provided at numerous popular sports and health promotion events. We also provide water for the Flower Festival and building of ice skating rinks in winter.
- We support the Estonian Disabled People's Sports Union. Our wish is to provide support to the disabled people and encourage them to do the sports and participate in social life, so that those people in the society who need more help and attention would also experience the feeling of success.
- Together with the Estonian Basketball Union we support the athletic development of young people and through that strengthen the mind-set striving for a healthier life style among the young generation.
- We also contributed to charity by participating in the traditional Rat Race in 2015. All the participants had to stop at the point on the track where they were expected to prepare a healthy tap water cocktail.
- For years now, we have been supporting the elementary school "Ristiku" for children with learning disabilities and the kindergarten "Õunake" for disabled children. In 2015 we supported the city camp for children from "Ristiku" and visited the school to speak about water; our employees also donated a lot of clothes, toys and other necessary things for the traditional flea market that the school is organizing. In kindergarten "Õunake" the company supported building of a shelter for the wheelchairs, and for years now, the company's electronical Christmas card is decorated with a drawing made by the children of "Õunake".
- In 2015, we gave away soil for greenery for free to everyone in cooperation with the city district governments.
- The Responsible Business Forum recognized us in 2015 with the Golden Mark in Corporate Social Responsibility index. This index helps us to consistently analyse how to act in a socially responsible manner and how to design a sustainable business model.
- City of Tallinn gave us a title of the Most Children and Youth Friendly Company in Tallinn in 2015, recognizing the work we are doing with children and young people.



*Rat Race run for charity*



*City camp for children from Ristiku elementary school*



RESPONSIBLE  
BUSINESS INDEX  
GOLD LEVEL 2015





- Each year we organize a joint charity team event for our team. In 2015, we went to the Estonian Food Bank to help at completing the food hampers.

### Environmental Education and Consumer Awareness

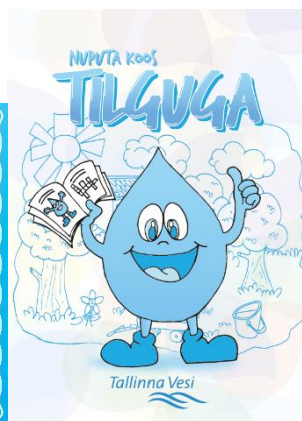
- We keep on working hard to promote the environmental thinking amongst our population. In our messages and activities we encourage them to drink tap water. With our message “Tap water IS drinking water” we draw people’s attention to the very good quality of tap water. We also continued our co-operation with restaurants within our campaign “Ask for tap water” so that the customers would have the courage and awareness to ask for tap water when they dine out in restaurants. In 2015, we organized a campaign in the old town and set up a public water tap at Tallinn Airport. While only few years ago, in 2011, 48% of people trusted to drink tap water, the number of people trusting tap water quality had grown to 86% by the end of 2015.



*Tap water campaign in Tallinn old town*



- We continue contributing to environmental awareness of young people who would value the nature and environment. Each year, our employees organize water lessons in kindergartens and schools discussing water circulation, how to save water and avoid blockages. Nearly 1,500 children participated in these lessons in 2015.
- Over the years, we have prepared many educational study materials related to water and environment issues for children and teachers. These include, for example, a study material series “Blue Classroom” for the teachers in nature studies supporting the national study program in water-related classes. The games and puzzle book for kindergartens and primary schools got new great sequels in 2015: Tilgu’s playing cards and a puzzle book „Puzzle with Tilgu“. To introduce the water-related study materials to kindergarten and school teachers an information day was organized in 2015 August with nearly 100 teachers participating from all over Estonia.
- Besides our main responsibilities – production of drinking water and treatment of wastewater – our treatment plants also have an important role to play in increasing the population’s awareness. Each year, we introduce the plants’ work to more and more people. In 2015, more than 3,000 visitors took guided tours in the treatment plants.
- Each year, we open our doors at the treatment plants to everyone interested during the open doors events. In spring 2015, we had 150 people visiting the wastewater treatment plant, and the open doors day at Ülemiste Water Treatment Plant in August 2015 attracted nearly 400 people participating in the sports event to visit also the plant.



*Tilgu’s playing cards and puzzle book*



*Open doors day at the wastewater treatment plant and seminar for teachers*

## 10. Ecological Footprint

Ecological footprint method enables to evaluate the environmental impact of our activities in a complex manner. Ecological footprint assesses the use of space accompanying the lifecycle of a product or service and can be measured in hectares per year (hereinafter ha/y).

Our ecological footprint is calculated based on the methodology developed by the Estonian Fund for Nature. The calculation takes into consideration 11 different components and corresponding factors<sup>1</sup>. The components have been divided into five fields (water, waste, electricity, heating, transport). In order to get a better comparison, the ecological footprint per one employee has been pointed out separately.

In 2015, we reviewed the principles of collecting the input for the ecological footprint calculation. For several components (waste, electricity and heating energy) it is not possible to separate out the consumption of AS Tallinna Vesi and its subsidiary OÜ Watercom. For this reason, the consumption of OÜ Watercom has been included in the transport component starting from this year. In addition, the collection of input for water consumption was improved, resulting in a significant increase in the amount of consumed water. In previous years the water consumption only covered the water consumed in the water treatment plant, but since 2015 the water consumption of technical services and pumping stations was included in the data.

Annually, the Company has the strongest impact on the environment through its use of electricity, followed by the use of heat energy and motor transport. The use of electricity and heat energy and motor transport are in a close and inevitable connection with our core activity and the factors that impact this. The consumption of all the resources is analysed in the next chapters of this report.

Table 4: GROUP'S ECOLOGICAL FOOTPRINT IN 2015

Aspects that serve as the basis for calculating the ecological footprint	Year	Consumption/ production	Ecological footprint per employee, ha/y per employee	Ecological footprint, ha/y	Direction of change
WATER					
1. Water consumed, m³	2015	1 259 936	0.3	100.8	↑
	2014	514 180	0.1	41.1	
WASTE					
2. Recycled paper, t	2015	5	0.04	13.5	↓
	2014	6	0.05	14.1	
3. Recycled metal, t	2015	68	0.2	74.4	↑
	2014	12	0.05	13.7	
4. Concrete (to a landfill), t	2015	274	0.1	27.4	↑
	2014	62	0.02	6.2	
5. Mixed municipal waste (to a landfill), t	2015	67	0.9	269.0	↓
	2014	93	1.25	374.8	
ELECTRICITY					
6. Electricity, MWh	2015	38 465	20.1	6 192.9	↑
	2014	37 188	20.0	5 987.3	
HEAT ENERGY					
7. heat energy produced from natural gas*, MWh	2015	3 623	1.1	340.5	

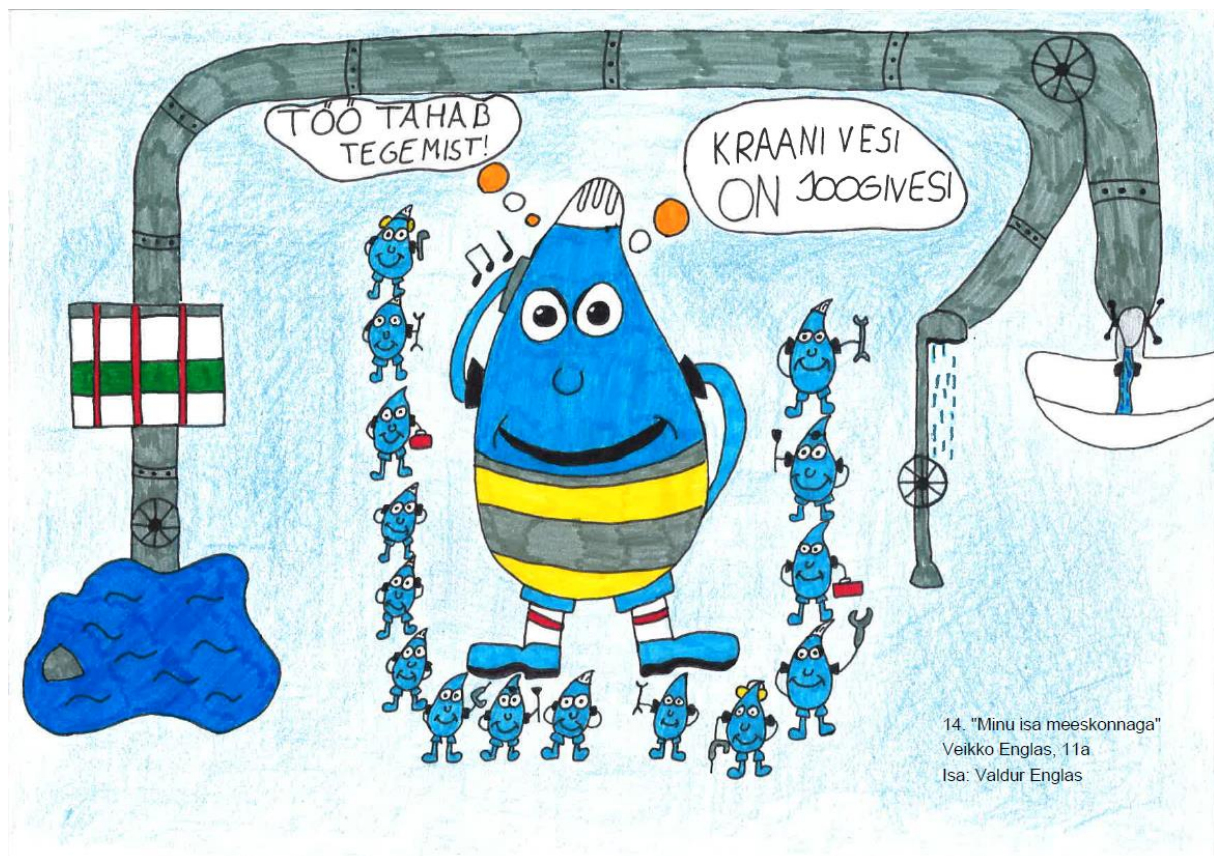
<sup>1</sup> Ecological footprint factor is a conversion unit which helps to equalize the measured source data so that the result would be easily understandable and comparable.



	2014**	4 256	1.3	399.0	↓
<b>TRANSPORT FOR PEOPLE</b>					
8. By car, km	2015	5 558 977	1.1	333.5	↑
	2014	2 745 044	0.5	164.7	
9. By plane, km	2015	153 346	0.04	13.8	↓
	2014	326 203	0.09	26.2	
10. By bus, km	2015	1 948	0.0002	0.1	↑
	2014	40	0.000004	0.001	
11. By ship, km	2015	5 576	0.0002	0.1	↑
	2014	3 188	0.0001	0.03	
<b>TOTAL:</b>	2015		23.9	7 366	↑
	2014		23.5	7 066	

\*In addition to the heat energy produced from natural gas we use the biogas, which is a by-product of the sludge treatment process, to produce the heat energy.

\*\*Difference compared to the 2014 report. Heat resold has been deducted from the heat consumption.



Children drawing competition "My parent at work"

## 11. Quality and Use of Water Resource

### Permits for special use of water

Our activities in using water resources are regulated by the Water Act and its implementing provisions. As a water company we must hold a valid permit for a special use of water for a specific term and pay a fee for the water resource we have used. The permit for a special use of water involves certain obligations and restrictions (e.g. the permit sets out the allowed water extraction volume (m<sup>3</sup>)), keeping the account of water, metering ground water level, requirements for sampling, monitoring and analyse standards, as well as the allowed limit values for pollutants in effluent, requirements for monitoring the pollutants and the measures to reduce the impact of a special use of water).

All requirements established in the permits for a special use of water were met in 2015. Fee for a special use of water is paid for the amount of water taken into Ülemiste Water Treatment Plant and for the ground water pumped from the aquifers. In 2015, the fee for a special use of water amounted to 4.6% of the costs of the sold products/services.

Table 5: VALID PERMITS FOR A SPECIAL USE OF WATER OF AS TALLINNA VESI

Permit no.	Valid until	Description of special use of water
Permit for a special use of water (L.VV/323855)	31.10.2018	<b>Saue City public water and sewerage service area.</b> Extraction of ground water from boreholes, over 5 m <sup>3</sup> /day. Collection of wastewater and directing wastewater to Paljassaare Wastewater Treatment Plant owned by AS Tallinna Vesi.
Permit for a special use of water (L.VV/322982)	31.03.2018	<b>Tallinn public water supply and sewerage system main operating area, Tallinn surface water catchment system facilities area in Harju and Järva Counties.</b> Regulating surface water resources in water bodies of Ülemiste-Pirita-Jägala surface water system, water extraction from Lake Ülemiste, extracting ground water from Ordovician-Cambrian and Cambrian-Vendi aquifers through Tallinn public water supply and sewerage system boreholes, for discharging biologically treated effluent through a deep-sea outlet pipe into Tallinn Bay and for discharging mechanically treated storm water into the sea, Mustjõe Stream and Pääsküla Wetland.
Temporary permit for a special use of water (327108)	27.11.2015-10.03.2016	<b>Temporary discharge of wastewater to the receiving body via K5 overflow in Paljassaare in extreme situation.</b>
Permit for a special use of water (L.VV/320972)	6.11.2016	<b>Harju County, Harku Municipality.</b> Extraction of ground water from boreholes, over 5 m <sup>3</sup> /day. Discharge and treatment of sewage and storm water from sutomers and discharge of wastewater to the receiving body of water.
Permit for a special use of water (L.VV/320980)	31.10.2016	<b>Maardu City public water supply and sewerage system operating area.</b> Extraction of industrial and drinking water from Cambrian-Vendi aquifers in order to supply water to the institutions, enterprises and inhabitants of Maardu City, Kallasvere and Muuga area. All Kallasvere and Maardu public sewerage system is discharged to Tallinna public sewerage system.

### Water catchment

Nearly 90% of our consumers in Tallinn and Maardu get their drinking water from the surface water resources. Even though Lake Ülemiste is the main drinking water source for the people of Tallinn, the natural catchment of the lake itself is small. To increase the water volume and ensure that the needs of the City of Tallinn are met, we have built a water catchment system, which consists of hydropoints constructed on rivers, as well as water reservoirs and channels connecting those. Our water catchment system mainly comprises Harju sub-basin and the river basins of Soodla, Jägala and Pirita Rivers with the total area of ca 1,800 km<sup>2</sup>. The most important water reservoir is Lake Ülemiste with a net volume of 15.8 million m<sup>3</sup>. Additional water reserves for dry periods have been accumulated to Paunküla water

reservoir on the headwaters of the Pirita River (9.9 million m<sup>3</sup>) and to Soodla water reservoir on the Soodla River (7.4 million m<sup>3</sup>).

The volume of water resources in Tallinn surface water catchment system primarily depends on the annual amount of precipitation. Constant information on the flows enables us to use the water resource in the most efficient manner. To regulate the water resources in an optimum and accurate manner we have established water metering points at all hydropoints, which enable us to meter the flows conducted to the channels and the sanitary flows in the rivers. We perform metering regularly, as per the requirements of the permit for a special use of water.

2015 was a dry year and thus additional water was taken to Lake Ülemiste throughout the entire year. More than half of the water need was covered by water from Pirita-Ülemiste channel (15 million m<sup>3</sup>). Due to the low precipitation considerably smaller amount of nutrients were washed from soil into water bodies and this significantly improved the water quality in all water bodies. Single deviations clearly indicate the impact of human activity.

In order to protect the water resources and the water body used for the drinking water extraction, a sanitary protection zone around Lake Ülemiste has been formed. The sanitary protection zone comprises Lake Ülemiste, water catchment facilities, bank reinforcements and the land in the immediate vicinity of the lake, which needs to be kept in its natural condition. In addition, sanitary protection zones are formed in the catchment areas to protect the facilities of Soodla, Kaunissaare, Paunküla and Aavoja water reservoirs.

### Use and quality of surface water

Pursuant to the permit for a special use of water no L.VV/322982, the Company is allowed to extract 47.60 million m<sup>3</sup> of surface water per year from Lake Ülemiste. The actual surface water use in 2015 was 22.76 million m<sup>3</sup>.

Table 6: USE OF SURFACE WATER FROM LAKE ÜLEMISTE AND COMPLIANCE WITH THE PERMIT FOR A SPECIAL USE OF WATER No. L.VV/322982, million m<sup>3</sup>

	2011	2012	2013	2014	2015
Use of surface water from lake Ülemiste	21.57	21.75	22.2	22.61	22.76

Maximum volume permitted 47,6 million m<sup>3</sup>/year

The water quality in surface water sources is monitored in line with the programme established based on the conditions of the permit for a special use of water. In 2015, the quality of raw water in the treatment system complied with the class A2 requirements of the European Council Directive 75/440/EC. To ensure compliance, the raw water quality indicators are analysed once a day at the intake to the treatment system. The raw water pollution indicators, such as total phosphorus and total nitrogen, are analysed once a week. Furthermore, an in-depth analysis of raw water is carried out once a month in accordance with the drinking water quality monitoring programme. Based on the outcome from these results, we make an assessment of the changes and processes in the catchment area and make decisions regarding additional intake to supplement the water resources in the lake.

In 2015, raw water was of an average quality. In 2015, the permanganate oxygen demand was slightly higher than in previous year. Also the water colour parameters in raw water were higher.

Table 7: PERMANGANATE OXYGEN DEMAND IN RAW WATER IN 2011-2015 O<sub>2</sub>, mg/l

	2011	2012	2013	2014	2015
COD <sub>MN</sub>	9.4	10.1	10.1	8.9	9.6

Table 8: RAW WATER COLOUR IN 2011-2015, Pt mg/l

	2011	2012	2013	2014	2015
Colour	56	46	43	33	35

### Use and quality of ground water

Approximately 10% of consumers in Tallinn are supplied with water extracted from the Cambrian-Vendian and Cambrian-Ordovician aquifers. Ground water is supplied in the districts of Nõmme, Laagri, Merivälja, Piritä and Tiskre in Tallinn, Tiskre village in Harku Rural Municipality and City of Saue. Total of 2,470,177 m<sup>3</sup> of ground water was extracted in 2015.

Table 9: USE OF GROUND WATER AND COMPLIANCE WITH THE PERMITS FOR A SPECIAL USE OF WATER NO L.VV/322982, L.VV/323855, L.VV/320972 AND L.VV/320980, th m<sup>3</sup>

Parameter	Maximum volume currently permitted	Average results				
		2011	2012	2013	2014	2015
<b>Use in Tallinn</b> (Permit no. L.VV/322982)	7150.7	2 229.6	2 161.8	2 152	2 076.3	2 146.1
<b>Use in Saue</b> (Permit no. L.VV/323855)	511	213.7	210.7	205.2	230.7	265.5
<b>Use in Harku</b> (Permit no. L.VV/320972)	138.12	12.7	57.2	58.3	57.9	58.6
<b>Use in Maardu City</b> (Permit no. L.VV/320980)	1382.4	618.8	36	1.5	0	0.1

According to the EU Water Framework Directive (2000/60/EC), the qualitative or chemical condition of ground water is regarded to be good if the concentration of pollutants does not indicate an inflow of salty water or other water, nor does it exceed the respective quality standards. In 2015, the quality of drinking water at the borehole pumping stations complied with the requirements of the Regulation No 82, issued by the Minister of Social Affairs. There were no ground water pollution incidents or potential pollution incidents demanding the notification of the City of Tallinn and the Health Board.

We monitor the ground water quality parameters in accordance with the permits for a special use of water and the drinking water source quality monitoring programme, and if necessary, the ground water will undergo a treatment process. We monitor the treated ground water quality (content of iron, manganese, and ammonia) at 20 ground water pumping stations on a monthly basis. All bore-wells of the Company currently in use are equipped with automatic hydrostatic pressure sensors, which enable to measure the static and dynamic level of ground water. The results of this measuring enables us to assess the recovery of ground water resources.

Ground water in Northern Estonia (Cambrian-Vendian aquifer) contains natural radionuclides. The natural radioactivity of Estonian ground water has been thoroughly studied by the Geological Survey of Estonia, as well as the Estonian Radiation Centre. To assess the health impacts of radioactivity, the Radiation Centre together with the Health Board carried out a health risk assessment in Tallinn ground water areas in 2010. Based on the results of this risk assessment, any random health damage resulting from the content of radionuclides in the water of Cambrian-Vendian bore-wells is unlikely. Repeated radiological analyses in all the bore-wells are carried out in every ten years, in accordance with the requirements.



## 12. Drinking Water Production and Quality

Drinking water quality is required to comply with the Regulation No 82 “Quality and Control Requirements and Analysis Methods for Drinking Water”, issued by the Minister of Social Affairs on 31 July 2001 (hereinafter referred to as the Regulation No 82), originating from the Estonian Water Act and the European Union Drinking Water Directive 98/83/EC.

The water quality is monitored following the monitoring programmes approved by the Health Board. Samples are taken from the raw water (Lake Ülemiste, the catchment area thereof, and ground water), treatment process, bore-wells, as well as the customer taps. Water analyses are carried out by the Company’s water and microbiology laboratory, which is one of the largest water laboratories in Estonia. The quality of the analyses is guaranteed by the certified samplers and laboratories accredited by the quality management system (EVS-EN ISO/EC 17025 standard), using modern equipment and employing professional staff. In 2015, our water and microbiology laboratory performed a total of 99,000 analyses.

Number of people drinking tap water has been continuously growing over the recent years. While in 2011, 48% of our customers trusted to drink tap water, in 2015 this number was already 85%. The growing trend of drinking tap water is definitely based on the excellent water quality and increased consumer awareness.

### Surface water treatment process

Ülemiste Water Treatment Plant treats water extracted from the lake applying a treatment scheme which is used world-wide. Due to the quality of surface water in Lake Ülemiste, the law stipulates that in order to ensure the drinking water quality, the surface water must undergo mechanical and chemical treatment – preliminary ozonation, coagulation, clarification, filtration, and disinfection.

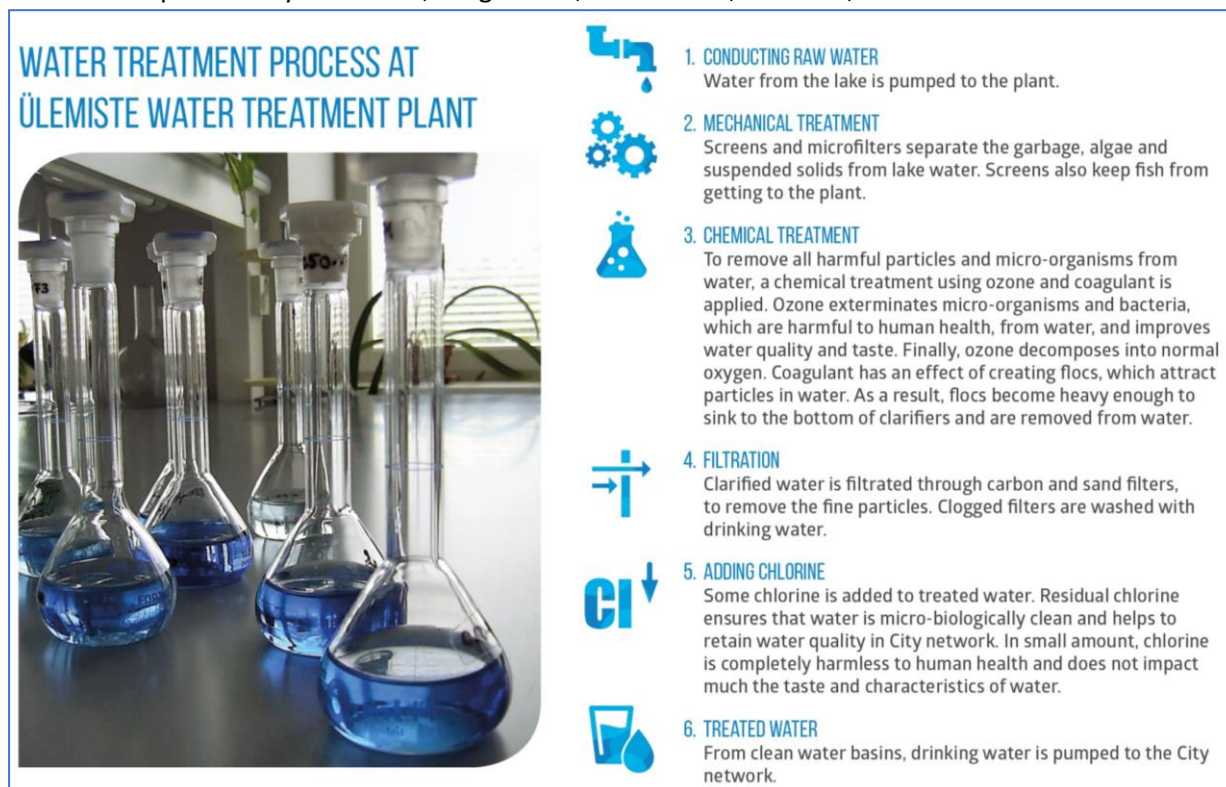


Diagram 1: WATER TREATMENT PROCESS AT ÜLEMISTE WATER TREATMENT PLANT

To improve the water treatment process performance, four filters were regenerated in 2015. To reduce the load of filters, a water recirculation system of clarifiers' sludge catcher was built at the old water treatment plant, which enables additional treatment of water with high turbidity after flushing process.

Table 10: DRINKING WATER QUALITY IN ÜLEMISTE WATER TREATMENT PLANT IN 2011-2015\*

Parameter	Unit	Average results					Decree no 82, EU directive 98/83/EC
		2011	2012	2013	2014	2015	
Odour	points	1	1	1	1	1	Acceptable to consumer
Taste	points	1	1	1	1	1	Acceptable to consumer
Turbidity	NTU	0.11	0.12	0.11	0.07	0.09	1.0
Colour	Pt mg/l	3	<3	<3	<3	<3	Acceptable to consumer
pH		7.3	7.3	7.26	7.42	7.37	6.5 – 9.5
Conductivity	µS/cm	366	366	373	381	385	2500
Alkalinity	mg-ekv/l	2.83	2.79	2.93	2.93	2.94	
Total hardness	mg-ekv/l	3.87	3.86	3.96	4.04	4.07	
Permanganate index (COD <sub>Mn</sub> )	O <sub>2</sub> mg/l	3	3.2	3.1	2.9	3.07	5.0
Total organic carbon (TOC)	mg/l	5.9	6.2	5.8	5.7	5.73	Without unusual changes
Chlorides Cl <sup>-</sup>	mg/l	25.1	26	26	25	26	250
Sulphates SO <sub>4</sub> <sup>2-</sup>	mg/l	25	26	23	29	28	250
Orthophosphates PO <sub>4</sub> <sup>3-</sup>	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	
Fluoride F <sup>-</sup>	mg/l	0.09	0,1	0.09	0.11	0.1	1.5
Nitrates NO <sub>3</sub> <sup>-</sup>	mg/l	2.9	3.1	2.6	2.6	3.2	50
Ammonium NH <sub>4</sub> <sup>+</sup>	mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	0.5
Calcium Ca	mg/l	65.7	67	66.4	67.4	65.5	
Magnesium Mg	mg/l	7.3	6.6	6.9	7.5	7.8	
Total iron Fe	µg/l	<10	<10	<10	<10	<10	200
Manganese Mn	µg/l	13.2	5.3	12.2	3.1	4.3	50
Aluminium Al	µg/l	101	110	79	73	94	200
Sodium Na	mg/l	6.6	6.3	6.1	5.9	6.2	200
Potassium K	mg/l	2.8	2.7	2.6	2.5	2.4	
Chromium Cr	µg/l	0.65	0.59	0.67	0.69	0.61	50
Copper Cu	µg/l	0.4	0.52	0.58	0.57	0.42	2000
Mercury Hg	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	1
Lead Pb	µg/l	<0.02	<0.02	0.02	0.02	<0.02	10
Selenium Se	µg/l	<0.7	<0.7	<0.7	<0.7	<0.7	10
Zinc Zn	µg/l	0.51	0.43	0.55	0.47	0.42	
Enterococci	CFU/100ml	0	0	0	0	0	0
No of colony forming units at 22°C	CFU/ml	0	0	0	0.5	0	Without unusual changes
Coliform bacteria	CFU/100ml	0	0	0	0	0	0
<i>Escherichia coli</i>	CFU/100ml	0	0	0	0	0	0
<i>Clostridium perfringens</i>	CFU/100ml	0	0	0	0	0	0

\*Compared to the 2014 report, the following less important parameters have been removed from the table: dry residue, temporary and permanent hardness, free CO<sub>2</sub>, carbonates, bicarbonates, acrylic amide, chloroform, THM.

## Ground water treatment

Ground water used for producing drinking water usually falls under the quality class I-III. Ground water from Ordovician-Cambrian aquifer usually falls under the quality class I and does not need any treatment. However, ground water from Cambrian-Vendian aquifer, which is the main drinking water

source, falls under the quality class II or III and requires treatment. The main reason is mostly a natural excess content of iron, manganese, or ammonium, resulting in higher turbidity of water than usual.

In order to supply compliant drinking water, we treat ground water by using filtration and aeration to remove excess iron, manganese and ammonium from the water. The Water Act foresees the preservation of ground water as similar to its natural conditions as possible, therefore, no chemicals are used. The samples taken after the ground water treatment process indicate a significant decrease in turbidity as well as in the content of iron, manganese and ammonium, an improvement of colour and stability index and an increase in oxygen content.

Table 11: GROUND WATER QUALITY IN PUMPING STATIONS IN 2011-2015\*\*

Parameter	Unit	Average results					Decree no 82, EU directive 98/83/EC
		2011	2012	2013	2014	2015	
Odour	points	1	1	1	1	1	Acceptable to consumer
Taste	points	1	1	1	1	1	Acceptable to consumer
Colour	mg Pt/l	4	<4	<3	<3	<3	Acceptable to consumer
Turbidity	NTU	0.48	0.38	0.39	0.37	0.3	Acceptable to consumer
pH		8.05	7.95	7.97	7.93	7.96	6.5 – 9.5
Conductivity	µS/cm	493	493	489	482	494	2500
Permanganate index (COD <sub>Mn</sub> )*	O <sub>2</sub> mg/l	0.66	0.69	0.73	0.61	0.77	5
Total organic carbon (TOC)	mg/l	0.75	0.73	0.76	0.71	0.75	Without unusual changes
Total hardness	mg-ekv/l	3.23	3.29	3.23	3.21	3.27	
Total iron Fe	µg/l	56	50	44	21.5	30	200
Fluoride F <sup>-</sup>	mg/l	0.61	0.59	0.59	0.54	0.58	1,5
Manganese Mn	µg/l	14	12	14	8.15	10.4	50
Ammonium NH <sub>4</sub> <sup>+</sup>	mg/l	0.124	0.125	0.126	0.107	0.125	0,5
Nitrites NO <sub>2</sub> <sup>-</sup>	mg/l	0.013	0.010	0.014	0.012	0.01	0,5
Nitrates NO <sub>3</sub> <sup>-</sup>	mg/l	0.8	<1	<1	<1	<1	50
Stability index		0.22	0.1	0.11	0.08	0.093	
Calcium Ca	mg/l	45	46	45	45	46	
Sodium Na	mg/l	43.3	43	44	42	48	200
Potassium K	mg/l	6.88	6.8	6.76	6.79	6.95	
Sulphates SO <sub>4</sub> <sup>2-</sup>	mg/l	18.4	19	20	20	15.92	250
Bicarbonates HCO <sub>3</sub> <sup>-</sup>	mg/l	153.5	158	152	155	154	250
Chlorides Cl <sup>-</sup>	mg/l	82.8	83	85	83	86	250
Boron B	mg/l	0.176	0.16	0.156	0.166	0.166	1
Aluminium Al	µg/l	0.91	1.4	1.52	2.57	3.0	200
Chromium Cr	µg/l	0.5	0.52	0.48	0.5	0.47	50
Copper Cu	mg/l	0.0033	0.0036	0.005	0.0022	0.001	2
Mercury Hg	µg/l	0.06	<0.1	<0.1	<0.1	<0.1	1
Nickel Ni	µg/l	1	1.5	3.24	1.29	0.35	20
Lead Pb	µg/l	0.14	0.20	0.3	0.13	0.078	10
Enterococh	CFU/100ml	0	0	0	0	0	0
No of colony forming units at 22°C	CFU/ml	6	3	4	3	2	Without unusual changes
<i>Coliform bacteria</i>	CFU/100ml	0	0	0	0	0	0
<i>Escherichia coli</i>	CFU/100ml	0	0	0	0	0	0

\* Minister of Social Affairs decree No 82 does not establish a requirement to determine COD in drinking water, provided that total organic carbon has been determined. The listed indicator has been determined in the drinking water sources and the content of that does not change after going through filters.

\*\*Compared to the 2014 report, the following less important parameters have been removed from the table: temperature, dissolved O<sub>2</sub>, alkalinity, temporary and permanent hardness, free CO<sub>2</sub>, sulphides, dry residue, magnesium, arsenic, cadmium, antimony, selenium.

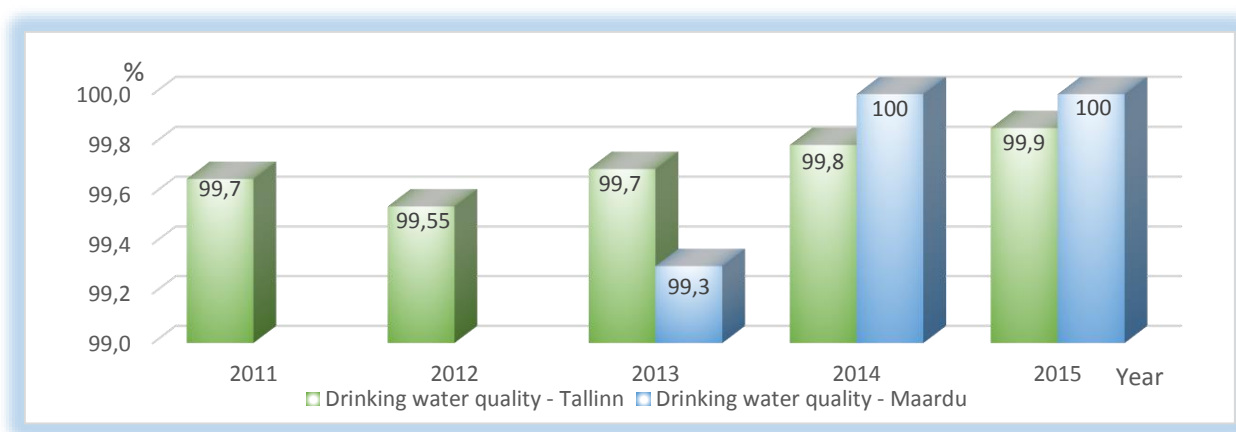
### Drinking water quality in the network and at customer premises

Tap water in Tallinn and Maardu is of a very good quality and safe to drink. In terms of quality, the year 2015 did not differ from the previous periods. During the year, we took samples twice a month at the sampling points (at customer premises) agreed with the Northern Department of the Health Board.

The best ever result - 99.86% of all water samples complied with the standards - means that in 2015 we detected non-compliances only in 4 samples of the total of 2,945 samples taken from the customer taps. Non-compliances were mainly related to higher iron and turbidity parameters caused by the conditions of the water network. We immediately reacted to all non-compliances.

100% of the 144 water samples taken in Maardu in 2015 complied with the standards. Before connecting with Tallinn water network, the quality compliance of drinking water in Maardu was only 33%.

DIAGRAM 4: COMPLIANCE OF DRINKING WATER QUALITY WITH THE REQUIREMENTS OF THE REGULATION NO 82, ISSUED BY THE MINISTER OF SOCIAL AFFAIRS, IN 2011-2015, %



### Water network maintenance and related investments

We are constantly performing maintenance and rehabilitation works on the network to retain and improve the drinking water quality. We regularly clean and flush the water network to guarantee high drinking water quality for the consumers. During the cleaning process the sediment build-up is removed from the network, serving as one of the important methods improving water quality in distribution networks. In 2015, air-scouring pipe cleaning method was carried out on 140 km of water network.

Table 12: CLEANED WATER NETWORK IN 2011-2015, km

	2011	2012	2013	2014	2015
Cleaned water network	151	143	140	145	140

Investments in replacing old water pipes have facilitated an improvement in water quality at customer premises and a more efficient use of water resources. Each year, we renovate at least 5 km of sewerage network and 5 km of water network, pursuant to the Services Agreement signed with the City of Tallinn.



### Leakages and interruptions to water supply

One of our most important objectives is to constantly reduce water losses in the network. The level of leakages has decreased compared to the last year. The Services Agreement applied in the Tallinn service area sets us the commitment to reduce the level of leakages to 26%. In 2015, we managed to achieve 14.68%, which is an excellent performance. About ten years ago the level of leakages exceeded 32%, which means saving over 14 thousand m<sup>3</sup> of water a day compared to the period ten years ago. This reduction in the level of leakages has been facilitated by our consistent efforts to use the water resource sustainably and with lower losses.

Detecting and eliminating the leakages as fast as possible contributes to the reduction in the level of leakages. Our specialists have special equipment for finding leakages and, along with zoning the network and remote reading devices, it allows us to detect the leakages faster.

Table 13: LEAKAGE LEVEL IN 2011-2015, %

	2011	2012	2013	2014	2015
Leakage level	17.73	15.86	16.98	16.14	14.68

In order to mitigate the inconveniences resulting from an interruption to the service, we notified the customers in advance of unplanned interruptions in 98% of the events. In case of interruptions to water supply we provide customers with a temporary water supply with the water tanks.

### Water metering

The water meters we use are of high quality and comply with the European standard EN14154 and the Directive 2004/22/EC, as well as the accuracy requirements thereof. The expert studies and calibration of water meters is performed by the national Central Office of Metrology, AS Metrosert.

23,308 water meters in total have been installed to customers' connection points, facilitating to achieve a more accurate accounting for the usage of water resources.

Pursuant to the Metrology Act, we have an obligation to verify and replace the water meters every two years. In 2015, we replaced the total of 11,561 water meters based on a programme developed for that purpose. In 2016, we shall continue our work to make sure that all our customers have duly verified water meters.

## 13. Wastewater Collection

### Wastewater network and collection of wastewater

Wastewater is directed to the wastewater treatment plant by using the combined sewer system, which collects both sewerage and storm water. Some parts of our service area are also covered with a separate storm water system with storm water outlets. However, most of the storm water is collected with a combined sewer system and ends up at the wastewater treatment plant in Paljassaare.

The number of blockages is an indicator reflecting the condition of the wastewater network. Blockages are mainly caused by the sediments build-up in the wastewater network. Initially, the pipelines were dimensioned for larger flow volumes, so today's smaller water consumption results in the reduction of flow volumes and flow speeds, which in turn increases the risk of blockages. Additionally, continuous extension of sewerage network is affecting the total number of blockages.

Table 14: NUMBER OF BLOCKAGES IN 2011-2015, pcs

	2011	2012	2013	2014	2015
Number of blockages	982	749	789	772	759

We have been able to achieve evenly good level of blockages in recent years due to many preventive actions, such as arranging preventive flushing on the pipelines. For flushing a pipe, first, a flow speed is generated with high pressure carrying sediment into the nearest cesspool. Sediment is then collected with pressure washing trucks and transported to Paljassaare Wastewater Treatment Plant.

In addition, each year the Company rehabilitates at least 5 km of problematic wastewater pipelines, which also facilitates effective wastewater collection.

### Pollution load in wastewater and storm water

In order to ensure acceptable pollution load in wastewater reaching the Paljassaare Wastewater Treatment Plant we regularly monitor the wastewater discharged in Tallinn and Maardu and in the surrounding areas and check the compliance of pollution parameters with legal requirements. Information on the average pollution indicators of major industries is also regularly submitted to the Environmental Board.

In 2015, our Wastewater Inspectorate performed 672 inspections to identify inspection wells, to check local treatment facilities and boundary drawings. 1,417 wastewater samples, incl. 488 monitoring samples were taken for determining the wastewater pollution load at sites. Over-pollution instances were identified and over-pollution fees were applied on 407 occasions.

The average level of precipitation in Tallinn was 590 mm per area unit in 2015, which is slightly more than in 2014 when this figure was 576 mm. Consequently, the amount of storm water discharged to the environment through storm water outlets slightly increased in 2015, too.

Table 15: STORM WATER VOLUME IN 2011-2015, million m<sup>3</sup>

	2011	2012	2013	2014	2015
Storm water volume	6.00	7.40	4.17	4.08	4.2

Pursuant to the requirements set forth in the permits for a special use of water we monitor 24 storm water outlets, the largest among them being the Lasnamäe, Harku and Mustoja outlets. Four storm

water outlets (in Olevi, Kaare, Raba and Vabaduse Streets) have been equipped with sand and oil traps, which we regularly maintain.

Table 16: POLLUTANTS FROM THE MAIN OUTLETS IN 2011-2015, t

	2011	2012	2013	2014	2015
Suspended solids	114.5	143.4	69.8	109.4	84
Oil products	0.5	0.5	0.5	0.8	0.2



Children drawing competition "My parent at work"



## 14. Wastewater Treatment

We treat the wastewater collected in Tallinn and nearest surrounding areas, using environment-friendly and modern technologies at Paljassaare Wastewater Treatment Plant. We are committed to maintaining the high standards and achieving the results that would outperform the standards that have been set for the treated effluent discharged into the Baltic Sea.

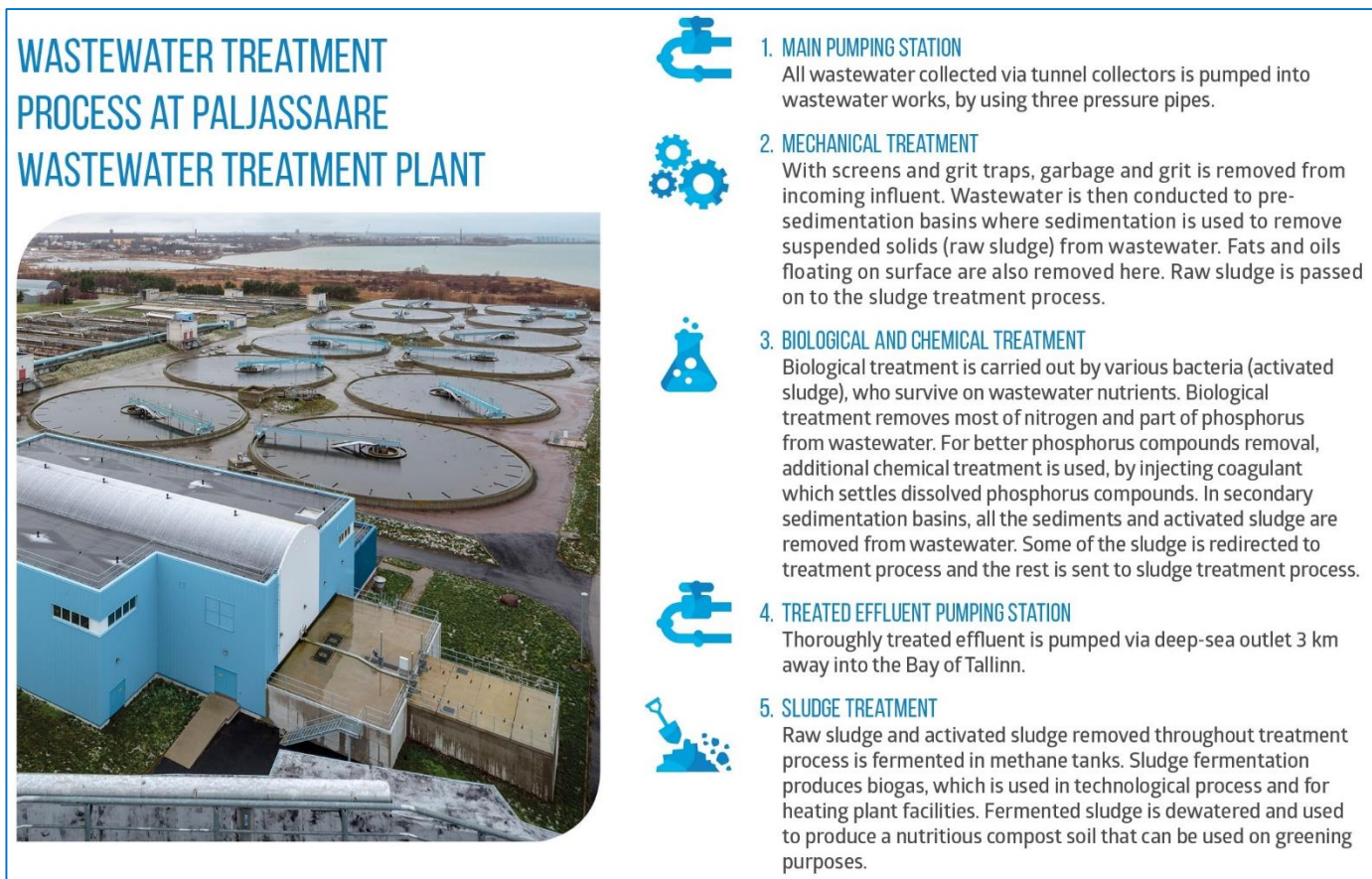


Diagram 2: DESCRIPTION OF THE WASTEWATER TREATMENT PROCESS AT PALJASSAARE TREATMENT PLANT

45 million m<sup>3</sup> of wastewater was treated at Paljassaare Wastewater Treatment Plant in 2015.

Table 17: TREATED WASTEWATER VOLUME IN 2011-2015, million m<sup>3</sup>

	2011	2012	2013	2014	2015
Treated wastewater volume	50.81	56.98	45.02	42.99	45.07

The quality of effluent discharged into the sea is set by the legal acts and the water extraction permit no L.VV/322982. The concentration of pollutants in wastewater arriving to the treatment plant and in the effluent leaving the plant are monitored in order to assess the efficiency of the treatment process and the quality of effluent. In 2015, the wastewater laboratory carried out 47,000 analyses at different wastewater treatment stages.

The important pollution parameters for us are the following:

- **BOD<sub>7</sub>** - biological oxygen demand shows the amount of oxygen required for the defined biological decomposition of organic matter in the course of 7 days;

- **COD<sub>Cr</sub>** - chemical oxygen demand is a measure of the decomposition of organic matter, measured as the consumption of oxygen in chemical oxidation of all organic matter in water;
- **SS** - suspended solids shows the volume of solid matter in water which is caught in a filter with a defined mesh size;
- **N<sub>total</sub>** and **P<sub>total</sub>** - total phosphorus and total nitrogen are elements contained in nutrient salts, which increase the growth of plankton in water. If the content of nutrient salts is too high, the growth can be so strong that oxygen is used up and a shortage of oxygen arises;
- **Oil products** - show the amount of light and heavy oil products.

Wastewater volumes and the pollution loads in 2015 were slightly higher, but the level of pollutants discharged with effluent were compliant with all the requirements and similar to previous years.

Diagram 5: AMOUNT OF POLLUTANTS COMING TO THE WASTEWATER TREATMENT PLANT AND DISCHARGED INTO THE SEA IN 2011-2015, t/y

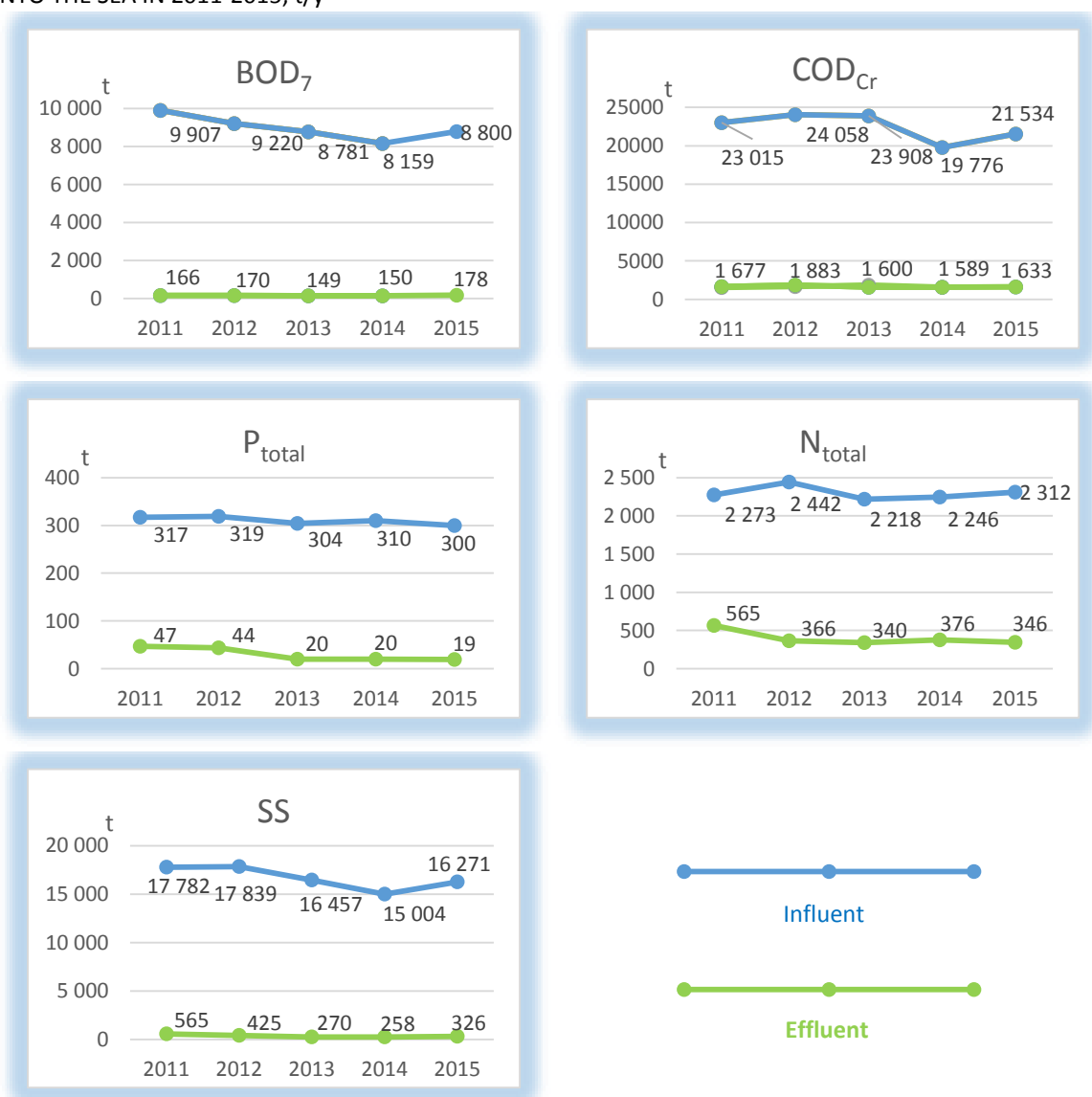


Diagram 6: AVERAGE POLLUTION INDICATORS IN TREATED EFFLUENT IN 2011-2015, COMPARED TO REGULATORY REQUIREMENTS AND RESULTS OF HELSINKI HSY, mg/l

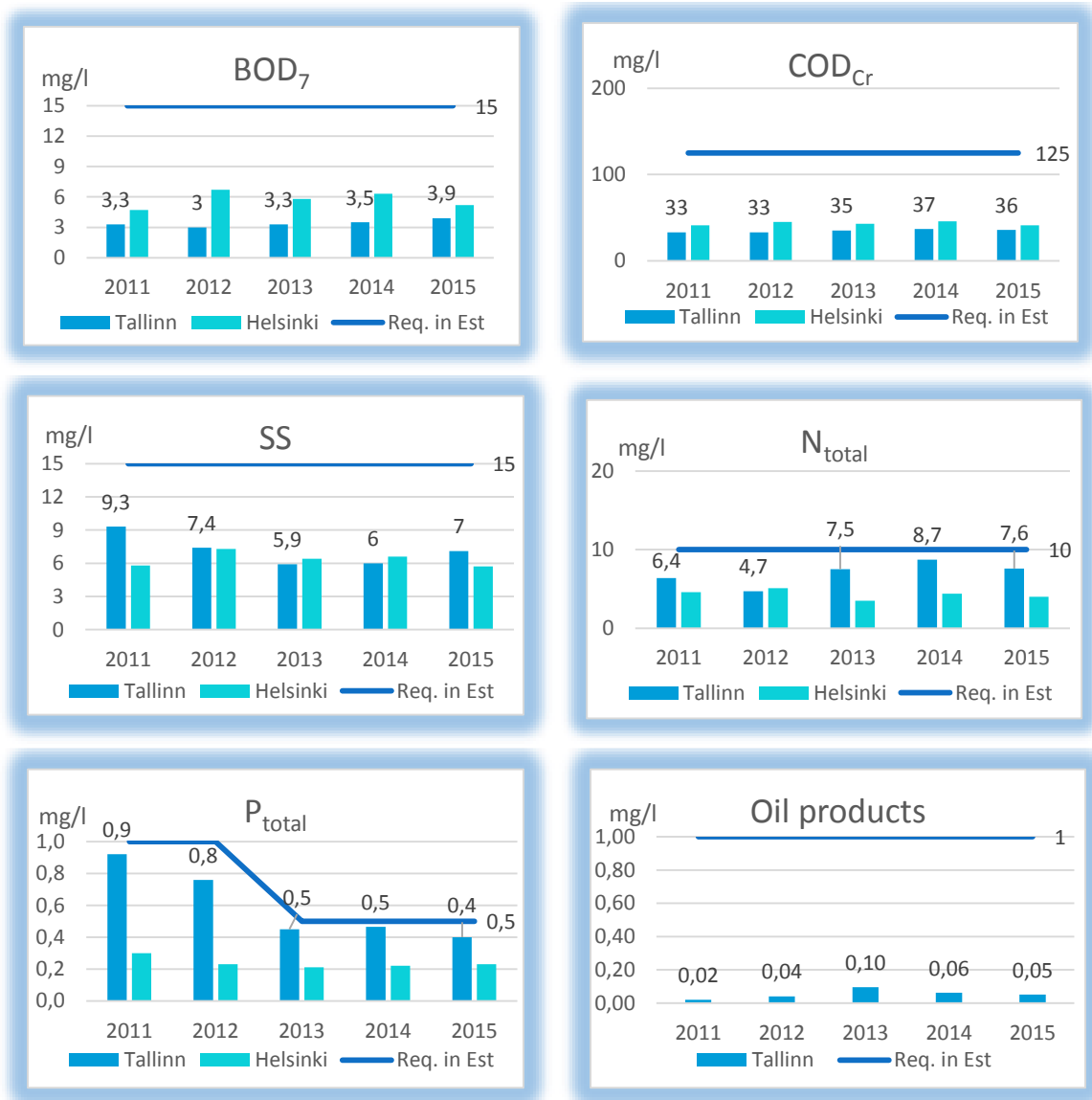
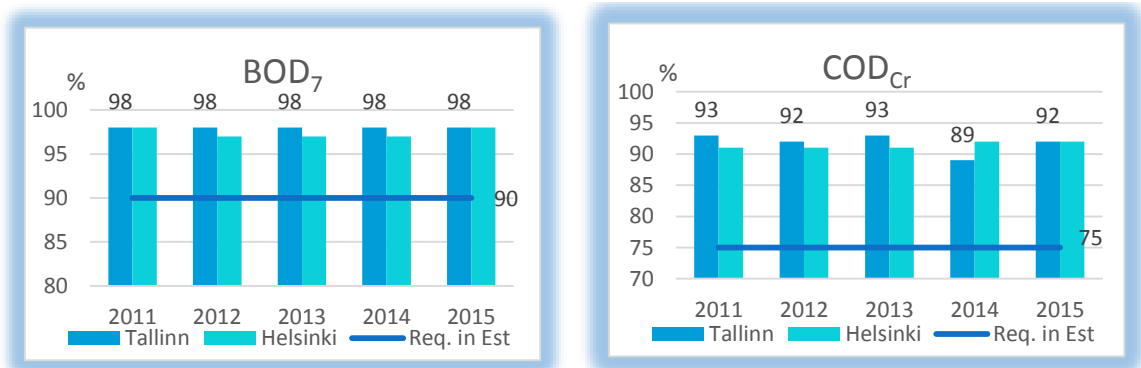
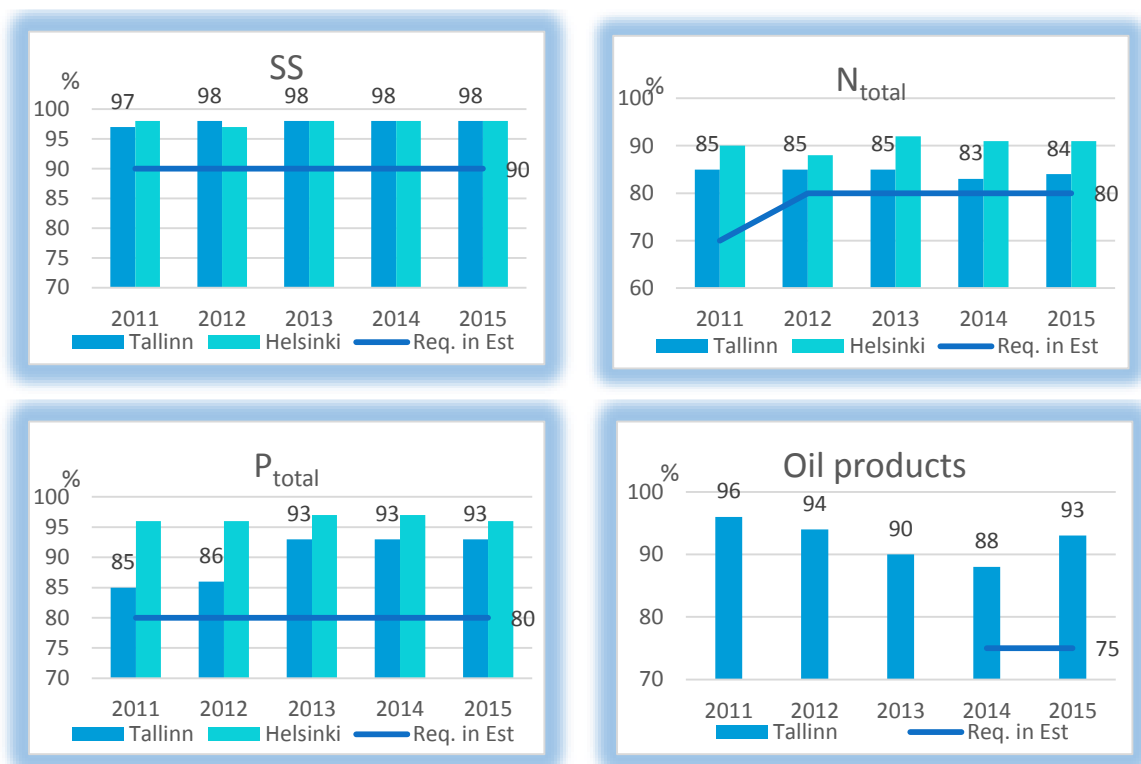


Diagram 7: WASTEWATER TREATMENT PLANT'S TREATMENT EFFICIENCY IN 2011-2015, COMPARED TO REGULATORY REQUIREMENTS AND RESULTS OF HELSINKI HSY, %





### Wastewater outlets to the sea

During 2015, we were bound to open the emergency outlets in the Wastewater Treatment Plant five times for a short period of time during heavy showers, in order to avoid any major damages. Total of 45,443 m<sup>3</sup> of wastewater diluted by storm water (dilution ¼) was conducted to the sea.

Due to the shock loads which exceeded the biological treatment capacity, 317,432 m<sup>3</sup> of highly diluted wastewater that had undergone mechanical treatment was discharged into the sea through the deep-sea outlet.

Table 18: WASTEWATER TREATMENT PLANT OVERFLOWS IN 2011-2015, th m<sup>3</sup>/y

	2011	2012	2013	2014	2015
Untreated wastewater discharged to the sea	108	137	380	1.3	45
Partly treated wastewater discharged to the sea	24	186	200	225	317

### Pollution charges

As a water company we are required to act in line with the environmental permits and pay pollution charge with the aim to avoid and reduce the potential damage caused by pollutants or waste discharged to the environment.

The calculation of pollution charge is established in the permit for a special use of water and the Environmental Charges Act, and is applied to the pollutants contained in the effluent and storm water at the particular outlets. Both the receiving water coefficient of the specific outlet, as well as compliance with the pollutant limit value in effluent are taken into account in pollution charge calculations. In 2015, the pollution charge paid for discharging pollutants into receiving waters formed 4.2% of the cost of services sold.

## 15. Use of Chemicals

We use approximately 325 hazardous and less hazardous chemicals (indicated by new chemical inventory) in our operating activities. With regard to the health and wellbeing of our employees we deem a safe handling of chemicals at the work site extremely important. For this purpose, we have created necessary conditions for a safe storage and use of all chemicals. In 2015, we used total of approximately 6,090 tons of various chemicals in our operations.

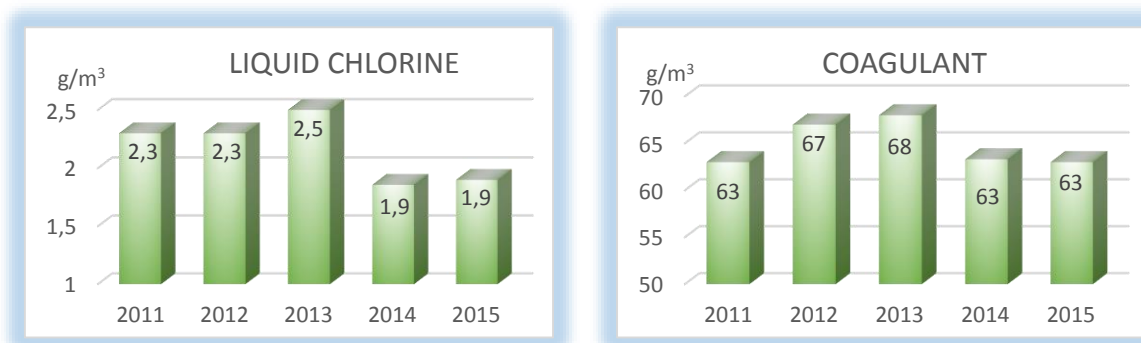
In 2015, no reported accidents with chemicals occurred, which could have caused damage to people or the environment.

### Use of water treatment chemicals

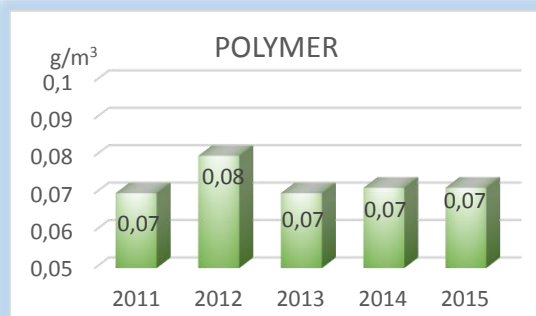
- **Chlorine** is an effective disinfecting chemical with a long-term aftereffect. We add chlorine in the final stage of the water treatment process to ensure the microbiological purity of water and to help to maintain the water quality in the city's water distribution network. Chlorine has a strong oxidising effect and is extremely poisonous for aquatic life. In Estonia, we have been classified as a category B company with risk of a major accident due to the chlorine stored at the plant and used in the water treatment process. By applying the necessary safety measures we have minimized the likelihood of chlorine accidents.
- **Ozone** is a good and quick oxidiser which effectively breaks down organic matter and microorganisms in raw water. Ozone is produced locally by us and only in amounts needed. Thanks to the closed process and no stock being kept, the environmental risk is taken to minimum.
- **Coagulants and polymers** – Significant amounts of coagulants and polymers in liquid form are added in the treatment process to remove the particular matter (e.g. suspended solids and organic substance) from water.

Water quality in Lake Ülemiste is strongly dependent on the weather, however, long-term observation has established periodic changes in quality by comparing the years. Year 2015 was average in terms of raw water parameters and the use of chemicals was the same as or, in case of ozone, slightly higher than in 2014.

Diagram 8: AVERAGE USE OF WATER TREATMENT CHEMICALS PER UNIT OF PRODUCTION IN 2011-2015, g/m<sup>3</sup>





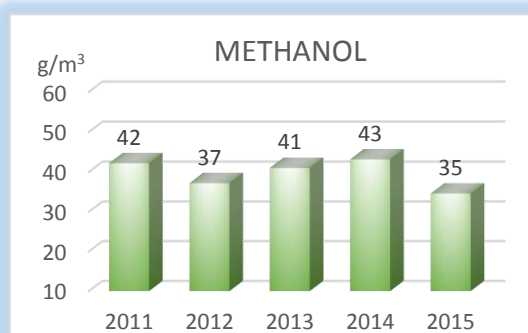
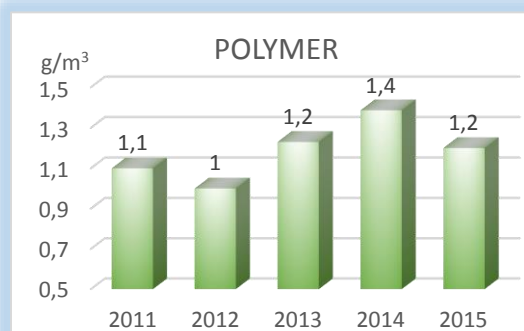
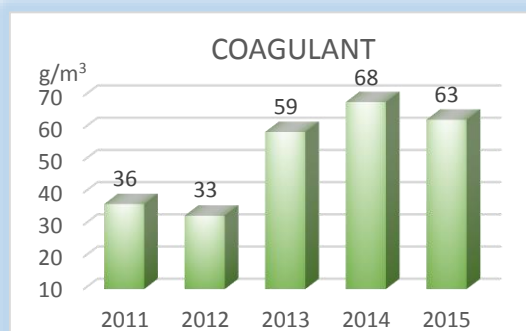


### Use of wastewater treatment chemicals

- **Methanol** – We use methanol at the wastewater treatment plant to increase the nitrogen removal efficiency of the bacteria participating in the biological treatment process. Due to the extremely explosive methanol used in the wastewater treatment, we have been classified as one of the most hazardous companies in Estonia.
- **Coagulants and polymers** – Significant amounts of coagulants and polymers are used in the wastewater treatment process. Coagulants are used for the chemical processing of wastewater to remove phosphorus. Polymers are used to change the qualities of sludge by accelerating the dewatering process.

The amount of chemicals used in the wastewater treatment process is dependent on the pollution levels of incoming wastewater being in its turn affected also by the weather. The higher the concentration of pollutants in incoming wastewater and the lower the limits of pollutants in the treated effluent have been set by the legal requirements, the higher is the volume of chemicals used in the wastewater treatment process. The use of chemicals in 2015 was slightly smaller than in 2014.

Diagram 9: AVERAGE USE OF WASTEWATER TREATMENT CHEMICALS PER UNIT OF PRODUCTION IN 2011-2015, g/m³



## 16. Waste Management

### Waste generation

A total of 45,844 tons of waste was generated in the Company in 2015. The majority of waste is made up by the sludge, which is a by-product of the wastewater treatment process. Quite a substantial part of waste is also generated as a result of the construction and excavation works.

Table 19: TYPES AND AMOUNTS OF MAIN WASTE IN 2011-2015, t

Type of waste	2011	2012	2013	2014	2015
Mixed municipal waste	112	96	97	93	67
Paper and cardboard	14	4	4	6	5
Packages	4.5	0.7	0.7	0.5	0.6
Biodegradable waste	5.3	4.4	5.0	7.2	7
Waste from screens	596	920	984	1085	615
Wastewater sludge	28 763	20 437	27 220	32 109	31 974
Sandtraps grid	509	141	422	142	0
Excavated stones and soil	12 417	39 183	13 341	10 882	11 235
Asphalt waste	1 161	2 305	869	1 190	1 548
Mixed building waste	30	103	47	84	40
Concrete and bricks	38	243	53	62	274
Metal scrap	23.6	47.0	14.0	44.8	68
Hazardous waste	2.1	3.0	0.0	3	2.4
Other waste	116	32	79	2	9
<b>TOTAL</b>	<b>43 791</b>	<b>63 518</b>	<b>43 135</b>	<b>45 711*</b>	<b>45 844</b>

Possible to reuse

\*Calculation mistake in 2014 Environmental Report

Although the sludge generated in the wastewater treatment process forms large part of our waste, we recycle all the sludge in our sludge treatment process. Sludge treatment process includes producing of planting soil from raw sludge and biogas from raw sludge fermentation, which then is used in the technological process and to heat the buildings. We make analyses from the planting soil four times a year, according to the requirements set in the Decree No 78, issued by the Minister of Environment on 30.12.2002. All the results of the sludge analyses are publicly available on the Company's webpage.

In addition to sludge, the wastewater treatment process produces significant amount of other types of waste, such as waste from screens, which is disposed to our waste handling partner. The volume of waste generated within the wastewater treatment process is directly affected by the volume of incoming wastewater, the weather and the efficiency of the City cleaning services. However, people also have an important role to play here as they can avoid throwing waste and hazardous substances into the wastewater system.

Excavated soil, stones and asphalt waste account for the majority of waste resulting from the networks maintenance and repair works. The volume of waste from construction and excavation works is again dependent on the volume of works. In 2015-2016 we have a very big Tihase collector reconstruction project, which resulted in the increase of construction wastes such as metals and concrete. However,

since 2013, we have been performing most of the network reconstruction works using the so-called no-dig method, which allows carrying the works out faster and reducing the inconveniences caused by traffic jams during the road works.

We collect and sort the other types of waste, which have a smaller share in the total waste volume, by their types to hand them over to the waste handling company. We separately collect paper and cardboard, biodegradable waste, hazardous waste, metal and mixed municipal waste.

### Waste permits and sludge

The Company has two waste permits, issued to allow recycling the sludge produced in the wastewater treatment process. The permits establish technical and environmental requirements for the waste handling process.

Table 20: VALID WASTE PERMITS ISSUED TO AS TALLINNA VESI

Permits	Valid until	Description of waste permit
Waste permit No. L.JÄ/325362	*	Issued for recycling waste at Paljassaare, procedure code R3o – recycling**
Waste permit No. L.JÄ/325737	18.06.2020	Issued for recycling waste in Liikva, procedure code R12o – biological treatment preceding the recycling of waste

\*Valid until a court decision to be made in the administrative case no 3-14-52374 takes effect or the currently applied interim injunction is amended or terminated.

\*\*Mistake in the 2014 report description of the waste permit

In 2015, a total of 31,974 tons of mixed sludge was produced within the wastewater treatment process and by the end of 2015, the estimated volume of mixed sludge in stock on the composting fields was 32,843 tons of mixed sludge. In 2015, 38,285 tons of soil for greenery was given to people for free. Although a waste permit was issued also for Liikva composting field, since 2014, no sludge has been recycled in Liikva and the Liikva field is currently in reserve.

Table 21: VOLUME OF PRODUCED SLUDGE AND STABILISED SLUDGE AND COMPLIANCE THEREOF WITH THE WASTE PERMITS IN 2011-2015, t/y

Type of waste	Permitted	Actual				
		2011	2012	2013	2014*	2015
Waste permit L.JÄ/325362 (Paljassaare)						
Domestic wastewater treatment sludge	32000*	34 968	26 928	29 856	32 109	31 974
Stabilised waste	32000*	28 960	24 764	24 548	25 744	31 904
Waste permit L.JÄ/325737 (Liikva)**						
Stabilised waste	7000***	6 008	4 210	5 524	0	0

\*According to the waste permit, effective until the middle of 2014, the limit set to the volume of produced sludge was 45,000 t/y and the limit set to the volume of stabilised sludge was 30,000 t/y. Since October 2014, the allowed volume is 32,000 t/y.

\*\*Liikva composting field is out of use since 2014.

\*\*\*According to the new waste permit, issued in June 2015, the allowed volume is 7,000 t/y, before that it was 15,000 t/y.

## 17. Energy Consumption

### Electricity consumption

The majority of electricity is used to run the Company's core processes – to operate the Water Treatment Plant, Wastewater Treatment Plant and pumping stations on the network.

In 2015, the Company's total consumption of electricity slightly increased in comparison with the previous year, however, it has generally remained relatively stable over the last years. Although we have been making significant investments aimed at decreasing electricity consumption, the energy consumption is still inevitably and closely connected to the operation of our core processes. Those are in turn affected by changes in consumption and in service areas, also by the weather.

Table 22: ELECTRICITY CONSUMPTION IN 2011-2015, MWh

Unit	2011	2012	2013	2014	2015
Water Treatment	10 382	10 325	9 705	8 709	9 746
Wastewater Treatment	21 721	25 195	22 336	21 295	21 617
Networks pumping stations, incl. Maardu	7 043	7 662	6 838	6 409	6 346
Other	800	993	830	776	757
<b>TOTAL</b>	<b>39 946</b>	<b>44 175</b>	<b>39 709</b>	<b>37 188</b>	<b>38 465</b>

In the water treatment process, electricity is mostly used for pumping water in the various stages of the treatment process and to the water network. Significant volume of electricity is also used for producing ozone. The electricity consumption of the Water Treatment Plant has been growing due to a steady increase in the use of surface water over the years and the said consumption is also affected by the quality of raw water.

Diagram 10: ELECTRICITY CONSUMPTION PER UNIT PRODUCTED AT THE WATER TREATMENT PLANT IN 2011-2015, kWh/m<sup>3</sup>



Electricity consumption in the wastewater treatment process is to a large degree impacted by the weather. In 2015, the electricity consumption slightly decreased in the Wastewater Treatment Plant due to a decreased volume of precipitation, small number of heavy showers and the improvement of energy efficiency.

Diagram 11: ELECTRICITY CONSUMPTION PER UNIT PRODUCED AT THE WASTEWATER TREATMENT PLANT IN 2011-2015, kWh/m<sup>3</sup>



### Consumption of heat energy

In addition to heating the premises we need heat energy to run the core processes. The Water Treatment Plant produces heat out of outsourced natural gas in its boiler house. Ådala site uses central heating also produced out of natural gas in our area. The majority of Wastewater Treatment Plant's needs for heat energy is covered by biogas.

Table 23: CONSUMPTION OF HEAT ENERGY IN 2011-2015, MWh

Unit	2011	2012	2013	2014	2015
Water Treatment	4 358	4 800	4 111	3 978	3 540
Wastewater Treatment	6 634	10 467	7 310	8 989	9 446
incl. heat energy from biogas	5 134	10 467	7 310	8 977	9 446
Ådala office	1 176	1 213	1 049	1 164	920
<b>TOTAL</b>	<b>12 168</b>	<b>16 480</b>	<b>12 470</b>	<b>14 131</b>	<b>13 906</b>

We produce biogas at the Wastewater Treatment Plant within the process of digesting sludge in the digesters. We use biogas to produce heat energy on site to be used for heating the premises at the Wastewater Treatment Plant and for operating the core processes. Due to the nature of biogas production we are bound to burn some of the biogas and to use some natural gas from time to time as well (in 2015 we only used heat energy from biogas in Wastewater Treatment Plant). In 2015, we used 78% of the total volume of biogas to produce heat energy (70% in 2014) and it accounts for 68% of the total heat energy consumed in 2015.

Diagram 12: BIOGAS PRODUCTION IN 2011-2015, th m<sup>3</sup>



## Transportation and fuel consumption

Road transport accounts for the biggest part of our need for transportation. The Company has 94 vehicles for carrying out different operating tasks and for driving between the company locations and numerous service sites. The biggest group of vehicles is passenger cars and operating vehicles, including minivans and team vans. We have a total of 82 passenger cars and operating vehicles and a total of 12 special purpose vehicles (such as tractors, loaders, excavators, jet washing trucks etc.).

Table 24: NUMBER OF VEHICLES AND FUEL CONSUMPTION IN 2011-2015

	2011	2012	2013	2014	2015
Total number of vehicles, pcs	98	95	95	93	94
Petrol, l	66 418	71 939	71 095	70 075	65 962
Diesel, l	140 331	132 284	135 738	122 456	115 485
<b>Total fuel, l</b>	<b>206 749</b>	<b>204 223</b>	<b>206 833</b>	<b>192 531</b>	<b>181 447</b>

In 2015, the total consumption of fuel has again slightly reduced in comparison with the previous year. We continuously try to keep the fuel consumption under control through the fuel limits set on the car users and through GPS-tracking devices. Part of the cars have been transferred to shared use so that as many people as possible would be able to use the cars to deliver their work duties and save costs.

The number of business trips made by our staff in and outside Estonia is relatively low. In planning the travel routes we follow the principle of always choosing the cheapest option. The most frequent destinations of business trips outside Estonia are the United Kingdom and Finland, to where our staff usually travels by plane and by boat. Other means of transport (e.g. bus and train) are used very little.

## 18. Air Emission

In order to reduce ambient air pollution, the Company focuses on limiting the amount of pollutants emitted from Ülemiste and Paljassaare boiler houses, particularly the pollutants of primary importance, such as nitrogen dioxide, carbon monoxide and volatile organic compounds, as well as CO<sub>2</sub> greenhouse gas emissions. Also the emissions of ozone produced for drinking water treatment are regulated. The Company pays a pollution charge for pollutants emitted into ambient air.

Table 25: VALID AIR POLLUTION PERMITS OF AS TALLINNA VESI

Permit	Valid until	Description of ambient air pollution permit
Pollution permit No. L.ÕV.HA 48701	termless	Valid for Paljassaare Wastewater Treatment Plant pollution sources - the chimney of the boiler house, exhaust pipes, the chimney of the combined heat plant. Establishes the list of pollutants emitted into ambient air and the annual permitted emission amounts thereof.
Pollution permit No. L.ÕV/319438	termless	Valid for Ülemiste Water Treatment Plant pollution sources - the chimney of the boiler house, ozonisation, diesel generator. Establishes the list of pollutants emitted into ambient air and the annual permitted emission amounts thereof.

Emissions from both Ülemiste Water Treatment Plant and Paljassaare Wastewater Treatment Plant have been relatively low and remained stable throughout the years. Also in 2015, there were no significant changes in this regard.

Table 26: AMBIENT AIR POLLUTION FROM WATER TREATMENT PLANT POLLUTION SOURCES IN 2011-2015, t

Pollutant	Limit	2011	2012	2013	2014	2015
Nitrogen dioxide	1.954	1.3	1.24	1.11	1.1	1.01
Carbon monoxide	1.846	1.19	1.13	0.98	0.97	0.88
Volatile organic compounds	0.125	0.08	0.08	0.07	0.07	0.06
Carbon dioxide	1688	1081	1021	880	868	787
Sulphur dioxide	0	0	0.001*	0.001*	0.001*	0.001*
Total solid particles	0.004	0.004	0.004	0.004	0.004	0.004

\* Sulphur dioxide pollution below the limit

Table 27: AMBIENT AIR POLLUTION FROM WASTEWATER TREATMENT PLANT POLLUTION SOURCES IN 2011-2015, t

Pollutant	Limit	2011	2012	2013	2014	2015
Nitrogen dioxide	29.8	11	2.9	2.3	2.7	2.6
Carbon monoxide	210	65	2.6	2.3	2.7	2.6
Volatile organic compounds	14	5	0.2	0.2	0.2	0.2
Carbon dioxide	4440	3298	2392	2039	2477	2341
Sulphur dioxide	17.8	17.4	17.8	17	16.8	0.172

## 19. Occupational Health and Safety

Work environment performance of the Company is in compliance with the requirements of national legislation and international occupational health and safety management system standard OHSAS 18001. We want to be a company who promotes safe work culture and ensures its customers and team a safe environment. Safety is an inseparable part of our business. It is central to everything we do, and we absolutely do not compromise on it.

In 2015, the Labour Inspectorate recognized us with an award “Good Working Environment 2015”. This award was given to two companies who value occupational safety and health of their employees.

We had no work accidents in AS Tallinna Vesi in 2015. One minor work accident with an employee working at Company’s subsidiary OÜ Watercom was registered.

### Work environment trainings

The implementation and results of work environment related actions are largely dependent on the awareness of employees. Therefore, much attention is paid to trainings, information materials and other actions to raise awareness of the issues related to work environment.

In addition to usual trainings on safety we carried out following trainings in 2015:

- Members of the Work Environment Council had a study tour to our parent company United Utilities in UK, to learn about the local work environment and safety measures. The visit was followed by an action plan on how to implement the ideas gathered on this trip in our Company.
- Surface rescue and pollution removal training exercise at the Water Treatment Plant, organized in cooperation with Tallinn Airport and Northern Rescue Centre, to check the reactions and preparedness for a large-scale rescue operation in the event of a plane crash at Lake Ülemiste, and the preparedness of Tallinn Ambulance Service to react to the events involving numerous casualties.
- Chemical training exercise at the Wastewater Treatment Plant, organized in cooperation with the Rescue Board, Tallinn Ambulance Service, Police and the Environmental Board, to check the reactions and solving the problem in the event of a chemical (methanol) leakage in a hazardous enterprise.

### Continuous improvement in occupational safety

Similar to the previous years we are committed to the continuous improvement of work environment. Most important actions in 2015 included:

- All management members, as well as the main and substitute members of the Work Environment Council carried out at least six occupational safety audits throughout the Company. Out of nearly 500 findings 85% have been corrected and active work is ongoing to correct the rest of the findings. These type of audits will become inseparable part of our activity also in the upcoming years. In addition, we inspect our repair and construction sites on a daily basis to ensure that the H&S and environmental requirements are being met.
- The company placed four heart defibrillators at various locations, thus improving our first aid and preparedness for the emergency situations. 100 employees, including all the first aid givers, attended the trainings on how to use the defibrillators.
- During the period of 2013-2015 we replaced all office chairs and organized relevant trainings to ensure an ergonomically correct and convenient seating position for the staff.



## 20. Environmental Performance

In addition to the data on ecological footprint and as set out by the requirements of EMAS III, we outline below our main indicators of the environmental performance regarding energy efficiency, material efficiency, water, waste, biological diversity and emissions. Three elements have been presented for each main indicator:

- Figure A, which stands for the total annual input/impact in the respective area.
- Figure B, which stands for the total gross sale revenue of the organization in millions of euros.
- Figure R, which stands for the ratio A/B.

Table 28: ENVIRONMENTAL PERFORMANCE IN 2014-2015

Main indicators of environmental performance	Year	Consumption (rounded) i.e. annual input (figure A)	Annual output of the Company (figure B)	Ratio R (A/B)
<b>Electricity</b>				
Electric power produced from oil shale, MWh	2015	38 465	55.9	688
	2014	37 188	53.2	699
<b>Heat</b>				
Heat produced from natural gas, MWh*	2015	3 623	55.9	65
	2014	4 256	53.2	80
Renewable energy produced from biogas, MWh	2015	9 446	55.9	169
	2014	8 977	53.2	169
<b>Handling of chemicals</b>				
Liquid chlorine, t	2015	43	55.9	0.8
	2014	42	53.2	0.8
Coagulant, t	2015	4 266	55.9	76.3
	2014	4 358	53.2	82
Polymer, t	2015	55	55.9	1.0
	2014	61	53.2	1.2
Ozone, t	2015	161	55.9	2.9
	2014	127	53.2	2.4
Methanol, t	2015	1 557	55.9	28
	2014	1 856	53.2	35
<b>Water</b>				
Water for own consumption, th. m <sup>3</sup>	2015	1 259 936	55.9	22 539
	2014	514 180	53.2	9 665
Surface water, th. m <sup>3</sup>	2015	22 756	55.9	407
	2014	22 607	53.2	425
Ground water, th. m <sup>3</sup>	2015	2 470	55.9	44
	2014	2 365	53.2	44
Effluent, th. m <sup>3</sup>	2015	45 075	55.9	806
	2014	42 991	53.2	808
<b>Waste</b>				
Mixed municipal waste, t	2015	67	55.9	1.2
	2 014	93	53.2	1.7
Recycled paper and cardboard, t	2015	5	55.9	0.1
	2 014	6	53.2	0.1
Recycled packages, t	2015	0.6	55.9	0.01
	2 014	0.5	53.2	0.01
Recycled biodegradable waste, t	2015	7	55.9	0.1

	2 014	7	53.2	0.1
Waste from screens, t	2015	615	55.9	11
	2 014	1 085	53.2	20
Recycled sludge, t	2015	31 974	55.9	572
	2 014	32 109	53.2	604
Sandtraps grid, t	2015	0	55.9	0.0
	2 014	142	53.2	2.7
Recycled excavated stones and soil, t	2015	11 235	55.9	201
	2 014	10 882	53.2	205
Asphalt waste, t	2015	1 548	55.9	28
	2 014	1 190	53.2	22
Mixed building waste, t	2015	40	55.9	0.7
	2 014	84	53.2	1.6
Concrete and bricks, t	2015	274	55.9	4.9
	2 014	62	53.2	1.2
Recycled metal, t	2015	68	55.9	1.2
	2 014	45	53.2	0.8
Hazardous waste, t	2015	2	55.9	0.0
	2 014	3	53.2	0.1
Other, t	2015	9	55.9	0.2
	2 014	2	53.2	0.0
Biological diversity				
Land use, land carrying buildings, m <sup>2</sup>	2015	462 000	55.9	8265
	2 014	462 000	53.2	8684
Emissions				
Nitrogen dioxide, t	2015	3.6	55.9	0.1
	2 014	3.8	53.2	0.1
Carbon monoxide, t	2015	3.5	55.9	0.1
	2 014	3.7	53.2	0.1
Volatile organic compounds, t	2015	0.3	55.9	0.005
	2 014	0.3	53.2	0.005
Carbon dioxide, t	2015	3 128	55.9	56
	2 014	3 345	53.2	63
Sulphur dioxide, t	2015	0.001	55.9	0.00002
	2 014	0.001	53.2	0.00002
Total solid particles, t	2015	0.004	55.9	0.0001
	2 014	0.004	53.2	0.0001
Hydrogen sulphide, t	2015	17	55.9	0.3
	2 014	17	53.2	0.3

\*Difference compared to the 2014 report. Heat resold has been deducted from the heat consumption.

## 21. EMAS Verification

DNV GL Business Assurance Finland Oy Ab as an accredited verifier (FI-V-0002) has examined the environmental management system and the information given in the 2015 environmental report of Tallinna Vesi. It has been verified on the 12 April 2016 that both the environmental management system and the environmental report (original report is in English) comply with the requirements of EU Council Regulation 1221/2009 of Eco Management and Audit Scheme EMAS. The environmental report is available on the website at [www.tallinnavesi.ee](http://www.tallinnavesi.ee). Next report will be published before the end of August 2017.



## 22. Important changes in the Environmental Report

This chapter outlines the major substantive changes made to the 2015 Environmental Report in comparison with the 2014 Environmental Report.

1. The 2015 Environmental Report has an amended structure and order of chapters.
2. The 2015 Environmental Report excludes the company structure and quality policy, because the EMAS regulation does not require the submission of the said information.
3. The structure of the environmental objectives' chapter was amended to outline the significant environmental aspects, performance against the environmental objectives of the year reported and the environmental objectives set for the following year.
4. Given that the environmental management system conforming to the EMAS regulation is only implemented in AS Tallinna Vesi, the 2015 report excludes information about the environmental performance of OÜ Watercom, subsidiary of AS Tallinna Vesi, except for the calculation of ecological footprint, which reflects the consumption of the entire group.
5. Considerable changes were made to the content and structure of the chapters describing the Company's core activities (chapters 11-14). The report excludes information, which is insignificant from environmental perspective. The structure of the report was amended so that the text follows the actual logical order of our core activities.
6. Changes to various chapters of the Environmental Report also involve the exclusion of repetitive and low-key information. In the chapters, which are less significant with respect to the EMAS regulation, the focus lies only on important aspects.