

Programme of Measures for Achieving Water  
Protection Objectives within the Venta River  
Basin District  
Annex 2

**RATIONALE FOR THE PROGRAMME OF MEASURES FOR ACHIEVING  
WATER PROTECTION OBJECTIVES WITHIN THE VENTA RIVER BASIN  
DISTRICT**

**CHAPTER I. GENERAL PROVISIONS**

1. The Programme is designed for the Venta River Basin District (RBD) which consists of the Lithuanian parts of the Venta, Bartuva and Šventoji river basins.

The Programme was drawn up upon analysis of the status of water bodies within the Venta RBD and assessment of impacts of anthropogenic activities on water bodies. The development of the Programme took account of the programmes currently implemented on the national level as well as technical feasibility of the measures and economic resources, including recovery of costs related to the provision of water services.

Pursuant to the requirements of the Law of the Republic of Lithuania on Water (Žin.\* , 1997, No. 104-2615; 2003, No. 36-1544), a programme of measures must be established for each river basin district in order to achieve water protection objectives. Each programme of measures comprises basic measures which are the mandatory requirements under the Lithuanian laws regulating the water sector and relevant European Union (EU) directives (construction of wastewater treatment facilities and manure storage facilities, balanced soil fertilisation, crop rotation, etc.). Where the assessment of the effect of the basic measures reveals that they are sufficient for achieving water protection objectives, the programme is limited to these measures. If, however, the basic measures are not sufficient for a water body to achieve water protection objectives, supplementary measures are then chosen as may be necessary in order to attain the set water protection objectives.

A wide range of measures can be available. Some of them are purely engineering ones, for example, construction of domestic and industrial wastewater treatment facilities, installation of protection belts for water bodies, renaturalisation of straightened river beds, etc. Other instruments are legal (permits for carrying out economic activities, impoundment of rivers or construction of hydropower plants (HPP), etc.), economic (taxes and charges, sanctions, incentives, subsidies and the like), information (seminars, events, public education through the press, on the internet), etc.

Legal acts provide for possible exceptions in respect of the achievement of certain water protection objectives. One of them is the extension of the deadline (until 2027 at the latest) for achieving the set objective, provided that the objective cannot be achieved in time for reasons of technical feasibility, disproportionate costs or natural conditions. Another exception is the establishment of less stringent objectives that must also be justified by technical feasibility, natural conditions or disproportionate costs, as well as when the achievement of good status would lead to far-reaching negative socio-economic consequences that cannot be avoided by any significantly better

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\* Valstybės žinios [official gazette]

environmental option. These exceptions can be applied only in rare cases, subject to the economic analysis and reasoned arguments for the necessity of the exception.

The present document on the Programme of Measures for the Venta RBD gives a description of the basic and supplementary measures, as well as specifies the costs of their implementation.

## **CHAPTER II. BASIC MEASURES FOR ACHIEVING GOOD WATER STATUS IN THE VENTA RBD**

Taking into account that the implementation of the basic measures has been regulated in relevant legislation currently in force as well as in programmes and various other documents, the requirements of the basic measures which have already been transposed into the national legal framework are not specified in this document to avoid repetition of these requirements in different documents.

2. Pursuant to Part A of Annex VI to Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ 2004 special edition, Chapter 15, Volume 5, p. 275), (WFD), basic measures are those which must be implemented in order to meet the requirements of the following directives:

2.1 Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC (OJ 2006 L 64, p. 37) (Bathing Water Directive);

2.2. Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ 2010 L 20, p. 7) (Birds Directive);

2.3 Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption (OJ 2004 special edition, Chapter 15, Volume 4, p. 90), (Drinking Water Directive);

2.4. Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances (OJ 2004 special edition, Chapter 5, Volume 2, p. 410) (Major Accidents Directive);

2.5. Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (OJ 2004 special edition, Chapter 15, Volume 1, p. 248) as last amended by Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 (Environmental Impact Assessment Directive);

2.6. Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (OJ 2004 special edition, Chapter 15, Volume 1, p. 265) (Sewage Sludge Directive);

2.7. Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment (OJ, 2004 special edition, Chapter 15, Volume 10 p. 26) (Urban Wastewater Treatment Directive);

2.8. Council Directive 91/414/EEC concerning the placing of plant protection products on the market (OJ 2004 special edition, Chapter 3, Volume 11, p. 332) as last amended by the Commission Directive 2010/42/EU of 28 June 2010 (OJ 2006 L 161, p. 6) (Plant Protection Products Directive);

- 2.9. Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (OJ 2004 special edition, Chapter 15, Volume 2, p. 68) (Nitrates Directive);
- 2.10. Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora of 21 May 1992 (OJ 2004 special edition, Chapter 15, Volume 2, p. 102) (Habitats Directive);
- 2.11. Directive 2008/1/EC of the European Parliament and of the Council concerning integrated pollution prevention and control of 15 January 2008 (OJ 2008 L 24, p. 8), as last amended by Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 (OJ 2009 L 140, p. 114) (IPPC Directive).

Seven directives out of the eleven ones listed above the implementation of which also means introduction of the basic measures are related to high costs. The largest investments are required for the Urban Wastewater Treatment Directive and the Nitrates Directive therefore these directives are addressed on a first priority basis in the sections below. The implementation of the remaining directives – the Birds Directive, Environmental Impact Assessment Directive, Plant Protection Products Directive, and the Habitats Directive – is mainly related to the establishment of relevant legal, institutional, procedural and other “soft” measures with a lower investment demand.

## **SECTION I. MEASURES PROVIDED FOR IN THE COMMUNITY WATER LEGISLATION AND TRANSPOSED INTO THE LITHUANIAN LEGAL FRAMEWORK**

### **Urban Wastewater Treatment Directive**

3.3. The basic measures under the Urban Wastewater Directive cover construction and reconstruction of wastewater treatment facilities in agglomerations with a population equivalent (p.e.) of more than 2 000 with a view to improve the quality of discharged wastewater so that it conforms to the requirements set for effluents emitted into surface water bodies.

The said requirements are defined in the Wastewater Management Regulation approved by Order No. D1-236 of the Minister of Environment of the Republic of Lithuania of 17 May 2006 (Žin., 2006, No. 59-2103; 2007, No. 110-4522). Although loads discharged from urban wastewater treatment plants have significantly decreased during the recent years, pollutants emitted from some of them continue significantly affecting the quality of the receiving water bodies.

The key piece of legislation transposing the Urban Wastewater Treatment Directive is the Law of the Republic of Lithuania on Water, which started regulating treatment of wastewater.

Later, the following legislation was passed:

- 3.1. Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management (Žin., 2006, No. 82-3260);
- 3.2. Law of the Republic of Lithuania on the Entry into Force and Implementation of the Law on Drinking Water Supply and Wastewater Management (Žin., 2006, No. 82-3261);

3.3. Drinking Water Supply and Wastewater Management Development Strategy for 2008–2015 approved by Resolution No. 832 of the Government of the Republic of Lithuania of 27 August 2008 (Žin., 2008, 104-3975);

3.4. Wastewater Management Regulation;

3.5. List of National Projects No. 1 under Measure No. VP3-3.1-AM-01-V “Renovation and development of water supply and wastewater management systems” approved by Order No. D1-462 of the Minister of Environment of the Republic of Lithuania of 9 September 2008 (Žin., 2008, No. 109-4162; 2009, No. 47-1882).

4. Under the EU Treaty of Accession, Lithuania has been granted a transitional period for the implementation of the requirements of the Urban Wastewater Treatment Directive. Lithuania has undertaken to collect and adequately treat wastewater observing the following schedule:

4.1. wastewater in agglomerations with a p.e. of 10 000 and more shall be treated observing the established standards as from 31 December 2007;

4.2. wastewater collection systems in conformity with the established requirements shall be in place in agglomerations with a p.e. of more than 2 000 as from 31 December 2009;

4.3. wastewater shall be treated observing the established standards in agglomerations of between 2 000 and 10 000 as from 31 December 2009;

4.4. in newly planned agglomerations, wastewater management requirements shall be observed from the moment of the wastewater generation.

### **Effect of the measures under the Urban Wastewater Treatment Directive**

5. There are eight agglomerations with a p.e. of more than 2 000 in the Venta RBD on a list drawn up by the Environmental Protection Agency (EPA). The wastewater treatment plants (WWTP) of these agglomerations are the main objects actually subject to the requirements of the Urban Wastewater Treatment Directive.

The quality parameters of wastewater discharged from the agglomerations with a p.e. of more than 2 000 in the Venta RBD and conformity thereof with the requirements of the Urban Wastewater Treatment Directive are provided in Table 1 below.

Table 1. Quality parameters of wastewater discharged from large agglomerations with a p.e. of more than 2 000 in the Venta RBD. Concentrations which fail the requirements of the Urban Wastewater Treatment Directive are given in bold italics.

Town	Agglomeration size	Receiving water body	Wastewater volume, thou. m <sup>3</sup> /m	BOD <sub>7</sub> * mg/l	NH <sub>4</sub> -N * mg/l	NO <sub>3</sub> -N* mg/l	N <sub>total</sub> * mg/l	P <sub>total</sub> * mg/l
Kuršėnai	10000 - 100000	Urdupis	759	4.7	0.107	26.7	<b>34.7</b>	<b>4.47</b>
Mažeikiai	10000 – 100000	Venta	2 667	4.13	2.99	0.33	4.95	0.366
N. Akmenė	10000 – 100000	Agluona	24	5.7	7.2	6.6	<b>19</b>	<b>3</b>
N. Akmenė	10000 – 100000	Agluona	36	7.7	0.62	8.5	15	2.04
N. Akmenė	10000 – 100000	Agluona	72	7	3.29	4.33	11	0.87
N. Akmenė	10000 – 100000	Drūktupis	260	7.6	2.97	17.4	<b>27.4</b>	<b>3.35</b>
N. Akmenė	10000 – 100000	Agluona	28	11.3	20.3	1.11	<b>26</b>	<b>2.7</b>
N. Akmenė	10000 – 100000	Agluona	24	8.8	2.5	7.4	<b>18</b>	<b>2.6</b>
N. Akmenė	10000 – 100000	Agluona	64	6.8	1.02	6.1	11.5	<b>2.4</b>

Town	Agglomeration size	Receiving water body	Wastewater volume, thou. m <sup>3</sup> /m	BOD <sub>7</sub> * mg/l	NH <sub>4</sub> -N * mg/l	NO <sub>3</sub> -N* mg/l	N <sub>total</sub> * mg/l	P <sub>total</sub> * mg/l
N. Akmenė	10000 – 100000	Agluona	91	9.1	1.62	6.89	11.47	1.53
Telšiai	10000 - 100000	Svaigė	2 636	5.8	2.42	1.15	5.34	<b>3.63</b>
Akmenė	2000 - 10000	Dabikinė	67	14	6.78	15.2	26.6	4.76
Skuodas	2000 – 10000	Bartuva	135.6	2.16	2.4	3.84	9.59	0.76
Venta	2000 – 10000	Venta	28	13	14.4	6.98	26.8	5.25
Viekšnai	2000 - 10000	Varduva	299	23.4	36.6	6.55	52.2	6.25

\*BOD<sub>7</sub> – biochemical oxygen demand for 7 days; NH<sub>4</sub>-N – ammonium nitrogen; NO<sub>3</sub>-N – nitrate nitrogen; N<sub>total</sub> – total nitrogen; P<sub>total</sub> – total phosphorus

Source: 2009 data on point pollution loads (EPA)

In 2009, concentrations of total nitrogen in wastewater discharged from Kuršėnai and Naujoji Akmenė WWTP as well as concentrations of total phosphorus in wastewater emitted from Kuršėnai, Naujoji Akmenė and Telšiai WWTP were still failing the requirements of the Urban Wastewater Treatment Directive.

Kuršėnai WWTP is undergoing reconstruction which is planned to be completed by July 2010. Concentrations of P<sub>total</sub> in wastewater emitted therefrom after the reconstruction are expected to conform to the requirements of the Urban Wastewater Treatment Directive, i.e. to be lower than 2 mg/l. Concentrations of total nitrogen after the reconstruction should also go down to the required level (i.e. down to 15 mg/l)

A new wastewater treatment plant was constructed in Naujoji Akmenė in July 2009. Today (in 2010) the level of purification of wastewater emitted therefrom is very high: the concentration of BOD<sub>7</sub> in wastewater discharged into the Agluona River totals to about 4.2 mg, dissolved oxygen in water (O<sub>2</sub>) – about 4.2 mgO<sub>2</sub>/l, N<sub>total</sub> – 11 mg/l, P<sub>total</sub> – 0.94 mg/l. In the analysis of the effect of the basic measures, it was assumed that such wastewater quality will remain in future.

Telšiai WWTP is also under reconstruction, which is planned to be completed in 2010. Concentrations of P<sub>total</sub> in wastewater are expected to go down after the reconstruction to the required 2 mg/l.

A new wastewater treatment plant with tertiary treatment of wastewater is being constructed in Akmenė. The construction is planned to be completed in autumn 2010. Concentrations of BOD<sub>7</sub> in treated wastewater should not exceed 10 mgO<sub>2</sub>/l, N<sub>total</sub> – 38 mg/l, P<sub>total</sub> – 2 mg/l.

The construction and reconstruction of the said wastewater treatment facilities are carried out under Project No. 2006/LT/16/C/PE/001 “Investment Programme for the Venta – Lielupė River Basin, 1<sup>st</sup> stage”, which is implemented by the Environmental Project Management Agency under the Ministry of Environment of the Republic of Lithuania.

The scope of the implementation of the basic measures was assessed taking into account the available information of projects already completed and those planned for the future and assuming the following:

5.1. After the reconstruction of Kuršėnai WWTP, the concentration of total phosphorus in effluents will go down to 2 mg/l and the concentration of total nitrogen – to 15 mg/l. The concentration of  $BOD_7$  will remain the same as in 2009.

5.2. The efficiency of Naujoji Akmenė WWTP will remain similar as today, i.e. the concentration of  $BOD_7$  in effluents will be around 4.2 mgO<sub>2</sub>/l, the concentration of  $N_{total}$  is expected to be 11 mg/l and that of  $P_{total}$  – 0.94 mg/l.

5.3. After the reconstruction of Telšiai WWTP, the concentration of  $P_{total}$  in effluents will be around 2 mg/l. The values of other quality parameters will remain the same as in 2009.

5.4. After the construction of WWTP in Akmenė, the concentration of  $BOD_7$  in effluents will be around 10 mgO<sub>2</sub>/l, the concentration of  $P_{total}$  – about 2 mg/l, and concentrations of nitrogen compounds will remain the same as in 2009.

5.5. The quality parameters of wastewater discharged from Skuodas, Mažeikiai, Venta and Viekšniai wastewater treatment facilities are not expected to change and will remain the same as in 2009.

5.6. The volume of wastewater discharged from the wastewater treatment facilities in larger agglomerations is not expected to change in the nearest future and will remain the same as in 2009.

5.7. Loads emitted from other wastewater dischargers (i.e. dischargers of industrial wastewater and surface runoff and dischargers in settlements with a p.e. of less than 2 000 p.e.) will not change and will remain the same as in 2009.

The loads currently discharged into surface water bodies within the Venta RBD from point pollution sources and loads forecasted after the implementation of the basic measures under the Urban Wastewater Treatment Directive are presented in Table 2. The present point pollution loads were assessed using the EPA data of 2009.

The information given in the table below demonstrates that the basic measures under the Urban Wastewater Treatment Directive are likely to result in point pollution reduction only in the Venta Basin, meanwhile point pollution loads in the Bartuva Basin and in the Šventoji Basin are expected to remain the same as today. The reduction of pollution loads in the Venta Basin as compared to the ones in 2009 will be achieved due to the reconstruction of wastewater treatment facilities in Kuršėnai and Telšiai and the construction of new wastewater treatment facilities in Akmenė and Naujoji Akmenė.

The load of  $BOD_7$  discharged from point pollution loads in the Venta Basin is expected to go down only by 3%, the decrease of the load of total nitrogen should be around 20% and that of total phosphorus – up to 33%.

Table 2. Present and forecasted point pollution loads in the Venta RBD after the implementation of the basic measures under the Urban Wastewater Treatment Directive

Pollutant	Discharger	Basin				
		Bartuva		Šventoji		Venta
		Present load	Forecasted load after the implementation of the basic measures under the Urban Wastewater Treatment Directive	Present load	Forecasted load after the implementation of the basic measures under the Urban Wastewater Treatment Directive	Present load
$BOD_7$ , t/year	Agglomerations of >10 000 p.e.	0	0	0	0	34.5
	Agglomerations of between 2 000 and 10 000 p.e.	0.75	0.75	0	0	3.1
	Agglomerations of <2 000 p.e.	0.55	0.55	1.2	1.2	4.3
	Industrial wastewater	0	0	0.13	0.13	18.35
	Surface runoff	0.08	0.08	0.3	0.3	21.55
	<b>TOTAL:</b>	<b>1.38</b>	<b>1.38</b>	<b>1.63</b>	<b>1.63</b>	<b>81.8</b>
$N_{total}$ , t/year	Agglomerations of >10 000 GE	0	0	0	0	65.5
	Agglomerations of between 2 000 and 10 000 p.e.	3.3	3.3	0	0	6.45
	Agglomerations of <2 000 p.e.	1.2	1.2	2.2	2.2	8.5
	Industrial wastewater	0	0	0.16	0.16	19.2
	Surface runoff	0.09	0.09	0.4	0.4	10.7
	<b>TOTAL:</b>	<b>4.59</b>	<b>4.59</b>	<b>2.76</b>	<b>2.76</b>	<b>110.35</b>
$P_{total}$ , t/year	Agglomerations of >10 000 GE	0	0	0	0	15.4
	Agglomerations of between 2 000 and 10 000 p.e.	0.26	0.26	0	0	1.1
	Agglomerations of <2 000 p.e.	0.24	0.24	0.2	0.2	1.2
	Industrial wastewater	0	0	0.014	0.014	3.3
	Surface runoff	0.02	0.02	0.1	0.1	1
	<b>TOTAL:</b>	<b>0.52</b>	<b>0.52</b>	<b>0.314</b>	<b>0.314</b>	<b>22</b>

Source: experts' estimations taking into account the data on point pollution loads in 2009 (EPA) and information about water purification projects already completed and those planned for the future

6. Mathematical modelling was employed to evaluate the effect of the implementation of the basic measures under the Urban Wastewater Treatment Directive on the quality of surface water bodies. A mathematical model was used to forecast changes in the quality of water bodies as a result of decrease of point pollution loads after the introduction of the basic measures under the Urban Wastewater Treatment Directive.

The forecasting results show that the implementation of the basic measures pursuant to the Urban Wastewater Treatment Directive will enable to achieve concentrations of total phosphorus in conformity with good ecological status criteria in two water bodies of the Venta River downstream of Kuršėnai. Pollution of the Venta is expected to go down after the reconstruction of Kuršėnai WWTP.

After the construction of a new wastewater treatment plant in Naujoji Akmenė, wastewater is no longer discharged into Drūktupis (wherefrom it used to enter the Dabikinė) but into the Agluona. However, wastewater is discharged into the very upper reaches of the Agluona River, which complicates achievement of good ecological status in the receiving water body even when the wastewater purification level is very high. The concentration of  $BOD_7$  discharged from Naujoji Akmenė WWTP is about 4.2 mgO<sub>2</sub>/l, the concentration of NH<sub>4</sub>-N – around 3.29 mg/l, that of NO<sub>3</sub>-N – approximately 4.33 mg/l and of P<sub>total</sub> – 0.94 mg/l. The mathematical modelling findings indicate that exceedance of the allowable concentrations of  $BOD_7$  in the river can be avoided at such wastewater quality parameters. However, concentrations of ammonium nitrogen and total phosphorus in the river downstream of the town will most likely be failing the requirements of good ecological status.

Findings of the study ‘Preparation of a feasibility study on the construction of stormwater management systems in selected problematic settlements and development of recommendations for the construction of such systems in individual typical cases’ have demonstrated that the Agluona River is significantly affected not only by household wastewater but also by surface (stormwater) runoff. Consequently, it is obvious that the implementation of the measures under the Urban Wastewater Treatment Directive will not lead to the achievement of good ecological potential in the Agluona.

New wastewater treatment facilities in Akmenė and Naujoji Akmenė are supposed to solve the Dabikinė River pollution problem. However, a water quality analysis conducted in the Dabikinė upstream of the discharger of Akmenė WWTP by the company AB Akmenės vandenys in 2010 when wastewater from Naujoji Akmenė was already being diverted to the Agluona indicated rather significant pollution of the river. As in many towns situated at small rivers, this could be determined by illegal discharges. Therefore, it cannot be firmly maintained that new wastewater treatment facilities in Akmenė and Naujoji Akmenė will ensure conformity of pollutant concentrations in the Dabikinė to the good ecological status/potential requirements.

After the completion of the currently undertaken reconstruction of Telšiai WWTP, concentrations of P<sub>total</sub> in effluents should no longer exceed 2 mg/l (in 2009 the concentrations were as high as 3.63 mg/l). However, the mathematical modelling findings indicate that such purification level will most probably be insufficient to achieve that concentrations of P<sub>total</sub> in the Tausalas River meet the good ecological status requirements. The reconstruction of Telšiai WWTP might not lead to a lower level of ammonium nitrogen in the Tausalas either.

The basic measures under the Urban Wastewater Treatment Directive will not have any effect on the quality of rivers in the Bartuva and Šventoji river basins. If point pollution loads in future do not exceed the present levels, pollutant concentrations in rivers within these basins are not expected to exceed the limits established for good ecological status.

The data available and the analyses findings show that four water bodies in the Venta RBD identified in the rivers Dabikinė, Tausalas and Agluona will still be failing the requirements for good ecological status/potential due to the point pollution impact even after the implementation of the basic measures under the Urban Wastewater Treatment Directive. These water bodies have been designated as water bodies at risk which will require supplementary measures in order to achieve their good ecological status/potential. The demand and implementation prospects of supplementary measures required to reduce point pollution are discussed in Chapter III of this Programme of Measures.

### **Implementation costs of the Urban Wastewater Treatment Directive**

7. Planned measures in the Venta RBD include construction of two new wastewater treatment plants and 53.7 km of new sewerage networks using funds of the Financial Instrument for 2007-2013. Table 3 provides data on the national projects on renovation and development of water supply and wastewater management systems in the Venta RBD in 2007-2013. The investment costs given therein also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Venta RBD are estimated at LTL 81.09 million. Since most of the new investment costs are related to the construction of new water supply or sewerage collection networks, it is assumed that the annual operating costs total to 2% of the investments. Such assumption is based on the current practice that the annual operating costs of wastewater treatment facilities make up approximately 5% and those of water supply or sewerage collection networks – about 2% of the investment costs.

Table 3. National projects on renovation and development of water supply and wastewater management systems in the Venta River Basin in 2007-2013

Municipality	Settlement	Planned works						Project value, LTL million	Maintenance costs, LTL million per year
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km		
Akmenė distr.	Akmenė	1		7.2		6.8		31.7	
	Venta	1		10.9		7.6			
Mažeikiai distr.	Mažeikiai			5.5		7.8		18.59	
	Viekšnai			6.5		5.7			
Mažeikiai distr.	Mažeikiai			4.7		4.0		9.45	
	Viekšnai			2.0		2.8			
Šiauliai distr.	Kuršėnai			7.7		4.6		9.52	
Telšiai distr.	Telšiai			9.2		7.7		11.83	
<b>TOTAL</b>		<b>2</b>		<b>53.7</b>		<b>47.0</b>		<b>81.09</b>	<b>1.62</b>

Source: List of National Projects No. 1 under Measure No VP3-3.1-AM-01-V “Renovation and development of water supply and wastewater management systems”

Notes:

1. Two projects on the development of water supply and wastewater management infrastructure have been planned for Mažeikiai district. Both of them will be implemented in Mažeikiai town and Vieksniai settlement.
2. Development of Kuršėnai (Šiauliai district) water supply and wastewater infrastructure is included in the project “Development of the water supply and wastewater management infrastructure in Šiauliai district (Kairiai, Vijoliai, Kuršėnai)”. The project also includes development of the infrastructure in Kairiai and Vijoliai settlements (Lielpė RBD, Mūša Sub-

basin). The total value of the project is LTL 28.56 million. It is assumed that one third of the project value will be invested in the Venta River Basin.

3. The length of new or renovated networks is the minimum one specified in a relevant order of the Minister of Environment. Changes in construction prices can result in different work scopes.

### **Nitrates Directive**

8. The objective of the Nitrates Directive is to reduce pollution of water bodies generated or induced with nitrates used in agriculture and to prevent such pollution in future.

The key piece of legislation transposing the Nitrates Directive is the Programme on the Reduction of Water Pollution from Agricultural Sources approved by Order No. 3D-686/D1-676 of the Minister of Agriculture of the Republic of Lithuania and the Minister of Environment of the Republic of Lithuania of 9 December 2008 (Žin., 2008, No. 143-5741), which is the document regulating the second stage of the Programme. The first stage ended in 2007 and the second one will last until May 2012.

9. The Programme on the Reduction of Water Pollution from Agricultural Sources provides for the following basic mandatory requirements:

- 9.1. Livestock density on a farm shall not exceed 1.7 livestock units (LSU) per hectare of utilised agricultural land;
- 9.2. The total nitrogen input ( $N_{total}$ ) in the soil (which enters the soil with organic fertilisers and when pasturing livestock) shall not exceed 170 kg per hectare of utilised agricultural land;
- 9.3. Manure storages shall be constructed on farms with more than 10 LSU;
- 9.4. 50% of the area of farms with more than 15 ha of arable land shall be sowed with wintering (winter and perennial) plants.
- 9.5. Crop rotation shall be applied on farms situated in hilly terrains to prevent erosion.

At present, the livestock density does not exceed the required standard of 1.7 LSU and the amount of nitrogen applied to the soil with manure is much lower than 170 kg of  $N_{total}/ha$ .

### **Effect of the measures under the Nitrates Directive**

10. The effect of the measures under the Nitrates Directive was assessed forecasting changes in the status of water bodies as a result of the implementation of the said measures, which was done with a help of mathematical modelling. Changes in the water status as compared to the present situation were assessed taking into account the effectiveness and extent of the implementation of the planned measures.

A list of the key measures under the Nitrates Directive as well as prospects and extent of the implementation of the measures in Lithuania are provided in Table 4, which also gives information on the effect and effectiveness of the measures.

However, it is rather difficult to determine the effect of each measure because it depends on a number of factors, such as natural conditions, farming methods and type. Accordingly, the effectiveness of the measures may differ from farm to farm. The effectiveness values used for the forecasting of the impact of the Nitrates Directive were

determined on the basis of summary results of studies conducted in other countries (UK and Denmark).

The table below demonstrates that many basic measures under the Nitrates Directive will have either no or only a minor impact on pollution loads. The main measure which is expected to have a noticeable effect is construction of manure storages on farms with more than 10 livestock units (LSU).

Table 4. Basic measures under the Nitrates Directive and their effectiveness

No.	Requirement	Application	Impact on pollution loads	Expected decrease in pollution loads after implementation of the measure, %
1	Construction of manure storages on farms (except for those with deep animal houses). Capacity of the manure storage (of the pit, tank or lagoon type) shall be 8 months for storing manure from pigs and poultry and 6 months for storing manure from cattle, horses, sheep and other animals.	Farms with more than 300 LSU - by 1 January 2008	Loads of $\text{NO}_3\text{-N}$ and $P_{\text{total}}$ will go down on farms with more than 300 LSU. When manure is spread at the time of the lowest likelihood of surface runoff, reduction of $\text{NH}_4\text{-N}$ and biochemical oxygen demand (BOD) can be expected. The measure is effective only when manure is spread at a suitable time and at a safe distance from water bodies. The measure has been partially implemented.	It is assumed that pollution loads on farms with manure storages are 20% lower than on farms without such storages.
2	Construction of manure storages on farms (except for those with deep animal houses). Capacity of the manure storage (of the pit, tank or lagoon type) shall be 8 months for storing manure from pigs and poultry and 6 months for storing manure from cattle, horses, sheep and other animals.	Farms with 10 to 300 LSU by 1 January 2012.	Loads of $\text{NO}_3\text{-N}$ and $P_{\text{total}}$ will go down on farms with more than 10 LSU. When manure is spread at the time of the lowest likelihood of surface runoff, reduction of $\text{NH}_4\text{-N}$ and BOD loads can be expected. The measure is effective only when manure is spread at a suitable time and at a safe distance from water bodies.	Livestock pollution loads will go down by 20-30% on farms where this measure will be applied.
3	The amount of $N_{\text{total}}$ entering the soil (when fertilising it with organic fertilisers (OF), and pasturing livestock) shall not exceed 170 kg/ha.	All livestock farms	This measure will have either no or only a minor effect, because according to the available data the load of 170 kg/ha is currently not exceeded.	No decrease
4	Organic fertilisers shall not be used between 1 December and 1 April and shall not be applied when the soil is frozen hard, waterlogged or snow covered. In exceptional cases, when autumn is dry, warm and long and fields are ploughed later, or when spring is early and warm and fields are ploughed earlier, organic fertilisers may be applied later or earlier, upon prior notification of the regional environmental protection agency of the relevant Regional Environmental Protection Department (REPD) thereof. Such fertilisation shall be prohibited when the wind is blowing in the direction of a neighbouring residential place. Application of mineral fertilisers is recommended	All livestock farms	It is assumed that application of organic fertilisers on hard-frozen fields is not widely spread because the demand of fertilisers for crops is minimum at this time of the year.	No decrease

No.	Requirement	Application	Impact on pollution loads	Expected decrease in pollution loads after implementation of the measure, %
	only on working days.			
5	Fertilisation plans in conformity with the established requirements shall be in place.	Farms which apply manure on more than 150 ha of utilised agricultural land per year as well as farms which use manure produced by 200 or more LSU for fertilisation, or farms where the annual amount of N <sub>total</sub> in organic fertilisers used is 20 tonnes or more	The main purpose of fertilisation plans is to stop over-fertilisation. However, so far fertilisation plans are only supposed to specify the amount of organic fertilisers used so the measure will not be effective until mineral fertilisers are included in fertilisation plans.	No decrease
6	The chosen type of fertilisation shall ensure uniform application of fertilisers and a minimum impact of the fertilisation on the environment. When applied on the soil surface, solid and semi-liquid manure shall be incorporated into the soil no later than within 12 hours from its application.	All livestock farms	Application of manure has no or even a negative effect on nitrogen loads because during incorporation of manure NH <sub>4</sub> -N does not evaporate and enters the soil. The impact of incorporation on loads of P <sub>total</sub> has been included in the impact of construction of manure storages.	No change in nitrogen loads is expected, the impact on loads of P <sub>total</sub> is about 5% and it has been included in the impact of the construction of manure storages.
7	Organic fertilisers shall not be used in riparian protection zones of surface water bodies as well as closer than 2 meters from the upper edges of the slopes of reclamation ditches.	All livestock farms	Fertilisation in riparian protection zones of surface water bodies is not expedient due to low density of LSU so most likely it is not widely spread.	No decrease
8	50% of the area shall be sowed with wintering (winter or perennial) plants.	Farms with more than 15 ha of arable land	This requirement has already been met. According to declarations, wintering crops, meadows and pastures in 2004 accounted for 63.1% of the total declared area, in 2005 this number was 60.6%, in 2006 – 58.2% and in 2007– 60.2%.	No decrease
9	Livestock density on a farm shall not exceed 1.7 of livestock units per hectare of utilised agricultural land.	All livestock farms	At present livestock density does not exceed 1.7 LSU/ha	No decrease
10	Application of crop rotation to prevent erosion.	Farms situated in hilly terrains	Reduction of input of nitrogen, phosphorus and suspended matter into water bodies	Likely decrease in pollution with suspended matter and phosphorus

Source: experts' estimations

The number of LSU on farms of different size and on farms which already have manure storages is provided in Table 5. The table also gives a forecasted number of LSU on farms where manure storages will be constructed after the introduction of the basic measures under the Nitrates Directive.

Table 5. Number of LSU on farms of different size and forecasted number of LSU on farms where manure storages will be constructed as a result of the implementation of the basic measures under the Nitrates Directive

Basin	Number of LSU	No. of LSU on farms with less than 10 LSU	No. of LSU on farms with more than 10 LSU	No. of LSU on farms with manure storages	No. of LSU on farms where manure storages will be constructed
Šventoji	4 409.1	2 373.6	2 035.5	189.4	1 846.1
Bartuva	18 206.3	7 021.7	11 184.6	2 170.4	9 014.2
Venta	66 945.7	29 005.2	37 940.5	9 732.4	28 208.1
<b>TOTAL:</b>	<b>89 561.1</b>	<b>38 400.5</b>	<b>51 160.6</b>	<b>12 092.2</b>	<b>39 068.4</b>

Source: Agri-Information and Rural Business Centre

The information provided in the table above demonstrates that pollution reduction potential due to the construction of manure storage is not very high as compared to the present situation. Today about 13.5% of all LSU in the Venta RBD is held on farms with manure storages. The implementation of the basic measures under the Nitrates Directive should increase this number: after the construction of manure storage on all farms with more than 10 LSU, the amount of manure stored in manure storages could total to 57% of the manure of all LSU.

Forecasts of changes in the status of water bodies as a result of the implementation of the basic measures under the Nitrates Directive were developed on the assumption that animal pollution loads will decrease by 20-30% on farms where manure storages will be built meanwhile consumption of mineral fertilisers will remain the same.

Estimations indicate that overall pollution reduction after the implementation of the basic measures under the Nitrates Directive, of which only manure storages will have a noticeable effect, will most probably be rather insignificant. The nitrate nitrogen pollution load generated in Lithuania and transported by rivers from the Venta River Basin to Latvia should go down by about 4%, which is 104 tonnes per year on average. The nitrate nitrogen load transported by the Bartuva River could decrease by about 5.5%, or 21 tonnes per year. Even a lower change in pollution loads is forecasted for the Šventoji River Basin where the implementation of the basic measures under the Nitrates Directive could result in the decrease of only 3%, or 6 tonnes per year.

It is forecasted that the annual average concentrations of nitrate nitrogen in certain tributaries of the Venta (Ringuva, Dabikinė, Šventupis, Ašva, Agluona) and their catchments might still be failing the good ecological status/potential requirements (i.e. >2.3 mg/l) even after the introduction of the basic measures under the Nitrates Directive and therefore these rivers have been designated as water bodies at risk.

Supplementary measures to reduce diffuse pollution with nitrate nitrogen will be required in 1 167.8 km<sup>2</sup> of the Venta basin area which makes up around 23% of the total area of the RBD. To be able to achieve good ecological status in all water bodies by nitrate nitrogen, the decrease of agricultural pollution loads in problematic catchments should be about 1.2 kg/ha per year.

## Implementation costs of the Nitrates Directive

11. 914 manure storages for 170 500 livestock units (LSU) were built from 2004 through 2008. The annual capacity of these storages is 540 thousand tonnes of manure/slurry. The average size of farms which used the assistance under the Nitrates Directive during the said period was 82 LSU. The actual average number of LSU on farms which implemented the requirements of the Nitrates Directive was twice higher than planned because the implementation of these requirements during the assistance period was highly relevant for large farms with more than 300 LSU. Since the main users of the assistance were large farms, the number of manure/slurry tanks built was three times lower than actually planned; however, the capacity of these tanks was much larger.

The basic measures under the Nitrates Directive will cover farms with more than 10 LSU which to date do not have manure storages. The total number of LSU in the Venta RBD and the number of LSU on farms of different size and on farms which already have manure storages are given in Table 6. Information on the distribution of LSU on farms of different size and on those with manure storages at the level of wards was provided by the Agri-Information and Rural Business Centre. The LSU number in the basin data was estimated in proportion to area of a respective ward in the basin.

Table 6. LSU number on farms of different size and on farms with manure storage already in place in the Venta RBD, 2008

RBD	LSU number	LSU density	LSU number on farms with less than 10 LSU	LSU number on farms with 10 to 300 LSU	LSU number on farms with more than 300	No. of LSU on farms with manure storages in place
Bartuva	18 206.3	0.24	7 021.7	9 972	1 212.6	2 170.4
Šventoji	4 409.1	0.11	2 373.6	1 953.7	81.8	189.4
Venta	66 945.7	0.13	29 005.2	29 797.2	8 143.3	9 732.4
<b>TOTAL:</b>	<b>89 561.1</b>	<b>0.14</b>	<b>38 400.5</b>	<b>41 722.9</b>	<b>9437.7</b>	<b>12 092.2</b>

Source: Agri-Information and Rural Business Centre

To date, the implementation of the requirements for manure management was funded under two programmes: under the Measure “Compliance with standards” of the Rural Development Programme for 2004-2006 and under the first activity area “Implementation of the requirements of the Nitrates Directive and new mandatory Community standards” of the Measure “Modernisation of agricultural holdings” of the Rural Development Programme for 2007-2013 approved by Commission Decision No. C (2007)5076 of 19 October 2007.

Under the Measure “Compliance with standards” of the Rural Development Programme for 2004-2006<sup>1</sup>, substantial assistance was provided for the introduction of advanced manure management technologies, acquisition of new manure loading and transportation vehicles, slurry spreading equipment, and reconstruction of the existing or construction of new manure storages or slurry collectors. Economic entities which participate in this programme (about 2 468) are supposed to achieve compliance of their farms with the environmental requirements of the Nitrates Directive within three years from the signing of the agreement. Pursuant to the Measure “Compliance with

<sup>1</sup> Covers two directives: Council Directive 92/46/EEC of 16 June 1992 laying down the health rules for the production and placing on the market of raw milk, heat-treated milk and milk-based (OJ L 268, 1992 9 14, p. 1-32, Chapter 3, Volume 13, p. 103-134) (Milk Directive) and the Nitrates Directive.

standards” of the Rural Development Programme for 2004-2006, the total amount allocated from the budget of 2004-2006 in Lithuania was LTL 368 021 000. Also, LTL 57 582 384 were paid out by July 2010 from the 2007-2013 Programme budget under the Measure “Compliance with Standards. Obligations of the Rural Development Programme” of the Rural Development Programme for 2004-2006. In addition, LTL 24 686 045 were paid out (the value of the authorised agreements totals to LTL 38 937 853) until July from the 2007-2013 Programme budget for the “Implementation of the requirements of the Nitrates Directive and new mandatory Community standards”.

The amount allocated for one LSU under the Programme for 2004-2006 varied between LTL 805 and LTL 960 and that under the Programme for 2007-2013 – between LTL 345 and LTL 1 934 (however, the beneficiaries may use these funds to cover not more than 40-60% of the eligible project expenditure). Although the number of manure storages built is available, there is no data on which particular programme the construction was funded from. The final report on the assessment of the Programme for 2004-2006 stated that the implementation of the Nitrates Directive had been allocated 2.5 times more funds than for the implementation of the Milk Directive. Following this proportion, it is assumed that about LTL 280 million could have been allocated from the EU and national budget funds for the implementation of the Nitrates Directive by 2010.

Since the number of LSU for the manure whereof storages should still be built is more than twice larger than the number of those whose manure is already managed in an appropriate manner, the additional amount needed in Lithuania totals to about LTL 600 million and the total amount required for the implementation of this requirement of the Directive may be as large as LTL 900 million.

The distribution of the funds in different basins was calculated by dividing the total amount allocated for Lithuania in proportion to the number of manure storages in the basins. It is assumed that the share of manure storages built using the assistance funds is more or less the same in all basins. The estimated distribution of funds is provided in Table 7.

Table 7. Demand of costs for the implementation of the Nitrates Directive in the Venta RBD, LTL, rounded up

Basin	Funds paid out for the implementation of the Nitrates Directive	Demand of additional funds for the implementation of the Nitrates Directive
Šventoji	399 000	3 955 000
Bartuva	4 572 000	18 986 000
Venta	20 500 000	59 415 000
<b>Total:</b>	<b>25 470 000</b>	<b>82 360 000</b>

Source: experts' estimations based on the data of the National Paying Agency

The level of the implementation of the requirement to construct manure storages differs depending on the individual RBD. The amount already paid out in the Venta RBD for the implementation of the Directive totals to LTL 25.5 million and the additional demand may be more than LTL 80 million.

## **Drinking Water Directive**

12. The Drinking Water Directive is intended to protect people from negative effects of water pollution ensuring that drinking water is wholesome and clean. The provisions of the Directive are applicable to all kinds of drinking water as well as water used for food preparation and processing. The Directive is not applicable for natural mineral waters and waters which are medicinal products. When the minimum requirements of the Directive are applied, water is wholesome and clean if it is free from any micro-organisms and parasites and from any substances which, in numbers or concentrations, constitute a potential danger to human health.

13. The key legislation transposing the requirements of the Drinking Water Directive:

- 13.1. Law of the Republic of Lithuania on Drinking Water (Žin., 2001, No. 64-2327);
- 13.2. Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management;
- 13.3. Wastewater Management Regulation;

13.4. Rules for the Development of Plans for Expansion of Water Supply and Wastewater Management Infrastructure approved by Order No. D1-636 of the Minister of Environment of the Republic of Lithuania of 29 December 2006 (Žin., 2007, No. 8-337);

13.5. Procedure for State Control of Drinking Water approved by Order No. 643 of the Director of the State Food and Veterinary Service of the Republic of Lithuania of 10 December 2002 ((Žin., 2003, No. 3-99), which transposed the specific requirements of the Directive for drinking water quality control;

13.6. Lithuanian Hygiene Norm HN 24:2003 “Drinking water safety and quality requirements” approved by Order No. V-455 of the Minister of Health of the Republic of Lithuania of 23 July 2003 (Žin., 2003, No. 79-3606);

13.7. Lithuanian Hygiene Norm HN 44:2006 “Delineation and maintenance of sanitary protection zones of wellfields” approved by Order No. V-613 of the Minister of Health of the Republic of Lithuania (Žin., 2006, No. 81-3217);

13.8. Law of the Republic of Lithuania on Local Self-Government (Žin., 1994, No. 55-1049; 2008, No. 113-4290), which contains a provision on the obligation of municipalities to organise supply of drinking water.

## **Effect of the measures under the Drinking Water Directive**

14. Controls over drinking water quality

This measure is implemented in accordance with the requirements of the Lithuanian Hygiene Norm HN 24:2003 “Drinking water safety and quality requirements”. The Hygiene Norm sets forth the requirements for the quality of drinking water (chemical composition, the number of quality assessments per year, analysis methods, etc.). The quality of drinking water in Lithuania is controlled by the Ministry of Health and the State Food and Veterinary Service.

15. Removal of old operational bore wells which are no longer in use

The procedure for the removal of old operational bore wells which are no longer used and which can turn into potential groundwater pollution sources is laid down in the Lithuanian environmental regulatory document LAND 4-99 “Procedure for the design,

installation, temporary shutdown and removal of wells intended for water supply and use of water for heating energy” approved by Order No. 417 of the Minister of Environment of the Republic of Lithuania of 23 December 1999 (Žin., 1999, No. 112-3263). The procedure for the removal of bore wells is controlled by the Ministry of Environment of the Republic of Lithuania.

#### 16. Establishment of sanitary protection zones of wellfields

Sanitary protection zones (SPZ) of wellfields are established and validated in accordance with the requirements of the Hygiene Norm HN 44:2006 “Delineation and maintenance of sanitary protection zones of water extraction sites”. Sanitary protection zones are defined for each water extraction site and consist of three belts:

- 16.1. the belt of strict regime (first belt) is a belt located closest to the catchment equipment and designed for the protection of the wellfield and groundwater catchment equipment against intentional or accidental pollution, where any economic or other activity not related with the extraction, improvement and supply of groundwater is forbidden;
- 16.2. the belt preventing microbial pollution (second belt) is a protective belt where microbial and chemical pollution is restricted;
- 16.3. the belt preventing chemical pollution (third belt) is a protective belt where chemical pollution is restricted.

The municipality on the territory of which a respective wellfield is located shall organise establishment and protection of the WPZ in accordance with the requirements of the Law of the Republic of Lithuania on Drinking Water and the Law of the Republic of Lithuania on Protected Areas (Žin., 1993, No. 63-1188; 2001, No. 108-3902).

A special plan of the SPZ of a wellfield drafted, agreed and approved pursuant to the procedure laid down in relevant legislation has to be registered with the Register of Documents of Planning of Municipal Territories and with the Register of the Earth Entrails. The approved belts of the SPZ of wellfields have to be marked when drafting other territorial planning documents, and economic activities are regulated in accordance with the limitations laid down in the Hygiene Norms HN 44:2006 and other legislation. An important measure is controls over establishment and official designation of SPZ because so far, as provided for in HN 44:2006 “Delineation and maintenance of sanitary protection zones of water extraction sites”, sanitary protection zones have been officially designated only for three wellfields in the Venta RBD: two wellfields of Šiauliai city and one wellfield of the dairy products company Žemaitijos pienas.

Only groundwater is used for drinking purposes in Lithuania and the quality of groundwater is good due to favourable natural conditions and environmental measures applied.

#### **Implementation costs of the Drinking Water Directive**

17. The Drinking Water Supply and Wastewater Management Strategy for 2008-2015 has set forth that drinking water supply and wastewater management services shall become accessible to at least 95% of the Lithuanian population by 2015 and that publicly supplied water shall fully (100%) comply with the established safety and quality requirements.

18. Measures for the implementation of the requirements of the Drinking Water Directive (construction of new and reconstruction of the existing water supply networks, construction and rehabilitation of water improvement facilities) for 2007-2013 cover measures provided for on the List of National Projects No. 1 under Measure No. VP3-3.1-AM-01-V “Renovation and development of water supply and wastewater management systems”.

The measures for the implementation of the requirements under the Drinking Water Directive are planned to be introduced together with the basic measures for wastewater management (investment projects cover both water supply and wastewater management systems). The information provided on the List of National Projects does not enable precise assessment of investments planned separately for the development of water supply systems therefore the information on planned investments for water supply and wastewater management is provided in the paragraph on the implementation costs of the Urban Wastewater Treatment Directive. The length of new water supply networks planned to be constructed in the Venta RBD totals to 47 km, the total investment costs of the measures for the improvement of the water supply infrastructure and the wastewater management infrastructure in the Venta RBD amount to LTL 81.09 million.

### **Birds Directive**

19. The Birds Directive regulates the protection of areas of importance for birds and requires establishment of special protected areas for the conservation of certain species of birds.

The Checklist of the Birds of Lithuania at present contains 358 species of birds. 77 areas of importance for the conservation of birds were established in Lithuania as part of the NATURA 2000 network as on 1 January 2009. Of these, eight areas are situated in the Venta RBD.

The key legislation transposing the Birds Directive:

19.1. Law of the Republic of Lithuania on Protected Areas;

19.2. General Regulations of Areas of Importance for the Conservation of Habitats or Birds approved by Resolution No. 276 of the Government of the Republic of Lithuania of 15 March 2004 (Žin., 2004, No. 41-1335);

19.3. Criteria for the Screening of Areas of Importance for the Conservation of Birds approved by Order No. D1-358 of the Minister of Environment of the Republic of Lithuania of 2 July 2008 (Žin., 2008, No. 77-3048), which regulate the screening of areas important for the conservation of birds.

For the purpose of conservation, restoration and maintenance of such areas, certain measures have to be implemented. Very often such measures include restriction of economic activities in protected areas, or special measures designed to recreate and restore such areas. These measures are listed below.

### **Establishment of areas of importance for the conservation of birds**

20. The General Regulations of Areas of Importance for the Conservation of Habitats or Birds laid down that areas of importance for the conservation of birds shall be

established with a view to preserve protected species of birds in their habitats. In addition, areas important for bird migration must also be preserved.

The establishment of protected areas in Lithuania falls within the responsibility of the State Service for Protected Areas. Areas of importance for the conservation of birds are included in the List of Protected Areas of the Republic of Lithuania, or Parts thereof, Containing Areas of Importance for the Conservation of Birds approved by Resolution No. 399 of the Government of the Republic of Lithuania of 8 April 2004 (Žin., 2004, No. 55-1899; 2006, No. 92-3635). The number of the approved areas of importance for the conservation of birds totals to 82.

### **Development of nature management plans for protected areas**

21. The General Regulations of Areas of Importance for the Conservation of Habitats or Birds require preventing deterioration in the status of conservation of natural habitats and protected species. This requires development of nature management plans (NMP) for protected areas and strategic planning documents. NMP are approved by orders of the Minister of Environment designating institutions to be in charge and potential sources of financing.

### **Status of the implementation of the Birds Directive**

22. The Regulations of Areas of Importance for the Conservation of Birds and boundaries of the areas were approved by relevant resolutions of the Government of the Republic of Lithuania. There are eight areas of importance for the conservation of birds (AICB) in the Venta RBD occupying a territory of 32 677 ha. A considerable area thereof, 12 385 ha (38%), coincides with the territory of areas of importance for the conservation of natural habitats (AICH) (Table 8).

Table 8. Areas of importance for the conservation of birds in the Venta RBD

	AICB	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	Area of AICB overlapping with AICH, ha
1	Apšė River valley	LTSKUB001	Skuodas distr.	325	325	100	
2	Biržulis-Stervas wetland complex	LTTELB001	Telšiai distr.	3 621	3 621	100	
3	Old valleys of rivers Erla and Salantas	LTSKUB002	Kretinga distr. and Skuodas distr.	1 463	761	52	
4	Gubernijos forest	LTSIAB001	Šiauliai distr. Joniškis distr.	19 262	4 680	24	
5	Kamanos bog	LTAKMB001	Akmenė distr. and Mažeikiai distr.	6 401	6 401	100	6 401
6	Plinkšių forest	LTMAZB001	Mažeikiai distr., Telšiai distr. and Plungė distr.	6 043	6 043	100	33
7	Venta River valley	LTAKMB002	Mažeikiai distr., Akmenė distr., Šiauliai distr.	3 356	3 355	100	312
8	Žemaitija National Park	LTPLUB001	Plungė distr. and Skuodas distr.	21 485	7 490	35	5 638
<b>TOTAL</b>				<b>61 956</b>	<b>32 677</b>	<b>53</b>	<b>12 385</b>

Source: State Service for Protected Areas and experts' estimations

Note: The area of AICB and AICH were established using geographical information systems (GIS)

Nature management plans for AICB are approved by orders of the Minister of Environment designating institutions to be in charge, measures and costs of implementation and potential funding sources. Nature management plans are elaborated for specific areas and usually cover both AICB and AICH. Until July 2010, nature management plans were developed for 54 areas (in the entire country) and approved by respective orders of the Minister of Environment. The majority of the plans are designed for a 10 years' period (2008-2017).

Information on the nature management plans for areas within the Venta RBD is provided in Table 9.

Table 9. Protected areas with nature management plans (NMP) in place in the Venta RBD

NMP	Status	Area of the site with NMP in place, ha	Area of the site covered by NMP in the sub-basin, ha	Share of the site covered by NMP in the sub-basin, %	Area of the site covered by NMP in the sub-basin where AICB is situated, ha
Biosphere polygon of Apšė River	Under development (not published)	325	325	100.0	325
Old valleys of rivers Erla and Salantas	Approved	1 461	761	52.1	761
Biosphere polygon of Plinkšių forest	Under development (not published)	6 043	6 043	100.0	6 043
Venta River Valley	Under development (not published)	3 356	3 355	100.0	3 355
<b>TOTAL</b>		<b>11 185</b>	<b>10 484</b>		<b>10 484</b>

Source: State Service for Protected Areas and experts' estimations

Note: Titles of the nature management plans usually do not coincide with the names of the corresponding AICB or AICH.

### Implementation costs of the Birds Directive

23. The costs of the implementation of the Birds Directive include the costs needed for the development and implementation of nature management plans for areas of importance for the conservation of birds, and for the monitoring of AICB (information thereon is provided in Table 10). The average investment costs of the implementation of the Birds Directive in the Venta RBD total to around LTL 665 993 and the average annual operating costs are about LTL 343 893. These costs are planned to be funded from the state budget. The costs of the measures provided in the nature management plans should be deemed as indicative ones. The costs of the implementation of individual measures will be revised by announcing tenders<sup>2</sup>.

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<sup>2</sup> Data of the State Service for Protected Areas

Table 10. Implementation costs of the Birds Directive in the Venta RBD

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL
Development of NMP	10 years	0	723 917	144 783
Implementation of NMP already in place	10 years	9 378	227 895	25 322
Implementation of new NMP	10 years	656 615	490 557	98 115
AICB monitoring	1 year	0		75 673
<b>TOTAL ~</b>		<b>665 993</b>	<b>1 442 369</b>	<b>343 893</b>

Source: experts' estimations

Notes:

1. The average costs of the development of a nature management plan were estimated on the basis of a survey of suppliers' prices for elaboration of 40 nature management plans (with the total area of 37 146 ha), which was conducted by the State Service for Protected Areas. The bids for the development of these plans varied from LTL 1.352 million to LTL 1.965 million (on average LTL 1.66 million or LTL 45 per ha). For the calculation purposes, it was assumed that the costs of the development of a NMP on the territory of one hectare are the same. In NATURA 2000 areas where AICB and AICH overlap, 50% of the costs were assigned to the costs of the implementation of the Habitats Directive. It is assumed that NMP for all AICB will be prepared in five years.
2. The investment and operating costs of the implementation of the nature management plans were estimated on the basis of information contained in the NMP provided on the website of the Ministry of Environment of the Republic of Lithuania<sup>3</sup>. The implementation costs were recalculated for the period of the implementation of the Management Plan of the RBD (i.e. until 2015).
3. The costs of the implementation of the Birds Directive for the areas with no nature management plans<sup>4</sup> were calculated following the methodology of unit costs. The average annual investment costs of the implementation of NMP in areas of importance for the conservation of birds (during the period 2007-2015) total to LTL 54 per ha and the average annual operating costs are 7.89 LTL/ha. On sites where AICB and AICH overlap, the average investment costs (for the period 2007-2015) total to LTL 20 per ha, and the average annual operating costs are LTL 3.12 per ha. These unit costs were calculated on the basis of the implementation costs of the NMP already developed and those to be elaborated in future<sup>5</sup>, taking into account the overlapping of AICB and AICH<sup>6</sup>.
4. AICB monitoring costs include expenditures for salaries, social insurance contributions and fuel costs<sup>7</sup>. The recalculation of the monitoring costs for sub-basins assumed that monitoring costs for one hectare are the same in different areas important for the conservation of birds. The costs of salaries were estimated following the gross salary per average month in the public sector during the first quarter of 2009<sup>8</sup>.

According to the State Service for Protected Areas, 90 more areas for the conservation of birds are planned to be established in Lithuania with a view to implement the requirements of the Birds Directive. A number of these areas should be established in the Venta Basin so the annual implementation costs of the Birds Directive might go up.

<sup>3</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>4</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>5</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>6</sup> Information source: GIS information of the cadastre of the Areas Protected by the State.

<sup>7</sup> The average costs of AICB monitoring were estimated having surveyed the Administrations of Labanoras Regional Park, Aukštaitija National Park, Žuvintas Regional Park, Regional Parks of the Nemunas Loops, Regional park of Kaunas Lagoon, Anykščiai Regional Park, and Varniai Regional Park about work and fuel costs for the monitoring of AICB in 2007-2009. Due to variation of the monitoring scopes, the average data of 2007-2009 was used.

<sup>8</sup> According to Statistics Lithuania, the average monthly gross salary in the public sector during the first quarter of 2009 was LTL 2 318.8.

## **Habitats Directive**

24. The Habitats Directive regulates protection of areas of importance for natural habitats and requires establishment of special protected areas for the conservation of certain natural habitats.

The key legislation transposing the Habitats Directive:

24.1. Law of the Republic of Lithuania on Protected Areas;

24.2. General Regulations of Areas of Importance for the Conservation of Habitats or Birds;

24.3. Boundaries of areas of importance for the conservation of habitats were approved with the List of Areas in Conformity with the Criteria for the Screening of Areas of Importance for the Conservation of Natural Habitats Intended for the Provision to the European Commission, which was adopted by Order No. D1-210 of the Minister of Environment of the Republic of Lithuania of 22 April 2009 (Žin., 2009, No. 51-2039). The said List was supplemented by Order No. D1-654 of the Minister of Environment of the Republic of Lithuania of 3 November 2009 on the amendment of Order No. D1-210 of the Minister of Environment of the Republic of Lithuania.

### **Establishment of areas of importance for the conservation of habitats**

25. The General Regulations of Areas of Importance for the Conservation of Habitats or Birds laid down that areas of importance for the conservation of habitats shall be established with a view to preserve and restore natural habitats of flora and fauna. The establishment of protected areas in Lithuania falls within the responsibility of the State Service for Protected Areas. The number of areas of importance for the conservation of habitats established within the Venta RBD until 2009 totals to 32, including one Ramsar site (Kamanos Strict Nature Reserve) with the area of 3 935 ha.

Conservation, restoration and maintenance of natural habitats require certain measures. Very often such measures include restriction of economic activities in protected areas, or special measures designed to recreate and restore such areas.

### **Development of nature management plans for habitats**

26. The General Regulations of Areas of Importance for the Conservation of Habitats or Birds require preventing deterioration in the status of conservation of natural habitats and protected species. This requires development of nature management plans for protected areas or other strategic planning documents providing for specific nature management measures.

### **Other measures**

27. Apart from the establishment of special areas for the protection and conservation of birds and habitats, a number of other relevant measures have been introduced. These include implementation of special protection and conservation projects (e.g. building of nests, or training courses on getting to know and observe birds), application of subsidies for farmers who undertake to protect birds with the help of certain measures, as well as conducting of trainings and research projects, and publishing activities. Every year the Minister of Environment of the Republic of Lithuania approves a monitoring plan – a list of birds to be monitored and monitoring sites.

Other sectors are also subject to a number of measures. For example, the Rural Development Programme for 2004-2006 provided for that farmers were eligible to compensations for certain farming restrictions important for the protection of bird habitats. Two of the four agri-environmental programmes of measures were directly related to the protection of birds: one programme was designed for the protection and maintenance of riparian zones of water bodies and the other one – for the care and maintenance of landscape. Unfortunately, only 349 farmers joined this programme because of relatively low payments and insufficient information, the area managed observing the specific requirements totalled to 3 123 hectares.

Assistance in the field of protected areas is related to the intervention area “Improvement and maintenance of the ecological balance of protected forested areas”. 35% of the total assistance under Measures 1.3 (LTL 50.2 million) was actually allocated for this field in Lithuania as compared to the average of 1% of the EU structural assistance for the environment in other countries.

The Lithuanian Rural Development Programme for 2007-2013 also provides for measures promoting environmentally-friendly farming.

### **Network of NATURA 2000 sites**

28. NATURA 2000 is a network of protected areas on the territory of the European Union, which covers natural habitats and species that are very important for the biological diversity of Europe. The network is developed by implementing the requirements of the Birds Directive and the Habitats Directive. Both directives require establishment of special protected areas for the conservation of certain biological species or important habitats.

Lithuania has been developing the network of NATURA 2000 sites incorporating it into the existing national system of protected areas. To date, the status of NATURA 2000 sites has been mainly granted to the existing protected areas (strict reserves, reserves, national and regional parks) or parts thereof.

### **Status of the implementation of the Habitats Directive**

26. The Regulations of Areas of Importance for the Conservation of Natural Habitats were adopted by a resolution of the Government of the Republic of Lithuania and the boundaries of the areas of importance for the conservation of natural habitats were approved by an order of the Minister of Environment of the Republic of Lithuania. There are 40 areas of importance for the conservation of natural habitats (AICH) in the Venta RBD occupying the territory of 21 633 ha. A large area thereof, 12 385 ha (57%), coincides with the territory of the areas of importance for the conservation of birds (Table 11).

Table 11. Areas of importance for the conservation of natural habitats in the Venta RBD

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the RBD, ha	Share of AICH in the RBD, %	Area of AICH overlapping with AICB, ha
1	Ankantų bog	Telšiai distr.	LTTEL0006	420	417	99	
2	Šventoji (Baltic) River	Kretinga distr., Palanga town municipality	LTKRE0006	27	27	100	
3	Bulėnų bog	Šiauliai distr.	LTSIA0003	115	115	100	
4	Dautarų forest	Mažeikiai distr.	LTMAZ0005	178	178	100	
5	Surroundings of Galvydiškė	Kelmė distr.	LTKEL0002	962	962	100	
6	Lake Gelžis	Telšiai distr.	LTTEL0011	23	23	100	
7	Lake Germantas	Telšiai distr.	LTTEL0001	164	164	100	
8	Gudmoniškės bog	Kelmė distr., Šiauliai distr.	LTKEL0015	100	100	100	
9	Gumbakiai exposure	Akmenė distr.	LTAKM0005	1	1	102	1
10	Juodlės forest	Kelmė distr.	LTKEL0014	955	955	100	
11	Kamanos bog	Akmenė distr., Mažeikiai distr.	LTAKM0001	6 401	6 401	100	6 401
12	Karalmiškio old forest	Kelmė distr.	LTKEL0020	409	409	100	
13	Kulalių bolder area	Skuodas distr.	LTSKU0003	59	27	46	
14	Laumių forest	Skuodas distr.	LTSKU0007	254	254	100	
15	Luoba River	Skuodas distr.	LTSKU0005	458	458	100	
16	Medvėgalis meadows	Šilalė distr.	LTSIL0003	45	3	6	
17	Moteraitis meadows	Telšiai distr.	LTTEL0009	16	16	100	
18	Pakėvio forest	Kelmė distr.	LTKEL0001	451	451	100	
19	Paršežerio-Lūksto wetland complex	Šilalė distr., Telšiai distr.	LTTEL0005	2.867	2.866	100	
20	Surroundings of Purviai village	Akmenė distr., Mažeikiai distr.	LTAKM0003	149	149	100	
21	Purvių forest	Akmenė distr., Mažeikiai distr.	LTMAZ0011	121	121	100	
22	Rimšinės forest	Skuodas distr.	LTSKU0004	26	26	100	
23	Surroundings of Senosios Išpiltis village	Kretinga distr.	LTKRE0004	70	70	100	
24	Sprūdė meadows	Kelmė distr., Telšiai distr.	LTTEL0014	23	23	100	
25	Meadows of Sudėnai	Kretinga distr.	LTKRE0001	110	110	100	
26	Svilė springs	Kelmė distr.	LTKEL0006	2	2	100	
27	Svirkančiai exposure	Mažeikiai distr.	LTMAZ0004	0	0	100	

28	Šatrija meadows	Telšiai distr.	LTTEL0010	26	26	100	
29	Šaukliai boulder area	Skuodas distr.	LTSKU0002	82	82	100	
30	Šerkšnė River	Mažeikiai distr.	LTMAZ0010	230	230	100	1
31	Šventoji River valley at Margininkai	Skuodas distr.	LTSKU0001	146	146	100	
32	Meadows of Užpelkiai	Akmenė distr.	LTAKM0004	47	47	100	
33	Varduva River	Mažeikiai distr.	LTMAZ0009	469	469	100	
34	Varputėnų forest	Šiauliai distr.	LTSIA0006	289	289	100	
35	Venta River	Akmenė distr., Mažeikiai distr., Šiauliai distr.	LTAKM0002	179	178	99	173
36	Venta River valley upstream of Venta village	Akmenė distr.	LTAKM0008	13	85	681	79
37	Venta River valley downstream of Papilė town	Akmenė distr.	LTAKM0007	78	78	100	56
38	Vidgirio forest	Mažeikiai distr.	LTMAZ0008	33	33	100	33
39	Višetė River	Mažeikiai distr.	LTMAZ0001	2	2	100	1
40	Žemaitija National Park	Plungė distr., Skuodas distr.	LTPLU0009	17 957	5 638	31	5 638
	Total:			33 958	21 633	64	12 385

Source: State Service for Protected Areas and experts' estimations

Note: The area of AICB and AICH were established using GIS.

Nature management plans for habitats are approved by orders of the Minister of Environment designating institutions to be in charge and providing for measures and costs of implementation and potential funding sources. NMP are elaborated for specific areas and usually cover both AICB and AICH. Until July 2010, nature management plans were developed for 55 areas (throughout Lithuania) and approved by respective orders of the Minister of Environment. The majority of the plans are designed for a 10 years' period (2008-2017).

Information on nature management plans for areas within the Venta RBD is given in Table 12 below.

Table 12. Protected areas with nature management plans (NMP) in place in the Venta RBD

NMP	Status	Area of the site with NMP in place, ha	Area of the site covered by NMP in the RBD, ha	Share of the site covered by NMP in the RBD, %	Area of the site covered by NMP in the RBD where AICH is situated, ha
Bulėnų bog	Approved	113	113	100.0	113
Surroundings of Gabriolė village	Under development (not published)	168	168	100.0	166
Surroundings of Galvydiškė village	Under development (not published)	297	297	100.0	283

NMP	Status	Area of the site with NMP in place, ha	Area of the site covered by NMP in the RBD, ha	Share of the site covered by NMP in the RBD, %	Area of the site covered by NMP in the RBD where AICH is situated, ha
Kulaliai boulder area	Approved	59	27	45.8	27
Šaukliai boulder area	Approved	82	82	100.0	82
Šventoji River valley at Margininkai village	Approved	146	146	100.0	146
Venta River valley	Under development (not published)	3 356	3 355	100.0	174
<b>TOTAL</b>		<b>4 221</b>	<b>4 188</b>		<b>991</b>

Source: State Service for Protected Areas and experts' estimations

Note: Titles of the nature management plans usually do not coincide with the names of the corresponding AICB or AICH.

### Implementation costs of the Habitats Directive

30. The costs of the implementation of the Habitats Directive include the costs needed for the development and implementation of nature management plans for areas of importance for the conservation of habitats, and for the monitoring of AICH (information thereon is provided in Table 13). The average investment costs of the implementation of the Habitats Directive in the Venta RBD total to around LTL 180 226 and the average annual operating costs are about LTL 495 706. These costs are planned to be funded from the state budget. The costs of the measures provided in the nature management plans should be deemed as indicative ones. The costs of the implementation of individual measures will be revised by announcing tenders<sup>9</sup>.

Table 13. Implementation costs of the Habitats Directive in the Venta RBD

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL
Development of NMP	10 years	0	654 100	130 820
Implementation of NMP in place	10 years	5 000	1 501 937	166 882
Implementation of new NMP	10 years	175 226	732 607	146 521
AICH monitoring	1 year	0	0	51 483
<b>TOTAL ~</b>		<b>180 226</b>	<b>2 888 644</b>	<b>495 706</b>

Source: experts' estimations

Notes:

1. The average costs of the development of a nature management plan were estimated on the basis of a survey of suppliers' prices for elaboration of 40 nature management plans (with the total area of 37 146 ha), which was conducted by the State Service for Protected Areas. The bids for the development of these plans varied from LTL 1.352 million to LTL 1.965 million (on average LTL 1.66 million or LTL 45 per ha). For the calculation purposes, it was assumed that the costs of the development of a NMP on the territory of one hectare are the same. In NATURA 2000 areas where AICH and AICB overlap, 50% of the costs were assigned to the costs of the implementation of the Birds Directive. It is assumed that NMP for all AICH will be prepared in five years.
2. The investment and operating costs of the implementation of the nature management plans were estimated on the basis of information contained in the NMP provided on the website of the Ministry

<sup>9</sup> Data of the State Service for Protected Areas

- of Environment of the Republic of Lithuania<sup>10</sup>. The implementation costs were recalculated for the period of the implementation of the Management Plan of the RBD (i.e. until 2015).
3. The costs of the implementation of the Habitats Directive for the areas with no nature management plans<sup>11</sup> were calculated following the methodology of unit costs. The average annual investment costs of the implementation of NMP in areas of importance for the conservation of natural habitats (during the period 2007-2015) total to LTL 6.55 per ha and the average annual operating costs are LTL 15.06 per ha. On sites where AICH and AICB overlap, the average investment costs (for the period 2007-2015) total to LTL 19.66 per ha, and the average annual operating costs are LTL 3.12 per ha. These unit costs were calculated on the basis of the implementation costs of the NMP already developed and those to be elaborated in future<sup>12</sup>, taking into account the overlapping of AICB and AICH<sup>13</sup>.
  4. AICH monitoring costs include expenditures for salaries, social insurance contributions and fuel costs<sup>14</sup>. The recalculation of the monitoring costs for sub-basins assumed that monitoring costs for one hectare are the same in different areas important for the conservation of natural habitats. The costs of salaries were estimated following the gross salary per average month in the public sector during the first quarter of 2009<sup>15</sup>. The estimations did not include habitat monitoring costs because such monitoring was not carried out and the required monitoring methodologies were not in place.

### **Bathing Water Directive**

31. The Bathing Water Directive requires that the Member States officially designate bathing sites and take all necessary measures to ensure adequate quality of bathing waters. Though the parameters set in the Bathing Water Directive do not include such water quality indicators as nitrogen (N), phosphorus (P) or BOD, but does regulate parameters which characterise microbiological bathing water quality and can affect bathers' health.

The key piece of national legislation transposing the Bathing Water Directive is the Lithuanian Hygiene Norm HN 92:2007 "Beaches and bathing water quality" approved by Order No. V-1055 of the Minister of Health of the Republic of Lithuania of 21 December 2007 (Žin., 2007, No.139-5716).

Another document which regulates practical introduction of the measures under the Bathing Water Directive is the Bathing Water Quality Monitoring Programme, which is approved every two years. The key objective of this Programme is to assess the quality of bathing waters, to develop a general management strategy and policy for recreational waters, and to establish new bathing sites.

The most important measures of the implementation of the Bathing Water Directive are as follows:

- 31.1. monitoring of bathing water quality;
- 31.2. provision of information on the quality of bathing waters to the public;
- 31.3. official designation of bathing waters;

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<sup>10</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>11</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>12</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>13</sup> Information source: GIS information of the cadastre of the Areas Protected by the State.

<sup>14</sup> The average costs of AICB monitoring were estimated having surveyed the Administrations of Labanoras Regional Park, Aukštaitija National Park, Žuvintas Regional Park, Regional Parks of the Nemunas Loops, Regional park of Kaunas Lagoon, Anykščiai Regional Park, and Varniai Regional Park about work and fuel costs for the monitoring of AICB in 2007-2009. Due to variation of the monitoring scopes, the average data of 2007-2009 was used.

<sup>15</sup> According to Statistic Lithuania, the average monthly gross salary in the public sector during the first quarter of 2009 was LTL 2 318.8.

- 31.4. improvement of bathing water quality and restoration of poor bathing water quality to good status;
- 31.5. development of an information system on bathing waters.

### **Monitoring of the quality of bathing waters**

32. 99 bathing waters were monitored<sup>16</sup> in 2008 under the Bathing Water Quality Monitoring Programme for 2006-2008 approved by Resolution No. 773 of the Government of the Republic of Lithuania of 4 August 2006 (Žin., 2006 No. 88-3459), including 9 bathing waters in the Venta RBD.

- 32.1. Sablauskių pond (Akmenė distr.),
- 32.2. Lake Germantas (Telšiai distr.),
- 32.3. Lake Lukstas (Telšiai distr.),
- 32.4. Lake Paršežeris (Šilalė distr.),
- 32.5. Lake Plinkšių ežeras (Mažeikiai distr.),
- 32.6. Pragalgvio pond (Akmenė distr.),
- 32.7. Skuodo pond (Skuodas distr.),
- 32.8. Venta River (Akmenė distr.),
- 32.9. Venta River (Mažeikiai distr.).

Measures for the implementation of the provisions of the Bathing Water Directive for 2009-2011 are provided for in the Bathing Water Quality Monitoring Programme for 2009-2011 approved by Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 (Žin., 2009, No. 80-3344). Annex 1 to this Programme contains a List of Monitored Bathing Waters in Lithuania (151 bathing waters in total). 11 of these bathing areas are situated in the Venta RBD. In addition to the above-listed bathing waters, the following ones are included in Annex 1:

- 32.10. Kuršėnų pond (Šiauliai distr.),
- 32.11. Dam in Užventis (Kelmė distr.).

### **Provision of information on bathing water quality to the public**

33. Information on water quality to the general public in Lithuania is provided in the mass media. Following Order No. V-484/D1-273 of the Minister of Health and the Minister of Environment of the Republic of Lithuania of 26 May 2008 on the approval of the Regulations of the Procedure for the Reporting on Bathing Water Quality to the European Commission (Žin., 2008, No. 62-2362), the responsibility for the implementations of the provisions of the Directive related to the collection and assessment of information on bathing water quality and submission thereof to the European Commission lies with the Institute of Hygiene. Also, the Institute of Hygiene is responsible for the assessment of the quality of bathing waters and provision of this information to the public pursuant to Order No. V-1055 of the Minister of Health of the Republic of Lithuania of 21 December 2007 on the approval of the Lithuanian Hygiene Norm HN 92:2007 “Beaches and Bathing Water Quality” (Žin., 2007, No.139-5716). Information on the quality of bathing waters is regularly announced in the press and on the website of the Institute of Hygiene ([www.hi.lt](http://www.hi.lt)).

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<sup>16</sup> Report to the European Commission „Bathing water results 2008- Lithuania“. Source: Institute of Hygiene: [http://www.hi.lt/content/I5\\_atask\\_EK.html](http://www.hi.lt/content/I5_atask_EK.html)

### **Official designation of bathing waters**

34. There were 99 officially designated bathing waters in Lithuania in 2008, including 9 ones in the Venta RBD.

### **Improvement of bathing water quality**

35. The bathing waters within the Venta RBD conform to the established quality requirements so no special measures are required at the moment. The key directive the implementation of which also determines the quality of bathing waters is the Urban Wastewater Treatment Directive hence the measures under this Directive at the same time improve the quality of the existing and potential bathing waters.

The main requirements defining the quality of bathing waters are the number of colony forming units (cfu) of *Escherichia coli* in 100 ml of water and the number of colony forming units of intestinal enterococci in 100 ml of water. Exceedances of the intestinal enterococci limit (not more than 100 cfu/100 ml) were registered in 16 bathing waters. Two of these are situated in the Venta RBD; however, such exceedance was observed only once therefore the bathing waters are deemed to be compliant with the existing quality requirements.

Table 14. Exceedances of the *Escherichia coli* and intestinal enterococci limits in bathing waters in 2008

RBD	Bathing water	Intestinal enterococci, cfu/100 ml (=<100)	<i>Escherichia coli</i> , cfu/100 ml (=<1000)
Venta	Venta	126 and 122	
Venta	Paršežeris	200	

Source: Lithuania's annual report on the implementation of the Bathing Waters Directive, xls. file, 2008

### **Development of an information system on bathing waters**

36. The existing information system on bathing waters is rather simple and covers exchange of necessary information between relevant departments, including municipalities. There are plans, however, to connect this system to the database/information system managed by the Environmental Protection Agency.

### **Implementation costs of the Bathing Water Directive**

37. All bathing waters monitored in 2008 were compliant with the mandatory quality requirements<sup>17</sup> so no investment costs will be required for implementing the provisions of the Bathing Waters Directive.

The operating costs of the Bathing Water Directive cover the costs of the recognition of beaches as suitable for use, sampling of bathing water, water analysis and provision of information to the public (the data is provided in Table 15). The average annual operating costs of the implementation of the Bathing Water Directive in the Venta RBD total to LTL 50 000. These costs are planned to be funded from municipal budgets under the Bathing Water Monitoring Programme for 2009-2011. Taking into account the status of the Lithuanian economy, the number of monitored bathing waters in 2009 is likely to remain the same as in 2008.

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<sup>17</sup> Report to the European Commission “Bathing water results 2008- Lithuania”. Source: Institute of Hygiene [http://www.hi.lt/content/I5\\_atask\\_EK.html](http://www.hi.lt/content/I5_atask_EK.html)

No additional costs are planned for the implementation for the Bathing Water Directive.

**Table 15. Average annual costs of the implementation of the Bathing Water Directive in the Venta RBD in 2009-2011**

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the basin	Annual operating costs in the basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	11	7 700
Sampling of bathing water and analysis of water	bathing water	3 500	11	38 500
Provision of information to the public on the quality of bathing water	bathing water	340	11	3 740
<b>TOTAL</b>		<b>4 540</b>		<b>49 940</b>

Source: Bathing Water Quality Monitoring Programme for 2009-2011

### **Sewage Sludge Directive**

38. The Sewage Sludge Directive specifies the conditions under which sewage sludge may be used in agriculture as well as the amount of heavy metals in the soil which is to be fertilised. The Directive has also established the allowable concentrations of heavy metals in sludge and the maximum amount of heavy metals that may enter the soil during a year. The implementation of the Directive should facilitate limitation of the input of heavy metals contained in sludge into the soil.

The study “Investment Programme for Sludge Management in Lithuania” prepared by SWECO BKG in 2006 analysed several ways of sewage sludge handling and emphasised that the use of sludge in agriculture or for the restoration of affected areas is not the best alternative of the sludge use. The priority scheme opted for in the Programme first of all provides for the use of sludge for energy generation. If needed, sludge could be used in agriculture, for fertilising energy forests or restoring affected areas. The Programme has also envisaged that such sludge could be used in agriculture.

39. The key piece of legislation which has transposed the requirements of the Sewage Sludge Directive is the regulatory document LAND 20-2001 “Requirements for the use of sewage sludge for fertilisation” approved by Order No. 349 of the Minister of Environment of the Republic of Lithuania of 29 June 2001 (Žin., 2001, No. 61-2196; 2005, No. 142-5135) (LAND 20-2005), which has laid down an obligation to develop fertilisation plans and analyse amounts of heavy metals in sewage sludge and in the soil.

### **Measures for the implementation of the Sewage Sludge Directive**

#### **Fertilisation plans**

40. The regulatory document LAND 20-2005 has laid down that persons intending to use sewage sludge for agricultural purposes must develop fertilisation plans, which have to be coordinated with a relevant Regional Environmental Protection Department (REPD). Fertilisation plans shall be elaborated for six years. These plans are supposed to provide information on soil analysis results and the maximum concentrations of heavy metals which may enter the soil through sewage sludge. However, no data on the annual number of fertilisation plans prepared and agreed with REPD is available, therefore stricter accounting and control of the plan development is required.

### **Analysis of sludge composition, data storage, banning and withdrawal of dangerous substances from circulation**

41. Sludge suppliers must conduct accounting of the quality of sewage sludge, collect information on the ways of sludge processing, amount and uses. Apart from that, information on concentrations of the following metals in sludge must be collected: lead (Pb), cadmium (Cd), chromium (Cr), copper (Cu), nickel (nickel), zinc (Zn), mercury (Hg). LAND 20-2005 has set forth that sewage sludge may be classified into three categories depending on concentrations of heavy metals in sludge.

#### **Implementation costs of the Sewage Sludge Directive**

42. Measures for implementing the requirements of the Sewage Sludge Directive for 2007-2013 are provided for in the List of National Projects No. 01 under Measure No. VP3-3.1-AM-01-V “Renovation and development of water supply and wastewater treatment systems, activity Development of a sludge management infrastructure”. Plans to develop a sludge management infrastructure in Lithuania include construction of sludge processing facilities in 23 towns.

Table 16 provides planned investment projects on the development of sludge management infrastructures in towns located in the Venta Basin. The total investment costs amount to LTL 51.317 million. It is assumed that the annual operating costs account for 3% of the investment costs.

**Table 16. Projects on development of sludge management infrastructures in 2007-2013 in the Venta Basin**

Municipality	Expected project outputs	Preliminary investment costs, LTL million	Operating costs, LTL million per year
Akmenė distr.	1 composting site	4.717	
Mažeikiai distr.	1 rotting-drying equipment	21.4	
Telšiai distr.	1 rotting-drying equipment	25.2	
<b>TOTAL</b>		<b>51.317</b>	<b>1.5</b>

Source: List of National Projects No. 01 under Measure No. VP3-3.1-AM-01-V “Renovation and development of water supply and wastewater treatment systems, activity “Development of a sludge management infrastructure”

#### **Plant Protection Products Directive**

43. The requirements of the Plant Protection Products Directive are related to the authorisation, placing on the market, use and control of plant protection products. In Lithuania, only approved products of plant protection may be marketed and used, and companies intending to place such products on the market must obtain special permits. All products must be used under the same conditions which are specified on the label and must be stored observing the requirements of the Code of Good Practice for the Use of Plant Protection Products.

To date, there are 215 plant protection products and 140 active substances that may be contained in plant protection products registered in Lithuania.

The aggregate amount of plant protection products consumed within the Venta RBD is not available but it is likely that the largest amounts are consumed in areas of intensive agriculture. The annual consumption of these products is growing up.

It is difficult to forecast an impact of plant protection products on the quality of groundwater and surface water. This impact would go down if plant protection products were used adequately and in accordance with the recommendations of the Code of Good Practice for the Use of Plant Protection Products.

43. The key legislation transposing the Plant Protection Products Directive:

43.1. Law of the Republic of Lithuania on Plant Protection (Žin., 1995, No. 90-2013; 2010, No. 13-620);

43.2. List of Authorised Active Substances in Plant Protection Products approved by Order 3D-187 of the Minister of Agriculture of the Republic of Lithuania of 19 April 2004 (Žin., 1995, No. 60-2145).

### **Measures for the implementation of the Plant Protection Products Directive**

#### **Authorisation of plant protection products**

45. Plant protection products must be authorised before placing them on the market. Active substances contained in plant protection products are authorised by orders of the Minister of Agriculture. To date, over 150 active substances which may be contained in plant protection products have been authorised in Lithuania.

**Table 17. Number of plant protection products authorised in Lithuania**

Product	Products authorised for professional usage	Products authorised for individual usage
Insecticides	15	7
Fungicides	52	10
Mordants	18	
Herbicides	85	17
Growth regulators	7	
Defoliants	1	
Other	3	
<b>Total</b>	<b>181</b>	<b>34</b>

#### **Labelling of plant protection products**

46. The Law of the Republic of Lithuania on Plant Protection specifies detailed requirements for the labelling of plant protection, including provision of the name and amount of an active substance, information on danger for health and the environment, and recommendations regarding the product use.

#### **Application of Good Plant Protection Practice**

47. The Rules for Good Plant Protection Practice were approved by Order No. 3D-227 of the Minister of Agriculture of the Republic of Lithuania of 26 April 2004 (Žin., 2004, No. 66-2349). The State Plant Protection Services organises annual seminars and trainings for farmers thus encouraging the observance of the said Rules.

#### **Controls of the use of plant protection products**

48. The State Plant Service controls the use of plant protection products.

Other measures include studies and analysis of an impact of plant protection measures, withdrawal and prohibition of harmful substances.

### **Status of the implementation of the Plant Protection Products Directive**

49. The requirements of the Plant Protection Products Directive are related to the authorisation, placing on the market, use and control of plant protection products. Lithuania was not granted a transitional period for transposing this Directive so formally it has already been implemented.

The use of plant protection products (PPP) in Lithuania has been increasing and so have the areas sprayed with plant protection products (Tables 18 and 19).

Table 18. Amounts of plant protection products used in Lithuania (in tonnes, by the active substance)

	2000	2001	2002	2003	2004	2005	2006
Insecticides	6.8	6.3	6.2	7.1	5.7	6.8	7.0
Fungicides	109.5	102.3	97.4	101.7	127.8	152.9	159.2
Mordants	52.4	33.5	35.3	28.4	27.3	22.3	42.2
Herbicides	476.9	530.8	576.8	579.1	725.2	732.4	858.9
Defoliants	5.1	1.0	0.4	0.6	0.6	0.7	0.6
Growth regulators	35.7	51.4	60.2	99.2	110.9	123.3	125.7
Others	1.4	22.9	15.9	31.1	26.1	10.1	3.4
Total:	687.8	748.2	792.2	847.2	1 023.6	1 048.5	1 197.0

Source: website of the State Plant Service

Table 19. Area of sprayed utilised agricultural land in Lithuania, thousand ha

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Herbicides	786.5	800.5	859.1	938	1 036.1	1 251.2	1 278.3	1 473.0	1 454
Fungicides	306.3	336.9	357.4	292.5	372.3	425.7	364.2	477.4	507.4
Insecticides	199.7	193.56	393.6	327.9	397.9	397.1	402.6	464.6	412.5
Growth regulators	46.8	67.5	98.6	122.7	157.1	161.9	141.5	152.6	197.2
Defoliants	1.3	3.3	2.7	0.4	1.1	2.2	33.0	1.5	3.5
Total:	1 340.6	1 401.8	1 711.4	1 681.8	1 964.5	2 238.3	2 219.6	2 567.6	2 574.6

Source: website of the State Plant Service

50. Plant protection inspectors of the State Plant Service carry out assessments of conformity of the packaging, labelling, storage, use and placement of products on the market with the requirements laid down in relevant legislation. Around 50% of all breaches in 2008 were violations of the requirements for product storage, 20% – for product use, 15% – for placement on the market, 15% – for packaging and labelling. Although no direct breaches in relation to failure to observe water protection requirements were registered, inadequate storage and use of products can be related to pollution of water resources. The said type of violations constitutes the largest share of all breaches.

Table 20. Inspections of PPP carried out and breaches identified in 2007-2008

	2007		2008	
	inspections	breaches	inspections	breaches
Use	2 027	455	2 197	420
Placing on the market	1 411	166	1 387	164
Packaging and labelling	479	137	661	121
Storage	721	151	701	126
Total:	4 638	909	4 946	832

Source: website of the State Plant Service

The data in the tables above demonstrates that the statistics on plant protection products is available only for the entire country. There is no data on the use of plant protection products in individual administrative units. Therefore, distribution of the figures for individual RBD was carried out on certain assumptions.

Assuming that plant protection products in individual river basins or sub-basins are used with more or less the same intensity, the plant protection figures can be distributed in proportion to the areas of agriculture and forests in the basins and sub-basins. Such areas in the Venta RBD make up around 11% of the total areas in Lithuania. Consequently, following the above-said assumption, the amount of active substances of plant protection products used in this RBD totals to 11% or 134 tonnes.

### **Implementation costs of the Plant Protection Products Directive**

51. Implementation costs of the Plant Protection Products Directive in Lithuania have never been estimated. The main legal, administrative and investment instruments required to ensure the introduction of the Code of Good Practice for the Use of Plant Protection Products in Lithuania, thus reducing pollution of water, were established during interviews with employees of the State Plant Service and regional plant protection inspectors.

The major costs related to potential investments for such measures are required for the acquisition of sprayers and construction of decontamination sites. There are very few such sites in Lithuania. Besides, in the opinion of many inspectors, such sites are not necessary in Lithuania where plant protection products remaining after the main spray are once again sprayed on the fields. Construction of a decontamination site, consisting of a ramp, walls, straw, mixture of peat and humus, etc., can cost from LTL 1 000 to LTL 10 000. There are no such sites in the Venta RBD and no construction of the sites here is planned at least until 2015. Consequently, the implementation costs of the Plant Protection Products Directive in the Venta RBD are related only to the acquisition and maintenance of sprayers.

All sprayers in Lithuania must have a technical inspection certificate, which is the main disciplinary measure, also having a significant environmental benefit. Inspection costs around LTL 200 and is valid for three years. The price of a sprayer varies a lot depending on its type. The cheapest and most common ones cost about LTL 4 000-5 000, the price of a sprayer needed for a large farm can be as high as LTL 200 000. There are just a few such expensive sprayers in the Venta RBD and the majority of sprayers are of the said cheaper type. According to the information collected from plant protection products inspectors, their number in the Venta RBD totals to approximately 500. About ten sprayers are acquired in each administrative district of the Venta RBD

every year. It should be emphasised that this is a very rough estimate because there is no formal accounting of sprayers.

The estimated costs of the acquisition and maintenance of sprayers for farmers in the Venta RBD and, consequently, the implementation of the Plant Protection Products Directive are provided in Table 21 below.

Table 21. Implementation costs of the Plant Protection Products Directive in the Venta RBD in 2010-2015, LTL

Measure	Amount			Service life	Costs			
	Annual number	Number of years	Total		Unit costs	Investments	Operating costs	Annual costs
New sprayer	50	5	250	10	5 000	1 250 000	12 500	182 500
Technical inspection of new sprayers	50	1	50	3	200	10 000	0	4 000
Technical inspection of the existing sprayers	500	2	1 000	3	200	200 000	0	75 000
Total						1 460 000	12 500	261 500

Notes:

\* Technical inspection of new sprayers will be required once during the period in question.

\*\* Technical inspection of the existing sprayers will be required twice during the period in question.

Source: experts' estimations

### **Environmental Impact Assessment Directive**

52. The main objective of the Environmental Impact Assessment Directive is to assess public or private projects which can have a significant impact on the environment. The Directive requires that all Member States take measures to ensure that relevant procedures of environmental impact assessment (EIA) are carried out before authorising projects which can have a potential impact on the environment. EIA, *inter alia*, involves assessment of direct and indirect impacts on the aquatic environment.

Having evaluated an EIA report, a responsible institution takes a decision whether a proposed economic activity may be conducted in a selected area. If the decision is negative, such activity may not be started on that territory. EIA is a preventive measure designed to reduce impacts of economic activities on the environmental components, including surface water bodies and groundwater. An impact on the environment is reduced by selecting a most suitable territory, technologies, and construction solutions as well as conditions of the operation of an object.

53. The provisions of the Environmental Impact Assessment Directive have been transposed into several national legal acts, the key of which is the Law of the Republic of Lithuania on Environmental Impact Assessment of the Proposed Economic Activity (Žin., 1996, No. 82-1965; 2005, No. 84-3105). The Law contains two lists of economic activities. The first list specifies economic activities which are subject to EIA before their startup, and the second ones lists economic activities which are subject to screening procedures. EIA have been carried out in Lithuanian since 1996 when the said Law was passed.

### **Implementation costs of the Environmental Impact Assessment Directive**

54. No estimation of costs of the implementation of this Directive in Lithuania has been carried out yet. A study conducted for the European Commission<sup>18</sup>, which analysed 18 cases in a number of EU Member States, indicates that in most cases EIA costs make up less than 0.5% of project investment costs. The smaller the project, the relatively larger are EIA costs.

As a minimum, an EIA process encompasses development of an EIA programme, development of an EIA study, consultations, public participation, review and decision-making. The whole process can be as long as two years though usually the procedure is completed within less than a year.

According to the Environmental Protection Department of Šiauliai Region which covers part of the Venta Basin, as from 2006 decisions were taken in respect of 18 EIA: The number of EIA in 2006 was 4, in 2007 – 8, in 2007 – 4, in 2009 – 2.

For the purpose of estimating costs of EIA studies until 2015, it is assumed that one EIA will be carried out per year until 2015 (based on the average figure of the last four years).

The costs of an EIA study depend on a number of factors, such as the size of the investment project, technologies, the natural environment, etc. However, following the costs of the existing EIA, the costs of one EIA are estimated to be around LTL 70 thousand. Consequently, the implementation of the Environmental Impact Directive in the Venta RBD would cost approximately LTL 280 thousand every year, under the baseline scenario.

### **Integrated Pollution Prevention and Control Directive**

55. The Integrated Pollution Prevention and Control (IPPC) Directive aims at reducing pollution from industrial sources. An IPPC permit is the main pollution reduction measure envisaged in the Directive. IPPC permits must provide for that all activities of a company will be arranged so as to care for the environment, specifying requirements for pollution of air, water and soil, generation of waste, etc. The IPPC Directive contains the requirements to introduce measures designed for rational use of water and reduction of pollution. These measures, which must be specified in IPPC permits, enable ensuring that an impact of economic activities is maximally reduced.

56. The key piece of legislation transposing the requirements of the Directive is the Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits approved by Order No. 80 of the Minister of Environment of 27 February 2002 (Žin., 2002, No. 85-3684; 2005, No. 103-3829). The Rules require that all activities listed in Annexes I and II thereto have IPPC permits as from 31 December 2007.

Other legislation which regulates pollution prevention:

56.1. Procedure for the Drafting of Reports on the Implementation of the Council Directive 96/61/EB Concerning Integrated Pollution Prevention and Control and

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<sup>18</sup> <http://ec.europa.eu/environment/eia/eia-studies-and-reports/eia-costs-benefit-en.htm>

Submission of the Reports to the European Commission approved by Order No. D1-630 of the Minister of Environment of the Republic of Lithuania of 10 December 2004 (Žin., 2004, No. 181-6714);

56.2. Procedure for the Assessment of the Implementation of the Best Available Techniques (BAT) in Industrial Enterprises approved by Order No. D1-526 of the Minister of Environment of the Republic of Lithuania of 16 October 2007 (Žin., 2007, No. 108-4446).

### **IPPC permits**

57. All industrial enterprises engaged in the activities listed in Annexes I and II to the Rules are subject to IPPC permits. The permits first of all require implementation of all available pollution prevention measures and introduction of the BAT. Apart from these general requirements, the permits specify pollution limit values as well as require developing programmes on the reduction of water pollution with priority hazardous substances. Table 22 provides information on IPPC installations in the basins of the Venta RBD.

Table 22. Number of IPPC installations in the Venta RBD, 2009

<b>VENTA RBD</b>	
Venta Basin	16
Bartuva Basin	1
Šventoji Basin	0
<b>Total in Venta RBD:</b>	<b>17</b>

Source: EPA data distributed by experts according to the basins

### **Implementation costs of the IPPC Directive**

58. The 17 installations given in Table 22 above include 3 landfills, 5 installations for intensive rearing of poultry (including one and the only IPPC enterprise located in the Bartuva Basin), 2 cement installations, 2 pig rearing installations, 1 oil refinery, 1 fuel combustion installation, 1 installation for the disposal of hazardous waste, 1 installation for the production of basic organic chemicals and 1 milk treatment and processing with a relevant treatment capacity.

It is hardly likely that new installations subject to IPPC permitting will appear in the Venta RBD in the nearest future. New IPPC permits may be required only due to changes in technologies. The costs of the preparation of IPPC permits vary depending on the size of relevant installations and the technology used. There are a few large companies which employ complex technologies in the Venta RBD, therefore the cost of the preparation of IPPC permits used for the estimations is higher than the average one – around LTL 20 thousand for one IPPC permit. It is also assumed that about one fourth of the enterprises operating within the Venta RBD may update their technologies by 2015 so that new IPPC permits will be required. Consequently, one-time costs of the implementation of the IPPC Directive in the Venta RBD until 2015 would total to approximately LTL 100 thousand.

### **Major Accidents Directive**

59. The Major Accidents Directive focuses on dangerous substances used in installations. It also covers industrial activities where chemical substances are used, and

storage of dangerous substances. The Directive provides for certain controls of installations depending on the quantity of dangerous substances used therein.

When the quantity of dangerous substances held by a company is lower than the lower threshold levels given in the Major Accidents Directive, compliance of the company to the general provisions on health, safety and environmental protection shall be checked. When the quantity of dangerous substances is above the upper threshold contained in the Major Accidents Directive, the company shall be subject to all requirements provided for therein.

60. The key national legislation transposing the Major Accidents Directive:

- 60.1. Regulations of the Prevention, Response to and Investigation of Industrial Accidents approved by Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 (Žin., 2004, No. 130-4649; 2008, No. 109-4159);
- 60.2. Programme on the Inspection of Dangerous Installations of the Republic of Lithuania approved by Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 (Žin., 2007, No. 3-143);
- 60.3. List of Potentially Dangerous Installations approved by Order No. 539 of the Minister of Environment of the Republic of Lithuania of 11 October 2002 (Žin., 2002, No. 111-4929; 2005, No. 58-2025).

Measures for the implementation of the Major Accidents Directive are briefly discussed below.

### **Development of emergency plans and safety reports, measures for accident prevention**

61. The Regulations of the Prevention, Response to and Investigation of Industrial Accidents require development of accident prevention plans and safety reports in industries working with dangerous substances. The List of Potentially Dangerous Installations in Lithuania currently contains 21 installations which are subject to the requirements of the Major Accidents Directive.

### **Selection of sites for potentially dangerous installations**

62. The Regulations of the Prevention, Response to and Investigation of Industrial Accidents require that a site for a new installation is selected ensuring a safe distance therefrom to residential areas, roads with intensive traffic, recreational and public areas.

### **Controls over the implementation of the Major Accidents Directive**

63. Programmes on the inspection of dangerous installations are approved each year by orders of the Director of the State Fire and Rescue Department, laying down a schedule of the inspection of dangerous installations. The Programme on the Inspection of Dangerous Installations of the Republic of Lithuania approved by Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 (Žin., 2007, No. 3-143) contains a control schedule for 2007. The new Programme also introduced systematic control which is supposed to ensure safe operation of dangerous installations.

## **Implementation costs of the Major Accidents Directive**

64. The costs required for the implementation of this Directive have not been estimated.

No investment costs are required, the main costs are related to the development of emergency plans. Such plans are required for companies which work with dangerous substances and conform to certain size criteria. Besides, the development of plans is not a continuous process, plans are developed at the start-up of the company or change of technologies.

As indicated in the Venta RBD Management Plan, 16 enterprises which have been issued IPPC permits are located in the Venta Basin and 1 enterprise – in the Bartuva Basin. The 17 enterprises are: 3 landfills, 5 installations for intensive rearing of poultry (including one and the only IPPC enterprise located in the Bartuva Basin), 2 cement installations, 2 pig rearing installations, 1 oil refinery, 1 fuel combustion installation, 1 installation for the disposal of hazardous waste, 1 installation for the production of basic organic chemicals and 1 milk treatment and processing with a relevant treatment capacity.

It is hardly likely that new installations subject to IPPC permitting will appear in the Venta RBD in the nearest future. Emergency plans may be required only due to changes in technologies.

The costs of emergency plans may significantly vary depending on the installation size and the technologies used. Following the experience of plan developers, the costs of one plan under the basic scenario are estimated at LTL 50 thousand. It is also assumed that about one fourth of the IPPC installations operating in the Venta RBD may update their technologies by 2015 so that new emergency plans will be required. Consequently, one-time costs of the implementation of the Major Accidents Directive in the Venta RBD until 2015 would total to approximately LTL 200 thousand.

### **Aggregate costs of the basic measures**

65. Aggregate summary costs of the implementation of the key directives during the period until 2015 are given in Table 23 below.

Table 23. Implementation costs of the key water sector directives in the Venta RBD during the period until 2015

Directive	Costs		
	Investment costs until 2015, LTL	Operating costs, LTL/year	Annual costs, LTL/year
Bathing Water Directive	0	50 000	50 000
Birds Directive *	666 000	344 000	434 000
Drinking Water Directive	together with the costs of the Nitrates Directive		
Major Accidents Directive *	200 000	0	27 000
Environmental Impact Assessment Directive	0	280 000	280 000
Sewage Sludge Directive **	51 317 000	1 539 510	6 013 510
Urban Wastewater Treatment Directive**	81 090 000	1 621 800	8 691 800
Plant Protection Products Directive	1 460 000	12 500	261 500

Directive	Costs		
	Investment costs until 2015, LTL	Operating costs, LTL/year	Annual costs, LTL/year
Nitrates Directive **	82 360 000	823 600	8 004 600
Habitats Directive *	163 077	431 557	453 557
IPPC Directive *	100 000	0	14 000
<b>Total</b>	<b>217 360 000</b>	<b>5 100 000</b>	<b>24 230 000</b>

Notes:

\* Calculations of annual (annualised) costs were based on a 10 years service life;

\*\* Calculations of annual (annualised) costs were based on a 20 years service life.

Operating costs were calculated applying the following investment percentage: Sewage Sludge Directive – 3%, Nitrates Directive – 1%.

Source: experts' estimations

### **Measures for the implementation of the requirements of other articles of the WFD**

#### **Practical measures designed to introduce the principle of recovery of water costs (Article 9 of the WFD)**

66. Article 9 of the WFD and the Law of the Republic of Lithuania on Water provide for the recovery of the costs of water services pointing out that these costs shall include environmental and natural resources “external” costs and have regard to the polluter pays principle.

67. The national legislation transposing the requirements of Article 9:

67.1. The cost recovery principle has been enacted in the Law of the Republic of Lithuania on Water. Article 31 thereof says: “The costs incurred while aiming to achieve water protection objectives and providing water services shall be covered by water users.”

67.2. The pricing of water services on the basis of the cost recovery principle is described in the Methodology for the Pricing of Drinking Water Supply and Wastewater Management Services approved by Order No. 03-92 of the National Control Commission for Prices and Energy of 21 December 2006 (Žin., 2006, No. 143-5455).

### **Water pricing**

68. Prices of water supply and wastewater collection and management in Lithuania are set observing the cost recovery principle. The price may not be higher than the actual costs of water supply and wastewater collection and management. The price is calculating taking into account the following:

68.1. the number of water meters and the volume of drinking water supplied and wastewater collected;

68.2. activity efficiency and services quality indicators;

68.3. long-term activity and investment plans;

68.4. operating costs;

68.5. water abstraction and water pollution charges.

69. An estimation of the cost recovery level in the sector of water supply and wastewater management carried out on the basis of direct comparison of income and

expenses demonstrated that the water supply companies operating within the Venta RBD in 2009 recovered 93% of their costs on average.

Table 24. Financial recovery of water supply and wastewater management costs of five major water supply companies in the Venta RBD in 2008, %

	1	2	3	4	5	Venta RBD
<b>Total water supply and wastewater management costs, 2008</b>	<b>80</b>	<b>66</b>	<b>94</b>	<b>90</b>	<b>73</b>	<b>85</b>
<b>Total costs, 2009</b>	<b>98</b>	<b>76</b>	<b>93</b>	<b>97</b>	<b>83</b>	<b>93</b>

Source: experts' estimations on the basis of prices and cost prices of water supply companies

70. At present, the main reason of the failure to fully implement the cost recovery principle in many water supply companies is the delay by municipalities to approve the required tariffs covering the costs.

Environmental costs are included in the cost recovery mechanisms through charges for state natural resources and for pollution of the environment.

Municipalities are currently preparing Water Supply and Wastewater Management Infrastructure Development Plans. 25 such plans were prepared until 2010, 26 were being prepared and the remaining 9 municipalities were only planning to develop of such plans. One of the components of the plans is assessment of the forthcoming tariffs and affordability, hence these plans are believed to have enhanced and to enhance capacities of decision makers in the municipalities. In this way the approval of tariffs based on the cost recovery principle will become more effective.

Industrial enterprises usually finance investments to the water sector with their own funds and bank credits. The amount of subsidies to the water sector in Lithuania is rather small. There are two main potential sources of funding:

70.1. EU support granted through mechanisms under the control of the Ministry of Economy, and

70.2. subsidies granted by the Lithuanian Environmental Investments Fund (LEIF).

Until 2007, EU structural support was granted to business (industry included) under the Single Programming Document of Lithuania for 2004–2006 (SPD). More than LTL 1.13 billion of the support administered by the Ministry of Economy was allocated for the implementation of 333 projects during that period. None of these, however, was related to the water sector. Accordingly, the only source of importance for the assessment of cost recovery is subsidies granted by the LEIF.

Only about LTL 1 million of the annual amount of LTL 13 million received from the LEIF was granted to industrial and construction companies for the water sector in 2008 and about LTL 1.7 million – in 2007. As a result of a poor financial situation, only one application of an industrial enterprise was approved for the funding of the water sector in 2009.

Having in mind that industry creates more than LTL 20 billion of the value added, internalisation of LTL 1-2 million (which is the amount of subsidies granted during a

more favourable period 2007-2008), i.e. inclusion of such amount into the polluter's costs, does not have any effect on the cost recovery level in the sector of industry.

Today, no reliable data is available on which companies are responsible for emitting certain hazardous substances to rivers, and to what extent. For this reason, the costs of supplementary measures (if any) for the sector of industry cannot be compared to the "external" pollution costs at the moment<sup>19</sup>.

Following the afore-said assumption that charges for state natural resources and for pollution of the environment reflect the external environmental costs, it can be maintained that the cost recovery level in the sector of industry is 100%.

71. The cost recovery estimation method used for the public sector cannot be applied for agriculture. The sector of agriculture is not an important direct user of water in Lithuania, the Venta RBD included. An important component for estimations is diffuse agricultural pollution which is not included in water or any other costs.

It is very difficult to assess costs of the environment, resources and other expenditure due to agricultural pressures (there are no studies and data available on how much the "value" of water bodies is reduced due to agricultural pollution) hence another estimating method could be applied. In such case it should be assumed that "external" costs are approximately equal to the agricultural pollution removal costs. This amount in the Venta RBD during the first stage of the Management Plan will total to about LTL 3.511 million every year until 2015. LTL 59 thousand of this amount will have to be borne by the state for measures of control. Farmers will have to fund the major part of the costs – LTL 3.44 million. Such agricultural pollution reduction measures would cut down agricultural pollution in areas where it exerts a significant impact. Since there are no water bodies which require supplementary measures to be financed with state funds within this RBD, it is believed that the polluter pays principle will be implemented and the cost recovery level will reach 100% by 2015, on condition that the established measures will be introduced.

However, this is only an a priori assessment meanwhile the actual cost recovery level in agriculture will be identified only in 2015 upon evaluation of farmers' contribution to the implementation of the measures.

### **Measures to meet the requirements of Article 7 of the WFD**

72. Article 7 of the WFD requires:

72.1. identifying all bodies of water used for the abstraction of water intended for human consumption which provide more than 10 m<sup>3</sup> a day as an average or serving more than fifty persons, and

72.2. monitoring those bodies of water which provide more than 100 m<sup>3</sup> a day as an average.

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<sup>19</sup> Deterioration of the environmental status is treated as "external costs" in our economic system. External costs appear when action or failure to act by one individual or a group of individuals has a damaging effect on other individuals or groups. Pollution means negative "external costs". For example, when a factory pollutes a river with untreated wastewater, the downstream water users incur expenses related to health or water treatment. The English equivalent "externality" is sometimes used in other economic areas. It means an external impact, i.e. a benefit or loss caused by an action or process and incurred by a party not related to that action or process.

**73. National legislation transposing the requirements of Article 7:**

73.1. Regulations of the Register of the Earth Entrails approved by Resolution No. 584 of the Government of the Republic of Lithuania of 26 April 2002 (Žin., 2002, No. 44-1676; 2006, No. 54-1961). The purpose of the Register is to register underground resources, bore wells and exploration of the entrails of the earth, to collect, accumulate, systematise, store, process, use, and provide data required for the management of the entrails of the Earth and protection of the environment;

73.2. Procedure for Groundwater Monitoring by Economic Entities approved by Order No. 1-190 of the Director of the State Geological Survey under the Ministry of Environment of 24 December 2009 (Žin., 2009, No. 157-7130), which has laid down the procedure for the monitoring of groundwater by economic entities which exert an impact of the environment in order to ensure reduction of pollution or any other negative impact caused thereby.

**Identification of water bodies providing more than 10 m<sup>3</sup> of water per day**

74. Wellfields abstracting more than 10 m<sup>3</sup> of groundwater per day are registered with the Register of the Earth Entrails.

**Identification of water bodies intended for future use**

75. The Lithuanian Geological Survey under the Minister of Environment of the Republic of Lithuania has commissioned a project “Assessment of groundwater resources in Lithuania”. The targets of the project are as follows:

75.1. to determine the volume of the available groundwater resources, to analyse their quality and potential use in 2007–2025, taking into account the requirements set for the quality of drinking water;

75.2. to develop measures for protection, improvement and quality control of water resources in wellfields;

75.3. to develop a system of information on relations between institutions which analyse and supply groundwater for human consumption and control the quality thereof, and those which design water supply objects and manage resources of water bodies.

As at the end of 2008, the available resources of three groundwater bodies as well as the current and prospective use thereof were assessed. Groundwater resources in the entire territory of Lithuania are planned to be assessed during 2009-2010.

**Monitoring of water bodies which provide more than 100 m<sup>3</sup> of water a day**

76. Following the Procedure for Groundwater Monitoring by Economic Entities, all economic entities which abstract more than 100 m<sup>3</sup> of groundwater a day are subject to groundwater monitoring requirements. Every economic entity shall develop a monitoring programme for a period of 3-5 years providing information on the economic entity, type of activity, hydro-geological conditions, etc. The programme shall also indicate the monitoring methodology, frequency, and analysis methods. Economic entities are fulfilling the requirements laid down in relevant legislations and providing information to the Lithuanian Geological Survey in due manner.

## **Establishment and authorisation of sanitary protection zones of wellfields**

77. This measure has been described in the analysis of the implementation of the Drinking Water Directive (Paragraph 16 of the Programme of Measures).

## **Controls for point source discharges and other activities with an impact on the status of water**

78. The key pieces of legislation which regulate control over point pollution sources are the Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits, Wastewater Management Regulation and the Surface Runoff Management Regulation approved by Order No. D1-193 of the Minister of Environment of the Republic of Lithuania of 2 April 2007 (Žin., 2007, No. 42-1594).

## **Measures for preventing or controlling the potential input of pollutants from diffuse sources**

79. Legislation:

- 79.1. Law of the Republic of Lithuania on Water;
- 79.2. Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management;
- 79.3. Requirements for the Protection of Waters against Pollution with Nitrogen Compounds from Agricultural Sources approved by Order No. 452/607 of the Minister of Agriculture of the Republic of Lithuania and the Minister of Environment of the Republic of Lithuania of 19 December 2001 (Žin., 2002, No. 1-14);
- 79.4. Environmental Requirements for Manure Management approved by Order No. D1-367 / 3D-342 of the Minister of Environment of the Republic of Lithuania and the Minister of Agriculture of the Republic of Lithuania of 14 July 2005 (Žin., 2005, No. 92-3434; 2010, No. 85-4492);
- 79.5. Programme on the Reduction of Water Pollution from Agricultural Sources;
- 79.6. Lithuanian Hygiene Norm HN 44:2006 “Delineation and maintenance of sanitary protection zones of wellfields”;
- 79.7. Rules for the Establishment of Protection Zones for Surface Water Bodies and Protection Belts for Shores approved by Order No. 540 of the Minister of Environment of the Republic of Lithuania of 7 November 2001 (Žin., 2001, No. 95-3372).

The legislation above has provided for general requirements for the protection of surface water bodies and groundwater bodies against pollution from diffuse sources. The requirements are revised on a regular basis and amended if necessary.

## **Controls over the abstraction of water and measures to promote an efficient and sustainable water use in order to avoid compromising the achievement of the objectives specified in Article 4**

80. Legislation:

- 80.1. Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits;
- 80.2. Building Technical Regulation STR 2.02.04:2004 “Water abstraction, water preparation. Basic provisions” approved by Order No. No. D1-156 of the Minister of

Environment of the Republic of Lithuania of 31 March 2004 (Žin., 2004, No. 104-3848);

80.3. Regulations of the Register of the Earth Entrails. The Regulations were drafted with a view to register underground resources and to collect, accumulate and analyse information on the resources. Groundwater resources are attributed to underground resources hence they are registered in accordance with the provisions of the Register;

80.4. Form 1-PV for quarterly reports on groundwater abstraction and explanation of its compilation approved by Order No. 1-10 of the Director of the State Geological Survey under the Ministry of Environment of the Republic of Lithuania of 19 February 2003 (Žin, 2003, No. 19-849);

80.5. Procedure for the Use of Surface Water Bodies for Water Abstraction Purposes approved by Order No. D1-302 of the Minister of Environment of the Republic of Lithuania of 2 June 2008 (Žin., 2008, No. 64-2439).

### **IPPC permits**

81. IPPC permitting requirements are applicable to companies which abstract, consume or supply groundwater and surface water (including for hydropower purposes). The permits shall specify the water source, water abstraction capacity of the facilities, m<sup>3</sup>/s, the volume of the water abstracted, presence of water accounting equipment, etc. The permits shall also provide for measures for the rational use and protection of water.

### **Controls over the abstraction and sustainable use of surface water**

82. Water abstraction sites must be designed taking into account the relevant category, hydrological characteristics of the water body, the maximum and the minimum water levels according to estimated probabilities, the requirements laid down by institutions engaged in the protection and use of water, the Centre of Hygiene, as well as the requirements set for the protection of fish resources and waterways. Water abstraction sites shall not be established within ship movement zones, zones of sedimentation of outwash materials, fish wintering and spawning places, potential shore erosion sites, places of accumulation of plants and floating materials, places of formation of ice and trash-ice, and beaches. Water abstraction sites must be selected upstream of a wastewater discharger, settlement, or site of intensive economic activities.

Entities engaged in water abstraction shall declare the abstracted amount. The Environmental Protection Agency accumulates the information received in its data bases.

With a view to ensure good status of waters within the Venta RBD, the amount of surface water abstracted may not exceed the critical values: 1) the aggregate volume of water abstracted and not returned to a catchment may not be higher than 5% of the average annual river discharge in the river cross-section downstream of the water abstraction site; 2) depending on water abstraction periods, the aggregate volume of water abstracted may not account for more than 10% of the annual average river discharge of the 30 driest days during a summer or winter season in the water abstraction site.

### **Controls over groundwater abstraction and sustainable use**

83. Control of groundwater use falls within the responsibility of the Lithuanian Geological Survey. All economic entities which abstract more than 10 m<sup>3</sup> of groundwater per day for the purposes of drinking water supply or for industrial needs must fill in forms of quarterly water abstraction reports pursuant to the Procedure for the Submission of Reports on Groundwater Abstraction. The Lithuanian Geological Survey registers the information on water consumption received in its data bases.

### **Controls over the impoundment of water**

84. Controls over the impoundment of water can be preventive, i.e. restricting the use of water in ponds (e.g. requiring to provide environmental flow, abstain from violating the specified fluctuation of water levels in a pond) and/or prohibiting any kind of dams (ponds), and those which require investments, such as building environmental facilities in impounded places (e.g. fish passes, fish diversion screens, automatic meters of water levels) and removal of old dams for improving conditions for fish migration.

The controls over the impoundment of water are provided for in the below-listed Lithuanian legislation.

#### **84.1. Law of the Republic of Lithuania on Water**

No separate permit for a water use is needed for the construction and use of waterworks. No permit is required when a water use does not have a significant impact on the physical, chemical and biological characteristics of a water body. Limits for a water use and/or impact above which a permit is required are established by an institution which is empowered by the law to regulate the issuance of permits. A procedure for the use and maintenance of ponds is laid down by the Minister of Environment who issues respective legal acts. Construction and use of waterworks is subject to a number of measures regulating the regime of water levels, environmental flow, water accounting, management of erosion processes, and fish protection.

#### **84.2. Law of the Republic of Lithuania on Environmental Impact Assessment of the Proposed Economic Activity**

This Law regulates the process of environmental impact assessment of the proposed economic activity and relationships between the participants in this process.

Waterworks – dams and ponds subject to an environmental impact assessment – are contained in two lists of economic activities:

84.2.1. construction of dams and other installations designed for the holding back or permanent storage of water (where the amount of water exceeds 5 million m<sup>3</sup> or the area of water surface exceeds 250 hectares);

84.2.2. transfer of the flow between river basins (where the amount of water transferred is equivalent to or exceeds 100 million m<sup>3</sup>/year) or works for the transfer of water resources between river basins (where the multi-annual average flow of the basin of abstraction is equivalent to or exceeds 2 000 million m<sup>3</sup>/year and where the amount of water transferred is equivalent to or exceeds 5% of this flow).

Economic activities subject to screening for an environmental impact assessment:

84.2.3. construction of dams and other installations designed for the holding back or permanent storage of water (the amount of water less than 5 million m<sup>3</sup> but exceeding 200 000 m<sup>3</sup> or the area of water surface less than 250 hectares but exceeding 10 hectares);

84.2.4. construction of hydropower plants (hydroelectric power plants, windmills, sawmills or other power plants using the accumulated hydropower) (with an output of more than 0.1 megawatts).

#### 84.3. Law of the Republic of Lithuania on Protected Areas

It is prohibited to dam natural rivers and to set up larger water bodies in reserves which are areas of conservational protection priority. It is allowed to re-erect former dams, to set up ponds and other waterworks structures only in cases when this is required for the restoration and management of the objects of cultural heritage (immovable heritage properties) located in a reserve (unconditionally, in strict reserves), and when implementing natural disaster prevention measures in cities, towns and villages.

84.4. Standard Rules for the Use and Maintenance of Ponds (LAND 2-95) (hereinafter – the Standard Rules) approved by Order No. 33 of the Minister of Environment of the Republic of Lithuania of 7 March 1995 (Žin., 1995, No. 70-1790; 2004, No. 96-3563; 2006, No. 101-3915)

The Standard Rules is the main piece of legislation regulating the use and maintenance of ponds, impounded lakes and respective waterworks. It is intended for the owners, operators and users of these ponds. A separate section discusses ponds designated for hydropower. The last amendment of the Standard Rules has set a deadline for the introduction of automatic devices for the measurement and registration of the water level, and requires performing control measurements of discharges and water levels.

84.5. Resolution No. 1144 of the Government of the Republic of Lithuania of 8 September 2004 on the approval of the List of Ecologically or Culturally Valuable Rivers or River Stretches (Žin., 2004, No. 137-4995)

This is a piece of secondary legislation pursuant to paragraph 3 of Article 14 of the Law of the Republic of Lithuania on Water, which unconditionally prohibits construction of dams for any purposes in 169 rivers and their stretches (recently, this List has been slightly reduced). The key legal bases are as follows: fish species listed in the Red Book of Lithuania; species protected under the Directive on the conservation of natural habitats and of wild fauna and flora; species protected under the Bern Convention on the Conservation of European Wildlife and Natural Habitats; rivers where salmons in Lithuania are protected under the Programme of Restoration and Conservation of Salmons of HELCOM, International Baltic Sea Fishery Commission and Lithuania. This List also includes rivers where no reserves are situated.

84.6. Procedure for the Estimation of the Environmental Water Flow approved by Order No. D1-382 of the Minister of Environment of the Republic of Lithuania of 29 July 2005 (LAND 22-97) (Žin., 2005, No. 94-3508)

This legal act has laid down the procedure for the estimation of the environmental flow in water bodies and for the provision thereof into the tail bay of ponds or impounded lakes, which is mandatory for all natural and legal persons designing, building and reconstructing, repairing, and operating waterworks. The environmental flow is needed to ensure discharges required for the existence of ecosystems in water bodies.

84.7. List of Dams where Facilities for Fish Migration are Required and List of Former Dam Remains where Barriers for Fish Migration Have to Be Removed approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (Žin., 2007, No. 102-4180)

The lists contain 28 dams and dam remains of 33 former watermills where conditions for fish migration should be improved as described above.

84.8. Order No. 68 of the Minister of Environment of the Republic of Lithuania of 23 February 2000 on measures for fish protection in small hydropower plants (Žin., 2000, No. 19-471)

This piece of legislation gives the number of fish allowed to be injured in hydro turbines, recommends power generators to select turbines which have the least potential impact on hydromont species when constructing new or reconstructing former hydropower plants, specifies various fish protection measures, and proposes to restrict operation of HPP during fish migration.

84.9. Building Technical Regulation STR 2.02.03:2003 “Fish bypass facilities. Basic provisions” approved by Order No. 565 of the Minister of Environment of the Republic of Lithuania of 17 November 2003 (Žin., 2003, No. 119-5449)

The Building Technical Regulation establishes technical requirements for fish bypasses. The main purpose of fish bypasses is to let actively migrating fish pass from one bay to another during their migration period ensuring conditions necessary for their life in Lithuanian water flows. The most important actively migrating fish include salmonid fishes (salmon and sea trout) as well as other fishes contained in the list of preserved and protected fish.

84.10. Regulations of the State Cadastre of Rivers, Lakes and Reservoirs of the Republic of Lithuania approved by Resolution No. 1114 of the Government of the Republic of Lithuania of 19 September 2000 (Žin., 2000, No. 80-2422; 2009, No. 103-4318)

The State Cadastre of Rivers, Lakes and Reservoirs of the Republic of Lithuania was officially established in 2001. Before that, data on ponds (dams) was published by various organisations. This Cadastre requires publishing the data of ponds larger than 0.5 ha. The Cadastre contains more than 1 100 ponds and their dams and does not include, due to the said area restriction, ruined dams of old watermills, or remains of other waterworks.

### **Controls over hazardous substances provided for in Article 16 of the WFD**

85. Article 16 of the WFD requires providing for specific measures against pollution of water with individual pollutants or groups of pollutants presenting a significant risk to or via the aquatic environment, including such risks to waters used for the abstraction of drinking water. For those pollutants measures shall be aimed at the progressive reduction and, for priority hazardous substances, at the cessation or phasing out of discharges, emissions and losses.

86. Legislation:

Wastewater Management Regulation regulates discharge of hazardous and priority hazardous substances in wastewater.

### **Establishment of the maximum allowable concentrations**

87. The Wastewater Regulation requires that all economic entities discharging wastewater polluted with hazardous substances abide by the requirements set for the concentration of hazardous substances. Different maximum allowable concentrations (MAC) have been set for wastewater discharged into the natural environment and for wastewater discharged into wastewater collection systems. The Regulation has also laid down a requirement to reduce discharge of hazardous substances in wastewater to the maximum extent. The annexes to the Regulation contain tables which specify:

- 87.1. maximum allowable concentrations for priority hazardous substances;
- 87.2. maximum allowable concentrations for hazardous and other controlled substances;
- 87.3. controlled parameters of industrial discharges by types of pollution sources.

### **Monitoring of hazardous and priority hazardous substances by economic entities**

88. Depending on the type of economic activity, economic entities have to conduct monitoring of discharge of hazardous substances every two or three years.

### **Monitoring of hazardous substances in surface waters**

89. Monitoring is carried out under the National Environmental Monitoring Programme for 2005-2010 approved by Resolution No. 130 of the Government of the Republic of Lithuania of 7 February 2005 (Žin., 2005, No. 19-608) and amended by Resolution No. 830 of the Government of the Republic of Lithuania of 27 August 2008 (Žin., 2008, No. 104-3973). The latter document envisages specification and maximum improvement of the measures developed for the period 2008-2010.

### **Measures to reduce the impact of accidental pollution incidents**

90. These measures are designed to prevent, respond to and investigate large-scale industrial accidents and to promote safe use of dangerous installations, protect people and the environment in case of accidents in such installations, and to limit consequences of industrial accidents on people and the environment.

#### **91. Legislation**

Measures for the prevention and reduction of pollution generated during accidents have been provided for in the following legislation:

90.1. Regulations of the Prevention, Response to and Investigation of Industrial Accidents;

90.2. Programme on the Inspection of Dangerous Installations of the Republic of Lithuania approved by Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 (Žin., 2007, No. 3-143).

#### **92. Measures for the prevention and response to industrial accidents are as follows:**

##### **92.1. Drafting of safety reports and emergency response plans**

The Regulations of the Prevention, Response to and Investigation of Industrial Accidents provide for that all installations which store a certain amount of dangerous substances must prepare safety reports. Such safety reports must also contain plans of measures for accident prevention. The List of Potentially Dangerous Installations

includes 21 installations in Lithuania subject to the requirements of the Major Accidents Directive.

#### **92.2. Selection of a suitable place**

The Regulations of the Prevention, Response to and Investigation of Industrial Accidents require that a place for the construction of all new dangerous installations must be selected ensuring a safe distance from other dangerous objects, residential areas, roads with intensive traffic, recreational zones, and other public or frequently visited places.

#### **92.3. Controls over the fulfilment of the requirements**

Programmes on the inspection of dangerous installations which are approved by the Director of the State Fire and Rescue Department on the annual basis specify a schedule of inspection of dangerous installations. The main purpose of these programmes is to introduce a regular system of control and to ensure safe operation of dangerous installations.

### **Measures prohibiting unauthorised discharges of pollutants directly into groundwater**

#### **93. Legislation:**

The issuance of permits is regulated pursuant to the Procedure for the Inventory of Discharges of Hazardous Substances into Groundwater and Collection of Information Thereon approved by Order No. 1-06 of the Director of the Lithuanian Geological Survey under the Ministry of Environment of 3 February 2003 (Žin., 2003 No. 17-770).

The Lithuanian Geological Survey issues permits for companies abstracting hydrocarbons and thermal water in western Lithuania. Water is discharged into the same geological strata from which hydrocarbons and/or thermal water have been extracted ensuring that these strata will never be suitable for any other purposes due to natural reasons. Such discharges should not contain any other substances but those which are formed during the said activity.

### **Summary of controls over point source discharges and other activities with an impact on the status of water**

94. Pollution by point sources is regulated in the Wastewater Management Regulation and the Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits.

### **Measures for flood control**

#### **95. Legislation:**

95.1. Civil Protection Law of the Republic of Lithuania (Žin., 1998, No. 115-3230; 2009, No. 159-7207);

95.2. Procedure for Flood Risk Assessment and Management approved by Resolution No. 1558 of the Government of the Republic of Lithuania of 25 November 2009 (Žin., 2009, No. 144-6376). Pursuant to the said Resolution, the Ministry of Environment has to:

95.2.1. draw up and approve preliminary flood risk assessment reports not later than by 22 December 2011;

95.2.2. discuss and approve, if required, preliminary flood risk assessment reports and amendments thereof not later than by 22 December 2018, and afterwards – every six years;

95.2.3. draw flood threat maps and flood risk maps and submit these to the Government of the Republic of Lithuania for approval not later than by 22 June 2013;

95.2.4. prepare flood risk management plans and submit these to the Government of the Republic of Lithuania for approval not later than by 22 June 2015.

**Measures which ensure that hydromorphological conditions of water bodies are consistent with good ecological status or good ecological potential for artificial or heavily modified water bodies**

96. Legislation:

96.1. Procedure for the Estimation of the Environmental Water Flow (LAND-22-97) approved by Order No. D1-382 of the Minister of Environment of the Republic of Lithuania of 29 July 2005 (Žin., 2005, No. 94-3508)

This legal act has laid down the procedure for the estimation of the environmental flow in water bodies and for the provision thereof into the tail bay of ponds or impounded lakes, which is mandatory for all natural and legal persons designing, building and reconstructing, repairing, and operating waterworks. The environmental flow is needed to ensure discharges required for the existence of ecosystems in water bodies.

96.2. List of Dams where Facilities for Fish Migration are Required and List of Former Dam Remains where Barriers for Fish Migration Have to Be Removed

The lists contain 28 dams and dam remains of 33 former watermills where conditions for fish migration should be improved. Taking into account a remark of the Lithuanian Hydropower Association on preservation of old dams which are objects of heritage, before the removal of dam remains, it is recommended to check whether these stand on the list of objects of cultural heritage.

96.3. Order No. 68 of the Minister of Environment of the Republic of Lithuania of 23 February 2000 on measures for fish protection in small hydropower plants (Žin., 2000, No. 19-471; 2003, No. 78-3583)

This legal act gives the number of fish allowed to be injured in hydro turbines, recommends power generators to select turbines which have the least potential impact on hydrobiotic species when constructing new or reconstructing former hydropower plants, specifies various fish protection measures, and proposes to restrict operation of HPP during fish migration.

Until now, a potential impact of waterworks (dams) and other morphological alterations on river ecosystems and river bed processes has not been adequately studied in Lithuania. The present Programme of Measures recommends a number of measures ensuring conformity of hydromorphological conditions of water bodies with the required ecological status or good ecological potential in water bodies designated as artificial or heavily modified.

## **Measures for water bodies which are unlikely to achieve the environmental objectives set out under Article 4**

97. Lithuanian legislation provides for certain exceptions for water bodies where water protection objectives cannot be achieved or achievement would be disproportionately expensive:

97.1. postponing of an objective (maximum until 2027) if the accomplishment thereof is prevented by technical possibilities, disproportionate costs or natural conditions;

97.2. in the procedure laid down by the Minister of Environment, water bodies heavily modified by anthropogenic activities may be subject to less stringent water protection objectives ensuring that such less stringent objectives will not decrease the status of a water body in question.

The exceptions may be applied only upon well-founded proof of the necessity of the derogation. The exceptions to the achievement of the water protection objectives in the Venta RBD are described in paragraph 5.6 of the Management Plan.

### **Details of supplementary measures identified as necessary to meet the environmental objectives**

98. Supplementary measures will be proposed for water bodies which will be failing the good water status requirements after the implementation of the basic measures, and environmental and economic efficiency of these measures will be evaluated. Supplementary measures have been defined for reduction of point and diffuse pollution, improvement of hydromorphological status, and reduction of an impact of recreation. These are described in Chapter 3 below.

### **Details of measures to avoid increase in pollution of marine waters in accordance with Article 11 (6)**

99. This provision is more relevant for water bodies within the Nemunas RBD. All basic measures which improve the status of inland waters also have a positive impact on the status of marine waters. These include implementation of the requirements of the Urban Wastewater Directive and the Nitrates Directive, and HELCOM recommendations. As part of the implementation of the HELCOM Baltic Sea Action Plan and Directive 2008/56/EC of 17 June 2008 establishing a framework for Community action in the field of marine environmental policy (OL 2008 L 164, p. 19-40) (Marine Strategy Framework Directive), a national strategy on the protection of the marine environment of the Baltic Sea and an action plan for the implementation thereof are planned to be developed by 2010.

### **Measures to mitigate temporary deterioration in the status of water bodies if this is the result of circumstances of natural cause or force majeure which are exceptional or could not reasonably have been foreseen**

100. Measures to prevent and mitigate pollution arising from unforeseen accidents (which are always unpredictable) have been provided for in the following legislation:

100.1. Regulations of the Prevention, Response to and Investigation of Industrial Accidents;

100.2. Programme on the Inspection of Dangerous Installations.

Emergency plans provide for ensuring protection of people and the environment in the event of emergencies as well as mitigation of negative impacts of accidents on people and the environment.

### **Controls over artificial recharge or augmentation of groundwater bodies**

101. These measures are not relevant for Lithuania because there is no artificial recharge/augmentation of groundwater in our country.

### **Other basic measures**

102. In addition to the above-listed basic measures, other programmes which correspond to the basic measures and which will affect the improvement of the status of water bodies in the Venta RBD are being planned and have to be implemented.

#### **102.1. Programme on the Reduction of Water Pollution from Agricultural Sources**

The objective of the Programme is to reduce pollution of surface waters and groundwater with nutrients, especially nitrogen and phosphorus compounds coming from agricultural sources with a view to continuously improve the status of water bodies and prevent eutrophication of surface water bodies.

Implementation period: 2008-2012.

Measures:

102.1.1. training of farmers, provision of information thereto, promotion of environment-friendly farming technologies, and encouragement of participation in activities under the Lithuanian rural development measures for 2007-2013;

102.1.2. enhancement of legal regulation ensuring the implementation of the EU and international requirements to reduce agricultural pollution;

102.1.3. continuous monitoring of the status of the soil and water bodies, identification of possibilities to improve the surface water monitoring network;

102.1.4. scientific research aimed at solving the issues of optimal capacities of manure storages and rational use of fertilisers in agriculture;

102.1.5. collection of information on fertilisers use, which would enable accurate assessment of the agricultural impact on water bodies;

102.1.6. provision of conditions for the construction of manure, slurry and wastewater storages on farms holding from 10 to 300 LSU.

Financing sources of the Programme: funds of natural and legal persons, EU funds, allocations from the state budget of the Republic of Lithuania, and other funds.

102.2. Groundwater Use and Protection Strategy for 2002–2010 approved by Resolution No. 107 of the Government of the Republic of Lithuania of 25 January 2002 (Žin., 2002, No. 10-362)

The objective of the Strategy is to ensure provision of drinking water of high quality to the public and to preserve it for future generations.

Implementation period: 2002-2010.

**Measures:**

- 102.2.1. analysis of groundwater resources, their quality and possibilities of use (analysis of regional resources of fresh water, possibilities of provision of good quality drinking water to rural population, etc.);
- 102.2.2. analysis of natural protection of groundwater resources, assessment of the anthropogenic impact on groundwater and preparation of adequate management programmes (inventory of polluted areas and other potential pollution sources, identification of their impact on groundwater and preparation of reclamation programmes for these areas; inventory of bore wells which are no longer in use and which are in a bad technical condition, development of adequate rehabilitation programmes, etc.);
- 102.2.3. collection of information necessary for the use and protection of groundwater resources (transboundary, national and municipal monitoring; management of the Register of the Earth Entrails, etc.);
- 102.2.4. settlement of issues related to the development of the use and protection of groundwater (drafting of documents required for the preparation of water management plans of different levels as well as for various other regional and territorial activities in relation to the use and management of groundwater resources, etc.);
- 102.2.5. dissemination of information on groundwater resources, their quality, use, and protection (publishing geological and hydro-geological information, preparation of a map of the Lithuanian groundwater resources, etc.).

**102.3. Programme on the Assessment and Use of Groundwater Resources for the Provision of Drinking Water for 2007–2025**

The main objective of this Programme is to update, taking into account the global practice, information on water resources and their proper use while expanding and designing new water supply systems every 20-25 years; to create a new database for information on raw groundwater resources intended for the provision of good quality drinking water to the Lithuanian population during the coming 20-25 years; to create a database of systematised new data on groundwater resources which is necessary for the development of projects on the expansion of water supply systems in Lithuanian towns and rural settlements, and management thereof on the basin level.

**Tasks provided for in the Programme:**

- 102.3.1. to quantify the available groundwater resources, to assess their quality (taking into account changes in the water quality due to its use) and a possibility to use these resources in the period 2007–2025 on the basis of the latest hydro-geological information collected during the last 25 years, applying advanced mathematical modelling methods and taking into consideration the EU requirements for the quality of drinking water;
- 102.3.2. to develop measures for the protection, improvement and quality control of the resources of wellfields (to identify the actual area of formation of groundwater bodies (impact zones) and potential changes therein during their use period 2007-2025; to identify all potential points of pollution of the underground hydrosphere and to examine the scope of a threat for the quality of groundwater bodies, etc.);
- 102.3.3. to create an interdepartmental information system connecting institutions engaged in water analysis, supply and quality control as well as those which design

waterworks and manage water basin resources (to identify and define groundwater resources and various activities related to their assessment and use as well as information structures and flows, and to include new institutions; to design an information system providing for its connection with other information systems and links with the sub-systems of the information system GEOLIS of the Lithuanian Geological Survey);

102.3.4. to conduct scientific research focused on regional problems of the formation of the chemical composition of groundwater (to determine the origin of chloro-organic compounds and polycyclic aromatic hydrocarbons in groundwater, the amount of boron and pesticides therein and their impact on the quality of drinking water resources, etc.).

This Programme is financed with funds allocated for its implementation from the state budget of the Republic of Lithuania to the manager of the appropriations – the Lithuanian Geological Survey and, if possible, with funds allocated for this purpose by international organisations or other funds, following the procedure laid down in relevant legislation.

#### 102.4. Drinking Water Supply and Wastewater Management Development Strategy for 2008–2015

The objectives of the Strategy are as follows:

102.4.1. to provide for favourable conditions for the improvement of accessibility and quality of drinking water supply and wastewater management services;

102.4.2. to protect the environment from an adverse impact of discharges into the environment.

The Strategy is to be implemented in two stages: during 2008–2009 and 2010–2015.

Tasks for 2008–2009:

102.4.3. to improve legislation which regulates drinking water supply and wastewater management services and development of infrastructures and which lays down environmental requirements for wastewater management;

102.4.4. to inform consumers about safety and quality of publicly supplied water;

102.4.5. to approve a list of water supply and wastewater management projects financed from the EU Structural Funds.

In 2009, the Ministry of Environment of the Republic of Lithuania developed the Plan of Measures for 2010–2015 and submitted it to the Government of the Republic of Lithuania.

The measures for implementing this Strategy are financed from general appropriations approved for relevant institutions in the Law on the Approval of the Financial Indicators of the State and Municipal Budgets of a respective year, and with other funds received in the procedure laid down in the relevant legislation of the Republic of Lithuania.

102.5. National Strategy for the Implementation of the United Nations Framework Convention on Climate Change by 2012 approved by Resolution No. 94 of the Government of the Republic of Lithuania of 23 January 2008 (Žin., 2008, No. 19-685)

The main objective of this Strategy is to fulfil the requirements of the United Nations Framework Convention on Climate Change and Kyoto Protocol and to reduce greenhouse gas emission in 2008–2012 by 8% below 1990 levels.

The main tasks:

- 102.5.1. to organise and to conduct continuous and ongoing monitoring of the Lithuanian climate indicators, to provide data on hydro-meteorological conditions and phenomena which is necessary for the assessment of the current state and preparation of forecasts, to accumulate and store necessary data on the climate state and changes;
- 102.5.2. to conduct assessments of the landscape, ecosystems and biological diversity (including protected areas) for the purpose of evaluating impacts of the changing climate on various ecosystems and parts thereof, to develop plans for the mitigation of impacts of climate change, to provide for specific adjustment measures for the conservation of the landscape, ecosystems and biological diversity (including the development and implementation of river renaturalisation projects, measures for wastewater treatment, safe handling of sludge, etc.);
- 102.5.3. to draft legislation, recommendations, promotion measures and assistance programmes which facilitate reduction of greenhouse gas emissions and help these sectors to adjust to alterations caused by climate change as well as to increase energy efficiency;
- 102.5.4. to introduce measures which reduce greenhouse gas emissions in wastewater management and to adjust their storage facilities to potential climate changes;
- 102.5.5. to develop scientific research, including technologies designed for the assessment and mitigation of consequences of climate change;
- 102.5.6. to provide information to the public on climate change, potential threats, measures for the mitigation of consequences, to raise public awareness on combating climate change.

The measures provided for in this Strategy are financed from the general appropriations allocated for institutions in the state budget of the Republic of Lithuania.

102.6. Lithuanian Rural Development Programme for 2007-2013. Measures provided for under Axes I and II

Table 25. Environmental measures under the Lithuanian Rural Development Programme for 2007-2013

Measure	Description
<b>AXIS I ‘Improving the competitiveness of the agricultural and forestry sector’</b>	
“Vocational training and information actions” (Articles 20(a)(i), Article 21, Article 52(c) and Article 58 of the Council Regulation (EC) No. 1698/2005)	Special focus is given to trainings introducing mandatory legislation, economy management and agri-environmental requirements.
“Use of advisory services” (Article 20(a)(vi) of the Council Regulation (EC) No. 1698/2005)	This measure covers assessments of farms and consultation of farmers on conformity of farms to good agri-environmental practice as well as consultation of farmers on the implementation of agri-environmental measures.
“Modernisation of agricultural holdings” (Article 20(b)(i) and Article 26 of the Council Regulation (EC) No. 1698/2005) (including obligations under the Measure “Agri-environmental commitments”, RDP	One of the areas under this Measure is intended for the implementation of the requirements of the Nitrates Directive on farms with less than 10 LSU, reducing water pollution and focusing on nitrates and other chemical factors which are likely to have an adverse impact on public health, biological

<b>Measure</b>	<b>Description</b>
2004–2006 (Article 21(b) and Article 21(c) of the Council Regulation (EC) No. 1257/1999)	diversity and to change the traditional landscape. Another objective is to protect water bodies in the Republic of Lithuania against eutrophication.
<b>AXIS II “Improving the environment and the countryside”</b>	
“Agri-environment payments” (Article 36(a)(iv) and Article 39 of the Council Regulation (EC) No. 1698/2005) (including obligations under the Measure “Agri-environment payments”, RDP 2004–2006 (Articles 22-24 of the Council Regulation (EC) No. 1257/1999)	The objective is to promote sustainable use of land, prevent deterioration of biological diversity and degradation of ecosystems, to preserve natural shores of rivers and lakes, to preserve and properly maintain natural and semi-natural grasslands and extensively used wetlands, recreational environment, to ensure effective use of natural resources, to protect the landscape and biological diversity, to reduce an adverse impact of agriculture on the environment in water bodies which have been identified as water bodies at risk of failing to achieve good status by 2015.
Landscape Stewardship Scheme	The objective is to preserve and properly maintain natural and semi-natural grasslands, wetlands, recreational environment, to preserve or, if needed, to restore extensive farming systems in grasslands and wetlands, to reduce farming intensiveness in intensively used grasslands, to protect biological diversity and water bodies against pollution.
Organic Farming Scheme	The objective of the Scheme is to support ecological farming as a production system which ensures production of quality food products with good prospects on the market. It is an important agri-environmental measure because it helps maintain and improve the soil quality, reduce air and water pollution, and preserve stability of ecosystems as well as biological diversity.
Scheme for Improving the Status of Water Bodies at Risk	The objective of the Scheme is to achieve good status in water bodies which have been identified as water bodies at risk of failing to achieve good status by 2015 (as required under the WFD and the Republic of Lithuania Law on Water) because of a highly significant adverse impact of agriculture (pollution of water with nutrients and organic matter).
Natura 2000 payments and payments linked to the WFD (support to agricultural land in Natura 2000 areas) (Article 38 of the Council Regulation (EC) No. 1698/2005)	The measure is important for the implementation of the WFD. The implementation of the WFD is postponed until the approval of the river basin management plans and establishment of comprehensive rules of support. The objective is to address specific difficulties encountered in relevant places in relation to the implementation of the Birds Directive, Habitats Directive and WFD, thus enhancing living quality in rural areas and raising ecological awareness of local communities. <b>A specific objective</b> is to implement environmental requirements in Natura 2000 areas with a view to protect wild birds, natural habitats, protected species and their habitats.

#### 102.7. Cohesion Promotion Action Programme approved by the Commission Resolution of 30 July 2007 (not published)

This Programme corresponds to the third priority of the use of the EU structural support “Life quality and cohesion”. The total amount of the EU structural funds allocated for the Programme under the Convergence objective is EUR 2 648 332 571 (the allocation for “Environment and sustainable development” totals to EUR 1 128 119 555). The Programme is financed from the European Regional Development Fund and Cohesion Fund (for the protection of the environment).

The objectives of the Cohesion Promotion Action Programme:

- 102.7.1. to provide for conditions necessary for strengthening and unlocking local potential;
- 102.7.2. to offer accessible quality public services provided by institutions which implement health, education, and state support for employment policies, ambulatory social services, and services for the disabled;
- 102.7.3. to seek better quality of the environment, with particular emphasis on especially increasing energy efficiency.

The attainment of the third objective focuses on the improvement of the status in water bodies and implementation of the provisions of the WFD, Urban Wastewater Treatment Directive, and other directives which regulate water protection and use. The following tasks have been set:

- 102.7.4. to renovate and develop water supply and wastewater treatment systems;
- 102.7.5. to identify water protection and management measures: to develop management plans, programmes of measures for the Nemunas, Venta, Lielupė, and Dauguva River Basin Districts, as well as other documents necessary for the establishment of water protection objectives; to carry out preliminary assessments of flood risks in the Nemunas, Venta, Lielupė, and Dauguva River Basin Districts; to develop maps of flood threats and risks and flood risk management plans;
- 102.7.6. to improve the ecological and/or chemical status of surface water bodies – to implement measures designed for the improvement of the status of water bodies (transitional waters, rivers and lakes), such as treatment and handling; restoration of a more natural hydrological regime; reduction of the input of pollutants into water bodies; environmental cleanup and rehabilitations of banks).

#### **Effect of implementation of basic measures**

103. The implementation of the basic measures will have a modest but nevertheless a positive impact on the status of water bodies. The most significant effect will be produced by the introduction of the requirements of the Urban Wastewater Treatment Directive and the Nitrates Directive.

The decrease in the BOD<sub>7</sub> loads from point pollution sources after the implementation of the Urban Wastewater Treatment Directive in the Venta RBD is expected to be very low – only around 3%. The loads of total nitrogen should go down by up to 20% and those of total phosphorus – by up to 33%. Point pollution loads in the Bartuva Basin and Šventoji Basin are expected to remain the same.

The data available and the analyses findings show that four water bodies in the Venta RBD identified in the rivers Dabikinė, Tausalas and Agluona will still be failing the requirements for good ecological status/potential due to the point pollution impact even after the implementation of the basic measures under the Urban Wastewater Treatment Directive. These water bodies have been designated as water bodies at risk which will require supplementary measures in order to achieve their good ecological status/potential.

The implementation of the Nitrates Directive will also reduce diffuse pollution loads. Estimations indicate that overall pollution reduction after the implementation of the

basic measures under the Nitrates Directive, of which only manure storage will have a noticeable effect, will most probably be rather insignificant. The nitrate nitrogen pollution load generated in Lithuania and transported by rivers from the Venta River Basin to Latvia should go down by about 4%. The nitrate nitrogen load transported by the Bartuva River could decrease by about 5.5%. Even a lower change in pollution loads is forecasted for the Šventoji Basin where the implementation of the basic measures under the Nitrates Directive could result in the decrease by only 3%.

After the implementation of the basic measures under the Nitrates Directive, 11 water bodies in the Venta RBD identified in the rivers Ringuva, Dabikinė, Šventupis, Agluona and Ašva will still be failing the requirements for good ecological status/potential by concentrations of nitrate nitrogen. These water bodies have been designated as water bodies at risk and will require supplementary measures in order to achieve their good ecological status/potential. Supplementary measures to reduce diffuse pollution with nitrate nitrogen will be required in 1 167.8 km<sup>2</sup> of the Venta basin area which makes up around 23% of the total RBD area. To be able to achieve good ecological status in all water bodies by nitrate nitrogen, the decrease of agricultural pollution loads in problematic catchments should be about 1.2 kg/ha per year.

The implementation of other directives discussed will have a less significant effect on the status of water bodies because their requirements are only indirectly related to the improvement of water status.

### **CHAPTER III. SUPPLEMENTARY MEASURES**

104. Supplementary measures have been proposed for the bodies of water which will be failing the good status requirements after the implementation of the basic measures, and their environmental and economic efficiency has been assessed.

Supplementary measures have been discussed and proposed for the following key areas:

- 104.1. for reducing the impact of point pollution;
- 104.2. for reducing the impact of agricultural pollution;
- 104.3. for reducing pollution with hazardous and priority hazardous substances;
- 104.4. for mitigating and regulating hydromorphological changes.

#### **Assumptions for cost assessment**

105. The costs of supplementary measures were estimated observing the following general assumptions:

- 105.1. The number of population in cities and villages was taken from the website of Statistics Lithuania, data of 1 January 2009;
- 105.2. According to the Statistical Yearbook, the average monthly income of a household member in Telšiai county in 2008 was LTL 851.5, meanwhile the national average was LTL 986.6 (LTL 1 073.9 in towns, LTL 811.2 in rural areas);
- 105.3. The actual discount rate used was 6 %;
- 105.4. The annual operating costs of wastewater collection networks were assumed to be 2%;

105.5. The annual (annualised) total costs which reflect the actual annual burden during every service life year of the newly developed infrastructure were estimated using a standard depreciation formula:

$$MK = I * r / (1-(1+r)-n) + EK, \text{ where:}$$

I = investment costs

r = annual interest (discount) rate

n = service life of the investment

EK = annual operating costs

The use of annualised costs offers two advantages. First, they better reflect the actual costs of the investments selected. Calculations are very accurate when the investments are funded on credit. Second, in this way the investment costs are depreciated over time and can be better compared with the operating costs.

105.6. Available costs of fish bypass channels in 2001<sup>20</sup> were adjusted for 2009 following the consumer price indices of 2001-2008;

105.7. The service life of a fish bypass channel infrastructure was assumed to be 50 years;

105.8. The annual operational costs of fish bypass channel infrastructure were assumed to be 3% of investments;

105.9. Construction of 1 kW of an environmentally friendly HPP turbine costs LTL 4 000<sup>21</sup>;

105.10. The average costs of complete renaturalisation of 1 km is LTL 100 000, including land purchasing costs<sup>22</sup>;

105.11. The operating time of investigative monitoring is 10 years.

## **SECTION I. DESCRIPTION OF SUPPLEMENTARY MEASURES**

### **Measures to reduce point pollution**

106. The data available and the analyses findings show that four water bodies within the Venta RBD identified in the rivers Dabikinė, Tausalas and Agluona will still be failing the requirements for good ecological status/potential due to the significant impact of point pollution even after the implementation of the basic measures under the Urban Wastewater Treatment Directive. All these water bodies are small and their pollution accumulation potential is too low to be able to receive pollution from the neighbouring town even when wastewater treatment facilities are operating efficiently and the quality of discharges complies with the requirements of the Urban Wastewater Treatment Directive.

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<sup>20</sup> Study “Improvement of fish migration conditions in ichtiologically important rivers” (Gedilieta and the Institute of Ecology, 2001)

<sup>21</sup> On the basis of the existing market prices of relevant HPP turbines

<sup>22</sup> Study “Preparation of a feasibility study and recommendations on establishment/restoration of wetlands aiming to reduce input of organic and biogenic emissions into water bodies” (2009) and study “Preparation of a feasibility study on the restoration of morphological and ecological conditions close to the natural ones in straightened rivers and streams and development of practical recommendations for the activities to restore the said conditions” (2010)

One of the pollution sources exerting a significant impact on the Agluona River is Naujoji Akmenė WWTP. A new relatively efficient WWTP is already operating in this town therefore there is no need to recommend supplementary measures for reducing point pollution from wastewater treatment facilities.

Findings of the study “Preparation of a feasibility study on the construction of stormwater management systems in selected problematic settlements and development of recommendations for the construction of such systems in individual typical cases” (conducted by the company UAB Projektų gama, 2009) demonstrated that the Agluona River is significantly affected not only by household wastewater but also by surface (stormwater) runoff. Therefore the measures for reducing pollution with surface (stormwater) runoff provided for in the said study, i.e. construction of wastewater collection and treatment system in Naujoji Akmenė, are recommended in order to achieve good ecological status of the Agluona. Following the feasibility study on stormwater treatment, the demand of investments totals to around LTL 2 740 000. Such amount will not be available until 2015. Hence it is suggested postponing the achievement of water protection objectives in the Agluona River. Instead, it is recommended to conduct operational monitoring downstream of Naujoji Akmenė.

No supplementary measures are recommended for WWTP in Telšiai because this town faces industrial pollution problem. According to preliminary assessments, about half of pollution loads come to Telšiai WWTP from the milk processing company Žemaitijos pienas. Hence it is not worthwhile improving the efficiency of the WWTP operation due to such significant amounts from this industrial enterprise. To reduce the pollution loads, first of all the share of pollution coming to the WWTP from the company Žemaitijos pienas should be reduced. In addition, despite the identification of the key source of pollution of the Tausalas River, data on its impact is still insufficient. Consequently, it is recommended to postpone the achievement of the water protection objectives in the Tausalas River and to perform operational monitoring in this river to specify pollution reduction objectives in more detail.

Estimations show that pollutant concentrations in the Dabikinė River should be no longer exceeding the threshold values of good ecological status after the implementation of the Urban Wastewater Treatment Directive. However, measurements performed at the water company Akmenės vandenys demonstrate significant pollution of the river even after having transferred pollution of Naujoji Akmenė to the Agluona River. The water quality of the Dabikinė may be seriously affected by households whose wastewater is not subject to centralised collection and treatment, therefore this river has been designated as a water body at risk and its status should be monitored in order to establish the demand of supplementary pollution reduction measures. If the monitoring results demonstrate that the implemented basic measures under the Urban Wastewater Treatment Directive did not lead to good ecological status of the river, supplementary pollution reduction measures will have to be planned in future. It is suggested to postpone achievement of the water protection objectives in the water bodies identified in the Dabikinė River until a sufficient amount of data is collected to be able to establish the demand and implementation scope of supplementary measures.

Simulated pollution loads from diffuse and point pollution loads indicate that Ubiškės pond in the Venta RBD (water body at risk) suffers from a significant impact of point pollution, which account for 67% of the total pollution loads. Pollution is transported by the Tausalas from Telšiai WWTP which receives industrial wastewater (from the company Žemaitijos pienas).

All the above-said water bodies will be subject to investigative monitoring which will allow, in the next planning period, identifying the reasons of the pollution and providing for relevant pollution reduction measures. No measures to reduce point pollution have been provided for in this planning period due to shortage of funds.

### Measures to reduce diffuse pollution

107. Diffuse agricultural pollution prevents good water status in a number of water bodies within the Venta RBD. This problem is relevant only for the Venta Basin where nitrogen leaching into water bodies has to be reduced in the area of 1 167.8 km<sup>2</sup> (Figure 1), which situates 8 problematic catchments (units used for the assessment of agricultural pollution in a mathematical model) with 11 water bodies. It was estimated that pollution loads leached out into water bodies have to be reduced by 1.2 kg/ha – in total 141 tonnes of total nitrogen. Good ecological status/potential of water bodies in the Venta RBD can be achieved by introducing diffuse pollution reduction measures common for the whole of Lithuania, a number of which have been adopted in the Programme of Measures for Achieving Water Protection Objectives within the Nemunas River Basin District approved by Resolution No. 1098 of the Government of the Republic of Lithuania of 21 July 2010 (Žin., 2010, No. 90-4756). Measures, including those approved by Resolution No. 1098 of the Government of the Republic of Lithuania of 21 July 2010, are described in detail below.

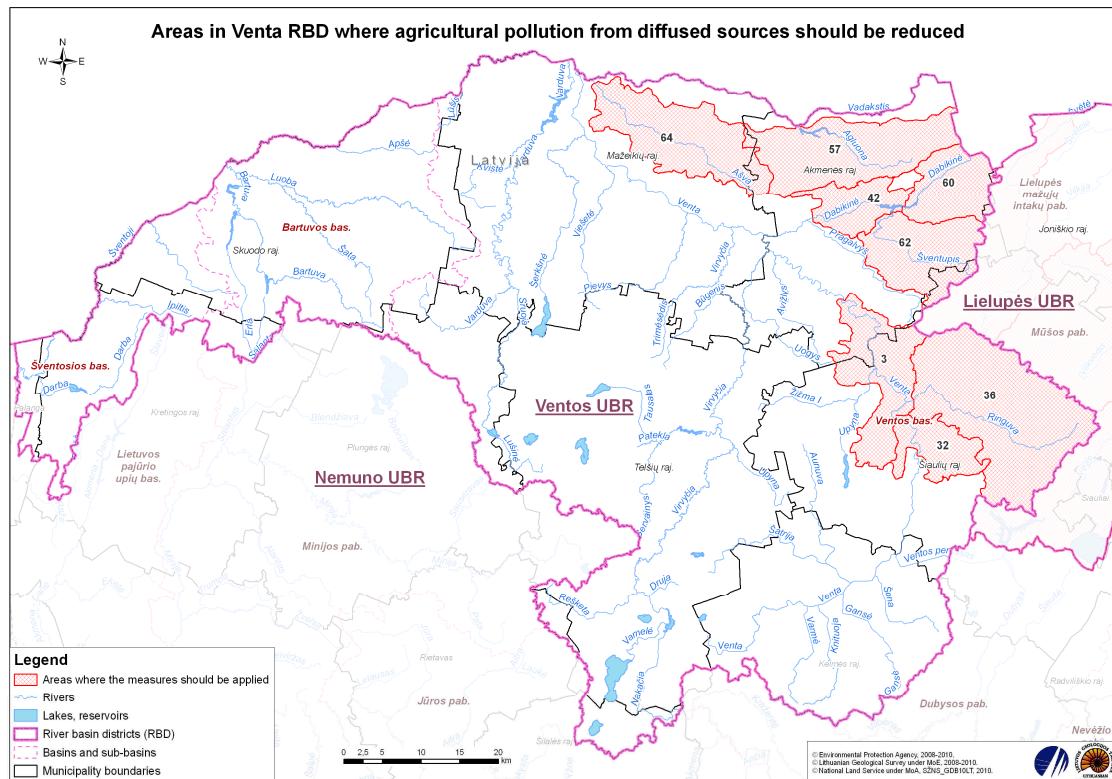


Figure 1. Areas in the Venta RBD where diffuse pollution has to be reduced

108. Diffuse agricultural pollution pressures should be first of all subject to measures which help introducing the polluter pays principle common in many EU Member States. Such measures are proposed for the entire country independently of the intensity of agricultural activities because these measures also play a preventive role. They would also become a reference point for the application of other measures indicating the

amount and type of substances entering the soil. The below-listed are measures recommended for the whole country.

109. Drafting and enactment of normative standards comprising a legal and methodical basis for the development of fertilisation plans covering:

- 109.1. maximum allowable amounts of nitrogen and phosphorus fertilisers per hectare, irrespective of whether organic or mineral fertilisers are used;
- 109.2. general fertilisation recommendations;
- 109.3. a methodology for estimating the economically optimal amount of fertilisers.

The methodology should define fertiliser norms by plant species, taking into account nutrient needs for standard crop yield, give formulas enabling to calculate fertiliser needs depending on the soil physical and agrochemical properties established by the analysis of the soil in a particular field, as well as the correction coefficient for the absorption of substances from different fertilisers.

Similar normative standards have already been prepared by scientists of the Lithuanian Institute of Agriculture. They have established the standard productivity of 12 plant species and nutrient needs for standard crop yield, as well as correction coefficients on the basis of soil physical and agrochemical properties. It is recommended to review and enact these normative standards.

One of the proposed substantial changes is to increase the coefficient of nitrogen absorption from manure. The current coefficient of 0.45 does not reflect the process of nitrogen accumulation in the soil in the long run. It is proposed to increase this coefficient to 0.65. In practice, this would mean reduced fertilisation norms for farmers. The major impact of the measure would be felt on the farms where organic fertilisers make up a considerable share of fertilisers. It is important that the coefficient is changed in parallel with training courses for farmers intended to help them to introduce methods allowing the maximum utilisation of substances accumulated in the soil. Transition to more advanced farming methods is expected to help avoid losses that could result from inefficient farming practices when plants are not allowed to take up substances from the soil.

110. Mandatory development and implementation of fertilisation plans for farms utilising ten and more hectares of land<sup>23</sup>

Enactment of normative standards as such would not have any direct impact on the reduction of diffuse pollution. The effect of the measure would be visible when preparing and implementing fertilisation plans, which, in their turn, would not only ensure balanced fertilisation but would also become a reference point for the application of many other measures related to fertilisation norms. Information would be obtained on the amount and type of substances entering the soil – at least in the area which belongs to farms fertilising ten or more hectares of utilised agricultural land. The introduction of the measure in smaller farms would be complication due to its acceptability and relatively high costs meanwhile its application only in large farms would facilitate control of only a small area of land (and a respective amount of fertilisers therein).

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<sup>23</sup> The number of farms with 10-100 ha within the Venta RBD totals to more than 6 000 (2007). Pursuant to the Manure and Slurry Management Procedure, as from 2011 fertilisation plans will be mandatory for farms with 100 ha and more. There are 358 such farms in the Venta RBD (2007).

Following observations and estimations, it can be stated that the major problem in Lithuania arises from unbalanced fertilisation rather than over-fertilisation. Some areas are not fertilised at all, whereas in other locations, based on the experience of the Agri-Information and Rural Business Centre, the spread of fertilisers is much too high. Farmers mostly use nitrogen fertilisers seeking to increase productive capacity without considering amounts of other elements and their interaction. In the event of a lack or surplus of a certain element, the absorption of other elements is obstructed, i.e. plants cannot take them from the soil. Therefore, the preparation of a fertilisation plan requires knowing nutrient stocks in the soil in a particular field. Analyses of the amounts of the main substances should be a must every spring, while soil acidity, humus percentage, phosphorus and potassium contents, which are less variable, could be tested every five years. The application of optimal fertilisation norms calculated in accordance with the approved norms and methodology would help to balance the ratio of nutrients (N, P, K), i.e. the amount of fertilisers used would be the minimum amount needed by plants, without leaving surplus nutrients in the soil which usually leach into deeper soil layers.

Since the major problem in Lithuania is only local and not general over-fertilisation, the effect of the measures – application of fertilisation norms and mandatory development of fertilisation plans – would be local as well. Estimations of this impact were based on the assumption that half of an area is over-fertilised and the other half is insufficiently fertilised. If over-fertilisation accounts for about 10%, the amount of fertilisers will total to 10 kg/ha in the over-fertilised zones, or 5 kg/ha in the total area (following the said assumption that half of a field is over-fertilised and the other half is insufficiently fertilised). Taking into account that about half of this amount is leached out (according to rough estimates), the effect of the introduction of the norm in the root zone will be 2.5 kg/ha.

Though the strongest effects of fertilisation plans would be observed in intensive agricultural areas, the requirement to introduce such plans only in the said areas might be regarded as breach of competition terms. Hence it is proposed to develop and implement fertilisation plans all around Lithuania. Besides, the application of the measure in areas where pollution from agriculture has less impact on water quality would serve as a pollution prevention measure.

The costs of the implementation of fertilisation plans would be borne by farmers. According to the existing rates based on the data of the Agricultural Advisory Service, the average costs of a fertilisation plan (including sampling) is LTL 100 per field. The number of fields is very different on farms, though an average farm statistically has five fields (this number was derived from the data of farms using the services of the Agricultural Advisory Service). Hence, the average estimated price for the development of a fertilisation plan for a farm was equalled to LTL 500, which makes up 0.3-1.3% of the profit of farms ranging from 10 ha to 150 ha, including subsidies.

111. At present, fertilisation plans can be developed by any person having agricultural education therefore relevant requirements will be set for natural and legal persons developing fertilisation plans.

112. Mandatory observance of manure and slurry management recommendations set forth in the Good Farming Rules and Guidelines by farms with less than 10 LSU

It is proposed to enact the requirement for all Lithuanian farms with less than 10 LSU (i.e. farms which are not subject to the requirements of the Nitrates Directive) to

manage manure and slurry in line with the recommendations set forth in the Good Farming Rules and Guidelines and in compliance with the Environmental Requirements for Manure Management. The Good Farming Rules provide for that solid manure may be temporarily stored in field heaps in accordance with the following recommendations:

- 112.1. temporary manure storage sites must be installed in higher locations to avoid any risk of getting flooded or waterlogged by rain;
- 112.2. the storage site must be confined with a 50 cm embankment;
- 112.3. prior to starting stockpiling manure, the storage site must be covered with a 5 cm thick layer of dry peat substrate or a 70 cm thick layer of chopped straw or leaves to absorb manure runoffs;
- 112.4. the stockpiled manure must be covered with a plastic sheet or a 20 cm mixed layer of peat and chopped straw.

The costs of the installation and maintenance of such manure field heaps for a farmer would be minimal. The required resources include small quantities of straw and peat and a period of working time of a farmer necessary for installation. It is assumed that maintenance would cost about LTL 10 per livestock unit a year (peat, time for maintenance). Such costs should be acceptable to small farms. For example, the average costs on a farm with nine hectares of land and five LSU would make up 0.4% of the gross profit of the farm, including subsidies.

### **Supportive measures to reduce diffuse pollution**

113. Supportive measures usually do not produce any direct effects, but they are very important in implementing other measures. Their introduction is proposed throughout Lithuania, focusing on areas affected by significant diffuse pollution from agriculture. The implementation of educational and information measures falls under the responsibility of the Ministry of Agriculture.

#### 113.1. Education and information of farmers and implementing institutions

Educational measures are usually very effective, but their effect is hard to be measured directly, particularly because this effect is evidenced indirectly and only after a while. The main areas of information and training are as follows:

113.1.1. information campaigns for farmers throughout Lithuania on the maximum allowed fertilisation norms, procedure of the development of fertilisation plans and benefits of the plans;

113.1.2. trainings for developers of fertilisation plans throughout Lithuania.

#### 113.2. Additional control of farms

Control is one of the key mechanisms helping to ensure the implementation of measures. While exercising control over both the measures currently being implemented and the recommended measures, the reallocation of resources is recommended in a way ensuring adequate control at least in the areas which suffer from significant agricultural pollution.

The most effective measures for reducing the amounts of nutrients in water bodies are supposed to have been introduced in Lithuania by now. These include manure storages in large farms, restrictions on animal density and on the use of organic fertilisers,

fertilisation plans on large farms, protection zones and belts of water bodies, and other measures. The important thing in addition to education and other kinds of encouragement to introduce point pollution reduction measures is to increase control. The implementation of the basic measures is especially important in areas suffering from significant agricultural pollution. If control is not exercised and the basic measures are not implemented, supplementary measures will not be sufficient to reduce agricultural pollution to the desired level and so good water status will not be achieved. Since the state is already supposed to be implementing the said measures, no additional funds for control and related activities have been provided for in the present Programme of Measures.

While implementing supplementary measures, it is recommended to conduct additional checks on 5% of all small farms in Lithuania having up to 10 LSU; 10% of farms utilising 10 ha agricultural land and more (which will have to develop fertilisation plans) in areas where supplementary measures are required to reduce diffuse pollution from agriculture; and 2% of farms of the same size in the remaining territory of Lithuania.

It is assumed that a check on a large farm will cost LTL 200 on average and on a small one – LTL 49.<sup>24</sup> Checks on large farms take more time; they may cover not only fertilisation plans but also the implementation of other measures and related requirements (such as contracts on manure transference or sale). Moreover, larger farms are usually located at a considerable distance from each other. Checks carried out on small farms cost less because they usually concern just the storage of manure and slurry and thus are less time-consuming, as well as farms are closer to each other.

The responsibility for the implementation of this measure would rest with relevant competent institutions exercising control over agricultural activities. It is suggested to start exercising control as from 2012.

### 113.3. Additional accountability of farms

The major problem at the moment is local and not general over-fertilisation in districts of intensive agriculture, therefore it is important to establish the amounts of fertilisers used and specific fertiliser application places. Currently, only a small number of farms are obligated to have documents on the use of fertilisers. It is recommended to amend the Environmental Requirements for Manure and Slurry Management approved by Order No. D1-608/3D-651 of the Minister of Environment and the Minister of Agriculture of the Republic of Lithuania of 14 July 2010 introducing the requirement for farms with 50 and more LSU to keep documents proving legal use, transfer or sale of manure and/or slurry at least two years.

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<sup>24</sup> The estimation methodology is provided in the Technical Report (Part VI of the Activity Results).

Table 26. Summary of assumptions underlying the proposed measures<sup>25</sup>

Measure	Mandatory everywhere/ Optional in identified areas	Reimbursable /non-reimbursable	Operating costs, unit/LTL/year <sup>26</sup>	Effect of a unit, N kg <sup>27</sup>	Source of financing	Effectiveness LTL/kg	Area or objects potentially subject to the measure	Measure implementation scope (% from J) <sup>28</sup>	Acceptability, attainability, other assumptions and comments
A	C	D	F	G	H	I	J	K	L
Manure management on small farms	Mandatory in the entire country	Non-reimbursable	LTL 10 LSU	4 (in the root zone)	Farmers' funds	3.3	Livestock on farms < 10 LSU	80%	Acceptability is sufficient. An important condition – provision of information to farmers about new requirements
Mandatory development and introduction of fertilisation plans following the approved methodology on farms from 10 ha	Mandatory in the entire country	Non-reimbursable	LTL 100 per field	2.5 (in the root zone) in agricultural land (or 5 in the over-fertilised zone)	Farmers' funds	Depends on the farm size, number of fields	Agricultural land owned by farms ≥ 10 ha	80%	Acceptability is insufficient, may entail the risk of failure to achieve objectives. An important condition – education of farmers.
Increase of the manure absorption capacity coefficient in the fertilisation plan development methodology	Mandatory in the entire country	Non-reimbursable	LTL 0 per LSU	8 (in the root zone)	Farmers' funds	0	Livestock on farms ≥ 10 LSU	80%	1. In practice, it concerns the reduction of fertilisation norms for farmers using organic fertilisers. If farmers observe fertilisation plans, the measure will be implemented. 2. It is assumed that the share of animal manure generated on farms with more than 10 LSU (from the total amount of manure) is proportionate to the share of hectares which belongs to farms larger than 10 ha.

Source: summarised experts' estimations

<sup>25</sup> Assumptions used for the estimations<sup>26</sup> The cost estimation methodology is provided in the part on the description of measures at each individual measure<sup>27</sup> The effect estimation methodology is provided in the part on the description of measures at each individual measure<sup>28</sup> The share from the maximum potential implementation scope

### **Application of supplementary measures to reduce diffuse pollution**

114. Diffuse pollution loads do not pose any major problem in the Venta RBD. No reduction is required in the Šventoji and Bartuva basins. Nitrogen leaching into water bodies has to be reduced only in the Venta Basin – in the area of 1 167.8 km<sup>2</sup>, which situates 8 problematic catchments (units used for the assessment of agricultural pollution in a mathematical model) with 11 water bodies. It was estimated that pollution loads leached out into water bodies have to be reduced by 1.2 kg/ha – in total 141 tonnes of total nitrogen. Good ecological status/potential of water bodies in the Venta RBD can be achieved by introducing diffuse pollution reduction measures common for the whole of Lithuania, such as:

- 114.1. enactment of maximum allowable amounts of nitrogen and phosphorus fertilisers per hectare, irrespective of whether organic or mineral fertilisers are used;
- 114.2. revision of the fertilisation plan development methodology and enactment of it as mandatory;
- 114.3. introduction of the mandatory requirement to develop fertilisation plans for farms utilising 10 ha and more and to manage manure observing the Good Farming Rules for farms with less than 10 LSU (i.e. for farms which are not subject to the requirements of the Nitrates Directive).

Cost estimates of the agricultural measures are given in Tables 27 to 30 below.

**Table 27. Scope and costs of diffuse pollution reduction in the Venta Basin**

Measures for Venta Basin	Measure application scope, ha/LSU/unit	Effect of the measure on N reduction, kg/year	Annual costs, LTL
Manure management on small farms	29 004 LSU	52 169	290 042
Fertilisation plans on farms ≥ 10 ha	113 232 ha	269 289	2 307 778
Additional control	-	-	48 000
Total:		321 458	2 645 820

Source: experts' estimations

**Table 28. Scope and costs of diffuse pollution reduction in the Šventoji Basin**

Measures for Šventoji Basin	Measure application scope, ha/LSU/unit	Effect of the measure on N reduction, kg/year	Annual costs, LTL
Manure management on small farms	2 341 LSU	0	23 413
Fertilisation plans on farms ≥ 10 ha	7 467 ha	0	177 699
Additional control		-	2 573
Total:		0	203 685

Source: experts' estimations

**Table 29. Scope and costs of diffuse pollution reduction in the Bartuva Basin**

Measures for Bartuva Basin	Measure application scope, ha/LSU/unit	Effect of the measure on N reduction, kg/year	Annual costs, LTL
Manure management on small farms	7 021 LSU	0	70 215
Fertilisation plans on farms ≥ 10 ha	21 606 ha	0	571 465
Additional control		-	8 025
Total:		0	649 705

Source: experts' estimations

All national measures for reducing diffuse pollution are included in Resolution No. 1098 of the Government of the Republic of Lithuania of 21 July 2010, which adopted the Management Plan and Programme of Measures of the Nemunas RBD. It has been decided to avoid overlapping with the national pollution reduction measures provided for in the Nemunas RBD. Consequently, diffuse pollution reduction measures will not be included in the piece of legislation enacting the Programme of Measures of the Venta RBD.

**Table 30. Scope and costs of diffuse pollution reduction in the Venta RBD**

Measures for Venta RBD	Measure application scope, ha/LSU/unit	Effect of the measure on N reduction, kg/year	Annual costs, LTL
Manure management on small farms	38 367 SG	52 169	383 670
Fertilisation plans on farms $\geq$ 10 ha	142 305 ha	269 289	3 056 940
Additional control		-	58 600
Total:	323 000	321 000	3 499 210

Source: experts' estimations

The annual costs of the measures required to reduce diffuse pollution in the Venta RBD would total to around LTL 3.5 million. The major amount would have to be borne by farmers with more than 10 ha of land who will have to develop fertilisation plans (LTL 3 million) and farmers who keep up to 10 LSU (LTL 384 thousand). The burden to the state would total to LTL 59 thousand for the control of the implementation of the measures.

### **Measures to reduce pollution with hazardous and priority hazardous substances**

115. During the project "Identification of substances dangerous for the aquatic environment in Lithuania", concentrations of di-(2-ethylhexyl) phthalate (DEHP) were found to be exceeding the established norms in the Šventoji at the border; allowable concentrations of DEHP and trichloromethane were exceeded in the Venta, also at the border. The sources of the hazardous substances and their routes to the rivers have not been identified yet. A potential source of these substances in the Venta is the oil refinery Mažeikių nafta, wastewater from which is transported to the Venta by the Varduva River. Therefore the stretch of the Varduva downstream of the discharger of the oil refinery has been identified as a water body which fails good chemical status. The entire stretch of the Šventoji flowing along the Lithuanian-Latvian border has been designated as a water body at risk.

Concentrations of hazardous substances exceeding the MAC were detected in the said water bodies during one-time measurements, therefore these concentrations will be analysed in the intensive monitoring sites located at the mouth of the rivers Varduva and Šventoji in order to identify the actual pollution level. It is proposed to postpone the achievement of water protection objectives in the water bodies identified in the Varduva and Šventoji and to perform intensive surveillance monitoring therein until sufficient data is collected proving a significant level of pollution with hazardous substances and allowing planning pollution reduction measures.

### **Measures to improve hydromorphological status**

116. The main reasons which determine hydromorphological changes in water bodies and thus prevent the achievement of good ecological status in some bodies of water are related to:

- 116.1. artificial barriers (disruption of river continuity),
- 116.2. hydropower plants,
- 116.3. straightened rivers.

To eliminate these causes or mitigate their impact, the following measures are proposed:

- 116.4. restoring/ensuring river continuity and flow,
- 116.5. reduction of the impact of hydropower plants,
- 116.6. renaturalisation of river beds.

### **Construction of fish bypass facilities**

117. The most important measure which allows mitigating impacts of disruption of river continuity is construction of fish bypass facilities. Five fish migration facilities were constructed in the Venta RBD during the last couple of years. Four of these were constructed on the Venta River: fish bypasses in Jautakiai (2004), Rudikiai (2002), Kuodžiai (2005) and Viekšniai (2008). Another fish bypass has been constructed in the Šventoji (Baltic) River at Laukžemė dam (2008). Fish bypass facilities should be first of all constructed in rivers which are most important for fish migration. Such place in the Venta RBD is Bugeniai dam.

Construction of fish bypass facilities should be based on specific feasibility studies selecting the most suitable technological solution for the bypass. The construction should also be supplemented with monitoring data both prior and after the construction in order to be able to assess an impact of such facility of the ecological status of the river and to select the best alternative. However, no such information is available in Lithuania hence the impact analysis should be postponed for the second stage of the development of the plan for the Venta RBD, i.e. the planning cycle from 2015.

Supplementary priority measures are established following the List of Dams where Facilities for Fish Migration are Required and on the List of Former Dam Remains where Barriers for Fish Migration Have to Be Removed, which provide for both construction of fish bypass facilities and removal of the remains of former dams. Having supplemented these lists on the basis of expert judgement, the fish bypass facilities required and the barriers to be removed in the Venta RBD are provided in Table 27.

Table 27. Fish bypass channels required and dam remains to be removed in the Venta RBD and their costs, LTL

River	Dam	Measure****	District	Investment costs, 2009*, LTL
Fish bypass facilities				
Šerkšnė	Bugeniai dam***	Fish pass <sup>(2)</sup>	Mažeikiai distr.	151 500
Barriers to be removed				
Šerkšnė	Rock weir	to remove the rock weir <sup>(1)</sup>	Mažeikiai distr.	24 200
Šata	Rock weir	to remove the rock weir <sup>(2)</sup>	Skuodas distr.	24 000**
Total:				200 000

Source: List of Dams where Facilities for Fish Migration are Required and List of Former Dam Remains where Barriers for Fish Migration Have to Be Removed, and expert judgement.

\* Costs taken from the study “Improvement of fish migration conditions in ichtiologically important rivers” (Gedilieta and Institute of Ecology, 2001) and adjusted for 2009 taking into account the inflation.

\*\* Removal costs of the rock weir on the Šata have not been analysed in previously conducted detailed studies therefore the same costs are proposed as the costs for the Šerkšnė River.

\*\*\* On the Šerkšnė, first, the rock weir downstream of Bugeniai dam should be removed and only then a fish pass at Bugeniai dam should be built.

\*\*\*\* <sup>(1)</sup> a higher priority measure, <sup>(2)</sup> a lower priority measure

Construction of one fish bypass and removal of two old dam remains will require around LTL 200 thousand of investment costs. If this amount is distributed evenly on a yearly basis from 2011 until 2015, the annual demand would be about LTL 40 thousand.

However, although the necessity of a number of works has been approved by an order of the Minister of Agriculture, no funds have been allocated for this purpose. Therefore it is proposed to envisage funds for the fish migration facilities and removal of old dam remains for the next programming period (2014-2020).

An artificial barrier mechanically blocks the water way for the migration of water organisms. This impact is most significant for migratory fish: they are blocked from the river stretch upstream of the barrier, therefore the fish species variety in such river stretch is always much lower than in the stretch downstream of the barrier (at the expense of migratory and, in a way, semi-migratory fish species). As a result (due to the decreased variety of sensitive fish species), the ecological status of the river stretches upstream of the artificial barrier is always lower by the fish index than the ecological status of those downstream of the barrier. Construction of fish bypass facilities mitigates the said impacts. However, measures which are necessary to ensure (or improve) conditions for fish migration produce different effects on the status of fish populations. Some rivers are particularly important for the reproduction of migratory or semi-migratory fish and hence migration barriers have a highly significant impact on the status of their populations (and also on the ecological status of the river), meanwhile construction of fish passes (or removal of barriers for migration) in other rivers would produce a lower effect. Accordingly, different priorities were given to the measures designed to provide for conditions for fish migration. A higher priority was granted to migration conditions in rivers (at the barriers) which are important for migratory fish, including the fish species and lamprey species protected under the Habitats Directive, as well as for the Sea Trout (the International Council for the Exploration of the Sea (ICES) is currently working on a plan for the protection of the population and enhancement of the resources of the Baltic Sea Trout, which would be implemented by all countries in the Baltic Sea region). Provision of adequate migration conditions in these rivers would enhance the overall status and resources of the said fish populations in Lithuania and

would improve the ecological status (by fish indices) of the river stretches upstream of the artificial barriers. The protected fish species in the Venta and Bartuva basins are the River Lamprey and the Sea Trout (migratory fish). The migration of these species to a tributary of the Venta, the Šerkšnė, is prevented by the rock weir of a former mill in lower reaches of the river. Hence the improvement of migration conditions at this weir is given a higher priority. Another barrier for fish migrations is located in the Šerkšnė River upstream of the weir. Here, fish migration conditions should be improved only if the path for migration is opened up at the barrier located downstream. In the Bartuva Basin, a hardly passable barrier is Juknaičiai weir on the Šata River. Since this weir only partially blocks the migration of the said species (depending on hydrological conditions), the improvement of migration conditions at this barrier should be given a lower priority. Following the criteria set for the Nemunas RBD, the barriers for fish migration in the Venta RBD would be given lower – second and third – priorities.

### **Measures to reduce the impact of HPP**

118. River stretches downstream of hydropower plants are proposed to be assigned to water bodies at risk due to unnatural fluctuation of their water level and runoff. Besides, turbines of certain types injure by-passing fish. Six water bodies in the Venta RBD identified in the rivers Venta, Dabikinė, Patekla, Varduva, Sruoga and Bartuva have been designated as water bodies at risk due to a significant impact of HP. Such impact can be mitigated by replacing old-type turbines with modern ones which are more environmentally friendly.

119. There are 28 HPP in the Venta RBD. There is no need to replace turbines in newly built HPP; however, when such need arises, HPP owners should be obligated to replace the old turbine with an environmentally friendly one.

Assuming that the owners of small HPP will be able to make use of the EU support for the introduction of environmentally friendly turbines, the following priority turbines of importance for fish resources will have to be replaced:

- 119.1. HPP in Rudikiai – 40 kW,
- 119.2. HPP in Viekšnai – 90 kW,
- 119.3. HPP in Alsėdžiai – 75 kW,
- 119.4. HPP in Leckava – 125 kW.

The total costs of the replacement of turbines with modern ones in the Venta RBD are estimated at about LTL 1 320 thousand because the cost of a new turbine is about LTL 4 000 per one kW (see the paragraph on assumptions).

This Programme of Measures also suggests amending/supplementing a number of legal acts, which would facilitate reduction of HPP impact on water bodies.

### **Remeandering of rivers**

120. The length of straightened rivers and streams in the Venta RBD, established using GIS methods, totals to 560 km. 36 water bodies (with the total length of 385 km) in the Venta RBD have been identified as water bodies at risk due to a significant impact of straightening. 11 water bodies (174 km) have been assigned to heavily modified water bodies.

Remeandering is an expensive process and may lack justification as compared to its benefits. Hence, the following is proposed for the Venta RBD:

- 120.1. to leave the stretches of rivers flowing in the upper reaches of rivers, in hilly, springy, laky and protected areas which already are in the process of the natural regaining of their original state for complete self-naturalisation;
- 120.2. to perform renaturalisation of rivers only in areas with a clear public demand (settlements, parts, etc.) as well as in places where the naturalisation can have a significant effect of minimising floods, capturing pollutants and increasing/restoring biodiversity (habitats of plants and animals);
- 120.3. to leave the stretches of rivers in non-agricultural areas for self-naturalisation controlling this process with regard to drainage needs in the upstream and downstream areas.

The studies “Preparation of a feasibility study and recommendations on the establishment/restoration of wetlands aiming to reduce the input of organic and biogenic emissions into water bodies” and “Preparation of a feasibility study on the restoration of morphological and ecological conditions close to the natural ones in straightened rivers and streams and development of practical recommendations for the activities to restore the said conditions” analysed remeandering costs. Although such costs depend on the river width, slope of the depth and other characteristics, the average demand of investment costs for one kilometre is about LTL 100 thousand (including land acquisition costs).

The total length of straightened rivers at risk flowing over plains within the Venta RBD is 560 km. Remeandering of these stretches to the maximum extent would cost approximately LTL 20.4 million. The operating costs can be equated to zero. The total annual costs would be around LTL 1.6 million. However, no funds for renaturalisation are available at the moment. In addition, the acceptability of the measures to the public is still very low. As a result, no river renaturalisation measures are proposed at this stage.

### **Studies and monitoring of the status in water bodies**

121. Although there are water bodies in the Venta RBD which may be suffering from pollution from both point and diffuse pollution sources, no accurate data thereon is available at the moment. In addition, rivers in the Venta Basin have substantial hydro power capacities but physical impacts of HPP on water bodies and their significance for hydromorphological and biological elements has not been sufficiently studied. To this end, investigative monitoring of the water bodies affected by HPP has been proposed upstream of the impoundment in the Programme of Measure for Achieving Water Protection Objectives within the Nemunas RBD approved by Resolution No. 1098 of the Government of the Republic of Lithuania of 21 July 2010 (Žin., 2010, No. 90-4756). The monitoring results obtained represent the conditions not only of the Nemunas River Basin but also those in other river basin districts.

The problematic water bodies whose pollution causes have to be identified are discussed below.

Pollution load models suggest that the ecological status of Lake Mastis should be high; however, according to both monitoring data and lake study findings, the ecological status of the water body is lower than good. It should be noted that, following the modelling data, point pollution in Lake Mastis accounted for 45% (although as such it should not

be exerting a significant impact). The status of Lake Mastis may be materially affected by pollutants transported with surface runoff from the urban areas. Also, it is highly likely that the lake is being polluted with wastewater discharged from households illegally connected to the surface runoff collection system. Hence inventory of pollution sources and investigative monitoring are required in order to identify the causes determining poor status of this lake. At the same time, analysis of hazardous substances and heavy metals in the lake water and sediments is required. A lake study findings indicate that the lake used to be polluted with industrial wastewater, pollutants from diffuse pollution sources continue entering the lake. Such studies would enable more precise identification of the chemical status of the lake (to date, no monitoring data on the chemical status of the lake is available).

Poor ecological potential of Lake Biržulis could be determined by resuspension of biogenic substances accumulated in bottom sediments into the water and significant drop in the water level (change in the hydrological regime).

In 1954, the water level of Lake Biržulis was lowered by ~1.5 m to create cultivated grasslands. As a result, the lake area decreased more than six times. Nevertheless, the attempts to create grasslands failed practically in all drained areas, which finally were overgrown with sedges, bushes or floating bogs above shallow water. The annually increasing area of the floating bogs reduces the area of the remaining southern part of the lake meanwhile the sedgy northern area is gradually overgrown by bushes.

Today the lake and wetlands which have opened up after the lowering of the lake water level practically are not suitable either for farming or recreational purposes. However, this is an area important for the conservation of birds. Continued changes in the lake and riparian wetlands can have a negative impact on the birds and aquatic communities therein. In addition, the ecological potential of Lake Biržulis may be affected by resuspension of biogenic substances accumulated in bottom sediments into the water as well as by diffuse pollution (the modelling results suggest that the lake is subject to certain pollution loads but its ecological status should still be good).

It is recommended to study changes in the physico-chemical and morphometric parameters of the lake in more detail (to conduct more intensive – investigative monitoring, including checks of pollution sources situated around the lake and assessing changes of the morphometric parameters of the lake). Such studies would enable evaluating possibilities to stabilise the ecological potential of the lake.

Causes conditioning poor ecological status of Lake Gludas are not known. Mathematical pollution load modelling results indicate that the status of the lake should be high. However, following the lake study findings, sometimes fish deaths occur in this lake during prolonged ice cover periods. No monitoring data is available on the quality parameters of this lake. Hence, monitoring of the quality parameters is required (within investigative monitoring) to establish whether the lake should really be designated as a water body at risk.

Pollution load modelling results suggest high ecological status of Sablauskių pond; however, according to monitoring data, it is lower than good. It should be noted that, following the modelling data, point pollution in this pond accounts for 47% of the pollution load therein (although as such it should not be exerting a significant impact).

Hence inventory of pollution sources and investigative monitoring are required in order to identify the causes determining poor ecological potential of this pond.

Lower than good ecological status of Lake Alsėdžių ežeras and Lake Tausalas could be determined by historic pollution (modelling results suggest high status of these lakes). To be able to identify the origin of pollution of these lakes lake at risk (to find out whether they suffer from anthropogenic pressures due to historic or present pollution), detailed studies (investigative monitoring, including monitoring of the near-bottom layer of the lake, checks of the pollution sources around the lake) are required.

The research required is summarised in Table 28 below. Such studies also cover provision of information on the importance of the Programme of Measures for Achieving Water Protection Objectives in the basin management processes to the population of the Venta RBD as well as provision of information on the national diffuse pollution reduction measures to farmers and other groups of interest in this RBD.

Table 28. Studies required in the first implementation stage of the Programme of Measures for the Venta RBD

<b>Study or educational measure</b>	<b>Required costs</b>		
	<b>Investment/ one-time, LTL</b>	<b>Operating, LTL/year</b>	<b>Annual, LTL/year</b>
Inventory of morphometric, physico-chemical and biological parameters and sources and analysis of identified pollution sources in Lake Biržulis	18 000		2 000
Investigative monitoring, including monitoring of the near-bottom layer, and inventory of pollution sources in Lake Alsėdžių ežeras and Lake Tausalas	35 000		5 000
Investigative monitoring and inventory of pollution sources in Lake Mastis and Sablauskų pond	105 000		14 000
Information campaigns for implementers of the Programme of Measures and for the general public		10 000	10 000
<b>Total</b>	<b>158 000</b>	<b>10 000</b>	<b>31 000</b>

Source: experts' estimations

### **Amendment of relevant legislation**

122. Amendment of certain legislation may be a sufficient measure for improving status of a number of water bodies. One of the amendment proposals concerns the Special Conditions for the Use of Land and Forest approved by Resolution No. 343 of the Government of the Republic of Lithuania of 12 May 1992. It is recommended to enact new sizes of sanitary protection zones of wastewater treatment facilities taking into account the level of modern treatment technologies.

Table 29 provides recommended amendments of relevant legislation to reduce the impact of HPP. The implementation of these legal acts will positively affect the status of water bodies not only within the Venta RBD but also in entire country.

Table 29. Recommended amendments of relevant legislation

<b>Recommended amendment</b>	<b>Current situation</b>	<b>Effectiveness of the measure</b>	<b>Potential effect and implementation of the measure</b>	<b>Costs, implementers, deadlines and funding sources</b>
To obligate the owners of HPP with the capacity of 100 kW and more to ensure hourly automatic transmission of water level measurements to the data base of the Environmental Protection Agency	The Standard Rules provide for that water levels in the pond and in the tail bay have to be registered with the help of automatic water level measuring and registering devices every hour and transmitted to the data base at the real time (paragraph 42). However, no internet access to the data is required as well as there is no obligation to revise the downstream discharge rating curve.	Environmentally effective measure	Paragraph 42 of the Standard Rules has to be supplemented with the obligation to provide Internet access to the water level data. However, it is not easy to enact this obligation due to potential resistance of HPP owners on the following grounds: 1) the right of transferring data ownership to another party; 2) data transmitting and equipment installation/maintenance costs.	EPA/Ministry of Environment may have to finance maintenance of servers for the access to the data: 12 months x LTL 50 = LTL 600 x 60 HPP = LTL 36 000 per year
To obligate HPP owners to develop and annually revise downstream discharge rating curves for the dry season	There is no such obligation under the legislation in force	Effective measure		New requirement
To introduce the requirement to select suitable start-up power and number of regulated turbines in newly built hydropower plants with a view to reduce a negative impact of hydropower plants on the status of water bodies	The existing Standard Rules do not cover this requirement. This is a prerogative of HPP planning and not of pond maintenance.	Effective measure	HPP operator would be aware of the requirements in advance and would be better able to adjust the turbines to the natural regime of the river.	New requirement
To develop a methodology for the assessment of damage done by hydropower plants for water bodies as a result of failure to observe the established environmental requirements.	The legislation in force does not cover this requirement	Effective measure	A possibility would open up to better control HPP owners and provide for relevant environmental measures.	New requirement

### Summary costs of supplementary measures and the whole Programme of Measures

123. Summary information on the costs of supplementary measures is provided in Table 30 below.

Table 30. Costs of supplementary measures for the Venta RBD

<b>Measures, excl. reduction of point pollution, renaturalisation of river beds and replacement of turbines</b>	<b>Investment costs, LTL</b>	<b>Operating costs, LTL/year</b>	<b>Annual costs, LTL/year</b>
Reduction of diffuse pollution	0	3 500 000	3 500 000
Hydromorphological changes	200 000	4 500	17 100
Research and education	158 000	10 000	31 000
<b>Total ~</b>	<b>360 000</b>	<b>3 510 000</b>	<b>3 550 000</b>

Source: experts' estimations

124. The total costs of the whole Programme of Measures, including both the basic and the supplementary measures, are provided in Table 31 and Figure 2.

Table 31. Implementation costs of the whole Programme of Measures for the Venta RBD until 2015

<b>Group of measures</b>	<b>Investment costs, LTL</b>	<b>Operating costs, LTL/year</b>	<b>Annual costs, LTL/year</b>
<b>Basic measures</b>			
Bathing Water Directive	0	50 000	50 000
Birds Directive	666 000	344 000	434 000
Drinking Water Directive	together with the costs of the Nitrates Directive		
Major Accidents Directive	200 000	0	27 000
Environmental Impact Assessment Directive	0	280 000	280 000
Sewage Sludge Directive	51 317 000	1 539 510	6 013 510
Urban Wastewater Treatment Directive	81 090 000	1 621 800	8 691 800
Plant Protection Products Directive	1 460 000	12 500	261 500
Nitrates Directive	82 360 000	823 600	8 004 600
Habitats Directive	180 230	495 710	519 710
IPPC Directive	100 000	0	14 000
<b>Basic measures in total</b>	<b>217 370 000</b>	<b>5 170 000</b>	<b>24 300 000</b>
<b>Supplementary measures</b>			
Point pollution	0	0	0
Diffuse pollution	0	3 500 000	3 500 000
Hydromorphological changes	200 000	4 500	17 100
Studies and education	158 000	10 000	31 000
<b>Supplementary measures in total ~</b>	<b>360 000</b>	<b>3 510 000</b>	<b>3 550 000</b>
<b>Basic and supplementary measures</b>			
<b>GRAND TOTAL ~</b>	<b>217 730 000</b>	<b>8 680 000</b>	<b>27 850 000</b>

Source: experts' estimations

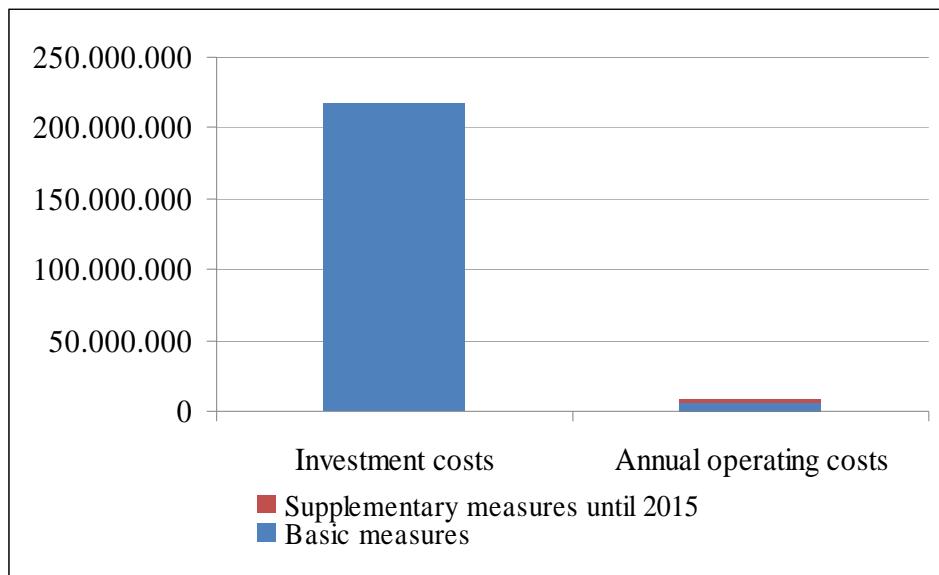


Figure 2. Investment and operating costs of the implementation of the basic and supplementary measures in the Venta RBD until 2015

Source: experts' estimations

The investment costs of the supplementary measures proposed for the period until 2015 make up only 0.17% of the total investments for the entire Programme of Measures. The operating costs of the supplementary measures account for 40% of the total demand of annual operating costs because annual maintenance of most of the basic measures makes up 1-3% of the investments, meanwhile the amount of investments in the programme of supplementary measures is not high but the major share consists of funds required to reduce diffuse pollution. It is important to note that the latter funds are mainly private funds meanwhile the investments are funded from the national and EU budgets.

#### **CHAPTER IV. BENEFITS OF ACHIEVING GOOD STATUS IN WATER BODIES**

125. The benefit which will be obtained upon the implementation of the supplementary measures has been estimated on the basis of the findings of the “Study on willingness to pay for improvement of the Nevezis River water quality to achieve good status” and the “Study on willingness to pay for improvement of the Neris River water quality to achieve good status and remeandering of the Neris”. Such relative assessment studies are rather widely used in many countries for the estimating benefits of natural resources (i.e. the benefits which cannot be estimated using conventional economic-commercial methods).

The said two sub-basins are situated in the Nemunas RBD. It is believed that the benefits derived therein may be directly transferred into other sub-basins in Lithuania due to highly similar geographical and social conditions throughout the country.

It was estimated that a statistically reliable monthly amount which respondents agreed to pay in the Nevezis Sub-basin is LTL 1.85 per household (including the households which agree to pay 0 litas). Such study was conducted in 2007.

The “Study on willingness to pay for improvement of the Neris River water quality to achieve good status” identified four scenarios.

125.1. Willingness to pay for improvement of all water bodies in the Neris Sub-basin to achieve good ecological status;

125.2. Willingness to pay for improvement of all water bodies in the Neris Sub-basin to achieve good ecological status and also for remeandering of straightened rivers;

125.3. Willingness to pay for improvement of the water quality of Lake Riešės ežeras to achieve good ecological status;

125.4. Willingness to pay for improvement of the water quality of Lake Riešės ežeras and Lake Didžiulis to achieve good ecological status.

126. In this way statistically reliable figures illustrating willingness to pay both for individual water bodies and for improvement of all bodies of water in the Neris Sub-basin were derived.

In the Neris Sub-basin, the amount agreed to be paid by one household was LTL 40.51 per year, or LTL 3.38 per month only for improvement of the water quality, and LTL 48.18 per year, or LTL 4.01 per month both for improvement of the water quality and remeandering of rivers. In the first case, the amount totals to about 0.29% and in the second case – to 0.36% of the income of the studied households.

In the case of willingness to pay (i.e. to pay more than 0 litas), the payment for improvement of the water quality and remeandering of rivers totals averagely to more than 30% of people's water bills.

Having in mind that the number of population in the Venta RBD is totals to about 190 thousand and that the size of one household is 2.4 persons, the benefit estimated on the basis of the said study would be around LTL 320 thousand per month, or LTL 3.8 million per year.

It should be pointed out that these figures are provided for the purposes of information on how people in the Venta RBD view good status in water bodies.

At the present stage of the development of the Programme of Measures, the measures selected pursuant to a cost-efficiency analysis are those which will be the most effective during the first cycle of the implementation of the Management Plan. The question of whether the costs of a measure intended for achieving good ecological status in a water body are disproportionate or not and whether such costs may serve as a basis for derogation is a political decision based on economic information. Such decision needs comparing relevant costs and benefits. The principle of disproportionate costs, i.e. cost-benefit comparison was not required in any case of extension of the deadline in the Venta RBD. All cases of extension are based either on technical uncertainties already discussed or on affordability and/or negative attitude (acceptability) of the public to implement such measures by 2015. The latter is in a way a component of the principle of disproportionate costs. Besides, only extension of the deadline for the attainment of good water status objectives is required and no lower objects are proposed. Consequently, a cost-benefit analysis and the figures illustrating the benefit which are given in this section were not required at this stage.

## **CHAPTER V. AFFORDABILITY ANALYSIS**

127. An affordability analysis plays a very important role in providing rationale for a possibility and deadline to achieve the proposed ecological status in water bodies. Even when measures are feasible technically, they can be too expensive for the specific implementer – household, agricultural unit, municipality, or the state.

An affordability analysis requires information on two things: demand of costs and supply of potential funding sources.

It should be pointed out that the option of redistributing public finances among sectors (when the usual allocations for environmental measures are found to be insufficient for the implementation of the programme) is not to be considered at the present stage of the development of the Programme of Measures and RBD Management Plan due to the persisting consequences of the financial crisis, which started back in 2008, and therefore ways to continue reducing the budget deficit are still sought at the state level. One option is to cut down various expenditure of the public sector.

### **Affordability to the state**

128. The text below contains comparisons of the demand of investment costs against the existing and future funds from potential financing sources by every measure required:

- 128.1. EU funds,
- 128.2. state budget,
- 128.3. municipal budgets,
- 128.4. other state or municipal funds.

### **Wastewater management**

129. Planned measures in the Venta RBD include construction of one new and reconstruction of two existing wastewater treatment plants, and construction of 50 km of new sewerage networks and 50 km of new water supply networks. In addition, LTL 4.717 million for sewage sludge management in Akmenė and LTL 25.2 million for sewage sludge management in Telšiai have been provided for from the same funding sources. It should be noted that sewage sludge from the neighbouring wastewater treatment plants will also be handled in these facilities.

Accordingly, almost LTL 140 million have been allocated for the existing wastewater and sewage sludge management and water supply facilities in the Venta RBD for the period until 2013, which is the cost of the basic measures.

The achievement of the established good ecological status objectives requires additional reduction of surface runoff loads in Naujoji Akmenė. According to preliminary estimates, these measures would require about LTL 3 million of investment costs. Although surface runoff management is one of the priority measures identified by the Ministry of Environment, it is not included among the national investment projects which are planned to be implemented by 2013 and which have already been allocated EU and state budget funds, and hence no funding has been envisaged for this measure. In addition, no adequate investment project has been fully prepared for funding as there are no feasibility studies conducted or technical projects developed. Hence there are no possibilities to implement such project during the first stage of the Programme of Measures for the Venta RBD. However, efforts should be made to conduct a required

feasibility study and prepare technical drawings so that they are completed and ready for implementation after 2013.

### **Measures to restore hydromorphology**

130. Estimates indicate that the construction of fish passes and the removal of old dam remains require about LTL 200 thousand of investment costs.

Though the necessity of a number of works has been approved by an order of the Minister of Agriculture of the Republic of Lithuania, no funds have been allocated for this purpose. Therefore, it is proposed to take advantage of the EU assistance envisaged for the period from 2014 and to implement the measures related to the construction of fish passes by the end of 2015. If the state has to co-finance, for example, 25% of the total required amount, its contribution would total to LTL 50 thousand. If the measures are implemented in two years, the annual demand of budgetary funds to be allocated through the Ministry of Environment or the Environmental Protection Agency would be LTL 25 thousand.

Remeandering costs in the Venta RBD, if decided to restore meanders, would total to about LTL 20.4 million. If these investment costs are distributed for a five years' period (until 2015), the annual demand of additional costs would be about LTL 4.1 million. However, it is not clear where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At present, the state would not be able to afford such measure. Besides, an impact of the remeandering on the status of a stream in question is not known yet. Hence it is recommended that actions until 2015 are limited to the implementation of a pilot project on renaturalisation in the Grūda River in the Merkys Sub-basin.

### **Agriculture**

131. As already said in the sub-section on supplementary agricultural measures, diffuse pollution does not have any significant impact in the Venta RBD. However, the key measures – development of fertilisation plans for farms with 10 ha and more and manure management on small farms (with less than 10 LSU) – have been envisaged for the whole of Lithuania, hence additional state funds for controls over the implementation of these activities would amount to about LTL 59 thousand every year. This means a demand of additional two employees, if the average wage in the public sector in 2009 is applied (LTL 2 283 per month). Should this function be divided among the municipalities which occupy the largest areas in the Venta RBD and which have agricultural land, the employees responsible for the supervision of fertilisation plans in the respective environmental agencies in each of these municipalities would have to devote additional 0.25 of their working time for this task. It is proposed to provide for such additional funds in the budget of the Ministry of Environment of the Republic of Lithuania. If no additional funds could be allocated from the state budget, an alternative solution would be to revise the functions of the specialist in charge of control over the implementation of agricultural measures and to redistribute these functions in a way to include inspection of the development and implementation of fertilisation plans.

### **Research and educational projects**

132. In addition to investment costs, one-time costs will be required in the Venta RBD for supplementary research and education, totalling to around LTL 158 thousand.

Of the said amount, LTL 87 thousand will be needed until 2013 and the remaining amount of LTL 71 thousand – after 2013. EU support has already been envisaged to provide LTL 10 thousand for trainings on agricultural measures. EU support funds are also suggested for measures to be implemented during the next planning period after 2013. In such case, provided that the EU co-financing accounts for 75% of the value of one-time projects, the contribution of the national budget would total to LTL 18 thousand: LTL 9 thousand in 2014 and LTL 9 thousand in 2015.

The demand of funds for research in the Venta RBD from the state budget for the period until 2013 totals to LTL 87 thousand: LTL 20 thousand for 2011 and LTL 67 thousand for 2012.

In the event of rational planning and use of funds, the financing of supplementary measures is not expected to constitute a burden to the state budget, i.e. the budget of the Ministry of Environment either before or after 2013.

#### **Municipal affordability**

##### **Wastewater management**

133. The surface runoff management project for Naujoji Akmenė is not to be implemented during the first stage of the Programme of Measures for the Venta RBD, therefore today the municipality has simply to include the project into future plans (after 2013) and take care of adequate preparation of the required documents.

If a similar procedure is applied in the next EU financing period after 2013 as today (2007-2013) and if the EU co-financing makes up, for example, 70% of the investments of a project, the municipality of Naujoji Akmenė would have to co-finance the remaining amount of 30%, i.e. LTL 822 thousand in total at 2010 prices.

#### **Measures to restore hydromorphology**

134. The state contribution has been envisaged for the construction of fish passes and removal of dam remains in addition to the EU support, hence no burden will be placed on municipalities.

#### **Affordability to households**

135. No additional costs will be required for wastewater management in the Venta RBD therefore affordability of this measure to households has not been estimated.

Other supplementary measures (restoration of hydromorphology, energy, agriculture) do not have any effect on the burden for households.

#### **Affordability to the energy sector**

136. The turbines of four HPP in the Venta RBD have to be replaced with modern ones, requiring LTL 1.3 million. Without the EU support, such burden is too high for the HPP owners; however, no EU support for hydropower has been envisaged for the planning period 2007-2013. The only solution is to plan the implementation of this measure for the next period, i.e. after 2013.

### Affordability to the agricultural sector

137. The number of farms in the range from 10 to 100 ha which will have to develop fertilisation plans under this Programme of Measures in the Venta RBD totals to more than 6 000 (data of 2007). Pursuant to the Environmental Requirements for Manure and Slurry Management, as from 2011, fertilisation plans will also have to be developed by farms with 100 ha and more. There were 358 such farms in the Venta RBD in 2007. It is assumed that only a small number of farms are preparing fertilisation plans at the moment, so the effect of the measure was estimated for all farms with 10 ha and more.

The annual costs of all farms with less than 10 LSU in the Venta RBD total to approximately LTL 384 thousand. This amount is based on the assumption that the annual costs of manure management following the good practice requirements on a small farm will be as low as LTL 10 per one livestock unit. The total annual costs of the development of fertilisation plans in the Venta RBD amount to LTL 3 057 thousand assuming that the development of one fertilisation plan for an average farm costs about LTL 500.

The share of expenses of a farm with 5 fields and 5 LSU for the envisaged measures in variable and fixed costs and profit with subsidies would make up about 0.4-1.5%. Hence the costs of both the development of fertilisation plans and implementation of the manure management requirements are deemed to be acceptable, even when these two measures have to be implemented together.

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