

**ACTION PLAN FOR THE NITRATE VULNERABLE PANDIVERE AND ANDAVERE-
PÖLTSAMAA AREA FOR 2016–2020**

Tallinn 2016

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1. Introduction

The surface area of Estonia is 45,226 km², of which 50% is covered with forest and 21% is agricultural land.¹ The population of Estonia is approximately 1.3 million and one third of the population lives in rural areas. The share of agriculture in economy is approximately 3%. In 2013, there were 19,186 agricultural enterprises in Estonia. 1,000 largest of them used the total of 75% of agricultural land. 20% of agricultural enterprises are traditional family farms, allowing full-time living for one or two persons. Over two thirds of the agricultural enterprises are so small that they cannot provide full-time work. Approximately 25% of the users of agricultural land do not produce any products, they simply maintain the land in good agricultural and environmental condition. The share of agricultural land is relatively low, except for the area with more intensive agricultural production in the central Estonia. Central Estonia has been determined as a Nitrate Vulnerable Zone (hereinafter NVZ).²

Pursuant to Article 5(1) and (7) of Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (hereinafter the Nitrates Directive), the Member States have to establish and implement action plans for avoiding or reducing water pollution resulting from nitrogen compounds. Action Plan for the Nitrate Vulnerable Pandivere and Adavere-Põltsamaa Zone for 2016–2020 (hereinafter the NVZ action plan) is fourth in order.

NVZ action plan supports the achievements set in river basin management plans for supplying drinking water for the inhabitants and for maintaining or achieving the good status of bodies of surface and groundwater. The Nitrates Directive has been integrated into Estonian law with Water Act, Sections 26¹ and 26² of which establish the general water protection measures from agricultural load and the requirements for storing manure and liquid manure. Section 26³ of the Water Act establishes water protection measures on Nitrate Vulnerable Zones, whereas subsection 12 establishes the NVZ action plan.

The Water Act establishes the following provisions for the transposition of the Nitrates Directive:

Provisions of the Nitrates Directive (91/676/EEC)	Legal act of Estonia and reference to the provision
Annex II, A, 1. periods when the land application of fertiliser is inappropriate	Section § 26 ¹ of the Water Act. (4 ⁴) Land application of mineral nitrogen-containing fertilisers and liquid manure is prohibited from 1 December to 20 March or at any other time when the ground is covered with snow, frozen or periodically flooded or saturated with water.
Annex III, 1.1. periods when the land application	(4 ⁶) Land application of manure on arable land with growing crops is allowed from 1 November to 30 November, provided that it is taken into soil within 48 hours.

¹ Historically the surface area of agricultural land was the following: 2.5 million ha (55%) in 1940 and 1.5 million ha (33%) in 1990.

² Information leaflet of Estonian Rural Development Plan for 2014–2020.

of certain types of fertiliser is prohibited	(4 ⁷) Land application of solid and deep litter manure or other organic fertilisers is prohibited from 1 December to 20 March or at any other time when the ground is covered with snow, frozen or periodically flooded or saturated with water.
Annex II, A, 2. the land application of fertiliser to steeply sloping ground	Section 26 ¹ of the Water Act. (4 ³) Land application of fertilisers is prohibited on arable land with a slope of more than 10 per cent. If the slope of land is 5–10 per cent, the land application of fertilisers is prohibited from 1 October to 20 March.
Annex II, A, 3. the land application of fertiliser to water-saturated, flooded, frozen or snow-covered ground	Section § 26 ¹ of the Water Act. (4 ⁴) Land application of mineral nitrogen-containing fertilisers and liquid manure is prohibited from 1 December to 20 March or at any other time when the ground is covered with snow, frozen or periodically flooded or saturated with water. (4 ⁷) Land application of solid and deep litter manure or other organic fertilisers is prohibited from 1 December to 20 March or at any other time when the ground is covered with snow, frozen or periodically flooded or saturated with water.
Annex II, A, 4. the conditions for land application of fertiliser near water courses	Section 26 ¹ of the Water Act. (5) The use of fertilisers and plant protection products as well as any other activity compromising the quality of water is prohibited in 10 metres from water border or from the edge of a sinkhole. Section 29 of the Water Act. (1) In order to protect water and avoid the flushing of shore, water protection zones are formed on the shoreline areas of water bodies. (2) The extent of a water protection zone from the normal water border is: 1) 20 m for the Baltic Sea, Lake Peipus, Lake Lämmijärv and Lake Pihkva and Lake Võrtsjärv; 2) 10 m for other lakes, water reservoirs, rivers, brooks, springs, main ditches and channels and artificial recipients of land improvement systems; 3) 1 km for artificial recipients of land improvement systems with the catchment area of less than 10 km ² . (4) In a water protection zone it is forbidden to: 3) perform economic activities, except for removal of plants washed out of the water, mowing grass, cutting reed, cleaning grass and reed and grazing on sea coasts with the permission of and terms and conditions established by the Environmental Board; 4) use fertilisers, chemical plant protection products and waste water sediments and to install a manure storage or place manure stack. The use of plant protection products is permitted in case of plant diseases and for eliminating outbreaks of pests only, whereas a separate permission has to be obtained from the Environmental Board in each different case. Section 6 of the Government of the Republic Regulation No. 17. (1) In the area of springs or sinkholes, the following is prohibited in a 10-metre zone from water border or from the edge of a sinkhole: 1) fertilising; 2) use of plant protection products; 3) storage of manure in manure stack.

<p>Annex II, A, 5, the capacity and construction of storage vessels for livestock manures, including measures to prevent water pollution by run-off and seepage into the groundwater and surface water of liquids containing livestock manures and effluents from stored plant materials such as silage</p> <p>Annex III, 1.2, the capacity of storage vessels for livestock manure</p>	<p>Section 26¹ of the Water Act. (1) For the protection of surface and groundwater from pollution originating from agricultural production, the Government of the Republic issues a regulation which establishes the requirements for the use and storage of manure, liquid silage and other fertilisers and the measures for controlling the performance of such requirements.</p> <p>(1²) The calculated values of nutrient content of different types of manure and the capacity of manure storage vessels will be established with the regulation of the minister responsible for the respective field.</p> <p>(6) For one hectare of agricultural land, the amount of livestock that is permitted to keep as an annual average corresponds up to two livestock units (LSU). Keeping the amount of livestock that exceeds two LSUs for one hectare is permitted if there is a manure storage or a manure and liquid manure storage with proper capacity and an agreement for land application or purchase-sales agreement. The coefficients for calculating agricultural livestock into LSUs will be established with the regulation of the minister responsible for the respective field.</p> <p>Section 26² of the Water Act. (1) All livestock buildings which hold over 10 LSUs of livestock, shall have, depending on the type of manure, a manure storage or manure and liquid manure storage.</p> <p>(2) A manure storage or manure and liquid storage shall hold the manure and liquid manure of at least eight months and depending on the technology used in the livestock building, also the sewage if necessary. When calculating the capacity of the manure storage, the amount of manure left on the pasture during the grazing period, may be excluded from the calculations.</p> <p>(3) A livestock building which uses deep litter technology and holds the amount of manure stipulated in subsection 26² (2) of the Water Act does not have to have a manure storage. If the livestock building does not hold the amount of manure stated in subsection 2, there shall be a manure storage with the capacity to store the exceeding amount of manure.</p> <p>(3¹) If based on an agreement an animal keeper directs the manure to be stored or processed in another person's storage facility or processing place, the livestock building shall have a leakproof storage facility which holds the amount of manure produced in one month.</p> <p>(3²) Manure storages, manure and liquid manure storages and livestock buildings with deep litter shall be leakproof and their structure shall guarantee safety and avoidance of leaks during the operation of the storage facility, including when filled and emptied.</p> <p>(3³) If the amount of livestock kept in a livestock building is 10 or below that and solid manure or deep litter manure is created, then before land application or stacking of such manure, the manure may be temporarily stored near the building on an area with a waterproof base and protected from rainwater.</p> <p>(5) Before land application, it is only permitted to keep solid manure in a manure stack on arable land within two months, whereas the dry matter content of such manure is at least 20% and it does not exceed the amount used in one of vegetation period.</p> <p>(6) Deep litter manure, the dry matter content of which is at least 25 per cent and the amount of which does not exceed the amount used in one</p>
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	<p>vegetation period, may be kept in a stack for up to eight months by informing the Environmental Board about it at least 14 days before the formation of the stack.</p> <p>(7) Storing solid and deep litter manure in stack is prohibited from 1 December to 31 January.</p> <p>(8) A manure stack shall be located on a level ground, at least 50 metres away from a body of surface water, well and sinkhole. Manure stack cannot be formed above drainage pipes of land improvement systems, on areas with unprotected groundwater, water-saturated or flooded areas.</p>
Annex II, A, 6, procedures for the land application, including the rate and uniformity of spreading, of both chemical fertilizer and livestock manure, that will maintain nutrient losses to water at an acceptable level	Section 26 ¹ of the Water Act. (4 ⁵) On a field with no arable crops, the incorporation of manure into soil within 48 hours.
Annex II, B, 7, land use management, including the use of crop rotation systems and the proportion of the land area devoted to permanent crops relative to annual tillage crops	Section 26 ³ of the Water Act. (7) At least 30 per cent of the arable land used by a person engaged in agriculture, which is located on a Nitrate Vulnerable Zone, shall be covered with a vegetation cover from 1 November to 31 March. 1/3 of this percentage may be replaced with autumn ploughing of cereal, rape or turnip rape straw. Vegetation cover in the meaning of the current act is overwinter crops, such as winter cereal, winter rape, winter turnip rape, grasses and leguminous plants and herbs and medicinal plants.
Annex II, B, 8, the maintenance of a minimum quantity of vegetation cover during (rainy) periods that will take up the nitrogen from the soil that could otherwise cause nitrate pollution of water	Section 26 ³ of the Water Act. (7) At least 30 per cent of the arable land used by a person engaged in agriculture, which is located on a Nitrate Vulnerable Zone, shall be covered with a vegetation cover from 1 November 1 to 31 March. 1/3 of this percentage may be replaced with autumn ploughing of cereal, rape or turnip rape straw. Vegetation cover in the meaning of the current act is overwinter crops, such as winter cereal, winter rape, winter turnip rape, grasses and leguminous plants and herbs and medicinal plants.
Annex II, B, 9, the establishment of fertiliser plans on a farm-by-farm basis and the keeping of records on fertiliser use	<p>Section 26¹ of the Water Act. (8) A person engaged in agriculture shall keep a farm record book which shall include, among other things, the following data:</p> <ol style="list-style-type: none"> 1) name and personal identification code or Commercial Register or a code of a register of taxable persons; 2) list of production blocks, including a map of the production block in a scale 1 : 10,000; in the case of production blocks smaller than 0.5 ha, a map of the production block in a scale 1 : 5,000 or in the absence of the said maps, a cadastral map or any other suitable map; 3) number and surface area of the field; 4) plant or plant species grown on the field or another purpose for using the arable land; 5) in the case of grazing, data on the grazing period, type and number of grazed animals, location of the pasture land and its surface area;

	<p>6) amounts of fertilisers, including the used solid and liquid manure, their nitrogen and phosphorous content, time of their use and the name and quantity of the used soil conditioners;</p> <p>7) beginning and end date of the formation of manure stack, the date of land application of the manure taken from the stack and the location of the manure stack on the production block map;</p> <p>8) data indicated in subsection 78 (6) of the Plant Protection Act;</p> <p>9) date of the work performed.</p>
<p>Annex III, 1.3, limitation of the land application of fertilizers, consistent with good agricultural practice and taking into account the characteristics of the vulnerable zone concerned, in particular:</p> <p>(a) soil conditions, soil type and slope;</p> <p>(b) climatic conditions, rainfall and irrigation;</p> <p>(c) land use and agricultural practices, including crop rotation systems</p>	<p>Section 26¹ of the Water Act. (4) The annual permitted amount of nitrogen per one hectare of arable land from the use of fertilisers used for growing arable crops is established based on subsection 26¹ (1) of the Water Act.</p> <p>(4⁸) The annual permitted amount of phosphorus per one hectare of arable land from the use of manure is up to 25 kg, including the phosphorus which is left on the land with animal excrements at the time of grazing. The amount of phosphorus given to the arable land with manure may be increased or reduced if necessary, taking into consideration that the average amount of phosphorus would not exceed 25 kg per hectare in a five-year period.</p> <p>(4⁹) The use of fertilisers on natural grasslands is prohibited, except the nitrogen and phosphorus from the manure left on the grassland during grazing, the amount of which may not exceed the limit values of nitrogen and phosphorus established in subsections 26¹ (4¹) and (4⁸) of the Water Act.</p> <p>Section 26³ of the Water Act. (5) On Nitrate Vulnerable Zones where the groundwater is not protected and the surface thickness is up to two metres and on karstic areas the following limits may be established based on the protection regulation:</p> <p>1) the annual average amount of nitrogen from mineral fertilisers to be up to 100 kg per one hectare of arable land;</p> <p>2) keeping of animals up to 1.5 LSUs per one hectare of arable land;</p> <p>3) use of waste water sediments.</p> <p>Section 4 of the Government of the Republic Regulation No. 17. In areas with unprotected groundwater, it is prohibited to:</p> <p>1) allow the annual amount of nitrogen from mineral fertilisers to be more than 120 kg per one hectare of arable land and the annual amount of nitrogen given to winter crops and grasslands which are mowed several times a year may not exceed 80 kg per one hectare of arable land;</p> <p>2) keep over 1 LSU of animals per one hectare of arable land;</p> <p>3) use wastewater sediments.</p>
<p>Annex III, 2. These measures will ensure that, for each farm or livestock unit, the amount of livestock manure applied to the land each year, including by the animals themselves, shall not</p>	<p>Section 26¹ of the Water Act. (4¹) The annual permitted amount of nitrogen spread with manure to one hectare of arable land is 170 kg, including the nitrogen contained in the manure left on the land during grazing.</p>

<p>exceed a specified amount per hectare. This amount per one hectare is the amount of manure which includes 170 kg of nitrogen.</p>	
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The European Commission has launched an infringement procedure against Estonia in relation to the insufficient transposition and implementation of the Nitrates Directive in Estonia. The main reproaches are related to the absence of manure storages at livestock buildings with less than 10 LSUs of animals; keeping manure stacked on fields; the calculations related to the capacity of manure storages and the nutrient content in manure; the absence of clear methodology for balances fertilising and the time limit of land application of manure. In relation to the above-mentioned, Riigikogu passed a law amending the Water Act on 16 December 2015, which updates the requirements for limiting the water pollution from agriculture.

Water protection measures are also included in a guideline “Good Agricultural Practice”. Some of the measures have been made mandatory with legal acts, the rest are recommended.

NVZ is established for the protection of surface and groundwater in regions with intensive agricultural production. In Estonia, the NVZ is established with Government of the Republic Regulation No. 17 of 21 January 2003 “Protection Rules for the Nitrate Vulnerable Pandivere and Adavere-Põltsamaa Area” (State Gazette I 2003, 10, 49). A Nitrate Vulnerable Zone is an area where the agricultural activity has caused or may cause the content of nitrate ion to exceed 50 mg/l or the surface water bodies of which are subject to eutrophication or in danger of eutrophication. The Pandivere and Adavere-Põltsamaa Nitrate Vulnerable Zone with a total surface area of 3,250 km² is located in Central Estonia and is divided into Pandivere (2,382 km²) and Adavere-Põltsamaa (667 km²) nitrate vulnerable regions. Between them is Endla Wetland (201 km²).

Resulting from the above said criteria — the increasing trend of the content of nitrate ion in groundwater, also an increase in the content of nitrate ion in surface water and their increasing leakage to the Baltic Sea — the extension of the NVZ based on the state water monitoring results has become topical. The expert assessment offers three main alternatives:

1. Extension of the NVZ to the regions with intensive agriculture in the direction of North and West and South-West together with specifying the eastern border of the NVZ in its eastern part.
2. Extension of the NVZ where in addition to the areas listed in point 1, the regions with intensive agriculture in Tartu, Rapla and Viljandi County will also be added, as well as the drinking water river basin district in Harju County.
3. Declaring the whole territory of Estonia to be the NVZ, whereas the action plan shall be implemented selectively.³

³ Iital, A. Karin. Pachel. 2011. Analysis of the Necessity to Extend the Nitrate Vulnerable Zone (NVZ). Tallinn University of Technology

From the point of view of water protection, the extension of the NVZ is justified. At the same time, some of the objectives set in the previous action plan have not been achieved even within the limits of the current NVZ and the distribution of limited resources on a larger area may make the performance of the execution of the plan even tenser.

Based on the data of Statistics Estonia, the surface area of the used agricultural land has increased from 792,409 hectares to 965,907 hectares in 2004–2013. Thereat both the surface area of arable land as well as permanent grassland has increased. The surface area of agricultural land has also increased in Jõgeva, Järva and Lääne-Viru County where the NVZ is located. Based on the water monitoring results of the Nitrate Vulnerable Zone, the impact of agricultural production on the condition of water is most clear, as the impact of the intensive agricultural production of this region is quickly revealed in the groundwater which is mainly unprotected or poorly protected. At the same time, the content of nitrates has also increased in sampling stations outside the NVZ, which indicates the overall increase in agricultural load and insufficient water protection.

There are no fundamental differences between the SNA and other regions when considering the statistics on the use of fertilisers. The annual general amount of the used fertilisers depends on the economic conditions of the given year; however, there is a clear tendency in the increase in the use of mineral fertilisers. According to Statistics Estonia, the use of organic fertilisers per one hectare has been stable, 24 tons per hectare on average, which means approximately 100–140 kg nitrogen per one hectare of fertilised land.

The nitrate ion content of both surface and groundwater depends on the amount of nitrogen fertilisers used, the fertilising technology and the time and climate, especially the abundance of water in the autumn-winter period and the temperature in winter.

The indicator of the NVZ action plan regarding the individual households located on the fields indicates a setback — the nitrate content and the share of wells with contaminated drinking water among monitoring points increases.

Groundwater monitoring of SNA is divided into main monitoring carried out four times a year (including regular monitoring in 55 monitoring points, 16 springs, 2 karstic forms and 18 wells in Pandivere region, 4 springs and 15 wells in Adavere-Põltsamaa region) and supporting monitoring carried out once a year (58 sampling stations, 5 springs and 33 wells in Pandivere region, 20 wells in Adavere region). In 2014, the average value of NO_3 content (50 mg/l)⁴ was exceeded by 25.7% and the maximum value was exceeded by 39.5% of the wells in Adavere region, and the amount of such wells has increased in the past years. In 2014, the average limit value was exceeded by 2% of the wells in Pandivere region and the maximum value was exceeded by 18% of the examined wells. The exceedance of limit value was not observed in the monitoring point of the springs.

⁴ The average content of nitrate is the average value of four samples, maximum value occurs, if the result of one or more samples of the four exceeded the limit value 50 mg/l.

The amount of monitoring points in the so-called hazardous zone (40–50 mg/l) has increased throughout the NVZ — 8 monitoring points in 2011 and 19 monitoring points in 2014. Compared to the previous reporting period, the NO₃ content has decreased in 35.35% of all the NVZ monitoring points, including in 36.6% points in Pandivere and 33.3% points in Adavere region, but increased in 50%, 51% and 49% of points respectively.

If so far the shallower monitoring wells were more influenced of the load of nitrates, then comparing the average value of the nitrate content in deeper wells (more than 30 m) in 2014 with the long-term average indicator, the content of nitrates has decreased in only three wells and increased in others. Therefore, considering the overall rising tendency, it may be assumed that in the following years more and more nitrates also get into deeper wells.⁵

Problems with the quality of drinking water in low density areas persist and are increasing based on the monitoring results, because a substantial part of the inhabitants of rural areas still use shallow dug and bore wells, where the quality of water is completely unprotected from the pollution originating from the ground. During the past years, however, the nitrate content is also increasing in deeper wells. Findings of residues of plant protection products must be noted, as they can be very persistent in groundwater. Throughout the monitoring period, the contamination of the wells of public water supply system with nitrates and plant protection products has only been registered in single samples.

The status of the two NVZ bodies of groundwater close to the surface, Pandivere Silurian-Ordovician body of groundwater in the East Estonia river basin and Adavere-Põltsamaa Silurian-Ordovician body of groundwater, has been assessed as bad.⁶ One of the reasons for this assessment is the increase in nitrate ion during the past decade and the findings of the residue of plant protection products in the recent years. In Eastern Estonia, the occurrence of oil products in groundwater is also a problem.

The load of plant nutrients in surface water is an acute problem especially for the Baltic Sea and the lakes. The results of river mouths monitoring indicate an increase in the leakage of nitrogen compounds to the sea. In the state monitoring thresholds, the average nitrate ion content in the rivers starting from the NVZ has increased from 10 mg/l to 15 mg/l in this century.⁷ The negative impact of the increased nitrate content in water is especially important for the status of those rivers that serve as recipients for the effluent of larger settlements, such as Soolikaoja brook and Selja River (eutrophic rivers, Soolikaoja reaches to the NVZ). Jänijõgi River is an example of a river with a large nitrogen content originating mainly from agricultural load. According to the report of the

⁵ Monitoring of the Nitrate Vulnerable Zone in 2014. Estonian Environmental Research Centre

⁶ Assessment of the status of bodies of groundwater, stage II OÜ Hartal Projekt, 2014.

⁷ Analysis of implementation of the action plan of the Nitrate Vulnerable Zone up to 2015 and the evaluation of effectiveness of the measures of the action plan. 2014 AS Maves

previous period of the Nitrates Directive (a total of 9 monitored rivers within the NVZ), 2 rivers can become eutrophic: Jänijõgi River and Pedja River.⁸

Experiences from previous action plans

The performance results of the action plan of the previous period, up to 2015, have been taken into consideration, and they are reflected in the action plan performance report “Analysis of implementation of the action plan of the Nitrate Vulnerable Zone up to 2015 and the evaluation of effectiveness of the measures of the action plan”. The report is published on the website of the Ministry of the Environment at:

http://www.envir.ee/sites/default/files/nta_hinnang_2014_loppaaruanne.pdf.

Since in parallel with the preparation of the draft of the present action plan, river basin management plans were developed for 2015–2021, then the aim was to combine the measures for the reduction of agricultural pollution reflected in both action plans to achieve the maximum synergy of the activities.

When setting objectives for the reduction of nitrate pollution, the specifics and environmental impact of certain agricultural activities have to be considered:

- Nitrogen compounds form a substantial part of the circulation of substances in nature and when used as fertilisers, it is not possible to direct all the added nitrogen compounds into the final agricultural products.
- By improving the environmental requirements for the performance and the technology for manure storage and use and for the use of mineral fertilisers, it is possible to reduce the loss of nitrogen compounds per one production unit, however, the amount of losses will largely depend on the weather during the production process, which cannot be foreseen for the whole vegetation period.
- The load of nitrogen compounds from agriculture remains the main load flow of nitrogen compounds on the aquatic environment and this load shall be limited with costs that are reasonable from the socio-economic perspective, the impact of the load shall be mitigated and compensated.
- The drinking water quality of the aquifer near the ground surface cannot be guaranteed in shallow wells located on the fields.
- In order to ensure the drinking water quality, deeper wells have to be established in low-density areas.
- In order to achieve the good status of water bodies with the largest load, recovery and mitigation measures have to be implemented.

⁸ Council directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources, performance in Estonia in 2008–2011. 2012 Ministry of the Environment

2. Objective and measures of the action plan

NVZ action plan is an additional plan to the River Basin Management Plan, which supports the achievement of the objectives set in river basin management plans regarding the supply of drinking water for residents, achievement and maintenance of the good status of surface and groundwater and maintenance of the living conditions of aquatic biota on the NVZ.

The action plan is prepared based on valid river basin management plans and the drafts for the river basin management plans for the period 2015-2021⁹ and the materials of the action plans for the implementation of the River Basin Management Plan¹⁰.

Measures based on bodies of water are presented in the draft of the measure programme for river basin management plans for 2015–2021 and in the enclosed tables of measures.¹¹

Objectives of the action plan for limiting the environmental load:

- Limit the environmental load in places with a more substantial load in order to mitigate its impact on the bodies of surface and groundwater with bad status.
- Continuously update the information needed for planning and implementing water protection measures.
- Reduce the share of agricultural production which does not correspond to the environmental requirements.
- Update the legal framework and promote cooperation with the parties, including in the field of specifying the requirements for the calculation of applied fertilisers.
- Raise the awareness of agricultural producers, agricultural advisers and officials, as well as explain the possibilities for the implementation of water protection measures to the producers at their location, taking into consideration the natural conditions of the production site.
- Ensure healthy drinking water for households located in the zones of agricultural production.

In order to achieve the objective of the action plan, the following measures shall be implemented:

- Ensuring healthy drinking water in low-density areas.
- Implementation of environmentally friendly technologies in agriculture (including the implementation of the measures of the Estonian Rural Development Plan 2014–2020).
- Organisation of impact studies and monitoring of agricultural production. The task is to observe and acknowledge the natural background load agricultural trends of nitrogen and phosphorus load. More specific studies shall be carried out on the catchments of these bodies of water where the load of nutrients is also the reason for the poor or bad status of

⁹ Website of the Ministry of the Environment <http://www.envir.ee/et/veemajanduskavad>

¹⁰ Website of the Environmental Board <http://vesikonnad.keskkonnaamet.ee/?op=body&id=142>

¹¹ Website of the Ministry of the Environment

http://www.envir.ee/sites/default/files/veemajanduskavade_meetmeprogramm_2.pdf

the body of surface water. For the targeted fertilisation of crops, a guide and a calculator shall be developed for the preparation of nitrogen balances at the level of the field and the company. Keeping in mind the future, a possibility for a common electronic farm record or the development of a database for the use of fertilisers has been considered at different levels. The example has been set by other countries, e.g., Denmark, where it gives an accurate overview of the use of fertilisers in agricultural production and based on that, an overview of the load to the environment. The said data is also a good tool to the person engaged in agriculture in particular, allowing the optimal use of fertilisers and keeping the production costs under control.

- Development of a legal framework and cooperation for the achievement of the NVZ protection objectives. The current key issue is the limitation of the nitrogen and phosphorus losses by setting restrictions to the time and conditions of fertilisation at the end of the vegetation period.
- Information and ensuring expertise.
- Improving supervision and the competence of the compliance authority officers.

The main indicators for the assessment of the performance of the objectives of the action plan are the following:

Indicator	Source level 2014	Target level 2020
Status of bodies of surface water and the changes in their content of plant nutrients	Number of eutrophicated water bodies (source level 1 – Soolikaoja, Selja) and water bodies in danger of eutrophication (source level 2 (Jänijõgi and Pedja 1)) of the total number of monitored water bodies (10)	The share of eutrophicated water bodies and water bodies in danger of eutrophication of the total number of monitored water bodies will not increase.
Status of bodies of groundwater	Two out of three NVZ bodies of groundwater near the ground surface are in bad status	At least two NVZ bodies of groundwater near the ground surface are in good status regarding the nitrate content.
Share of the monitoring points of the monitored wells with the nitration over 50 mg/l among the total number of monitoring points (%)	Adavere region 25.7% Pandivere region 2%	20% 1%
Share of the monitoring points of the monitored wells with the nitration of 40–50 mg/l among the total number of monitoring points (%)	Adavere region 17.1% Pandivere region 18%	15% 15%

Number of certified agricultural-environmental advisors	Two certified advisers in the advisory service.	At least one certified advisor in each county.
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2.1. Ensuring healthy drinking water in low density areas

Based on the complaints submitted by citizens, the Health Board takes samples for analysis if there is a doubt about the deterioration of the quality of water. In 2008–2011, with the support from the foundation Environmental Investment Centre, 143 new bore wells were established for individual households instead of their polluted old wells. The applications for financing the wells were submitted to the foundation Environmental Investment Centre (EIC) by local governments. In 2007–2012, it was possible to apply for the means of the water programme for the low-density areas for improving the water supply and sewage of individual households. Support from the low density areas programme for the activities related to the development of water supply and sewage systems, access roads and autonomous power systems for households can also be applied for in the next period. Pursuant to the programme document of the low-density area programme for 2015, the supported areas are water supply systems, sewage systems, access roads and autonomous power systems. Among other things in the area of water supply systems, the establishment of wells (bore and dug wells) and cleaning of wells and the construction of well houses is supported.

There is still a possibility to apply for project-based support for water supply surveys and establishment of the systems from the water management programme of the foundation EIC.

Due to other social problems in rural areas, there is also a development gap in supplying individual households with high quality drinking water. In addition to support schemes, the state can also help with surveys and relevant trainings. The initiative in organising water supply should in particular be taken by the households and local governments, whereas they should also make proposals for more specified surveys in villages, where the monitoring results have indicated poor quality of groundwater or where the inhabitants have complained about the quality of drinking water.

Measure 1. Ensuring healthy drinking water in low density areas			
Main activities	Immediate result	Deadline	Administering authority
1.1. Monitoring of the nitrate ions content in water wells in the framework of the sub-programme of the state subordinate programme of groundwater monitoring "NVZ groundwater monitoring".	Information of the dynamics of nitrate content . Approximately 250 water samples from wells located in low-density areas have been analysed annually during the state groundwater monitoring process.	Continuous	Ministry of the Environment (in the process of NVZ monitoring) Estonian Environmental Research Centre
1.2. Survey of residue of plant protection products in the areas most polluted with nitrate.	The work is necessary for controlling the spread of plant production products in the body of groundwater and in bore wells and for timely actions which allow to prevent pollution.	2019	Ministry of the Environment (in the process of NVZ monitoring) Estonian Environmental Research Centre
1.3. Determination of nitrogen content in wells of NVZ individual households in the endangered areas.	Information on the extent of the pollution of the body of groundwater and on the number of people whose drinking water is not healthy. Based on this information, the site-targeted pollution restriction and mitigation activities can be implemented.	Continuous	Local government Ministry of the Environment Ministry of Social Affairs
1.4. Surveys for finding the water source suitable for individual households in the areas with polluted aquifer near the ground surface.	Information necessary for the concerned parties for the improvement of water supply in the areas with polluted aquifer near the ground.	Continuous	Local government

Measure 1. Ensuring healthy drinking water in low density areas			
Main activities	Immediate result	Deadline	Administering authority
1.5. Updating the guidelines for arranging water supply of private households in areas with unprotected or poorly protected groundwater and training for the specialists of local governments and the Environmental Board	The information necessary for arranging water supply in areas with endangered groundwater quality is available for the parties.	2017	Environmental Board Local government
1.6. Replacement of the polluted wells of individual consumers.*	Establishment of bore wells based on applications.	Continuous	Local government, water consumer

*Source of funding is the low-density area programme

2.2. Implementation of environmentally friendly technologies in agriculture

Besides the optimisation of the use of fertilisers, the implementation of contemporary agricultural technologies play an important role. Contemporary equipment for land application of fertilisers, including manure, allow to measure out more precise doses of fertiliser and take it into the ground, which also reduces leaching. In the case of livestock buildings, the condition and sufficient capacity of manure and liquid manure storages and also silage storages is important for avoiding pollution. New opportunities for environmental protection in agriculture are opened up by the production of biogas from liquid manure, which in addition to manure also allows using plant and animal waste. The implementation of such measures helps to improve the competitiveness of agricultural production without increasing the load on the environment.

Investment and environmental support of the **Estonian Rural Development Plan 2014–2020** (hereinafter *ERDP 2014–2020*), which in addition to the increase in the performance of the production of agricultural enterprises also take into consideration the alignment of the requirements of manure management and reduction of the negative impact of agriculture on soil and water (support for environmentally friendly management, regional water protection support).

Although the situation of manure management has substantially increased in livestock farming in the past few years, the supervision activities still reveal manure storages which fail to meet the requirements. The number of non-compliant manure storages for the companies with the obligation of the integrated environmental permit is less than 25% of the total number of manure storages, for smaller cattle, pig and bird breeders the percentage of non-compliant

manure storages is even larger. Investments in manure storages reduce the ambient air and water pollution.

Estonia's National Renewable Energy Action Plan up to 2030 has set an objective to increase the share of renewable energy to 25% by 2020 and to 45% by 2030 of the final energy consumption. The objective is to increase the share of biofuel in transport to 10% by 2020 and the objective for 2030 shall be reviewed before 2020. More active production of biofuel and bioenergy from agricultural waste would help to achieve the set aim, reducing the impact of energy (as one of the production inputs) on the competitiveness of agricultural producers and at the same time making the agriculture of Estonia more environmentally friendly (reduced greenhouse gas emissions and leakage of nitrogen into internal water bodies). Besides extending the production of biofuels, it is important to create possibilities for implementing them as an input in the agricultural production process. Investments into the production of biofuel and bioenergy promote the use of local renewable raw material, thus helping to mitigate climate changes. Among other things, the reconstruction of agricultural equipment in a way that they could run on biogas or biofuel is also supported. In addition, support is given to the acquisition of mobile machines and equipment (including agricultural vehicles, coupling devices) necessary for the production, maintenance and preparation for the first sale of agricultural products.¹²

Measure 2. Implementation of environmentally friendly technologies in agriculture			
Main activities	Immediate result	Deadline	Administering authority
2.1. Arrangement and reconstruction of manure and silage storages and the establishment of storages which comply with the requirements.	New livestock buildings shall be commissioned with proper manure handling and storage systems. The manure and silage storages of the existing livestock buildings comply with the requirements. The risk of point pollution load decreases.	Continuous	Ministry of Rural Affairs, entrepreneur
2.2. Implementation of updated environmentally sustainable technologies for the land application of fertilisers, including manure.	As the result of the implementation of new equipment, the environmental load of agricultural production per one production unit decreases.	Continuous	Ministry of Rural Affairs, entrepreneur

¹² Estonian Rural Development Plan for 2014–2020. Ministry of the Environment 2015

Measure 2. Implementation of environmentally friendly technologies in agriculture			
Main activities	Immediate result	Deadline	Administering authority
2.3. Innovative manure processing technologies, including the extension of biogas production.	By using processed manure, the uptake of nutrients by plants increases, which is why the fertilisers are used more accurately and efficiently. The load of agricultural production per one production unit decreases.	Continuous	Ministry of Rural Affairs, entrepreneur

2.3. Organisation of impact studies and monitoring of agricultural production

The impact of agricultural production on the environment is assessed during the groundwater-monitoring programme of the Nitrate Vulnerable Zone. Four samples are annually taken from each groundwater sample point. Additionally, 4–12 samples are annually taken in the framework of the water-monitoring programme of river basins, depending on the sample point and the parameters to be determined. In addition to the said water monitoring programmes, more specific surveys are organised on bodies of water or parts thereof where the water nutrient content causes the bad or poor status of the body of water or threatens the quality of groundwater used as drinking water. Surveys are necessary for specifying the mandatory environmental requirements and recommendations on voluntary measures for agricultural producers and for planning the mitigation of the impact of environmental load.

Measure 3. Organisation of impact studies and monitoring of agricultural production			
Main activities	Immediate result	Deadline	Administering authority
3.1 Development of the humus balance calculator and plant nutrient elements balance calculator which suit to the local conditions.	Agricultural producers can easily assess the efficiency of the use of nitrogen. A possibility to use the achieved results together with monitoring and survey results for planning the limitation of site-targeted nitrogen load.	2019	Ministry of Rural Affairs

Measure 3. Organisation of impact studies and monitoring of agricultural production			
Main activities	Immediate result	Deadline	Administering authority
3.2. A specifying survey of the areas where, according to the point of the decrease of the growth trend of nitrates in NVZ bodies of groundwater with bad status, the nitrate content exceeds 40 mg/l, for the implementation of relevant measures for reversing the nitrate content.	Specifying studies shall be carried out periodically in areas where the monitoring results indicate the content of nitrate ion to be over 40 mg/l. Based on the surveys, the necessary activities can be determined for limiting the increase in nitrate content in groundwater.	Continuous	Ministry of the Environment
3.3. Survey of the load of streams with larger content of plant nutrients (eutrophicated or in danger of eutrophication) and specifying the measures for the reducing stream-based load. Test rivers are Jänijõgi River and Soolikaoja brook.	Implementation of a test project of the limitation of plant nutrients load in two NVZ river sets. There are former background studies about Jänijõgi River (TUT), the load survey for Soolikaoja brook and the proposal for activities will be prepared in 2015 during or based on the survey of Selja River (AS Kobras) ordered by the Environmental Board.	2019	Ministry of the Environment
3.4. Inventory of the manure handling and manure storages of livestock companies in 2015–2017.	As the result of the re-inventory, information on the compliance of manure storages of livestock companies is updated. The result can be used in assessing the load, planning the measures and planning the supervision of the Environmental Inspectorate.	2017	Ministry of the Environment
3.5. Survey of the economic impact of the extension of the NVZ	An economic impact assessment has been given to the possible scenarios of the NVZ, which were handled in the paper on the need about the extension of the NVZ completed at the end of 2015, and based on this assessment the Government of the Republic shall develop a	2017	Ministry of the Environment Ministry of Rural Affairs

Measure 3. Organisation of impact studies and monitoring of agricultural production			
Main activities	Immediate result	Deadline	Administering authority
	respective regulation.		
3.6. Survey on the content of the residue of plant protection products in NVZ areas with larger nitrate content in groundwater.	Information on the NVZ bodies of groundwater endangered by the spread of plant protection products and on the need for additional measures.	2017	Ministry of the Environment
3.7. Load assessment of contemporary silage production on the aquatic environment.	Information on the compatibility of the environmental requirements of silage production and proposals for the specification of environmental requirements if necessary.	2020	Ministry of the Environment
3.8. Updating the agricultural load sources of water and the information on their impact, the determination of the measures for reducing the impact in the sub-basin of Lake Peipus (the works were commenced in 2015).	The share of the load originating from different sources of agricultural production compared to nitrogen and phosphorus load from other sources has been clarified.	2017	Ministry of the Environment

Additional measures of the action plan of the NVZ planned in the activities of river basin management plans for 2015–2021

Surface water measures from the programme of measures of the river basin management plan (implement measures on test rivers — Jänijõgi River and Soolikaoja brook, activity 3.3):

- Maintenance works of artificial recipients and more frequent maintenance (removal of obstacles of flow, cleaning the streambeds from litter and sediments, maintenance of the shores of artificial recipients). (Agricultural Board, land user).
- Implementation of environmental measures planned for artificial recipients (sediment pools, marshes). (Agricultural Board, land user).
- Establishment and/or preservation of buffer zones with vegetation that bounds nutrients at

the riparian zone of water bodies to minimise the leakage of nutrients from arable land. (Agricultural Board, land user).

- Preparation of plans for the land application of liquid manure for controlling the observation of the time and quantity restrictions of the land application of manure and the related leakage of nutrients from the land (including additional measures). (Agricultural producer, approved by the Environmental Board).

Measures for groundwater:

- Preparation of the plans for the land application of liquid manure for controlling the observation of the time and quantity restrictions of the land application of manure, thus avoiding the pollution of joint catchments and individual wells (including additional measures). (Water user, agricultural producer, approved by the Environmental Board).
- Inventory and organisation of catchments and their sanitary protection zones. (Water user, landowner).
- Elimination of unused bore wells. (Owner, local government).
- Arrangement of the areas around springs and sinkholes. (Land owner, land user, local community).

2.4. Development of legal framework and cooperation for the achievement of the NVZ protection objectives

Restriction of the load of plant nutrients assumes close cooperation between different authorities and interest groups at both the state level and international level, and the amendment and supplementation of the legal acts regulating this area.

In order to reach a mutual understanding in the issue of nitrate load and organising cooperation, regular meetings should be held between the parties to discuss issues related to the performance of the NVZ action plan, issues related to the legislation process, exchange information and plan new activities. For instance, in order to limit the load of nutrients, limiting late autumn fertilisation is extremely important; the relevant amendments in the Water Act have been made. Pursuant to the amendments, the land application of liquid manure is prohibited as of 1 November instead of 1 December. In addition, the long-term storage of manure on fields is also an issue (manure stacks left exposed to rainfall during autumn and winter).

Measure 4. Development of legal framework and cooperation for the achievement of the			
Main activities	Immediate result	Deadline	Administering authority
<p>4.1. Formation of shared visions, sharing and registration of knowledge</p> <p>At least once a year summon the persons and representative of organisations responsible for the achievement of the objectives of the Nitrates Directive and the NVZ action plan or contributing to them.</p>	All the persons responsible for or contributing to the performance of the objectives of the Nitrates Directive and the NVZ action plan have a common understanding of the performed, ongoing and planned activities.	Continuous	Ministry of the Environment Ministry of Rural Affairs
<p>4.2. Complement the legal acts regulating water protection in agricultural production according to the necessity to follow the objectives of the status of the aquatic environment, including limiting the fertilisation time at the end of vegetation period and specifying the restrictions for fertilising: on the sanitary protection zones and supply areas of joint catchments, near the valuable habitats depending on water and recreational water bodies.</p>	Legal acts are coordinated with the Nitrates Directive - and the established requirements are sufficient for avoiding the deterioration of the aquatic environment.	Continuous	Ministry of the Environment Ministry of Rural Affairs
<p>4.3. Functioning of the agricultural working group during the period of the action plan.</p>	Through its broad-based composition, the working group helps the Ministry of the Environment to - coordinate and analyse the performance of the NVZ action plan.	Continuous	Ministry of the Environment

2.5. Information and ensuring expertise

Year by year, the importance of environmental issues as an aspect of agricultural production increases. Environmentally sustainable production does not only set limits for agricultural production but also promotes the implementation of innovative and more environmentally friendly technologies in production.

Increasing the competitiveness of agriculture without increasing the environmental load is a task

which requires extensive knowledge. Availability of updated guidance materials and advice plays a very important role here. The agricultural advisers offering advisory services have to have a high qualification. At the same time, as of May 2014 (according to the Estonian Rural Development Plan) the number of professionally certified environmental and nature conservation advisers was two. In measure M02 “Advisory services, farm management and farm relief services” of the Estonian Rural Development Plan, the share of the importance of topics related to the environment is attempted to be increased in many ways. The use of advisory services is annually supported with maximum 3,000 euros per one end user. The maximum support sum for one advisory service is 1,500 euros. Up to 90% of the price of the advisory services related to small-scale food handling or the environment, advisory services related to the compliance to the requirements or occupational health and safety and also advisory services related to the specific area of activity (technological advice) shall be supported. Considering the limited amount of workforce, the exchange of information and cooperation between the Ministry of Rural Affairs and the Ministry of the Environment and the experts engaged in this area of work is definitely needed here.

It is important that a competent advisory system be ensured for agricultural producers, which ensures the necessary information on the requirements of legal acts and the best available technologies. The awareness of many producers and the fact whether they follow the environmental requirements or not depends on the awareness of the advisers of the issues related to water protection. Agricultural advisers have to be regularly trained to give them new knowledge and to embed the existing ones. It is probably not possible to get more advisers specialised only on environmental protection and conservation and to provide work for them.

Measure 5. Information and ensuring expertise			
Main activities	Immediate result	Deadline	Administering authority
5.1. Updating the guideline “Good Agricultural Practice” issued by the Ministry of Rural Affairs in 2007.	Recommended guidelines of the modes of production described in the good agricultural practice are available for agricultural producers and advisers.	2018–2019	Ministry of Rural Affairs
5.2. Regular training of agricultural advisers on the subject of water protection.	Competent advisory service is available for agricultural producers.	Continuous	Rural Development Foundation Ministry of Rural Affairs Ministry of the Environment Environmental Board

Measure 5. Information and ensuring expertise			
Main activities	Immediate result	Deadline	Administering authority
5.3. Seminar for agricultural producers, the Environmental board, the Environmental Inspectorate, the Ministry of Rural Affairs, the Ministry of the Environment and the experts	Introduction of the survey results made during the period, informing the participants of the problems and proposals for further work.	Annual	Environmental Board Ministry of the Environment Ministry of Rural Affairs Agricultural Board
5.4. Ensuring the availability of expert advice for solving on-site environmental protection problems	Conditions have been created for operative involvement of experts for preventing pollution incidents, clarifying the reasons of such incidents and eliminating the environmental hazard.	Continuous	Agricultural research institutions, Agricultural Research Centre, Agricultural Board, Rural Development Foundation Environmental Board Environmental Inspectorate
5.5. Environmentally friendly management of organic fertilisers in the agricultural sector	In the framework of the project, 10 farmers from Estonia and 10 from Latvia act as test companies to implement innovative technologies and methods in cooperation of the best experts in the field. During the approximately 1.5-year test period, water and soil samples shall be collected and an analysis shall be prepared at the end of the project about the performance of the measures for reducing the leaching of nutrients.	2018	The Estonian Chamber of Agriculture and Commerce Producers

2.6. Improving supervision and the competence of the compliance authority officers

According to their competence, two institutions exercise supervision over the performance of environmental requirements in agriculture — the Environmental Inspectorate and the Agricultural Board. The task of the Environmental Board is to process and issue environmental permits. This institution is also related to the supervision of the performance of the requirements of integrated environmental permits.

The supervision capacity of the Environmental Inspectorate shall be improved. In order to do this, means shall be allocated for continuous and effective control of the performance of water protection requirements on the NVZ; this should be done in addition to the functioning control of the performance of requirements and installations that have integrated environmental permits, and for processing complaints. Supervision could be made more efficient by making the inputs and outputs of agriculture (perhaps even the nutrients balance in the future) completely electronic.¹³

In addition to the above-listed, one of the prerequisites for ensuring the quality of supervision is the competence of inspectors, whereas in addition to regular training events, their competence should be enhanced by organising seminars and trainings targeted directly at the control activities of the area of agriculture.

Measure 6. Improving supervision and the competence of the compliance authority officers			
Main activities	Immediate result	Deadline	Administering authority
6.1. Organising a theoretical and practical training on the subject of supervision in the area of agriculture for the compliance authority officers of the Environmental Inspectorate. Including the control procedures for the compliance to the requirements of fertilising on the areas around springs and sinkholes and sloping areas by using the updated map applications of the Land Board.	Improvement in the quality and performance of the work of compliance authority officers	2020	Environmental Inspectorate
6.2. Seminar for the specialists of the Environmental Board, integrated environmental permits of agricultural enterprises, environmental impact	Specialists are aware of the requirements and the changes.	2017	Environmental Board

¹³ Preparing an overview of the implementation of the action plans for implementing the measure programmes of the river basin management plans of river basins 2013–2014. AS Maves 2014

Measure 6. Improving supervision and the competence of the compliance authority officers			
Main activities	Immediate result	Deadline	Administering authority
assessment, manure handling, etc.			
6.3. Analysis for assessing the expedience of collecting all the agricultural production data (farm record, use of fertilisers and plant protection products) into one electronic database and cost analysis of the preparation of such system.	Helps to automatically control compliance to the requirements, compare the data with monitoring data and focus on areas with larger environmental risk.	2020	Ministry of the Environment Ministry of Rural Affairs

2.7. Estimated cost of the action plan

The total cost of the action plan up to 2020 is 921,300 euros. The planned budget of the draft of the NVZ action plan does not include sums planned from the Estonian Rural Development Plan or other action plans. Financing of the measures is planned from both the state budget as well as means applied for from the foundation Environmental Investment Centre and the means from the low-density area programme.

Measure	2016	2017	2018	2019	2020
Measure 1. Ensuring healthy drinking water in low density areas *)					
Measure 2. Implementation of environmentally friendly technologies in agriculture *)					
Measure 3. Organisation of impact studies and monitoring of agricultural production **	185,000	190,000	120,000	185,000	180,000
Measure 4. Development of legal framework and cooperation for the achievement of the NVZ protection objectives	5,300	6,500	8,000	5,000	8,000
Measure 5. Information and ensuring expertise***	5,000	3,000	2,000	2,000	2,000
Measure 6. Improving supervision and the competence of the compliance authority officers		4,500	5,000		5,000
Total	195,300	204,000	135,000	192,000	195,000

Measure	2016	2017	2018	2019	2020
	Total cost				921,300

*) The cost estimation of the action plan does not include the implementation costs of measures that are important from the point of view of water protection that are financed from other sources (e.g., measures of the Estonian Rural Development Plan, implementation plan 2014–2017 of the Estonian Regional Development Strategy 2014–2020), since the financing is performed based on the submitted applications that cannot be foreseen.

**) The cost estimation of the action plan does not currently include the cost of project-based mitigation measures, since the activities 3.2. and 3.3. of measure 3, which shall be clarified during the research and design works.

***) The cost estimation of the action plan does not include the cost of these project-based measures which are funded from other sources, such as the Estonian–Latvian joint project which is funded by the INTERREG Central Baltic Programme 2014–2020.

3. Implementation of the action plan

An agricultural water protection working group was formed with the order No. 405 of 29 April 2015 of the Minister of the Environment. The working group joins the representatives of agricultural producers, organisations and non-profit organisations engaged in environmental protection, local governments, agricultural advisers, the ministries and boards and inspectorates.

The main task of the working group is to analyse the connections and impacts between the status of Estonian surface and groundwater and the diffuse and point load from agriculture, analyse and assess the procedure of the performance of the agricultural measures of the River Basin Management Plan and the NVZ action plan and, if necessary, make proposals for the better implementation of the measures.

Differently from the tasks of the previous NVZ working groups, which were related to the NVZ activities, the agricultural water protection working group focuses on the territory of the whole Estonia.

The implementation of the NVZ action plan is organised by the Ministry of the Environment in cooperation with the Ministry of Rural Affairs. Based on the nature of the work, both ministries shall involve their divisions (Environmental Board, Agricultural Research Centre, Environmental Inspectorate, Agricultural Board, Agricultural Registers and Information Board, Rural Development Foundation) but also community organisations, representatives of scientists and interested parties. The issues regarding the quality of drinking water shall be solved by the Ministry of Social Affairs and the Health Board.

Pursuant to the requirements of Article 10 of the Nitrates Directive, all Member States shall submit a report to the Commission based on the common guidelines in every four years. The last report for the NVZ action plan period was submitted in October 2012. The deadline for the submission of the report for the current period is in June 2016.

4. Criteria for assessing the implementation of the action plan

The performance of the NVZ action plan shall be assessed and analysed by the agricultural water protection working group based on the assessment criteria which mainly originate from the Water Act and its subsidiary legislation.

The criteria of good status of groundwater have been established with Regulation No. 75 of 29 December 2009 of the Minister of the Environment “Procedure for establishing bodies of groundwater and the list of the groundwater bodies, the status class of which has to be determined, status classes of bodies of groundwater, values of quality indicators corresponding to status classes and the conditions for quantitative indicators, list of pollutants posing a hazard to groundwater, threshold values of the content of such pollutants and their limit values in groundwater and the procedure for determining the status classes of bodies of groundwater”.

The criteria of good status of surface water have been established with Regulation No. 44 of the Minister of the Environment of 28 July 2009 “Procedure for establishing bodies of surface water and the list of the bodies of surface water the status class of which has to be determined, status classes of bodies of surface water and the values of quality indicators corresponding to status classes and the procedure for determining the status classes”.

Requirements for healthy drinking water have been established with Regulation No. 82 of 31 July 2001 of the Minister of Social Affairs “Quality and control requirements for drinking water and methods of analysis”. The quality and control requirements for the surface and groundwater used or intended to be used for producing drinking water are provided in Regulation No. 1 of 2 January 2003 of the Minister of Social Affairs.

Requirements for storing manure and liquid manure have been established in Section 26² of the Water Act and with Government of the Republic Regulation No. 288 “Water protection requirements for fertiliser and manure storages and for places storing silage, and the requirements for using and storing manure, liquid silage and other fertilisers”.

5. Annexes

5.1. Connections between the action plan and other strategic documents.

The measure programme of the River Basin Management Plan 2015–2021 includes measures for reducing point load and diffuse load, large part of which is related to the restriction and reduction of nutrients originating from agriculture. The NVZ action plan specifies the implementation of these measures on the NVZ. As larger point load sources (including waste water treatment plants and manure systems of large farms) mostly correspond to the requirements by now, the load restriction is mainly concentrated on limiting the point load from the manure and silage storages of smaller farms and more widely on the possibilities of reducing the total diffuse load originating from agricultural production.

The control of point and diffuse load is strategically particularly important for the purpose of protecting the Baltic Sea, at regional and local level, however, especially for ensuring the sustainability of groundwater supply and maintenance or improvement of the status of surface water.

The Estonian Rural Development Plan 2014–2020 includes environmental aid which also promotes the reduction of negative impact of agriculture on soil and water (support for environmentally friendly management, regional water protection support, support for organic production). The objective of the said measure is to compensate to the agricultural producers the costs and the loss of income related to the voluntary implementation of environmental protection measures which are stricter than those provided by law. Support for advisory services helps to ensure the good quality of advisory services.

General environmental objectives, such as the good status of surface and groundwater, healthy drinking and swimming water are presented in the Estonian Environmental Strategy Until 2030. The NVZ action plan aims to achieve all these objectives. They primarily include the reduction of the impact of agricultural activities with the aim to achieve or maintain the good status of surface and groundwater in the meaning of the Water Framework Directive and the Water Act. It must be noted, however, that the indicator of the environmental strategy — *the share of wells and springs where the content of plant protection products and nitrates as individual substances has been identified as exceeding the norm (limit value)* — has increased compared to the source level (2007).

One of the main objectives of the Nature Conservation Development Plan Until 2020 is to ensure a favourable condition of habitats (including aquatic habitats). The Nature Conservation Development Plan aims at directing more resources for reducing the agricultural diffuse load through different support schemes. The springs and sinkholes located on the NVZ have undergone an inventory and their locations have been specified in the digital database. This creates preconditions for the protection of these water and natural objects. In order to restore the good status of river as habitats on agricultural lands, in addition to the establishment of fish

ladders and rapids stressed in the Nature Conservation Development Plan, attention must also be paid to the more frequent maintenance of rivers, brooks and main ditches for the purpose of mitigating the impact of eutrophication.

According to the National Health Plan 2009–2020, one of the indicator of health risks from living environment is the share of population supplied with drinking water corresponding to the requirements. State control and statistics handle public water supply systems (over 50 people) where the nitrates content is currently not the issue. However, attention must still be paid on individual households in low-density areas. In addition to the NVZ, the water in dug wells on the fields of Southern Estonia has to be analysed for nitrate content, as this has not been done for decades.

5.2. Involved ministries and relevant institutions

The representatives and advisers of the Ministry of Rural Affairs, the Environmental Board, the Environment Agency, the Environmental Inspectorate and representation organisations of agricultural producers were involved in the preparation of the NVZ action plan.