

Programme of Measures for achieving water  
protection objectives within the Nemunas River  
Basin District  
Annex 2

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

**CHAPTER I. GENERAL PROVISIONS**

1. The Programme is designed for the Nemunas RBD which consists of the Lithuanian part of the Nemunas River Basin, the Lithuanian Coastal Rivers Basin (with the exception of the Šventoji River Basin and the Bartuva River Basin), the Lithuanian part of the Prieglius River Basin, the Lithuanian part of the Curonian Lagoon (*Kuršių marios*), as well as the plume of the Curonian Lagoon in the Baltic Sea and coastal waters of the Baltic Sea within the territory of the Republic of Lithuania.

The Programme was drawn up upon analysis of the status of water bodies within the Nemunas 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 Lithuanian water legislation, 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 the 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 achieve the set water protection objectives. These measures must be inter-coordinated so as to adopt the most effective set of instruments which will enable attainment of the set objectives at the lowest cost. Supplementary measures are chosen on the basis of a socio-economic impact analysis: the assessment of the efficiency of the measures and the cost-benefit assessment of the achievement of water protection objectives.

A wide range of measures can be available. Some of them are purely engineering measures, e.g. construction of domestic and industrial wastewater facilities, installation of protection belts for water bodies, renaturalisation of straightened river beds, etc. Other instruments are legal (e.g. permits for carrying out economic activities, impoundment of rivers or construction of hydropower plants, 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 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 Nemunas 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 WITHIN THE NEMUNAS RBD**

2. Pursuant to Part A of Annex VI to the Water Framework Directive 2000/60/EC, 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 concerning the management of bathing water quality and repealing Directive 76/160/EEC;

2.2. Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds;

2.3 Council Directive 98/83/EC on the quality of water intended for human consumption;

2.4. Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances as amended by Directive 2003/105/EC of the European Parliament and of the Council of 16 December 2003;

2.5. Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2009/31/EC of the European Parliament and of the Council of 16 December 2003;

2.6. Council Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture as amended by Council Directive 91/692/EEC of 23 December 1991;

2.7. Council Directive 91/271/EEC concerning urban wastewater treatment as amended by the Commission Directive 2010/42/EEC of 27 February 1998;

28. Council Directive 91/414/EEC concerning the placing of plant protection products on the market as amended by the Commission Directive 2010/42/EU of 28 June 2010;

2.9. Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources;

2.10. Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora as amended by the Council Directive 97/62/EC of 27 October 1997;

2.11. Directive 2008/1/EC of the European Parliament and of the Council concerning integrated pollution prevention and control as amended by Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009.

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 ACQUIS**

### **Urban Wastewater Treatment Directive (91/271/EEC)**

3. The measures required for the implementation of this Directive are one of the most important and investment-intensive basic measures which usually result in improvement of surface water quality. According to the data provided by the Environmental Protection Agency, there were 1 412 wastewater dischargers emitting 256 million m<sup>3</sup> of wastewater per year in the Nemunas RBD in 2007. Wastewater from 1 342 dischargers was emitted into rivers and lakes, from 65 – into the Curonian Lagoon, and from 5 – into the Baltic Sea. The number and designation (according to the type of effluents) of the dischargers identified in the basins and sub-basins of the Nemunas RBD are given in Table 1 and point pollution loads are provided in Table 2.

Table 1. The number of dischargers and type of discharges in basins and sub-basins of the Nemunas RBD

Basin/sub-basin	Number of dischargers	of which the number of dischargers with the following designation (code):						
		0	1	2	3	4	5	6
Žeimena	45	10	4	0	2	13	10	6
Šventoji	138	47	8	0	9	44	24	6
Neris Small Tributaries	210	80	7	3	12	50	36	22
Merkys	35	5	4	0	3	16	6	1
Nevezis	177	63	5	0	4	71	33	1
Šešupė	149	62	10	0	4	33	39	1
Dubysa	23	4	2	1	0	12	4	0
Jūra	91	32	6	1	4	24	23	1
Minija	63	18	4	1	0	27	13	0
Coastal Rivers	119	67	6	2	6	6	32	0
Nemunas Small Tributaries	292	170	12	5	12	53	39	1
Prieglius	0	0	0	0	0	0	0	0
Curonian Lagoon	65	39	1	0	2	1	21	1
Baltic Sea	5	2	1	0	0	0	2	0
<b>Total in the Nemunas RBD</b>	<b>1 412</b>	<b>599</b>	<b>70</b>	<b>13</b>	<b>58</b>	<b>350</b>	<b>282</b>	<b>40</b>

\* Designation (codes) of the dischargers:

0 – Untreated effluents;

1 – Urban wastewater treatment plants (WWTP) (municipal services);

2 – WWTP which are included in the balance of industrial enterprises and which also treat urban wastewater;

3 – WWTP of industrial enterprises;

4 – WWTP in rural areas, except for WWTP of industrial enterprises;

5 – Storm water (surface) runoff treatment facilities;

6 – Other WWTP.

Table 2. Point pollution loads in basins and sub-basins of the Nemunas RBD according to 2007-2008 data (having filled data gaps)

Basin/sub-basin	Number of dischargers	Annual wastewater volume, million m <sup>3</sup>	BOD <sub>7</sub> , t/year	TN, t/year	TP, t/year
Žeimena	45	8.42	62.04	32.42	6.00
Šventoji	138	15.47	107.53	88.43	12.48
Neris Small Tributaries	210	77.91	465.42	738.83	56.12
Merkys	35	8.38	128.21	64.30	10.41
Nevėžis	177	23.06	145.23	229.45	19.64
Šešupė	149	15.67	82.14	105.11	12.25
Dubysa	23	2.76	6.07	10.44	1.79
Jūra	91	5.05	32.84	60.20	12.79
Minija	63	6.10	60.91	50.78	6.39
Coastal Rivers	119	14.50	186.39	167.07	20.77
Nemunas Small Tributaries	292	51.38	938.05	627.55	72.90
Prieglius	0	0.00	0.00	0.00	0.00
Curonian Lagoon	65	24.12	329.05	248.45	17.89
Baltic Sea	5	3.26	12.21	43.83	3.30
<b>Total:</b>	<b>1 412</b>	<b>256.08</b>	<b>2556.1</b>	<b>2466.9</b>	<b>252.7</b>

National legislation transposing the Directive:

- 1) Law No. VIII-529 of the Republic of Lithuania on Environmental Monitoring (*Valstybės žinios*\*, 1997, No. 112-2824);
- 2) Law No. IX-1613 of the Republic of Lithuania on the Amendment of Article 13 of the Law on Environmental Monitoring (*Valstybės žinios*, 2003, No. 61-2766);
- 3) Order No. 334 of the Minister of the Environment of the Republic of Lithuania of 4 July 2003 on the amendment of Order No. 408 of the Minister of the Environment on the approval of the procedure for the accounting of pollution emissions to the environment (*Valstybės žinios*, 2003, No. 79-3610);
- 4) Order No. 467 of the Minister of the Environment of the Republic of Lithuania of 20 September 2001 on the amendment of the procedure for the accounting of pollution emissions to the environment approved by Order No. 408 of the Minister of the Environment of 20 December 1999 (*Valstybės žinios*, 2001, No. 83-2903);
- 5) Order No. 408 of the Minister of the Environment of the Republic of Lithuania of 20 December 1999 on the approval of the procedure for the accounting of pollution emissions to the environment (*Valstybės žinios*, 2000, No. 8-213);
- 6) Order No. 9 of the Minister of the Environment of the Republic of Lithuania of 8 January 2002 on the amendment of the procedure for the accounting of pollution emissions to the environment approved by Order No. 408 of the Minister of the Environment of 20 December 1999 (*Valstybės žinios*, 2002, No. 5-191);
- 7) Order No. 80 of the Minister of the Environment of the Republic of Lithuania of 27 February 2002 on the approval of the Rules on the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits (*Valstybės žinios*, 2002, No. 85-3684);
- 8) Order No. 349 of the Minister of the Environment of the Republic of Lithuania of 29 June 2001 on the approval of the regulatory document LAND 20-2001

\* Official gazette

- “Requirements for the use of sewage sludge for fertilisation” (*Valstybės žinios*, 2001, No. 61-2196);
- 9) Law No. IX-1388 of the Republic of Lithuania on the Amendment of the Law on Water (*Valstybės žinios*, 2003, No. 36-1544);
  - 10) Order No. 267 of the Minister of the Environment of the Republic of Lithuania of 22 May 2002 on partial amendment of certain orders of the Minister of the Environment which regulate management of wastewater (*Valstybės žinios*, 2002, No. 62-2533);
  - 11) Order No. 623 of the Minister of the Environment of the Republic of Lithuania of 21 December 2001 on the approval of the Rules on Reduction of Pollution of Waters with Priority Hazardous Substances (*Valstybės žinios*, 2002, No. 14-522);
  - 12) Order No. 171 of the Minister of the Environment of the Republic of Lithuania of 30 March 2001 on the approval of the procedure for initial accounting and control of the use of water resources and emission of pollutants discharged with wastewater (*Valstybės žinios*, 2001, No. 29-941);
  - 13) Order No. 252 of the Minister of the Environment of the Republic of Lithuania of 9 May 2001 on the approval of the Rules on Installation of Environmental Filtration Equipment for Domestic Wastewater under Natural Conditions (LAND 21-01) (*Valstybės žinios*, 2001, No. 41-1438);
  - 14) Order No. 333 of the Minister of the Environment of the Republic of Lithuania of 14 June 2002 on the amendment of Order No. 80 of the Minister of the Environment of the Republic of Lithuania of 27 February 2002 on the approval of the Rules on the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits (*Valstybės žinios*, 2002, No. 81-3498);
  - 15) Order No. 525 of the Minister of the Environment of the Republic of Lithuania of 25 October 2001 on the approval of the classification procedure and quality norms for surface water bodies (*Valstybės žinios*, 2001, No. 93-3295);
  - 16) Order No. 643 of the Minister of the Environment of the Republic of Lithuania of 22 December 2001 on the approval of guidelines for the development of programmes on reduction of pollution of waters with hazardous substances (*Valstybės žinios*, 2002, No. 14-524);
  - 17) Law No. IX-1017 on the Amendment of Articles 53, 54, 56 and 57 of the Law on the protection of the Marine Environment (*Valstybės žinios*, 2002, No. 73-3092);
  - 18) Law No. VIII-512 of the Republic of Lithuania on the protection of the Marine Environment (*Valstybės žinios*, 1997, No. 108-2731);
  - 19) Order No. D1-503 of the Minister of the Environment of the Republic of Lithuania of 31 October 2006 on the amendment of Order No. 80 of the Minister of the Environment of 27 February 2002 on the approval of the Rules on the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits (*Valstybės žinios*, 2006, No. 120-4571)
  - 20) Order No. D1-236 of the Minister of the Environment of the Republic of Lithuania of 17 May 2006 on the approval of the Wastewater Management Regulation (*Valstybės žinios*, 2006, No. 59-2103);
  - 21) Law No. X-595 of the Republic of Lithuania on the Amendment of the Law on Environmental Monitoring (*Valstybės žinios*, 2006, No. 57-2025);

### Measures for reducing point pollution

4. The basic measures under the Urban Wastewater Treatment Directive include construction and reconstruction of wastewater treatment facilities in agglomerations with a p.e. of more than 2 000 so that the quality of effluents discharged therefrom conforms to the requirements set for discharges into surface water bodies. The said quality requirements are defined in the Wastewater Regulation and provided in Table 3 below.

Table 3. Pollution norms for effluents discharged into the natural environment

Parameter	Agglomeration size (volume of wastewater/ source of pollution)	Unit of measurement	MAC of an average daily sample <sup>1</sup> (maximum level of treatment) <sup>9</sup>	Momentary MAC (maximum level of treatment) <sup>9</sup>	Average annual MAC (maximum level of treatment) <sup>9</sup>	Minimum efficiency of treatment, % <sup>2</sup>
Biochemical oxygen demand BOD <sub>5</sub> / BOD <sub>7</sub> <sup>3</sup>	< 5 m <sup>3</sup> /day	mg/l O <sub>2</sub>	-	35/40	25/29	-
	>5 m <sup>3</sup> /day, < 2 000 p.e.,	mg/l O <sub>2</sub>	-	30/34 (15/17)	20/23 (10/12)	-
	>5 m <sup>3</sup> /day, 2 000 – 10 000 p.e.,	mg/l O <sub>2</sub>	25/29 (10/12)	-	set on an individual basis <sup>6</sup>	70–90
	>5 m <sup>3</sup> /day, > 10 000 p.e.,	mg/l O <sub>2</sub>	15/17 (8/10)	-	set on an individual basis <sup>6</sup>	70–90
COD	more than 2 000 p.e.	mg/l O <sub>2</sub>	125	-	-	75
Total phosphorus	>5 m <sup>3</sup> /day, < 10 000 p.e.	mgP/l	-	-	2 <sup>7</sup>	80
	>5 m <sup>3</sup> /day, 10 000 – 100 000 p.e.	mgP/l	-	-	2 (1)	
	>5 m <sup>3</sup> /day, > 100 000 p.e.	mgP/l	-	-	1 (0.5)	
Total nitrogen <sup>4,5</sup>	>5 m <sup>3</sup> /day, < 10 000 p.e.	mgN/l	-	-	20 <sup>8</sup>	70–80
	>5 m <sup>3</sup> /day, 10 000 – 100 000 p.e.	mgN/l	-	-	15 (10)	
	>5 m <sup>3</sup> /day, > 100 000 p.e.	mgN/l	-	-	10 (10)	

Notes:

<sup>1</sup> Pollutant concentration in an average daily (in proportion to the flow or time) sample.

<sup>2</sup> Wastewater treatment efficiency = ((volume of incoming wastewater – volume of wastewater discharged) / volume of incoming wastewater)\*100.

Requirements for the minimum treatment efficiency are not applied for estimations of pollution charges, i.e. pollution allowed during a reporting period and the annual average allowed concentration may not be exceeded irrespective of whether the minimum treatment efficiency has been achieved or not; however, exceedance of the concentration of an average daily sample or of a momentary allowed concentration is not deemed to be a violation provided that the minimum treatment efficiency is retained during the exceedance.

<sup>3</sup> A permit, design conditions, etc. shall contain a normative standard by BOD<sub>7</sub>. Translation of BOD<sub>5</sub> into BOD<sub>7</sub> shall be conducted according to the equation: BOD<sub>7</sub> = 1.15 x BOD<sub>5</sub>.

<sup>4</sup> Total nitrogen is calculated by adding Kjeldahl Nitrogen (organic and ammonium nitrogen) and concentrations of nitrite-N and nitrate-N.

<sup>5</sup> Total nitrogen can also be controlled on the basis of a daily average. In such case a daily average may not exceed 20 mg/l, when the temperature of wastewater is 12°C or higher (applicable only for evaluation of conformity of treatment facilities to the EU requirements (when reporting to the EU)).

<sup>6</sup> The average annual concentration is determined on the basis of the actual possibilities of an object in question but it may not be higher than the MAC of an average daily sample.

<sup>7</sup> Applicable only to municipal/domestic wastewater and only when assessment of an impact on a recipient has to be carried out according to the provisions of paragraph 11. When the calculated allowed average annual concentration of pollution of wastewater with total phosphorus which would not result in exceedance of an allowed impact on a surface water body is lower than 2 mg/l (when the calculated concentration is between 2 and 10 mg/l, the allowed concentration is determined on the basis of calculation results; when the calculated concentration is higher than 10 mg/l, no allowed concentration is determined (total P is not rationed); when the concentration is lower than or equals to 2 mg/l, the allowed concentration is 2 mg/l).

<sup>8</sup> Applicable only to municipal/domestic wastewater and only when assessment of an impact on a recipient has to be carried out according to the provisions of paragraph 11. When the calculated allowed average annual concentration of pollution of wastewater with total nitrogen which would not result in exceedance of an allowed impact on a surface water body is lower than 20 mg/l (when the calculated concentration is between 20 and 40 mg/l, the allowed concentration is determined on the basis of calculation results; when the calculated concentration is higher than 40 mg/l, no allowed concentration is determined (total N is not rationed); when the concentration is lower than or equals to 20 mg/l, the allowed concentration is 20 mg/l).

<sup>9</sup> The lowest possible value of the allowed concentration, i.e. the allowed concentration of domestic/municipal wastewater discharges may not be stricter than the value given in brackets.

A list of agglomerations with a p.e. of more than 2 000 was drawn up by the Environmental Protection Agency in 2004 (*Wastewater treatment in Lithuania; A report under Article 16 of the Urban Wastewater Treatment Directive 91/271/EEC, 2006*). The results of the distribution of agglomerations by a population equivalent conducted by the EPA showed that there are 73 agglomerations with a p.e. of more than 2 000, 4 cities with a p.e. of more than 100 000, 22 towns of between 10 000 and 100 000 p.e., and 47 towns and settlements of between 2 000 and 10 000 p.e. within the Nemunas RBD.

The scope of the implementation of the basic measures under the UWWT Directive was assessed on the basis of the following assumptions:

1) After the implementation of the basic measures of the UWWT Directive, the quality of wastewater in all towns with a p.e. of more than 10 000 will conform to the requirements set in the Wastewater Regulation for the quality of wastewater discharged into surface waters.

2) If the present quality of wastewater in agglomerations of more than 10 000 p.e. meets the requirements set in the Wastewater Regulation (i.e. according to 2008 data), it is not expected to change.

3) Concentrations of BOD<sub>7</sub> in wastewater of agglomerations with a p.e. of between 2 000 and 10 000 will not exceed the MAC set in the Wastewater Regulation.

4) Since there is no strict regulation of concentrations of total nitrogen and total phosphorus in agglomerations with a p.e. of between 2 000 and 10 000 and these concentrations are limited only if this is required for achieving good status in a receiving water body, the implementation of the basic measures under the UWWT Directive in these agglomerations will not lead to reduction of loads of total nitrogen and total phosphorus. At present, no allowable concentrations of total nitrogen and total phosphorus are determined for wastewater discharged from WWTP in agglomerations with a p.e. of between 2 000 and 10 000 taking into account the status of a receiving water body. However, this assumption is valid only in respect of the existing wastewater treatment facilities because pollution loads of new WWTP are planned taking into account characteristics of a receiving water body.

5) Operation of WWTP and wastewater quality parameters in towns of less than 10 000 p.e. will be improved only in towns where construction of new WWTP or reconstruction of the existing ones has been planned.

6) In the event of plans to construct new WWTP or reconstruct the existing ones in agglomerations with less than 10 000 p.e., the quality of wastewater in such agglomerations by total nitrogen and total phosphorus will conform to the most stringent requirements set for the settlements of the said size, i.e. the concentration of total nitrogen will not exceed 20 mg/l and that of total phosphorus – 2 mg/l.

7) When no new WWTP or reconstruction of the existing ones have been planned in agglomerations of less than 10 000 p.e., the quality of wastewater therein is expected to remain the same.

Identification of investments and works planned for the water management sector was carried out following Order No. D1-462 of the Minister of the Environment of 9 September 2008 (*Valstybės žinios*, 2008, No. 109-4162; 2009, No. 47-1882).

Taking into account the above-listed assumptions, the estimated change in point pollution loads after the implementation of the basic measures under the UWWT Directive in the basins and sub-basins of the Nemunas RBD is provided in Table 4 below.

Table 4. Present point pollution loads (estimated on the basis of the results of 2007-2008) and loads predicted after the implementation of the basic measures

Basin/ sub-basin	Pollution load	BOD <sub>7</sub> , t/year		Total nitrogen, t/year		Total phosphorus, t/year	
		Present	Forecasted	Present	Forecasted	Present	Forecasted
Žeimena	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 10 000 and 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 2 000 and 10 000 p.e.	36.7	7.3	19.8	19.8	5.1	5.0
	Other pollution sources	25.3	25.3	12.6	12.6	0.9	0.9
	<b>TOTAL:</b>	<b>62.0</b>	<b>32.6</b>	<b>32.4</b>	<b>32.4</b>	<b>6.00</b>	<b>5.90</b>
Šventoji	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 10 000 and 100 000 p.e.	37.9	37.9	41.1	41.1	4.8	4.8
	Agglomerations of between 2 000 and 10 000 p.e.	8.0	8.0	7.9	7.9	2.5	2.5
	Other pollution sources	61.6	61.6	39.5	39.5	5.2	5.2
	<b>TOTAL:</b>	<b>107.5</b>	<b>107.5</b>	<b>88.5</b>	<b>88.5</b>	<b>12.5</b>	<b>12.5</b>
Dubysa	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 10 000 and 100 000 p.e.	2.0	2.0	3.2	3.2	0.5	0.5

Basin/ sub-basin	Pollution load	BOD <sub>7</sub> , t/year		Total nitrogen, t/year		Total phosphorus, t/year	
		Present	Forecasted	Present	Forecasted	Present	Forecasted
	Agglomerations of between 2 000 and 10 000 p.e.	0.8	0.8	3.6	2.0	0.6	0.5
	Other pollution sources	3.3	3.3	3.6	3.6	0.7	0.7
	<b>TOTAL:</b>	<b>6.10</b>	<b>6.10</b>	<b>10.4</b>	<b>8.8</b>	<b>1.8</b>	<b>1.7</b>
Jūra	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 10 000 and 100 000 p.e.	14.2	14.2	34.3	24.3	8.9	3.4
	Agglomerations of between 2 000 and 10 000 p.e.	5.4	4.6	11.6	11.0	1.7	1.6
	Other pollution sources	13.2	13.2	14.3	14.3	2.2	2.2
	<b>TOTAL:</b>	<b>32.8</b>	<b>32.0</b>	<b>60.2</b>	<b>49.6</b>	<b>12.8</b>	<b>7.2</b>
Lithuanian Coastal Rivers	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 10 000 and 100 000 p.e.	15.4	15.4	20.4	20.2	1.4	1.4
	Agglomerations of between 2 000 and 10 000 p.e.	-	-	-	-	-	-
	Other pollution sources	171.0	171.0	146.7	146.7	19.4	19.34
	<b>TOTAL:</b>	<b>186.4</b>	<b>186.4</b>	<b>167.1</b>	<b>166.9</b>	<b>20.8</b>	<b>20.74</b>
Merkys	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 10 000 and 100 000 p.e.	3.3	3.3	4.7	4.7	1.0	0.9
	Agglomerations of between 2 000 and 10 000 p.e.	41.7	15.7	26.6	26.6	3.9	3.6
	Other pollution sources	83.2	83.2	33	33	5.5	5.5
	<b>TOTAL:</b>	<b>128.2</b>	<b>102.2</b>	<b>64.3</b>	<b>64.3</b>	<b>10.4</b>	<b>10.0</b>
Minija	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 10 000 and 100 000 p.e.	33.7	28.7	18.4	18.4	3.0	3.0
	Agglomerations of between 2 000 and 10 000 p.e.	0.9	0.9	1.5	1.5	0.2	0.1
	Other pollution	26.3	26.1	30.9	30.26	3.2	3.0

Basin/ sub-basin	Pollution load sources	BOD <sub>7</sub> , t/year		Total nitrogen, t/year		Total phosphorus, t/year	
		Present	Forecasted	Present	Forecasted	Present	Forecasted
	<b>TOTAL:</b>	<b>60.9</b>	<b>55.7</b>	<b>50.8</b>	<b>50.16</b>	<b>6.4</b>	<b>6.1</b>
Nemunas	Agglomerations of > 100 000 p.e.	671.7	380.6	380.6	223.9	37.6	22.4
	Agglomerations of between 10 000 and 100 000 p.e.	50.4	50.4	73.3	66.2	9.7	8.0
	Agglomerations of between 2 000 and 10 000 p.e.	8.5	6.2	19.7	18.9	4.0	3.6
	Other pollution sources	207.4	207.4	153.9	153.7	21.6	21.55
	<b>TOTAL:</b>	<b>938.0</b>	<b>644.6</b>	<b>627.5</b>	<b>462.7</b>	<b>72.9</b>	<b>55.55</b>
Neris	Agglomerations of > 100 000 p.e.	203.7	203.7	386.9	386.9	25.7	25.7
	Agglomerations of between 10 000 and 100 000 p.e.	25.0	25.0	56.1	51.2	4.6	4.6
	Agglomerations of between 2 000 and 10 000 p.e.	13.4	13.4	35.7	35.3	6.6	5.4
	Other pollution sources	223.3	223.3	260.1	260.1	19.2	19.2
	<b>TOTAL:</b>	<b>465.4</b>	<b>465.4</b>	<b>738.8</b>	<b>733.5</b>	<b>56.1</b>	<b>54.9</b>
Nevėžis	Agglomerations of > 100 000 p.e.	49.5	49.5	89.7	85.4	3.8	3.8
	Agglomerations of between 10 000 and 100 000 p.e.	27.0	27.0	41.7	36.8	2.8	2.8
	Agglomerations of between 2 000 and 10 000 p.e.	4.3	4.3	7.0	7.0	0.8	0.8
	Other pollution sources	64.4	64.4	91.0	91.0	12.2	12.2
	<b>TOTAL:</b>	<b>145.2</b>	<b>145.2</b>	<b>229.40</b>	<b>220.2</b>	<b>19.6</b>	<b>19.6</b>
Šešupė	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 10 000 and 100 000 p.e.	25.6	25.6	45.5	45.5	5.2	5.2
	Agglomerations of between 2 000 and 10 000 p.e.	13.6	13.6	25.2	23.1	3.3	3.1
	Other pollution sources	42.9	42.9	34.4	34.4	3.75	3.75
	<b>TOTAL:</b>	<b>82.1</b>	<b>82.1</b>	<b>105.1</b>	<b>103.0</b>	<b>12.25</b>	<b>12.05</b>
Baltic Sea	Agglomerations of > 100 000 p.e.	-	-	-	-	-	-
	Agglomerations	11.0	11.0	42.4	42.4	2.98	2.98

Basin/ sub-basin	Pollution load	BOD <sub>7</sub> , t/year		Total nitrogen, t/year		Total phosphorus, t/year	
		Present	Forecasted	Present	Forecasted	Present	Forecasted
	of between 10 000 and 100 000 p.e.						
	Agglomerations of between 2 000 and 10 000 p.e.	-	-	-	-	-	-
	Other pollution sources	1.2	1.2	1.4	1.4	0.3	0.3
	<b>TOTAL:</b>	<b>12.20</b>	<b>12.20</b>	<b>43.80</b>	<b>43.80</b>	<b>3.28</b>	<b>3.28</b>
Curonian Lagoon	Agglomerations of > 100 000 p.e.	139.3	139.3	182.6	182.6	6.64	6.64
	Agglomerations of between 10 000 and 100 000 p.e.	-	-	-	-	-	-
	Agglomerations of between 2 000 and 10 000 p.e.	49.0	8.9	11.6	11.6	1.97	1.97
	Other pollution sources	140.7	140.7	54.2	54.2	9.2	9.2
	<b>TOTAL:</b>	<b>329.0</b>	<b>288.9</b>	<b>248.4</b>	<b>248.4</b>	<b>17.81</b>	<b>17.81</b>

### Dischargers of surface runoff and their pollution loads

5. Totalling to 795, dischargers of surface runoff comprise the largest group of dischargers within the Nemunas RBD. The volume of wastewater discharged therefrom accounts for 24 % of the total amount of wastewater emitted from point pollution dischargers. However, it is difficult to estimate the pollution loads of this discharger group because the wastewater quality has been little analysed. Most of the wastewater enters bodies of water from large agglomerations (of more than 2 000 p.e.) where WWTP discharge about 69 % of the total volume of the wastewater.

The main parameter measured in surface runoff is BOD<sub>7</sub> meanwhile concentrations of nitrogen and phosphorus are measured very seldom. Accordingly, concentrations of total nitrogen and total phosphorus in effluents from a number of dischargers of storm water runoff were estimated on the basis of available information on the ratio of BOD<sub>7</sub> to other parameters typical of storm water runoff. The pollution loads of dischargers of storm water runoff, upon having filled data gaps, are provided in Table 5.

Table 5. Number of storm water runoff dischargers in basins and sub-basins of the Nemunas RBD and their pollution loads

Sub-basin	No. of dischargers	Annual wastewater volume, thou m <sup>3</sup>	BOD <sub>7</sub> , t/year	TN, t/year	TP, t/year
Žeimena	13	91.4	0.56	0.60	0.13
Šventoji	60	2 254.8	23.03	18.99	2.60
Neris Small Tributaries	107	6 518	66.25	45.33	6.04
Merkys	6	193.4	10.53	12.63	3.16
Nevėžis	94	6 724	34.32	29.29	4.25
Šešupė	96	2 781.7	16.48	14.99	2.41
Dubysa	7	38	0.30	0.28	0.05
Jūra	48	852.2	3.79	3.61	0.64
Minija	29	992	5.75	4.82	0.76

Coastal rivers	97	12 077.4	162.66	131.92	17.21
Nemunas Small Tributaries	183	9 206.6	141.70	103.49	13.87
Curonian Lagoon	51	2 942.5	101.30	37.78	6.56
Baltic Sea	4	254	1.21	1.43	0.30
<b>Total:</b>	<b>795</b>	<b>44 926.00</b>	<b>567.89</b>	<b>405.15</b>	<b>57.98</b>

The pollution loads of storm water runoff were estimated to account for about 22 % of the total BOD<sub>7</sub>, 23 % of total phosphorus, and 16 % of the total nitrogen loads generated by point pollution sources.

According to the data of 2007, treated storm water runoff comprised only 10 % of the total amount of storm water runoff. The remaining volume is discharged into bodies of water without any treatment. At present, only storm water runoff collected from the most polluted (usually industrial) territories is accounted; however, the actual volume of the runoff that enters water bodies, and respective pollution loads, may be much higher than the registered ones.

Assessment of an impact of surface runoff on the ecological status of water bodies revealed that individual dischargers do not have any significant impact on the status of rivers. However, large groups of dischargers of storm water runoff which are typical of larger towns may significantly contribute to pollutant amounts released from WWTP which already are discharging large pollution loads. Utena and Vilkaviškis towns are good examples illustrating this situation. Analysis shows that dischargers of storm water runoff in these towns, the number of which totals to 20-30, may be significantly contributing to pollution loads discharged from WWTP. As a result, due to aggregate pollution coming from storm water runoff and WWTP, the status of the receiving rivers might fail to conform to the good ecological status requirements. In such cases, control and reduction measures are required in respect of pollution from both WWTP and storm water runoff in order to ensure good ecological status in rivers.

Aggregate pollution by dischargers of storm water runoff located on the territory of the town may have a significant impact on the status of the Ražė and Smeltalė and also contribute to poorer status of the Akmena-Danė in its lower reaches. In such cases of large groups of dischargers, individual dischargers which exert a significant impact are not identified because it is the aggregate impact of all dischargers which counts.

This shows that the problem of storm water runoff should be addressed by reducing the total number of storm water runoff dischargers in urban territories and directing part of the wastewater into wastewater treatment facilities.

Due to a number of uncertainties related to an impact and management of storm water runoff, and whereas no funding sources have been planned for the management of such runoff at least until the end of 2013, an analysis concluded that there are neither technical nor financial possibilities to include measures for the management of storm water runoff into the Programme of Measures for the Nemunas RBD during the first cycle of the implementation of the WFD. Measures for the management of storm water runoff, after having performed additional studies which would enable accurate assessment of the input of storm water runoff into the total point pollution load and having decided on the necessity of the application of the measures, can be included into the Programme of Measures of the second cycle of the implementation of the WFD.

## **Impact of the basic measures under the UWWT Directive on the quality of water bodies**

### **The Žeimena Sub-basin**

6. Mathematical modelling showed that a significant impact of point pollution in the Žeimena Sub-basin is exerted only on the quality of the Mera-Kūna where the concentration of total phosphorus fails to conform to the good ecological status requirements due to pollution from Švenčionys WWTP. The concentration of total phosphorus in the Mera-Kūna below the discharger of Švenčionys WWTP may be about 0.2 mg/l meanwhile the threshold value for good ecological status is 0.14 mg/l. The concentrations of total phosphorus in the wastewater discharged from Švenčionys WWTP are rather high – in 2008 they totalled to 10 mg/l on average. However, it is forecasted that the implementation of the basic measures will not result in reduction of loads of total phosphorus discharged from Švenčionys WWTP into the Mera-Kūna because individual requirements for the removal of total phosphorus have to be set in respect of this discharger taking into account the status of the receiving body of water. During the implementation of the basic measures under the UWWT Directive, these requirements will most likely not be defined yet. Also, there is no information concerning any plans to reconstruct Švenčionys WWTP. Calculations showed that in the event of the unchanged wastewater volume, the concentration of total phosphorus in the wastewater discharged from Švenčionys WWTP should be around 5.5 mg/l to be able to meet the good ecological status requirements in respect of this pollutant in the river downstream of the discharger.

It is forecasted that the implementation of the basic measures under the UWWT Directive will result in significant reduction of BOD<sub>7</sub> loads in Švenčionėliai WWTP, where at present the concentration of this pollutant is 195 mgO<sub>2</sub>/l and should go down to 29 mgO<sub>2</sub>/l according to the requirements of the Wastewater Regulation. However, this reduction will not have any major impact on the quality of the Žeimena because today pollution from Švenčionėliai WWTP does not have any significant impact on the ecological status of the river either, due to a comparatively low volume of effluents. The modelling results showed that the concentration of BOD<sub>7</sub> in the Žeimena below Švenčionėliai may be 1.6 mg O<sub>2</sub>/l on average and would decrease to 1.5 mg O<sub>2</sub>/l as a result of reduced pollution in Švenčionėliai.

Reduction of total phosphorus loads is expected in the wastewater discharged from Pabradė WWTP, although this reduction will not have any noticeable impact on the Žeimena River.

Since no significant reduction of pollution as a result of the implementation of the basic measures under the UWWT Directive is planned in other wastewater dischargers of the Žeimena Sub-basin, the status of other rivers is also expected to remain unchanged.

### **The Šventoji Sub-basin**

7. The Vyžuona is significantly affected by pollution from Utena WWTP and dischargers of storm water runoff in Utena, however, no reduction of pollution as a result of the implementation of the basic measures under the UWWT Directive is planned and therefore the status of the Vyžuona is expected to remain unchanged. The modelling results showed that the concentration of total phosphorus in the river below Utena may be 0.16 mg O<sub>2</sub>/l on average. Since concentrations of total phosphorus in the

Vyžuona at present fail to conform to the good ecological status requirements and the basic measures under the UWWT Directive do not ensure the required pollution reduction, supplementary measures should be implemented in order to reduce pollution of wastewater discharges in Utena town with total phosphorus.

No reduction of pollution loads from other WWTP in the Šventoji Sub-basin as a result of the implementation of the basic measures under the UWWT Directive is planned therefore the ecological status of rivers in the sub-basin is expected to remain unchanged.

### **The Neris Small Tributaries Sub-basin**

8. A major impact of point pollution in the Neris Small Tributaries Sub-basin is exerted on the Lomena River due to loads from Kaišiadorys WWTP. The implementation of the basic measures under the UWWT Directive should reduce loads of total nitrogen in Kaišiadorys WWTP where at present the concentration of this pollutant (22 mg/l) fails to conform to the requirements of the Wastewater Regulation (15 mg/l). However, calculations show that even this reduction achieved as a result of the implementation of the Wastewater Regulation may not be sufficient for the attainment of good ecological status in the river. If the ratio of the concentrations of ammonium nitrogen to the concentrations of nitrate nitrogen in the wastewater of Kaišiadorys WWTP remains the same (i.e. ammonium nitrogen continues to constitute the major part of total nitrogen), the concentrations of ammonium nitrogen in the Lomena below the discharger of Kaišiadorys WWTP will continue to be high and will be significantly exceeding the good ecological status requirements. Mathematical modelling results show that the average annual concentration in the Lomena downstream of Kaišiadorys may go down from 2.6 mg/l to 2 mg/l meanwhile the threshold value for good ecological status is 0.2 mg/l.

Concentrations of total phosphorus in the Lomena downstream of Kaišiadorys also fail to conform to the good ecological status criteria; however, no basic measures have been planned for reduction of pollution with total phosphorus in Kaišiadorys, so this type of pollution will continue to be significant. Consequently, supplementary measures will have to be implemented in Kaišiadorys WWTP in order to reduce pollutant concentrations down to the level required for achieving good ecological status.

Reconstruction of wastewater treatment facilities which would result in reduced pollution loads is planned in Kalveliai, Neveronys and Rukla. Even today pollution from these dischargers does not have any noticeable impact on the ecological status of the receiving water bodies. Wastewater from Kalveliai WWTP is discharged into the Vilnia, the one from Rukla WWTP – into the Neris, and from Neveronys WWTP – into the Zversa<sup>1</sup>.

The status of the remaining water bodies in the Neris Small Tributaries Sub-basin is not expected to change because no reduction of pollution from other WWTP has been planned as a result of the implementation of the basic measures under the UWWT Directive.

---

<sup>1</sup> The Zversa is not included among the water bodies assessed in the category of rivers therefore the impact of Neveronys WWTP is assessed in respect of the Neris.

### **The Merkys Sub-basin**

9. In the Merkys Sub-basin, a significant impact of Šalčininkai WWTP is exerted on the concentrations of BOD<sub>7</sub>, ammonium nitrogen and total phosphorus in the river Šalčia. The introduction of the basic measures related to the implementation of the requirements under the UWWT Directive should ensure reduction of pollution with BOD<sub>7</sub> and this reduction should be rather significant as the concentration is expected to go down from the present concentration of 80.4 mg O<sub>2</sub>/l to 29 mg O<sub>2</sub>/l. Nevertheless, it is forecasted that even such reduction of BOD<sub>7</sub> loads discharged from Šalčininkai WWTP might be insufficient. Calculations show that the present concentration of BOD<sub>7</sub> downstream of the discharger of Šalčininkai WWTP may be about 6.5 mgO<sub>2</sub>/l on average, which would go down to 4 mg O<sub>2</sub>/l as a result of reduced pollution. Hence the threshold value of good ecological status (3.3 mg O<sub>2</sub>/l) in the river will still be exceeded.

Concentrations of total nitrogen and total phosphorus in the wastewater discharged from Šalčininkai WWTP are also high but it is forecasted that they will not be affected by the basic measures because individual requirements for these concentrations should be set according to the status of a receiving body of water. Thus, the concentrations of these pollutants in the Šalčia will remain unchanged and will fail to conform to the good status requirements. Mathematical modelling results show that the concentration of ammonium nitrogen downstream of Šalčininkai WWTP may be about 1.5 mg/l and that of total phosphorus – 0.4 mg/l. For the purpose of achieving good ecological status of the Šalčia River, supplementary pollution reduction measures will have to be implemented in Šalčininkai WWTP.

It is forecasted that the reconstruction might result in reduced concentrations of total phosphorus in wastewater discharged from Eišiškės WWTP which enter the Verseka where the concentrations of total phosphorus currently conform to the good status requirements, so pollution reduction will not lead to any noticeable changes in these concentrations. The concentration of total phosphorus below Eišiškės should be around 0.09 mg/l.

A minor decrease in total phosphorus loads can also be expected in Varėna WWTP because the present concentration in wastewater (2.1 mg/l) slightly exceeds the value permitted by the Wastewater Regulation (2 mg/l). However, practically no impact of such reduction will be felt in the Merkys.

The status of the remaining rivers in the Merkys Sub-basin is not expected to change because no reduction of pollution from other WWTP has been planned.

### **The Nevėžis Sub-basin**

10. The status of water bodies in the Nevėžis Sub-basin is not expected to change because the basic measures under the UWWT Directive practically will not have any impact on the decrease of point pollution loads. Pursuant to the requirements of the Wastewater Regulation, minor reduction of pollution with total nitrogen is required in Panevėžys and Kėdainiai WWTP. At present, the concentration of total nitrogen in the wastewater discharged from Panevėžys WWTP is about 10.5 mg/l meanwhile it should not exceed 10 mg/l pursuant to the said regulation. The concentration of total nitrogen in the wastewater discharged from Kėdainiai WWTP in 2008 was 17 mg/l and it should go down to 15 mg/l. If the ratio of ammonium nitrogen to nitrate nitrogen in the

wastewater remains unchanged, such slight reduction would not lead to any sufficient reduction of pollution of the Nevėžis with ammonium nitrogen. At present, the concentration of ammonium nitrogen below Panevėžys might be around 0.5 mg/l (it may differ to a very large extent in individual years depending on the water content) and below Kėdainiai – around 0.3 mg/l. Calculation results show that no major changes in the concentrations can be expected after the implementation of the basic measures.

No basic measures under the UWWT Directive are planned to be implemented in other WWTP of the Nevėžis Sub-basin, therefore the status of the receiving water bodies is expected to remain unchanged.

### **The Dubysa Sub-basin**

11. Tytuvėnai WWTP is the only pollution source in the Dubysa Sub-basin which exerts a significant impact on the status of receiving waters. As a result of the pressure, the concentrations of ammonium nitrogen in the Lapišė fail to conform to the good status requirements<sup>2</sup>. At present, the concentrations of ammonium nitrogen in the wastewater of Tytuvėnai WWTP are very high and averagely totalled to 59 mg/l in 2008. Planned reconstruction of Tytuvėnai WWTP should ensure reduction of pollution with nitrogen. It is forecasted that the concentration of total nitrogen in the wastewater of Tytuvėnai should not exceed 20 mg/l. It is not clear yet how the concentration of ammonium nitrogen will change after the reconstruction of the WWTP; however, such reduction would not be sufficient for the achievement of good ecological status of the river if ammonium nitrogen continues to comprise the major part of total nitrogen in wastewater. Mathematical modelling results show that the concentration of ammonium nitrogen in the Lapišė downstream of the Tytuva may currently be about 1.1 mg/l and after the reconstruction - 0.4 mg/l.

Other wastewater treatment facilities in the Dubysa Sub-basin will not be affected by the basic measures of the UWWT Directive, so no major changes are expected in their pollution loads as well as in the ecological status of water bodies.

### **The Šešupė Sub-basin**

12. Reduction of point pollution loads as a result of the implementation of the basic measures under the UWWT Directive in this sub-basin is expected in Kazlų Rūda and Kudirkos Naumištis WWTP which are planned to be reconstructed. Reconstruction is also planned for Marijampolė, Vilkaviškis and Simnas WWTP; however, pollutant concentrations in the wastewater discharged therefrom in 2008 were already low so no significant changes are expected after the reconstruction.

Despite the planned reconstruction of Kazlų Rūda WWTP which currently exerts a significant impact on the quality of the Jūrė, reduction of pollution with total phosphorus will most likely be of a minor importance and will not be sufficient for the achievement of good ecological status of the river. If the volume of the wastewater discharged from Kazlų Rūda WWTP remains the same, the concentrations of ammonium nitrogen and total phosphorus determined for good ecological status will still be exceeded in the river Jūrė. Mathematical modelling results show that the concentration of ammonium nitrogen in the Jūrė downstream of the discharger of Kazlų

---

<sup>2</sup> Wastewater from Tytuvėnai WWTP is discharged into the Tytuva; however, the latter is not identified as a water body assessed in the category of rivers and therefore the impact is assessed in respect of the Lapišė.

Rūda may currently be about 0.85 mg/l and that of total phosphorus – about 0.18 mg/l. If pollution loads from Kazlų Rūda WWTP go down to the forecasted level, the concentration of total phosphorus would drop to 0.17 mg/l, which means that it would still be exceeding the threshold value of good ecological status (0.14 mg/l).

Since no reduction of other significant pollution loads from dischargers is forecasted, the status of the remaining rivers in the Šešupė Sub-basin should also remain unchanged. The rivers Siesartis, Liepona, Šeimena, Širvinta, and Raišupis, which are undergoing a significant impact of point pollution, will be assigned to a risk group and the dischargers which affect their quality will have to be subject to supplementary pollution reduction measures.

### **The Nemunas Small Tributaries Sub-basin**

13. A major decrease in point pollution loads in the Nemunas Small Tributaries Sub-basin will be achieved after having implemented the basic measures under the UWWT Directive in Kaunas WWTP. The concentration of BOD<sub>7</sub> in the wastewater of Kaunas WWTP is expected to go down significantly: the concentration is currently about 30 mg O<sub>2</sub>/l and should be reduced to at least 17 mg O<sub>2</sub>/l pursuant to the Wastewater Regulation. Despite forecasted significant reduction of BOD<sub>7</sub> loads in Kaunas WWTP, calculation results show that this decrease will not have any noticeable effect on the ecological status of the Nemunas. Due to an impact of transboundary pollution or natural factors, high concentrations of BOD<sub>7</sub> in the Nemunas are formed already upstream of Kaunas so improved operation of Kaunas WWTP will not be able to lead to any improvement of the ecological status. Pursuant to the Wastewater Regulation, concentrations of total nitrogen and total phosphorus in the wastewater of Kaunas WWTP should also be reduced: the concentration of total nitrogen should go down from 17 to 10 mg/l and that of total phosphorus – from 1.68 mg/l to 1 mg/l. Nevertheless, as in the case of pollution with BOD<sub>7</sub>, practically no impact of the reduction will be noticed in the river Nemunas.

In the wastewater discharged from Birštonas and Prienai WWTP, concentrations that fail to meet the requirements of the Wastewater Regulation are those of total nitrogen and total phosphorus. It is forecasted that pollution will be reduced to the allowed level; however, such reduction will not have any impact on the status of the Nemunas because pollution from Birštonas and Prienai WWTP does not affect the quality of this river.

Construction of new or reconstruction of the existing wastewater treatment facilities is expected to reduce pollution loads in the wastewater discharged from Gelgaudiškis, Rusnė, Veisiejai and Balbieriškis WWTP. Wastewater from Veisiejai WWTP enters Lake Ančia, from Gelgaudiškis – the Nemunas River, from Rusnė – the Skirvytė River, and from Balbieriškis – the Peršėkė River (very close to the mouth so practically wastewater is discharged into the Nemunas). The loads discharged from all these dischargers are too small to affect the status of the receiving waters therefore reduction of their pollution will not result in any noticeable impact, i.e. will not affect the ecological status of water bodies.

No basic measures under the UWWT Directive which would lead to pollution reduction are planned to be implemented in other wastewater treatment facilities in the Nemunas Small Tributaries Sub-basin, so the status of water bodies should remain the same. The quality of rivers where pollutant concentrations are currently in conformity with the good status requirements should continue to be good, meanwhile rivers suffering from a

significant impact of point pollution, such as the Praviena, Šyša, Armena, and Liekė, will be designated as water bodies at risk, and supplementary measures will have to be introduced in Pravieniškės, Šilutė, Lekėčiai and Klausučiai WWTP to reduce pollution of the said rivers.

### **The Jūra Sub-basin**

14. The implementation of the basic measures under the UWWT Directive should reduce loads of total nitrogen and total phosphorus discharged from Tauragė WWTP. At present, the concentration of total phosphorus in the wastewater of Tauragė WWTP is about 22 mg/l and the concentration of total nitrogen is about 5.8 mg/l. Taking into account the requirements laid down in the Wastewater Regulation, the concentration of total nitrogen is forecasted to be below 15 mg/l and that of total phosphorus – below 2 mg/l. Assessment of an impact of pollution reduction on the status of the receiving river established that the concentration of total phosphorus in the Jūra below the discharger of Tauragė WWTP, which is currently about 0.096 mg/l, may go down to 0.077 mg/l. The concentration of ammonium nitrogen may go down from 0.067 to 0.054 mg/l. Such reduction will not have any impact on the ecological status of the river.

A significant reduction of pollution loads as a result of planned reconstruction of WWTP is planned in Viduklė. At present, the concentration of BOD<sub>7</sub> in the wastewater discharged from Viduklė WWTP is as high as 132 mg O<sub>2</sub>/l, that of total nitrogen – 95 mg/l, and of total phosphorus – 14 mg/l. It is forecasted that after the reconstruction the concentration of BOD<sub>7</sub> in the wastewater discharged from Viduklė WWTP will not exceed 29 mg/l, that of total nitrogen will not be higher than 20 mg/l, and of total phosphorus – 2 mg/l. Wastewater from Viduklė WWTP is discharged into the Apusinas River<sup>3</sup> whereby it is transported to the Šešuvis. If pollution from Viduklė WWTP is reduced to the predicted level, the concentration of BOD<sub>7</sub> in the Šešuvis downstream of the Apusinas will go down from 2.6 to 2.55 mg O<sub>2</sub>/l, that of ammonium nitrogen – from 0.094 mg/l to 0.07 mg/l, of total phosphorus – from 0.094 to 0.087 mg/l. Consequently, a change in the pollution load will most likely have no impact on the ecological status of the Šešuvis.

Pollution loads from Raseiniai WWTP which have a significant impact on the Šlyna and the Šaltuona are not expected to change so these rivers will be designated as water bodies at risk and Raseiniai WWTP will have to be subject to supplementary pollution reduction measures. Such measures may also be required in respect of the wastewater treatment facilities of Adakavas boarding-house; however, this will be known only upon establishment of the present pollution loads of this discharger.

### **The Minija Sub-basin**

15. The measured average annual concentration of BOD<sub>7</sub> in the wastewater of Plungė WWTP in 2008 (19.95 mgO<sub>2</sub>/l) was higher than the one provided for in the Wastewater Regulation (17 mgO<sub>2</sub>/l), so it is forecasted that measures will be taken to reduce this pollution down to the allowed level. Wastewater from Plungė WWTP enters the Mažoji Sruoja<sup>4</sup> and, consequently, to the Minija. Calculations show that the reduction of pollution with BOD<sub>7</sub> to the forecasted level (i.e. if the concentration in wastewater no

<sup>3</sup> The Apusinas is not included among the water bodies assessed in the category of rivers and hence the impact of Viduklė WWTP is assessed in respect of the Šešuvis.

<sup>4</sup> The Mažoji Sruoja is not included among the water bodies assessed in the category of rivers and hence the impact of Plungė WWTP is assessed in respect of the Minija.

longer exceeds 17 mg O<sub>2</sub>/l) will not have any noticeable impact on the ecological status of the Minija – the concentration in the river may go down from 2.8 mg O<sub>2</sub>/l to 2.7 mg O<sub>2</sub>/l.

The planned reconstruction should result in reduced pollution by Salantai and Vėžaičiai WWTP. However, it should be noted that only a minor reduction of total phosphorus is forecasted for Salantai, meanwhile in Vėžaičiai the concentrations of both BOD<sub>7</sub> and total phosphorus and total nitrogen should be reduced. Pollution from Salantai WWTP has a little impact on the concentration of total phosphorus in the Salantas River and thus no impact of the reduced pollution load will be felt.

An evaluation of the river status showed that at present Vėžaičiai WWTP may be exerting a significant impact on the quality of the Skinija; however, if pollution by Vėžaičiai WWTP after the reconstruction goes down to the predicted level (i.e. the concentration of total nitrogen in the wastewater does not exceed 20 mg/l), good ecological status should be achieved in the river, i.e. the concentrations of ammonium nitrogen should conform to the good status requirements.

An assessment of the scope of the basic measures under the UWWT Directive indicates that the implementation thereof would lead to the improvement of the quality of a single river – the Skinija, meanwhile the status of other rivers would remain unchanged.

### **The Lithuanian Coastal Rivers Basin**

16. The implementation of the basic measures under the UWWT Directive would result only in minor changes in point pollution loads in the Lithuanian Coastal Rivers Basin. Since the measured concentration of total nitrogen in wastewater discharged from Kretinga WWTP in 2008 (15.15 mg/l) only slightly exceeded the requirements of the Wastewater Regulation (15 mg/l), it can be predicted that pollution with total nitrogen by Kretinga WWTP will practically remain the same. According to the data of 2008, it is ammonium nitrogen that constitutes the major part of total nitrogen. If the ratio of the concentrations of ammonium nitrogen to the concentrations of nitrate nitrogen do not change in future, the concentrations of ammonium nitrogen in the Tenžė and Akmena-Danė will continue to exceed the good ecological status requirements due to pollution discharged from Kretinga WWTP into the Tenžė and Akmena-Danė. Mathematical modelling results show that the concentration of ammonium nitrogen in the Tenžė below Kretinga may be as high as 5.4 mg/l and in the Akmena-Danė, upon the inflow of the Tenžė – 1.15 mg/l if the pollution load remains unchanged.

Since no reduction of pollution with BOD<sub>7</sub> and total phosphorus is predicted for Kretinga WWTP, the concentrations of BOD<sub>7</sub> and total phosphorus will continue to exceed the good status requirements in the Tenžė, and those of total phosphorus – in the Akmena-Danė. Consequently, supplementary measures will have to be implemented in Kretinga WWTP in order to achieve good ecological status of these rivers.

The implementation of the basic measures under the UWWT Directive will not have any impact on the status of other rivers in the basin. Supplementary pollution reduction measures may be required in order to ensure good ecological status of the Smeltalė and Ražė; however, first of all, pollution loads of dischargers which release large volumes of surface (storm water) runoff into the said rivers should be identified.

### **The Curonian Lagoon**

17. Calculations showed that the implementation of the basic measures under the UWWT Directive will not have any significant impact on loads transported into the Curonian Lagoon. Reduced loads BOD<sub>7</sub> are expected (see Table 7).

Summing up the scope of the basic measures under the UWWT Directive to be implemented and a forecasted effect of these measures on the quality of surface water bodies, it can be concluded that this impact will be of a minor importance. The main reason thereof is the fact that at present the majority of larger agglomerations (>2 000 p.e.) the pollution of which is addressed by the basic measures under the UWWT Directive are already in conformity with the requirements set for the quality of discharges. It should be noted that certain exceedances of concentrations are still observed in wastewater discharged from a few agglomerations but these are usually very insignificant.

Planned construction of new or reconstruction of the existing WWTP have been assessed as one of the basic measures under the UWWT Directive. However, the number of such wastewater treatment facilities is not high (about 30). Although it is difficult to plan reduction of pollution upon the implementation of the said projects, the available data indicates that pollutant concentrations in discharges from the wastewater treatment facilities which are planned to be reconstructed are not very high so no significant decrease in pollution can be expected.

Another basic measure under the UWWT Directive is expansion of wastewater collection infrastructure. This measure should protect water bodies from illegal discharges and discharges in unallowable places, though on the other hand, connection of additional subscribers can increase loads of pollution discharged by urban WWTP. This reason makes it complicated to assess the benefit of the measure.

A pollution reduction potential for the implementation of the basic measures under the UWWT Directive is comparatively low, so consequently an impact of these measures on the ecological status of water bodies will not be very noticeable. After the implementation of the basic measures under the UWWT Directive in the Nemunas RBD, good ecological status will still be unachieved in a number of water bodies due to a significant impact of point pollution. Such situation arises because the basic measures under the UWWT Directive ensure only a certain level of treatment of wastewater which in certain cases may not be sufficient to achieve good status of a receiving water body. This is typical of small rivers or river stretches in the upper reaches which receive wastewater of towns or settlements. In such cases wastewater treatment facilities should be subject to more stringent requirements for the wastewater quality than those provided for in the Wastewater Regulation.

#### **Prioritising supplementary point pollution reduction measures**

18. Assessments of the river status and the effect of the basic measures under the UWWT Directive established that a number of water bodies within the Nemunas RBD will have to be subject to supplementary measures to achieve good ecological status.

With a view to determine validity of the implementation of supplementary measures against point pollution and identify water bodies where attainment of water protection objectives should be postponed due to a lack of data, an additional analysis of water

bodies at risk in the category of rivers and of pollution sources that exert a significant impact on the status thereof was carried out. The analysis aimed at determining whether the available information on pollution and relevant problems is sufficient to be able to propose upgrading measures for wastewater treatment facilities in order to reduce the impact of point pollution.

Significance of the pollution impact in respect of many rivers was determined on the basis of mathematical modelling results. Having summed up the analysis results, priorities were determined for the upgrading of wastewater treatment facilities. Upgrading measures are proposed to be applied only in cases when information on the significance of impacts exerted by a WWTP in question is deemed to be sufficiently reliable. If there are any doubts regarding significance of an impact of point pollution sources, or identification of point pollution sources which might be exerting a significant impact, supplementary research should be carried out.

The wastewater treatment plants where supplementary pollution reduction measures (upgrading) are proposed to be implemented in accordance with the available water quality monitoring data and mathematical modelling results are listed in Table 6. The demand of reduction of pollution by these wastewater treatment facilities is provided in Table 7, which also gives forecasted pollution loads by WWTP after the implementation of the basic measures and estimated loads which are required for the achievement of good ecological status. If reduction of pollution is not required, no pollution load necessary for the attainment of good ecological status is provided.

Table 6. The demand of upgrading wastewater treatment facilities which exert a significant impact on the ecological status of the rivers

Basin/ sub-basin	River which undergoes a significant impact of point pollution	Dischargers which exert a significant impact	Recommendation on whether supplementary measures are required or not	Argumentation
Žeimena	Mera-Kūna	Švenčionys WWTP	YES	The measured concentration of total phosphorus in the river in 2007 exceeded the threshold value of good ecological status; modelling results indicating that the good status requirements by total phosphorus are not met are more or less in conformity with the measured value. In addition, the load of total phosphorus discharged from Švenčionys WWTP in 2008 increased as compared to 2007.
Šventoji	Vyžuona	Utena WWTP	NO	There is sufficient data indicating that the concentration of total phosphorus in the Vyžuona below Utena fails to conform to the good status requirements, however, it is difficult to determine the pollution sources which have a major impact on the status of the river. Calculations show that loads of storm water runoff may be significantly contributing to pollution by Utena WWTP. In such case reduction of pollution discharged from Utena WWTP would not be expedient. Concentrations of total phosphorus in storm water runoff are not measured at the moment so additional research is required in order to establish a demand of pollution reduction.
		Dischargers of storm water runoff of Utena town		
Neris	Lomena	Kaišiadorys WWTP	YES	Modelling results showing that the threshold concentrations of good ecological status are heavily exceeded in the river due to pollution by Kaišiadorys WWTP are supported by the monitoring data of 2006. The pollution loads of the discharger have little changed as compared to 2006, or even went up (ammonium nitrogen).
Merkys	Šalčia	Šalčininkai WWTP	YES	Monitoring in the Šalčia downstream of Šalčininkai was conducted in 2006. The data collected supports modelling results which indicate that the threshold concentrations of good ecological status are heavily exceeded in the river. The pollution loads in Šalčininkai have little changed as compared to 2006.
Nevēžis	Gynia	Eigirgala - Voškonys WWTP	NO	The available monitoring data is not sufficient to prove significance of the impact. To be able to determine the significance more precisely, it is proposed to establish an operational monitoring site and carry out monitoring of the water quality.
Nevēžis	Barupė	Batėgala NV	NO	A measurement conducted downstream of these dischargers in 2007 showed only slight exceedance of the concentrations of total phosphorus hence it is recommended to continue monitoring activities and to assess the significance of the impact of these discharges when more data is collected.
		Kulva WWTP	NO	
Nevēžis	Jaugila	Akademija WWTP	NO	Calculations show that concentrations of ammonium nitrogen and total phosphorus may be failing the good status requirements in the river. A measurement in the river in 2009

<b>Basin/ sub-basin</b>	<b>River which undergoes a significant impact of point pollution</b>	<b>Dischargers which exert a significant impact</b>	<b>Recommendation on whether supplementary measures are required or not</b>	<b>Argumentation</b>
				registered exceedance of the threshold concentration of total phosphorus but the concentration of ammonium nitrogen was not higher than the threshold one. To be able to determine whether reduction measures are required only in respect of total phosphorus or also for ammonium nitrogen, it is recommended to continue monitoring activities and to conduct more measurements.
Nevēžis	Beržė	Linkaičiai WWTP	NO	Modelling results show that pollution by Linkaičiai WWTP may be exerting a significant impact on the ecological status of the Beržė; however, the monitoring data of 2008 does not support this. Operational monitoring should be continued.
Nevēžis	Kiršinas	Baisogala WWTP	YES	An analysis carried out in the Kiršinas River in 2006 supports the modelling results showing that the threshold concentrations of ammonium nitrogen and total phosphorus are heavily exceeded in the river. The pollution loads discharged from Baisogala WWTP even went up as compared to 2006.
		Pakiršinis WWTP	YES	
		Sidabravas WWTP	NO	
Nevēžis	Lankesa	Bukonys WWTP	YES	A measurement conducted in the Srautas River (a tributary of the Lankesa) in 2007 showed that the threshold concentrations of ammonium nitrogen and total phosphorus were heavily exceeded in the river. This supports a belief that the Lankesa may also be failing the good status requirements because its catchment up to the inflow of the Srautas is not that big, therefore dilution of pollution transported with the Srautas is not sufficient. Calculations also showed that the concentrations of ammonium nitrogen and total phosphorus in the Lankesa below the Srautas may be failing the good ecological status requirements.
Nevēžis	Obelis	sedimentation ponds of the company Lifosa	NO	Significance of the sources of pollution was determined only on the basis of the mathematical modelling results; however, there is no measurement data supporting such impact.
Nevēžis	Nevēžis	Panevėžys WWTP	YES	An analysis of all available monitoring data showed that practically the data verifies the fact established during the modelling that both Panevėžys and Kėdainiai WWTP are significantly contributing to the loads of ammonium nitrogen in the Nevėžis (although there is no later reliable data on the concentrations of ammonium nitrogen below Panevėžys, exceedances of the threshold concentrations under similar pollution loads were registered in earlier years). However, it is believed that the required reduction of
Nevēžis	Nevēžis	Kėdainiai WWTP	YES	

Basin/ sub-basin	River which undergoes a significant impact of point pollution	Dischargers which exert a significant impact	Recommendation on whether supplementary measures are required or not	Argumentation
				the load of ammonium nitrogen in these WWTP can be achieved without large investments or even by implementing the basic measures.
Šešupė	Siesartis	Šakiai WWTP	YES	A significant impact of Šakiai WWTP is indicated by high concentrations of ammonium nitrogen and total phosphorus registered in the river during the summer time in 2005, and monitoring data of earlier years shows a very high level of pollution of the river. No major reduction of pollution in discharges from Šakiai WWTP has been observed since 2005. The fact that pollution by Šakiai WWTP will continue to exert a significant impact is also demonstrated by water quality modelling results, hence supplementary measures are required in Šakiai WWTP. It can happen, though, that the planned supplementary pollution reduction measures may be insufficient for achieving good ecological status in the river because the measured pollutant concentrations are much higher than the estimated ones. This shows that the impact of Šakiai WWTP may actually be higher than the one calculated, or that there are other significant pollution sources where pollution should be reduced.
Šešupė	Šeimena	Vilkaviškis WWTP	NO	There is sufficient data proving a significant impact of point pollution in the status of the Šeimena; however, it is difficult to make an unambiguous identification of pollution reduction measures because at least 22 other dischargers are emitting wastewater into the river or its tributaries in addition to Vilkaviškis WWTP. Although Vilkaviškis WWTP is the major polluter, pollution from the said dischargers (especially pollution with total phosphorus) may also have a significant input. Hence, measures for reduction of pollution with total phosphorus may be required not only in Vilkaviškis WWTP but also in other dischargers, only first of all the actual scope of pollution should be determined because no measurements of concentrations of total phosphorus and ammonium nitrogen in wastewater of many of these dischargers are taken.
		Storm water runoff dischargers of Vilkaviškis town	NO	
Šešupė	Jūrė	Kazlų Rūda WWTP	NO	There is no data proving a significant impact of pollution by this discharger because so far measurements have been taken upstream of the discharger. Therefore, reliability of the assessment of an impact of Kazlų Rūda WWTP is not sufficient, and an operational monitoring site should be established for the assessment of significance of the impact.
Šešupė	Liepona	Kybartai WWTP	YES	Taking into account monitoring data (one measurement was taken in the Liepona in 2005 when high pollutant concentrations exceeding the good status criteria were registered), the discharger has a significant impact on the ecological status of the river.

Basin/ sub-basin	River which undergoes a significant impact of point pollution	Dischargers which exert a significant impact	Recommendation on whether supplementary measures are required or not	Argumentation
				As compared to 2005, a change in pollution loads of Kybartai WWTP is not big (the concentration of ammonium nitrogen in wastewater has even increased, though on the other hand, the volume of discharges went down).
Šešupė	Raišupis	Lazdijai WWTP	NO	No high concentrations of ammonium nitrogen which determine assignment, on the basis of modelling results, of a river in question to a risk group were detected during measurements in 2006-2007. Therefore reliability of the assessment of an impact of the discharger is not sufficient, and operational monitoring should be continued.
Nemunas Small Tributaries	Praviena	Pravieniškės WWTP	YES	Significance of the impact of the discharger is supported by the monitoring data of 2008 hence therefore the assignment of the water body to a risk group due to pollution by Pravieniškės WWTP is deemed to be sufficiently reliable. In addition, monitoring data shows that the impact of pollution by the discharger (in respect of the concentrations of BOD <sub>7</sub> ) may be higher than the estimated one so there is a risk that the proposed pollution reduction measures may be insufficient to achieve good status in the river.
Nemunas Small Tributaries	Šyša	Šilutė WWTP	YES	The designation of the river to a risk group is supported by the monitoring data of 2008, which shows that pollution of the river may be higher than the estimated one and so there is a risk that the proposed pollution reduction measures for Šilutė WWTP may be insufficient to achieve good status in the river.
Nemunas Small Tributaries	Jiesia	Lithuanian State Pisciculture and Fisheries Research Centre, Šilavotas subsidiary	NO	As a result of an aggregate impact of diffuse pollution and water discharged from Šilavotas subsidiary of the Lithuanian State Pisciculture and Fisheries Research Centre, two water bodies at risk have been identified in the Jiesia River. The designation of the river as a water body at risk due to increased concentrations of BOD <sub>7</sub> is also supported by the data of monitoring carried out in the river at Kliokiškė in 2006-2007. Accordingly, reliability of the assignment of the Jiesia to a risk group is sufficient. Reliability of the establishment of operating pollution sources, however, is deemed to be insufficient because it is difficult to determine the exact shares of diffuse pollution and water released from fishery ponds. It is likely that the implementation of supplementary diffuse pollution reduction measures all over the country would result in reduction of BOD <sub>7</sub> concentrations in the Jiesia down to the allowed level without applying supplementary measures for reduction of pollution by fishery ponds.
Nemunas Small	Armena	Klausučiai WWTP	YES	The water body is assigned to water bodies at risk due to potential exceedance of concentrations of BOD <sub>7</sub> and ammonium nitrogen. The measurement results of 2006

Basin/ sub-basin	River which undergoes a significant impact of point pollution	Dischargers which exert a significant impact	Recommendation on whether supplementary measures are required or not	Argumentation
Tributaries				show that the designation of the river as a water body at risk due to exceeded concentrations of BOD <sub>7</sub> is well-founded. Although no exceedances of concentrations of ammonium nitrogen were registered during the measurements in the river, a high concentration of total nitrogen was observed. High concentrations of BOD <sub>7</sub> in the wastewater discharged from Klausučiai WWTP were registered again in 2008, and ammonium nitrogen accounted for the largest share of total nitrogen.
Nemunas Small Tributaries	Liekė	Lekėčiai WWTP	YES	Following the modelling results, Lekėčiai WWTP exerts a significant impact on the concentrations of ammonium nitrogen in the Liekė River. Potential exceedance of concentrations of ammonium nitrogen is supported by the measurement results of 2006 when the registered concentration in the river was much higher than the threshold value of good ecological status. As compared to 2006, the pollution load of ammonium nitrogen discharged from Lekėčiai WWTP has not changed and therefore reliability of the assignment of the river to water bodies at risk is deemed to be sufficient and measures for reduction of pollution with ammonium nitrogen should be implemented in Lekėčiai WWTP.
Jūra	Šlyna	Raseiniai WWTP	YES	Due to an impact of pollution by Raseiniai WWTP, one water body at risk in the Šlyna and one water body at risk in the Šaltuona have been identified. There is no monitoring data which could confirm the validity of the designation either in the Šlyna or Šaltuona. However, high concentrations of total phosphorus were registered in the Reizgupis, which receives wastewater directly discharged thereto from Raseiniai WWTP, during a measurement in 2006. As compared to the situation in 2006, pollution loads discharged from Raseiniai WWTP have significantly increased (the volume of discharges went up). Modelling data shows that at the present level of pollution by Raseiniai WWTP, the threshold values of good ecological status may be exceeded in the rivers to a very large extent.
Jūra	Trišiūkštė	Adakavas WWTP	NO	An impact of this discharger was assessed using expert judgement because pollutant concentrations in wastewater here are not measured. Consequently, reliability is deemed to be insufficient. Besides, the measurement results of 2007 do not verify the risk either. It is recommended to continue operational monitoring in the river.
Dubysa	Lapišė	Tytuvėnai WWTP	YES	Although there is no water quality monitoring data supporting the assignment of the Lapišė to water bodies at risk, high concentrations exceeding the good ecological status

Basin/ sub-basin	River which undergoes a significant impact of point pollution	Dischargers which exert a significant impact	Recommendation on whether supplementary measures are required or not	Argumentation
				<p>requirements were registered in the Tytuva, which receives wastewater directly discharged thereto from Tytuvėnai WWTP, during a measurement in 2007. In addition, pollution loads of ammonium nitrogen have significantly increased. Therefore, reliability of the designation of the river as a water body at risk is deemed to be sufficient and measures for reduction of pollution with ammonium nitrogen should be implemented in Tytuvėnai WWTP.</p>
Lithuanian Coastal Rivers	Tenžė, Akmena-Danė	Kretinga WWTP	YES	Significance of pollution by Kretinga WWTP is verified by monitoring data (both data collected earlier in the Akmena-Danė downstream of Kretinga and the latest measurements in the mouth of the Akmena-Danė).
Lithuanian Coastal Rivers	Tenžė, Akmena-Danė	UAB Kretingos žvėrininkystės ūkis [Kretinga game farm]	NO	Measures implemented in Kretinga WWTP should be sufficient.
Lithuanian Coastal Rivers	Smeltalė	Storm water runoff dischargers of UAB Klaipėdos vanduo [Klaipėda water company]	NO	Due to an impact of wastewater emitted from dischargers of Klaipėda water company AB Klaipėdos vanduo, one water body at risk in the Smeltalė River has been identified. Concentrations of nitrogen and total phosphorus are not measured in storm water runoff so these were assessed using expert judgement. The results of a measurement carried out in the river in 2005 indicate only slight exceedance of BOD <sub>7</sub> concentrations, which is not sufficient for determining validity of the designation of the river as a water body at risk. Hence, operational monitoring in the Smeltalė should be continued.
Lithuanian Coastal Rivers	Ražė	Storm water runoff dischargers of UAB Palangos komunalinis ūkis [Palanga public utilities company]	NO	Due to an impact of dischargers of storm water runoff of Palanga public utilities company UAB Palangos komunalinis ūkis, one water body at risk in the Ražė River has been identified. Reliability of the designation of the river as a water body at risk is deemed to be insufficient because concentrations of nitrogen, which served as the basis for the designation of the river as a water body at risk, have not been measured in the wastewater of the dischargers. Instead, they were assessed using expert judgement. The results of the monitoring of 2008 do not verify the risk either, though measured concentrations of ammonium nitrogen are close to the margin value of good ecological status. Hence, operational monitoring in the Ražė should be continued.

Table 7. Pollution reduction demand

Basin/ sub-basin	Discharger	Annual wastewater volume, thou m <sup>3</sup>	BOD <sub>7</sub> pollution load, kg/year		NH <sub>4</sub> -N pollution load, kg/year		NO <sub>3</sub> -N pollution load, kg/year		Total phosphorus pollution load, kg/year	
			After basic measures	Required for achieving good status	After basic measures	Required for achieving good status	After basic measures	Required for achieving good status	After basic measures	Required for achieving good status
Žeimena	Švenčionys WWTP	115	537	-	247	-	4 862	-	1 150	638
Merkys	Šalčininkai WWTP	507	14 703	6 500	15 367	1 370	71	-	3 372	540.7
Neris	Kaišiadorys WWTP	709	5 459	-	10 344.3	709	290.7	-	1 191	<354.5
Nevėžis	Baisogala WWTP	97	2 037	-	2 716	723	329.8	-	281.3	364
Nevėžis	Pakiršinis WWTP	42	588	-	882		243.6	-	79.8	
Nevėžio	Bukonys WWTP	29	784	-	551	245	8.99	-	216.63	113
Šešupė	Šakiai WWTP	296	858.4	-	1 154.4	-	36.704	-	562.4	459
Šešupė	Kybartai WWTP	89	569.6	-	3 675.7	2280	89	-	445	-
Nemunas	Pravieniškės WWTP	508	2 082.8	-	4 978.4	1068	3 962.4	-	1 981.2	385
Nemunas	Klausučiai WWTP	43	1966	-	688	311	19.3	-	126.5	-
Nemunas	Lekėčiai WWTP	29	272.6	-	870	282	101.5	-	84.1	-
Jūra	Raseiniai WWTP	625	2 687.5	-	2 000	754	212.5	-	581.25	240
Lithuanian Coastal Rivers	Kretinga WWTP	1 347	15 436.6	6284	22 764.3	648	1 043.9	-	1 400.88	324

## Directive implementation costs in basins and sub-basins of the Nemunas RBD

19. Investments into the water supply and wastewater management infrastructure in 2003-2009 totalled to about LTL 1 billion. In the period 2007-2013, about LTL 2.1 billion are planned to be allocated for settlements of more than 2 000 p.e. for the development and upgrading of infrastructures for water supply, wastewater collection and treatment, and sludge management. Measures for the implementation of the Urban Wastewater Treatment Directive (construction and reconstruction of wastewater treatment facilities, construction of new sewerage networks and reconstruction of the old ones) in 2007-2013 have been provided for in a list of national projects<sup>5</sup>. These measures are further specified by individual basins and sub-basins of the Nemunas RBD.

### The Šešupė Sub-basin (including the Prieglius Basin)

20. Planned measures in the Šešupė Sub-basin include reconstruction of five wastewater treatment facilities, construction of 64.5 km of new and reconstruction of 0.5 km of the existing sewerage networks. The investment costs provided in Table 8 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Šešupė Sub-basin are estimated at LTL 102.18 million.

Table 8. National projects on renovation and development of water supply and wastewater management systems in the Šešupė Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Alytus distr.	Simnas		1	2.6		3.0			7.46
Kalvarija	Kalvarija			4.6		1.8			4.48
Kazlų Rūda	Kazlų Rūda		1	6.0		5.0			13.42
Lazdijai distr.	Lazdijai			4.7		4.3			8.728
Marijampolė	Marijampolė		1	10.7		8.9			26.7
Prienai distr.	Veiveriai				0.5				2.192
Šakiai distr.	Šakiai			2.3					17.0
	Kudirkos Naumiestis		1	11.7		3.8			
Prienai distr.	Kybartai			5.6		4.7			22.2
	Vilkaviškis		1	12.1		6.9			
<b>TOTAL</b>			<b>5</b>	<b>62.3</b>	<b>0.5</b>	<b>38.4</b>			<b>102.18</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Notes:

1. Development of Lazdijai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Lazdijai district*. The project also includes development of the infrastructure in Veisėjai settlement (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 17.455 million. It is assumed that half of the project value will be invested in the Šešupė Sub-basin.
2. Development of Veiveriai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Prienai district*.

<sup>5</sup> 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* was approved by Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 29 April 2009).

The project also includes development of the infrastructure in Prienai town and in Balbieriškis and Išlaužas settlements (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 8.766 million. It is assumed that one forth of the project value will be invested in the Šešupė Sub-basin.

### The Dubysa Sub-basin

21. Planned measures in the Dubysa Sub-basin include reconstruction of one existing wastewater treatment plant and construction of 14.5 km of new sewerage networks. The investment costs provided in Table 9 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Dubysa Sub-basin are estimated at LTL 23.333 million.

Table 9. National projects on renovation and development of water supply and wastewater management systems in the Dubysa Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Kelmė distr.	Kelmė			7.2		6.7			19.9
	Tytuvėnai		1	5.5		2.9			
Raseiniai distr.	Ariogala			1.8		1.8			3.433
<b>TOTAL</b>			<b>1</b>	<b>14.5</b>		<b>11.4</b>			<b>23.333</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Note:

Development of Ariogala water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Raseiniai district*. The project also includes development of the infrastructure in Raseiniai town and Viduklė settlement (the Jūra Sub-basin). The total value of the project is LTL 10.3 million. It is assumed that one third of the project amount will be invested in the Dubysa Sub-basin.

### The Jūra Sub-basin

22. Planned measures in the Jūra Sub-basin include construction of one new wastewater treatment plant and reconstruction of the existing wastewater treatment facilities, and construction of 61.2 km of new sewerage networks. The investment costs provided in Table 10 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Jūra Sub-basin are estimated at LTL 79.267 million.

Table 10. National projects on renovation and development of water supply and wastewater management systems in the Jūra Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LT
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Raseiniai distr.	Raseiniai			2.6		1.8			6.867
	Viduklė		1	1.8		0.9			
Šilalė distr.	Šilalė			14.5		12.4			37.2
	Kvėdarna		1	11.0		11.0			

Tauragė distr.	Tauragė			13.1		12.2			35.2
	Skaidvilė	1		18.2		3.9			
<b>TOTAL</b>		<b>1</b>	<b>2</b>	<b>61.2</b>		<b>42.2</b>			<b>79.267</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Note:

Development of Raseiniai and Viduklė water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Raseiniai district*. The project also includes development of the infrastructure in Ariogala settlement (the Dubysa Sub-basin). The total value of the project is LTL 10.3 million. It is assumed that two thirds of the project amount will be invested in the Jūra Sub-basin.

### The Lithuanian Coastal Rivers Basin

23. Planned measures in the Lithuanian Coastal Rivers Basin include reconstruction of four existing wastewater treatment facilities, construction of 28.7 km of new and reconstruction of 4.4 km of the existing sewerage networks. The investment costs provided in Table 11 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Lithuanian Coastal Rivers Basin are estimated at LTL 121.411 million.

Table 11. National projects on renovation and development of water supply and wastewater management systems in the Lithuanian Coastal Rivers Basin sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Klaipėda city	Klaipėda			13.0		9.0		1	52.0
Klaipėda distr.	Kretingalė		1	4.0		1.2		1	10.92
Kretinga distr.	Kretinga		1						18.911
	Vydmantai		1	4.3		4.3		1	
Neringa	Neringa			1.2	4.4	1.8	14.5		24.48
Palanga town	Palanga		1	6.2		6.2			15.1
<b>TOTAL</b>			<b>4</b>	<b>28.7</b>	<b>4.4</b>	<b>22.5</b>	<b>59.6</b>	<b>3</b>	<b>121.411</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Notes:

1. Development of Kretingalė water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Klaipėda district*. The project also includes development of the infrastructure in Vėžaičiai settlement (the Minija Sub-basin). The total value of the project is LTL 21.84 million. It is assumed that half of the project amount will be invested in the Lithuanian Coastal Rivers Basin.
2. Development of Kretinga and Vydmantai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kretinga district*. The project also includes development of the infrastructure in Salantai settlement (the Minija Sub-basin). The total value of the project is LTL 28.366 million. It is assumed that two thirds of the project amount will be invested in the Lithuanian Coastal Rivers Basin.

### The Merkys Sub-basin

24. Planned measures in the Merkys Sub-basin include construction of one new and reconstruction on one existing wastewater treatment plant, and construction 25.2 km of new sewerage networks. The investment costs provided in Table 12 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Merkys Sub-basin are estimated at LTL 60.905 million.

Table 12. National projects on renovation and development of water supply and wastewater management systems in the Merkys Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Šalčininkai distr.	Eišiškės		1						8.0
	Šalčininkai			1.7		1.7			
Trakai distr.	Rūdiškės	1		1.1		0.9			29.9
Varėna distr.	Varėna			22.4		3.7			23.005
<b>TOTAL</b>		<b>1</b>	<b>1</b>	<b>25.2</b>	<b>0</b>	<b>6.3</b>	<b>0</b>	<b>0</b>	<b>60.905</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Note:

Development of Rūdiškės water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Trakai district*. The project also includes development of the infrastructure in Trakai and Lentvaris towns (the Neris Small Tributaries Sub-basin). The total value of the project is LTL 59.8 million. It is assumed that half of the project amount will be invested in the Merkys Sub-basin.

### The Miniija Sub-basin

25. Planned measures in the Miniija Sub-basin include reconstruction of two wastewater treatment facilities, construction of 51.1 km of new and reconstruction of 2 km of the existing sewerage networks. The investment costs provided in Table 13 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Miniija Sub-basin are estimated at LTL 69.478 million.

Table 13. National projects on renovation and development of water supply and wastewater management systems in the Miniija Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Klaipėda distr.	Gargždai			3.4		3.4			4.76
	Vėžaičiai		1	6.1		4.9			10.92
Kretinga distr.	Salantai		1	3.9		3.2		1	9.455
Plungė distr.	Plungė			5.6		3.3			8.9
Plungė distr.	Plungė			24.0		17.3			28.91

Šilutė distr.	Švėkšna			4.7				6.533
<b>TOTAL</b>			<b>2</b>	<b>51.1</b>		<b>32.1</b>		<b>69.478</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Notes:

1. Development of Vėžaičiai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Klaipėda district*. The project also includes development of the infrastructure in Kretingalė settlement (Lithuanian Coastal Rivers Basin). The total value of the project is LTL 21.84 million. It is assumed that half of the project amount will be invested in the Miniija Sub-basin.
2. Development of Salantai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kretinga district*. The project also includes development of the infrastructure in Kretinga town and in Vydmantai settlement (Lithuanian Coastal Rivers Basin). The total value of the project is LTL 28.366 million. It is assumed that one third of the project amount will be invested in the Miniija Sub-basin.
3. Two investment projects are planned to be implemented in Plungė town: *Development of the water supply and wastewater management infrastructure in Plungė. Stage I* and *Development of the water supply and wastewater management infrastructure in Plungė. Stage II*. In the table, the information on these two projects is given in separate lines.
4. Development of Švėkšna water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Šilutė district*. The project also includes development of the infrastructure in Šilutė town and in Rusnė settlement (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 19.6 million. It is assumed that one third of the project amount will be invested in the Miniija Sub-basin.

### The Nemunas Small Tributaries Sub-basin

26. Planned measures in the Nemunas Small Tributaries Sub-basin include construction of two new and reconstruction of three existing wastewater treatment plants, construction of 177.1 km of new and reconstruction of 6.5 km of the existing sewerage networks. The investment costs provided in Table 14 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Nemunas Small Tributaries Sub-basin are estimated at LTL 277.127 million.

Table 14. National projects on renovation and development of water supply and wastewater management systems in the Nemunas Small Tributaries Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Alytus town	Alytus			28.9	5.0	31.3			49.764
Birštonas	Birštonas			3.2		3.0			4.34
Druskininkai	Druskininkai			2.1		1.5			2.52
Jurbarkas distr.	Jurbarkas			9.8		9.1			12.9
Kaunas city	Kaunas			44.5		39.8			72.8
Kaunas distr.	Ežerėlis			1.1		0.1			6.417
	Neveronys				0.3				

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
	Šlienava			4.0					
Kaunas distr.	Akademija			2.8		2.8			44.415
	Garliava			17.5		13.1			
	Ringaudai			5.6		5.6			
Kaunas distr.	Neveronys			5.8		4.9			24.456
	Vilkija			3.7					
	Šlienava			0.8					
Kaišiadorys	Rumšiškės			6.7		1.2			11.867
	Žiežmariai			0.9		0.9			
Lazdijai distr.	Veisiejai		1	3.6		2.3			8.728
	Pagėgiai			2.6		2.6			3.64
Prienai distr.	Prienai			4.1	1.2	4.2			6.575
	Balbieriškis	1							
	Išlaužas		1						
Prienai distr.	Prienai			2.3		1.3			4.338
	Jieznas			1.3		1.3			
Šilutė distr.	Šilutė			17.9					13.067
	Rusnė		1	0.9		0.9			
Šakiai distr.	Gelgaudiškis	1		7.0		2.0			11.3
<b>TOTAL</b>		<b>2</b>	<b>3</b>	<b>177.1</b>	<b>6.5</b>	<b>127.9</b>	<b>0</b>	<b>0</b>	<b>277.127</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Notes:

1. Development of Akademija, Domeikava and Ringaudai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Akademija, Domeikava, Garliava, Ringaudai)*. The project also includes development of the infrastructure in Domeikava settlement (the Nevėžis Sub-basin). The total value of the project is LTL 59.22 million. It is assumed that three fourths of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.
2. Development of Neveronys, Vilkija and Šlienava water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Karmėlava and Ramučiai, Neveronys, Raudondvaris, Vilkija, Šlienava)*. The project also includes development of the infrastructure in Karmėlava and Ramučiai settlements (the Neris Small Tributaries Sub-basin) and in Raudondvaris. The total value of the project is LTL 40.76 million. It is assumed that three fifths of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.
3. Three investment projects are planned to be implemented in Kaunas district: *Development of the water supply and wastewater management infrastructure in Kaunas district (Ežerėlis, Neveronys, Šlienava)*, *Development of the water supply and wastewater management infrastructure in Kaunas district (Akademija, Domeikava, Garliava, Ringaudai)*, and *Development of the water supply and wastewater management infrastructure in Kaunas district (Karmėlava and Ramučiai, Neveronys, Raudondvaris, Vilkija, Šlienava)*. In the table above, the information on these three projects is given in separate lines.
4. Development of Rumšiškės and Žiežmariai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaišiadorys district*. The project also includes development of the infrastructure

in Kaišiadorys town (the Neris Small Tributaries Sub-basin). The total value of the project is LTL 17.8 million. It is assumed that two thirds of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.

5. Development of Veisiejai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Lazdijai district*. The project also includes development of the infrastructure in Lazdijai town (the Šešupė Sub-basin). The total value of the project is LTL 17.455 million. It is assumed that half of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.
6. Development of Prienai, Balbieriškis and Išlaužas water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Prienai district*. The project also includes development of the infrastructure in Veiveriai settlement (the Šešupė Sub-basin). The total value of the project is LTL 8.766 million. It is assumed that three fourths of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.
7. Two investment projects are planned to be implemented in Prienai district: *Development of the water supply and wastewater management infrastructure in Prienai district* and *Development of the water supply and wastewater management infrastructure in Prienai*. In the table above, the information on these projects is given in separate lines.
8. Development of Šilutė and Rusnė water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Šilutė district*. The project also includes development of the infrastructure in Švėkšna settlement (the Minija Sub-basin). The total value of the project is LTL 19.6 million. It is assumed that two thirds of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.

### The Neris Small Tributaries Sub-basin

27. Planned measures in the Neris Small Tributaries Sub-basin include construction of one new and reconstruction of two existing wastewater treatment plants, construction of 161 km of new and reconstruction of 4.6 km of the existing sewerage networks. The investment costs provided in Table 15 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Neris Small Tributaries Sub-basin are estimated at LTL 179.686 million.

Table 15. National projects on renovation and development of water supply and wastewater management systems in the Neris Small Tributaries Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Elektrėnai	Elektrėnai - Vievis			2.1		2.0			8.47
	Elektrėnai – Elektrėnai – northern part of Vievis agglomeration (Kazokiškės)	1		3.9		3.8			
Jonava distr.	Jonava			7.3		2.0			10.1
	Rukla		1						

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Kaišiadorys distr.	Kaišiadorys			8.1		7.6			5.933
Kaunas distr.	Karmėlava and Ramučiai			20.1		8.8			8.152
Trakai distr.	Trakai-Lentvaris			26.7	0.4	18.3		1	29.9
Vilnius city	Vilnius			47.8	4.2	32.9	4.6		62.65
Vilnius distr.	Avižieniai			6.4		2.1			54.481
	Juodšiliai			6.1		1.5			
	Kalveliai		1	3.5		2.2			
	Nemenčinė			2.6		2.0			
	Nemėžis			3.0					
	Pagiriai			6.9		5.2			
	Rudamina			9.9		7.2			
	Skaidiškės			5.5		5.5			
	Valčiūnai			1.1					
<b>TOTAL</b>		<b>1</b>	<b>2</b>	<b>161</b>	<b>4.6</b>	<b>101.1</b>	<b>4.6</b>	<b>1</b>	<b>179.686</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Notes:

1. Development of Kaišiadorys water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaišiadorys district*. The project also includes development of the infrastructure in Rumšiškės and Žiežmariai settlements (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 17.8 million. It is assumed that one third of the project amount will be invested in the Neris Small Tributaries Sub-basin.
2. Development of Karmėlava and Ramučiai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Karmėlava and Ramučiai, Neveronys, Raudondvaris, Vilkija, and Šlienava)*. The project also includes development of the infrastructure in Raudondvaris (the Nevėžis Sub-basin), Neveronys, Vilkija and Šlienava (the Nemunas Small Tributaries Sub-basin) settlements. The total value of the project is LTL 40.76 million. It is assumed that one fifth of the project amount will be invested in the Neris Small Tributaries Sub-basin.
3. Development of Trakai-Lentvaris water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Trakai district*. The project also includes development of the infrastructure in Rūdiškės settlement (the Merkys Sub-basin). The total value of the project is LTL 59.8 million. It is assumed that half of the project amount will be invested in the Neris Small Tributaries Sub-basin.

### The Nevėžis Sub-basin

28. Planned measures in the Nevėžis Sub-basin include construction of 69.1 km of new sewerage networks. The investment costs provided in Table 16 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Nevėžis Sub-basin are estimated at LTL 73.503 million.

Table 16. National projects on renovation and development of water supply and wastewater management systems in the Nevėžis Sub-basin in 2007-2013

Municipality	Settlement	Planned works						Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	
Kaunas distr.	Domeikava			23.9		13.3		14.805
Kaunas distr.	Raudondvaris			7.2		2.8		8.152
Kėdainiai distr.	Kėdainiai			2.6		2.6		3.64
Panevėžys city	Panevėžys			31.4		31.4		43.96
Panevėžys distr.	Ramygala			2.0		2.0		2.8
Radviliškis distr.	Baisogala			2.0		0.9		3.146
<b>TOTAL</b>				<b>69.1</b>		<b>53</b>		<b>76.503</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Notes:

1. Development of Domeikava water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Akademija, Domeikava, Garliava, Ringaudai)*. The project also includes development of the infrastructure in Akademija, Garliava and Ringaudai settlements (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 59.220 million. It is assumed that one fourth of the project amount will be invested in the Nevėžis Sub-basin.
2. Development of Raudondvaris water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Karmėlava, Ramučiai, Neveronys, Raudondvaris, Vilkija, Šlienava)*. The project also includes development of the infrastructure in Karmėlava settlement (The Neris Small Tributaries Sub-basin) and in Ramučiai, Neveronys, Vilkija, and Šlienava settlements (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 40.76 million. It is assumed that one fifth of the project amount will be invested in the Nevėžis Sub-basin.
3. Two investment projects are planned to be implemented in Kaunas district. In the table, the information on these two projects is given in separate lines.
4. Development of Baisogala water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Radviliškis district*. The project also includes development of the infrastructure in Radviliškis town. The total value of the project is LTL 6.291 million. It is assumed that half of the project amount will be invested in the Nevėžis Sub-basin.

### The Šventoji Sub-basin

29. Planned measures in the Šventoji Sub-basin include reconstruction of three wastewater treatment plants and construction of 23 km of new sewerage networks. The investment costs provided in Table 17 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Šventoji Sub-basin are estimated at LTL 49.32 million.

Table 17. National projects on renovation and development of water supply and wastewater management systems in the Šventoji Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Anykščiai	Anykščiai		1	3.1		3.1			22.24
Ukmergė	Ukmergė		1	5.7		4.7			9.4
Utena	Utena			6.2		6.2			8.68
Zarasai	Dusetos-Padusetėlis Užtiltė		1	8.0		1.6			9.0
<b>TOTAL:</b>			<b>3</b>	<b>23.0</b>		<b>15.6</b>			<b>49.32</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

### The Žeimena Sub-basin

30. Planned measures in the Žeimena Sub-basin include reconstruction of one wastewater treatment plant and construction of 16.5 km of new sewerage networks. The investment costs provided in Table 18 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Žeimena Sub-basin are estimated at LTL 18.664 million.

Table 18. National projects on renovation and development of water supply and wastewater management systems in the Žeimena Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Ignalina distr.	Ignalina			2.3		1.0			2.31
Švenčionys distr.	Pabradė		1	3.2		3.2			16.354
	Švenčionys			11.0		7.7			
<b>TOTAL</b>			<b>1</b>	<b>16.5</b>		<b>11.9</b>			<b>18.664</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

### Directive concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC)

31. The Nitrates Directive requires implementing measures for reduction of pollution of water bodies with nitrates from agricultural sources. The measures provided for in the Directive are included in the National Programme on the Reduction of Water Pollution with Nitrates from Agricultural Sources, which has to be implemented in two stages. The first stage ended in 2007 and the second one will continue until May 2012. The Programme of Measures provides for four basic measures to be implemented in Lithuania:

31.1. Livestock density on a farm shall not exceed 1.7 livestock units (LSU) per hectare of utilised agricultural land;

31.2. The amount of nitrogen applied to the soil with manure shall not exceed 170 kg per hectare of utilised agricultural land;

31.3. Manure storages shall be constructed on farms with more than 10 LSU;

31.4. Part of the area of farms with more than 15 ha of utilised agricultural land shall be sowed with wintering plants.

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 N<sub>b</sub>/ha.

National legislation transposing the Directive:

- 1) Law No. VIII-529 of the Republic of Lithuania on Environmental Monitoring (*Valstybės žinios*, 1997, No. 112-2824);
- 2) Law No. IX-1613 of the Republic of Lithuania on the Amendment of Article 13 of the Law on Environmental Monitoring (*Valstybės žinios*, 2003, No. 61-2766);
- 3) Order No. D1-655 of the Minister of the Environment of the Republic of Lithuania of 3 December 2007 on the approval of the environmental regulatory documents LAND 47-1:2007 “Quality of water. Determination of biological oxygen demand per n days (BOD<sub>n</sub>). Part 1. Method of dilution and sowing with addition of allyl thiocarbamide” and LAND 47-2:2007 “Quality of water. Determination of biological oxygen demand per n days (BOD<sub>n</sub>). Part 2. Method of undiluted samples” (*Valstybės žinios*, 2007, No. 130-5270);
- 4) Order No. D1-412 of the Minister of the Environment of the Republic of Lithuania of 13 July 2007 on the approval of the environmental regulatory documents LAND 46-2007 “Quality of water. Identification of suspended matter. Method of filtering through a glass fibre filter” (*Valstybės žinios*, 2007, No. 80-3284);
- 5) Order No. 666 of the Minister of the Environment of the Republic of Lithuania of 23 December 2003 on general environmental requirements for husbandry farms (*Valstybės žinios*, 2003, No. 4-154);
- 6) Resolution No. 1076 of the Government of the Republic of Lithuania on the National Programme on the Reduction of Water Pollution with Nitrates from Agricultural Sources (*Valstybės žinios*, 2003, No. 83-3792);
- 7) Order No. 485 of the Minister of the Environment of the Republic of Lithuania of 6 November 2000 on the approval of the environmental regulatory documents LAND 38-2000 and LAND 39-2000 (*Valstybės žinios*, 2000, No. 101-3209);
- 8) Law No. IX-1388 of the Republic of Lithuania on the Amendment of the Law on Water (*Valstybės žinios*, 2003, No. 36-1544);
- 9) Order No. 426 of the Minister of the Environment of the Republic of Lithuania of 27 December 1999 on the approval of the environmental requirements for the management of manure and wastewater on farms (LAND 33-99) (*Valstybės žinios*, 2000, No. 8-217);
- 10) Order No. 452/607 of the Minister of Agriculture and the Minister of the Environment of the Republic of Lithuania of 19 December 2001 on the approval of

requirements for the protection of waters against pollution with nitrogen compounds (*Valstybės žinios*, 2002, No. 1-14);

- 11) Order No. V-455 of the Minister of Health of the Republic of Lithuania of 23 July 2003 on the approval of the Lithuanian Hygiene Norm HN 24:2003 “Drinking water safety and quality requirements” (*Valstybės žinios*, 2003, No. 79-3606);
- 12) Order No. 475/3D-397 of the Minister of the Environment and the Minister of Agriculture of the Republic of Lithuania of 29 September 2003 on the approval of the procedure for the reporting on pollution of water from agricultural sources to the European Commission (*Valstybės žinios*, 2004, No. 68-2380);
- 13) Order No. D1-367/3D-342 of the Minister of the Environment and the Minister of Agriculture of the Republic of Lithuania of 14 July 2005 on the approval of environmental requirements for manure management (*Valstybės žinios*, 2005, No. 92-3434);
- 14) Order No. D1-341/3D-307 of the Minister of the Environment and the Minister of Agriculture of the Republic of Lithuania of 18 June 2007 on the amendment of Order No. D1-367/3D-342 of the Minister of the Environment and the Minister of Agriculture of 14 July 2005 on the approval of environmental requirements for manure management (*Valstybės žinios*, 2007, No. 68-2689);
- 15) Law No. X-595 of the Republic of Lithuania on the Amendment of the Law on Environmental Monitoring (*Valstybės žinios*, 2006, No. 57-2025);
- 16) Order No. 1-06 of the Director of the Lithuanian Geological Survey under the Ministry of the Environment of 3 February 2003 on the approval of the procedure for the inventory of discharges of hazardous substances into groundwater and collection of information thereon (*Valstybės žinios*, 2003 No.17-770);
- 17) Order No. D1-624 of the Minister of the Environment of the Republic of Lithuania of 29 December 2006 on the amendment of Order No. 160 of the Minister of the Environment of 8 April 2002 on the approval of the National Environmental Monitoring Regulations and repeal of Order No. 106 of the Minister of the Environment of 12 March 2002 on the approval of the Regulations of the Environmental Monitoring Data Fund (*Valstybės žinios*, 2007, No. 4-179);
- 18) Order No. 3D-686/D1-676 of the Minister of the Environment and the Minister of Agriculture of 9 December 2008 on the approval of the Programme on the Reduction of Water Pollution from Agricultural Sources (*Valstybės žinios*, 2008, No. 143-5741).

### **Brief description of the measures**

32. During an analysis of consequences of the implementation of the Nitrates Directive, the effect of the first two measures is not evaluated because the livestock density in Lithuania is currently much lower than 1.7 LSU/ha (the average figure at the level of wards in agricultural land is 0.35 LSU/ha and the maximum one – about 1 LSU/ha), and the amount of nitrogen entering the soil with manure is lower than 170 kg/ha (35 kg/ha in the Nemunas RBD on average).

A list of the basic measures under the Nitrates Directive and the effectiveness of the implementation of these measures in Lithuania are given in Table 19.

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 measures may differ from farm to farm. The effectiveness values used for forecasting the impacts of the Nitrates Directive were determined on the basis of summary results of studies conducted in other countries (UK and Denmark).

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

### Scope of the implementation of the basic measures under the Nitrates Directive

33. As already said, the basic measures under the Nitrates Directive will cover farms with more than 10 LSU and with no manure storages. The total number of LSU in the basins and sub-basins of the Nemunas RBD and the number of LSU in farms of different size and in farms which already have manure storages is given in Table 20. Information on the distribution of LSU in the said farms was provided by the Agri-Information and Rural Business Centre.

Table 19. The basic measures under the Nitrates Directive and their effectiveness

No.	Requirement	Application	Impact on pollution loads	Expected decrease in pollution loads after the implementation of the measures, %
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 nitrate nitrogen and total phosphorus will go down in farms with more than 300 LSU. When manure is applied at the time of the lowest likelihood of surface runoff, reduction of ammonium nitrogen and BOD loads can be expected. The measure is efficient only when manure is applied at a suitable time and at a safe distance from water bodies. The measure has been partially implemented.	It is assumed that pollution loads in farms with manure storages are 20 % lower than in 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 nitrate nitrogen and total phosphorus will go down in farms with more than 10 LSU. When manure is applied at the time of the lowest likelihood of surface runoff, reduction of ammonium nitrogen and BOD loads can be expected.	Livestock pollution loads will go down by 20-30 % in farms where this measure will be applied.

No.	Requirement	Application	Impact on pollution loads	Expected decrease in pollution loads after the implementation of the measures, %
			The measure is efficient only when manure is applied at a suitable time and at a safe distance from water bodies.	
3	The amount of total nitrogen (TN) entering the soil (when fertilising it with organic fertilisers, and pasturing livestock) shall not exceed 170 kg/ha.	All livestock farms	This measure will have either no or a minor impact 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 <sup>st</sup> December and 1 <sup>st</sup> 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 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 only on working days.	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
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 TN in organic fertilisers used is 20 t 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 efficient as long as mineral fertilisers are included in fertilisation plans.	No decrease
6	The chosen type of fertilisation shall ensure uniform application of	All livestock farms	Application of manure has no or a negative impact on nitrogen	No change in nitrogen loads is expected, the

No.	Requirement	Application	Impact on pollution loads	Expected decrease in pollution loads after the implementation of the measures, %
	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.		loads because during incorporation of manure ammonium nitrogen does not evaporate and enters the soil. The impact of incorporation on loads of total phosphorus has been included in the impact of construction of manure storages.	impact on loads of total nitrogen is about 5 % and it has been included in the impact of 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, in 2004 wintering crops, meadows and pastures 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 for prevention of erosion	Farms situated in hilly terrains	Impact is very local, mainly through reduction of pollution with suspended matters and phosphorus*	No decrease

\* The impact of crop rotation for the prevention of erosion is analysed in more detail in the feasibility study *Development of recommendations for the reduction of erosion in agricultural areas and for the efficient implementation of good farming practice measures with a view to reduce pollution of water bodies* commissioned by the EPA and conducted by the Agri-Chemical Research Centre under the Lithuanian Institute of Agriculture in 2008-2009.

Table 20. The number of LSU on farms of different size and in farms which already have manure storages in basins and sub-basins of the Nemunas RBD

Sub-basin / basin	No. of LSU	LSU density (per basin/ sub-basin area)	Density of LSU	No. of LSU in farms with less than 10 LSU	No. of LSU in farms with 10 to 300 LSU	No. of LSU in farms with manure storages	No. of LSU in farms where manure storages will be constructed
Žeimena	15 798	0.06	11 714	2 289	1 795	1 757	2 328
Šventoji	66 429	0.10	42 658	20 076	3 695	5 168	18 603

Neris Small Tributaries	32 593	0.08	22 102	4 310	6 182	11 084	0
Merkys	24 716	0.07	17 435	4 391	2 890	2 472	4 809
Nevėžis	91 628	0.15	30 540	23 639	37 450	23 276	37 813
Šešupė	90 246	0.19	43 566	28 360	18 320	9 107	37 572
Dubysa	29 103	0.15	14 006	12 191	2 905	3 791	11 306
Nemunas Small Tributaries	115 368	0.13	63 802	37 418	14 147	16 624	34 942
Jūra	70 757	0.18	32 151	36 729	1 877	7 447	31 159
Minija	45 489	0.15	21 388	20 542	3 558	4 365	19 736
Lithuanian Coastal Rivers	10 403	0.10	3 316	1 103	1 103	905	6 182
Prieglius	1 028	0.14	716	311	0	21	290

The information provided in the table above demonstrates that at present 14.5 % of all LSU are held on farms with manure storages. This number varies between 2 % and 34 % depending on the basin or sub-basin in the Nemunas RBD. The largest number of LSU on farms with manure storages is currently held in the Neris Small Tributaries Sub-basin (about 34 %) and the Nevėžis Sub-basin (about 25 %). The implementation of the basic measures under the Nitrates Directive should result in increase of the number of LSU on farms with manure storages in the Nemunas RBD to 48 %. Depending on the basin/sub-basin of the Nemunas RBD, the number of LSU on farms with manure storages should be 26-67 %. The largest percentage, about 67 %, is expected in the Nevėžis Sub-basin, and approximately 50 % of all LSU should be held in the Šešupė, Dubysa, Minija, and Jūra sub-basins. A major impact of the construction of manure storages is forecasted for the Nevėžis, Šešupė, Jūra and Minija Sub-basins, where the most considerable change in the number of LSU on farms with manure storages is expected. The number of LSU in the said sub-basins should increase to more than 40 %.

### Nitrates Directive implementation costs

34. The investment costs of the implementation of the Directive were estimated in 2002 and totalled to LTL 320 million. Today, in the year 2009, expenditure already incurred for the introduction of the measures of the Nitrates Directive by now as well as costs that will still be required can be assessed on the basis of data of various assistance programmes related to the implementation of agricultural measures.

914 manure storages for 170 500 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 this period is 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 during the base period will cover farms with more than 10 LSU which still do not have manure storages. The total number of LSU in the basins and sub-basin of the Nemunas RBD and the number of LSU on farms of different size are given in Table 20. Information on the distribution of LSU on farms

of different size and on those with manure storages was provided by the Agri-Information and Rural Business Centre. The data was distributed by sub-basins in proportion to land areas of agricultural use.

Until now, 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.

Under the Measure *Compliance with standards* of the Rural Development Programme for 2004-2006<sup>6</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 2 470) are supposed to achieve compliance of their farms with the environmental requirements of the Nitrates Directive within three years from the signing of an agreement. Pursuant to the Measure *Compliance with 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. In addition, LTL 36 328 770 were paid out by July 2009 from the Programme budget under the Measure *Compliance with Standards. Obligations of the Rural Development Programme*.

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 amount allocated accounts for not more than 40-60 % of the 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 2009.

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 and since smaller manure storages are required, the additional amount needed in Lithuania totals to about LTL 600 million.

The distribution of the funds already paid out was calculated by dividing the total amount allocated for Lithuania in proportion to the number of manure storages in sub-basins and basins. It is assumed that the share of manure storages built using the assistance funds is more or less the same in all sub-basins/basins. The estimated distribution of funds is provided in Table 21. The figures in the table show that the implementation of the Nitrates Directives will require more investment funds than already allocated.

---

<sup>6</sup> Covers two directives – the Milk Directive and the Nitrates Directive.

Table 21. The demand of costs for the implementation of the Nitrates Directive in the Nemunas RBD, LTL, rounded up

Sub-basin / basin	Funds paid out for the implementation of the Nitrates Directive	Demand of additional funds for the implementation of the Nitrates Directive
Žeimena	3 699 898	4 903 707
Šventoji	10 886 104	39 185 424
Neris Small Tributaries	23 348 219	0
Merkys	5 207 661	10 129 484
Nevēžis	49 028 226	79 648 381
Šešupė	19 183 438	79 142 423
Dubysa	7 985 165	23 813 944
Nemunas Small Tributaries	35 016 430	73 601 318
Jūra	15 686 176	65 633 426
Minija	9 193 819	41 571 979
Lithuanian Coastal Rivers	1 906 716	13 021 786
Prieglius	44 234	611 700
<b>Total ~</b>	<b>181 200 000</b>	<b>431 300 000</b>

### Impact of the implementation of the basic measures under the Nitrates Directive

35. Mathematical modelling results show that the impact of the basic measures under the Nitrates Directive, of which only the construction of manure storages is expected to have a visible impact, on water bodies will be of a minor importance. The average loads currently transported by the main rivers in the Nemunas RBD and those forecasted after the implementation of the basic measures under the Nitrates Directive are provided in Table 22 below. The change was estimated assuming that pollution loads may go down by 20-30 % in farms where manure storages will be built.

The table results demonstrate that practically no decrease in diffuse pollution loads will be noticed in sub-basins where agricultural activities are not very intensive, namely, in the Žeimena and Merkys, where the forecasted reduction of nitrate nitrogen loads is as low as 0.5-1.5 % and that of other pollutants – less than 1 %. The nitrate loads as well as the loads of BOD<sub>7</sub> transported by the Šventoji are expected to go down approximately by 2 %. Pollution with ammonium nitrogen in the Šventoji Sub-basin should decrease by about 1.6 % and pollution with total phosphorus should go down by 0.6 %. Decrease in pollution loads transported by the Neris is similar to the situation in the Šventoji Sub-basin: the loads of nitrate nitrogen should go down by up to 2.4 %, the loads of BOD<sub>7</sub> and ammonium nitrogen - by up to 1 %, and of total phosphorus – 0.5 %. The major impact of the basic measures under the Nitrates Directive is forecasted for the Nevėžis and Šešupė Sub-basins, where the loads of nitrate nitrogen transported by the main rivers should be reduced by 2.5-4 %. The same reduction is expected in respect of the loads of BOD<sub>7</sub>, the loads of ammonium nitrogen and total phosphorus should go down respectively by 2 % and 1-2 %. The reduction of pollution by nitrate nitrogen generated in the Jūra and Dubysa sub-basins and transported by the main rivers should be reduced by 4 % after the implementation of the basic measures under the Nitrates Directive. Similar reduction is expected in respect of the loads of BOD<sub>7</sub>, the loads of ammonium nitrogen may go down even by 3 %. The forecasted reduction in the loads of total phosphorus in the Dubysa is about 1 % and approximately 2.5 % in the Jūra. The implementation of the basic measures under the Nitrates Directive should result in reduction of nitrate nitrogen loads transported by the Minija by approximately 2-3 %, the loads of BOD<sub>7</sub> should also go down by the same percentage, i.e. 2-3 %. The load of

ammonium nitrogen transported by the Minija should decrease by 1.5-2.5 % and the load of total phosphorus – by 1-1.5 %. The loads of nitrate nitrogen and BOD<sub>7</sub> transported by the Akmena-Danė will go down by 1-2 % and the load of ammonium nitrogen and total phosphorus – by as little as 0.5 and 0.5-1 %. Calculations show that the implementation of the basic measures of the Nitrates Directive will slightly reduce pollution loads transported by the Nemunas (excluding the Minija) into the Curonian Lagoon: the decrease in pollution with nitrate nitrogen should be about 2-3 %, by BOD<sub>7</sub> and ammonium nitrogen – by about 1 % and with total phosphorus – by about 0.6 %.

Decrease in pollutant concentrations in rivers will be similar to the decrease in pollution loads and will vary from a few to 10 %, depending on the river. Such low decrease will not ensure improvement of the ecological status of rivers which are currently significantly affected by diffuse agricultural pollution. To be able to achieve good ecological status in such rivers, supplementary measures for reduction of diffuse agricultural pollution will be required.

Table 22. Change in pollution loads transported by the main rivers in the Nemunas RBD after the implementation of the basic measures under the Nitrates Directive

River	BDS <sub>7</sub> , t/year		NH <sub>4</sub> -N, t/year		NO <sub>3</sub> -N, t/year		Total phosphorus, t/ year	
	Present	Forecasted	Present	Forecasted	Present	Forecasted	Present	Forecasted
Žeimena	1 057.3	1 051.3 – 1 045.1	34.7	34.6 – 34.4	311.2	309.6 – 308.1	33.3	33.2 – 33.1
Šventoji	2 664.5	2 632.1 – 2 610.8	79.4	78.6 – 78.1	1 818.3	1 794.9 – 1 780.1	84.2	83.9 – 83.7
Neris	12 335.9	12 258.5 – 12 222.8	344.3	341.6 – 340.8	5 357.8	5 259.9 – 5 231.6	462.8	460.9 – 460.3
Merkys	2 002.9	1 996.5 – 1 992.0	55.7	55.5 – 55.3	682.7	676.7 – 672.5	80.0	79.8 – 79.7
Nevėžis	1 675.3	1 640.5 – 1 611.3	70.8	70.0 – 69.4	4 245.3	4 150.8 – 4 074.0	71.1	70.6 – 70.2
Dubysa	795.1	775.7 – 762.7	21.8	21.4 – 21.1	999.1	975.8 – 960.2	29.4	29.1 – 29.0
Šešupė	2 108.2	2 065.5 – 2 040.6	36.5	36.0 – 35.7	2 385.4	2 324.2 – 2 286.0	78.1	77.2 – 76.7
Jūra	3 270.5	3 194.8 – 3 147.8	71.2	69.8 – 68.9	2 268.5	2 219.6 – 2 189.3	94.1	92.6 – 91.7
Minija	2 631.5	2 574.7 – 2 539.8	67.3	66.3 – 65.6	1 469.9	1 442.1 – 1 425.2	75.6	74.9 – 74.5
Lithuanian coastal rivers	731.6	724.5 – 719.9	72.4	72.3 – 72.2	419.7	415.6 – 412.9	36.4	36.3
Nemunas (excl. Minija)	42 553.5	42 294.2 – 42 142.0	599.8	595.5 – 593.3	16 964.9	16 687.8 – 16 526.8	1 280.3	1 275.5 – 1 273.1

The demand of supplementary measures was estimated by calculating the required pollution reduction in each catchment (a part of a surface water sub-basin delineated for the purpose of estimating loads using the MIKE BASIN model) in the runoff of which concentrations of nitrate nitrogen are forecasted to fail the good status requirements after the implementation of the basic measures under the Nitrates Directive. Hence, the relationship of the upper and lower reaches of rivers (i.e. implementation of the measures which are required in the lower reaches depending on the measures implemented in the upper reaches) was not assessed. Such decision was first of all determined by the fact that the WFD requires achieving good status not only in identified water bodies (in respect of which calculations can be carried out taking into account the relationship of the upper and lower reaches) but also in all rivers and river beds. On the other hand, it would be difficult to establish a line separating the area of the upper reaches where softer measures would be required, or no measures needed at all, after the implementation of supplementary measures in the lower reaches. Such assessment would require only identification of individual areas of the upper reaches in a sub-basin for the implementation of supplementary measures; however, as already said, the identification of such border lines would be very complicated and inaccurate.

The identified demand of supplementary measures for the reduction of agricultural measures is given in Table 23, and places where diffuse agricultural pollution should be reduced are demonstrated in Figure 1.

Table 23. Demand of supplementary measures for reduction of diffuse agricultural pollution in the Nemunas RBD

<b>Sub-basin</b>	<b>Area were reduction of diffuse pollution is required, km<sup>2</sup></b>	<b>Required average reduction of the load of NO<sub>3</sub>-N, kg/ha</b>
Nevēžis	5 295.3	3.3
Šešupė	2 067.1	1.9
Dubysa	745.9	0.46
Jūra	189.9	1.0
Neris Small Tributaries	260.3	1.6
Šventoji	347.7	1.3

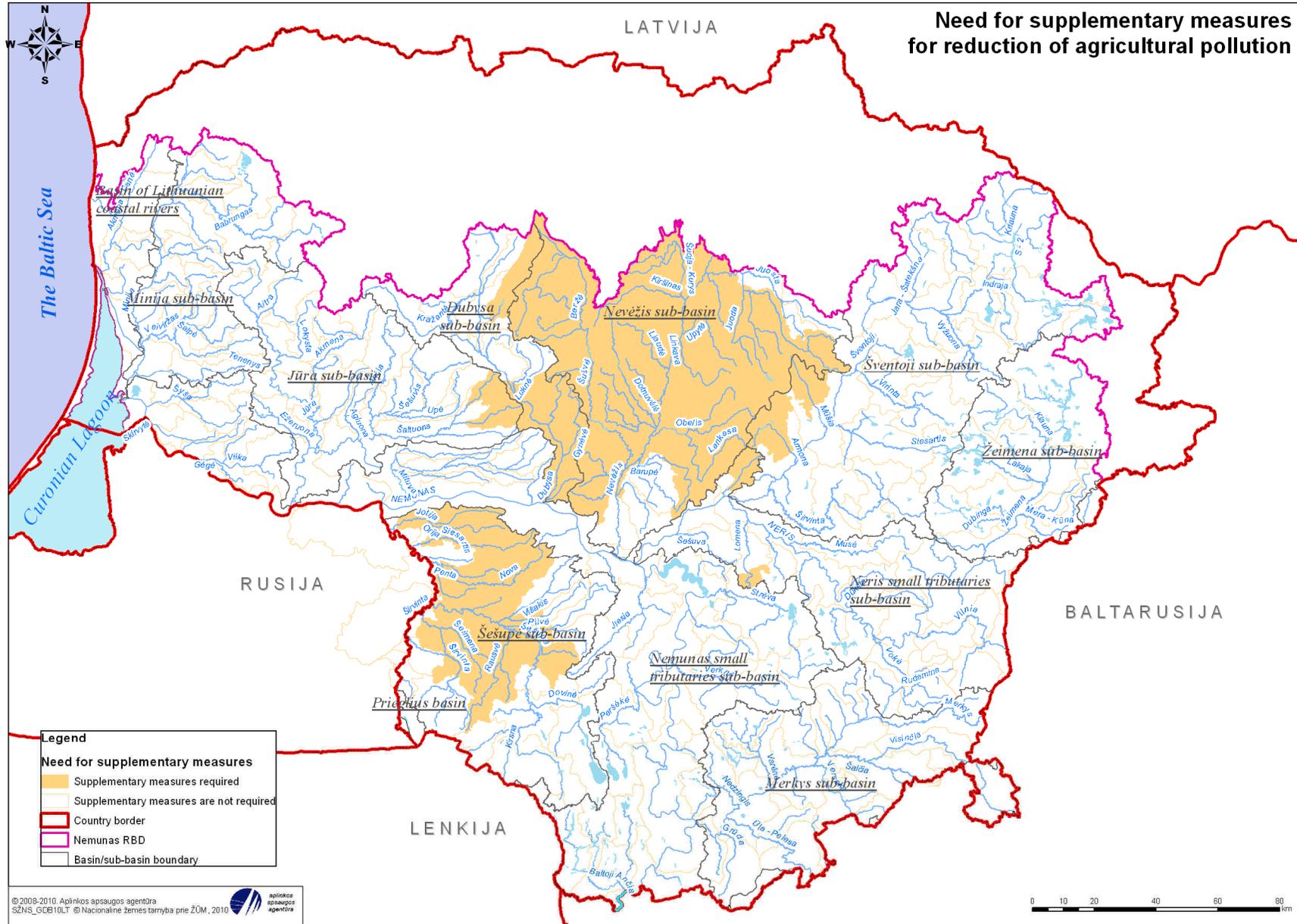


Figure 1. Demand of measures for reduction of diffuse agricultural pollution within the Nemunas RBD

### **Impact of the implementation of the measures under the Urban Wastewater Treatment Directive and the Nitrates Directive**

36. Calculations show that the implementation of the basic measures under the UWWT Directive and the Nitrates Directive will not have any significant impact on the ecological status of rivers. In many cases the forecasted alterations in concentrations will be minor and will vary within one and the same status class. Changes in the status are expected only in rivers where pollutant concentrations are currently close to the limit value of a certain status.

Potential changes in the ecological status by individual water quality indicators are provided in Table 24 below. It is forecasted that all water quality indicators in all rivers of the Nemunas RBD should remain in the same ecological status class.

Table 24. Forecasted changes in the ecological status after implementation of the basic measures under the UWWT Directive and the Nitrates Directive

<b>Basin/ sub-basin</b>	<b>River</b>	<b>Water quality indicator</b>	<b>Change in the status by a given indicator</b>
Neris Small Tributaries	Bražuolė	BOD <sub>7</sub> , NO <sub>3</sub> -N	from good to high
Šventoji	Širvinta	NO <sub>3</sub> -N	from good to high
Nevėžis	Aluona	NO <sub>3</sub> -N	from poor to moderate
Nevėžis	Žašinas	NO <sub>3</sub> -N	from poor to moderate
Šešupė	Širvinta (Šeimena)	NO <sub>3</sub> -N	from moderate to good
Jūra	Akmena	BOD <sub>7</sub>	from good to high
Nemunas Small Tributaries	Strėva	BOD <sub>7</sub>	from good to high
Minija	Skinija	NH <sub>4</sub> -N	from moderate to good

### **Measures for reducing pollution with total phosphorus**

37. Assessment of the impact of the basic measures on the status of water bodies established that a large number of water bodies will fail to meet the good status requirements even after the implementation of supplementary measures due to the impact of point or diffuse pollution.

An analysis of the significant impact of point pollution showed that a considerable share of dischargers which are exerting a significant impact leads to phosphorus-related water quality problems. One of the measures to reduce pollution with total phosphorus is to prohibit the use of detergents which contain phosphorus. This measure would noticeably reduce loads of phosphorus compounds entering water bodies with wastewater.

In the Nemunas RBD, 28 rivers were identified which are potentially subject to significant pollution with total phosphorus coming from point pollution sources. Introduction of requirements restricting the use of phosphorus for household and industrial purposes would help to reduce this type of pollution. Also, it should be taken into account that even restriction of phosphorus-containing detergents may not result in the solution of the present problems due to specific natural situations when a very high level of removal of phosphorus compounds has to be achieved before discharging wastewater into small rivers.

### **Directive on the quality of water intended for human consumption (98/83/EC)**

38. The Directive aims at protecting the health of water consumers in the European Union and ensuring that drinking water is healthy, clean and safe to drink throughout Europe. Besides other requirements, the Directive obliges Member States to take necessary measures ensuring continuous control of the quality of drinking water and to this end sets forth requirements for the drinking water monitoring procedure.

National legislation transposing the Directive:

- 1) Order No. V-455 of the Minister of Health of the Republic of Lithuania of 23 July 2003 on the approval of the Lithuanian Hygiene Norm HN 24:2003 “Drinking water safety and quality requirements” (*Valstybės žinios*, 2003, No. 79-3606);
- 2) Law No. IX-433 of the Republic of Lithuania on Drinking Water (*Valstybės žinios*, 2003, No. 79-3606);
- 3) Resolution No. 1388 of the Government of the Republic of Lithuania of 3 September 2002 on the approval of the procedure for the monitoring of drinking water supplied to the public through water supply distribution network (*Valstybės žinios*, 2002, No. 87-3753);
- 4) Order No. 685 of the Minister of the Environment of the Republic of Lithuania of 29 December 2001 on the approval of the procedure for the assessment of safety of products and processes intended for preparation and supply of drinking water on health (*Valstybės žinios*, 2002, No. 9325);
- 5) Order No. 476/442 of the Minister of Health of the Republic of Lithuania and the Director of the State Food and Veterinary Service of 27 September 2002 on the procedure for the provision of information on safety of drinking water (*Valstybės žinios*, 2002, No. 98-4379);
- 6) Order No. V-613 of the Minister of Health of the Republic of Lithuania of 17 July 2006 on the approval of the Lithuanian Hygiene Norm HN 44:2006 “Delineation and maintenance of sanitary protection zones of wellfields” (*Valstybės žinios*, 2006, No. 81-3217);
- 7) Order No. V-966 of the Minister of Health of the Republic of Lithuania of 29 November 2007 repealing Order No. 60 of the Chief State Sanitation Physician of the Republic of Lithuania of 23 November 1994 on the approval of HN 48 “Harmful substances. The maximum allowed concentration and temporarily permitted level in water intended for human consumption” and Order No. 621 of the Minister of Health of the Republic of Lithuania of 30 November 2001 on the approval of the Lithuanian Hygiene Norm HN 48:2001 “Hygiene requirements for the quality of raw water intended for human consumption” (*Valstybės žinios*, 2007, No. 127-5196);
- 8) Order No. 1-190 of the Director of the Lithuanian Geological Survey under the Ministry of the Environment of 24 December of 2009 on the approval of the procedure for groundwater monitoring by economic entities (*Valstybės žinios*, 2009, No. 157-7130).

### **Brief description of the measures**

39. Controls over drinking water quality

This measure is implemented in accordance with the requirements of the Hygiene Norm HN 24:2003. 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. Controls over the quality of drinking water is established in the Law of the Republic of Lithuania on Drinking Water (*Valstybės žinios*, 2001, No. 64-2327) – paragraph 2 of Article 11 sets forth that suppliers of drinking water must conduct monitoring of the water which is publicly supplied and used in food enterprises.

#### 40. 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 Order No. 417 of the Minister of the Environment of 23 December 1999 on the approval of the Lithuanian environmental regulatory document LAND 4-99 (*Valstybės žinios*, 1999, No. 112-3263; 2008, No. 144-5800).

The procedure for the removal of bore wells is controlled by the Ministry of the Environment.

#### 41. Establishment of sanitary protection zones (SPZ) of wellfields

Such zones are developed 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:

41.1. 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;

41.2. the belt preventing microbial pollution (second belt) is a protective belt where microbial and chemical pollution is restricted;

41.3. 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 organises 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. When the boundaries of the WPZ of a wellfield are located on the territories of several municipalities, establishment of a WPZ and protection of the wellfield is coordinated by the county governor and when the WPZ is situated on the territory of several counties – by the governor of the county where the wellfield is located.

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 validation of SPZ because so far, as provided for in HN 44:2006, sanitary protection zones are established only for a few wellfields.

### **Directive implementation results**

42. The Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015 was approved by the Government on 27 August 2008. The key provisions of this Strategy conform to the Water Economy (Water Supply and Wastewater Disposal) Development Strategy approved in 2005 by an order of the Minister of the Environment. The new Strategy aims at ensuring that drinking water supply and wastewater management services are accessible to at least 95 % of the total population of the country and that compliance of drinking water supplied for public needs with safety and quality requirements is not less than 100 % by 2015.

### **Directive implementation costs**

43. Costs required for the solution of fluorine and iron problems were estimated in 2001 and totalled to about LTL 100 million. However, the Drinking Water Directive does not require mandatory removal of iron as of an indicative parameter. After 2001, no other assessments of the costs of the implementation of the Drinking Water Directive were conducted either on the national or RBD level.

Measures for the implementation of the requirements of the Drinking Water Directive can also cover, even though indirectly, seven measures provided for on the List of National Projects for 2007-2013<sup>7</sup>. These include construction of new and reconstruction of the existing water supply networks, construction and rehabilitation of water improvement facilities. These measures are planned to be implemented together with the measures for the implementation of the Urban Wastewater Treatment Directive (the projects cover both water supply and wastewater management systems). The available data does not allow making an accurate assessment of investments planned only for the improvement and development of water supply systems hence the information of planned investments is given in Section 1 of Chapter 1 devoted to the implementation of the Wastewater Directive. The following sections provide data on the length of water supply networks planned to be constructed/reconstructed and planned construction/reconstruction of water improvement facilities.

### **The Šešupė Sub-basin**

44. The length of new water supply networks planned to be constructed in the Šešupė Sub-basin totals to 38.4 km (Table 8).

---

<sup>7</sup> A List of National Projects under Measure No. VP3-3.1-AM-01-V *Renovation and development of water supply and wastewater treatment systems* was approved by Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 29 April 2009).

### **The Dubysa Sub-basin**

45. The length of new water supply networks planned to be constructed in the Dubysa Sub-basin totals to 11.4 km (Table 9).

### **The Jūra Sub-basin**

46. The length of new water supply networks planned to be constructed in the Jūra Sub-basin totals to 42.2 km (Table 10).

### **The Lithuanian Coastal Rivers Basin**

47. The length of new water supply networks planned to be constructed in the Lithuanian Coastal Rivers Basin totals to 22.5 km and the length of the existing water supply networks planned to be reconstructed is 59.6 km. Also, three water improvement facilities will be constructed/reconstructed (Table 11).

### **The Merkys Sub-basin**

48. The length of new water supply networks planned to be constructed in the Merkys Sub-basin totals to 6.3 km (Table 12).

### **The Minija Sub-basin**

49. The length of new water supply networks planned to be constructed in the Minija Sub-basin totals to 32.1 km. Also, water improvement facilities will be built in Salantai (Kretinga distr.) (Table 13).

### **The Nemunas Small Tributaries Sub-basin**

50. The length of new water supply networks planned to be constructed in the Nemunas Small Tributaries Sub-basin totals to 127.9 km (Table 14).

### **The Neris Small Tributaries Sub-basin**

51. The length of new water supply networks planned to be constructed in the Neris Small Tributaries Sub-basin totals to 101.1 km and the length of the existing water supply networks planned to be reconstructed is 4.6 km. Also, water improvement facilities will be constructed/reconstructed (Trakai-Lentvaris) (Table 15).

### **The Nevėžis Sub-basin**

52. The length of new water supply networks planned to be constructed in the Nevėžis Sub-basin totals to 53 km (Table 16).

### **The Šventoji Sub-basin**

53. The length of new water supply networks planned to be constructed in the Šventoji Sub-basin totals to 15.6 km (Table 17).

### **The Žeimena Sub-basin**

54. The length of new water supply networks planned to be constructed in the Žeimena Sub-basin totals to 11.9 km (Table 18).

### The Prieglius Basin

55. No construction/reconstruction of water supply networks or water improvement facilities has been planned in the Prieglius Basin.

#### Directive on the conservation of wild birds (79/409/EEC)

56. The Directive on the conservation of wild birds regulates protection of areas important for birds and requires establishment of special protected areas for the conservation of certain species 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. It can happen that the objectives of the WFD contradict the objectives set for protected areas. In such cases exceptions can be provided for in RBD management plans and protection measures applied in protected areas.

However, so far no cases of contradiction of the objectives of the WFD to the requirements of the Birds Directive, or the Habitats Directive, have been identified in Lithuania.

National legislation transposing the Directive:

- 1) Law No. VIII-1768 of the Republic of Lithuania of 27 June 2000 on the Amendment of Articles 19, 20, 21 and 24 of the Law on Territorial Planning (*Valstybės žinios*, 2000, No. 58-1708);
- 2) Law No. VIII-1669 of the Republic of Lithuania of 9 May 2000 on the Amendment and Supplement of Articles 2, 17, 20 of the Law on Territorial Planning (*Valstybės žinios*, 2000, No. 42-1195);
- 3) Law No. VIII-2041 of the Republic of Lithuania of 12 October 2000 on the Amendment and Supplement of Articles 2, 4, 9, 14, 17, 20, 21, 22, 23, 24, 26, 32 of the Law on Territorial Planning (*Valstybės žinios*, 2000, No. 92-2881);
- 4) Law No. IX-288 of the Republic of Lithuania of 19 April 2001 on the Amendment of Articles 21, 24 and 26 of the Law on Territorial Planning (*Valstybės žinios*, 2001, No. 39-1358);
- 5) Law No. IX-1512 of the Republic of Lithuania of 17 April 2003 on the Amendment of Article 30 of the Law on Territorial Planning (*Valstybės žinios*, 2003, No. 42-1916);
- 6) Law No. I-1120 of the Republic of Lithuania of 12 December 1995 on Territorial Planning (*Valstybės žinios*, 1995, No. 107-2391);
- 7) Law No. IX-1614 of the Republic of Lithuania of 10 June 2003 on the Amendment of Articles 4, 8, 10 and 24 of the Law on Wildlife (*Valstybės žinios*, 2003, No. 61-2767);
- 8) Law No. IX-1091 of the Republic of Lithuania of 19 September 2002 on the Amendment of Articles 4, 10 and 13 of the Law on Wildlife (*Valstybės žinios*, 2002, No. 96-4168);
- 9) Law No. IX-638 of the Republic of Lithuania of 11 December 2001 on the Amendment of the Law on Wildlife (*Valstybės žinios*, 2001, No. 110-3988);

- 10) Law No. VIII-1612 of the Republic of Lithuania of 11 April 2000 on amendment and Supplement of Articles 30, 31 of the Law on Territorial Planning (*Valstybės žinios*, 2000, No. 34-953);
- 11) Law No. VIII-435 of the Republic of Lithuania of 7 October 1997 on the Amendment of Article 32 of the Law on Territorial Planning (*Valstybės žinios*, 2003, 1997, No. 96-2427);
- 12) Law No. VIII-323 of the Republic of Lithuania of 26 June 1997 on the Amendment of Articles 2, 4, 6, 8, 9, 11, 17, 20, 21, 23, 24, 29, 30, 32 of the Law on Territorial Planning (*Valstybės žinios*, 1997, No. 65-1548);
- 13) Law No. IX-966 of the Republic of Lithuania of 20 June 2002 on Hunting (*Valstybės žinios*, 2002, No. 65-2634) (version in force);
- 14) Law No. IX-1612 of the Republic of Lithuania of 10 June 2003 on the Amendment of Articles 6, 12 and 18 of the Law on Hunting (*Valstybės žinios*, 2003, No. 61-2765);
- 15) Order No. 139 of the Minister of the Environment of the Republic of Lithuania of 11 April 2000 on the approval of the procedure for the use of wild plants and mushroom for scientific, cultural, educational and aestehical purposes and for compiling of botanical and microbiological collections (*Valstybės žinios*, 2000, No. 32-910);
- 16) Order No. 372 of the Minister of the Environment of the Republic of Lithuania of 8 September 2000 on the approval of the procedure for picking protected species of animals, plants and mushrooms from the natural environment (*Valstybės žinios*, 2000, No. 79-2396);
- 17) Order No. 176/240 of the Minister of the Environment and the Minister of Forestry of the Republic of Lithuania of 5 December 1996 on the approval of the Rules for Visiting Woods (*Valstybės žinios*, 1996, No. 120-2833);
- 18) Order No. 159 of the Minister of the Environment of the Republic of Lithuania of 8 April 2002 on the approval of the lists of animals and plants of Community importance found in Lithuania (*Valstybės žinios*, 2002, No. 40-1513);
- 19) Order No. 223 of the Minister of the Environment of the Republic of Lithuania of 2 May 2002 on the approval of the List of Species Subject to Special Protection (*Valstybės žinios*, 2002, No. 49-1911);
- 20) Order No. 448 of the Minister of the Environment of the Republic of Lithuania of 21 August 2002 on the amendment of Order No. 173 of the Minister of the Environment of the Republic of Lithuania of 27 April 2000 on execution of paragraph 2 of Resolution No. 1446 of the Government of the Republic of Lithuania of 20 December 1999 on the implementation of the Law on Wild Flora (*Valstybės žinios*, 2002, No. 84-3670);
- 21) Order No. 173 of the Minister of the Environment of the Republic of Lithuania of 27 April 2000 on execution of paragraph 2 of Resolution No. 1446 of the Government of the Republic of Lithuania of 20 December 1999 on the implementation of the Law on Wild Flora (*Valstybės žinios*, 2000, No. 37-1046);
- 22) Order No. 226 of the Minister of the Environment of the Republic of Lithuania of 24 April 2001 on the amendment of the List of Species of Wild Plants and Mushrooms Subject to Restricted or Prohibited Picking and Marketing (*Valstybės žinios*, 2001, No. 37-1275);

- 23) Order No. 695 of the Minister of the Environment of the Republic of Lithuania of 31 December 2002 on the approval of the Monitoring Programme for Areas Important for the Conservation of Habitats and Birds (*Valstybės žinios*, 2003, No. 4-161);
- 24) Order No. 352 of the Minister of the Environment of the Republic of Lithuania of 1 July 2002 on the approval of the procedure for introduction, re-introduction and relocation, the procedure for the control and extermination of organisms of invasive species, composition and regulations of the board on control of invasive species, and the reintroduction and relocation programme (*Valstybės žinios*, 2002, No. 81-3505);
- 25) Order No. 511 of the Minister of the Environment of the Republic of Lithuania of 30 September 2002 on a new version of the Rules for Hunting on the Territory of the Republic of Lithuania approved by Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2002, No. 97-4308);
- 26) Order No. 697 of the Minister of the Environment of the Republic of Lithuania of 31 December 2002 on the approval of the procedure for the reporting on the implementation of the Habitats and Birds Directives to the European Commission (*Valstybės žinios*, 2002, No. 9-315);
- 27) Order No. D1-358 of the Minister of the Environment of 2 July 2008 on the approval of criteria for the screening of areas important for the conservation of birds (*Valstybės žinios*, 2008, No. 77-3048);
- 28) Law No. VIII-1636 of 18 April 2000 on the Amendment of the Law on Environmental Impact Assessment of the Proposed Economic Activity (new version) (*Valstybės žinios*, 2000, No. 39-1092);
- 29) Order No. 123 of the Minister of the Environment of 19 March 2002 on the amendment of certain orders of the Minister of the Environment (*Valstybės žinios*, 2002, No. 31-1175);
- 30) Law No. I-1352 of 28 May 1996 of the Republic of Lithuania on Amendment and Supplement of the Law on Environmental Protection (*Valstybės žinios*, 1996, No. 57-1335)
- 31) Law No. I-2223 of 21 January 1992 of the Republic of Lithuania on Environmental Protection (*Valstybės žinios*, 1992, No. 5-75) (version in force);
- 32) Law No. IX-1610 of 10 June 2003 of the Republic of Lithuania on the Amendment of Articles 6 and 30 of the Law on Environmental Protection (*Valstybės žinios*, 2003, No. 61-2763);
- 33) Law No. VIII-2026 of 12 October 2000 of the Republic of Lithuania on the Amendment of Article 30 of the Law on Environmental Protection (*Valstybės žinios*, 2000, No. 90-2773);
- 34) Law No. VIII-1637 of 18 April 2000 of the Republic of Lithuania on the Amendment of Articles 1, 7, 8, 15, 16, 26 and Repeal of Article 27 of the Law on Environmental Protection (*Valstybės žinios*, 2000, No.39-1093);
- 35) Law No. VIII-310 of 26 June 1997 of the Republic of Lithuania on the Amendment of Article 24 of the Law on Environmental Protection (*Valstybės žinios*, 1997, No. 65-1540);

- 36) Law No. VIII-2026 of 20 December 2001 of the Republic of Lithuania on the Amendment of Articles 1, 4, 6, 7, 8, 9, 23, Amendment of the Title of Chapter II of the Law on Environmental Protection and Supplement of the Law with Article 22(1) (*Valstybės žinios*, 2002, No.2-49)
- 37) Law No. IX-628 of 4 December 2001 of the Republic of Lithuania on the Amendment of the Law on Protected Areas (new version) (*Valstybės žinios*, 2001, No. 108-3902);
- 38) Resolution No. 276 of the Government of the Republic of Lithuania of 15 March 2004 on the approval of the Regulations on Areas Important for the Conservation of Habitats and Birds (*Valstybės žinios*, 2004, No. 41-1335);
- 39) Order No. 592 of the Minister of the Environment of 12 December 2001 on accumulation of data on animal and plant species of Community importance (*Valstybės žinios*, 2001, No. 68-2374);
- 40) Resolution No. 709 of the Government of the Republic of Lithuania of 9 June 2004 on the approval of the procedure for drafting and approving strategic planning documents on protected areas (*Valstybės žinios*, 2004, No. 93-3409);
- 41) Law No. X-258 of 21 June 2005 on the Amendment of the Law on Environmental Impact Assessment of the Proposed Economic Activity (new version) (*Valstybės žinios*, 2005, No. 84-3105);
- 42) Law No. IX-2032 of 19 February 2004 of the Republic of Lithuania on the Amendment and Supplement of Articles 1 and 2 of the Law on Environmental Protection and Supplement of the Law with Article 27 and an Annex (*Valstybės žinios*, 2004, No. 36-1179);
- 43) Law No. X-147 of 24 March 2005 of the Republic of Lithuania on the Amendment and Supplement of Articles 1, 2, 6, 7, 8, 14, 19, 26, 31, 32, 33, 34 and the Annex, Repeal of Article 24 of the Law on Environmental Protection and Supplement of the Law with Articles 32(1), 32(2) (*Valstybės žinios*, 2005, No. 47-1558);
- 44) Law No. IX-1962 of the Republic of Lithuania of 15 January 2004 on the Amendment of the Law on Territorial Planning (*Valstybės žinios*, 2004, No. 21-617);
- 45) Order No. B1-136 of the Director of the State Food and Veterinary Service of the Republic of Lithuania of 26 January 2007 on the approval of the procedure for issuing permits for animal carriers and the procedure for issuing competence certificates for handlers of transported animals (*Valstybės žinios*, 2007, No.16-610);
- 46) Resolution No. 130 of the Government of the Republic of Lithuania of 7 February 2005 on the approval of the National Monitoring Programme for 2005–2010 (*Valstybės žinios*, 2005, No.19-608);
- 47) Law No. IX-1983 of the Republic of Lithuania of 27 January 2004 on the Amendment of the Law on Land (*Valstybės žinios*, 2004, No. 28-868);
- 48) Order No. D1-645 of the Minister of the Environment of the Republic of Lithuania of 14 December 2004 on the approval of the requirements for the contents of nature management plans (*Valstybės žinios*, 2004, No. 184-6807);
- 49) Order No. D1-274/1B-532/B1-507 of the Minister of the Environment, the Director General of the Customs Department under the Ministry of Finance and the Director of the State Food and Veterinary Service of the Republic of Lithuania of

- 18 May 2004 on the amendment of Order No. 658/831/743 of the Minister of the Environment, the Director General of the Customs Department under the Ministry of Finance and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 21 December 2002 on the approval of the Rules for Trading Wild Animals (*Valstybės žinios*, 2004, No. 85-3097);
- 50) Order No. 309 of the Minister of the Environment of the Republic of Lithuania of 17 June 2003 on the approval of the Rules for Marking Wild Animals (*Valstybės žinios*, 2003, No. 61-2819);
  - 51) Resolution No. 380 of the Government of the Republic of Lithuania of 19 April 2006 on the amendment of Resolution No. 380 of the Government of the Republic of Lithuania of 15 April 2004 on the approval of the Regulations on Areas Important for the Conservation of Habitats and Birds (*Valstybės žinios*, 2006, No. 44-1606);
  - 52) Order No. 519/449 of the Minister of the Environment and Director of the State Food and Veterinary Service of the Republic of Lithuania of 2 October 2002 on the approval of the Rules for Keeping Wild Animals in Captivity and the amendment of Order No. 250/224 of the Minister of the Environment and the Director of the State Food and Veterinary Service of the Republic of Lithuania (*Valstybės žinios*, 2002, No. 100-4456)
  - 53) Order No. 586 of the Minister of the Environment of the Republic of Lithuania of 11 November 2002 on the approval of the Rules for Using Wild Animals For Scientific, Cultural, Educational and Aesthetical Purposes (*Valstybės žinios*, 2002, No. 111-4931);
  - 54) Order No. No. D1-712 of the Minister of the Environment of the Republic of Lithuania of 30 December 2004 on the amendment of Order No. 586 of the Minister of the Environment of the Republic of Lithuania of 11 November 2002 on the approval of the Rules For Using Wild Animals For Scientific, Cultural, Educational and Aesthetical Purposes (*Valstybės žinios*, 2005, No. 4-78);
  - 55) Resolution No. 967 of the Government of the Republic of Lithuania of 18 August 2004 (*Valstybės žinios*, 2004, No. 130-4650);
  - 56) Resolution No. 343 of the Government of the Republic of Lithuania of 12 May 1992 on the approval of special conditions for the use of land and forest (*Valstybės žinios*, 1992, No. 22-652);
  - 57) Resolution No. 1135 of the Government of the Republic of Lithuania of 30 September 1996 on the amendment of Resolution No. 343 of the Government of the Republic of Lithuania of 12 May 1992 on the approval of special conditions for the use of land and forest (*Valstybės žinios*, 1996, No. 43-1057);
  - 58) Resolution No. 414 of the Government of the Republic of Lithuania of 28 April 1997 on the amendment of Resolution No. 343 of the Government of the Republic of Lithuania of 12 May 1992 on the approval of special conditions for the use of land and forest (*Valstybės žinios*, 1997, No. 38-940);
  - 59) Order No. 513 of the Minister of the Environment of the Republic of Lithuania of 30 September 2002 on the approval of the procedure for the regulation of abundance of the game in areas where hunting is prohibited (*Valstybės žinios*, 2002, No. 97-4309);
  - 60) Order No. 701 of the Minister of the Environment of the Republic of Lithuania of 24 December 2003 on the approval of the Building Technical Regulation STR

- 1.05.05:2004 “Environmental part of the design of a structure” (*Valstybės žinios*, 2004, No. 50-1675);
- 61) Order No. D1-609 of the Minister of the Environment of the Republic of Lithuania of 1 December 2004 on the approval of the procedure for identifying significance of the effect of the implementation of plans or programmes on potential NATURA 2000 areas or on those already established (*Valstybės žinios*, 2004, No. 179-6651);
  - 62) Order No. 250/224 of the Minister of the Environment and Director of the State Food and Veterinary Service of the Republic of Lithuania of 16 May 2002 on the approval of the procedure for taking wild animals from their habitats for compiling collections and registration of such collections (*Valstybės žinios*, 2002, No. 60-2478)
  - 63) Order No. D1-24/B1-37 of the Minister of the Environment and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 16 January 2006 on the amendment of Order No. 250/224 of the Minister of the Environment and the Director of the State Food and Veterinary Service of 16 May 2002 on the approval of the procedure for taking wild animals from their habitats for compiling collections and registration of such collections (*Valstybės žinios*, 2006, No. 10-389);
  - 64) Order No. D1-584/1B-1019/B1-987 of the Minister of the Environment, the Director General of the Customs Department under the Ministry of Finance and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 12 November 2004 on the amendment of Order No. 658/831/743 of the Minister of the Environment, the Director General of the Customs Department under the Ministry of Finance and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 21 December 2002 on the approval of the Rules For Trading Wild Animals (*Valstybės žinios*, 2004, No. 167-6158);
  - 65) Resolution No. 1317 of the Government of the Republic of Lithuania of 22 October 2003 on the main provisions of the Rural Development Plan for 2004–2006 (*Valstybės žinios*, 2003, No. 101-4550);
  - 66) Law No. X-159 of the Republic of Lithuania of 14 April 2005 on the Amendment and Supplement of Articles 2, 9, 10, 11, 14 and 20 of the Law on Wild Fauna (*Valstybės žinios*, 2005, No. 57-1940);
  - 67) Order No. 258 of the Minister of the Environment of the Republic of Lithuania of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2000, No. 53-1540);
  - 68) Order No. 25 of the Minister of the Environment of the Republic of Lithuania of 16 January 2003 on the amendment of Order No. 511 of the Minister of the Environment of 30 September 2002 on a new version of the Rules for Hunting on the Territory of the Republic of Lithuania approved by Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2003, No. 9-318);
  - 69) Order No. 453 of the Minister of the Environment of the Republic of Lithuania of 11 September 2003 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2003, No. 90-4088);
  - 70) Order No. D1-255 of the Minister of the Environment of the Republic of Lithuania of 6 May 2004 on the amendment of Order No. 258 of the Minister of the

- Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2004, No. 79-2814);
- 71) Order No. D1-659 of the Minister of the Environment of the Republic of Lithuania of 22 December 2004 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2004, No. 185-6868);
  - 72) Order No. D1-184 of the Minister of the Environment of the Republic of Lithuania of 1 April 2005 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2005, No. 45-1477);
  - 73) Order No. D1-441 of the Minister of the Environment of the Republic of Lithuania of 14 September 2005 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2005, No. 113-4137);
  - 74) Order No. D1-480 of the Minister of the Environment of the Republic of Lithuania of 5 October 2005 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2005, No. 119-4309);
  - 75) Order No. D1-30 of the Minister of the Environment of the Republic of Lithuania of 19 January 2006 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2006, No. 10-392);
  - 76) Order No. D1-358 of the Minister of the Environment of the Republic of Lithuania of 14 July 2005 on the approval of the procedure for regulating the abundance of the population of the Great Cormorant (*Valstybės žinios*, 2005, No. 89-3366);
  - 77) Order No. D1-251 of the Minister of the Environment of the Republic of Lithuania of 22 May 2006 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2006, No. 60-2150);
  - 78) Order No. D1-250 of the Minister of the Environment of the Republic of Lithuania of 22 May 2006 on the amendment of Order No. 352 of the Minister of the Environment of the Republic of Lithuania of 1 July 2002 on the approval of the procedure for introduction, re-introduction and relocation, the procedure for the control and extermination of organisms of invasive species, composition and regulations of the board on control of invasive species, and the reintroduction and relocation programme (*Valstybės žinios*, 2006, No. 60-2149);
  - 79) Order No. D1-256 of the Minister of the Environment of the Republic of Lithuania of 22 May 2006 on the amendment of Order No. 701 of the Minister of the Environment of 24 December 2003 on the approval of the Building Technical Regulation STR 1.05.05:2004 “Environmental part of the design of a structure” (*Valstybės žinios*, 2006, No. 60-2152);
  - 80) Order No. D1-255 of the Minister of the Environment of the Republic of Lithuania of 22 May 2006 on the approval of the procedure for identifying significance of the effect of the implementation of plans or programmes and proposed economic activity on potential NATURA 2000 areas or on those already established (*Valstybės žinios*, 2006, No. 61-2214);

- 81) Order No. D1-144 of the Minister of the Environment of the Republic of Lithuania of 31 March 2006 on the amendment of Order No. 159 of the Minister of the Environment of 8 April 2002 on the approval of the lists of animals and plants of Community importance found in Lithuania (new version) (*Valstybės žinios*, 2006, No. 42-1531);
- 82) Order No. 670 of the Minister of the Environment of the Republic of Lithuania of 19 December 2003 on the amendment of the Basic Rules for the Felling of Woods (*Valstybės žinios*, 2004, No. 10-284);
- 83) Order No. D1-145 of the Minister of the Environment of the Republic of Lithuania of 29 March 2004 on the amendment of the Basic Rules for the Felling of Woods (*Valstybės žinios*, 2004, No. 54-1853);
- 84) Order No. D1-50 of the Minister of the Environment of the Republic of Lithuania of 28 January 2005 on the amendment of Order No. 73 of the Minister of the Environment of the Republic of Lithuania of 5 March 1999 on the approval of the Basic Rules for the Felling of Woods (*Valstybės žinios*, 2005, No. 16-523);
- 85) Order No. D1-613 of the Minister of the Environment of the Republic of Lithuania of 15 December 2005 on the amendment of Order No. 73 of the Minister of the Environment of the Republic of Lithuania of 5 March 1999 on the approval of the Basic Rules for the Felling of Woods (*Valstybės žinios*, 2005, No. 150-5515);
- 86) Law No. VIII-2025 of the Republic of Lithuania of 12 October 2000 on the Environmental Protection Support Programme (*Valstybės žinios*, 2000, No. 92-2872);
- 87) Law No. IX-1092 of the Republic of Lithuania of 19 September 2002 on the Amendment and Supplement of Articles 3, 4 of the Law on the Environmental Protection Support Programme (*Valstybės žinios*, 2002, No. 96-4169 );
- 88) Law No. IX-1611 of the Republic of Lithuania of 10 June 2003 on the Amendment of Article 3 of the Law on the Environmental Protection Support Programme (*Valstybės žinios*, 2003, No. 61-2764 );
- 89) Law No. IX-2380 of the Republic of Lithuania of 15 July 2004 on the Amendment of Article 3 of the Law on the Environmental Protection Support Programme (*Valstybės žinios*, 2004, No. 116-4328 );
- 90) Law No. X-268 of the Republic of Lithuania of 23 June 2005 on the Amendment of Articles 3 and 4 of the Law on the Environmental Protection Support Programme (*Valstybės žinios*, 2005, No. 84-3107);
- 91) Order No. D1-501 of the Minister of the Environment of the Republic of Lithuania of 30 October 2006 on the compilation of information required for the drafting of reports under the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora and the Council Directive 79/409/EC of 2 April 1979 on the conservation of wild birds (*Valstybės žinios*, 2006, No. 118-4513);
- 92) Order No. D1-22 of the Minister of the Environment of the Republic of Lithuania on the amendment of Order No. 372 of the Minister of the Environment of the Republic of Lithuania of 8 September 2000 on the approval of the procedure for picking protected species of animals, plants and mushrooms from the natural environment (new version) (*Valstybės žinios*, 2007, No. 7-294);
- 93) Order No. D1-531 of the Minister of the Environment of the Republic of Lithuania of 13 October 2008 on the amendment of Order No. D1-358 of the Minister of the

Environment of the Republic of Lithuania of 2 July 2008 approving criteria for the screening of areas important for the conservation of birds (*Valstybės žinios*, 2008, No. 119-4539);

- 94) Order No. D1-358 of the Minister of the Environment of the Republic of Lithuania of 2 July 2008 approving criteria for the screening of areas important for the conservation of birds (*Valstybės žinios*, 2008, No. 77-3048);
- 95) Order No. D1-697 of the Minister of the Environment of the Republic of Lithuania of 31 December 2008 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2009, No. 3-63);
- 96) Order No. D1-38 of the Minister of the Environment of the Republic of Lithuania of 2 February 2009 on the amendment of Order No. D1-358 of the Minister of the Environment of 14 July 2005 on the approval of the procedure for regulating the abundance of the population of the Great Cormorant (*Valstybės žinios*, 2009, No. 14-550);
- 97) Order No. D1-148 of the Minister of the Environment of the Republic of Lithuania of 7 April 2009 on the amendment of Order No. 372 of the Minister of the Environment of the Republic of Lithuania of 8 September 2000 on the approval of the procedure for picking protected species of animals, plants and mushrooms from the natural environment (*Valstybės žinios*, 2009, No. 41-1594);
- 98) Order No. D1-105 of the Minister of the Environment of the Republic of Lithuania of 17 March 2009 on the amendment of Order No. 586 of the Minister of the Environment of the Republic of Lithuania of 11 November 2002 on the approval of the Rules for Using Wild Animals for Scientific, Cultural, Educational and Aesthetical Purposes (*Valstybės žinios*, 2009, No. 34-1322);
- 99) Order No. D1-169/B1-183 of the Minister of the Environment and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 16 January 2006 on the amendment of Order No. 250/224 of the Minister of the Environment and the Director of the State Food and Veterinary Service of 16 May 2002 on the approval of the procedure for taking wild animals from their habitats for compiling collections and registration of such collections (*Valstybės žinios*, 2009, No. 46-1825);
- 100) Order No. D1-155 of the Minister of the Environment of the Republic of Lithuania of 9 April 2009 on the amendment of Order No. 513 of the Minister of the Environment of the Republic of Lithuania of 30 September 2002 on the approval of the procedure for the regulation of abundance of the game in areas where hunting is prohibited (*Valstybės žinios*, 2009, No. 42-1626);
- 101) Order No. D1-253/B1-200 of the Minister of the Environment and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 5 May 2009 on the amendment of Order No. 519/449 of the Minister of the Environment and Director of the State Food and Veterinary Service of the Republic of Lithuania of 2 October 2002 on the approval of the Rules for Keeping Wild Animals in Captivity and the amendment of Order No. 250/224 of the Minister of the Environment and the Director of the State Food and Veterinary Service of the Republic of Lithuania (*Valstybės žinios*, 2009, No. 53-2128);
- 102) Order No. D1-325/1B-333/B1-252 of the Minister of the Environment, the Director General of the Customs Department under the Ministry of Finance and the Director of the State Food and Veterinary Service of the Republic of

Lithuania of 11 June 2009 on the amendment of Order No. 658/831/743 of the Minister of the Environment, the Director General of the Customs Department under the Ministry of Finance and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 21 December 2002 on the approval of the Rules for Trading Wild Animals (*Valstybės žinios*, 2009, No. 71-2911);

- 103) Law No. XI-578 of the Republic of Lithuania of 17 December 2009 on the Amendment of the Law on Protected Species and Habitats of Animals, Plants and Mushrooms (*Valstybės žinios*, 2009, No. 159-7200)

### Brief description of the measures

#### 57. Establishment of protected areas

The Regulations on Areas Important for the Conservation of Habitats and Birds approved by a Government resolution has laid down that areas important for the conservation of birds are established with a view to conserve protected species of birds in their habitats. In addition, areas important for bird migration must also be conserved.

The establishment of protected areas in Lithuania falls under the responsibility of the State Service for Protected Areas. The Regulations on Areas Important for the Conservation of Habitats and Birds were approved by the Government of the Republic of Lithuania Resolution No. 276 of 15 March 2004 (as amended by Resolution No. 380 of 19 April 2006). Areas important for the conservation of birds and maps with the exact area boundaries were approved by the Government of the Republic of Lithuania Resolution No. 399 (*Valstybės žinios*, 2004, No. 55-1899; 2006, No. 92-3635). The number of the approved areas important for the conservation of birds totals to 77.

The number and area of the areas designated for the conservation of birds in each basin and sub-basin of the Nemunas RBD is provided in Table 25.

Table 25. Areas important for the conservation of birds (AICB) in the Nemunas RBD

Basin/ sub-basin	Area of the AICB in the sub-basin,	Number of AICB	Area overlapping with AICH, ha	Area overlapping with AICH, %
Baltic Sea and Curonian Lagoon	37 454	6	22 802	61
Dubysa Sub-basin	4 818	3	560	12
Jūra Sub-basin	5 356	5	797	15
Lithuanian Coastal Rivers Basin	12 511	6	12 395	99
Merkys Sub-basin	60 635	5	41 270	68
Minija Sub-basin	34 323	8	20 749	60
Nemunas Small Tributaries Sub-basin	74 291	19	58 405	79
Neris Small Tributaries Sub-basin	5 466	4	1 391	25
Nevėžis Sub-basin	41 227	8	15 368	37
Prieglius Sub-basin	0	0	0	0
Šešupė Sub-basin	17 909	4	16 639	93
Šventoji Sub-basin	37 694	6	37 627	100
Žeimena Sub-basin	98 042	6	95 323	97
<b>TOTAL</b>	<b>429 724</b>	<b>58</b>	<b>323 327</b>	<b>75</b>

Notes:

1. The area of the areas important for the conservation of habitats (AICH) and the areas important for the conservation of birds (AICB) in the sub-basins were established using GIS technologies.
2. The column “Number of AICB” specifies the number of AICB that are fully or partially situated on the territory of a sub-basin in question.

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

58. With a view to prevent decrease in the status of the conservation of protected areas, nature management plans and other strategic documents have to be developed for protected areas. Nature management plans are approved by an order of the Minister of the 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 August 2009, nature management plans were developed for 54 areas and approved by respective orders of the Minister of the Environment. The majority of the plans are designed for a 10 years' period (2008-2017m.).

#### Implementation costs

The costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds include the costs needed for the development and implementation of nature management plans for areas important for the conservation of birds, and for the monitoring of AICB. The estimation of the costs was based on the following assumptions:

- 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 the natural management plans 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 Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. It is assumed that nature management plans 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 nature management plans provided on the website of the Ministry of the Environment of the Republic of Lithuania<sup>8</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 Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds for the areas with no nature management plans were calculated following the methodology of unit costs. The average annual investment costs of the implementation of nature management plans in areas important for the conservation of birds (during the period 2007-2015)

---

<sup>8</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

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 nature management plans already developed and those to be elaborated in future, taking into account the overlapping of AICB and AICH<sup>9</sup>.

- 4) AICB monitoring costs include expenditures for salaries, social insurance contributions and fuel costs<sup>10</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>11</sup>.

As provided for in the plans of the State Service for Protected Areas, 90 more areas designated for the conservation of birds are planned to be established in Lithuania in order to implement the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds. Hence, the costs of the implementation of the Birds Directive may increase. In addition, the implementation costs of individual measures are specified during tenders<sup>12</sup>, therefore the costs provided in the nature management plans are only indicative ones.

These costs are planned to be funded from the state budget.

### The Šešupė Sub-basin

59. There are four areas important for the conservation of birds (AICB) in the Šešupė Sub-basin the total area of which on the territory of the sub-basin is 17 909 ha. The major part of AICB, 16 639 ha (93 %), overlaps with the areas important for the conservation of natural habitats (AICH) (Table 26).

Table 26. Areas important for the conservation of birds in the Šešupė Sub-basin (including the Prieglius Basin)

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Lakes Meteliai, Dusia and Obelija	LTALYB001	Lazdijai distr. and Alytus distr.	4 480	2 441	54	2 441
2	Novaraistis Peatbog	LTSAKB001	Šakiai distr., Kaunas distr., Kazlų Rūda	827	775	94	0
3	Valley of the	LTVLKB001	Vilkaviškis	496	495	100	0

<sup>9</sup> Information source: GIS information of the cadastre of the Areas Protected by the State.

<sup>10</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>11</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.

<sup>12</sup> Data of the State Service for Protected Areas.

	Širvinta		distr.				
4	Bogs Žuvintas, Žaltytis and Amalvas	LTALYB003	Marijampolė, Alytus distr., Lazdijai distr.	14 198	14 198	100	14 198
	<b>TOTAL</b>			<b>20 000</b>	<b>17 909</b>	<b>90</b>	<b>16 639</b>

Note: The area of the AICB and AICH in the sub-basins were established with the help of GIS technologies

Information on nature management plans under development for the areas in the Šešupė Sub-basin is provided in Table 27.

Table 27. Protected areas with nature management plans (NMP) in place in the Šešupė Sub-basin

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
Amalvas wetland complex	Approved	3 638	3 638	100.0	3 638
Kiaulyčia Botanical-Zoological Strict Reserve of Žuvintas Biosphere Reserve	Developed (not approved yet)	730	730	100.0	730
<b>TOTAL</b>		<b>4 368</b>	<b>4 368</b>		<b>4 368</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Šešupė Sub-basin total to around LTL 206 900 and the average annual operating costs are about LTL 176 026 (Table 28).

Table 28. Costs of implementation of the Birds Directive in the Šešupė Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years		333 235	66 647
Implementation of the nature management plans already in place	10 years	18 000	138 960	15 440
Implementation of new nature management plans	10 years	188 898	262 328	52 466
AICB monitoring	1 year			41 473
<b>TOTAL ~</b>		<b>207 000</b>	<b>735 000</b>	<b>176 000</b>

### The Prieglius Basin

60. There are no areas important for the conservation of birds in the Prieglius Basin.

### The Dubysa Sub-basin

61. There are three areas important for the conservation of birds in the Dubysa Sub-basin the total area of which on the territory of the sub-basin is 4 818 ha. A small part of the AICB, 560 ha (12 %), overlaps with the areas important for the conservation of natural habitats (Table 29).

Table 29. Areas important for the conservation of birds in the Dubysa Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Valley of the Dubysa River	LTRASB001	Raseiniai distr., Jurbarkas distr., Kaunas distr.	1 117	1 117	100	558
2	Riverside of the Nemunas and islands between Kulautuva and Smalininkai	LTKAUB001	Jurbarkas distr., Kaunas distr., Šakiai distr.	3 532	2	0	2
3	Tyruliai Bog	LTRADB005	Radviliškis distr. and Šiauliai distr.	3 699	3 699	100	
	<b>TOTAL</b>			<b>8 348</b>	<b>4 818</b>	<b>58</b>	<b>560</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Dubysa Sub-basin is provided in Table 30. Nature management plans have been developed for all areas important for the conservation of birds situated in the Dubysa Sub-basin.

Table 30. Protected areas with nature management plans (NMP) in place in the Dubysa Sub-basin

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
Valley of the Dubysa River	Developed (not approved yet)	1 117	1 117	100.0	1 117
Riverside of the Nemunas and islands between Kulautuva and Smalininkai	Approved	3 611	2	0.1	2
Tyruliai Bog	Developed (not approved yet)	3 699	3 699	100.0	3 699
<b>TOTAL</b>		<b>8 427</b>	<b>4 818</b>		<b>4 818</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Dubysa Sub-basin total to around LTL 150 825 and the average annual operating costs are about LTL 55 126 (Table 31).

Table 31. Costs of implementation of the Birds Directive in the Dubysa Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	0	0
Implementation of the nature management plans already in place	10 years	150 825	395 721	43 969
Implementation of new nature management plans	10 years	0	0	0
AICB monitoring	1 year			11 157
<b>TOTAL ~</b>		<b>150 800</b>	<b>395 700</b>	<b>55 100</b>

### The Jūra Sub-basin

62. There are five areas important for the conservation of birds in the Jūra Sub-basin the total area of which on the territory of the sub-basin is 5 356 ha. A small part of the AICB, 797 ha (15 %), overlaps with the areas important for the conservation of natural habitats (Table 32).

Table 32. Areas important for the conservation of birds in the Jūra Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Aukštasis Tyras Marsh	LTPLUB003	Rietavas	875	385	44	384
2	Blinstrubiškių Forest	LTRASB002	Raseiniai distr.	2 215	2 215	100	
3	Valleys of the Šesuvis and Jūra	LTTAUB001	Pagėgiai and Tauragė distr.	1 353	1 304	96	412
4	Vainuto Forests	LTSLUB004	Šilutė distr. and Šilalė distr.	14 687	790	5	
5	Fishery ponds in Visbarai	LTTAUB003	Tauragė distr.	661	661	100	
	<b>TOTAL</b>			<b>19 791</b>	<b>5 356</b>	<b>27</b>	<b>797</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Jūra Sub-basin is provided in Table 33.

Table 33. Protected areas with nature management plans (NMP) in place in the Jūra Sub-basin

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
Aukštasis Tyras Marsh	Approved	875	385	44.0	384
Blinstrubiškio Forest	Developed (not approved yet)	2 215	2 215	100.0	2 215
Biospheric ground of Vainuto Forests	Under development (not published)	14 687	790	5.4	790
<b>TOTAL</b>		<b>17 777</b>	<b>3 390</b>		<b>3 389</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Jūra Sub-basin total to around LTL 141 835 and the average annual operating costs are about LTL 65 700 (Table 34).

Table 34. Costs of implementation of the Birds Directive in the Jūra Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	79 176	15 835
Implementation of the nature management plans already in place	10 years	11 800	27 070	3 008
Implementation of new nature management plans	10 years	130 035	172 244	34 449
AICB monitoring	1 year	0		12 403
<b>TOTAL ~</b>		<b>141 800</b>	<b>278 500</b>	<b>65 700</b>

### The Lithuanian Coastal Rivers Basin

63. There are four areas important for the conservation of birds in the Lithuanian Coastal Rivers Basin the total area of which on the territory of the sub-basin is 12 511 ha. The major part of the AICB, 12 395 ha (99 %), overlaps with the areas important for the conservation of natural habitats (Table 35).

Table 35. Areas important for the conservation of birds in the Lithuanian Coastal Rivers Basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Coast of the Baltic Sea	LTPALB001	Lithuanian territorial	17 097	3	0	3

			waters				
2	National Park of the Curonian Spit	LTKLAB001	Neringa, Klaipėda city, Klaipėda distr., Šilutė distr.	24 996	7 596	30	7 538
3	Sand meadows in Nemirseta	LTKREB001	Klaipėda distr.	151	149	99	141
4	Nemunas delta	LTSLUB001	Šilutė distr.	26 674	2 474	9	2 474
5	Meadows of Svencelė	LTKLAB009	Klaipėda distr. and Šilutė distr.	55	55	99	5
6	Tyrai Marsh	LTKLAB002	Klaipėda distr.	2 619	2 234	85	2 234
	<b>TOTAL</b>			<b>71 590</b>	<b>12 511</b>	<b>17</b>	<b>12 395</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Lithuanian Coastal Rivers Basin is provided in Table 36.

Table 36. Protected areas with nature management plans (NMP) in place in the Lithuanian Coastal Rivers Basin

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
Aquaculture farm in Kintai	Approved	571	334	58.6	334
Meadows in Kintai and Kintų forests	Under development (not published)	519	518	99.9	5
Kuršių Nerija	Approved	24 996	7 596	30.4	7 596
Kniaupas Botanical-Zoological Reserve, Krokų Lanka Botanical-Zoological Reserve and part of Tulkiaragė polder of the ecological protection zone of the Nemunas Delta Regional Park	Developed (not approved yet)	2 628	349	13.3	349
Part of the Coastal Regional Park	Approved	436	432	99.2	149
Meadows of Svencelė	Approved	50	50	100.0	49
<b>TOTAL</b>		<b>29 198</b>	<b>9 280</b>		<b>8 483</b>

Note: The titles of the nature management plans usually do not coincide with the names of the corresponding AICP or AICH.

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Lithuanian Coastal Rivers Basin total to around LTL 348 240 and the average annual operating costs are about LTL 73 400 (Table 37).

Table 37. Costs of implementation of the Birds Directive in the Lithuanian Coastal Rivers

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	90 654	18 131
Implementation of the nature management plans already in place	10 years	308 532	152 648	16 961
Implementation of new nature management plans	10 years	39 708	56 651	11 330
AICB monitoring	1 year	0		28 973
<b>TOTAL ~</b>		<b>350 000</b>	<b>300 000</b>	<b>75 400</b>

### The Merkys Sub-basin

64. There are five areas important for the conservation of birds in the Merkys Sub-basin the total area of which on the territory of the sub-basin is 60 635 ha. A large part of the AICB, 41 270 ha (68 %), overlaps with the areas important for the conservation of natural habitats (Table 38).

Table 38. Areas important for the conservation of birds in the Merkys Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Čepkeliai Marsh	LTVARB002	Varėna distr.	11 227	6 280	56	6 281
2	Dainavos Forest	LTVARB005	Varėna distr. Alytus distr. Lazdijai distr. Druskininkai	55 965	33 174	59	33 171
3	Fishery ponds in Grybaulia	LTVARB007	Varėna distr.	742	742	100	
4	Karaviškių Forest	LTVARB004	Varėna distr.	343	343	100	343
5	Rūdinkų Forest	LTSALB002	Šalčininkai distr. and Varėna distr.	20 095	20 095	100	1 475
	<b>TOTAL</b>			<b>88 372</b>	<b>60 635</b>	<b>69</b>	<b>41 270</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Merkys Sub-basin is provided in Table 39.

Table 39. Protected areas with nature management plans (NMP) in place in the Merkys Sub-basin

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
Fishery ponds in Grybaulia	Under development (not published)	742	742	100.0	742
Karaviškių Forest	Approved	343	343	100.0	343
Biosphere ground of Rūdinkų Forest	Under development (not published)	20 095	20 095	100.0	20 095
<b>TOTAL</b>		<b>21 180</b>	<b>21 180</b>		<b>21 180</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Merkys Sub-basin total to around LTL 348 240 and the average annual operating costs are about LTL 70 360 (Table 40).

Table 40. Costs of implementation of the Birds Directive in the Merkys Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	90 654	18 131
Implementation of the nature management plans already in place	10 years	308 532	152 648	16 961
Implementation of new nature management plans	10 years	39 708	31 473	6 295
AICB monitoring	1 year	0		28 973
<b>TOTAL ~</b>		<b>348 000</b>	<b>275 000</b>	<b>70 400</b>

### The Minija Sub-basin

65. There are eight areas important for the conservation of birds in the Minija Sub-basin the total area of which on the territory of the sub-basin is 34 323 ha. A large part of the AICB, 20 749 ha (60 %), overlaps with the areas important for the conservation of natural habitats (Table 41).

Table 41. Areas important for the conservation of birds in the Minija Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Aukštasis Tyras Marsh	LTPLUB003	Rietavas	875	490	56	490
2	Old valleys	LTSKUB002	Kretinga	1 463	702	48	11

	of the Erla River and Salantas River		distr. and Skuodas distr.				
3	Quarry in Kalviai	LTKLAB003	Klaipėda distr.	37	37	100	
4	Valley of the Minija	LTKLAB005	Šilutė distr. Klaipėda distr., Kretinga distr., Plungė distr.	2 175	2 175	100	1 214
5	Nemunas delta	LTSLUB001	Šilutė distr.	26 674	2 109	8	2 109
6	Reiskių Tyras Marsh	LTPLUB002	Plungė distr., Klaipėda distr., Kretinga distr.	4 046	4 046	100	4 046
7	Vainuto Forests	LTSLUB004	Šilutė distr. and Šilalė distr.	14 687	10 949	75	565
8	Žemaitija National Park	LTPLUB001	Plungė distr. and Skuodas distr.	21 485	13 816	64	12 315
	<b>TOTAL</b>			<b>71 441</b>	<b>34 323</b>	<b>48</b>	<b>20 749</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Minija Sub-basin is provided in Table 42.

Table 42. Protected areas with nature management plans (NMP) in place in the Minija Sub-basin

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
Aukštasis Tyras Marsh	Approved	875	490	56.0	490
Old valleys of the Erla River and Salantas River	Approved	1 461	700	47.9	700
Quarry in Kalviai	Developed (not approved yet)	37	37	100.0	37
Aquaculture farm in Kintai	Approved	571	236	41.4	236
Valley of the Minija	Developed (not approved yet)	2 240	2 240	100.0	2 240
Valley of the Minija at Dyburiai	Under development (not published)	804	804	100.0	74
Kniaupas Botanical-	Developed	2 628	18	0.7	18

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
Zoological Reserve, Krokų Lanka Botanical-Zoological Reserve and part of Tulkiaragė polder of the ecological protection zone of the Nemunas Delta Regional Park	(not approved yet)				
Paburgės Forest	Developed (not approved yet)	238	238	100.0	238
Reiskių Tyras Marsh	Developed (not approved yet)	4 046	4 046	100.0	4 046
Siberija Bog	Approved	66	66	100.0	66
Biosphere ground of Vainuto Forests	Under development (not published)	14.687	10.949	74.5	10 949
<b>TOTAL</b>		<b>27.653</b>	<b>19.824</b>		<b>19 094</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Minija Sub-basin total to around LTL 1 240 470 and the average annual operating costs are about LTL 438 350 (Table 43).

Table 43. Costs of implementation of the Birds Directive in the Minija Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years		376 460	75 292
Implementation of the nature management plans already in place	10 years	460 231	669 631	74 403
Implementation of new nature management plans	10 years	780 238	1 045 841	209 168
AICB monitoring	1 year	0	0	79 486
<b>TOTAL ~</b>		<b>1 240 500</b>	<b>2 092 000</b>	<b>440 000</b>

### The Nemunas Small Tributaries Sub-basin

66. There are 19 areas important for the conservation of birds in the Nemunas Small Tributaries Sub-basin the total area of which on the territory of the sub-basin is 74 291 ha. A large part of the AICB, 58 405 ha (79 %), overlaps with the areas important for the conservation of natural habitats (Table 44).

Table 44. Areas important for the conservation of birds in the Nemunas Small Tributaries Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Balbieriškio Forest	LTPRIB003	Prienai distr.	3 061	3 061	100	
2	Būdos-Pravieniškių Forests	LTKAIB006	Kaišiadorys distr.	5 174	2 271	44	
3	Čepkeliai Marsh	LTVARB002	Varėna distr.	11 227	4 884	44	4 884
4	Dainavos Forest	LTVARB005	Varėna distr., Alytus distr., Lazdijai distr., Druskininkai	55 965	22 780	41	22 258
5	Kauno Marios Lagoon	LTKAUB008	Kaunas city, Kaunas distr., Kaišiadorys distr.	8 299	8 299	100	8 299
6	Lakes Meteliai, Dusia and Obelija	LTALYB001	Lazdijai distr. and Alytus distr.	4 480	2 039	46	2 037
7	Nemunas River between Pelėšiškės and Balbieriškis	LTPRIB006	Birštonas and Alytus distr.	404	404	100	404
8	Nemunas River between Prienai and Lengveniškės	LTPRIB005	Birštonas and Prienai distr.	142	142	100	141
9	Nemunas delta	LTSLUB001	Šilutė distr.	26 674	19 409	73	19 409
10	Meadows of the Nemunas valley between Raudonė and Gelgaudiškis	LTJURB002	Jurbarkas distr. and Šakiai distr.	760	760	100	9
11	Meadows of the Nemunas valley at Viešvilė	LTTAUB004	Jurbarkas distr.	595	595	100	
12	Riverside of the Nemunas and islands between Kulautuva and Smalininkai	LTKAUB001	Jurbarkas distr., Kaunas distr., Šakiai distr.	3 532	3 530	100	964
13	Lakes Niedus and Veisiejai	LTAZB001	Lazdijai distr.	119	119	100	
14	Novaraistis	L TSAKB001	Šakiai distr.,	827	52	6	

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
	Swamp		Kaunas distr., Kazlų Rūda				
15	Pertako Forest	LTAZB003	Lazdijai distr.	1 127	1 124	100	
16	Meadows in Sausgalviai	LTSLUB003	Šilutė distr.	240	240	100	
17	Lakes Senrusnė and Sennemunė	LTSLUB002	Pagėgiai	1 586	1 586	100	
18	Valleys of the Šesuvis River and Jūra River	LTTAUB001	Pagėgiai and Tauragė distr.	1 353	48	4	
19	Vainuto Forests	LTSLUB004	Šilutė distr. and Šilalė distr.	14 687	2 948	20	
	<b>TOTAL</b>			<b>140 250</b>	<b>74 291</b>	<b>53</b>	<b>58 405</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Nemunas Small Tributaries Sub-basin is provided in Table 45.

Table 45. Protected areas with nature management plans (NMP) in place in the Nemunas Small Tributaries Sub-basin

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
Arlaviškiai juniper bushes	Approved	45	45	100.0	43
Aukštumala Telmological Nature Reserve	Under development (not published)	1 017	1 017	100.0	1 017
Būdos-Pravieniškių forests	Under development (not published)	5 173	2 270	43.9	2 270
Nemunas River between Pelėšiškės and Balbieriškis	Approved	397	397	100.0	395
Nemunas River between Prienai and Lengveniškės	Approved	142	142	100.0	141
Kniaupas Botanical-Zoological Reserve, Krokų Lanka Botanical-Zoological	Developed (not approved yet)	2 628	1 901	72.3	1 901

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
Reserve and part of Tulkiaragė polder of the ecological protection zone of the Nemunas Delta Regional Park					
Meadows of the Nemunas valley at Viešvilė	Approved	595	595	100.0	595
Hornbeam forests of the Nemunas valley from Kriukai to Gelgaudiškės	Developed (not approved yet)	1 290	1 290	100.0	32
Riverside of the Nemunas and islands between Kulautuva and Smalininkai	Approved	3 611	3 609	99.9	3 609
Pertako Forest	Developed (not approved yet)	1 127	1 124	99.7	1 124
Surroundings of Rumšiškės	Under development (not published)	41	41	100.0	41
Rumšiškių Forest	Developed (not approved yet)	95	95	100.0	22
Meadows in Sausgalviai	Approved	240	240	100.0	240
Lakes Senrusnė and Sennemunė	Approved	1 586	1 586	100.0	1 586
Širvintos Forest	Approved	186	186	99.9	1
Biosphere ground of Vainuto Forests	Developed (not approved yet)	14 687	2 948	20.1	2 948
Surroundings of Viršužiglis village	Under development (not published)	304	304	100.0	291
<b>TOTAL</b>		<b>33 164</b>	<b>17 790</b>		<b>16 256</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Nemunas Small Tributaries Sub-basin total to around LTL 1 071 080 and the average annual operating costs are about LTL 636 840 (Table 46).

Table 46. Costs of implementation of the Birds Directive in the Nemunas Small Tributaries Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature	10 years	0	1 406 379	281 276

management plans				
Implementation of the nature management plans already in place	10 years	168 889	400 725	44 525
Implementation of new nature management plans	10 years	902 194	694 969	138 994
AICB monitoring	1 year	0	0	172 044
<b>TOTAL ~</b>		<b>1 071 000</b>	<b>2 502 000</b>	<b>637 000</b>

### The Neris Small Tributaries Sub-basin

67. There are four areas important for the conservation of birds in the Neris Small Tributaries Sub-basin the total area of which on the territory of the sub-basin is 5 466 ha. A small part of the AICB, 1 391 ha (25 %), overlaps with the areas important for the conservation of natural habitats (Table 47).

Table 47. Areas important for the conservation of birds in the Neris Small Tributaries Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Baltoji Vokė Wetlands	LTSALB003	Trakai distr., Vilnius distr., Šalčininkai distr.	1 391	1 391	100	1 391
2	Būdos-Pravieniškių Forests	LTKAIB006	Kaišiadorys distr.	5 174	2 903	56	
3	Gelednės Forest	LTSVEB004	Švenčionys distr.	1 655	1 026	62	
4	Kazimieravas Wetlands	LTVLNB001	Vilnius distr.	145	145	100	
	<b>TOTAL</b>			<b>8 365</b>	<b>5 466</b>	<b>65</b>	<b>1 391</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Neris Small Tributaries Sub-basin is provided in Table 48.

Table 48. Protected areas with nature management plans (NMP) in place in the Neris Small Tributaries Sub-basin

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
Baltoji Vokė Wetlands	Approved	1 391	1 391	100.0	1 391
Būdos-Pravieniškių Forests	Under development (not published)	5 173	2 903	56.1	2 903
Gelednės Forest	Developed (not approved yet)	1 655	1 026	62.0	1 026
<b>TOTAL</b>		<b>8 219</b>	<b>5 320</b>		<b>5 320</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Neris Small Tributaries Sub-basin total to around LTL 168 110 and the average annual operating costs are about LTL 60 350 (Table 49).

Table 49. Costs of implementation of the Birds Directive in the Neris Small Tributaries Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	6 531	1 306
Implementation of the nature management plans already in place	10 years	4 231	27 765	3 085
Implementation of new nature management plans	10 years	163 877	216 532	43 306
AICB monitoring	1 year	0	0	12 657
<b>TOTAL ~</b>		<b>168 100</b>	<b>251 000</b>	<b>60 400</b>

### The Nevėžis Sub-basin

68. There are eight areas important for the conservation of birds in the Nevėžis Sub-basin the total area of which on the territory of the sub-basin is 41 227 ha. A relatively large part of the AICB, 15 368 ha (37 %), overlaps with the areas important for the conservation of natural habitats (Table 50).

Table 50. Areas important for the conservation of birds in the Nevėžis Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Babtų-Varlupos Forests	LTKAUB006	Kaunas distr.	4 419	4 419	100	
2	Dotnuvos-Josvainių Forests	LTKEDB003	Kėdainiai distr.	5 782	5 782	100	
3	Labūnavos Forest	LTKEDB001	Kėdainiai distr., Kaunas distr., Jonava distr.	3 978	3 978	100	401
4	Lančiūnavos Forest	LTKEDB002	Kėdainiai distr.	5 222	5 222	100	
5	Valley of the Nevėžis River	LTKAUB004	Kaunas distr.	1 154	1 154	100	531
6	Padauguvos Forest	LTKAUB005	Kaunas distr.	5 783	5 783	100	
7	Sulinkių Peatbog	LTRADB004	Radviliškis distr.	454	454	100	
8	Taujėnų-Užulėnio	LTUKMB001	Ukmergė distr. and	22 532	14 437	64	14 437

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
	Forests		Panevėžys distr.				
	<b>TOTAL</b>			<b>49 322</b>	<b>41 227</b>	<b>84</b>	<b>15 368</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Nevėžis Sub-basin is provided in Table 51.

Table 51. Protected areas with nature management plans (NMP) in place in the Nevėžis Sub-basin

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 ground of Taujėnų-Užulėnio Forests	Under development (not published)	22 532	14 437	64.1	14 437
<b>TOTAL</b>		<b>22 532</b>	<b>14 437</b>	<b>64.1</b>	<b>14 437</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Nevėžis Sub-basin total to about LTL 1 399 200 and the average annual operating costs are about LTL 702 340 (Table 52).

Table 52. Costs of implementation of the Birds Directive in the Nevėžis Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	1 184 600	236 920
Implementation of the nature management plans already in place	10 years	0	0	0
Implementation of new nature management plans	10 years	1 399 193	1 849 727	369 945
AICB monitoring	1 year	0		95 474
<b>TOTAL ~</b>		<b>1 400 000</b>	<b>3 034 000</b>	<b>702 000</b>

### The Šventoji Sub-basin

69. There are six areas important for the conservation of birds in the Šventoji Sub-basin the total area of which on the territory of the sub-basin is 37 694 ha. Almost the whole area of the AICB, 237 627 ha (99.8 %), overlaps with the areas important for the conservation of natural habitats (Table 53).

Table 53. Areas important for the conservation of birds in the Šventoji Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Asveja Lake District	LTSVEB005	Švenčionys distr., Vilnius distr., Molėtai distr.	10 452	3	0	
2	Labanoro Forest	LTSVEB002	Švenčionys distr., Molėtai distr., Utena distr., Ignalina distr.	53 196	2 469	5	2 469
3	North-eastern part of Gražutė Regional Park	LTZARB004	Zarasai distr. and Ignalina distr.	5 700	4 052	71	4 052
4	Šimonių Forest	LTANYB001	Anykščiai distr. and Kupiškis distr.	23 263	23 011	99	23 011
5	Taujėnų-Užulėnio Forests	LTUKMB001	Ukmergė distr. and Panevėžys distr.	22 532	8 095	36	8 095
6	Ponds in Vasaknos	LTZARB001	Zarasai distr.	66	66	100	
	<b>TOTAL</b>			<b>104 756</b>	<b>37 694</b>	<b>36</b>	<b>37 627</b>

Note: the area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Šventoji Sub-basin is provided in Table 54.

Table 54. Protected areas with nature management plans (NMP) in place in the Šventoji Sub-basin

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 AIPB is situated, ha
Biosphere ground of Taujėnų-Užulėnio Forests	Developed (not published)	22 532	8 095	35.9	8 095
Lakes Zalvas and Zalvelis	Approved	49	49	100.0	49
<b>TOTAL</b>		<b>22 581</b>	<b>8 144</b>		<b>8 144</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Šventoji Sub-basin total to around LTL 293 300 and the average annual operating costs are about LTL 304 240 (Table 55).

Table 55. Costs of the implementation of the Birds Directive in the Šventoji Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	666 304	133 261
Implementation of the nature management plans already in place	10 years	0	500	56
Implementation of new nature management plans	10 years	293 303	418 147	83 629
AICB monitoring	1 year	0		87 292
<b>TOTAL ~</b>		<b>293 300</b>	<b>1 085 000</b>	<b>304 000</b>

### The Žeimena Sub-basin

70. There are six areas important for the conservation of birds in the Žeimena Sub-basin the total area of which on the territory of the sub-basin is 98 042 ha. Almost the whole area of the AICB, 95 323 ha (97 %), overlaps with the areas important for the conservation of natural habitats (Table 56).

Table 56. Areas important for the conservation of birds in the Žeimena Sub-basin

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Asveja Lake District	LTSVEB005	Švenčionys distr., Vilnius distr., Molėtai distr.	10 452	10 449	100	10 136
2	Gelednės Forest	LTSVEB004	Švenčionys distr.	1 655	627	38	
3	Lake Kretuonas	LTSVEB003	Švenčionys distr.	1 182	1 182	100	1 182
4	Labanoras Forest	LTSVEB002	Švenčionys distr., Molėtai distr., Utena distr., Ignalina distr.	53 196	50 727	95	50 726
5	Sand grasslands in Pabradė	LTSVEB009	Švenčionys distr.	410	410	100	410
6	Western part of Aukštaitija National Park	LTIGNB003	Utena distr., Ignalina distr., Švenčionys distr.	35 005	34 647	99	32 870
	<b>TOTAL</b>			<b>101 899</b>	<b>98 042</b>	<b>96</b>	<b>95 323</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Žeimena Sub-basin is provided in Table 57.

Table 57. Protected areas with nature management plans (NMP) in place in the Žeimena Sub-basin

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
Antaliedė botanical-zoological reserve	Under development (not published)	248	248	100.0	248
Lake Didysis Siaurys	Approved	278	278	100.0	278
Gelednės Forest	Developed (not approved)	1 655	627	37.9	627
Bog complex of Girutiškis Nature Reserve	Approved	1 402	1 402	100.0	1 402
Juodupio Bog	Approved	226	226	100.0	226
Telmological reserve of Ešerinis I of Labanoras Regional Park	Developed (not approved yet)	81	81	100.0	81
Valley of the Labanoras River	Approved	220	220	100.0	220
Laukagalio Bog	Approved	315	315	100.0	315
Luknelė River	Under development (not published)	156	156	100.0	156
Panatryčios Forest	Developed (not approved)	72	72	100.0	57
Lake Salaitis and its banks (parts of Pažemys Landscape Reserve)	Under development (not published)	455	455	100.0	455
<b>TOTAL</b>		<b>5 108</b>	<b>4 080</b>		<b>4 065</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds in the Žeimena Sub-basin total to around LTL 1 057 140 and the average annual operating costs are about LTL 968 880 (Table 58).

Table 58. Costs of implementation of the Birds Directive in the Žeimena Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	2 161 583	432 317
Implementation of the nature management plans already in place	10 years	35 364	182 683	20 298
Implementation of new nature management plans	10 years	1 021 774	1 446 079	289 216

AICB monitoring	1 year	0		227 047
<b>TOTAL ~</b>		<b>1 057 000</b>	<b>3 790 000</b>	<b>967 000</b>

### The Baltic Sea and Curonian Lagoon

71. There are six areas important for the conservation of birds on the Baltic Sea coast and in the Curonian Lagoon the total area of which on the territory of the sub-basin is 37 454 ha. The major part of the AICB, 22 802 ha (61 %), overlaps with the areas important for the conservation of natural habitats (Table 59).

Table 59. Areas important for the conservation of birds on the coast of the Baltic Sea and Curonian Lagoon

	Area important for the conservation of birds	AICB code	Municipality	Total area of AICB, ha	Area of AICB in the sub-basin, ha	Share of AICB in the sub-basin, %	AICB overlapping with AICH, ha
1	Baltic Sea coast	LTPALB001	Lithuanian territorial waters	17 097	17 094	100	12 630
2	National Park of the Curonian Spit	LTKLAB001	Neringa, Klaipėda city, Klaipėda distr., Šilutė distr.	24 996	17 398	70	7 209
3	Nemirseta sand grasslands	LTKREB001	Klaipėda distr.	151	1	1	1
4	Nemunas delta	LTSLUB001	Šilutė distr.	26 674	2 576	10	2 576
5	Meadows of Svencelė	LTKLAB009	Klaipėda distr. and Šilutė distr.	55	1	1	1
6	Tyrai Marsh	LTKLAB002	Klaipėda distr.	2 619	384	15	384
	<b>TOTAL</b>			<b>71 590</b>	<b>37 454</b>	<b>52</b>	<b>22 802</b>

Note: The area of the AICB and AICH in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas on the coast of the Baltic Sea Curonian Lagoon is provided in Table 60.

Table 60. Protected areas with nature management plans (NMP) in place on the coast of the Baltic Sea and Curonian Lagoon

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
Curonian Lagoon	Approved	31 138	31 086	99.8	407
Curonian Spit	Approved	24 996	17 398	69.6	17 398
Kniaupas Botanical-Zoological Reserve, Krokų Lanka Botanical-Zoological Reserve and part of Tulkiaragė polder of the ecological protection zone of the	Developed (not approved yet)	2 628	352	13.4	352

Nemunas Delta Regional Park					
Part of the Coastal Regional Park	Approved	436	3	0 8	1
<b>TOTAL</b>		<b>59 198</b>	<b>48 839</b>		<b>18 158</b>

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

The average investment costs of the implementation of the requirements of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds on the coast of the Baltic Sea and Curonian Lagoon total to around LTL 590 210 and the average annual operating costs are about LTL 313 234 (Table 61).

Table 61. Costs of the implementation of the Birds Directive on the coast of the Baltic Sea and Curonian Lagoon

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average annual operating costs, LTL/year
Development of nature management plans	10 years	0	534 485	106 897
Implementation of the nature management plans already in place	10 years	204 658	131 693	14 633
Implementation of new nature management plans	10 years	385 556	524 837	104 967
AICB monitoring	1 year	0	0	86 737
<b>TOTAL ~</b>		<b>590 200</b>	<b>1 191 000</b>	<b>313 200</b>

### **Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC)**

72. The Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEB) regulates protection of areas important for natural habitats and requires establishment of special protected areas for the conservation of certain natural habitats.

For the purpose of conservation, restoration and maintenance of such areas, certain measures should be implemented. Very often such measures include restriction of economic activities in protected areas, or special measures designed to restore such areas. No cases of contradiction of the objectives of the WFD to the requirements of the Birds Directive or the Habitats Directive have been identified in Lithuania.

National legislation transposing the Directive:

- 1) Law No. VIII-1768 of the Republic of Lithuania of 9 May 2000 on the Amendment of Articles 19, 20, 21 and 24 of the Law on Territorial Planning (*Valstybės žinios*, 2000, No. 58-1708)
- 2) Law No. VIII-1669 of the Republic of Lithuania of 9 May 2000 on the Amendment and Supplement of Articles 2, 17, 20 of the Law on Territorial Planning (*Valstybės žinios*, 2000, No. 42-1195);
- 3) Law No. VIII-1612 of the Republic of Lithuania on the Amendment of Articles 30, 31 of the Law on Territorial Planning (*Valstybės žinios*, 2000, No. 34-953);

- 4) Law No. VIII-435 of the Republic of Lithuania on the Amendment of Article 32 of the Law on Territorial Planning (*Valstybės žinios*, 1997, No. 96-2427);
- 5) Law No. VIII-323 of the Republic of Lithuania on the Amendment of Articles 2, 4, 6, 8, 9, 11, 17, 20, 21, 23, 24, 29, 30, 32 of the Law on Territorial Planning (*Valstybės žinios*, 1997, No. 65-1548);
- 6) Law No. IX-966 of the Republic of Lithuania on Hunting (*Valstybės žinios*, 2002, No. 65-2634);
- 7) Law No. IX-1612 of the Republic of Lithuania on the Amendment of Articles 6, 12 and 18 of the Law on Hunting (*Valstybės žinios*, 2003, No. 61-2765);
- 8) Law No. VIII-1226 of the Republic of Lithuania on Wild Flora (*Valstybės žinios*, 1999, No. 60-1944);
- 9) Law No. IX-1616 of the Republic of Lithuania on the Amendment of Article 8 of the Law Wild Flora (*Valstybės žinios*, 2003, No. 61-2769);
- 10) Order No. 139 of the Minister of the Environment of the Republic of Lithuania of 11 April 2000 on the approval of the procedure for the use of wild plants and mushroom for scientific, cultural, educational and aesthetical purposes and for compiling of botanical and microbiological collections (*Valstybės žinios*, 2000, No. 32-910);
- 11) Order No. 372 of the Minister of the Environment of the Republic of Lithuania of 8 September 2000 on the approval of the procedure for picking protected species of animals, plants and mushrooms from the natural environment (*Valstybės žinios*, 2000, No. 79-2396);
- 12) Order No. 176/240 of the Minister of the Environment and the Minister of Forestry of the Republic of Lithuania of 5 December 1996 on the approval of the Rules for Visiting Woods (*Valstybės žinios*, 1996, No. 120-2833);
- 13) Order No. 159 of the Minister of the Environment of the Republic of Lithuania of 8 April 2002 on the approval of the lists of animals and plants of Community importance found in Lithuania (*Valstybės žinios*, 2002, No. 40-1513);
- 14) Order No. 237 of the Minister of the Environment of the Republic of Lithuania of 30 November 1998 on the approval of the Red List of Plant Communities (*Valstybės žinios*, 1998, No. 108-2976);
- 15) Order No. 504 of the Minister of the Environment of the Republic of Lithuania of 13 October 2003 on the approval of the Red List of Protected Animal, Plant and Mushroom Species (*Valstybės žinios*, 2003, No. 100-4506);
- 16) Order No. 219 of the Minister of the Environment of the Republic of Lithuania of 20 April 2001 on the approval of the criteria for areas important for the conservation of natural habitats (*Valstybės žinios*, 2001, No. 37-1271);
- 17) Order No. 546 of the Minister of the Environment of the Republic of Lithuania of 7 November 2003 on the amendment of Order No. 219 of the Minister of the Environment of the Republic of Lithuania of 20 April 2001 on the approval of the criteria for areas important for the conservation of natural habitats (*Valstybės žinios*, 2003, No. 108-4848);
- 18) Order No. 448 of the Minister of the Environment of the Republic of Lithuania of 21 August 2002 on the amendment of Order No. 173 of the Minister of the Environment of 27 April 2000 on the execution of paragraph 2 of Resolution No.

1446 of the Government of the Republic of Lithuania of 20 December 1999 on the implementation of the Law on Wild Flora (*Valstybės žinios*, 2002, No. 84-3670)

- 19) Order No. 173 of the Minister of the Environment of the Republic of Lithuania of 27 April 2000 on the execution of paragraph 2 of Resolution No. 1446 of the Government of the Republic of Lithuania of 20 December 1999 on the implementation of the Law on Wild Flora (*Valstybės žinios*, 2000, No. 37-1046);
- 20) Order No. 226 of the Minister of the Environment of the Republic of Lithuania of 24 April 2001 on the amendment of the List of Species of Wild Plants and Mushrooms Subject to Restricted or Prohibited Picking and Marketing (*Valstybės žinios*, 2001, No. 37-1275);
- 21) Order No. 664 of the Minister of the Environment of the Republic of Lithuania of 21 December 2002 on the development of projects on species subject to special protection (*Valstybės žinios*, 2003, No. 12-455);
- 22) Order No. 695 of the Minister of the Environment of the Republic of Lithuania of 31 December 2002 on the approval of the Monitoring Programme for Areas Important for the Conservation of Habitats and Birds (*Valstybės žinios*, 2003, No. 4-161);
- 23) Order No. 352 of the Minister of the Environment of the Republic of Lithuania of 1 July 2002 on the approval of the procedure for introduction, re-introduction and relocation, the procedure for the control and extermination of organisms of invasive species, composition and regulations of the board on control of invasive species, and the reintroduction and relocation programme (*Valstybės žinios*, 2002, No. 81-3505);
- 24) Order No. 511 of the Minister of the Environment of the Republic of Lithuania of 30 September 2002 on a new version of the Rules for Hunting on the Territory of the Republic of Lithuania approved by Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2002, No. 97-4308);
- 25) Resolution No. 260 of the Government of the Republic of Lithuania of 20 February 2002 on the amendment of Resolution No. 1138 of the Government of the Republic of Lithuania of 22 September 1998 on the approval of the Regulations of the Ministry of the Environment of the Republic of Lithuania (*Valstybės žinios*, 2002, No. 20-766);
- 26) Law No. VIII-1636 of 18 April 2000 on the Amendment of the Law on Environmental Impact Assessment of the Proposed Economic Activity (new version) (*Valstybės žinios*, 2000, No. 39-1092);
- 27) Order No. 123 of the Minister of the Environment of 19 March 2002 on the amendment of certain orders of the Minister of the Environment (*Valstybės žinios*, 2002, No. 31-1175);
- 28) Law No. I-2223 of the Republic of Lithuania on the Law on Environmental Protection (*Valstybės žinios*, 1992, No. 5-75)
- 29) Law No. IX-1610 of 10 June 2003 of the Republic of Lithuania on the Amendment of Articles 6 and 30 of the Law on Environmental Protection (*Valstybės žinios*, 2003, No. 61-2763);

- 30) Law No. VIII-2026 of 12 October 2000 of the Republic of Lithuania on the Amendment of Article 30 of the Law on Environmental Protection (*Valstybės žinios*, 2000, No. 90-2773);
- 31) Law No. VIII-1637 of 18 April 2000 of the Republic of Lithuania on the Amendment of Articles 1, 7, 8, 15, 16, 26 and Repeal of Article 27 of the Law on Environmental Protection (*Valstybės žinios*, 2000, No.39-1093);
- 32) Law No. VIII-310 of 26 June 1997 of the Republic of Lithuania on the Amendment of Article 24 of the Law on Environmental Protection (*Valstybės žinios*, 1997, No. 65-1540);
- 33) Law No. IX-677 of the Republic of Lithuania on the Amendment of Articles 1, 4, 6, 7, 8, 9, 23, Amendment of the Title of Chapter II of the Law on Environmental Protection and Supplement of the Law with Article 22(1) (*Valstybės žinios*, 2002, No. 2-49);
- 34) Law No. IX-628 of the Republic of Lithuania on the Amendment of the Law on Protected Areas (new version) (*Valstybės žinios*, 2001, No. 108-3902);
- 35) Law No. IX-638 of the Republic of Lithuania of 11 December 2001 on the Amendment of the Law on Wildlife (*Valstybės žinios*, 2001, No. 110-3988);
- 36) Law No. IX-1091 of the Republic of Lithuania on the amendment of Articles 4, 10 and 13 of the Law on Wildlife (*Valstybės žinios*, 2002, No. 96-4168);
- 37) Law No. IX-1614 of the Republic of Lithuania of 10 June 2003 on the Amendment of Articles 4, 8, 10 and 24 of the Law on Wildlife (*Valstybės žinios*, 2003, No. 61-2767)
- 38) Law No. I-1120 of the Republic of Lithuania on Territorial Planning (*Valstybės žinios*, 1995, No. 107-2391);
- 39) Law No. IX-1512 of the Republic of Lithuania of 17 April 2003 on the Amendment of Article 30 of the Law on Territorial Planning (*Valstybės žinios*, 2003, No. 42-1916);
- 40) Law No. IX-288 of the Republic of Lithuania of 19 April 2001 on the Amendment of Articles 21, 24 and 26 of the Law on Territorial Planning (*Valstybės žinios*, 2001, No. 39-1358);
- 41) Law No. VIII-2041 of the Republic of Lithuania on the Amendment and Supplement of Articles 2, 4, 9, 14, 17, 20, 21, 22, 23, 24, 26, 32 of the Law on Territorial Planning (*Valstybės žinios*, 2000, No. 92-2881);
- 42) Resolution No. 276 of the Government of the Republic of Lithuania of 15 March 2004 on the approval of the Regulations on Areas Important for the Conservation of Habitats and Birds (*Valstybės žinios*, 2004, No. 41-1335);
- 43) Law No. I-1495 of the Republic of Lithuania on Environmental Impact Assessment of the Proposed Economic Activity (*Valstybės žinios*, 1996, No. 82-1965);
- 44) Order No. 306 of the Minister of the Environment of the Republic of Lithuania of 20 July 2000 on the approval of the Lithuanian Red List of Protected Animal, Plant and Mushroom Species (*Valstybės žinios*, 2000, No. 66-1998);
- 45) Order No. 560 of the Minister of the Environment of the Republic of Lithuania of 22 October 2002 on the amendment and repeal of certain orders of the Minister of the Environment of the Republic of Lithuania (*Valstybės žinios*, 2002, 113-5065);

- 46) Order No. 25 of the Minister of the Environment of the Republic of Lithuania of 16 January 2003 on the amendment of Order No. 511 of the Minister of the Environment of 30 September 2002 on a new version of the Rules for Hunting on the Territory of the Republic of Lithuania approved by Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2003, No. 9-318);
- 47) Resolution No. 1093 of the Government of the Republic of Lithuania of 28 August 2003 on the amendment of Resolution No. 1138 of the Government of the Republic of Lithuania of 22 September 1998 on the approval of the Regulations of the Ministry of the Environment of the Republic of Lithuania (*Valstybės žinios*, 2003, No. 84-3834);
- 48) Resolution No. 106 of the Government of the Republic of Lithuania of 28 January 2003 on the amendment of Resolution No. 1138 of the Government of the Republic of Lithuania of 22 September 1998 on the approval of the Regulations of the Ministry of the Environment of the Republic of Lithuania (*Valstybės žinios*, 2003, No. 11-403);
- 49) Resolution No. 903 of the Government of the Republic of Lithuania of 13 June 2002 on the amendment of Resolution No. 1138 of the Government of the Republic of Lithuania of 22 September 1998 on the approval of the Regulations of the Ministry of the Environment of the Republic of Lithuania (*Valstybės žinios*, 2002, No. 60-2464);
- 50) Resolution No. 1138 of the Government of the Republic of Lithuania of 22 September 1998 on the approval of the Regulations of the Ministry of the Environment of the Republic of Lithuania;
- 51) Order No. 592 of the Minister of the Environment of 12 December 2001 on accumulation of data on animal and plant species of Community importance (*Valstybės žinios*, 2001, No. 68-2374);
- 52) Resolution No. 709 of the Government of the Republic of Lithuania of 9 June 2004 on the approval of the procedure for drafting and approving strategic planning documents on protected areas (*Valstybės žinios*, 2004, No. 93-3409);
- 53) Order No. D1-210 of the Minister of the Environment of the Republic of Lithuania of 22 April 2009 on the approval of the list of areas in conformity with the criteria for the screening of areas important for the conservation of natural habitats intended for the provision to the Commission of Europe (*Valstybės žinios*, 2009, No. 51-2039);
- 54) Law No. X-258 of the Republic of Lithuania on the Amendment of the Law on Environmental Impact Assessment of the Proposed Economic Activity (new version) (*Valstybės žinios*, 2005, No. 84-3105);
- 55) Law No. IX-2032 of 19 February 2004 of the Republic of Lithuania on the Amendment and Supplement of Articles 1 and 2 of the Law on Environmental Protection and Supplement of the Law with Article 27 and an Annex (*Valstybės žinios*, 2004, No. 36-1179)
- 56) Law No. X-147 of 24 March 2005 of the Republic of Lithuania on the Amendment and Supplement of Articles 1, 2, 6, 7, 8, 14, 19, 26, 31, 32, 33, 34 and the Annex, Repeal of Article 24 of the Law on Environmental Protection and Supplement of the Law with Articles 32(1), 32(2) (*Valstybės žinios*, 2005, No. 47-1558);

- 57) Law No. IX-1962 of the Republic of Lithuania of 15 January 2004 on the Amendment of the Law on Territorial Planning (*Valstybės žinios*, 2004, No. 21-617);
- 58) Order No. D1-307 of the Minister of the Environment of the Republic of Lithuania of 16 June 2005 on the amendment of Order No. 219 of the Minister of the Environment of the Republic of Lithuania of 20 April 2001 on the approval of the criteria for areas important for the conservation of natural habitats (*Valstybės žinios*, 2005, No. 79-2864);
- 59) Resolution No. 380 of the Government of the Republic of Lithuania of 19 April 2006 on the amendment of Resolution No. 380 of the Government of the Republic of Lithuania of 15 April 2004 on the approval of the Regulations on Areas Important for the Conservation of Habitats and Birds (*Valstybės žinios*, 2006, No. 44-1606);
- 60) Order No. D1-284 of the Minister of the Environment of the Republic of Lithuania of 7 June 2006 on the amendment of Order No. 592 of the Minister of the Environment of 12 December 2001 on the accumulation of data on animal and plant species of Community importance (new version) (*Valstybės žinios*, 2006, No. 66-2445);
- 61) Order No. D1-260 of the Minister of the Environment of the Republic of Lithuania of 25 May 2006 on the approval of the Rules for the Marketing of Protected Wild Plant Species (*Valstybės žinios*, 2006, No. 61-2215);
- 62) Order No. D1-368 of the Minister of the Environment of the Republic of Lithuania of 4 August 2006 on the amendment of Order No. 219 of the Minister of the Environment of the Republic of Lithuania of 20 April 2001 on the approval of the criteria for areas important for the conservation of natural habitats (*Valstybės žinios*, 2006, No. 88-3497);
- 63) Order No. D1-501 of the Minister of the Environment of the Republic of Lithuania of 30 October 2006 on the compilation of information required for the drafting of reports under the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora and the Council Directive 79/409/EC of 2 April 1979 on the conservation of wild birds (*Valstybės žinios*, 2006, No. 118-4513);
- 64) Order No. D1-22 of the Minister of the Environment of the Republic of Lithuania on the amendment of Order No. 372 of the Minister of the Environment of the Republic of Lithuania of 8 September 2000 on the approval of the procedure for picking protected species of animals, plants and mushrooms from the natural environment (new version) (*Valstybės žinios*, 2007, No. 7-294);
- 65) Order No. D1-389 of the Minister of the Environment of the Republic of Lithuania of 21 July 2008 on the amendment of Order No. 219 of the Minister of the Environment of the Republic of Lithuania of 20 April 2001 on the approval of the criteria for areas important for the conservation of natural habitats (*Valstybės žinios*, 2008, No. 87-3495)
- 66) Resolution No. 967 of the Government of the Republic of Lithuania of 18 August 2004 on the approval of the procedure for the strategic assessment of consequences of plans and programmes on the environment (*Valstybės žinios*, 2004, No. 130-4650);
- 67) Order No. D1-697 of the Minister of the Environment of the Republic of Lithuania of 31 December 2008 on the amendment of Order No. 258 of the Minister of the

- Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2009, No. 3-63);
- 68) Order No. D1-697 of the Minister of the Environment of the Republic of Lithuania of 31 December 2008 on the amendment of Order No. 258 of the Minister of the Environment of 27 June 2000 on the approval of the Rules for Hunting on the Territory of the Republic of Lithuania (*Valstybės žinios*, 2009, No. 3-63);
- 69) Order No. D1-54 of the Minister of the Environment of the Republic of Lithuania of 17 February 2009 on the amendment of Order No. 352 of the Minister of the Environment of the Republic of Lithuania of 1 July 2002 on the approval of the procedure for introduction, re-introduction and relocation, the procedure for the control and extermination of organisms of invasive species, composition and regulations of the board on control of invasive species, and the reintroduction and relocation programme (*Valstybės žinios*, 2009, No. 20-811);
- 70) Order No. D1-148 of the Minister of the Environment of the Republic of Lithuania of 7 April 2009 on the amendment of Order No. 372 of the Minister of the Environment of the Republic of Lithuania of 8 September 2000 on the approval of the procedure for picking protected species of animals, plants and mushrooms from the natural environment (*Valstybės žinios*, 2009, No. 41-1594);
- 71) Order No. D1-155 of the Minister of the Environment of the Republic of Lithuania of 9 April 2009 on the amendment of Order No. 513 of the Minister of the Environment of the Republic of Lithuania of 30 September 2002 on the approval of the procedure for the regulation of abundance of the game in areas where hunting is prohibited (*Valstybės žinios*, 2009, No. 42-1626);
- 72) Resolution No. 192 of the Government of the Republic of Lithuania of 4 March 2009 on the approval of the list of and delineation of protected areas of the Republic of Lithuania or parts thereof which contain areas important for the conservation of habitats (*Valstybės žinios*, 2009, No. 34-1287);
- 73) Order No. D1-325/1B-333/B1-252 of the Minister of the Environment, the Director General of the Customs Department under the Ministry of Finance and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 11 June 2009 on the amendment of Order No. 658/831/743 of the Minister of the Environment, the Director General of the Customs Department under the Ministry of Finance and the Director of the State Food and Veterinary Service of the Republic of Lithuania of 21 December 2002 on the approval of the Rules for Trading Wild Animals (*Valstybės žinios*, 2009, No. 71-2911);
- 74) Order No. D1-721 of the Minister of the Environment of the Republic of Lithuania of 2 July 2009 on the amendment of Order No. D1-260 of the Minister of the Environment of the Republic of Lithuania of 25 May 2006 on the approval of the Rules for the Marketing of Protected Wild Plant Species (*Valstybės žinios*, 2009, No. 83-3470);
- 75) Order No. D1-721 of the Minister of the Environment of the Republic of Lithuania on the amendment of Order No. 586 of the Minister of the Environment of the Republic of Lithuania of 11 November 2002 on the approval of the Rules for Using Wild Animals for Scientific, Cultural, Educational and Aesthetical Purposes (*Valstybės žinios*, 2009, No. 144-6414);
- 76) Law No. XI-578 of the Republic of Lithuania of 17 December 2009 on the Amendment of the Law on Protected Species and Habitats of Animals, Plants and Mushrooms (*Valstybės žinios*, 2009, No. 159-7200).

### Brief description of the measures

73. Establishment of areas important for the protection of habitats for the purpose of conserving or restoring habitats of protected fauna and flora

The Regulations on Areas Important for the Conservation of Habitats and Birds approved by the Government of the Republic of Lithuania Resolution No. 276 have laid down that areas important for the conservation of habitats are established with a view to conserve and restore natural habitats of fauna and flora. The establishment of protected areas in Lithuania falls under the responsibility of the State Service for Protected Areas. The Areas Important for the Conservation of Habitats were approved by Order No. D1-210 of the Minister of the Environment of the Republic of Lithuania (*Valstybės žinios*, 2009, No. 51-2039; 2009, No. 135-5903).

The number and area of the areas designated for the conservation of habitats in each basin and sub-basin of the Nemunas RBD are provided in Table 62.

Table 62. Areas important for the conservation of habitats (AICH) in the Nemunas RBD

Basin/ sub-basin	Area of the AICH in the sub-basin,	Number of AICH	Area overlapping with AICB, ha	Area overlapping with AICB, %
Baltic Sea and Curonian Lagoon	53 351	7	22 801	43
Dubysa	5 284	12	560	11
Jūra	39 651	18	797	2
Lithuanian Coastal Rivers	14 519	9	12 393	85
Merkys	45 800	13	41 270	90
Minija	48 463	14	20 749	43
Nemunas Small Tributaries	107 661	76	58 405	54
Neris Small Tributaries	11 700	36	1 391	12
Nevēžis	24 145	17	15 368	64
Prieglius	407	4	0	0
Šešupė	28 322	9	16 639	59
Šventoji	69 809	49	37 630	54
Žeimena	99 422	17	95 323	96
<b>TOTAL</b>	<b>548 533</b>	<b>245</b>	<b>323 327</b>	<b>59</b>

Notes:

1. The area of the areas important for the conservation of habitats (AICH) and the areas important for the conservation of birds (AICB) in the sub-basins were established using GIS technologies.
2. The column “Number of AICH” specifies the number of AICH that are fully or partially situated on the territory of a sub-basin in question. The total number of AICH in the Nemunas RBD is lower than the aggregate amount of AICH in individual sub-basins.

406 areas important for the conservation of habitats were established in Lithuania by the end of 2009 (Order of the Minister of the Environment of the Republic of Lithuania on the supplement of Order No. D1-210 of the Minister of the Environment of the Republic of Lithuania of 22 April 2009 on the approval of the list of areas in conformity with the criteria for the screening of areas important for the conservation of natural habitats intended for the submission to the European Commission (*Valstybės žinios*, 2009, No. 135-5903). These areas, together with 77 sites important for the conservation of birds,

account for 12.5 % of the total territory of the country. During the last couple of years, the establishment of areas important for the conservation of habitats has made a considerable progress.

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

74. With a view to prevent decrease in the status of the conservation of protected species, nature management plans and other strategic documents have to be developed for protected areas. Nature management plans are approved by orders of the Minister of the 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. By August 2009, nature management plans were developed for 54 areas in Lithuania and approved by respective orders of the Minister of the Environment. The majority of the plans are designed for a 10 years' period (2008-2017).

The following text deals with the number and area of protected areas, statistics of nature management plans, and the Directive implementation costs by sub-basins.

#### **Implementation costs**

The costs of the implementation of the requirements of Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora include the costs needed for the development and implementation of nature management plans for areas important for the conservation of habitats, and for the monitoring of AICH.

As provided for in the plans of the State Service for Protected Areas, another 300 areas designated for the conservation of habitats are planned to be established in Lithuania in order to implement the requirements of Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Hence, the costs of the implementation of the Natural Habitats Directive may increase. In addition, the implementation costs of individual measures are specified during tenders<sup>13</sup>, therefore the costs provided in the nature management plans are only indicative ones.

These costs are planned to be funded from the state budget. The estimation of the costs of the implementation of the Natural Habitats Directive was based on the following assumptions:

- 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 the natural management plans on the territory of one hectare are the same. In places where AICB and AICH overlap, 50 % of the costs were assigned to the costs of the implementation of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds. It is assumed that nature management plans for all AICH will be elaborated in five years.

---

<sup>13</sup> Data of the State Service for Protected Areas.

- 2) The investment and operating costs of the implementation of the nature management plans were estimated on the basis on information contained in the nature management plans provided on the website of the Ministry of the Environment of the Republic of Lithuania<sup>14</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 Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora for the areas with no nature management plans<sup>15</sup> were calculated following the methodology of unit costs. The average annual investment costs of the implementation of nature management plans in areas important 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. In sites where AICB and AICH 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 nature management plans already developed and those to be elaborated in future<sup>16</sup>, taking into account the overlapping of AICB and AICH<sup>17</sup>.
- 4) AICH monitoring costs include expenditures for salaries, social insurance contributions and fuel costs<sup>18</sup>. The recalculation of the monitoring costs for sub-basins assumed that monitoring costs for 1 ha 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>19</sup>. The estimations did not cover the monitoring costs for natural habitats because no monitoring was carried out before 2009 and no monitoring methodologies have been developed.

### **The Šešupė Sub-basin (including the Prieglius Basin)**

75. There are ten areas important for the conservation of natural habitats (AICH) in the Šešupė Sub-basin the total area of which on the territory of the sub-basin is 28 729 ha. The major part of AICH, 16 639 ha (59 %), overlaps with the areas important for the conservation of birds (AICB) (Table 63).

Table 63. Areas important for the conservation of natural habitats in the Šešupė Sub-basin (including the Prieglius Basin)

---

<sup>14</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>15</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>16</sup> Information source: <http://www.am.lt/gamtotvarka/plans.php>

<sup>17</sup> Information source: GIS information of the cadastre of the Areas Protected by the State.

<sup>18</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>19</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.

	<b>AICH</b>	<b>Municipality</b>	<b>AICH code</b>	<b>Total area of AICH, ha</b>	<b>Area of AICH in the sub-basin, ha</b>	<b>Share of AICH in the sub-basin, %</b>	<b>AICH overlapping with AICB, ha</b>
1	Ažuolų Būdos Forest	Kazlų Rūda	LTMAR0001	860	860	100	
2	Drausgirio Forest	Vilkaviškis distr.	LTVIK0002	595	595	100	
3	Grybingirio Forest	Vilkaviškis distr.	LTVIK0004	355	355	100	
4	Surroundings of Liubavas village	Kalvarija	LTKAL0001	153	153	100	
5	Meteliai Regional Park <sup>20</sup>	Alytus distr., Lazdijai distr.	LTAZ0010	17 024	9 285	55	2 441
6	Meadows in Pavištytis	Vilkaviškis distr.	LTVIK0003	23	23	100	
7	Surroundings of Peleniai village	Kalvarija, Vilkaviškis distr.	LTVIK0007	47	47	100	
8	Tadarinės Forest and Vištytgirio Forest	Vilkaviškis distr.	LTVIK0005	1 176	1 176	100	
9	Virbalgis Forest	Vilkaviškis distr.	LTVIK0001	368	368	100	
10	Lake Žuvintas and Buktos Forest	Alytus distr., Lazdijai distr., Marijampolė	LTALY0005	15 868	15 868	100	14 198
	<b>TOTAL</b>			<b>36 468</b>	<b>28 729</b>	<b>79</b>	<b>16 639</b>

Note: The area of the AICB and AICH in the sub-basins were established with the help of GIS technologies

Information on nature management plans for the areas in the Šešupė Sub-basin is provided in Table 64.

Table 64. Protected areas with nature management plans (NMP) in place in the Šešupė Sub-basin (including the Prieglius Basin)

<b>NMP</b>	<b>Status</b>	<b>Area of the site with NMP in place, ha</b>	<b>Area of the site covered by NMP in the sub-basin, ha</b>	<b>Share of the site covered by NMP in the sub-basin, %</b>	<b>Area of the site covered by NMP in the sub-basin where AICH is situated, ha</b>
Amalvas Wetland Complex	Approved	3 638	3 638	100.0	3 638
Lake Bakšiai	Developed (not approved yet)	3	3	100.0	3
Diferencijos Forest	Developed (not approved yet)	37	37	100.0	37
Kalniškės Forest	Developed (not	277	277	100.0	271

<sup>20</sup> The area of the AICH overlaps with the one of the AICB: lakes Meteliai, Dusia, and Obelija (LTALYB001).

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 AICH is situated, ha
	approved yet)				
Rinkoto Forest	Developed (not approved yet)	108	107	98.9	107
Kiaulyčia Botanical-Zoological Strict Reserve of Žuvintas Biosphere Reserve	Developed (not approved yet)	730	730	100.0	730
<b>TOTAL</b>		<b>4 793</b>	<b>4792</b>		<b>4 786</b>

Notes:

1. The titles of the nature management plans usually do not coincide with the names of the corresponding AICB or AICH.
2. No nature management plans have been developed for the AICH in the Prieglius Basin.

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Šešupė Sub-basin total to around LTL 212 900 and the average annual operating costs are about LTL 428 200 (Table 65).

Table 65. Costs of the implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Šešupė Sub-basin (including the Prieglius Basin)

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	783 059	156 612
Implementation of the nature management plans already in place	10 years	18 000	138 960	15 440
Implementation of new nature management plans	10 years	194 380	943 718	188 744
AICB monitoring	1 year	0		67 400
<b>TOTAL ~</b>		<b>212 380</b>	<b>1 866 000</b>	<b>428 200</b>

### The Dubysa Sub-basin

76. There are 12 areas important for the conservation of natural habitats in the Dubysa Sub-basin the total area of which on the territory of the sub-basin is 5 284 ha. A small part of the AICH, 560 ha (11 %), overlaps with the areas important for the conservation of birds (Table 66).

Table 66. Areas important for the conservation of natural habitats in the Dubysa Sub-basin

	<b>AICH</b>	<b>Municipality</b>	<b>AICH code</b>	<b>Total area of AICH, ha</b>	<b>Area of AICH in the sub-basin, ha</b>	<b>Share of AICH in the sub-basin, %</b>	<b>AICH overlapping with AICB, ha</b>
1	Lake Apušis and its banks	Kelmė distr.	LTKEL0010	96	96	100	
2	Dubysa River below Lyduvėnai	Jurbarkas distr., Kaunas distr., Raseiniai distr.	LTRAS0002	1 052	1 050	100	560
3	Lake Lygė	Kelmė distr., Šiauliai distr.	LTSIA0001	197	197	100	
4	Margupis juniper bushes	Jurbarkas distr.	LTIJUR0010	25	25	100	
5	Pagėluvis Lake District	Šiauliai distr.	LTSIA0002	132	132	100	
6	Paraudžių Forest	Šiauliai distr.	LTSIA0004	101	101	100	
7	Praviršulio Tyrelis Marsh	Radviškis distr., Raseiniai distr.	LTRAD0001	3 316	887	27	
8	Rėkyva Bog	Šiauliai city, Šiauliai distr.	LTSIA0005	2 560	409	16	
9	Smirdelė Bog	Kelmė distr.	LTKEL0003	26	26	100	
10	Šiluvos Tyrelis Marsh	Kelmė distr.	LTKEL0012	254	199	78	
11	Šimšų Forest	Kelmė distr.	LTKEL0007	2 089	2 089	100	
12	Meadows in Vijurkai	Kelmė distr.	LTKEL0017	74	74	100	
	<b>TOTAL:</b>			<b>9 920</b>	<b>5 284</b>	<b>53</b>	<b>560</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Dubysa Sub-basin is provided in Table 67.

Table 67. Protected areas with nature management plans (NMP) in place in the Dubysa Sub-basin

<b>NMP</b>	<b>Status</b>	<b>Area of the site with NMP in place, ha</b>	<b>Area of the site covered by NMP in the sub-basin, ha</b>	<b>Share of the site covered by NMP in the sub-basin, %</b>	<b>Area of the site covered by NMP in the sub-basin where AICH is situated, ha</b>
Lake Apušis and its banks	Approved	94	94	100.0	94
Valley of the Dubysa River	Developed (not approved yet)	1 117	1 117	100.0	558
Pabijočiai Botanical-Zoological Reserve of Kurtuvėnai Regional Park	Under development (not published)	197	197	100.0	197
Riverside of the Nemunas and islands between Kulautuva and	Approved	3 611	2	0.1	2

Smalininkai					
Praviršulio Tyrelis Marsh	Under development (not published)	3 316	887	26.7	887
<b>TOTAL</b>		<b>8 335</b>	<b>2297</b>		<b>1 738</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Dubysa Sub-basin total to around LTL 71 310 and the average annual operating costs are about LTL 154 110 (Table 68).

Table 68. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Dubysa Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	159 574	31 915
Implementation of the nature management plans already in place	10 years	41 007	359 255	39 917
Implementation of new nature management plans	10 years	30 307	348 523	69 705
AICH monitoring	1 year	0		12,575
<b>TOTAL ~</b>		<b>71 300</b>	<b>867 000</b>	<b>154 000</b>

### The Jūra Sub-basin

77. There are 18 areas important for the conservation of natural habitats in the Jūra Sub-basin the total area of which on the territory of the sub-basin is 90 100 ha. A small part of the AICH, 797 ha (2 %), overlaps with the areas important for the conservation of birds (Table 69).

Table 69. Areas important for the conservation of natural habitats in the Jūra Sub-basin

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Valley of the Ančia	Tauragė distr.	LTTAU0001	338	338	100	
2	Balandinė Bog	Jurbarkas distr.	LTJUR0006	160	84	53	
3	Baužaičių Bog	Jurbarkas distr.	LTJUR0007	259	148	57	
4	Dabrupinės Forest	Tauragė distr.	LTTAU0014	115	115	100	
5	Gojus hornbeam forest	Šilalė distr.	LTSIL0002	12	12	100	
6	Jūkainių Forest	Raseiniai distr.	LTRAS0001	267	267	100	
7	Jūra River below Tauragė	Pagėgiai, Tauragė distr.	LTSIU0010	607	606	100	304

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
8	Karšuvos Forest	Jurbarkas distr., Tauragė distr., Pagėgiai	LTJUR0008	37 194	19 329	52	
9	Laukesa I	Jurbarkas distr., Tauragė distr.	LTJUR0009	1 187	658	55	
10	Meadows of Medvėgalis	Šilalė distr.	LTSIL0003	45	42	94	
11	Meškų meadows	Tauragė distr.	LTTAU0009	148	148	100	
12	Norkiškės Forest	Tauragė distr.	LTTAU0013	56	56	100	
13	Pagramantis Regional Park	Tauragė distr., Šilalė distr.	LTTAU0008	11 466	11 466	100	
14	Rietavo Forests	Klaipėda distr., Kretinga distr., Plungė distr., Rietavas	LTPLU0010	30 109	4 636	15	384
15	Valley of the Šaltuona	Jurbarkas distr.	LTJUR0011	66	66	100	
16	Šereitlaukio Forest	Pagėgiai	LTSIU0004	1 481	434	29	
17	Šešuvis River below Pašešuvis	Jurbarkas distr., Tauragė distr.	LTTAU0007	899	899	100	108
18	Swampland of the upper reaches of the Viešvilė	Jurbarkas distr., Tauragė distr.	LTTAU0006	5 693	347	6	
	<b>TOTAL:</b>			<b>90 100</b>	<b>39 651</b>	<b>44</b>	<b>797</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Jūra Sub-basin is provided in Table 70.

Table 70. Protected areas with nature management plans (NMP) in place in the Jūra Sub-basin

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 AICH is situated, ha
Valley of the Ančia	Approved	321	321	100.0	307
Aukštasis Tyras Marsh	Approved	875	385	44.0	384
Akmėna Landscape	Developed (not	1 888	1 888	100.0	1 888

Reserve of Pagramantis Regional Park	approved yet)				
<b>TOTAL</b>		<b>3 084</b>	<b>2 594</b>		<b>2 579</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Jūra Sub-basin total to around LTL 244 030 and the average annual operating costs are about LTL 1 065 130 (Table 71).

Table 71. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Jūra Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	1 658 923	331 785
Implementation of the nature management plans already in place	10 years	0	777 825	86 425
Implementation of new nature management plans	10 years	244 025	2 762 839	552 568
AICB monitoring	1 year	0	0	94 361
<b>TOTAL ~</b>		<b>244 000</b>	<b>5 200 000</b>	<b>1 065 000</b>

### Lithuanian Coastal Rivers Basin

78. There are ten areas important for the conservation of natural habitats in the Lithuanian Coastal Rivers Basin the total area of which on the territory of the sub-basin is 14 519 ha. The major part of the AICH, 12 393 ha (85 %), overlaps with the areas important for the conservation of birds (Table 72).

Table 72. Areas important for the conservation of natural habitats in the Lithuanian Coastal Rivers Basin

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Coast of the Baltic Sea		LTPAL0001	12 634	3	0	3
2	Curonian Lagoon	Šilutė distr., Klaipėda distr., Neringa	LTSIU0012	37 910	1 895	50	7 337
3	Meadows in Kintai and Kintų forests	Šilutė distr.	LTKLA0004	519	518	100	5
4	Curonian Spit	Neringa, Klaipėda city	LTNER0005	9 986	7 538	75	7 538
5	Lužijos Bog and Tyrų Bog	Klaipėda distr.	LTKLA0005	2 687	2 302	86	2 234
6	Minija River	Klaipėda distr., Kretinga distr., Plungė	LTKLA0007	1 870	20	1	17

		distr., Šilutė distr.					
7	Valley of the Minija	Klaipėda distr.	LTKLA0003	1 621	52	3	
8	Nemunas delta	Šilutė distr.	LTSIU0013	23 906	2 457	10	2 457
9	Coastal dunes	Klaipėda distr., Palanga town	LTKLA0009	425	422	99	140
10	Svencelė Bog	Klaipėda distr., Šilutė distr.	LTKLA0001	1 207	1 207	100	
	<b>TOTAL:</b>			<b>92.765</b>	<b>16.415</b>	<b>52</b>	<b>19.730</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Lithuanian Coastal Rivers Basin is provided in Table 73.

Table 73. Protected areas with nature management plans (NMP) in place in the Lithuanian Coastal Rivers Basin

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 AICH is situated, ha
Aquaculture farm in Kintai	Approved	571	334	58.6	334
Meadows in Kintai and Kintų forests	Under development (not published)	519	518	99.9	518
Curonian Spit	Approved	24 996	7 596	30.4	7 538
Kniaupas Botanical-Zoological Reserve, Krokų Lanka Botanical-Zoological Reserve and part of Tulkiaragė polder of the ecological protection zone of the Nemunas Delta	Developed (not approved yet)	2 628	349	13.3	349
Part of the Coastal Regional Park	Approved	436	432	99.2	424
<b>TOTAL</b>		<b>29 150</b>	<b>9 229</b>		<b>9 163</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Lithuanian Coastal Rivers Basin total to around LTL 357 430 and the average annual operating costs are about LTL 125 830 (Table 74).

Table 74. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Lithuanian Coastal Rivers Basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	150 405	30 081

Implementation of the nature management plans already in place	10 years	305 740	244 571	27 175
Implementation of new nature management plans	10 years	51 694	170 114	34 023
AICB monitoring	1 year	0		34 551
<b>TOTAL ~</b>		<b>357 400</b>	<b>565 000</b>	<b>126 000</b>

### The Merkys Sub-basin

79. There are 13 areas important for the conservation of natural habitats in the Merkys Sub-basin the total area of which on the territory of the sub-basin is 45 800 ha. The larger part of the AICH, 41 270 ha (90 %), overlaps with the areas important for the conservation of birds (Table 75).

Table 75. Areas important for the conservation of natural habitats in the Merkys Sub-basin

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Čepkeliai Marsh	Varėna distr.	LTVAR0009	12 752	7 733	61	6 623
2	Dainavos Forest	Alytus distr., Lazdijai distr., Varėna distr., Druskininkai	LTVAR0017	54 833	32 564	59	32 564
3	Derežna River	Varėna distr.	LTVAR0015	137	137	100	
4	Diržameniai Bog	Varėna distr.	LTVAR0019	75	75	100	
5	Geidukonių Bog	Varėna distr.	LTVAR0018	68	68	100	
6	Jurgionių forest	Trakai distr.	LTTRA0001	659	411	62	
7	Kernavas Bog	Šalčininkai distr.	LTSAL0001	1 449	1 449	100	1 449
8	Merkys River	Šalčininkai distr., Trakai distr., Varėna distr.	LTVAR0011	2 224	2 223	100	332
9	Spengla River and its valley	Varėna distr.	LTVAR0001	254	254	100	
10	Stojų meadows	Varėna distr.	LTVAR0025	193	193	100	
11	Ūla River below Rudnia	Varėna distr.	LTVAR0012	419	419	100	281
12	Verseka River	Šalčininkai distr., Varėna distr.	LTVAR0016	253	253	100	
13	Valley of the Visinčia at Gudeliai	Šalčininkai distr.	LTSAL0004	21	21	100	21
	<b>TOTAL:</b>			<b>73 337</b>	<b>45 800</b>	<b>62</b>	<b>41 270</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Merkys Sub-basin is provided in Table 76.

Table 76. Protected areas with nature management plans (NMP) in place in the Merkys Sub-basin

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 AICH is situated, ha
Derežna River	Developed (not approved yet)	137	137	100.0	137
Karaviškių Forest	Approved	343	343	100.0	343
Biosphere ground of Rūdinkų Forest	Under development (not published)	20 095	20 095	100.0	1 475
<b>TOTAL</b>		<b>20 575</b>	<b>20 575</b>		<b>1 955</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Merkys Sub-basin total to around LTL 404 110 and the average annual operating costs are about LTL 457 510 (Table 77).

Table 77. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Merkys Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	1 085 354	217 071
Implementation of the nature management plans already in place	10 years	9 000	13 667	1 519
Implementation of new nature management plans	10 years	431 108	649 635	129 927
AICB monitoring	1 year	0	0	108 994
<b>TOTAL ~</b>		<b>440 100</b>	<b>1 750 000</b>	<b>458 000</b>

### The Minija Sub-basin

80. There are 14 areas important for the conservation of natural habitats in the Minija Sub-basin the total area of which on the territory of the sub-basin is 48 463 ha. A relatively large part of the AICH, 20 749 ha (43 %), overlaps with the areas important for the conservation of birds (Table 78).

Table 78. Areas important for the conservation of natural habitats in the Minija Sub-basin

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Ankantų Bog	Telšiai distr.	LTTEL0006	420	3	1	

2	Kulalių boulder area	Skuodas distr.	LTSKU0003	59	32	54	
3	Minija River	Klaipėda distr., Kretinga distr., Plungė distr., Šilutė distr.	LTKLA0007	1 870	1 844	99	991
4	Valley of the Minija	Klaipėda distr.	LTKLA0003	1 621	1 568	97	329
5	Valley of the Minija at Dyburiai	Kretinga distr., Plungė distr.	LTKRE0002	754	754	100	37
6	Meadows in Nasrėnai	Kretinga distr.	LTKRE0003	21	21	100	11
7	Nemunas delta	Šilutė distr.	LTSIU0013	23 906	1 965	8	1 965
8	Rietavo Forests	Klaipėda distr., Kretinga distr., Plungė distr., Rietavas	LTPLU0010	30 109	25 474	85	4 536
9	Lake Salotas and the area around it	Telšiai distr.	LTTEL0002	306	306	100	
10	Sydeklio Bog	Telšiai distr.	LTTEL0007	157	157	100	
11	Veiviržis River and Šalpė River	Klaipėda distr., Šilutė distr.	LTKLA0010	1 714	1,714	100	1
12	Valley of the Veiviržas	Klaipėda distr., Šilutė distr.	LTKLA0006	1 729	1,729	100	
13	Žalioji Giria Forest	Šilalė distr., Šilutė distr.	LTSIL0005	581	581	100	565
14	Žemaitija National Park	Plungė distr., Skuodas distr.	LTPLU0009	17 957	12 316	69	12 315
	<b>TOTAL:</b>			<b>81 203</b>	<b>48 463</b>	<b>60</b>	<b>20 749</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Minija Sub-basin is provided in Table 79.

Table 79. Protected areas with nature management plans (NMP) in place in the Minija Sub-basin

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 AICH is situated, ha
Aukštasis Tyras Marsh	Approved	875	490	56.0	490
Old valleys of the Erla River and Salantas River	Approved	1 461	700	47.9	11
Quarry in Kalviai	Developed	37	37	100.0	0

	(not approved yet)				
Aquaculture farm in Kintai	Approved	571	236	41.4	236
Kulalių boulder area	Approved	59	32	54.2	32
Valley of the Minija	Developed (not approved yet)	2 240	2 240	100.0	1 279
Valley of the Minija at Dyburiai	Under development (not published)	804	804	100.0	781
Kniaupas Botanical-Zoological Reserve, Krokų Lanka Botanical-Zoological Reserve and part of Tulkiaragė polder of the ecological protection zone of the Nemunas Delta Regional Park	Developed (not approved yet)	2 628	18	0.7	18
Paburgės Forest	Developed (not approved yet)	238	238	100.0	238
Reiskių Tyras Bog	Developed (not approved yet)	4 046	4 046	100.0	4 046
Siberija Bog	Approved	66	66	100.0	66
Biosphere ground of Vainuto Forests	Under development (not published)	14 687	10 949	74.5	565
<b>TOTAL</b>		<b>27 712</b>	<b>19 856</b>		<b>7 762</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Minija Sub-basin total to around LTL 580 550 and the average annual operating costs are about LTL 909 030 (Table 80).

Table 80. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Minija Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	1 522 678	304 536
Implementation of the nature management plans already in place	10 years	258 120	449 969	49 997
Implementation of new nature management	10 years	322 431	2 195 832	439 166

plans				
AICB monitoring	1 year	0	0	115 332
<b>TOTAL ~</b>		<b>581 000</b>	<b>4 168 500</b>	<b>909 000</b>

### The Nemunas Small Tributaries Sub-basin

81. There are 76 areas important for the conservation of natural habitats in the Nemunas Small Tributaries Sub-basin the total area of which on the territory of the sub-basin is 107 661 ha. A relatively large part of the AICH, 58 405 ha (54 %), overlaps with the areas important for the conservation of birds (Table 81).

Table 81. Areas important for the conservation of natural habitats in the Nemunas Small Tributaries Sub-basin

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Northern lakeside of Lake Ančia	Lazdijai distr.	LTAZ0021	16	16	100	
2	Exposures of the Armena	Jurbarkas distr.	LTJUR0005	228	228	100	
3	Balandinė Bog	Jurbarkas distr.	LTJUR0006	160	76	47	
4	Exposure of Balbieriškis	Prienai distr.	LTPRI0007	8	8	100	
5	Lake Balsys	Lazdijai distr.	LTAZ0016	44	44	100	
6	Baužaičiai Bog	Jurbarkas distr.	LTJUR0007	259	110	43	
7	Čepkeliai Marsh	Varėna distr.	LTVAR0009	12 752	4 952	39	4 884
8	Dainaviškės bogs	Lazdijai distr.	LTAZ0023	57	57	100	
9	Dainavos Forest	Alytus distr., Lazdijai distr., Varėna distr., Druskininkai	LTVAR0017	54 833	22 258	41	22 258
10	Dubysa River below Lyduvėnai	Jurbarkas distr., Kaunas distr., Raseiniai distr.	LTRAS0002	1 052	2	0	1
11	Dubravos old forest	Kaunas distr.	LTKAU0013	120	120	100	
12	Valley of the Gauja	Šalčininkai distr.	LTSAL0002	483	480	99	
13	Valley of the Gystus	Jurbarkas distr.	LTJUR0002	147	147	100	
14	Part of Ilgininkų Forest	Lazdijai distr.	LTAZ0025	86	86	100	
15	Lake Ilgis (I)	Lazdijai distr.	LTAZ0026	66	66	100	
16	Jiesia River and its valleys	Kaunas city, Kaunas distr.	LTKAU0014	448	448	100	
17	Fort in Julijanava	Kaunas city	LTKAU0010	5	5	100	

	<b>AICH</b>	<b>Municipality</b>	<b>AICH code</b>	<b>Total area of AICH, ha</b>	<b>Area of AICH in the sub-basin, ha</b>	<b>Share of AICH in the sub-basin, %</b>	<b>AICH overlapping with AICB, ha</b>
18	Meadows in Jurgelionys	Šalčininkai distr.	LTSAL0006	7	7	100	
19	Jurgionių forest	Trakai distr.	LTTRA0001	659	248	38	
20	Kamšos Forest	Kaunas distr.	LTKAU0003	321	321	100	
21	Karšuvos Forest	Jurbarkas distr., Tauragė distr., Pagėgiai	LTJUR0008	37 194	17 864	48	
22	Kaukinės Forest	Kaišiadorys distr.	LTKAI0001	1 135	1 135	100	
23	Kaunas oak-tree area	Kaunas city	LTKAU0020	61	61	100	
24	Kauno Marios Lagoon	Kaišiadorys distr., Kaunas city, Kaunas distr.	LTKAU0007	9 020	9 020	100	8299
25	Meadows in Klangiai	Jurbarkas distr.	LTJUR0004	31	31	100	
26	Krakinis Bog	Lazdijai distr.	LTAZ0003	157	157	100	
27	Surroundings of Kučiuliškė village	Lazdijai distr.	LTAZ0001	146	146	100	
28	Laukesa I	Jurbarkas distr., Tauragė distr.	LTJUR0009	1 187	529	45	
29	Liubelio Forest	Lazdijai distr.	LTAZ0015	146	146	100	
30	Lake Liūnelis and its lakeside	Lazdijai distr.	LTAZ0019	45	45	100	
31	Mergiškių Forest	Trakai distr.	LTTRA0006	156	156	100	
32	Meteliai Regional Park	Alytus distr., Lazdijai distr.	LTAZ0010	17 024	7 739	45	2 037
33	Fort in Milikonys	Kaunas city	LTKAU0008	2	1	25	
34	Minija River	Klaipėda distr., Kretinga distr., Plungė distr., Šilutė distr.	LTKLA0007	1 870	6	0	6
35	Meadows of the Morkava valley	Lazdijai distr.	LTAZ0017	7	7	100	
36	Lake Mošia	Trakai distr.	LTTRA0021	39	39	100	
37	Fort in Naujoji Freda	Kaunas distr.	LTKAU0011	6	6	100	
38	Nemunas delta	Šilutė distr.	LTSIU0013	23 906	19 403	81	19 403

	<b>AICH</b>	<b>Municipality</b>	<b>AICH code</b>	<b>Total area of AICH, ha</b>	<b>Area of AICH in the sub-basin, ha</b>	<b>Share of AICH in the sub-basin, %</b>	<b>AICH overlapping with AICB, ha</b>
39	Nemunas loops	Alytus distr., Birštonas, Prienai distr.	LTPRI0010	1 346	1 346	100	546
40	Hornbeam Forest in the Nemunas valley from Kriukai to Gelgaudiškis	Šakiai distr.	LTSAK0001	1 378	1 378	100	20
41	Nemunas River in Panemunė Regional Park	Jurbarkas distr., Kaunas distr., Šakiai distr.	LTSAK0002	953	953	100	952
42	Nemunas River in Rambynas Regional Park	Pagėgiai	LTSIU0015	214	181	85	
43	Norūnų Forest	Alytus distr.	LTALY0002	243	243	100	
44	Ošvenčia River and its valleys	Prienai distr.	LTPRI0014	432	432	100	
45	Petroškų Forest	Lazdijai distr.	LTAZ0020	739	739	100	
46	Pleinės Bog	Šilutė distr.	LTSIU0001	277	277	100	
47	Plomėnų Bog	Trakai distr.	LTTRA0020	426	33	8	
48	Prienų pinewood	Prienai distr.	LTPRI0013	469	469	100	
49	Punios pinewood	Alytus distr.	LTALY0004	2 702	2 702	100	
50	Ragainė bend	Pagėgiai	LTSIU0003	689	689	100	
51	Revuona headwaters	Prienai distr.	LTPRI0005	23	23	100	
52	Ringovės Forests	Kaunas distr.	LTKAU0001	215	215	100	
53	Fort in Rokai	Kaunas city	LTKAU0012	8	8	100	
54	Rūdgių Wetland	Prienai distr.	LTPRI0011	26	26	100	
55	Meadows in Seredžius	Jurbarkas distr.	LTJUR0001	11	11	100	
56	Siponių exposure	Birštonas	LTBRS0001	3	3	100	
57	Skrebio Forest	Trakai distr.	LTTRA0005	119	119	100	
58	Lake Snaigynas	Lazdijai distr.	LTAZ0033	206	206	100	
59	Lake Solis ant its lakeside	Trakai distr.	LTTRA0003	235	235	100	
60	Spindžiaus Forest	Trakai distr.	LTTRA0007	1 382	1 382	100	
61	Stakų Forest	Šalčininkai distr.	LTSAL0003	693	693	100	

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
62	Strėvininkų Forest	Kaišiadorys distr.	LTKAI0002	194	194	100	
63	Šereitlaukio Forest	Pagėgiai	LTSIU0004	1 481	1 046	71	
64	Šilinė surroundings	Jurbarkas distr.	LTJUR0003	37	37	100	
65	Škėvonių exposure	Birštonas	LTBRS0002	1	1	100	
66	Surroundings of Škilietai lakes	Trakai distr.	LTTRA0002	91	91	100	
67	Valley of the Šlavantėlė	Lazdijai distr.	LTAZ0022	4	4	100	
68	Tartoko Bog	Prienai distr.	LTPRI0004	33	33	100	
69	Vaiguvos Forest	Kaišiadorys distr.	LTKAI0004	665	665	100	
70	Valley of the Verknė	Birštonas, Prienai distr.	LTPRI0002	594	594	100	
71	Middle reaches of the Verknė	Prienai distr., Trakai distr.	LTPRI0012	419	419	100	
72	Vidzgirio Forest	Alytus distr.	LTALY0001	388	388	100	
73	Bogland of the upper reaches of the Viešvilė	Jurbarkas distr., Tauragė distr.	LTTAU0006	5 693	5 346	94	
74	Valley of the Vizdija	Birštonas	LTPRI0009	199	199	100	
75	Fort in Žagariskės	Kaunas distr.	LTKAU0009	6	6	100	
76	Bogs of Žydkaimis village	Trakai distr.	LTTRA0004	100	100	100	
	<b>TOTAL:</b>			<b>186 579</b>	<b>107 661</b>	<b>58</b>	<b>58 405</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Nemunas Small Tributaries Sub-basin is provided in Table 82.

Table 82. Protected areas with nature management plans (NMP) in place in the Nemunas Small Tributaries Sub-basin

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 AICH is situated, ha
Northern lakeside of Lake Ančia	Approved	16	16	100.0	16
Arlaviškiai juniper bushes	Approved	45	45	100.0	43
Aukštumala Telmological Nature Reserve	Under development (not published)	1 017	1 017	100.0	1 017
Valley of the Gauja	Approved	91	91	100.0	86
Valley of the Gauja Gystus	Approved	122	122	100.0	117
Kamšos Forest	Developed (not approved yet)	321	321	100.0	321
Kaunas oak-tree park	Under development (not published)	70	70	100.0	57
Liubelio Forest	Approved	52	52	100.0	51
Lake Liūnelis and its lakeside	Approved	43	43	100.0	42
Nemunas River between Pelėšiškės and Balbieriškis	Approved	397	397	100.0	396
Nemunas River between Prienai and Lengveniškės	Approved	142	142	100.0	140
Kniaupas Botanical-Zoological Reserve, Krokų Lanka Botanical-Zoological Reserve and part of Tulkiaragė polder of the ecological protection zone of the Nemunas Delta Regional Park	Developed (not approved yet)	2 628	1 901	72.3	1 901
Forests in the Nemunas valley at Vilkija	Under development (not published)	57	57	100.0	52
Hornbeam forests of the Nemunas valley from Kriukai to Gelgaudiškės	Developed (not approved yet)	1 290	1 290	100.0	1 185
Riverside of the Nemunas and islands between Kulautuva and Smalininkai	Approved	3 611	3 609	99.9	970
Norūnų Forest	Developed (not approved yet)	243	243	100.0	243

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 AICH is situated, ha
Ragainė bend	Approved	687	687	100.0	638
Rinkoto Forest	Developed (not approved yet)	108	1	1.1	1
Fort in Rokai	Under development (not published)	26	26	100.0	8
Surroundings of Rumšiškės	Under development (not published)	41	41	100.0	41
Rumšiškių Forest	Developed (not approved yet)	95	95	100.0	95
Spindžiaus Forest	Approved	1 286	1 286	100.0	1 286
Širvinto Forest	Approved	186	186	99.9	186
Surroundings of Vaišvydava	Approved	23	23	100.0	19
Surroundings of Viršuziglis village	Under development (not published)	304	304	100.0	303
<b>TOTAL</b>		<b>12 901</b>	<b>12 065</b>		<b>9 214</b>

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

The average investment costs of the implementation of the requirements of the Natural Habitats Directive in the Nemunas Small Tributaries Sub-basin total to around LTL 1 104 450 and the average annual operating costs are about LTL 1 809 300 (Table 83).

Table 1.1.83. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Nemunas Small Tributaries Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	3 224 900	644 980
Implementation of the nature management plans already in place	10 years	269 951	1 303 711	144 857
Implementation of new nature management plans	10 years	834 503	3 816 247	763 249
AICB monitoring	1 year	0	0	256 209
<b>TOTAL ~</b>		<b>1 104 500</b>	<b>8 345 000</b>	<b>1 809 000</b>

### The Neris Small Tributaries Sub-basin

82. There are 36 areas important for the conservation of natural habitats in the Neris Small Tributaries Sub-basin the total area of which on the territory of the sub-basin is

111 700 ha. A small part of the AICH, 1 391 ha (12 %), overlaps with the areas important for the conservation of birds (Table 84).

Table 84. Areas important for the conservation of natural habitats in the Neris Small Tributaries Sub-basin

No	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Lake Akis and its lakeside	Trakai distr.	LTTRA0017	8	8	100	
2	Algirdėnų Bog	Švenčionys distr.	LTSVE0004	91	52	58	
3	Alionių Bog	Širvintos distr., Vilnius distr.	LTSIR0003	2 096	468	22	
4	Antakalnis dug-out	Vilnius city.	LTVIN0015	1	1	100	
5	Astruvkos forest	Širvintos distr.	LTSIR0001	427	364	85	
6	Aukštieji Paneriai railway tunnel	Vilnius city	LTVIN0014	2	2	100	
7	Baltasamanė Bog	Švenčionys distr.	LTSVE0003	606	426	70	
8	Lake Bitiškės	Trakai distr.	LTTRA0016	33	33	100	
9	Bražuolė River and its valley	Elektrėnai	LTTRA0009	23	23	100	
10	Valleys of the Bražuolė at Gratiškės	Trakai distr.	LTTRA0023	132	132	100	
11	Dūkštai oak wood and valley of the Dūkšta	Vilnius distr.	LTVIN0007	363	363	100	
12	Ežerėliai complex	Vilnius city	LTVIN0011	191	191	100	
13	Gerviraistis Bog	Širvintos distr.	LTSIR0002	198	198	100	
14	Giedraitiškių Bog	Vilnius distr.	LTVIN0013	73	73	100	
15	Girijos Forest	Vilnius distr.	LTVIN0018	127	127	100	
16	Grabijolų Forest	Elektrėnai, Vilnius distr.	LTELE0003	886	886	100	
17	Surroundings of Kiemeliškės village	Trakai distr.	LTTRA0022	94	94	100	
18	Kryžiokų Forest	Vilnius city	LTVIN0020	172	172	100	
19	Meadows in Medininkai	Vilnius distr.	LTVIN0003	16	16	100	
20	Fort in Milikonys	Kaunas city	LTKAU0008	2	2	75	
21	Neris River	Elektrėnai, Jonava distr.,	LTVIN0009	2 399	2 398	100	

No	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
		Kaišiadorys distr., Kaunas city, Kaunas distr., Širvintos distr., Švenčionys distr., Trakai distr., Vilnius city, Vilnius distr.					
22	Slope of the Neris at Verkiai	Vilnius city	LTVIN0012	7	7	100	
23	Paneriai Forest	Elektrėnai	LTELE0001	224	224	100	
24	Lake Papis	Šalčininkai distr., Trakai distr., Vilnius distr.	LTSAL0005	1 391	1391	100	1 391
25	Plomėnų Bog	Trakai distr.	LTTRA0020	426	393	92	
26	Raudonoji Bala Wetland	Vilnius distr.	LTVIN0006	135	135	100	
27	Valley of the Riešė	Vilnius city	LTVIN0010	37	37	100	
28	Lake Skaistis	Trakai distr.	LTTRA0012	288	288	100	
29	Part of Suktiškių Forest	Vilnius distr.	LTVIN0016	7	7	100	
30	Surroundings of Sviliškės village	Elektrėnai, Trakai distr., Vilnius distr.	LTVIN0023	1 320	1320	100	
31	Lake Širmukas	Trakai distr.	LTTRA0018	5	5	100	
32	Šveicarijos Forest	Vilnius distr.	LTVIN0002	792	792	100	
33	Šventoji River below Andrioniškis	Anykščiai distr., Jonava distr., Ukmergė distr.	LTUKM0002	1 628	1	0	
34	Taurijos Forest	Vilnius distr.	LTVIN0001	506	506	100	
35	Varnikų Forest	Trakai distr.	LTTRA0019	435	435	100	
36	Surroundings of Lake Žalieji Ežerai	Vilnius city	LTVIN0008	130	130	100	
	<b>TOTAL:</b>			<b>15 270</b>	<b>11 700</b>	<b>77</b>	<b>1 391</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Neris Small Tributaries Sub-basin is provided in Table 85.

Table 85. Protected areas with nature management plans (NMP) in place in the Neris Small Tributaries Sub-basin

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 AICH is situated, ha
Algirdėnų Bog	Developed (not approved yet)	91	52	57.6	52
Wetlands of Baltoji Vokė	Approved	1 391	1 391	100.0	1 391
Bražuolė River and its valleys	Developed (not approved yet)	23	23	100.0	23
Slope of the Neris at Verkiai	Approved	7	7	100.0	7
Valley of the Riešė	Developed (not approved yet)	64	64	100.0	33
Šveicarijos Forest	Approved	674	674	100.0	667
Taurijos Forest	Approved	506	506	100.0	506
<b>TOTAL</b>		<b>2 756</b>	<b>2 717</b>		<b>2 679</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Neris Small Tributaries Sub-basin total to around LTL 1 104 450 and the average annual operating costs are about LTL 1 809 300 (Table 86).

Table 86. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Neris Small Tributaries Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	405 929	81 186
Implementation of the nature management plans already in place	10 years	26 344	1 172 134	130 237
Implementation of new nature management plans	10 years	59 050	679 061	135 812
AICB monitoring	1 year	0	0	27 843
<b>TOTAL ~</b>		<b>85 400</b>	<b>2 257 100</b>	<b>375 000</b>

### The Nevėžis Sub-basin

83. There are 17 areas important for the conservation of natural habitats in the Nevėžis Sub-basin the total area of which on the territory of the sub-basin is 63 296 ha. The major part of the AICH, 15 368 ha (64 %), overlaps with the areas important for the conservation of birds (Table 87).

Table 87. Areas important for the conservation of natural habitats in the Nevėžis Sub-basin

No	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Surroundings of Dvariškės village	Kėdainiai distr., Panevėžys distr.	LTKED0002	385	385	100	
2	Gringalių Forest	Panevėžys distr.	LTPAN0004	479	479	100	
3	Labūnavos Forest	Kėdainiai distr.	LTKED0001	401	401	100	401
4	Naudvario Forest	Panevėžys distr.	LTPAN0001	68	68	100	
5	Confluence of the Nevėžis River and Kiršinas River	Panevėžys distr.	LTPAN0002	7	7	100	
6	Valley of the Nevėžis at Šventybrastis	Kėdainiai distr.	LTKED0003	10	10	100	
7	Valley of the Nevėžis Vadaktėliai	Panevėžys distr.	LTPAN0003	79	79	100	
8	Lower reaches of the Nevėžis	Kaunas city, Kaunas distr.	LTKAU0002	1 092	1 092	100	531
9	Papušnio Forest	Kelmė distr. Radviliškis distr.	LTKEL0013	263	263	100	
10	Pašilių Bog	Panevėžys distr.	LTPAN0005	336	336	100	
11	Praviršulio Tyrelis Marsh	Radviliškis distr., Raseiniai distr.	LTRAD0001	3 316	2 429	73	
12	Skilvionių Forest	Panevėžys distr.	LTPAN0008	48	48	100	
13	Šiluvos Tyrelis Marsh	Kelmė distr.	LTKEL0012	254	55	22	
14	Taujėnų-Užulėnio forests	Panevėžys distr., Ukmergė distr.	LTUKM0003	22 532	14 437	64	14 437
15	Surroundings of Užuraisčiai village	Anykščiai distr.	LTANY0016	118	118	100	
16	Žalioji Giria Forest	Biržai distr., Kupiškis distr., Panevėžys distr., Pasvalys distr.	LTPAN0006	33 870	3 898	12	
17	Žaliosios Pievos meadows	Anykščiai distr.	LTANY0014	40	40	100	
	<b>TOTAL:</b>			<b>63 296</b>	<b>24 145</b>	<b>38</b>	<b>15 368</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Nevėžis Sub-basin is provided in Table 88.

Table 88. Protected areas with nature management plans (NMP) in place in the Nevėžis Sub-basin

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 AICH is situated, ha
Gringalių Forest	Developed (not approved yet)	479	479	100.0	479
Valley of the Nevėžis at Vadaktėliai	Approved	101	101	100.0	68
Praviršulio Tyrelis Marsh	Developed (not approved yet)	3 316	2 429	73.3	2 429
Biosphere ground of Taujėnų-Užulėnio Forest	Developed (not approved yet)	22 532	14 437	64.1	14 437
<b>TOTAL</b>		<b>26 428</b>	<b>17 446</b>		<b>17 413</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Nevėžis Sub-basin total to around LTL 47 130 and the average annual operating costs are about LTL 209 300 (Table 89).

Table 89. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Nevėžis Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	281 964	56 393
Implementation of the nature management plans already in place	10 years	0	60 000	6 667
Implementation of new nature management plans	10 years	47 127	443 875	88 775
AICB monitoring	1 year	0	0	57 459
<b>TOTAL ~</b>		<b>47 100</b>	<b>786 000</b>	<b>209 300</b>

### The Šventoji Sub-basin

84. There are 49 areas important for the conservation of natural habitats in the Šventoji Sub-basin the total area of which on the territory of the sub-basin is 69 809 ha. The major part of the AICH, 37 630 ha (54 %), overlaps with the areas important for the conservation of birds (Table 90).

Table 90. Areas important for the conservation of natural habitats in the Šventoji Sub-basin

No	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICH, ha
1	Adomiškio Bog	Ukmergė distr.	LTUKM0010	52	52	100	
2	Alionių Bog	Širvintos distr., Vilnius distr.	LTSIR0003	2 096	1 628	78	
3	Alių Bog	Utena distr.	LTUTE0006	26	26	100	
4	Anykščių Forest	Anykščiai distr.	LTANY0012	1 668	1 668	100	
5	Antazavės Forest	Zarasai distr.	LTZAR0011	176	176	100	
6	Astruvkos Forest	Širvintos distr.	LTSIR0001	427	63	15	
7	Asveja Lake District	Molėtai distr., Švenčionys distr., Vilnius distr.	LTMOL0011	10 822	3	0	2
8	Lake Balnis and its lakeside	Zarasai distr.	LTZAR0005	14	14	100	
9	Baršėnų Bog	Rokiškis distr.	LTROK0006	24	24	100	
10	Bradėšiai juniper bushes	Rokiškis distr.	LTROK0002	3	3	100	
11	Dirvonų lakes and bogs	Ukmergė distr.	LTUKM0009	35	35	100	
12	Dukstynos Forest	Ukmergė distr.	LTUKM0001	46	46	100	
13	Dusetų Forest	Rokiškis distr.	LTROK0007	651	651	100	
14	Lakes Ėglis and Ėgliokas	Zarasai distr.	LTZAR0006	15	15	100	
15	Meadows of Gemeliškis village	Ukmergė distr.	LTUKM0011	7	7	100	
16	Surroundings of Gipėnai village	Zarasai distr.	LTZAR0003	14	14	100	
17	Girelės Forest	Anykščiai distr.	LTANY0011	69	69	100	
18	Gražutė Regional Park	Ignalina distr., Zarasai distr.	LTZAR0024	26 102	22 162	85	4 052
19	Ilgašilio Forest	Zarasai distr.	LTZAR0007	347	347	100	
20	Kazimieravas Bog	Ukmergė distr.	LTUKM0004	73	73	100	
21	Kepurinė Bog	Kupiškis distr.	LTKUP0001	700	265	38	
22	Labanoras Regional Park	Molėtai distr., Švenčionys distr., Utena distr.	LTMOL0010	53 198	2 469	5	2 469
23	Notigalė Bog	Kupiškis distr., Rokiškis distr.	LTKUP0003	1 391	121	9	

No	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICH, ha
24	Paažuolynė peat field	Jonava distr.	LTJOA0003	76	76	100	
25	Padustėlio bogs	Zarasai distr.	LTZAR0004	107	107	100	
26	Marshy lakeside of Lake Rašai	Zarasai distr.	LTZAR0002	75	75	100	
27	Petriošiškio Bog	Rokiškis distr.	LTROK0001	140	140	100	
28	Lake Rubikiai and its lakeside	Anykščiai distr.	LTANY0019	1 631	1 631	100	
29	Sakonių Wetland	Kupiškis distr.	LTKUP0002	61	1	2	
30	Samanių Bog	Zarasai distr.	LTZAR0023	112	96	85	
31	Siesartis River and its valley	Ukmergė distr.	LTUKM0005	196	196	100	
32	Skapagirio Forest	Kupiškis distr.	LTKUP0004	2 161	391	18	
33	Svirplinės Bog	Ukmergė distr.	LTUKM0006	24	24	100	
34	Šešuolėlių Forest	Širvintos distr.	LTSIR0004	509	509	100	
35	Šimonių Forest	Anykščiai distr., Kupiškis distr.	LTANY0013	23 263	23 011	99	23 011
36	Širvinta River and its valleys	Jonava distr., Širvintos distr., Ukmergė distr.	LTJOA0002	1 030	1 030	100	
37	Šventoji River below Andrioniškis	Anykščiai distr., Jonava distr., Ukmergė distr.	LTUKM0002	1 628	1 627	100	
38	Meadows of the Šventoji valley	Ukmergė distr.	LTUKM0007	5	5	100	
39	Valley of the Šventoji at Upninkai	Jonava distr.	LTJOA0001	106	106	100	
40	Taujėnų-Užulėnio Forests	Panevėžys distr., Ukmergė distr.	LTUKM0003	22 532	8 095	36	8 095
41	Valley of the Varius Stream	Anykščiai distr.	LTANY0009	72	72	100	
42	Viliukų Forest	Ukmergė distr.	LTUKM0008	909	909	100	
43	Vilkaraisčio forest	Molėtai distr.	LTMOL0012	670	670	100	
44	Vilkatėnų Forest	Anykščiai distr.	LTANY0001	114	114	100	
45	Virinta River	Anykščiai	LTANY0004	833	833	100	

No	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICH, ha
		distr.					
46	Lakeside of Lake Vykas	Zarasai distr.	LTZAR0008	86	86	100	
47	VyLIAUDIŠKIO Bog	Anykšėiai distr.	LTANY0002	53	53	100	
48	Zalvė Bog	Zarasai distr.	LTZAR0027	16	16	100	
49	Zalvė River valley	Rokiškis distr., Zarasai distr.	LTZAR0028	7	7	100	
	<b>TOTAL:</b>			<b>154 369</b>	<b>69 809</b>	<b>45</b>	<b>37 630</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Šventoji Sub-basin is provided in Table 91.

Table 91. Protected areas with nature management plans (NMP) in place in the Šventoji Sub-basin

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 AICH is situated, ha
Landscape reserve of Anykšėiai forest of Anykšėiai Regional Park	Developed (not approved yet)	2 253	2 251	99.9	1 735
Čiaunas Bog	Approved	4	4	100.0	4
Dukstynos Forest	Developed (not approved yet)	46	46	100.0	46
Surrounding of Lake Dūkštas	Developed (not approved yet)	203	203	100.0	203
Ilgašilis	Approved	109	109	100.0	99
Kepurinė Bog	Approved	700	265	37.8	265
Notigalė Bog	Approved	1 391	121	8.7	121
Raistas Bog	Approved	50	50	100.0	37
Šventoji River valley at Upninkai	Developed (not approved yet)	123	123	100.0	104
Biosphere ground of Taujėnų-Užulėnio Forests	Under development (not published)	22 532	8 095	35.9	8 095
Surroundings of Verslava village	Approved	4	4	100.0	4
Lakes Zalvas and Zalvelis	Approved	49	49	100.0	49
<b>TOTAL</b>		<b>27 464</b>	<b>11 320</b>		<b>10 762</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

in the Šventoji Sub-basin total to around LTL 486 380 and the average annual operating costs are about LTL 1 094 140 (Table 92).

Table 92. Costs of implementation of the Natural Habitats Directive in the Šventoji Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	1 993 678	398 736
Implementation of the nature management plans already in place	10 years	3 000	344 283	38 254
Implementation of new nature management plans	10 years	483 384	2 455 097	491 019
AICB monitoring	1 year	0	0	166 130
<b>TOTAL ~</b>		<b>486 000</b>	<b>4 793 000</b>	<b>1 094 100</b>

### The Žeimena Sub-basin

85. There are 17 areas important for the conservation of natural habitats in the Žeimena Sub-basin the total area of which on the territory of the sub-basin is 99 422 ha. The major part of the AICH, 95 323 ha (96 %), overlaps with the areas important for the conservation of birds (Table 93).

Table 93. Areas important for the conservation of natural habitats in the Žeimena Sub-basin

No	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Acintas bg and Perūno bog	Švenčionys distr.	LTSVE0001	1 036	1 036	100	
2	Algirdėnų Bog	Švenčionys distr.	LTSVE0004	91	39	42	
3	Asveja Lake District	Molėtai distr., Švenčionys distr., Vilnius distr.	LTMOL0011	10 822	10 819	100	10 136
4	Aukštaitija National Park	Ignalina distr., Utena distr., Švenčionys distr.	LTIGN0018	33 048	32 690	99	32 690
5	Baltasamanė Bog	Švenčionys distr.	LTSVE0003	606	175	29	
6	Gegužinės Bog	Vilnius distr.	LTVIN0017	43	43	100	
7	Lake Ilgis (II)	Švenčionys distr.	LTSVE0019	17	17	100	
8	Lake Kretuonas and its surroundings	Švenčionys distr.	LTSVE0033	1 972	1 972	100	1 182
9	Labanoras Regional	Molėtai distr.,	LTMOL0010	53 198	50 729	95	50 726

No	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
	Park	Švenčionys distr., Utena distr.					
10	Lake Mergežeris	Švenčionys distr.	LTSVE0018	12	12	100	
11	Lake Merkmenis	Ignalina distr.	LTIGN0013	46	46	100	
12	Mera River and its valley	Švenčionys distr.	LTSVE0008	134	134	100	
13	Sand grasslands in Pabradė	Švenčionys distr.	LTSVE0034	410	410	100	410
14	Lake Pravalas and its lakeside	Vilnius distr.	LTVIN0005	98	98	100	
15	Lake Salotis	Švenčionys distr.	LTSVE0026	90	90	100	
16	Saria River	Švenčionys distr.	LTSVE0024	88	88	100	
17	Žeimena River	Švenčionys distr., Vilnius distr.	LTSVE0020	1 025	1 025	100	180
	<b>TOTAL:</b>			<b>102 736</b>	<b>99 422</b>	<b>97</b>	<b>95 323</b>

Note: The area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas in the Žeimena Sub-basin is provided in Table 94.

Table 94. Protected areas with nature management plans (NMP) in place in the Žeimena Sub-basin

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 AICH is situated, ha
Algirdėnų Bog	Developed (not approved)	91	39	42.4	39
Antaliedė Botanical-Zoological Reserve	Under development (not published)	248	248	100.0	248
Lake Didysis Siaurys	Approved	278	278	100.0	278
Swamp complex of Girutiškis Nature Reserve	Approved	1 402	1 402	100.0	1 402
Juodupio Bog	Approved	226	226	100.0	226
Telmological reserve of Ešerinis I of Labanoras Regional Park	Developed (not approved yet)	81	81	100.0	81
Valley of the Labanoras River	Approved	220	220	100.0	220
Laukagalio Bog	Approved	315	315	100.0	315
Luknelė River	Under development (not published)	156	156	100.0	156

Panatoryčios Forest	Developed (not approved)	72	72	100.0	57
Lake Salaitis and its banks (parts of Pažemys Landscape Reserve)	Under development (not published)	455	455	100.0	455
<b>TOTAL</b>		<b>3 544</b>	<b>3 492</b>		<b>3 477</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Žeimena Sub-basin total to around LTL 971 270 and the average annual operating costs are about LTL 914 900 (Table 95).

Table 95. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora in the Žeimena Sub-basin

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	2 250 165	450 033
Implementation of the nature management plans already in place	10 years	35 356	206 665	22 963
Implementation of new nature management plans	10 years	935 917	1 026 482	205 296
AICB monitoring	1 year	0	0	236 602
<b>TOTAL ~</b>		<b>971 300</b>	<b>3 483 300</b>	<b>915 000</b>

### The Baltic Sea and Curonian Lagoon

86. There are seven areas important for the conservation of natural habitats on the coasts of the Baltic Sea the Curonian Lagoon the total area of which is 53 351 ha. A relatively large part of the AICH, 22 801 ha (43 %), overlaps with the areas important for the conservation of birds (Table 96).

Table 96. Areas important for the conservation of natural habitats on the coasts of the Baltic Sea and Curonian Lagoon

	AICH	Municipality	AICH code	Total area of AICH, ha	Area of AICH in the sub-basin, ha	Share of AICH in the sub-basin, %	AICH overlapping with AICB, ha
1	Baltic Sea coast		LTPAL0001	12 634	12 631	100	12 630
2	Meadows in Kintai and Kintų forests	Šilutė distr.	LTKLA0004	519	1	0	
3	Curonian Lagoon	Klaipėda distr., Šilutė distr.	LTSIU0012	37 910	37 883	100	7 337
4	Curonian Spit	Neringa	LTNER0005	9 986	2 448	25	2 447
5	Lužijos Bog and Tyrai Bog	Klaipėda distr.	LTKLA0005	2 687	384	14	384
6	Nemunas delta	Šilutė distr.	LTSIU0013	23 906	2	0	2
7	Coastal dunes	Klaipėda distr., Palanga m.	LTKLA0009	425	3	1	1
	<b>TOTAL:</b>			<b>88 066</b>	<b>53 351</b>	<b>61</b>	<b>22 801</b>

Note: the area of the AICH and AICB in the sub-basins was established with the help of GIS technologies

Information on nature management plans for the areas on the coasts of the Baltic Sea and Curonian Lagoon is provided in Table 97.

Table 97. Protected areas with nature management plans (NMP) in place on the coasts of the Baltic Sea and Curonian Lagoon

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 AICH is situated, ha
Meadows in Kintai and Kintų forests	Under development (not published)	519	1	0.1	1
Curonian Lagoon	Approved	31 138	31 086	99.8	30 505
Curonian Spit	Approved	24 996	17 398	69.6	7 209
Kniaupas Botanical-Zoological Reserve, Krokų Lanka botanical-zoological reserve and part of Tulkiaragė polder of the ecological protection zone of the Nemunas Delta Regional Park	Developed (not approved yet)	2 628	352	13.4	352
Pajūris Regional Park	Approved	436	3	0.8	3
<b>TOTAL</b>		<b>59 717</b>	<b>48 840</b>		<b>38 070</b>

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

The average investment costs of the implementation of the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora on the coast of the Baltic Sea and Curonian Lagoon total to around LTL 217 200 and the average annual operating costs are about LTL 234 310 (Table 98).

Table 98. Costs of implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora on the coast of the Baltic Sea and Curonian Lagoon

Group of costs	Measure period	Preliminary investment costs (2007-2015), LTL	Operating costs (2007-2015), LTL	Average operating costs, LTL/year
Development of nature management plans	10 years	0	353 793	70 759
Implementation of the nature management plans already in place	10 years	68 430	60 965	6 774
Implementation of new nature management plans	10 years	148 768	149 063	29 813
AICB monitoring	1 year	0	0	126 964
<b>TOTAL ~</b>		<b>217 200</b>	<b>563 800</b>	<b>234 300</b>

### Network of NATURA 2000 sites

87. 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 Council Directive 79/409/EEC on the conservation of wild birds and the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Both directives require establishment of special protected areas for conservation of certain biological species or important habitats.

Protected areas in the Nemunas RBD occupy around 16.8 % of the total area of the district (Table 99), which is a little higher than the national average. The largest protected areas are concentrated in hilly places with many lakes, sandy plains, and on the seaside. The majority of landscapes of this type are situated in the Nemunas RBD and hence indirectly determine a large number of protected areas therein. On the hand, the Nemunas RBD covers two thirds of the territory of the Lithuania hence indicators of the protected areas are rather close to the national average ones.

Table 99. Categories and areas of protected areas in the Nemunas RBD.

Categories and types of protected areas	Number	Area (ha)	% of protected areas in the RBD	Ratio with the country's average
Strict reserves and small strict reserves	5	14 834	0.31	>
Natural and complex reserves	284	137 031	2.83	>
Restorative plots	4	875	0.02	>
National parks	5	148 925	3.08	>
Regional parks	27	366 668	7.58	>
Biosphere reserves	1	18 490	0.38	>
Biosphere grounds	17	127 464	2.64	<
Total:	343	814 286	16.83	>

The objectives set for the protected areas do not contradict the objectives of the Water Framework Directive.

Apart from the establishment of special areas for 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 observing birds), application of subsidies for farmers who undertake to protect birds with the help of certain measures, as well as conducting of trainings and scientific projects, and publishing activities. Every year the Minister of the 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 few measures. For example, the Rural Development Plan for 2004-2006 provided for that farmers could get compensations for certain farming restrictions important for bird habitats. Two agri-environmental programmes out of four were directly related to the conservation of birds: one programme was designed for the protection of the riparian zones of water bodies, and the other one – for landscape management. Unfortunately, only 349 farmers joined these programmes, which most probably happened due to comparatively low payments and insufficient dissemination of information. The area of the sites managed pursuant to the specific requirements totalled to 3 123 ha.

Assistance in the field of protected areas is also related to the intervention area *Improvement and maintenance of the ecological balance of protected forested areas*. 35 % of the total assistance under Measure 1.3 (50.2 million LTL) was allocated for this area in Lithuania as compared to the average percentage of the EU structural assistance in the environmental field in other countries, which is only 1 %.

### **Directive concerning the management of bathing water quality (2006/7/EC)**

88. This Directive requires that the Member States legalise official bathing waters and take all necessary measures to ensure adequate quality of bathing waters.

88.1. Though the parameters set in the Bathing Water Directive do not include such water quality indicators as N, P or BOD, but does regulate parameters which characterise microbiological bathing water quality and can affect bathers' health.

National legislation transposing the Directive:

- 1) 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", (*Valstybės žinios*, 2007, No. 139-5716);
- 2) Order No. V-179 of the Minister of Health of the Republic of Lithuania of 6 March 2008 on the amendment of 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" (*Valstybės žinios*, 2008, No. 32-1121);
- 3) Order No. 472 of the Minister of the Environment of the Republic of Lithuania of 25 September 2003 on the approval of the procedure for the characterisation of river basin districts, assessment of the impact of human activity on the status of water bodies, economic analysis of water use and collection of data on river basin districts (*Valstybės žinios*, 2003, No. 99-4468);
- 4) Order No. 591 of the Minister of the Environment of the Republic of Lithuania of 25 November 2003 on the approval of the procedure for the development of river basin district management plans and programmes of measures intended for achieving water protection objectives and agreement thereof with foreign states (*Valstybės žinios*, 2003, No. 114-5170);
- 5) Order No. D1-569 of the Minister of the Environment of the Republic of Lithuania of 27 October 2008 on the amendment of Order 248 of the Minister of the Environment of 20 May 2003 on the management of actions in cases of extraordinary ecological situations and other emergencies and accidents and elimination of their consequences (new version) (*Valstybės žinios*, 2008, No. 129-4937);
- 6) Law No. IX-1388 of the Republic of Lithuania on the Amendment of the Law on Water (*Valstybės žinios*, 2003, No. 36-1544);
- 7) Resolution No. 733 of the Government of the Republic of Lithuania of 4 August 2006 on the approval of the Bathing Water Quality Monitoring Programme for 2006-2008 (*Valstybės žinios*, 2006, No. 88-3459);
- 8) Order No. V-484/D1-273 of the Minister of Health and the Minister of the Environment of the Republic of Lithuania of 26 May 2008 on the approval of the

Regulations on the Procedure for the Reporting on Bathing Water Quality for the Commission of the European Communities (*Valstybės žinios*, 2008, No. 62-2362);

- 9) Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344);
- 10) Resolution No. 44 of the Government of the Republic of Lithuania of 12 January 2010 on the amendment of Resolution No. 388 of the Government of the Republic of Lithuania of 7 April 2004 on the approval of the procedure for the submission of reports related to the implementation of the EU environmental legislation to the European Commission and provision of information required for the reporting to the European Environment Agency (*Valstybės žinios*, 2010, No. 8-359).

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

- 88.2.1. monitoring of bathing water quality;
- 88.2.2. provision of information on the quality of bathing waters to the public;
- 88.2.3. legalisation of bathing waters;
- 88.2.4. improvement of bathing water quality and restoration of poor bathing water quality to good status;
- 88.2.5. development of an information system on bathing waters.

### **Brief description of the measures**

#### 89. Monitoring of the quality of bathing waters

Monitoring of the quality of bathing waters in Lithuania is conducted in 99 bathing sites<sup>21</sup>. 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 approved by the Government<sup>22</sup>. Annex 1 to this Programme contains a list of Lithuanian bathing waters subject to monitoring (in total 151 bathing sites).

The objective of the said Programme is to maintain and improve the quality of bathing waters by providing safe conditions for people's health. The targets of the Programme are as follows: improvement of the management of the monitoring of bathing water quality; systematic monitoring and analysis of microbiological and chemical pollution of bathing waters; identification of short-term pollution or exceptional cases; assessment and classification of the quality of bathing waters and provision of characterisation thereof; provision of information on the quality of bathing waters and on short-term pollution or exceptional cases to the public and public authorities.

90. Information on water quality to the public in Lithuania is provided in mass media. Information on bathing water quality is regularly published in press and on the website of the Institute of Hygiene ([www.hi.lt](http://www.hi.lt)).

<sup>21</sup> Report to the European Commission *Bathing water results 2008 - Lithuania*. Source: Website of the Institute of Hygiene [http://www.hi.lt/content/15\\_atask\\_EK.html](http://www.hi.lt/content/15_atask_EK.html)

<sup>22</sup> Government of the Republic of Lithuania Resolution No. 668 of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011.

91. There were 99 official bathing waters in Lithuania in 2008, 70 of which are located within the Nemunas RBD.

92. The main directive the implementation of which determines the quality of bathing waters is the Urban Wastewater Treatment Directive hence the measures for the implementation of the this Directive also improve the quality of the existing and potential new bathing waters.

93. For the moment, the current information system is rather simple based on exchange of information between interested authorities, including municipalities. The latest plan is to get connected to the data base/information system managed by the Environmental Protection Agency.

#### 94. Directive implementation costs

The implementation of the Bathing Water Monitoring Programme for 2006-2008 required around LTL 3 200 thousand. This amount covered sampling and analysis of samples, training of employees (LTL 2 700 thousand), provision of information to the public and reporting to the European Commission (LTL 500 thousand). The future costs of the implementation of this basic measure are provided in the text below by individual sub-basins.

The quality of all bathing waters monitored in 2008 conformed to the mandatory quality requirements<sup>23</sup> hence there is no need for additional investment costs for the implementation of the Bathing Water Directive.

The operating costs of the implementation of the Bathing Water Directive consist of costs of recognition of beaches as suitable for use, sampling of bathing water and analysis of water, and provision of information to the public. The situation in the bathing waters and costs by individual sub-basins of the Nemunas RBD are provided below. These costs are planned to be funded from municipal budgets<sup>24</sup>. Taking into account the present status of the Lithuanian economy, the number of monitored bathing waters in 2009 is likely to remain the same as in 2008.

#### **The Šešupė Sub-basin (including the Prieglius Basin)**

95. The Šešupė Sub-basin contains seven bathing waters of the ones where the water quality monitoring was carried out in 2008:

- 95.1. Lake Dusia (Lazdijai distr.),
- 95.2. Lake Ygla (Marijampolė municipality),
- 95.3. Lake Žaltytis (Marijampolė municipality),
- 95.4. Šešupė River II (Marijampolė municipality),
- 95.5. Lake Paežeriai (Vilkaviškis distr.),
- 95.6. Lake Vištytis (Vilkaviškis distr., the Prieglius Basin),
- 95.7. Lake Orija (Kalvarija municipality).

<sup>23</sup> Report to the European Commission *Bathing water results 2008 - Lithuania*. Source: Website of the Institute of Hygiene [http://www.hi.lt/content/15\\_atask\\_EK.html](http://www.hi.lt/content/15_atask_EK.html)

<sup>24</sup> Government of the Republic of Lithuania Resolution No. 668 of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011.

96. The Šešupė Sub-basin situates ten bathing waters from the list of the Lithuanian bathing sites which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters, the following areas have been included in Annex 1 to the Bathing Waters Monitoring Programme:

- 96.1. Lake Gilutis (Alytus distr.),
- 96.2. Šešupė River I (Marijampolė municipality),
- 96.3. Valiulių pond (Šakiai distr.).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 100) in the Šešupė Sub-basin total to LTL 45 400.

Table 100. Average annual costs of implementation of the Bathing Water Directive in the Šešupė Sub-basin (including the Prieglius Basin) in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	10	7 000
Sampling of bathing water and analysis of water	bathing water	3500	10	35 000
Provision of information to the public on the quality of bathing water	bathing water	340	10	3 400
<b>TOTAL</b>		<b>4 540</b>		<b>45 400</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Dubysa Sub-basin

97. The Dubysa Sub-basin contains six bathing waters of the ones where water quality monitoring was carried out in 2008:

- 97.1. Dubysa River at Ariogala (Raseiniai distr.),
- 97.2. Lake Gauštvinis (Kelmė distr.),
- 97.3. Lake Bridvaišis (Kelmė distr.),
- 97.4. Lake Gilius (Kelmė distr.),
- 97.5. Dam in Kražantė (Kelmė I, Kelmė distr.),
- 97.6. Lake Pašiaušė (Kelmė distr.).

98. The Dubysa Sub-basin situates 14 bathing waters from the list of the Lithuanian bathing sites which are subject to monitoring in 2009-2011. Apart from the above-said bathing sites<sup>25</sup>, the following sites have been included in Annex 1 to the Bathing Water Quality Monitoring Programme:

- 98.1. Dubysa River at the Songs Valley (Raseiniai distr.),
- 98.2. Dubysa River at Partikliai (Raseiniai distr.),
- 98.3. Lake Geluva (Šiauliai distr.),
- 98.4. Lake Karklėnai (Kelmė distr.),
- 98.5. Liolių pond (Kelmė distr.),

<sup>25</sup> The bathing site located in the Dubysa at Ariogala was subject to monitoring in 2008 and thus it is not included in Annex I to the Bathing Waters Monitoring Programme.

- 98.6. Lake Pašvinis (Šiauliai distr.),  
 98.7. Prabaudos pond (Raseiniai distr.),  
 98.8. Šaukėnų pond (Kelmė distr.),  
 98.9. Vėjinės pond (Kelmė distr.).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 101) in the Dubysa Sub-basin total to LTL 63 600.

Table 101. Average annual costs of implementation of the Bathing Water Directive in the Dubysa Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	14	9 800
Sampling of bathing water and analysis of water	bathing water	3 500	14	49 000
Provision of information to the public on the quality of bathing water	bathing water	340	14	4 760
<b>TOTAL</b>		<b>4 540</b>		<b>63 560</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Jūra Sub-basin

99. The Jūra Sub-basin contains two bathing waters of the ones where water quality monitoring was carried out in 2008:

- 99.1. Lake Dievytis (Šilalė distr.),  
 99.2. Jūra River (Tauragė distr.)

100. The Jūra Sub-basin situates six bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters, the following areas have been included in Annex 1 to the Bathing Water Quality Monitoring Programme:

- 100.1. Balsių pond (Šilalė distr.),  
 100.2. Jūra River at Didkiemis (Šilalė distr.),  
 100.3. Keramikos pond (Tauragė distr.),  
 100.4. Nevočių pond (Šilalė distr.)

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 102) in the Jūra Sub-basin total to LTL 27 200.

Table 102. Average annual costs of implementation of the Bathing Water Directive in the Jūra Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	6	4 200
Sampling of bathing water and analysis of water	bathing water	3 500	6	21 000
Provision of information to	bathing	340	6	2 040

the public on the quality of bathing water	water			
<b>TOTAL</b>		<b>4 540</b>		<b>27 240</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Lithuanian Coastal Rivers Basin

101. The Lithuanian Coastal Rivers Basin contains one bathing site of the ones where water quality monitoring was carried out in 2008, namely, the river Akmena-Danė (Klaipėda city).

Although monitoring in this river was conducted in 2008, the bathing area in the Akmena-Danė is not included in the list of 2009-2011. Accordingly, it can be maintained that there are no costs related to the implementation of the bathing Water Directive in the Lithuanian Coastal Rivers Basin.

### The Merkys Sub-basin

102. The Merkys Sub-basin contains two bathing waters of the ones where the water quality monitoring was carried out in 2008:

- 102.1. Lake Daugų (Alytus distr.),
- 102.2. Derežnyčios pond (Varėna distr.).

103. The Merkys Sub-basin situates six bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters, the following areas have been included in Annex 1 to the Bathing Waters Quality Monitoring Programme:

- 103.1. Lake Glėbas (Varėna distr.),
- 103.2. Lake Glūkas (Varėna distr.),
- 103.3. Dam in Šalčininkai (Šalčininkai distr.),
- 103.4. Lake Žiežulis (Varėna distr.).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 103) in the Merkys Sub-basin total to LTL 27 200.

Table 103. Average annual costs of implementation of the Bathing Water Directive in the Merkys Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	6	4 200
Sampling of bathing water and analysis of water	bathing water	3 500	6	21 000
Provision of information to the public on the quality of bathing water	bathing water	340	6	2 040
<b>TOTAL</b>		<b>4 540</b>		<b>27 240</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Minija Sub-basin

104. The Minija Sub-basin contains one bathing area of the ones where water quality monitoring was carried out in 2008, namely, a site in Lake Plateliai (Plungė distr.).

105. The Minija Sub-basin situates nine bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters, the following areas have been included in Annex 1 to the Bathing Water Quality Monitoring Programme:

- 105.1. Quarry in Gargždai (Klaipėda distr.),
- 105.2. Minija River at Gargždai (Klaipėda distr.),
- 105.3. Minija River at Priekulė (Klaipėda distr.),
- 105.4. Lake Plateliai – Ažuolai islands (Plungė distr.),
- 105.5. Lake Plateliai – Beržynėlis (Plungė distr.),
- 105.6. Lake Plateliai – rowing base (Plungė distr.),
- 105.7. Lake Plateliai – Linelis (Plungė distr.),
- 105.8. Lake Plateliai – Plokštinė (Plungė distr.),
- 105.9. Lake Plateliai – Plungė town (Plungė distr.).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 104) in the Minija Sub-basin total to LTL 40 900.

Table 104. Average annual costs of implementation of the Bathing Water Directive in the Minija Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LT/year	Unit number in the sub-basin	Annual costs in the sub-basin, LT/year
Recognition of beaches as suitable for use	bathing water	700	9	6 300
Sampling of bathing water and analysis of water	bathing water	3 500	9	31 500
Provision of information to the public on the quality of bathing water	bathing water	340	9	3060
<b>TOTAL</b>		<b>4540</b>		<b>40 860</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Nemunas Small Tributaries Sub-basin

106. The Nemunas Small Tributaries Sub-basin contains nine bathing waters of the ones where water quality monitoring was carried out in 2008:

- 106.1. Lake Ančia (Lazdijai distr.),
- 106.2. Lake Dailidė (Alytus town),
- 106.3. Lake Elektrėnų (Trakai distr.),
- 106.4. Kaunas Lagoon I (Kaunas city),
- 106.5. Quarry in Lampėdžiai (Kaunas city),
- 106.6. Lake Meteliai (Lazdijai distr.),

- 106.7. Nemunas River (Kaunas city),
- 106.8. Vijūnelio pond (Druskininkai),
- 106.9. Pond in Žemaičių Naumiestis (Šilutė distr.).

107. The Nemunas Small Tributaries Sub-basin situates 18 bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters, the following areas have been included in Annex 1 to the Bathing Waters Monitoring Programme:

- 107.1. Lake Aviris (Druskininkai),
- 107.2. Pond in Birštonas (Prienai distr.),
- 107.3. Pond of the sanatorium *Eglė* ( Druskininkai),
- 107.4. Lake Guostas (Prienai distr.),
- 107.5. Lake Ilgis (Alytus distr.),
- 107.6. Lake Jieznas (Prienai distr.),
- 107.7. Quarry in Jurbarkas (Jurbarkas distr.),
- 107.8. Kaunas Lagoon II (Kaunas city),
- 107.9. Quarry in Kulautuva (Kaunas distr.).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 105) in the Nemunas Small Tributaries Sub-basin total to LTL 81 700.

Table 105. Average annual costs of implementation of the Bathing Water Directive in the Nemunas Small Tributaries Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LT/year
Recognition of beaches as suitable for use	bathing water	700	18	12 600
Sampling of bathing water and analysis of water	bathing water	3 500	18	63 000
Provision of information to the public on the quality of bathing water	bathing water	340	18	6 120
<b>TOTAL</b>		<b>4 540</b>		<b>81 720</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Neris Small Tributaries Sub-basin

108. The Neris Small Tributaries Sub-basin contains ten bathing waters of the ones where water quality monitoring was carried out in 2008:

- 108.1. Lake Akmena (Trakai distr.),
- 108.2. Lake Galvė (Trakai distr.),
- 108.3. Lake Lentvario (Trakai distr.),
- 108.4. Lake Luka (Trakai distr.),
- 108.5. Neris River at Valakampiai I (Vilnius city),
- 108.6. Lake Salotė (Vilnius city),
- 108.7. Lake Skaistis (Trakai distr.),
- 108.8. Lake Tapeliai (Vilnius city),
- 108.9. Lake Totoriškės (Trakai distr.),

## 108.10. The Green Lakes (Vilnius city)

109. The Neris Small Tributaries Sub-basin situates 15 bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters, the following areas have been included in Annex 1 to the Bathing Waters Monitoring Programme:

- 109.1. Lake Balžis (Vilnius city),
- 109.2. Neris River – Valakampiai II (Vilnius city),
- 109.3. Neris River – Žirmūnai (Vilnius city),
- 109.4. Lake Ščebnicos (Kaišiadorys distr.),
- 109.5. Lake Vievio (Trakai distr.).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 106) in the Neris Small Tributaries Sub-basin total to LTL 68 100.

Table 106. The average annual costs of the implementation of the Bathing Water Directive in the Neris Small Tributaries Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	15	10 500
Sampling of bathing water and analysis of water	bathing water	3500	15	52 500
Provision of information to the public on the quality of bathing water	bathing water	340	15	5 100
<b>TOTAL</b>		<b>4 540</b>		<b>68 100</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Nevėžis Sub-basin

110. The Nevėžis Sub-basin contains two bathing waters of the ones where water quality monitoring was carried out in 2008:

- 110.1. Ašarėna River (Kėdainiai distr.),
- 110.2. Bathing site of the factory “Ekranas” (Panevėžys).

111. The Nevėžis Sub-basin situates two bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters<sup>26</sup>, the following site has been included in Annex 1 to the Bathing Waters Monitoring Programme:

- 111.1. Nevėžis River (Panevėžys city).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 107) in the Nevėžis Sub-basin total to LTL 9 100.

<sup>26</sup> Annex 1 to the Bathing Waters Monitoring Programme does not include the bathing site of the factory “Ekranas” (Panevėžys distr.) where monitoring was conducted in 2008.

Table 107. Average annual costs of implementation of the Bathing Water Directive in the Nevėžis Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	2	1 400
Sampling of bathing water and analysis of water	bathing water	3 500	2	7 000
Provision of information to the public on the quality of bathing water	bathing water	340	2	680
<b>TOTAL</b>		<b>4 540</b>		<b>9 080</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Šventoji Sub-basin

112. The Šventoji Sub-basin contains nine bathing waters of the ones where water quality monitoring was carried out in 2008:

- 112.1. Lake Alaušas I (Utena distr.),
- 112.2. Lake Bebrusai (Molėtai distr.),
- 112.3. Dam in Kloviniai (Utena distr.),
- 112.4. Lake Pastovis (Molėtai distr.),
- 112.5. Lake Rubikių (Anykščiai distr.),
- 112.6. Lake Sartai (Rokiškis distr.),
- 112.7. Lake Sartai (Zarasai distr.),
- 112.8. Dam in Širvintos (Širvintos distr.),
- 112.9. Šventoji River (Anykščiai distr.).

113. The Šventoji Sub-basin situates 13 bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters, the following areas have been included in Annex 1 to the Bathing Waters Monitoring Programme:

- 113.1. Lake Alaušas II (Utena distr.),
- 113.2. Lake Dauniškis (Utena distr.),
- 113.3. Lake Molėtų (Molėtai distr.),
- 113.4. Lake Vyžuonaitis (Utena distr.).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 108) in the Šventoji Sub-basin total to LTL 59 000.

Table 108. Average annual costs of implementation of the Bathing Water Directive in the Šventoji Sub-basin in 2009-2011.

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	13	9 100
Sampling of bathing water and analysis of water	bathing water	3 500	13	45 500

Provision of information to the public on the quality of bathing water	bathing water	340	13	4 420
<b>TOTAL</b>		<b>4 540</b>		<b>59 020</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Žeimena Sub-basin

114. The Žeimena Sub-basin contains the following bathing waters of the ones where water quality monitoring was carried out in 2008:

- 114.1. Lake Galvis (Ignalina distr.),
- 114.2. Lake Lūšiai (Ignalina distr.),
- 114.3. Lake Tauragnas (Utena distr.),
- 114.4. Žeimena River (Švenčionys distr.).

The Žeimena Sub-basin situates four bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. These are the same bathing waters where monitoring was conducted in 2008

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 109) in the Žeimena Sub-basin total to LTL 18 200.

Table 109. The average annual costs of the implementation of the Bathing Water Directive in the Žeimena Sub-basin in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	4	2 800
Sampling of bathing water and analysis of water	bathing water	3 500	4	14 000
Provision of information to the public on the quality of bathing water	bathing water	340	4	1 360
<b>TOTAL</b>		<b>4 540</b>		<b>18 160</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### The Baltic Sea

115. The Baltic Sea contains 16 bathing waters of the ones where water quality monitoring was carried out in 2008:

- 115.1. in Giruliai (Klaipėda city),
- 115.2. in Juodkrantė (Neringa),
- 115.3. in Melnragė I (Klaipėda city),
- 115.4. in Melnragė II (Klaipėda city),
- 115.5. bathing site of the disabled (Klaipėda city),
- 115.6. in Nida (Neringa),
- 115.7. Palanga women's beach (Palanga town),
- 115.8. Palanga common beach (Palanga town),

- 115.9. Palanga common beach at the Botany Park (Palanga town),  
 115.10. in Pervalka (Neringa),  
 115.11. in Preila (Neringa),  
 115.12. Rąžė River mouth (Palanga town),  
 115.13. Smiltynė I (Klaipėda town),  
 115.14. Smiltynė II (Klaipėda town),  
 115.15. in Šventoji (Palanga town),  
 115.16. Šventoji women's beach (Palanga town).

116. The Baltic Sea situates 16 bathing waters from the list of the Lithuanian bathing waters which are subject to monitoring in 2009-2011. Apart from the above-said bathing waters<sup>27</sup>, the following bathing site has been included in Annex 1 to the Bathing Waters Monitoring Programme:

116.1. Quarry in Palanga (Palanga town).

The average annual operating costs of the implementation of the Bathing Water Directive (specified in Table 110) in the Baltic Sea total to LTL 72 600.

Table 110. Average annual costs of implementation of the Bathing Water Directive in the Baltic Sea in 2009-2011

Group of costs	Unit	Average unit costs, LTL/year	Unit number in the sub-basin	Annual costs in the sub-basin, LTL/year
Recognition of beaches as suitable for use	bathing water	700	16	11 200
Sampling of bathing water and analysis of water	bathing water	3 500	16	56 000
Provision of information to the public on the quality of bathing water	bathing water	340	16	5 440
<b>TOTAL</b>		<b>4 540</b>		<b>72 640</b>

Source: Resolution No. 668 of the Government of the Republic of Lithuania of 25 June 2009 on the approval of the Bathing Water Quality Monitoring Programme for 2009-2011 (*Valstybės žinios*, 2009, No. 80-3344).

### **Council Directive on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (86/278/EEC )**

117. The 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 allowed 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 entry of heavy metals contained in sludge into the soil.

In the last few years, the average annual volume of sewage generated in Lithuania totals to around 550 000 m<sup>3</sup>. The largest quantities are generated in the large counties of Vilnius and Klaipėda.

<sup>27</sup> Annex 1 to the Bathing Waters Monitoring Programme does not include the bathing site of the disabled in the municipality of Klaipėda city, where monitoring was conducted in 2008.

The study *Investment Programme for Sludge Management in Lithuania* developed 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 fertilisation of energy forests or restoration of affected areas. The Programme also provides for that only sludge of Category I and II (following the classification of LAND 20-2005) could be used in agriculture.

National legislation transposing the Directive:

- 1) Order No. 349 of the Minister of the Environment of the Republic of Lithuania of 29 June 2001 on the approval of the regulatory document LAND 20-2001 “Requirements for the use of sewage sludge for fertilisation” (*Valstybės žinios*, 2001, No. 61-2196);
- 2) Order No. V-114 of the Minister of Health of the Republic of Lithuania of 8 March 2004 on the approval of the Lithuanian Hygiene Norm HN 60:2004 “Maximum allowable concentrations of dangerous chemical substances in the soil” (*Valstybės žinios*, 2004, No. 41-1357)
- 3) Order No. D1-575 of the Minister of the Environment of the Republic of Lithuania of 28 November 2005 on the amendment of Order No. 349 of the Minister of the Environment of the Republic of Lithuania of 29 June 2001 on the approval of the regulatory document LAND 20-2001 “Requirements for the use of sewage sludge for fertilisation” (*Valstybės žinios*, 2005, No. 142-5135)

### **Brief description of the measures**

#### 118. Fertilisation plans

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. Analysis of sludge composition, data storage, withdrawal and banning of dangerous substances from use.

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 the concentrations of the following metals in sludge must be collected: Pb, Cd, Cr, Cu, Ni, Zn, Hg. LAND 20-2005 has set forth that sewage sludge may be classified into three categories depending on the concentrations of heavy metals in sludge.

Measures for the implementation of the requirements of the Sewage Sludge Directive (86/278/EEC) for 2007-2013 are provided for in the List of National Projects<sup>28</sup>. Plans to develop a sludge management infrastructure in Lithuania include construction of sludge processing facilities in 23 towns.

---

<sup>28</sup> A List of National Projects 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*, was approved by Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 9 December 2008 (as amended by Order No. D1-219 of 24 April 2009).

## 119. Directive implementation costs

According to the study *Development of an Investment Programme for Sludge Management in Lithuania* prepared by SWECO BKG, the required costs are estimated at approximately LTL 300 million. The amount of investments required in the Nemunas RBD (i.e. having deducted the investments needed in the municipalities of Telšiai, Mažeikiai, Naujoji Akmenė, Rokiškis, Pasvalys, Šiauliai, and Visaginas) would total to about LTL 225 million.

### The Šešupė Sub-basin (including the Prieglius sub-basin)

120. Table 111 provides planned investment projects on the development of a sludge management infrastructure in towns located in the Šešupė Sub-basin. The total investment costs amount to LTL 28.3 million.

Table 111. Projects on development of a sludge management infrastructure in 2007-2013 in the Šešupė Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Marijampolė	1 rotting and air drying equipment	28.3
<b>TOTAL</b>		<b>28.3</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 8 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913).

### The Dubysa Sub-basin

121. Table 112 provides planned investment projects on the development of a sludge management infrastructure in towns located in the Dubysa Sub-basin. The total investment costs amount to LTL 6.6 million.

Table 112. Projects on development of a sludge management infrastructure in 2007-2013 in the Dubysa Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Kelmė distr.	1 composting site	6.6
<b>TOTAL</b>		<b>6.6</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 8 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913).

### The Jūra Sub-basin

122. Table 113 provides planned investment projects on the development of a sludge management infrastructure in towns located in the Jūra Sub-basin. The total investment costs amount to LTL 23.8 million.

Table 113. Projects on development of a sludge management infrastructure in 2007-2013 in the Jūra Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Raseiniai distr.	1 composting site	3.1
Tauragė distr.	1 rotting and air drying equipment	20.7
<b>TOTAL</b>		<b>23.8</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 8 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913).

### The Lithuanian Coastal Rivers Basin

123. Table 114 provides planned investment projects on the development of a sludge management infrastructure in towns located in the Lithuanian Coastal Rivers Basin. The total investment costs amount to LTL 27.5.

Table 114. Projects on development of a sludge management infrastructure in 2007-2013 in the Lithuanian Coastal Rivers Basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Klaipėda city, Klaipėda distr.	1 rotting and air drying equipment	27.5
<b>TOTAL</b>		<b>27.5</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 8 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913).

### The Merkys Sub-basin

124. No investments into sludge processing facilities have been provided for in the Merkys Sub-basin.

### The Minija Sub-basin

125. No investments into sludge processing facilities have been provided for in the Minija Sub-basin.

### The Nemunas Small Tributaries Sub-basin

126. Table 115 provides planned investment projects on the development of a sludge management infrastructure in towns located in the Nemunas Small Tributaries Sub-basin. The total investment costs amount to LTL 107.83 million.

Table 115. Projects on development of a sludge management infrastructure in 2007-2013 in the Nemunas Small Tributaries Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Alytus town, Alytus distr.	1 rotting and air drying equipment	41.53
Druskininkai	1 composting site	4.3
Kaunas city	1 rotting and air drying equipment	49.0
Šilutė distr.	1 rotting and air drying equipment	13.0
<b>TOTAL</b>		<b>107.83</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 8 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913).

### The Neris Small Tributaries Sub-basin

127. Table 116 provides planned investment projects on the development of a sludge management infrastructure in towns located in the Neris Small Tributaries Sub-basin. The total investment costs amount to LTL 184.835 million.

Table 116. Projects on development of a sludge management infrastructure in 2007-2013 in the Neris Small Tributaries Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Vilnius city	1 rotting and air drying equipment	175.735

Jonava distr.	1 composting site	5.7
Kaišiadorys distr.	1 composting site	3.4
<b>TOTAL</b>		<b>184.835</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 8 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913).

### The Nevėžis Sub-basin

128. Table 117 provides planned investment projects on the development of a sludge management infrastructure in towns located in the Nevėžis Sub-basin. The total investment costs amount to LTL 41.3 million.

Table 117. Projects on development of a sludge management infrastructure in 2007-2013 in the Nevėžis Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Kėdainiai distr.	1 rotting and air drying equipment	23.4
Panevėžys distr.	1 rotting and air drying equipment	17.9
<b>TOTAL</b>		<b>41.3</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 8 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913).

### The Šventoji Sub-basin

129. Table 118 provides planned investment projects on the development of a sludge management infrastructure in towns located in the Šventoji Sub-basin. The total investment costs amount to LTL 6.6 million.

Table 118. Projects on development of a sludge management infrastructure in 2007-2013 in the Šventoji Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Ukmergė distr.	1 composting site	8.2
Utena distr.	1 rotting and air drying equipment	20.38
<b>TOTAL</b>		<b>28.58</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 8 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913).

### The Žeimena Sub-basin

130. No investments into sludge processing facilities have been provided for in the Žeimena Sub-basin.

### Council Directive concerning the placing of plant protection products on the market (91/414/EEC)

131. The requirements of the Directive are related to the authorisation, marketing, use and control of plant protection products. In Lithuania, only approved products of plant protection may be marketed and used, and companies intending to market such products 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 protection products registered in Lithuania.

The aggregate amount of plant protection products consumed within the Nemunas RBD is not available but it is likely that the largest amounts are consumed in areas of intensive agriculture. It is assumed that herbicides and growth regulators are mostly used in large farms of intensive agriculture hence 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. The use of plant protection products is controlled by the State Plant Protection Service.

National legislation transposing the Directive:

- 1) Order No. 259 of the Minister of Agriculture of 6 September 2000 on the approval of the Regulations on Good Experimental Practice (*Valstybės žinios*, 2000, No. 78-2372);
- 2) Law No. IX-1761 of 14 October 2003 of the Law on Plant Protection (new version) (*Valstybės žinios*, 2003, No. 102-4583);
- 3) No. 199 of the Minister of Agriculture of 19 June 2001 on the approval of the Rules for the Inspection of Sprayers (*Valstybės žinios*, 2001, No. 55-1967).

### Brief description of the measures

#### 132. Authorisation of plant protection products

Before the placing of plant protection products on the market, they must be authorised. Active substances contained in plant protection products are authorised by orders of the Minister of Agriculture of the Republic of Lithuania. To date, 140 active substances which may be contained in plant protection products have been authorised in Lithuania. (Table 119).

Table 119. 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	
Defoliant	1	
Other	3	
<b>Total</b>	<b>181</b>	<b>34</b>

#### Labelling of plant protection products

The Law 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 practice of plant protection

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

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

The State Plant Protection Services 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.

#### 133. Directive implementation costs

No estimations of the Directive implementation costs have been carried out.

### **Council Directive on the assessment of the effects of certain public and private projects on the environment (85/337/EEC )**

The main objective of the 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 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 a report of an environment impact assessment, 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. Environmental impact assessment 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 operation of an object.

#### National legislation transposing the Directive:

- 1) Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2004, No. 130-4649);
- 2) Resolution No. 1182 of the Government of the Republic of Lithuania of 29 October 2005 amending Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Elimination and Investigation of Industrial Accidents (*Valstybės žinios*, 2005, No. 131-4731);
- 3) Resolution No. 560 of the Government of the Republic of Lithuania of 22 April 1999 on the approval of the procedure for the provision of information to the populations in cases of industrial accidents (*Valstybės žinios*, 2002, No. 43-1626)

- 4) Resolution No. 783 of the Government of the Republic of Lithuania of 21 June 1999 on the approval of the procedure for the drafting of accident response plans (*Valstybės žinios*, 1999, No. 56-1812);
- 5) Resolution No. 1386 of the Government of the Republic of Lithuania of 8 November 2000 on the reorganisation of the Register of Dangerous Economic Objects of Lithuania into the Register of Objects of National Importance and Dangerous Objects (*Valstybės žinios*, 2000, No. 98-3117);
- 6) Resolution No. 982 of the Government of the Republic of Lithuania of 18 August 2004 on the amendment of Resolution No. 1386 of the Government of the Republic of Lithuania of 8 November 2000 on the reorganisation of the Register of Dangerous Economic Objects of Lithuania into the Register of Objects of National Importance and Dangerous Objects (*Valstybės žinios*, 2004, No. 130-4665);
- 7) Resolution No. 873 of the Government of the Republic of Lithuania of 11 September 2006 on the amendment of Resolution No. 1386 of the Government of the Republic of Lithuania of 8 November 2000 on the reorganisation of the Register of Dangerous Economic Objects of Lithuania into the Register of Objects of National Importance and Dangerous Installations (*Valstybės žinios*, 2006, No. 97-3783);
- 8) Resolution No. 1268 of the Government of the Republic of Lithuania of 13 December 2006 on the liquidation of the Register of Dangerous Chemical Substances and Preparations (*Valstybės žinios*, 2006, No. 137-5226);
- 9) Resolution No. 967 of the Government of the Republic of Lithuania of 18 August 2004 on the approval of the procedure for the strategic assessment of consequences of plans and programmes (*Valstybės žinios*, 2004, No. 130-4650);
- 10) Law No. X-258 of the Republic of Lithuania on the Amendment of the Law on Environmental Impact Assessment of the Proposed Economic Activity (*Valstybės žinios*, 2005, No. 84-3105)
- 11) Law No. IX-1113 of the Republic of Lithuania on the Amendment of the Law on Roads (*Valstybės žinios*, 2002, No. 101-4492);
- 12) Law No. IX-886 of the Republic of Lithuania on Public Health Care (*Valstybės žinios*, 2002, No. 56-2225);
- 13) Law No. X-1150 of the Republic of Lithuania on the Amendment and Supplement of Articles 2, 5, 6, 7, 9, 15, 16, 19, 21, 22, 24, 27, 36, 38, 39, 41, 42, 43, 44 and Repeal of Articles 8, 11, 14 of the Law on Public Health Care (*Valstybės žinios*, 2007, No. 64-2455);
- 14) Order No. V-131 of the Director of the Civil Safety Department under the Ministry of the Interior of 30 September 2004 on the approval of documents in compliance with the Convention on the Transboundary Effects of Industrial Accidents and the Council Directive on the control of major-accident hazards involving dangerous substances (*Valstybės žinios*, 2004, No. 183-6778);
- 15) Order No. IV-114 of the Minister of the Interior of the Republic of Lithuania of 30 March 2007 on the approval of the procedure for the exchange of information on emergency situations or emergency incidents (*Valstybės žinios*, 2007, No. 40-1515);
- 16) Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 on the approval of the Programme on Inspection of Dangerous Installations of the Republic of Lithuania (*Valstybės žinios*, 2007, No. 3-143);

- 17) Order No. 1-182 of the Director of the State Fire and Rescue Department of 4 June 2007 on the approval of the checklists for the Register of Objects of National Importance and Dangerous Installations (*Valstybės žinios*, 2007, No. 65-2542)
- 18) Order No. 367 of the Minister of the Environment of the Republic of Lithuania of 16 July 2002 on the approval of the Guidelines for the Evaluation of the Risk of Accidents of the Proposed Economic Activity R 41 - 02 (*Informaciniai pranešimai*, 2002, No. 61-297);
- 19) Order No. D1-239 of the Minister of the Environment of the Republic of Lithuania of 3 May 2004 on the approval of the Rules for the Drafting of Detailed Plans (*Valstybės žinios*, 2004, No. 79-2809);
- 20) Order No. D1-473 of the Minister of the Environment of the Republic of Lithuania of 18 October 2006 on the amendment of Order No. D1-239 of the Minister of the Environment of the Republic of Lithuania of 3 May 2004 on the approval of the Rules for the Drafting of Detailed plans (*Valstybės žinios*, 2006, No. 114-4364);
- 21) Order No. D1-223 of the Minister of the Environment of the Republic of Lithuania of 18 April 2007 on the amendment of Order No. D1-239 of the Minister of the Environment of the Republic of Lithuania of 3 May 2004 on the approval of the Rules for the Drafting of Detailed Plans (*Valstybės žinios*, 2007, No. 46-1776);
- 22) Order No. V-491 of the Minister of Health of the Republic of Lithuania of 1 July 2004 on the approval of the Methodological Guidelines for the Evaluation of Impacts on the Public Health (*Valstybės žinios*, 2004, No. 106-3947);
- 23) Order No. V-586 of the Minister of Health of the Republic of Lithuania of 19 August 2004 on the approval of the Rules for the Delineation and Regime of Sanitary Protection Zones (*Valstybės žinios*, 2004, No. 134-4878);
- 24) Order No. 3-453/D1-549 of the Minister of Transport of the Republic of Lithuania and the Minister of the Environment of the Republic of Lithuania of 24 November 2006 on the approval of the Rules for the Drafting of Special Plans of Transport Communications (*Valstybės žinios*, 2006, No. 130-4924);
- 25) Resolution No. 247 of the Government of the Republic of Lithuania of 14 March 2007 on the amendment of Resolution No. 1079 of the Government of the Republic of Lithuania of 18 September 1996 on the approval of the Regulations on the Participation of the Public in the Territorial Planning Process (*Valstybės žinios*, 2007, No. 33-1190);
- 26) Resolution No. 416 of the Government of the Republic of Lithuania of 15 April 2004 on the Implementation of the Law of the Republic of Lithuania on Territorial Planning (*Valstybės žinios*, 2004, No. 57-1989)
- 27) Resolution No. 388 of 7 April 2004 of the Government of the Republic of Lithuania on the approval of the procedure for the submission of reports related to the implementation of the EU environmental legislation to the European Commission and provision of information required for the reporting to the European Environment Agency (*Valstybės žinios*, 2004, No. 53-1804);
- 28) Resolution No. 299 of the Government of the Republic of Lithuania of 27 March 2006 amending Resolution No. 388 of 7 April 2004 of the Government of the Republic of Lithuania on the approval of the procedure for the submission of reports related to the implementation of the EU environmental legislation to the European Commission and provision of information required for the reporting to the European Environment Agency (*Valstybės žinios*, 2006, No. 35-1252);

- 29) Law No. X-679 of the Republic of Lithuania on the Amendment and Supplement of Articles 1, 2, 7, 10, 12, 15, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 34, 35, 36 of the Law on Territorial Planning (*Valstybės žinios*, 2006, No. 66-2429);
- 30) Law No. IX-1962 of the Republic of Lithuania on the Amendment of the Law on Territorial Planning (*Valstybės žinios*, 2004, No. 21-617);
- 31) Resolution No. 913 of the Government of the Republic of Lithuania of 10 September 2008 on the amendment of Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2008, No. 109-4159);
- 32) Resolution No. 938 of the Government of the Republic of Lithuania of 24 September 2008 on the amendment of Resolution No. 388 of 7 April 2004 of the Government of the Republic of Lithuania on the approval of the procedure for the submission of reports related to the implementation of the EU environmental legislation to the European Commission and provision of information required for the reporting to the European Environment Agency (*Valstybės žinios*, 2008, No. 112-4266);
- 33) Order No. D1-498 of the Minister of the Environment of the Republic of Lithuania of 25 September 2008 on the repeal of Order No. 221 of the Minister of the Environment of the Republic of Lithuania of 19 July 1999 on the approval of the marginal amounts of dangerous substances used in economic objects of Lithuania (*Valstybės žinios*, 2008, No. 112-4272);
- 34) Law No. XI-635 of the Republic of Lithuania on the Amendment of the Law on Civil Protection (*Valstybės žinios*, 2009, No. 159-7207);
- 35) Resolution No. 55 of the Government of the Republic of Lithuania of 12 May 2010 on the amendment of Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2010, No. 59-2894).

### **Brief description of the measures**

134. The Directive requires that all Member States take measures to ensure that relevant procedures of environmental impact assessment are carried out before authorising projects which can have a potential impact on the environment. Environmental impact assessments in Lithuania have been conducted since 1996 when the relevant law was passed.

135. Directive implementation costs

No additional investments are required.

### **Directive concerning integrated pollution prevention and control (96/61/EC)**

The Directive aims at reducing pollution from industrial sources. An IPPC permit is the main measure provided for in the Directive. IPPC permits must provide for that all activities of the 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 Rules contain a requirement 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.

National legislation transposing the Directive:

- 1) Order No. 80 of the Minister of the Environment on 27 February 2002 on the approval of of the Rules on the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2002, No. 85-3684);
- 2) Order No. 333 of the Minister of the Environment on 14 June 2002 on the amendment Order No. 80 of the Minister of the Environment on 27 February 2002 of the Rules on the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2002, No. 81-3498);
- 3) Law No. IX-2214 of the Republic of Lithuania on the Amendment of Articles 1, 2, 4, 5, 6, 8, 10, 11, 12 and 30 of and Annexes to the Law on Waste Management and Supplement of the Law with Section Eight(1), Article 4(1) and Annex 5 (*Valstybės žinios*, 2004, No. 73-2544);
- 4) Order No. D1-330 of the Minister of the Environment of the Republic of Lithuania of 29 June 2005 on the amendment of Order No. 80 of the Minister of the Environment on 27 February 2002 of the Rules on the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2005, No. 103-3829);
- 5) Order No. D1-630 of the Minister of the Environment of the Republic of Lithuania of 10 December 2004 on the approval of the procedure for the drafting of reports on the implementation of the Council Directive 96/61/EB concerning integrated pollution prevention and control and submission of the reports to the European Commission (*Valstybės žinios*, 2004, No. 181-6714);
- 6) Order No. D1-503 of the Minister of the Environment of the Republic of Lithuania of 31 October 2006 on the amendment of Order No. 80 of the Minister of the Environment on 27 February 2002 of the Rules for the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2006, No. 120-4571);
- 7) Law No. I-2224 of the Republic of Lithuania of 21 January 1992 on Environmental Protection (*Valstybės žinios*, 1992, No. 5-76);
- 8) Order No. 468 of the Minister of the Environment of the Republic of Lithuania of 25 September 2003 on the approval of the national limits for sulphur dioxide, nitrogen oxide, volatile organic compounds and ammonia (*Valstybės žinios*, 2003, No. 99-4465);
- 9) Law No. IX-2008 of the Republic of Lithuania of 5 February 2004 on the ratification of the protocol to the 1979 Convention on Long-Range Transboundary Air Pollution to abate acidification, eutrophication and ground-level ozone (*Valstybės žinios*, 2004, No. 44-1438);
- 10) Order No. D1-516 of the Minister of the Environment of the Republic of Lithuania of 9 October 2007 on the amendment of Order No. 80 of the Minister of the Environment on 27 February 2002 of the Rules for the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2007, No. 106-4358) ;

- 11) Order No. 230 of the Minister of the Environment of the Republic of Lithuania of 15 May 2003 on the approval of the procedure for the performance of environmental monitoring by economic entities (*Valstybės žinios*, 2003, No. 50-2240);
- 12) Order No. D1-660 of the Minister of the Environment of the Republic of Lithuania of 6 December 2007 on the amendment of Order No. 80 of the Minister of the Environment on 27 February 2002 of the Rules for the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2007, No. 133-5410);
- 13) Order No. D1-693 of the Minister of the Environment of the Republic of Lithuania of 29 December 2008 on the amendment of Order No. 80 of the Minister of the Environment on 27 February 2002 of the Rules for the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2009, No. 1-12);
- 14) Law No. VIII-1927 of the Republic of Lithuania of 19 September 2000 on the Amendment of the Law on Administrative Proceedings (*Valstybės žinios*, 2000, No. 85-2566);
- 15) Law No. X-1174 of the Republic of Lithuania of 7 June 2007 on the Amendment of Articles 2, 3, 15, 18, 19, 20, 22, 33, 35, 40, 46 and 88 of the Law on Administrative Proceedings (*Valstybės žinios*, 2007, No. 72-2830);
- 16) Law No. IX-743 of the Republic of Lithuania on the Approval, Entering into Force and Implementation of the Civil Proceeding Code (*Valstybės žinios*, 2002, No. 36-1340);
- 17) Order No. D1-63 of the Minister of the Environment of the Republic of Lithuania of 25 January 2010 on the supplement of Order No. 80 of the Minister of the Environment on 27 February 2002 of the Rules for the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2010, No. 13-634).

### **Brief description of the measures**

#### 136. Permits of Integrated Pollution Prevention and Control

All industries engaged in the activities listed in Annexes I and II to the Rules are subject to permits. The IPPC permits first of all require implementation of all available pollution prevention measures and introduction of the Best Available Techniques (BAT). Apart from these general requirements, the permits specify pollution limit values as well as require developing programmes on reduction of water pollution with priority dangerous substances. Table 120 below provides information on the number of IPPC installations in the Nemunas RBD.

Table 120. Number of IPPC installations in the Nemunas RBD

<b>Basin/sub-basin</b>	<b>No. of IPPC installations</b>
Neris Small Tributaries	26
Nevėžis	21
Nemunas Small Tributaries	27
Minija	9
Coastal rivers	20
Jūra	5
Šventoji	13
Šešupė	12

Basin/sub-basin	No. of IPPC installations
Žeimena	4
Merkys	2
Dubysa	2
<b>Total:</b>	<b>140</b>

### 137. Directive implementation costs

According to preliminary estimates carried out in 2000, the implementation of the IPPC Directive could have ranged from LTL 1 200 million to LTL 2 000 million. Investment costs of the IPPC Directive currently in force have not been calculated.

#### **Council Directive on the control of major-accident hazards involving dangerous substances (96/82/EC)**

The Directive was adopted in 1996 and 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.

If the quantity of dangerous substances held by a company is lower than the lower threshold levels given in the Directive, compliance of the company to the general provisions on health, safety and environmental protection will be checked. In the event that the quantity of dangerous substances is above the upper threshold contained in the Directive, the company will be subject to all requirements provided for therein (source: European Civil Protection: <http://ec.europa.eu/environment/seveso/legislation.htm>).

National legislation transposing the Directive:

- 1) Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2004, No. 130-4649);
- 2) Resolution No. 1182 of the Government of the Republic of Lithuania of 29 October 2005 on the amendment of Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2005, No. 131-4731);
- 3) Resolution No. 560 of the Government of the Republic of Lithuania of 22 April 1999 on the approval of the procedure for the provision of information to the populations in cases of industrial accidents (*Valstybės žinios*, 2002, No. 43-1626);
- 4) Resolution No. 783 of the Government of the Republic of Lithuania of 21 June 1999 on the approval of the procedure for the drafting of accident response plans (*Valstybės žinios*, 1999, No. 56-1812);
- 5) Resolution No. 1386 of the Government of the Republic of Lithuania of 8 November 2000 on the reorganisation of the Register of Dangerous Economic Objects of Lithuania into the Register of Objects of National Importance and Dangerous Objects (*Valstybės žinios*, 2000, No. 98-3117);
- 6) Resolution No. 982 of the Government of the Republic of Lithuania of 18 August 2004 on the amendment of Resolution No. 1386 of the Government of the Republic of Lithuania of 8 November 2000 on the reorganisation of the Register of

- Dangerous Economic Objects of Lithuania into the Register of Objects of National Importance and Dangerous Objects (*Valstybės žinios*, 2004, No. 130-4665);
- 7) Resolution No. 873 of the Government of the Republic of Lithuania of 11 September 2006 on the amendment of Resolution No. 1386 of the Government of the Republic of Lithuania of 8 November 2000 on the reorganisation of the Register of Dangerous Economic Objects of Lithuania into the Register of Objects of National Importance and Dangerous Installations (*Valstybės žinios*, 2006, No. 97-3783);
  - 8) Resolution No. 1268 of the Government of the Republic of Lithuania of 13 December 2006 on the liquidation of the Register of Dangerous Chemical Substances and Preparations (*Valstybės žinios*, 2006, No. 137-5226);
  - 9) Resolution No. 967 of the Government of the Republic of Lithuania of 18 August 2004 on the approval of the procedure for the strategic assessment of consequences of plans and programmes (*Valstybės žinios*, 2004, No. 130-4650);
  - 10) Law No. X-258 of the Republic of Lithuania on the Amendment of the Law on Environmental Impact Assessment of the Proposed Economic Activity (*Valstybės žinios*, 2005, No. 84-3105);
  - 11) Law No. IX-1113 of the Republic of Lithuania on the Amendment of the Law on Roads (*Valstybės žinios*, 2002, No. 101-4492);
  - 12) Law No. IX-886 of the Republic of Lithuania on Public Health Care (*Valstybės žinios*, 2002, No. 56-2225);
  - 13) Law No. X-1150 of the Republic of Lithuania on the Amendment and Supplement of Articles 2, 5, 6, 7, 9, 15, 16, 19, 21, 22, 24, 27, 36, 38, 39, 41, 42, 43, 44 and Repeal of Articles 8, 11, 14 of the Law on Public Health Care (*Valstybės žinios*, 2007, No. 64-2455);
  - 14) Order No. V-131 of the Director of the Civil Safety Department under the Ministry of the Interior of 30 September 2004 on the approval of documents in compliance with the Convention on the Transboundary Effects of Industrial Accidents and the Council Directive on the control of major-accident hazards involving dangerous substances (*Valstybės žinios*, 2004, No. 183-6778);
  - 15) Order No. IV-114 of the Minister of the Interior of the Republic of Lithuania of 30 March 2007 on the approval of the procedure for the exchange of information on emergency situations or emergency incidents (*Valstybės žinios*, 2007, No. 40-1515);
  - 16) Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 on the approval of the Programme on Inspection of Dangerous Installations of the Republic of Lithuania (*Valstybės žinios*, 2007, No. 3-143);
  - 17) Order No. 1-182 of the Director of the State Fire and Rescue Department of 4 June 2007 on the approval of the checklists for the Register of Objects of National Importance and Dangerous Installations (*Valstybės žinios*, 2007, No. 65-2542);
  - 18) Order No. 367 of the Minister of the Environment of the Republic of Lithuania of 16 July 2002 on the approval of Guidelines for Evaluation of the Risk of Accidents of the Proposed Economic Activity R 41 - 02 (*Informaciniai pranešimai*, 2002, No. 61-297);
  - 19) Order No. D1-239 of the Minister of the Environment of the Republic of Lithuania of 3 May 2004 on the approval of the Rules for the Drafting of Detailed Plans (*Valstybės žinios*, 2004, No. 79-2809);

- 20) Order No. D1-473 of the Minister of the Environment of the Republic of Lithuania of 18 October 2006 on the amendment of Order No. D1-239 of the Minister of the Environment of the Republic of Lithuania of 3 May 2004 on the approval of the Rules for the Drafting of Detailed Plans (*Valstybės žinios*, 2006, No. 114-4364);
- 21) Order No. D1-223 of the Minister of the Environment of the Republic of Lithuania of 18 April 2007 on the amendment of Order No. D1-239 of the Minister of the Environment of the Republic of Lithuania of 3 May 2004 on the approval of the Rules for the Drafting of Detailed Plans (*Valstybės žinios*, 2007, No. 46-1776);
- 22) Order No. V-491 of the Minister of Health of the Republic of Lithuania of 1 July 2004 on the approval of the Methodological Guidelines for Evaluation of Impacts on the Public Health (*Valstybės žinios*, 2004, No. 106-3947);
- 23) Order No. V-586 of the Minister of Health of the Republic of Lithuania of 19 August 2004 on the approval of the Rules for the Delineation and Regime of Sanitary Protection Zones (*Valstybės žinios*, 2004, No. 134-4878);
- 24) Order No. 3-453/D1-549 of the Minister of Transport of the Republic of Lithuania and the Minister of the Environment of the Republic of Lithuania of 24 November 2006 on the approval of the Rules for the Drafting of Special Plans of Transport Communications (*Valstybės žinios*, 2006, No. 130-4924);
- 25) Resolution No. 247 of the Government of the Republic of Lithuania of 14 March 2007 on the amendment of Resolution No. 1079 of the Government of the Republic of Lithuania of 18 September 1996 on the approval of the Regulations on the Participation of the Public in the Territorial Planning Process (*Valstybės žinios*, 2007, No. 33-1190);
- 26) Resolution No. 416 of the Government of the Republic of Lithuania of 15 April 2004 on the Implementation of the Law of the Republic of Lithuania on Territorial Planning (*Valstybės žinios*, 2004, No. 57-1989);
- 27) Resolution No. 388 of 7 April 2004 of the Government of the Republic of Lithuania on the approval of the procedure for the submission of reports related to the implementation of the EU environmental legislation to the European Commission and provision of information required for the reporting to the European Environment Agency (*Valstybės žinios*, 2004, No. 53-1804);
- 28) Resolution No. 299 of the Government of the Republic of Lithuania of 27 March 2006 on the amendment of Resolution No. 388 of 7 April 2004 of the Government of the Republic of Lithuania on the approval of the procedure for the submission of reports related to the implementation of the EU environmental legislation to the European Commission and provision of information required for the reporting to the European Environment Agency (*Valstybės žinios*, 2006, No. 35-1252);
- 29) Law No. X-679 of the Republic of Lithuania on the Amendment and Supplement of Articles 1, 2, 7, 10, 12, 15, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 34, 35, 36 of the Law on Territorial Planning (*Valstybės žinios*, 2006, No. 66-2429);
- 30) Law No. IX-1962 of the Republic of Lithuania on the Amendment of the Law on Territorial Planning (*Valstybės žinios*, 2004, No. 21-617);
- 31) Resolution No. 913 of the Government of the Republic of Lithuania of 10 September 2008 on the amendment of Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2008, No. 109-4159);

- 32) Resolution No. 938 of the Government of the Republic of Lithuania of 24 September 2008 on the amendment of Resolution No. 388 of 7 April 2004 of the Government of the Republic of Lithuania on the approval of the procedure for the submission of reports related to the implementation of the EU environmental legislation to the European Commission and provision of information required for the reporting to the European Environment Agency (*Valstybės žinios*, 2008, No. 112-4266);
- 33) Order No. D1-498 of the Minister of the Environment of the Republic of Lithuania of 25 September 2008 on the repeal of Order No. 221 of the Minister of the Environment of the Republic of Lithuania of 19 July 1999 on the approval of the marginal amounts of dangerous substances used in economic objects of Lithuania (*Valstybės žinios*, 2008, No. 112-4272);
- 34) Law No. XI-635 of the Republic of Lithuania on the Amendment of the Law on Civil Protection (*Valstybės žinios*, 2009, No. 159-7207);
- 35) Resolution No. 555 of the Government of the Republic of Lithuania of 12 May 2010 amending Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2010, No. 59-2894).

### 138. Brief description of the measures

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

The Regulation requires development of safety reports in industries working with dangerous substances. These reports must also incorporate plans of measures for accident prevention. The List of Potentially Dangerous Installations in Lithuania currently contains 21 installations which are subject to the requirements of the Directive.

#### 138.2. Selection of a site for potentially dangerous installations

The Regulation requires 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.

#### 138.3. Controls over the implementation of the Directive

Programmes on Inspection of Dangerous Installations of the Republic of Lithuania are approved each year by orders of the Director of the State Fire and Rescue Department, laying down a schedule of inspection of dangerous installations. The latest Order No. 1-528, which was adopted in 2006 (*Valstybės žinios*, 2006, No. 3-143), approved the Programme on Inspection of Dangerous Installations of the Republic of Lithuania and laid down a schedule for 2007. The new Programme has also introduced systematic control which ensures safe operation of dangerous installations. Control of these installations was started back in 2002. The Report of 2003-2005 to the Commission on the implementation of the Seveso Directive in the Member States indicated that there were 14 upper tier establishments in Lithuania in 2002, and in 2005 this number increased to 21. All these establishments were inspected in 2005. The number of establishments inspected in 2006 totalled to 20.

## 139. Directive implementation costs

No additional costs are required.

## **SECTION II. MEASURES FOR IMPLEMENTING THE REQUIREMENTS OF OTHER ARTICLES OF THE WFD**

Besides the basic measures intended for the implementation of the above-said directives, Article 11 of the WFD provides for mandatory assessment of the requirements laid down in other articles of the WFD. The measures for the implementation of these requirements are discussed in the following sub-sections.

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

140. Article 9 of the WFD discusses recovery of the costs of water services providing for that the state shall take into account the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis and in accordance in particular with the polluter pays principle.

National legislation transposing the requirements of Articles 9:

- 1) Law of the Republic of Lithuania on Water (*Valstybės žinios*, 1997, No. 104-2615; 2009, No. 154-6955);
- 2) Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management (*Valstybės žinios*, 2006, No. 82-3260);
- 3) 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 (*Valstybės žinios*, 2006, No. 143-5455).

## 141. Brief description of the measures

The Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management envisages amalgamation of water supply companies and revision of price tariffs. These measures have provided for the background for increasing cost recovery to 100 %. Larger water supply companies will be better able to coordinate the price agreement issue with relevant interested parties.

Environmental costs are included into the cost recovery mechanism through charges for the use of national natural resources and for pollution of the environment.

The present report was prepared on the basis of the data available at that time and hence the cost recovery level in the public water supply and wastewater management sector in individual sub-basins as well as the average one within the entire Nemunas RBD was estimated to be lower than it actually is today when a number of changes have taken place as a result of both revising the tariffs for water supply and wastewater management services and modernisation of water supply and wastewater management companies. Data of 2007 shows that the cost recovery level in the public water supply and wastewater management sector in the Nemunas RBD totaled to about 96 % of costs and the cost recovery level in the sector of industry was 100 %. As new tariffs for water supply and wastewater management services were adopted in 2009 – beginning of 2010

following the opinion of municipalities and the National Control Commission for Prices and Energy, it can be maintained that the cost recovery principle has been fully implemented. The cost recovery level in the sector of agriculture totals to 98.2 %.

Assessment of the financial cost recovery level in each sub-basin includes calculation of average cost prices of the main water supply companies located in a particular sub-basin and comparison of these cost prices with the existing average prices.

Further text discusses the level of financial cost recovery in the water supply and wastewater treatment sector within the Nemunas RBD taking into account the ratio of the price to the cost price. The average price and the cost price have been calculated applying the weighted average of the prices and costs of all water supply companies operating within a respective sub-basin. In addition, a detailed calculation of cost recovery in agriculture and industry is provided.

### The Miniija sub-basin

The main water supply companies located in the Miniija Sub-basin on average recovered 64 % of their costs (Table 121).

Table 121. Financial recovery level of water supply and wastewater management costs in the Miniija Sub-basin, 2007, %

	UAB Klaipėdos rajono vandenys	UAB Plungės vandenys	<b>Miniija Sub-basin</b>
Water supply	86 %	85 %	86 %
Wastewater management	37 %	80 %	73 %
<b>Total costs</b>	<b>50 %</b>	<b>82 %</b>	<b>64 %</b>

The source of the calculations in the table above and in the following tables: calculations by the Consultant on the basis of the data on prices and cost prices of water supply companies.

### The Merkys Sub-basin

The main water supply companies located in the Merkys Sub-basin on average recovered 101 % of their costs (Table 122).

Table 122. Financial recovery level of water supply and wastewater management costs in the Merkys Sub-basin, 2007, %

	UAB Vilniaus vandenys <sup>29</sup>	UAB Varėnos vandenys	<b>Merkys Sub-basin</b>
Water supply	101 %	71 %	100 %
Wastewater management	102 %	83 %	102 %
<b>Total costs</b>	<b>102 %</b>	<b>78 %</b>	<b>101 %</b>

The table above shows that the only water company which encountered problems in the introduction of the cost recovery principle in 2007 was Varėnos vandenys.

<sup>29</sup> The services of the water supply company Vilniaus vandenys are also provided to Šalčininkai. Having in mind the principle of the economies of scale and Lithuanian experience throughout the country, activity of a separate company of Šalčininkai would be yielding loss and the cost recovery level would be lower than specified above.

### The Žeimena Sub-basin

The main water supply company located in the Žeimena Sub-basin on average recovered 102 % of its costs (Table 123).

Table 123. Financial recovery level of water supply and wastewater management costs in the Žeimena Sub-basin, 2007, %

	UAB Vilniaus vandenys <sup>30</sup>	Žeimena Sub-basin
Water supply	101 %	101 %
Wastewater management	102 %	102 %
<b>Total costs</b>	<b>102 %</b>	<b>102 %</b>

The services of the water supply company Vilniaus vandenys are also provided to Švenčionys. Having in mind the principle of the economies of scale and Lithuanian experience throughout the country, activity of a separate company of Švenčionys would be yielding loss and the cost recovery level would be lower than specified above.

### The Šventoji Sub-basin

The main water supply companies located in the Šventoji Sub-basin on average recovered 91 % of their costs (Table 124).

Table 124. Financial recovery level of water supply and wastewater management costs in the Šventoji Sub-basin, 2007, %

	UAB Molėtų vanduo	UAB Utenos vandenys	UAB Anykščių vandenys	UAB Širvintų vandenys	UAB Ukmergės vandenys	UAB Zarasai vandenys	Šventoji Sub-basin
Water supply	92 %	109 %	130 %	74 %	115 %	76 %	106 %
Wastewater management	55 %	113 %	50 %	62 %	89 %	89 %	89 %
<b>Total costs</b>	<b>67 %</b>	<b>111 %</b>	<b>75 %</b>	<b>66 %</b>	<b>98 %</b>	<b>84 %</b>	<b>91 %</b>

The table above illustrates that all companies, except for the water supply company Utenos vandentiekis, failed to implement the cost recovery principle as indicated by the data of 2007.

### The Neris Small Tributaries Sub-basin

The main water supply companies located in the Neris Small Tributaries Sub-basin on average recovered 101 % of their costs (Table 125).

Table 125. Financial recovery level of water supply and wastewater management costs in the Neris Small Tributaries Sub-basin, %

	UAB Vilniaus vandenys	UAB Jonavos vandenys	UAB Kaišiadorių vandenys	Neris sub-basin
Water supply	101 %	93 %	69 %	100 %
Wastewater management	102 %	87 %	104 %	101 %
<b>Total costs</b>	<b>102 %</b>	<b>90 %</b>	<b>83 %</b>	<b>101 %</b>

<sup>30</sup> The main company providing services in the Žeimena Sub-basin is Vilniaus vandenys.

The table above illustrates that all companies, except for the water company Vilniaus vandenys, failed to implement the cost recovery principle as indicated by the data of 2007.

### The Nevėžis Sub-basin

The main water supply companies located in the Nevėžis Sub-basin on average recovered 85 % of their costs (Table 126).

Table 1.2.6. Financial recovery level of water supply and wastewater management costs in the Nevėžis Sub-basin, 2007, %

	UAB Aukštaitijos vandenys	UAB Kėdainių vandenys	UAB Radviliškio vandenys	<b>Nevėžis sub-basin</b>
Water supply	96 %	84 %	67 %	89 %
Wastewater management	80 %	96 %	73 %	82 %
<b>Total costs</b>	<b>86 %</b>	<b>91 %</b>	<b>71 %</b>	<b>85 %</b>

The table above illustrates that none of the companies manages to implement the cost recovery principle as indicated by the data of 2007.

### The Šešupė Sub-basin

The main water supply companies located in the Šešupė Sub-basin on average recovered 92 % of their costs (Table 127).

Table 127. Financial recovery level of water supply and wastewater management costs in the Šešupė Sub-basin, 2007, %

	UAB Sūduvos vandenys	UAB Šakių vandenys	UAB Vilkaviškio vandenys	UAB Kalvarijos komunalininkas	UAB Lazdijų vanduo	<b>Šešupė Sub-basin</b>
Water supply	96 %	104 %	85 %	90 %	85 %	95 %
Wastewater management	104 %	70 %	83 %	108 %	84 %	97 %
<b>Total costs</b>	<b>100 %</b>	<b>84 %</b>	<b>83 %</b>	<b>101 %</b>	<b>84 %</b>	<b>92 %</b>

The table above illustrates that all companies, except for the water companies Sūduvos vandenys and Kalvarijos komunalininkas, failed to implement the cost recovery principle as indicated by the data of 2007.

### The Dubysa Sub-basin

The main water supply companies located in the Dubysa Sub-basin on average recover 81 % of their costs (Table 128).

Table 128. Financial recovery level of water supply and wastewater management costs in the Dubysa Sub-basin, 2007, %

	UAB Raseinių vandenys	UAB Kelmės vanduo	<b>Dubysa Sub-basin</b>
Water supply	84 %	89 %	86 %
Wastewater management	74 %	86 %	78 %
<b>Total costs</b>	<b>78 %</b>	<b>87 %</b>	<b>81 %</b>

The table above illustrates that none of the companies operating in the Dubysa Sub-basin managed to implement the cost recovery principle as indicated by the data of 2007.

### The Jūra Sub-basin

The main water supply companies located in the Jūra Sub-basin on average recovered 88 % of their costs (Table 129).

Table 129. Financial recovery level of water supply and wastewater management costs in the Jūra Sub-basin, 2007, %

	Šilalės vandenys	Tauragės vandenys	Jūra Sub-basin
Water supply	82 %	100 %	94 %
Wastewater management	74 %	90 %	87 %
<b>Total costs</b>	<b>77 %</b>	<b>94 %</b>	<b>88 %</b>

The table above illustrates that none of the companies manages to implement the cost recovery principle as indicated by the data of 2007.

### The Lithuanian Coastal Rivers Basin

The main water supply companies located in the Lithuanian Coastal Rivers Basin on average recovered 94 % of their costs (Table 130).

Table 130. Financial recovery level of water supply and wastewater management costs in the Lithuanian Coastal Rivers Basin, 2007, %

	AB Klaipėdos vanduo	UAB Neringos vanduo	UAB Palangos vandenys	Coastal Rivers Basin
Water supply	83 %	68 %	71 %	80 %
Wastewater management	107 %	94 %	83 %	102 %
<b>Total costs</b>	<b>97 %</b>	<b>79 %</b>	<b>79 %</b>	<b>94 %</b>

### The Nemunas Small Tributaries Sub-basin

The main water supply companies located in the Nemunas Small Tributaries Sub-basin averagely recovered 93 % of their costs (Table 131).

Table 131. Financial recovery level of water supply and wastewater management costs in the Nemunas Small Tributaries Sub-basin, 2007, %

	Kauno vandenys	Dzūkijos vandenys	Šilutės vandenys	Druskininkų vandentiekis	Giraitės vandenys	Kaišiadorių vandenys	Jurbarko vandenys	Elektrėnų komunalinis ūkis	Birštono vandentiekis	Nemunas Small Tributaries Sub-basin
Water supply	99 %	81 %	89 %	155 %	92 %	69 %	108 %	89 %	83 %	96 %
Wastewater management	93 %	85 %	64 %	128 %	67 %	104 %	94 %	88 %	77 %	89 %
<b>Total costs</b>	<b>95 %</b>	<b>83 %</b>	<b>73 %</b>	<b>136 %</b>	<b>76 %</b>	<b>83 %</b>	<b>99 %</b>	<b>88 %</b>	<b>80 %</b>	<b>93 %</b>

The table above illustrates that all companies, except for the water supply company Druskininkų vandentiekis, failed to implement the cost recovery principle as indicated by the data of 2007.

### The Nemunas River Basin District

The summary table (132) illustrates that the financial cost recovery principle was not functioning in water supply companies in 2007 in the majority of the sub-basins.

Environmental costs are included in the cost recovery mechanism through charges for the use of national natural resources and for the pollution of the environment.

Table 1.32. The level of financial cost recovery in the sector of water supply and wastewater management in the Nemunas RBD, 2007, %. Summary table.

Basin/sub-basin	Water supply	Wastewater management	Total costs
Minija	86	73	64
Merkys	100	102	101
Žeimena	101	102	102
Šventoji	106	89	91
Neris Small Tributaries	100	101	101
Dubysa	86	78	81
Nevėžis	89	82	85
Šešupė	95	97	92
Jūra	94	87	88
Coastal Rivers	80	102	94
Nemunas Small Tributaries	96	89	93

The level of costs recovery in agriculture cannot be calculated using the same method as for the public sector. Agriculture is not a very important direct user of water in Lithuania, including the Nemunas RBD. The only type of pollution important for the assessment of cost recovery is diffuse agricultural pollution, which is not included into the price of water or any other costs in any way.

It is very difficult to assess environmental costs, costs of resources and other costs arising due to agricultural pressures, hence another method is applied for the evaluation of pollution loads. In such case it is assumed that these “external costs” are approximately equal to the costs of elimination of agricultural pollution. This amount in the Nemunas RBD during the first stage of the implementation of the WFD would total roughly to LTL 17.2 million every year until 2015. Part of these costs – LTL 200 thousand – would be required for control and would be covered by the state. The major burden – LTL 16.7 million – would be borne by farmers. These measures would eliminate agricultural pollution in many areas suffering from significant agricultural pressures.

In some areas, water bodies are more sensitive to agricultural pollution due to natural conditions of the environment, such as low runoff, etc. In such cases pollution by agriculture can be significant even when loads do not exceed the allowed limits (i.e. when they are not larger than in other places where agricultural pollution is not significant). It is proposed that such additional costs, which would be required in the Nevėžis Sub-basin, are borne by the state. These costs total to LTL 300 thousand and account for 1.76 % of the total costs required for the reduction of pollution (LTL 17

million, excluding the costs of controls). This means that the polluter pays principle would be implemented in all sub-basins, except for the Nevėžis Sub-basin, i.e. in the major part of the Nemunas RBD, and thus the cost recovery would total to 98.2 %.

In the Nevėžis Sub-basin, the cost recovery level is estimated at 85 % because part of the costs – LTL 300 thousand out of LTL 1.9 million – would be covered by state subsidies.

However, this is only an *a priori* assessment and the real cost recovery level in agriculture will be established in 2015 upon evaluation of the actual input of farmers into the implementation of the measures.

The costs of supplementary measures for the sector of industry, which have been assessed at the present stage of preparation for the implementation of the Programme of Measures for the Nemunas RBD, are related only to the studies on the identification sources of hazardous substances which are sometimes detected in surface waters. To date, there is no reliable data to be able to point out specific companies emitting certain hazardous substances into rivers and any specific amounts of such substances discharged thereby. Consequently, the costs of the supplementary measures needed for the sector of industry may not be equated to the costs of the reduction of this type of pollution.

As indicated by the analysis conducted, the cost recovery level in the sector of industry totals to 100 %.

### **Measures for meeting the requirements of Article 7 of the WFD**

Article 7 of the WFD requires:

- 1) identifying all bodies of water used for the abstraction of water intended for human consumption providing more than 10 m<sup>3</sup> a day as an average or serving more than fifty persons;
- 2) monitoring bodies of water which provide more than 100 m<sup>3</sup> a day as an average.

Legislation:

- 1) Resolution No. 584 of the Government of the Republic of Lithuania of 26 April 2002 on the Regulations of the Register of the Earth Entrails (*Valstybės žinios*, 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;
- 2) Order No. 1-190 of the Director of the State Geological Survey under the Ministry of the Environment of 24 December 2009 on the approval of the procedure for groundwater monitoring by economic entities (*Valstybės žinios*, 2009, No. 157-7130) 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.

142. Brief description of the measures

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

All wellfields abstracting more than 10 m<sup>3</sup> of groundwater per day must provide information to the Lithuanian Geological Survey. The procedure of the reporting on the abstraction of groundwater was approved in 2003 by Order No. 1-10 of the Director of the Geological Survey under the Minister of the Environment of the Republic of Lithuania. Pursuant to this Procedure, all economic entities which abstract more than 10 m<sup>3</sup> of groundwater for the purposes of drinking water supply or for industrial needs must provide quarterly water abstraction reports to the State Geological Survey. The Geological Survey registers the information received in its data bases thus identifying respective wellfields.

#### 142.2. Identification of bodies of water intended for future use

Resolution No. 562 of the Government of the Republic of Lithuania of 8 June 2006 approved the Programme on the Evaluation and Use of Groundwater Resources for Drinking Water Supply for 2007–2025 (*Valstybės žinios*, 2006, No. 66-2436; 2008, No. 104-3976) and initiated the project *Assessment of groundwater resources in Lithuania*.

#### 143.1. The targets of the project are as follows:

143.1.1. 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;

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

143.1.3. 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 basins.

Until 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 expected to be assessed during 2009-2010.

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

Order No. 1-59 of the Director of the State Geological Survey of 24 October 2003 on groundwater monitoring by economic entities has laid down that all economic entities which abstract more than 100 m<sup>3</sup> of groundwater per 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. The Programme is approved by the Lithuanian Geological Survey. Economic entities are fulfilling the requirements laid down in relevant legislations and providing information to the Lithuanian Geological Survey in a due manner.

#### Preparation and authorisation of sanitary protection zones of wellfields.

This measure is described in Section 3 of Chapter 1.

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

Legislation:

- 1) Order No. 80 of the Minister of the Environment of the Republic of Lithuania of 27 February 2002 on the approval of the Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits (*Valstybės žinios*, 2002, No. 85-3684; 2008, No. 1-12);
- 2) Order No. D1-236 of the Minister of the Environment of the Republic of Lithuania of 17 May 2006 on the approval of the Wastewater Management Regulation as amended by Order No. D1-386 (*Valstybės žinios*, 2006, No. 59-2103; 2009, No. 159-7267);
- 3) Order No. D1-193 of the Minister of the Environment of the Republic of Lithuania of 2 April 2007 on the approval of the Regulation on Surface Runoff Management (*Valstybės žinios*, 2007, No. 42-1594).

The above is the key legislation which regulates controls over point pollution sources.

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

Legislation:

- 1) Law of the Republic of Lithuania on Water (*Valstybės žinios*, 1997, No. 104-2615; 2003, No. 36-1544);
- 2) Law of the Republic of Lithuania on Drinking Water Supply and Wastewater Management (*Valstybės žinios*, 2006, No. 82-3260);
- 3) Order No. 452/607 of the Minister of Agriculture of the Republic of Lithuania and the Minister of the Environment of the Republic of Lithuania of 19 December 2001 on the approval of the requirements for the protection of waters against pollution with nitrogen compounds from agricultural sources (*Valstybės žinios*, 2002, No. 1-14);
- 4) Order No. D1-367 / 3D-342 of the Minister of the Environment of the Republic of Lithuania and the Minister of Agriculture of the Republic of Lithuania of 14 July 2005 on the approval of the environmental requirements for manure management (*Valstybės žinios*, 2005, No. 92-3434);
- 5) Order No. 3D-686/D1-676 of the Minister of Agriculture of the Republic of Lithuania and the Minister of the Environment of the Republic of Lithuania of 9 December 2008 on the approval of the Programme on the Reduction of Water Pollution from Agricultural Sources (*Valstybės žinios*, 2008, No. 143-5741);
- 6) Order No. 349 of the Minister of the Environment of the Republic of Lithuania of 28 June 2001 on the approval of the regulatory document LAND 20-2001 “Requirements for the use of sewage sludge for fertilisation” (*Valstybės žinios*, 2001, No. 61-2196; 2005, No. 142-5135);
- 7) Implementation of Measure VP3-1.4-AM-04-R “Improvement of the status of water bodies”.

The legislation above has provided for general requirements for the protection 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**

Legislation:

- 1) Order No. 80 of the Minister of the Environment of the Republic of Lithuania of 27 February 2002 on the approval of the Rules for the Issuing, Renewal and Revocation of Integrated Pollution Prevention and Control Permits (*Valstybės žinios*, 2002, No. 85-3684; 2005, No. 103-3829);
- 2) Order No. No. D1-156 of the Minister of the Environment of the Republic of Lithuania of 31 March 2004 on the approval of the Building Technical Regulation STR 2.02.04:2004 “Water abstraction, water preparation. Basic provisions” (*Valstybės žinios*, 2004, No. 104-3848);
- 3) Resolution No. 584 of the Government of the Republic of Lithuania of 26 April 2002 on the Regulations of the Register of the Earth Entrails (*Valstybės žinios*, 2002, No. 44-1676). 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;
- 4) Order No. 1-10 of the Director of the State Geological Survey under the Ministry of the Environment of the Republic of Lithuania of 19 February 2003 on the approval of the procedure for the reporting on the abstraction of groundwater (*Valstybės žinios*, 2003, No. 19-849);
- 5) Order No. D1-302 of the Minister of the Environment of the Republic of Lithuania of 2 June 2008 on the approval of the procedure of the use of surface water bodies for the purposes of water abstraction (*Valstybės žinios*, 2008, No. 64-2439).

#### 144. Brief description of the measures

##### 144.1. Permits of Integrated Pollution Prevention and Control

Permitting requirements are applicable to companies which abstract, consume or supply groundwater and surface water (including for hydro energy 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.

##### 144.2. Controls over the abstraction and sustainable use of surface water

Water abstraction sites must be designed taking into account 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 may be not 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 Nemunas 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.

#### 144.3. Controls over groundwater abstraction

Control of groundwater use falls under the responsibility of the Lithuanian Geological Service. 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 approved by Order No. 1-10 of the Director of the Geological Survey. The Lithuanian Geological Survey registers the information on water consumption received in its data bases.

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

145. 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 the improvement of conditions for fish migration.

#### 146. Legal regulation of the water impoundment measures

146.1. Law of the Republic of Lithuania on Water (*Valstybės žinios*, 1997, No. 104-2615; 2003, No. 36-1544). 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 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 permit. A procedure for the use and maintenance of ponds is laid down by the Minister of the 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.

146.2. Law No. X-258 of the Republic of Lithuania on the Amendment of the Law on Environmental Impact Assessment of the Proposed Economic Activity of 21 June 2005 258 (*Valstybės žinios*, 2005, No. 84-3105). This Law regulates the process of environmental impact assessment of the proposed economic activity and relationships between the participants in this process.

146.2.1. Waterworks – dams and ponds – are contained in two lists of economic activities:

146.2.1.1. Economic activities subject to an environmental impact assessment:

146.2.1.1.1. 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).

146.2.1.1.2. Works for the 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).

146.2.1.2. Economic activities subject to screening for an environmental impact assessment:

146.2.1.2.1. 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);

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

146.3. Law No. XP-3451 of the Republic of Lithuania on the Amendment of the Law on Protected Areas (draft law) of 7 November 2008, Seimas of the Republic of Lithuania

In reserves, which are areas of conservational protection priority, it is prohibited to dam natural rivers and to set up larger water bodies. 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.

146.4. 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 the Environment of the Republic of Lithuania of 7 March 1995 on the Standard Rules for the Use and Maintenance of Ponds (*Valstybės žinios*, 1995, No. 70-1790; 2008, No. 5-199)

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, administrators 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.

146.5. 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 (*Valstybės žinios*, 2004, No. 137-4995)

This is a piece of secondary legislation pursuant to paragraph 3 of Article 14 of the Republic of Lithuania Law 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 Council Directive 92/43/EEC 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 are protected in Lithuania under the Programme of Restoration and Conservation of Salmons of HELCOM, International Baltic Sea Fishery Commission (IBSFC) and Lithuania. This list also includes rivers where no reserves are situated.

146.6. Order No. D1-382 of the Minister of the Environment of the Republic of Lithuania of 29 July 2005 on the approval of the procedure for the estimation of the environmental water flow (LAND-22-97) (*Valstybės žinios*, 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.

146.7. Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 on the approval of a list of dams where fish migration facilities should be constructed and former dams where fish migration barriers have to be removed (*Valstybės žinios*, 2007, No. 102-4180)

This list contains 28 dams and dam remains of 33 former watermills where conditions for fish migration should be improved as described above.

146.8. Order No. 68 of the Minister of Agriculture of the Republic of Lithuania of 23 February 2000 on measures for fish protection in small hydropower plants (*Valstybės žinios*, 2000, No. 19-471; 2003, No. 78-3583)

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

146.9. Building Technical Regulation STR 2.02.03:2003 “Fish passes. Basic provisions” approved by Order No. 565 of the Minister of the Environment of the Republic of Lithuania of 17 November 2003 (*Valstybės žinios*, 2003, No. 119-5449)

The Regulation establishes technical requirements for fish passes. The main purpose of fish passes 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 conserved and protected fish

146.10. Resolution No. 1114 of the Government of the Republic of Lithuania of 19 September 2000 on the establishment of the National State Cadastre of Rivers, Lakes and Reservoirs of the Republic of Lithuania and approval of the Regulations thereof (*Valstybės žinios*, 2000, No. 80-2422; 2009, No. 103-4318).

The State Cadastre of Rivers, Lakes and Ponds of the Republic of Lithuania was officially established in 2001. Before that, data on ponds and reservoirs (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 reservoirs 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**

147. 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 have to be aimed at the progressive reduction and, for priority hazardous substances, at the cessation or phasing out of discharges, emissions and losses.

Legislation:

- 1) Wastewater Management Regulation adopted by Order No. D1-236 of the Minister of the Environment of the Republic of Lithuania of 17 May 2006 (*Valstybės žinios*, 2006, No. 59-2103; 2009, No. 159-7267), which regulates discharge of hazardous and priority hazardous substances in wastewater.

148. Brief description of the measures

148.1. Establishment of the maximum allowable concentrations

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 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:

- 1) the maximum allowable concentrations for priority hazardous substances;
- 2) the maximum allowable concentrations for hazardous and other controlled substances;
- 3) controlled parameters of industrial discharges by types of pollution sources.

The Wastewater Management Regulation has also provided for phasing out and cessation of discharge of certain hazardous substances in wastewater.

148.2. Monitoring of hazardous and priority hazardous substances by economic entities

A system of self-control of discharge of certain hazardous and priority hazardous substances in wastewater has been set up. Depending on the type of economic activity, economic entities have to conduct monitoring of discharge of hazardous substances every two or three years.

148.3. Monitoring of hazardous substances in surface waters

The National Environmental Monitoring Programme for 2005-2010 was approved by Resolution No. 130 of the Government of the Republic of Lithuania of 7 February 2005 and amended by Resolution No. 830 of the Government of the Republic of Lithuania of 27 August 2008 (*Valstybės žinios*, 2008, No. 104-3973). The latter document envisages specification and maximum improvement of the measures developed for the period 2008-2010.

It has been provided for to examine specific pollutants in water in 59 sites during an intensive river monitoring programme. Depending on parameters, measurements should be performed 4 or 12 times per year. Specific pollutants in river bottom sediments should also be examined in 59 sites once in six years. During operational monitoring in rivers, specific pollutants in water of water bodies at risk are examined 12 times per year taking measurements once in six years, and in bottom sediments – once in six years.

The Nemunas RBD Management Plan drafted at the end of 2009 envisages examining specific pollutants in 30 sites as part of the implementation of an intensive river monitoring programme. Measurements should be taken 12 times a year. Specific pollutants in river bottom sediments are planned to be examined once a year in 24 sites. During operational monitoring in rivers, specific pollutants in the water of water bodies at risk are to be examined 12 times a year taking measurements twice in six years, and in bottom sediments – once a year taking measurements twice in six years.

The Monitoring Programme for 2005–2010 for lakes envisages examining specific pollutants in the water of water bodies at risk 4 times a year taking measurements once in six years, and in bottom sediments – once in six years.

The intensive monitoring programme for lakes and ponds provided in the Nemunas RBD Management Plan which was drafted at the end of 2009 envisages examining specific pollutants in the water of water bodies at risk 9 times a year and in bottom sediments – once a year with measurements to be performed every year.

Under the National Monitoring Programme, all substances contained in the list of priority hazardous substances, except for hexachlorobutadiene (HCB) were monitored in river water in 2008. Also, concentrations of 22 hazardous substances and their compounds were measured in water of rivers. In lakes, concentrations of seven hazardous priority substances and four listed hazardous substances and their compounds were measured in water.

Hazardous and priority hazardous substances are also examined in bottom sediments of lakes and rivers: concentrations of two substances from the list of priority hazardous substances are examined in lake bottom sediments and one substance from this list – in bottom sediments of rivers where monitoring is also conducted in respect of eight substances from the list of hazardous substances.

Priority hazardous, hazardous and other substances subject to regulation in Lithuania in coastal and transitional waters and in the territorial sea are examined in water, bottom sediments and biota (in fish and molluscs).

During the project *Identification of substances dangerous for the aquatic environment in Lithuania* funded by the Finnish Ministry of the Environment, new generation

pollutants – phtalates and organotin compounds – were detected in water bodies in 2007. The project proposed the following controls over hazardous substances:

- 1) to include new polluting substances into the Lithuanian legislation and IPPC permits;
- 2) to identify primary sources of hazardous substances;
- 3) to supplement the Dangerous Substances Monitoring Programme with new compounds;
- 4) to improve methods of examination (chemical analysis) of hazardous substances;
- 5) to develop standard sampling procedures for hazardous substances.

The amended Programme on the Reduction of Water Pollution with Hazardous Substances approved in 2008 took into account the outputs of the said project.

### **Measures for reducing the impact of accidental pollution incidents**

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.

149. Measures for preventing and reducing pollution which occurs during accidents have been provided for in the following legislation:

- 1) Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2004, No. 130-4649, No. 109-4159);
- 2) Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 on the approval of the Programme on Inspection of Dangerous Installations of the Republic of Lithuania (*Valstybės žinios*, 2007, No. 3-143).

150. Measures proposed and already under implementation:

#### 150.1. Drafting of safety reports and emergency response plans

The Regulations on 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 accident prevention plans. A list of potentially dangerous installations includes 21 installations in Lithuania subject to the requirements of Directive 96/82/EC.

#### 150.2. Selection of a suitable place

The Regulations 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.

#### 150.3. Controls over the fulfilment of the requirements

Programmes on 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.

A number of accidents occur in coastal waters. Table 133 below provides statistics on pollution incidents during 2004-2008, which demonstrates that as much as 85 % of the pollution incidents took place in Klaipėda port, with the remaining 13 % happening in the Baltic Sea.

Table 133. Pollution incidents/cases (data of Klaipėda Regional Environmental Protection Department, Marine Environment Protection Agency)

Place of pollution	2004	2005	2006	2007	2008	Total
Klaipėda port	17	15	19	14	14	79
Curonian Lagoon	-	-	-	-	2	2
Baltic Sea	1	4	1	-	6	12
<b>Total:</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>14</b>	<b>22</b>	<b>93</b>
<b>Number of received notifications on pollution</b>	<b>35</b>	<b>50</b>	<b>31</b>	<b>35</b>	<b>26</b>	<b>177</b>

For the purpose of expedient receipt of as comprehensive information on accidents, pollution incidents in the sea as possible, the system of transmission of notifications from ships and aircrafts and receipt of messages onshore must be improved. All emergency response, fire extinction, rescue, and other plans should provide for one institution receiving initial notifications on accidents and incidents in the sea on the territory of Lithuania and transmitting the information received to other relevant institutions. Besides, Regulation 5 of Annex VII of the Helsinki Convention provides for that the Contracting Parties may request “masters or other persons having charge of ships and pilots of aircraft to report without delay on significant spillages of oil or other harmful substances observed at sea”.

This would facilitate collection of statistical information, preparation of analysis and summaries (of causes, types and tendencies of accidents and incidents) and preparation of relevant conclusions and recommendations on application of preventive measures, etc. Accordingly, it is recommended to draft a unified procedure for the provision of notifications from ships and aircrafts on pollution incidents and ship accidents at sea.

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

151. The issuance of permits is regulated by Order No. 1-06 of the Director of the Lithuanian Geological Survey under the Ministry of the Environment of 3 February 2003 on the approval of the procedure for the inventory of discharges of hazardous substances into groundwater and collection of information thereon (*Valstybės žinios*, 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**

152. Pollution from point sources is regulated by the Wastewater Management Regulation adopted by Order No. D1-236 of the Minister of the Environment of the Republic of Lithuania of 17 May 2006 (*Valstybės žinios*, 2006, No. 59-2103; 2009, No. 159-7267) and Order No. 80 of the Minister of the Environment on 27 February 2002 of the Rules on the Issuing, Renewal and Revocation of the Integrated Pollution Prevention Permits (*Valstybės žinios*, 2002, No. 85-3684; 2009, No. 1-12).

**Measures for flood control**

153. With a view to prepare for floods and respond to the consequences thereof, Programmes of Klaipėda and Tauragė Counties on the Preparation for Floods and Response to Flood Consequences for 2007-2015 were approved by Resolution No. 1202 of the Government of the Republic of Lithuania of 30 November 2006 (*Valstybės žinios*, 2006, No. 132-5007). The objective of this Programme is to reduce economic losses incurred by floods in Klaipėda and Tauragė counties, ensure operation of the polder system by employing organisational and technical measures, to preserve people's lives, health, property, and protect the environment from a negative impact of floods.

**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**

154. Order No. D1-382 of the Minister of the Environment of the Republic of Lithuania of 29 July 2005 on the approval of the procedure for the estimation of the environmental water flow (LAND-22-97) (*Valstybės žinios*, 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.

155. Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 on the approval of a list of dams where fish migration facilities should be constructed and former dams where fish migration barriers have to be removed (*Valstybės žinios*, 2007, No. 102-4180)

This list contains 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 are included on the list of objects of cultural heritage.

156. Order No. 68 of the Minister of Agriculture of the Republic of Lithuania of 23 February 2000 on measures for fish protection in small hydropower plants (*Valstybės žinios*, 2000, No. 19-471; 2003, No. 78-3583)

This legal act gives the number of fish that are allowed to be injured in hydro turbines, recommends power generators to select turbines which have the least potential impact

on hydrobiont 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 bodies of water which are unlikely to achieve the environmental objectives set out under Article 4**

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

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

157.2. in the procedure laid down by the Minister of the 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 questions.

Postponement and mitigation of the set objectives may be applied only upon well-founded proof of the necessity of the derogation.

584 water bodies in the category of rivers have been delineated within the Nemunas RBD, of which 54 ones have been designated as heavily modified water bodies.

The category of lakes and ponds contains 276 lakes and ponds larger than 50 ha in the Nemunas RBD. Four water bodies have been assigned to the category of transitional waters (one of which has been designated as a heavily modified water body) and two water bodies – to the category of coastal waters. All water bodies in then categories of transitional and coastal waters have been identified as water bodies at risk.

158. During the first stage of the implementation of the Programme of Measures (2010-2015), good status is expected to be achieved in 56 water bodies under the category of rivers and one body of water in the category of lakes, which currently fail the good status requirements and have been designated as water bodies at risk, by 2015. Thus, good status would be achieved in 17.5 % of water bodies in the category of rivers and 1.56 % – in the category of lakes identified as water bodies at risk within the first planning stage.

The following tasks have been envisaged for the first Programme implementation stage (2010-2015):

158.1. to achieve that 36 water bodies in the category of rivers and 1 body of water in the category of lakes which are currently categorised as water bodies at risk comply with the good status criteria by 2015;

158.2. to achieve that 20 heavily modified water bodies in the category of rivers which are currently categorised as water bodies at risk comply with the good potential criteria by 2015. In total, 320 water bodies in the category of rivers (including 34 heavily modified and artificial water bodies), 64 lakes and 26 ponds larger than 50 ha were designated as water bodies at risk in 2009. Good status or good potential would be achieved in 17.5 % of water bodies in the category of rivers and 1.56 % - under the category of lakes identified as water bodies at risk after the implementation of the measures of the first Programme implementation stage;

158.3. to evaluate and to find out whether three groundwater bodies at risk will comply with the requirements for good chemical status in 2015;

158.4. to maintain the existing high or good status in 240 water bodies under the category of rivers and 169 ones under the category of lakes;

158.5. to maintain the existing maximum or good potential in 24 artificial and heavily modified water bodies under the category of rivers and 17 ones under the category of ponds and artificial lakes;

158.6. to prevent deterioration in the status of transitional and coastal water bodies;

158.7. to maintain the existing good qualitative and chemical status of groundwater bodies.

Objectives for the second stage for water bodies which will still be failing the water protection objectives at the end of the first Programme implementation stage are going to be set upon assessment of the status of water bodies in 2015, identification of problems, revision of the objectives, and updating of the measures for a new six years' period.

159. It is impossible to envisage precise targeted outputs for the second stage before the start of the first stage. The outputs to be pursued will be provided for only after the implementation of the measures of the first stage, especially after the performance of studies on ambiguous problems. Taking into account the expected outputs of the first stage, the following outputs should be produced during the second and the third Programme implementation stages (2016-2027):

159.1. 250 water bodies in the category of rivers and 63 ones in the category of lakes which will still be failing the good status requirements in 2015 are expected to achieve good status in 2027;

159.2. In the second stage, good status is expected to be achieved in:

159.3. water bodies in the category of rivers where the ecological status is currently assessed as moderate or good chemical status has not been achieved due to impacts of anthropogenic pressures;

159.4. 50 water bodies in the category of rivers designated as water bodies at risk due to impacts of the bed straightening and HPP;

159.5. 55 under the category of lakes where the ecological status is currently assessed as moderate.

160. In the third stage, good status is expected to be achieved in:

- 161. 10 water bodies in the category of rivers where the ecological status is currently lower than moderate due to impacts of anthropogenic pressures;
- 162. 116 water bodies in the category of rivers designated as water bodies at risk due to impacts of the bed straightening and HPP;
- 163. 54 water bodies in the category of rivers designated as water bodies at risk due to impacts of both anthropogenic pressures and the bed straightening or HPP;
- 164. 8 water bodies in the category of lakes where the ecological status is currently assessed as lower than moderate.

The implementation of the measures of the second and third Programme implementation stages would result in the achievement of good status in all water bodies at risk under the categories of rivers, lakes, transitional and water bodies.

160. 14 artificial and heavily modified water bodies under the category of rivers and 26 ponds larger than 50 ha which will be failing the good potential requirements in 2015 are expected to have achieved good potential in 2027 in the Nemunas RBD.

160.1 In the second stage, good potential should be achieved in:

160.1.1. 5 artificial and heavily modified water bodies in the category of rivers where the ecological potential is currently assessed as moderate due to impacts of anthropogenic pressures;

160.1.2. 17 ponds where the ecological potential is currently assessed as moderate.

160.2. In the third stage, good potential should be achieved in:

160.2.1. 9 artificial and heavily modified water bodies in the category of rivers where the ecological potential is currently assessed as lower than moderate due to impacts of anthropogenic pressures;

160.2.2. 9 ponds where the ecological potential is currently assessed as lower than moderate.

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

Supplementary measures will be proposed for water bodies which will fail to meet 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)**

161. All basic measures which improve the status of inland waters also have a positive impact on the status of sea waters. These include implementation of the requirements of the Urban Waste Water Directive and the Nitrates Directive, and HELCOM recommendations.

On 15 November 2007, the Ministers of the Environment of the Baltic states adopted a HELCOM Baltic Sea Action Plan, which provides for actions to achieve good

ecological status of the Baltic Sea by 2021 and deals with four problems which are currently most urgent in the Baltic Sea: eutrophication, pollution with hazardous chemical substances, extinction of biodiversity, and a negative impact of navigation and other marine activities. 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, 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. Although the WFD does not contain a provision that measures adopted under international agreements, such as HELCOM, should unconditionally be considered as basic measures, the HELCOM measures, and especially the Baltic Sea Action Plan, are included among the basic measures in this Programme of Measures because Lithuania itself has undertaken to observe this agreement and the established actions.

So far it is difficult to assess the effectiveness of the Baltic Sea Action Plan. The following targets in relation to the prevention of marine pollution have been set:

#### 161.1. Launching and implementation of a national programme in accordance with the HELCOM Baltic Sea Action Plan

It was agreed to develop and to submit for HELCOM's assessment national programmes by 2010 with a view to evaluate the effectiveness of the programmes at a Ministerial Meeting in 2013 and to further evaluate whether additional measures are needed either on a national, HELCOM, or global level. In developing the programmes, it was to take into account the need for:

161.1.1. identification of sources of the selected hazardous substances or substance groups;

161.1.2. a ban or restrictions on the use of identified relevant hazardous substances or substance groups;

161.1.3. substitution of the selected hazardous substances or substance groups with less hazardous substances;

161.1.4. development of technical guidance documents for environmental permitting addressing hazardous substances;

161.1.5. capacity building for authorities and industries with regard to identification of hazardous substances and the possibilities for elimination of the use of substances as well as application of BEP and BAT;

161.1.6. raising awareness among consumers by arranging campaigns and disseminating information about environmentally friendly products;

161.1.7. relevant legislation including a proper definition of hazardous substances.

Besides, it was agreed to further identify, estimate and reduce the discharges, emissions and losses from sources within the identified potential sectors and main uses and include them into national implementation programmes.

#### 161.2. Update of HELCOM Recommendation 19/5 on the HELCOM Strategy for hazardous substances

It was agreed to update HELCOM Strategy for hazardous substances (Recommendation 19/5) with a view to identify important sources and pathways of hazardous substances to the environment.

#### 161.3. Update of HELCOM Recommendation 24/4 for the iron and steel industry

It was agreed to update HELCOM requirements for iron/steel industry (Recommendation 24/4) with a view to identify important sources and pathways of hazardous substances to the environment.

#### 161.4. Screening of sources of selected hazardous substances

It has been agreed to conduct screening of selected substances in municipal and industrial wastewaters as well as landfill effluents and with storm waters

#### 161.5. Introduction of Whole Effluent Assessment Approach

It was agreed to introduce the whole effluent assessment (WEA) approach to monitoring of complex discharges of hazardous substances into the HELCOM framework and to establish a pilot project to test some of the presented methods by making a survey in the HELCOM countries in municipal wastewater treatment plants and some specific industrial sectors. The outcome of this pilot project should be used to evaluate the effluents jointly for the Baltic Sea region and to possibly establish PBT (persistent, bioaccumulating, toxic)-based discharge limit values based on the WEA approach.

This approach is widely applied in a number of European countries and involves the use of surrogate parameters, such as AOX (halogenated organic compounds) and BOD, and assessment of toxicity (Andersen et al. 2002).

#### 161.6. Establishment of chemical product registers to be built upon e.g. Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

It was agreed by 2010 to establish a register of chemical products in order to have more reliable substance-specific information on uses and amounts of chemicals used. It has to be taken into account that existing registers and those under development should be used as much as possible and the respective developments under, e.g. the EU regulatory framework for Registration, Evaluation, Authorisation and Restriction of Chemicals, REACH (EC 1907/2006) should be built upon.

#### 161.7. Start work on strict restrictions of use for perfluorooctane sulfonate (PFOS), nonylphenol/nonylphenoethoxylates (NP/NPEs), short-chain chlorinated paraffins (SCCPs)

It was agreed to start by 2008 to work for strict restrictions on the use in the whole Baltic Sea catchment area of the Contracting States of the following substances:

- 161.7.1. perfluorooctane sulfonate (PFOS),
- 161.7.2. nonylphenol/nonylphenoethoxylates (NP/NPEs),
- 161.7.3. short-chain chlorinated paraffins (SCCPs).

#### 161.8. Introduction of use restrictions and substitutions if relevant assessments show the need to initiate adequate measures for medium-chain chlorinated paraffins (MCCPs), octylphenols (OP)/octylphenol ethoxylates (OPE), perfluorooctanoic acid

(PFOA), decabromodiphenyl ether (decaBDE) and hexabromocyclododecane (HBCDD)

It was agreed to initiate adequate measures in respect of the below-listed substances by 2009, such as use restrictions and substitutions of these substances in the most significant sectors identified by the Contracting Parties if relevant assessments show the need to initiate adequate measures:

- 161.8.1. medium-chain chlorinated paraffins (MCCPs),
- 161.8.2. octylphenols (OP)/Octylphenol ethoxylates (OPE),
- 161.8.3. perfluorooctanoic acid (PFOA),
- 161.8.4. decabromodiphenyl ether (decaBDE).

161.9. Introduction of ban on the use, production and marketing of endosulfan, pentabromodiphenylether (pentaBDE) and octabromodiphenylether (octaBDE)

It was agreed to ban the use, production and marketing of the following substances by 2010:

- 161.9.1. endosulfan,
- 161.9.2. pentabromodiphenylether (pentaBDE),
- 161.9.3. octabromodiphenylether (octaBDE).

161.10. Assessment of possibility of introduction of restrictions on cadmium content in fertilisers

It was agreed to assess by 2009 the possibility of introducing restrictions for cadmium content in fertilisers.

161.11. Application of strict restrictions on the use of mercury in products and from processes and support the work towards further limiting and where feasible totally banning mercury in products and from processes

It was agreed to apply strict restrictions on the use of mercury in products and from processes and support the work towards further limiting and where feasible totally banning mercury in products and from processes. This issue will be reviewed at the HELCOM Ministerial Meeting in 2010.

161.12. Application of same requirements concerning hazardous substances for products marketed globally as in the internal European market

It was agreed on the need to apply the same requirements for products marketed globally as in the internal European market concerning hazardous substances

161.13. Implementation the Globally Harmonised System (GHS) on classification and labelling of chemicals and to take into account guidelines for preparing safety data sheets

It was agreed to implement as soon as possible the Globally Harmonised System on classification and labelling of chemicals and to take into account guidelines for preparing safety data sheets.

161.14. Input to international forums to influence work on hazardous substances (e.g. revision of BREFs, REACH, plant protection and biocides regulation, etc.)

It was agreed to influence ongoing work on hazardous substances in other international forums by coherent input by HELCOM Contracting States, where possible based on a common HELCOM position:

161.14.1. to the development of EU BAT Reference Documents in order to enhance implementation of BAT with regard to hazardous substances with special focus on main uses or on uses having high emission factor to the environment;

161.14.2. to the updating of the EU Water Framework Directive list of priority substances and substances to be evaluated under REACH with a special focus on those substances included in Annex XIV of the EU chemicals legislation REACH, including by transmitting monitoring data to the European Chemical Agency;

161.14.3. on placing of plant protection and biocides products on the market, if e.g. levels of these substances in the Baltic marine environment are so high that they may cause adverse effects on marine organisms.

#### 161.15. Promotion of and participation in SAICM implementation process

It was agreed to promote the principle of Strategic Approach to International Chemical Management (SAICM) and to participate in the introduction thereof on a regional basis as soon as possible and in any case not later than by 2010.

#### 161.16. Development of biological effects monitoring

It was agreed starting in 2008 to develop biological effects monitoring to facilitate a reliable ecosystem health assessment.

161.17. Continuation of HELCOM's work with regard to radioactivity, including monitoring of discharges, emissions from nuclear power plants as well as their effects in the marine environment in order to reach the targets for radioactivity

It was agreed to continue HELCOM's work with regard to radioactivity, including monitoring of discharges, emissions from nuclear power plants as well as their effects in the marine environment in order to reach the targets for radioactivity.

161.18. Approval of HELCOM Recommendation 28E/7 concerning measures aimed at the substitution of polyphosphates (phosphorus) in detergents

It was agreed to approve HELCOM Recommendation 28E/7 concerning measures aimed at the substitution of polyphosphates (phosphorus) in detergents.

Polyphosphates as builders in laundry detergents for consumer use should be substituted according to national programmes and measures within a timetable to be presented and decided at the HELCOM Ministerial Meeting in 2010. A study is planned to further investigate possibilities for the substitution of the use of polyphosphates as builders in dishwasher detergents for consumer use. Also, investigations on alternative builders, especially on their use and environmental effects, will be carried out. Substitution of the use of polyphosphates as builders in dishwasher detergents for consumer use will be reconsidered in 2010 (HELCOM 2007).

The National Strategy on the protection of the Marine Environment of the Baltic Sea and the Action Plan for the implementation thereof will also include the measures recommended in the HELCOM Baltic Sea Action Plan which are most relevant for Lithuania.

**Measures for mitigating 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**

The Programme on the Preparation of Klaipėda and Tauragė Counties for Floods and Response to Flood Consequences for 2007-2015 was approved by Resolution of the Government of the Republic of Lithuania No. 1202 of 30 November 2006 intended for dealing with both unforeseen and natural floods and response to their consequences (*Valstybės žinios*, 2006, No.132-5007).

Plans have been made to create an effective system for the forecasting of flood risks and for the provision of information to rescue services and population, to improve the technical base and measures for the organisation of rescue operations.

Measures for the prevention and mitigation of pollution arising from unforeseen accidents (which are always unpredictable) have been provided for in the following legislation:

- 1) Resolution No. 966 of the Government of the Republic of Lithuania of 17 August 2004 on the approval of the Regulations on the Prevention, Response to and Investigation of Industrial Accidents (*Valstybės žinios*, 2004, No. 130-4649; 2009, No. 109-4159);
- 2) Order No. 1-528 of the Director of the State Fire and Rescue Department of 29 December 2006 on the approval of the Programme on Inspection of Dangerous Installations of the Republic of Lithuania (*Valstybės žinios*, 2007, No. 3-143).

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.

More effective coordination of the activities of responsible institutions, potential polluting entities and other related organisations are recommended in order to strengthen response capacities in cases of ship accidents and other pollution incidents at sea as well as to improve the system of response to oil spills at sea (e.g. by joint training programmes, coordination of acquisitions of equipment, exchange of the latest information, etc.).

### **OTHER BASIC MEASURES**

162. In addition to the basic measures for the improvement of the water quality provided for in the above-said directives, supplementary programmes fully or partially designed for water protection and sustainable development have been developed and implemented in Lithuania, which are listed and briefly overviewed below.

162.1. Programme on Reduction of Water Pollution by Agricultural Sources approved by Order No. 3D-686/D1-676 of the Minister of Agriculture and the Minister of the Environment of the Republic of Lithuania of 9 December 2008 (*Valstybės žinios*, No. 143-5741)

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:

162.1.1. 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;

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

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

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

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

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

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

162.2. 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 (*Valstybės žinios*, 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:

162.2.1. research 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.);

162.2.2. research 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.);

162.2.3. 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.);

162.2.4. 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.);

162.2.5. dissemination of information on groundwater resource, their quality, use, and protection (publishing geological and hydro-geological information, preparation of a map of the Lithuanian groundwater resources, etc.).

162.3. Programme on the Assessment and Use of Groundwater Resources for the Provision of Drinking Water for 2007–2025 approved by Resolution No. 562 of the Government of the Republic of Lithuania of 8 June 2006 (*Valstybės žinios*, 2006, No. 66-2436)

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 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 expansion of water supply systems in Lithuanian towns and rural settlements, and management thereof on the sub-basin level. Tasks provided for in the Programme:

162.2.1. 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;

162.2.2. to develop measures for the protection, improvement and quality control of the resources of groundwater 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.);

162.2.3. 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);

162.2.4. to conduct scientific research focused on regional problems of formation of the chemical composition of groundwater (to determine the origin of chloroorganic 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.

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

162.4.1. The objectives of the Strategy are as follows:

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

162.4.1.2. 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.

262.4.2. Tasks for 2008–2009:

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

262.4.2.2. to inform consumers on safety and quality of publicly supplied water;

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

In 2009, the Ministry of the Environment developed a Plan of Measures for 2010-2015 and submitted it to the Government of the Republic of Lithuania. The measures for the implementation of 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.

162.5. Programme on the Preparation of Klaipėda and Tauragė Counties for Floods and Response to Flood Consequences for 2007-2015 approved by the Government of the Republic of Lithuania Resolution No. 1202 of 30 November 2006 (*Valstybės žinios*, 2006, No. 132-5007)

The objective of the Programme is to reduce economic losses incurred by floods in Klaipėda and Tauragė counties, to ensure operation of the polder system employing organisational and technical measures, to preserve people's lives, health, property, and to protect the environment from a negative impact of floods. The Programme is intended for Klaipėda and Tauragė counties. The main tasks:

162.5.1. to prepare relevant feasibility studies and to provide a scientific justification of measures for the reduction of flood consequences, construction of waterworks, and repair and reconstruction of the existing facilities;

162.5.2. on the basis of the feasibility studies and technical documentation, to reconstruct facilities and embankments of the polder system, to construct protective embankments, and to implement measures for the reduction of river bank erosion;

162.5.3. to create an effective system for the forecasting of flood risks and for the provision of information to rescue services and population, to improve the technical base and measures for the organisation of rescue operations;

162.5.4. to prepare relevant project documentation (to conduct research) and to clean and dredge the bed of the Minija and the Tenenis; to clear away shoals in the river bed and distributaries of the Nemunas;

162.5.5. to provide indispensable health care services for the population living in flood areas.

Funds for the implementation of the measures laid down in the Programme are provided for, taking into account the financial possibilities of the country, and specified in a draft Law on the Approval of the Financial Indicators of the State and Municipal Budgets of a respective year. In addition, the measures may be financed from the EU Structural Funds, EU Cohesion Fund, European Agricultural Fund for Rural Development, and European Regional Development Fund.

162.6. National Strategy for the Implementation of the United Nations Framework Convention on Climate Change by 2012 approved by Resolution of the Government of the Republic of Lithuania No. 94 of 23 January 2008 (*Valstybės žinios*, 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 2008–2012 to 8 % below 1990 levels. The main tasks:

162.6.1. 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 current state and preparation of forecasts, to accumulate and store necessary data on climate state and change;

162.6.2. to conduct assessments of the landscape, ecosystems and biological diversity (including protected areas) for the purpose of assessment of an impact 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 purpose of conservation of the landscape, ecosystems and biological diversity (including the development and implementation of river renaturalisation projects, measures for wastewater treatment, and safe handling of sludge, etc.);

162.6.3. 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;

162.6.4. to introduce measures which reduce greenhouse gas emissions in wastewater management and to adjust their storage facilities to potential climate changes;

162.6.5. to develop scientific research, including technologies designed for the assessment and mitigation of consequences of climate change;

162.6.6. 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.

162.7. Lithuanian Rural Development Programme (hereinafter – RDP) for 2007-2013 approved at the EU Rural Development Committee on 19 September 2007

The overall objective of Axis 1 *Improving the competitiveness of the agricultural and forestry sector* is to develop modern and competitive agri-food and forestry sectors. The total amount envisaged for its implementation is EUR 930.20 million.

The overall objective of Axis 2 *Improving the environment and the countryside* is to improve environment and landscape and to stop decline of biodiversity through rational use of land resources and promotion of sustainable development of agriculture and forestry. The total amount envisaged for its implementation is EUR 824.59 million.

The overall objective of Axis 3 *Improving the quality of life in rural areas and encouraging diversification of economic activity* is to improve the quality of life and increase the employment of rural population in rural areas. The total amount envisaged for its implementation is EUR 275.61 million.

The overall objective of Axis 4 *Leader* is to promote rural development through local initiatives and partnership. The total amount envisaged for its implementation is EUR 136.99 million.

The implementation of the Water Framework Directive mainly relates to the measures provided for under Axes 1 and 2.

The areas to be funded under the Measure *Modernisation of agricultural holdings* of Axis 1 of the RDP are those required for the implementation of the Nitrates Directive: construction/ reconstruction of manure storages and/or slurry reservoirs; acquisition of new manure and slurry storage equipment, special machinery for taking away manure and slurry, slurry injection and spreading equipment and machinery.

Measures under Axis 2 *Improving the environment and the countryside* are planned to be implemented in three priority areas:

Priority 1: Environment-friendly farming practices. The key measure is agri-environment payments (Organic Farming Scheme);

Priority 2: Mitigation of climate change. Measures: first afforestation of agricultural land; first afforestation of non-agriculture land and afforestation of abandoned agricultural land; restoring forestry potential and introducing prevention actions, non-productive investments in forests; forest environment payments;

Priority 3: Preservation of biodiversity and development of high nature value and traditional agrarian areas. Measures: Natura 2000 payments; payments to farmers in areas with handicaps, other than mountain areas; Landscape Stewardship Scheme; Local Rare Animal and Poultry Breeds Scheme; Programme for improving the status of water bodies at risk.

The measures under this Axis are related to the application of environmentally friendly farming practices; overall mitigation of a negative impact on surface water and groundwater bodies and improvement of their status; preservation and maintenance of meadows; conservation of biodiversity; sustainable use of natural resources; conservation of traditional countryside landscapes; sustainable development of forestry.

162.8. Cohesion Promotion Action Programme approved by the Commission Resolution of 30 July 2007

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 this programme under the Convergence objective is 2 648 332 571 EUR (the allocation for

*Environment and sustainable development* totals to 1 128 119 555 EUR). The Programme is financed from the European Regional Development Fund Cohesion Fund (environment protection). The objectives of the Cohesion Promotion Action Programme:

162.8.1. to provide for conditions necessary for strengthening and unlocking local potential;

162.8.2. 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;

162.8.3. to seek better quality of the environment, with particular emphasis on especially increasing energy efficiency.

The attainment of the 3<sup>rd</sup> objective focuses on the improvement of the status in water bodies and implementation of the provisions of the Water Framework Directive 2000/60/EC, Urban Wastewater Treatment Directive 91/271/EEC, and other directives which regulate water protection and use. The following tasks have been set:

- 1) to renovate and develop water supply and wastewater treatment systems;
- 2) to identify water protection and management measures: to develop management plans, programmes of measures for the Nemunas, Venta, Lielupė, and Daugava River Basin Districts, as well as other documents necessary for the establishment of water protection objectives; to carry out a preliminary assessment of flood risks in the Nemunas, Venta, Lielupė, and Daugava River Basin Districts; to develop maps of flood threats and risks, and a flood risk management plan;
- 3) 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 entry of pollutants into water bodies; environmental cleanup and rehabilitations of banks).

The table below lists the institutions responsible for the implementation of the basic measures and the investments required.

Table 134. Summary of the basic measures

Directive	Institution in charge	Costs		
		Investment, LTL	Operating, LTL/year	Annual, LTL
Bathing Waters	MoH, municipalities	0	513 020	513 020
Birds	State Service for Protected Areas (SSPA)	7 015 546	3 866 833	4 819 833
Drinking Water	State Food and Veterinary Service	Including the costs of the Nitrates Directive		
Seveso	Fire and Rescue Department			
Environmental Impact Assessment	Ministry of the Environment (MoE)			
Sewage Sludge	MoE	448 745 000	13 462 350	52 586 350
Urban Wastewater Treatment	Municipality	903 183 000	45 159 100	123 901 100

Directive	Institution in charge	Costs		
		Investment, LTL	Operating, LTL/year	Annual, LTL
Plant Protection Products	Ministry of Agriculture, State Plant Protection Service			
Nitrates	MoA, MoE	431 263 572	4 312 636	41 912 636
Habitats	SSPA	4 817 642	7 776 829	8 432 829
Integrated Pollution Prevention and Control	MoE	0	0	0
<b>Total ~:</b>		<b>1 795 000 000</b>	<b>75 100 000</b>	<b>232 200 000</b>

### CHAPTER III. SUPPLEMENTARY MEASURES FOR ACHIEVING GOOD STATUS OF WATER IN THE NEMUNAS RBD

163. Supplementary measures have been proposed for the bodies of water which will fail to meet 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:

- 163.1. Reduction of the impact of municipal wastewater;
- 163.2. Mitigation of the impact of agricultural pollution;
- 163.3. Mitigation and regulation of hydromorphological changes;
- 163.4. Improvement of the status of lakes and ponds;
- 163.5. Reduction of the impact of recreation;
- 163.6. Improvement of the status of groundwater wellfields;
- 163.7. Improvement of the status of coastal and transitional waters;
- 163.8. Reduction of the impact of industrial facilities.

164. The programme of supplementary measures encompasses measures which are grouped together on the basis of the following aspects:

164.1. Type of the measure: measures can be legal and administrative; technical (investments); various studies, educational and pilot projects, and economic instruments;

164.2. Application scope of the measure: measures can be national; applicable to problematic areas; applicable to specific areas only;

164.3. Time of application;

164.4. Sector of economy responsible for the implementation of the respective measure: measures can be implemented by national institutions, municipal administrations, including water supply companies, and the private sector (farmers, owners of hydropower plants, industrial enterprises).

165. In addition, supplementary measures were also selected according to the type of water bodies (lakes, rivers, transitional and coastal waters) and individually for certain specific pollution types (like pollution with hazardous substances).

Extension of the deadline for achieving water protection objectives in the first cycle of the implementation of the WFD is recommended for 353 bodies of water (264 rivers, 63 lakes and 26 ponds).

The same result was also obtained during the screening of measures on the basis of indicators of their effectiveness and applicability. Such analysis was most successful in the sector of agriculture because it contains a longer list of potential measures than actually required for the achievement of the relevant objectives. Measures against agricultural pollution were selected according to the ratio of the pollution reduction effect of the measure (e.g. reduction of kgN in one hectare) to the costs required to obtain such effect in each catchment. Relatively cheapest measures should be implemented first. If a cheap measure is not sufficient taking into account the potential area of its implementation, other, more expensive, measures are proposed.

Measures to reduce point pollution were proposed for each individual settlement taking into account the current pollution situation and the existing wastewater treatment devices.

The costs were estimated using average prices. In each case, selection of a specific technology in an individual settlement would require detailed examination of the location and of the applicability of the technology.

Measures for the mitigation of hydromorphological changes were selected following specific technical proposals put forward by experts and thus did not involve alternative estimations of costs. However, the costs of one measure – renaturalisation – will be known after the implementation of the pilot projects in the Grūda River proposed for the first WFD implementation cycle.

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

### **Measures for reducing point pollution**

166. In the Programme of Measures, the measures designed to reduce point pollution are intended for the upgrading of wastewater treatment facilities in towns and settlements where the present treatment level is not sufficient as indicated by modelling results (i.e. having taken into account the implementation of the basic measures), which happens mainly because of poor capacity of the receiving waters to dilute wastewater.

Two alternative technologies are proposed for most facilities. The first one is based on wider application of mechanical/automatic devices which consume more power but ensure higher reliability of treatment; such technologies can be regulated on the basis of an actual demand. The second one is based on natural devices which require little power but a larger territory and the process itself is more difficult to control. Besides, such technologies take into account whether any basic measures have been implemented or whether there was no such need, for example, due to a small size of a settlement in question).

A very urgent problem in the Nemunas RBD, like in the rest of Lithuania, is management of surface runoff. To date there is little information on surface (storm water) runoff. Hence supplementary studies are planned for the first WFD implementation cycle. The studies would identify concentrations of biogenic

substances, suspended matter, oil, and hazardous substances in surface runoff discharged into the Vyžuona River on the territory of Utena town, into the Šeimena River on the territory of Vilkaviškis town, into the Nevėžis River on the territory of Panevėžys city, into the rivers Smeltalė, Akmena-Danė, Ražė and into the Curonian Lagoon on the territories of Klaipėda city, Palanga and Neringa towns and Klaipėda Seaport area. The said areas have been selected because sources of polluting substances detected therein are not known and because study results indicate that dischargers of surface runoff in the said river may be exerting a significant impact on the status of the water bodies. The purpose of the studies will be to assess a demand of expansion of surface runoff treatment systems.

Another measure to be implemented at the national level is related to the reduction of pollution of waters with phosphorus compounds. A feasibility study is proposed with a view to assess an impact of the reduction of phosphorus in detergents on the quality of wastewater evaluating a potential effect of the reduction or banning of the use of phosphorus on the economic and social environment.

### **Measures for reducing diffuse pollution**

167. Water bodies in part of the Nemunas RBD fail to achieve good water status due to diffuse pollution from agriculture. This problem is the most acute in the Nevėžis Sub-basin and somewhat less serious in the Šventoji and Šešupė Sub-basins. Furthermore, pollution from agriculture exceeds the permitted levels in individual areas of the Neris Small Tributaries Sub-basin, also in the Dubysa and Jūra sub-basins. The areas where supplementary diffuse pollution reduction measures are required are demonstrated in Figure 2.

Supplementary measures aimed at reducing diffuse pollution from agriculture have been chosen on the basis of foreign experience in addressing diffuse pollution problems and scientific research conducted in Lithuania and abroad, as well as with reference to statistical data. The evaluation of measures was primarily focused on their physical relevance and on their pollution reduction effects and costs.

One of the most important criteria for the selection of measures is the effectiveness of agricultural measures. It is calculated by dividing annualised costs by the effect of the measure. The indicator is expressed in litas per kilogram of pollutants, i.e. it shows how much it would cost to remove one kilogram of nitrogen from a water body with the help of a certain measure. The effectiveness of measures is estimated on the basis of scientific research conducted in Lithuania and abroad. The cost estimation method depends on the measure in question and the available data.

The establishment of the indicators of measure effectiveness was followed by analyses of the acceptability of the measures, practical possibilities to implement a measure in question in a certain place, confidence that the measure will be implemented in the required place and to the required extent. Taking into account all these criteria, the order of priority and principles of application of the measures were established.

Some of the measures are proposed for the entire country irrespective of the intensity of agricultural activities. These measures would not be subject to compensation and their costs will have to be covered by farmers, which in a way would help to implement the polluter pays principle. The rest of the measures are recommended for specially identified areas. In cases when such measures are implemented by farmers, the

measures should be optional and reimbursable so as to provide equal farming conditions for all farmers.

Since an important indicator for the selection of measures is their effectiveness, it is proposed that first all the measures provided for under the Rural Development Programme for 2007-2013 (RDP) are introduced. Other measures would require additional state funds.

The excessive amounts of nitrogen generated due to agricultural activities are very difficult to remove from water bodies in individual areas where agriculture is especially intensive or exerts a more significant impact on surface water or groundwater than in other places because of natural conditions. In such cases technical solutions are suggested helping to catch pollutants before their entry into the main water systems. Since such technical measures require large investments and such solutions have never been applied in Lithuania before, it is recommended to begin with pilot projects, postponing the implementation of these measures (if proven effective) for the next planning period.

Although there is a number of alternatives to the proposed technical measures, those options are less effective, which means that they would have to be implemented to a considerable extent (hence increasing the risk of failure to achieve the set objectives in the event of even slight unacceptability of the measure) and their costs would be higher than those of the technical measures.

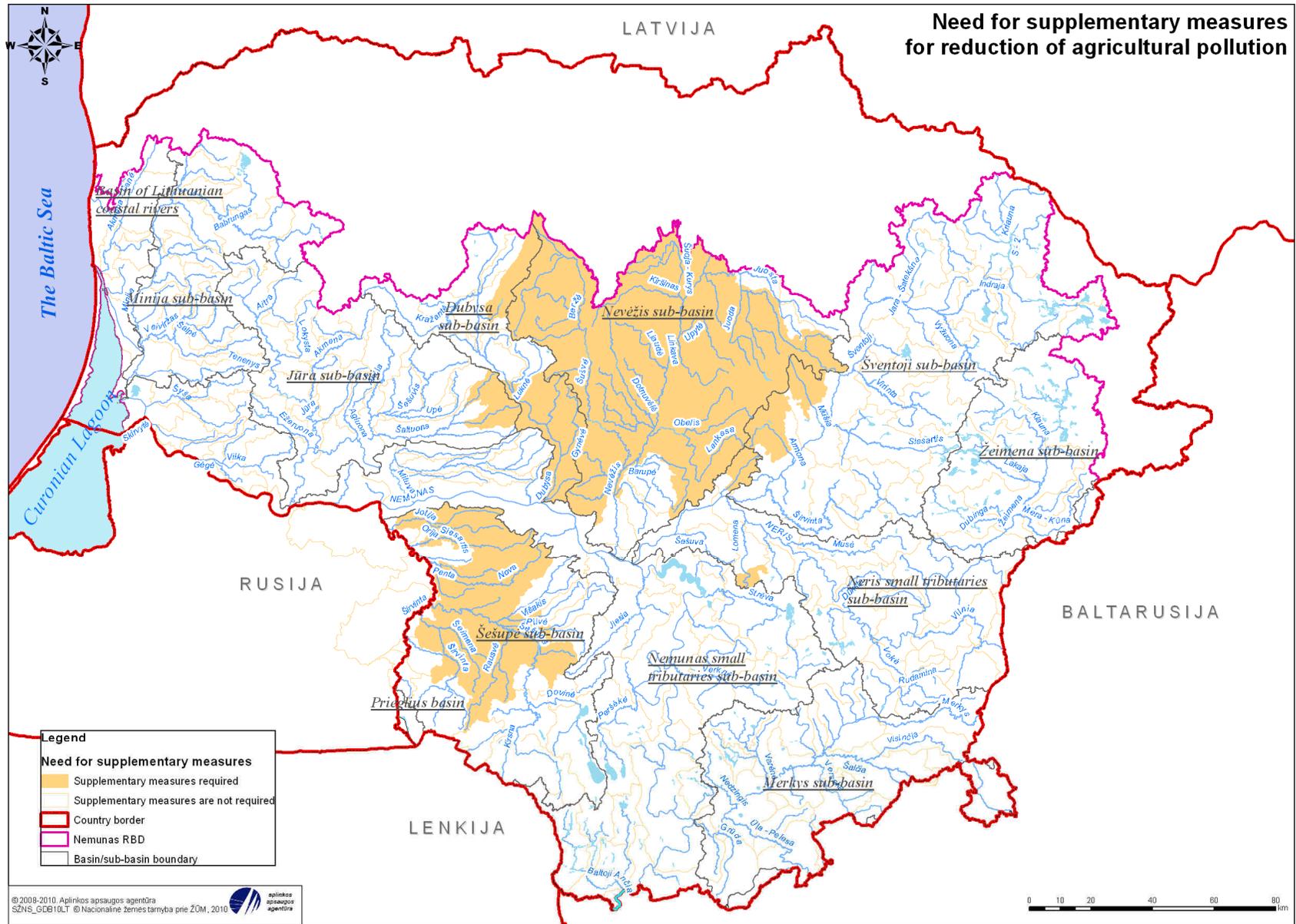


Figure 2. Areas in the Nemunas RBD where diffuse pollution from agriculture has to be reduced

The following sub-sections describe measures designed to reduce diffuse agricultural pollution.

### **Measures common for the whole of Lithuania**

168. 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.

169. Normative standards for plant fertilisation have to be prepared and validated comprising a legal and methodical basis for the development of fertilisation plans covering:

169.1. maximum allowable amounts of nitrogen and phosphorus fertilisers per hectare, irrespective of whether organic or mineral fertilisers are used;

169.2. general fertilisation recommendations;

169.3. a methodology for estimating the economically optimal amount of fertilisers.

170. 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 validate 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 suggested 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 farmers 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.

Normative standards and relevant documents should be revised and validated by 2012. The responsibility for the implementation of the measure should lie with the Ministry of Agriculture of the Republic of Lithuania.

Mandatory development and implementation of fertilisation plans for farms utilising from 10 ha to 150 ha of agricultural land

Effects of this measure would be seen in developing and implementing fertilisation plans which would not only balance fertilisation but also be a starting point for many measures related to fertilisation norms. It would reveal the amounts and types of fertilisers which get into the soil, at least in the part of land owned by farms utilising from 10 ha to 150 ha of agricultural land. The measure would be difficult to implement on smaller farms due to acceptability and considerable costs and its application only to larger farms would enable "control" only over a small portion of land (and thereby the input of fertilisers to the soil). Holdings over 10 ha cover about 91 % of all arable land in Lithuania, those over 100 ha constitute 41 % of arable land which belongs roughly to 2 000 farms (4 % of all farms), and holdings over 50 ha account for 55 % of all arable land in Lithuania (about 10 % of farms). It should be emphasised that the distribution by the farm size was made on the basis of the statistical data on the distribution of farms by utilised agricultural land and hence the actual share of arable land in the group of large farms is likely to be larger than the one given above.

Following observations and calculations, 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 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.

The strongest effects of fertilisation plans would be observed in intensive agricultural areas and the application of the measure in the 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 price for 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 has been derived from the data of farms using the services of the Agricultural Advisory Service). Hence, the average theoretical price for the development of a fertilisation plan for a farm has been equalled to LTL 500.

At present, fertilisation plans can be developed by any person having agricultural education. It is suggested to impose stricter requirements for natural and legal persons developing fertilisation plans.

The responsibility for the implementation of this measure, namely, the preparation and validation of legal acts by 2012, would lie with the Ministry of Agriculture, while

farmers would have to start implementing this measure, i.e. develop fertilisation plans and comply with their requirements, as from 2012.

171. To validate 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 under Order No. D1-367 / 3D-342 of the Minister of Agriculture of 14 July 2005 (as amended by Order No. D1-341/3D-307 of 18 June 2007). The Good Farming Rules provide for that solid manure may be temporarily stored in field heaps in accordance with the following recommendations:

- 1) temporary manure storage sites must be installed in higher locations to avoid any risk of getting flooded or waterlogged by rain;
- 2) the storage site must be confined with a 50 cm embankment;
- 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;
- 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. Assumptions are made that such maintenance would cost about LTL 10 per livestock unit per year (peat and periods of time for maintenance).

The responsibility for the implementation of this measure covering the development and validation of legal acts, i.e. the validation of good farming provisions as mandatory and not as recommendable (by 2011), would lie with the Ministry of Agriculture, while farmers would have to start implementing this measure as from 2012.

### **Measures applicable in identified areas**

172. These measures are not mandatory for the entire country. It is proposed that such measures are optional and their costs are compensated thus ensuring equal farming conditions for all farmers. It is very important that the support schemes are prepared/amended in a way enabling to implement the measures in due places and to the required extent. One of the most important criteria for the screening of measures is the indicator of effectiveness (the ratio of the effect to costs) hence first of all the implementation of measures which have already been granted funding should be promoted. At present, measures which facilitate the implementation of the objectives of the WFD in the sector of agriculture are supported by the Rural Development Programme (RDP) for 2007-2013. It is proposed to allocate additional funds for the support schemes intended for the growing of catch crops and conversion of arable land into grassland or fallow land in areas where agricultural pollution is especially significant.

Measures under the RDP for 2007-2013 which can improve the status of water bodies or have an indirect impact thereon

At present, support under the RDP for 2007-2013 is granted for various activities which contribute to the reduction of excessive nitrogen amounts in water bodies. It is recommended to amend the rules for the support schemes under RDP for 2007-2013 so that activities which can reduce entry of nitrogen and other nutrients into water bodies are encouraged to the maximum extent in the identified areas (Figure 2), i.e. in places where nitrogen concentrations in water bodies, as a result of agricultural activities, remain too high even after the application of common measures. A general recommendation is to redistribute support funds, if required, for all the below-listed support areas on a territorial basis, allocating more funds for the identified areas (Figure 2) and thus ensuring the maximum scope of the implementation of the said measures therein. The recommended amendments are discussed in the text below.

173.1. Lithuanian Rural Development Programme for 2007–2013, Axis I, Measure 1 “Vocational training and information actions”, Activity 2 “Dissemination of scientific knowledge and innovative practices related to agriculture, forestry and processing of agricultural products in a farm”. Rationale: Information and training are important measures supporting the implementation of other planned measures in the field of agriculture. It is recommended to allocate part of the RDP funds for practical training of farmers in efficient farming.

173.2. Lithuanian Rural Development Programme for 2007–2013, Axis I, Measure 6 “Modernisation of agricultural holdings“, Activity 1 “Compliance with the requirements of the Nitrates Directive and the new compulsory Community standards” – projects aiming at the implementation of the Nitrates Directive. Rationale: At present, allocation of support funds does not take into account whether agricultural pollution has to be reduced in the place of the potential applicant in order to meet the requirements of the WFD. For the purpose of the implementation of the WFD, sometimes it is more useful to restrict pollution from small farms which are, however, situated in zones highly sensitive to pollution.

173.3. Lithuanian Rural Development Programme for 2007–2013, Axis I, Measure 6 “Modernisation of agricultural holdings“, Activity 3 “Planting of short-rotation coppices”. Rationale: Perennial energy crops, such as willows or osiers, may be grown in place of conventional agricultural crops in any type of farms; however, from the environmental point of view energy crops are best grown in wet areas with particularly high nitrogen concentrations, e.g. swampy areas near large farm holdings. The measure of energy crops may also be coordinated with measures relating to the restoration or construction of wetlands, as well as controlled drainage. Perennial energy crops have a permanent deep rooting system which significantly limits nitrate leaching. In addition, these crops require large amounts of nitrogen for their growth which they can take up from the soil. According to the data of agricultural experts from the Danish Institute DHI, the coverage of one ha of arable land with energy crops limits nitrogen leaching by 30-45 kg on average, but this indicator in sandy soils may be about 10 kg higher. This measure also reduces erosion.

Table 135. Municipalities and wards where more favourable conditions should be created to receive support provided under the RDP

Municipality	Ward
Anykščiai distr.	Kavarskas
Jonava distr.	Bukonys, Kulva, Šilai, Žeimiai
Kalvarija	Akmenynai

Kaunas distr.	Babtai, Čekiškė
Kazlų Rūda	Antanavas, Kazlų Rūda
Kėdainiai distr.	Dotnuva, Gudžiūnai, Josvainiai, Krakiai, Pelėdnagai, Pernarava, Surviliškis, Šėta, Truskava, Vilainiai
Marijampolė	Marijampolė, Sasnava, Šunskai
Panevėžys distr.	Krekenava, Naujamiestis, Raguva, Ramygala, Smilgiai, Upytė, Vadokliai, Velžys
Radviliškis distr.	Baisogala, Grinkiškis, Pakalniškiai, Radviliškis, Sidabravas, Skėmiai, Šaukotas, Šeduva, Šiaulėnai, Tyruliai
Šakiai distr.	Barzdai, Griškabūdis, Lukšiai, Plokščiai, Sintautai, Šakiai, Žvirgždaičiai
Ukmergė distr.	Siesikai, Taujėnai
Vilkaviškis distr.	Bartninkai, Gižai, Keturvalakiai, Klausučiai, Pilviškiai, Šeimena, Vilkaviškis town

Since it is difficult to forecast what measures under the RDP are going to be implemented in specific areas and as the effect of the measures differs depending not only on the measure in question but also on the place where that measure is implemented, it is assumed that the amendment of the rules of the support schemes under the RDP for 2007-2013 would result in the reduction of pollution with nitrogen by 0.5 kg/ha in additionally identified areas.

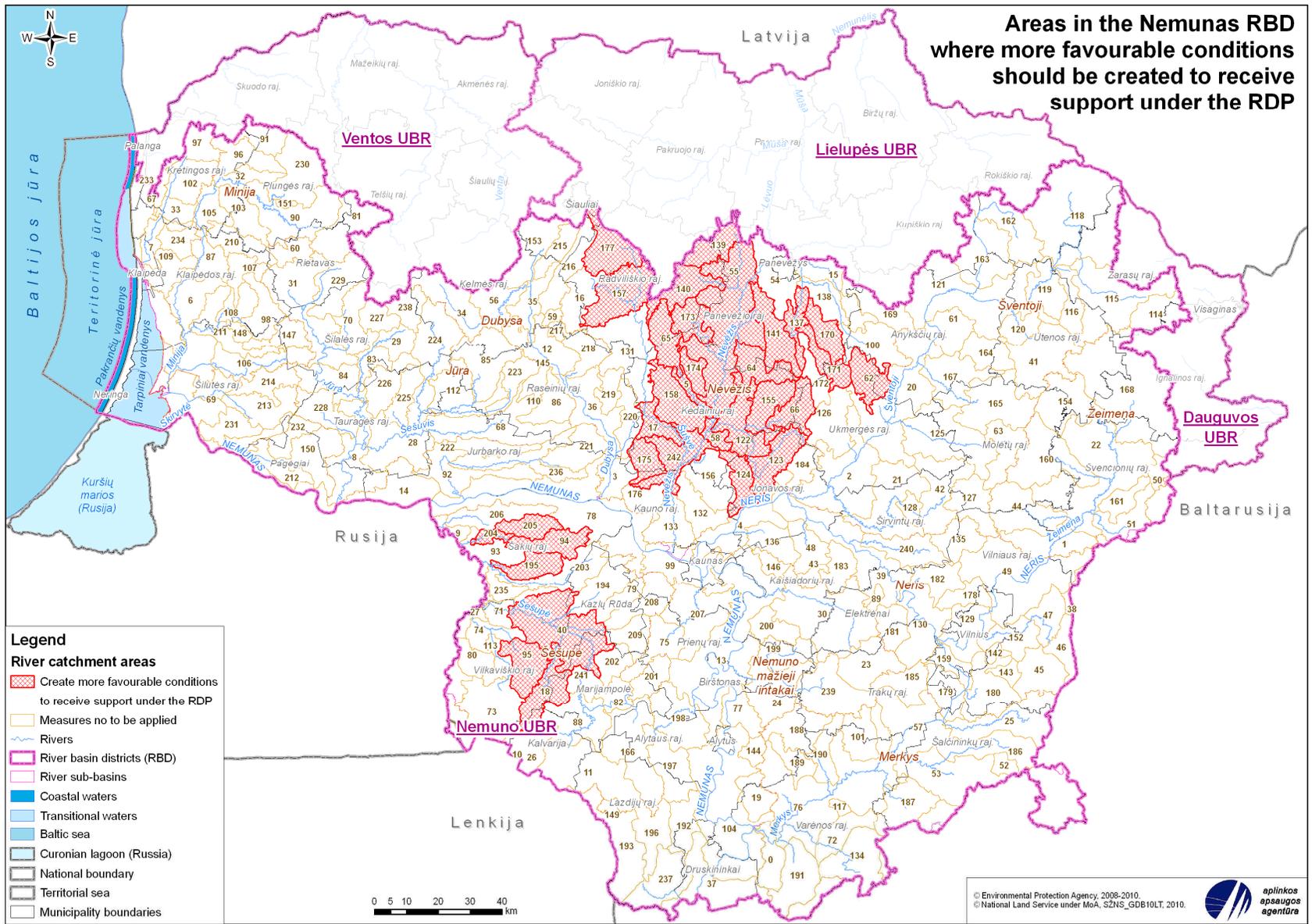


Figure 3. Areas in the Nemunas RBD where more favourable conditions should be created to receive support under the RDP

174. In addition to the said amendments, it is also recommended to revise the support schemes to be used first of all by farms subject to fertilisation norms lower by 20 %, as provided for in their respective fertilisation plans (the area demonstrated in Figure 4, Table 136).

It is proposed that fertilisation norms lower than those specified in the methodology for the development of fertilisation plans by 20 % are applied until 2015 when developing fertilisation plans for areas where the implementation of common measures and measures supported under the RDP for 2007-2013 would not ensure the reduction of diffuse agricultural pollution down to the required level (Figure 3). This would significantly reduce the leaching of nitrogen because a large amount of fertilisers applied close to the maximum norm leaches into water instead of being absorbed by plants.

Table 136. Municipalities and wards where fertilisation norms should be 20 % lower than those calculated in accordance with the approved methodology

<b>Municipality</b>	<b>Ward</b>
Anykščiai distr.	Kavarskas
Jonava distr.	Bukonys, Kulva, Žeimiai
Kalvarija	Akmenynai
Kaunas distr.	Babtai, Čekiškė
Kėdainiai distr.	Dotnuva, Gudžiūnai, Josvainiai, Krakiai, Pelėdnagai, Pernarava, Surviliškis, Šėta, Truskava, Vilainiai
Marijampolė	Marijampolė, Šunskai
Panevėžys distr.	Krekenava, Naujamiestis, Raguva, Ramygala, Smilgiai, Upytė, Vadokliai, Velžys
Pasvalys distr.	Pušalotas
Radviliškis distr.	Baisogala, Grinkiškis, Pakalniškiai, Radviliškis, Sidabravas, Skėmiai, Šaukotas, Šeduva, Šiaulėnai, Tyruliai
Šakiai distr.	Griškabūdis, Lukšiai, Plokščiai, Šakiai
Ukmergė distr.	Siesikai, Taujėnai
Vilkaviškis distr.	Bartninkai, Gižai, Keturvalakiai, Pilviškiai

175. There is a slight risk that farms subject to lower fertilisation norms will sustain losses due to lower crop yields or lower nutrient value of plants during the period until 2015. Such risk is higher in farms where the use of fertilisers is already close to the maximum limit and where mainly organic fertilisers are used. The risk is considered to be minor because of the following reasons:

- 1) There is no accurate data on the exact amounts of fertilisers used, therefore it is assumed that fertilisation is close to the maximum quotas only in part of farms;
- 2) Farmers using mineral fertilisers would save money because the cost of such fertilisers is high;
- 3) The final 10-20 % (to the economically optimal fertilisation norm) of fertilisers has the minimum impact on crop yields (Figure 5).

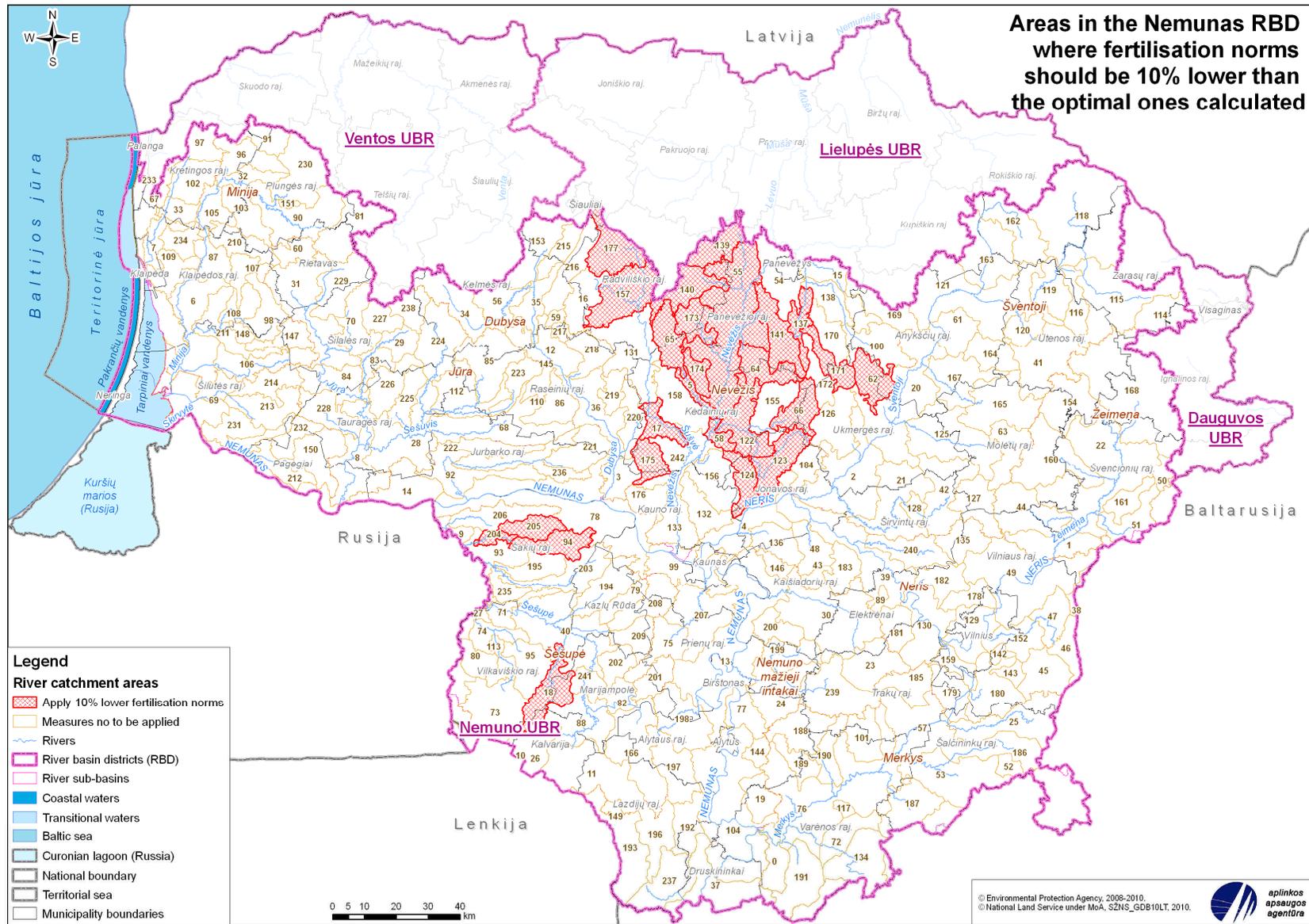


Figure 4. Areas in the Nemunas RBD where fertilisation norms should be 20 % lower than the optimal ones calculated in accordance with the approved methodology

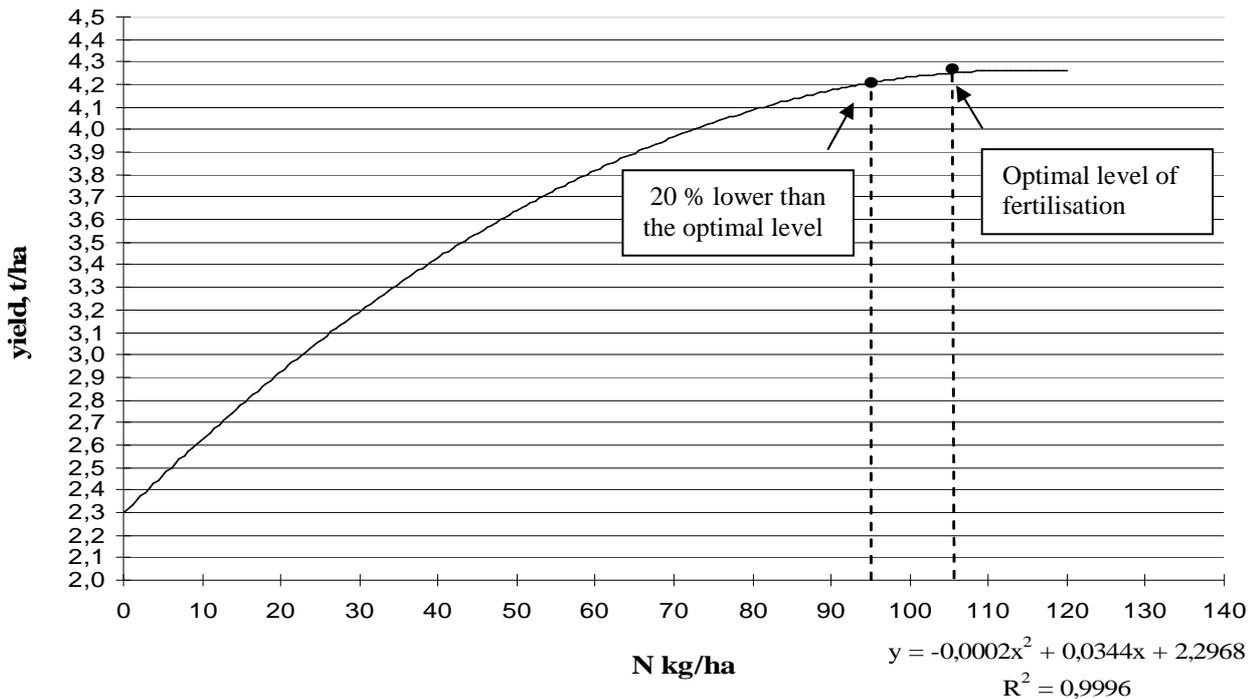


Figure 5. Ratio between the crop yield and the level of fertilisation

176. No additional costs are forecasted on the assumption that the risk of losses is low. It is important to conduct training courses for farmers on more efficient utilisation of nutrients concentrated in the soil in places where the lower norms are to be applied. With a view to increase the acceptability of the measures, it is proposed that more favourable conditions to draw support for advisory services under Measure 2, Axis I of the RDP for 2007-2013 and support for production of agricultural products and (or) services for agriculture sector under Measure 6, Axis I of the RDP for 2007-2013<sup>31</sup> are offered for farmers who are subject to lower fertilisation norms. The required amendments are provided in the section on the measures of the RDP.

### Growing of catch crops in sandy and mixed soil

177. The growing of catch crops is one of the most effective measures, especially in sandy soil. It is proposed that compensations are used to promote the implementation of this measure by preparing a support scheme to be used by farmers in areas where significant agricultural pollution persists after the introduction of the above-listed measures (Figures 5 and 6, Tables 137 and 138).

Catch crops are crops that are grown after the harvest or undersown before the harvest of one crop until the planting of another crop – approximately from August to early

<sup>31</sup> Supported activities: repair and technical maintenance of agricultural machinery, inventory, all types of vehicles (except for cars) and equipment; preparation of fields, cultivation, fertilisation of soil; sowing, planting of agricultural plants; maintenance of agricultural plants; harvesting and preparation of the harvest for marketing; storage of agricultural products owned by another agricultural entity; mediation services provided by a cooperative to its members in selling their agricultural products and/or acquiring fuel, fertilisers, seeds, fodder, pest and weed controls, and fixed assets intended for the use in the agricultural activity of the members only. Also, processing and marketing of brand agricultural products (produced and/or grown in the holding) (or preparation, processing and marketing of agricultural products produced on farms of cooperative members and purchased by the cooperative which has been acknowledged an agricultural cooperative before the submission of an application for support).

spring. Such crops reduce the leaching of nutrients by gathering nitrogen from the soil and accumulating it in their biomass. In addition, catch crops are beneficial for agriculture as they keep nutrients in the soil arable layer, part of which is available for uptake by other plants. E.g. mustard is able to hold up to 70 kg N/ha, 15-25 % of which may be later taken up by other plants. Also, catch crops help to sustain the balance of soil organic matter, improve soil physical properties, and contain the spread of weeds.

The measure is particularly effective in areas where nutrients are not retained by natural processes. The strongest effects are observed in sandy soils and areas with high precipitation rates. The effects of the measure in reducing the leaching have been assessed on the basis of calculations made in Denmark. It has been estimated that in clayey soils under low precipitation the leaching from the root zone is reduced by 12 kg/ha, while in sandy soils under higher precipitation – by 37 kg/ha. Reduced leaching is observed in the first year already.

Assumptions are made that the annual costs of the measure for a farmer are about LTL 300/ha (i.e. seeds and sowing). Also, the above-mentioned effect when catch crops retain some nitrogen in the soil thus substituting fertilisers would be of additional value. The proposed compensation is LTL 350 per one hectare of land sown with catch crops. As the measure is optional, it is practically impossible to ensure that it will be introduced in the required areas and to the needed extent. Hence, additional 10 % is added to the estimated costs of the measure in order to compensate for the error of the implementation of the measure.

Taking into account the ratio between the effect and the costs, it is proposed that funds for the said compensation schemes are allocated only for the growing of catch crops in sandy and mixed soil.

The responsibility for the implementation of this measure, i.e. the preparation and validation of legal acts by 2012, would lie with the Ministry of Agriculture and the Ministry of the Environment of the Republic of Lithuania, while farmers would start implementing this measure (growing catch crops) as from 2012.

### **Special Rural Support Programme**

178. Support granted pursuant to Order No. 3D-948 of the Minister of Agriculture of the Republic of Lithuania of 8 December 2009 on the amendment of Order No. 3D-237 of the Minister of Agriculture of 16 May 2007 on the approval of the rules for funding of training of agricultural entities, dissemination of scientific knowledge, organisation of agricultural exhibitions, fairs, and competitions (*Valstybės žinios*, 2009, No. 152-6854).

Recommended amendments: When distributing support funds, to give priority to information and training programmes required for the implementation of the WFD.

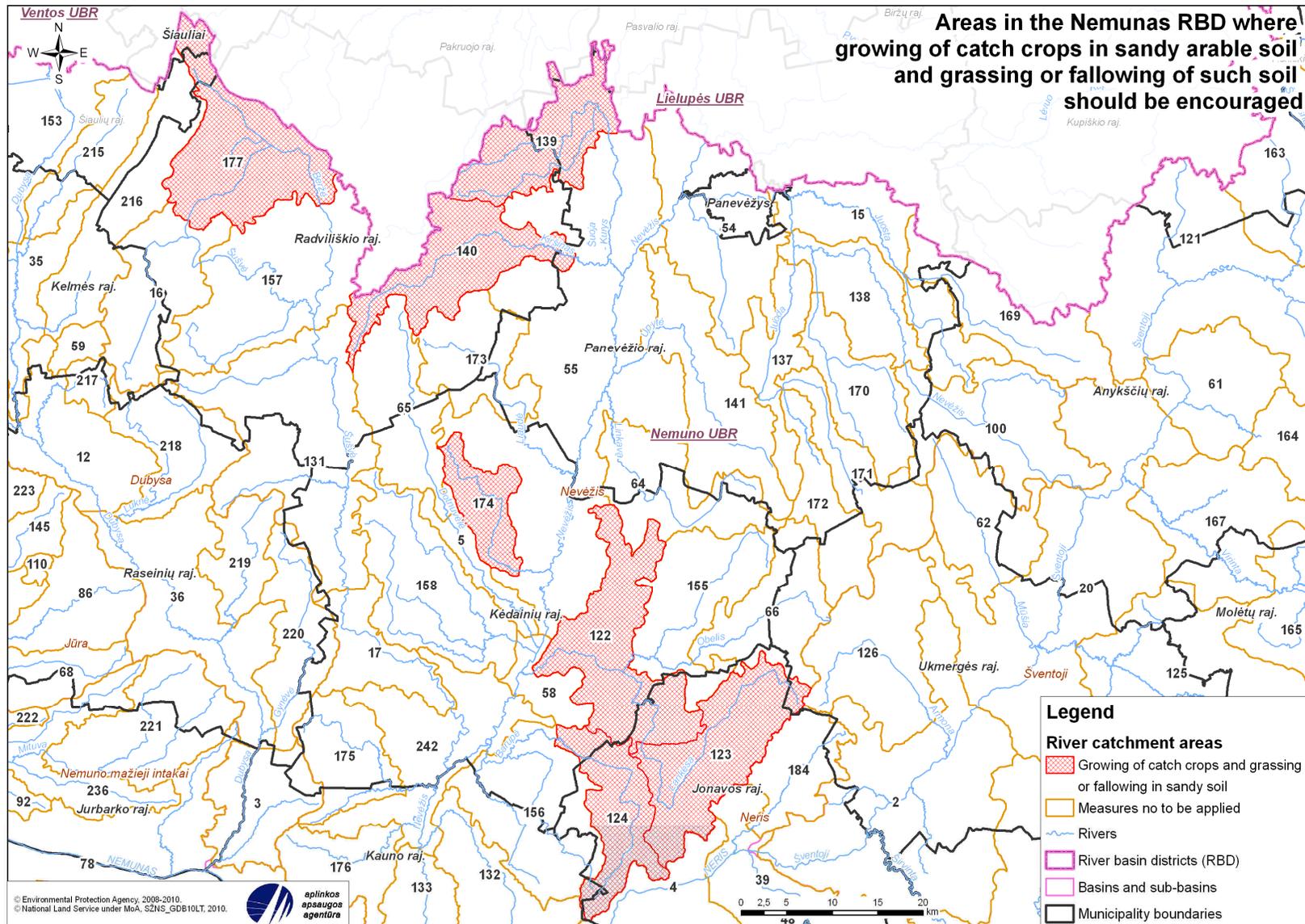


Figure 6. Areas in the Nemunas RBD where growing of catch crops in sandy arable soil and grassing or fallowing of such soil should be encouraged

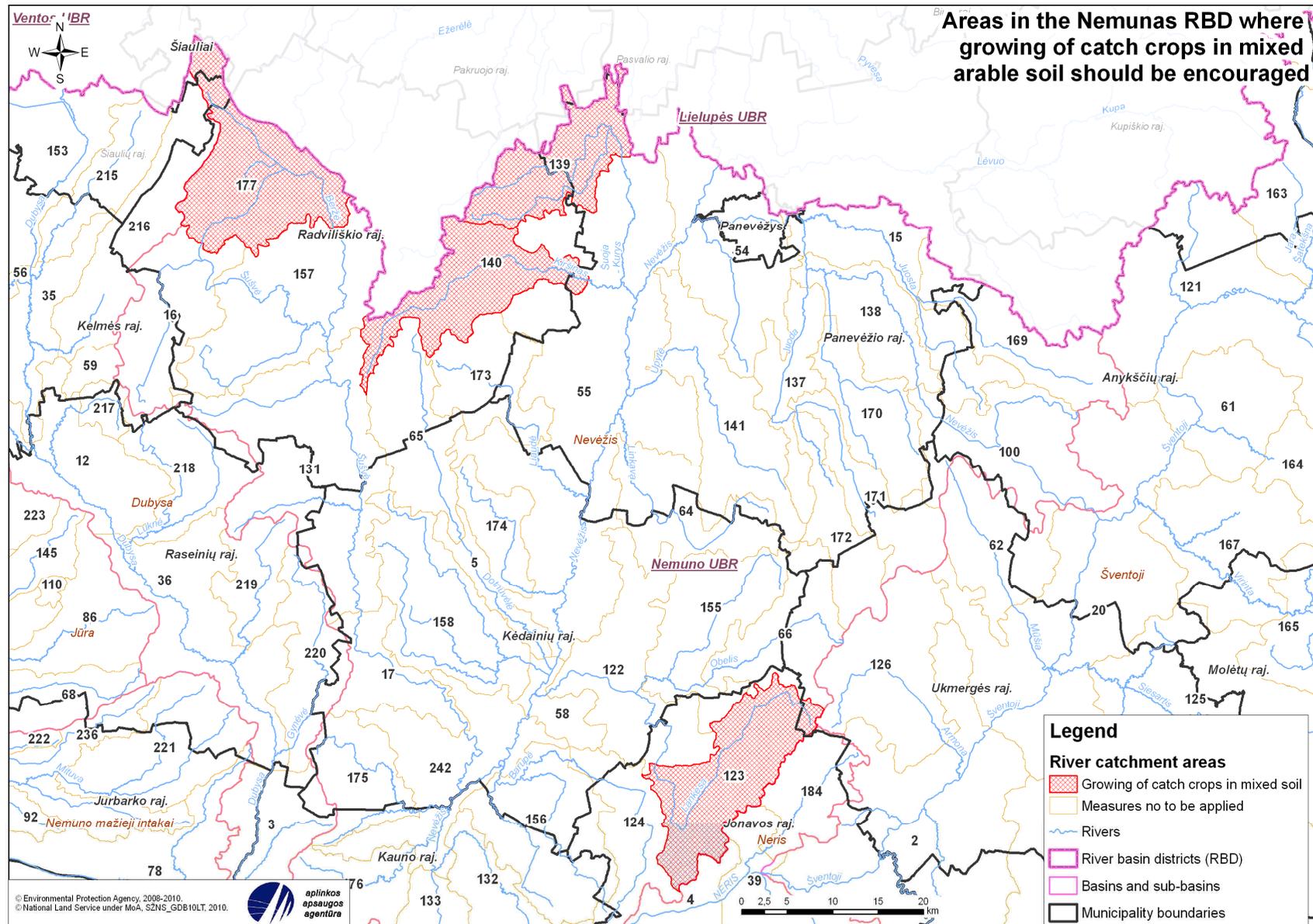


Figure 7. Areas in the Nemunas RBD where growing of catch crops in mixed arable soil should be encouraged

Table 137. Municipalities and wards where growing of catch crops in sandy arable soil should be encouraged

Municipality	Ward
Jonava distr.	Bukonys, Kulva, Šilai, Žeimiai
Kėdainiai distr.	Dotnuva, Gudžiūnai, Kėdainiai town, Pelėdnagiai, Truskava, Vilainiai
Panevėžys distr.	Smilgiai
Radviliškis distr.	Baisogala, Pakalniškiai, Radviliškis, Sidabravas, Šeduva, Šiaulėnai, Tyruliai

Table 138. Municipalities and wards where growing of catch crops in mixed arable soil is recommended to be encouraged

Municipality	Ward
Jonava distr.	Bukonys, Kulva, Šilai, Žeimiai
Panevėžys distr.	Smilgiai
Radviliškis distr.	Baisogala, Pakalniškiai, Radviliškis, Sidabravas, Šeduva, Šiaulėnai, Tyruliai

### Supportive measures

179. Supportive measures usually do not produce any direct effects, but they are very important in implementing other measures. Their implementation is proposed throughout Lithuania, focusing on areas affected by significant diffuse pollution from agriculture. As a rule, the implementation of these measures is the responsibility of state institutions.

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

180. 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:

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

180.2. Information campaigns for farmers on the procedure of the development of fertilisation plans in regions where these plans include fertilisation norms lower than the optimal norms by 20 %, in combination with training courses on efficient farming methods which enable the maximum use of nutrients accumulated in the soil;

180.3. Information campaigns and training throughout Lithuania for small farms on manure and slurry management;

180.4. Trainings for developers of fertilisation plans throughout Lithuania.

181. The annual demand of costs for these information and education measures is LTL 60 thousand. Funds for these measures have been provided for under the Lithuanian Rural Development Programme for 2007-2013, Axis 1, Measure 1 “Vocational training and information actions”, Activity 1 “Training and information of natural persons engaged in agriculture or forestry sectors”, as well as under the Special Rural Support Programme pursuant to Order No. 3D-948 of the Minister of Agriculture of the Republic of Lithuania of 8 December 2009 on the amendment of Order No. 3D-237 of the Minister of Agriculture of 16 May 2007 on the approval of the rules for funding of

training of agricultural entities, dissemination of scientific knowledge, organisation of agricultural exhibitions, fairs, and competitions (*Valstybės žinios*, 2009, No. 152-6854).

The implementation of the measures of education and information falls under the responsibility of the Ministry of Agriculture of the Republic of Lithuania.

### **Additional control of farms**

182. 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 have already been introduced in Lithuania. These include manure storages in large farms, restrictions on animal density and on the use of organic fertilisers, fertilisation plans in large farms, protection zones and belts of water bodies, and other measures. However, control must be increased over the implementation of measures designed to reduce diffuse pollution in addition to education of farmers and other ways of promoting reduction of diffuse pollution. Checks of compliance with the requirement to develop and introduce fertilisation plans should cover not only formal verification of relevant documents but also analyses of the soil and neighbouring water bodies. Sanctions for farms which fail to meet the requirements concerning water protection zones or belts should be monitored and applied to a larger extent. The implementation of the basic measures is especially important in areas suffering from significant agricultural pollution. 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 exercising control over the implementation of supplementary measures, it is important that adequate schemes are engaged. For instance, controls over fertilisation plans could include a requirement to provide fertilisation plans along with declaration of 10 and more ha of utilised (arable) land for which a payment could be granted to the farmers.

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 and more ha of agricultural land 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 has been assumed that a check on a large farm will cost LTL 150 on average and on a small one – LTL 31. Checks on large farms take more time; they may cover not only fertilisation plans but also the implementation of other measures and related requirements. Moreover, larger farms are usually located at a considerable distance from each other. On the other hand, 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.

### **Technical measures recommended to be postponed**

183. For the purpose of reducing water pollution from drained agricultural areas, some countries have introduced brand new requirements for the formation of the environment for the diversion drainage system and water recipients. There are several possible solutions or their combinations, but they all serve a similar purpose – to prevent the direct input of drainage runoff into the main ditch, river or any other water recipient.

These measures are local and capture only biogenic substances which directly get into "treatment facilities". The effect of the measures largely depends on the load (pollutant collection catchment, land use) and hydromorphological conditions on the site of their application. The major share of biogenic substances is trapped in the areas with high loads.

For the purpose of reducing the inflow of biogenic substances from agricultural areas, regular drainage structures may be redesigned into controlled drainage systems. It is known that biological assimilation of soluble nitrogen and phosphorus compounds does not take place in late autumn, winter and early spring and these substances are removed through drainage systems. Seeking to minimise losses of pollutants, the drainage water level may be controlled at different points of drainage systems, thereby reducing the runoff volume and accelerating nitrogen transformations (denitrification). During dryer springs, the system can also help to prevent the desiccation of plants. This measure may reduce annual losses of soluble nitrogen compounds by 30 % to 50 %. This measure is advisable only in drained areas of intensive agricultural land. It is mostly appropriate in loamy and clayey soils (with at least 15 % of clayey soil and a maximum slope of 2 %). This measure is not suitable in the areas sown with winter crops and catch crops.

Another measure which may be applied either together with regulated drainage systems or as a separate measure for capturing biogens in drainage water is construction of artificial wetlands/sedimentation ponds. There are two types of constructed wetlands depending on their location in respect of the hydrographical network. In the first case, prior to directly releasing drainage water into a surface water diversion system, artificial wetlands are constructed at drainage outlets. Such wetlands are horseshoe-shaped ponds covered with moisture-loving vegetation (galingale, watercress, arrowhead), as well as backwaters, stretches of wet meadows, or strips of bushes. Such constructed sites hold back nitrogen leaching through drainage and its release into an open hydrographical network by 10 % to 50 %. Ponds capture not only soluble substances, but also outwash material. Former lowlands and other natural relief descents are best-suited for installing them. A wetland may be formed by deepening (to 0.5 m) and widening descents; this allows coordinating agricultural measures and measures aimed at reducing diffuse pollution transport. Flow conditions in such ponds undergo changes resulting in a wider cross-section, slower flow rates, accumulation of outwash material, and growth of hydrophytic vegetation. The area of a pond must be calculated on the basis of the drainage runoff characteristics and nitrogen concentrations in outflowing water. The second option may be applied when drainage water reaches the hydrographical network (ditches). Then, measures aimed at reconstructing the diversion (ditch) network would be appropriate, i.e. to widen the cross-section of a ditch by installing small (0.05-0.1 ha) ponds both at the end and in another section of the ditch. Such ponds capture not only soluble substances, but also outwash material. They may be an effective means for trapping nitrogen and especially phosphorus in ditches. Estonia's experience in maintaining the constructed ponds has shown that they have to be cleaned every 3-5

years. In individual cases, the water level in ponds could be controlled by constructing a spillway. Such ponds capture 3-48 % of nitrogen compounds. Danish and UK cases show that the installation (investment) costs of one artificial wetland (about 500 m<sup>2</sup>) amount to about LTL 45 thousand. A feasibility study on wetlands carried out in Lithuania revealed that the costs of the installation of drainage and diversion ditches are rather similar. Moreover, this measure requires follow-up costs. Assumptions are made that maintenance would require about 3 % of the investment costs every year, which is roughly LTL 1 500.

One more option is to restore former natural wetlands. Restoration works and costs may differ to a very large extent depending on the type of the drained wetlands as well as hydromorphological and other conditions. A common restoration practice is to replace the drainage system so that water could flow from fields into the river through the wetland to be restored. This usually requires only minor differences in the heights of the relief. For instance, a drainage ditch may be built so as to allow water to spill over at the edge of the swampy area rather than at the end of the drainage ditch, which would enable a better spread of water. The potential effect of the wetland under restoration is conditioned by the current purpose and use of land and the type of the wetland to be restored. The costs of this measure are rather high as compared with its effect. Nevertheless, it still can be considered under favourable conditions. Besides, wetlands are an important element of the ecosystems providing many ecological services. Hence, the restoration of wetlands may be regarded as an overall investment into the environment.

Taking into account foreign experience, the said technical measures require would be effective and would require less costs of the reduction of one kilogram of nitrogen in water bodies than other measures. In addition, the implementation of these measures is easier to coordinate and control. Nevertheless, the measures would still be a considerable investment and such solutions have never been applied in Lithuania before. Therefore, it is recommended to begin with pilot projects by 2015, postponing the implementation of these measures (if proven effective) for the next planning period.

The objective of the pilot project is to assess the effectiveness of capturing pollutants emitted with drainage water under the Lithuanian conditions, constructing three objects: artificial wetland/sedimentation pond, regulated drainage and diversion of drainage water to a natural or restored wetland.

Three areas are proposed for the pilot project (Table 139) abundant in drained land and favourable conditions for restoring wetlands.

Following the study *Analysing feasibility of the construction/restoration of wetlands and developing recommendations for the construction/restoration of wetlands* conducted by the Environmental Protection Agency, the construction of such three objects would require about LTL 340 thousand.

Table 139. Municipalities and wards where agricultural pollution will continue to be significant after the implementation of the above-said measures and where technical measures are recommended to reduce nitrogen surplus

Municipality	Ward
Jonava distr.	Bukonys, Šilai, Žeimiai
Kėdainiai distr.	Dotnuva, Gudžiūnai, Šėta
Pakruojis distr.	Klovainiai

Panevėžys distr.	Smilgiai
Radviliškis distr.	Baisogala, Pakalniškiai, Sidabravas, Šeduva
Ukmergė distr.	Siesikai

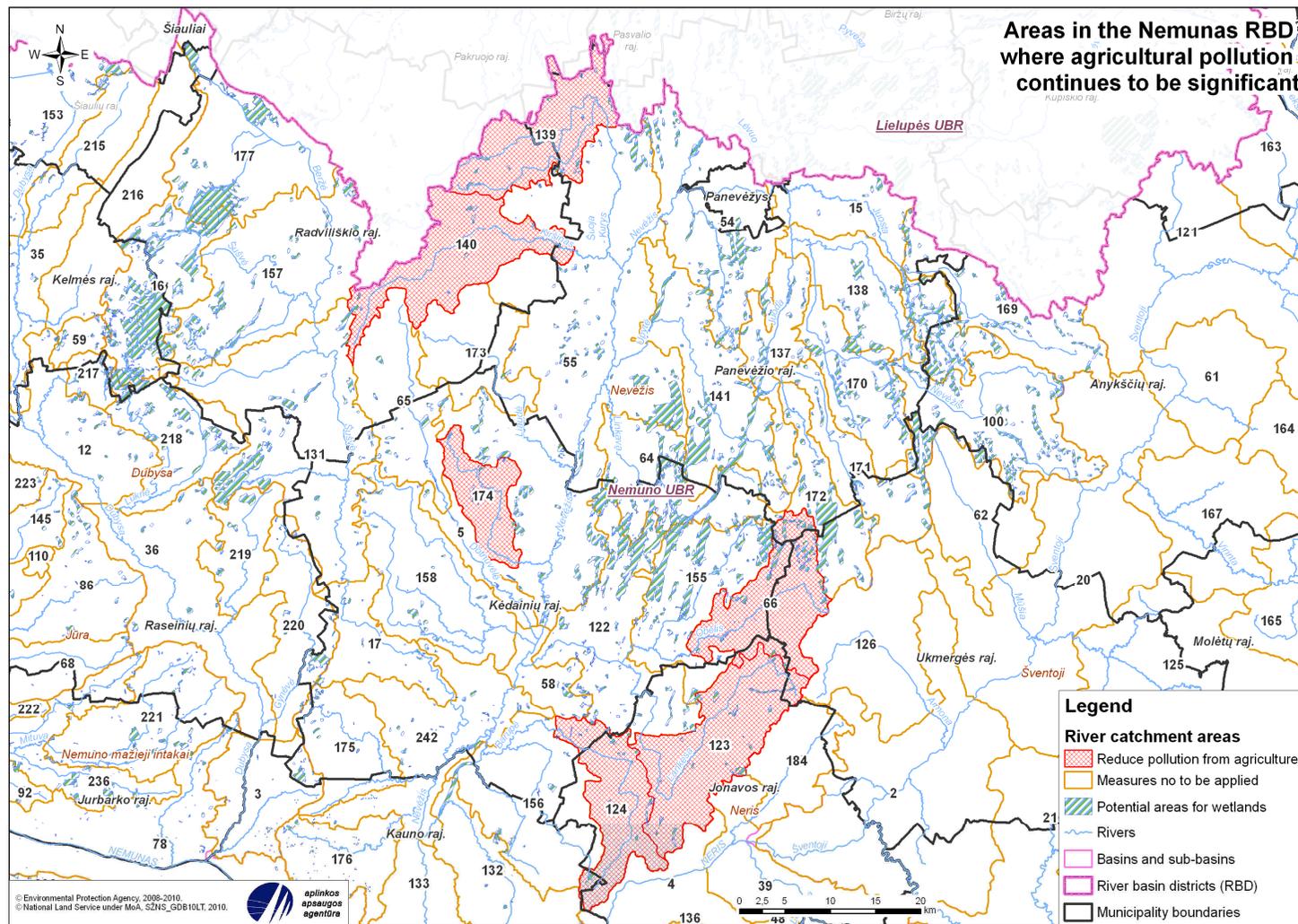


Figure 8. Areas in the Nemunas RBD where agricultural pollution will continue to be significant after the implementation of the proposed measures and where technical measures are recommended in order to reduce nitrogen surplus during the next stage, after the implementation of pilot projects

Summary information on the proposed supplementary measures is given in Table 140.

Table 140. Summary of assumptions underlying the proposed measures<sup>32</sup>

Measure	Necessary legal and organisational changes	Mandatory everywhere/ Optional in identified areas	Reimbursable/non-reimbursable	Investment costs, unit/LTL	Operating costs, unit/LTL/year <sup>33</sup>	Effect of a unit, N kg <sup>34</sup>	Source of financing	Effectiveness LTL/kg	Applicable for	Feasibility (% from J)	Acceptability, attainability, other assumptions and comments
A	B	C	D	E	F	G	H	I	J	K	L
Measures envisaged to be implemented by 2015											
Manure management on small farms	Legal basis setting out requirements and defining subjects who must comply with these requirements	Mandatory in the entire country	Non-reimbursable	LTL 0 per LSU	LTL 10 per LSU	4 (in the root zone)	Farmers' funds	6-120 <sup>35</sup>	Livestock in farms < 10 LSU	100 %	Acceptability is sufficient. An important condition – provision of information to farmers about new requirements.
Mandatory development and implementation of fertilisation plans in accordance with the approved normative standards in farms with 10-150 ha of utilised agricultural land	1. Revision and validation of the methodology for development of fertilisation plans (prepared by the Lithuanian Institute of Agriculture) 2. Legal basis setting out the requirement to develop fertilisation plans in farms fertilising more than 10 ha of utilised agricultural land	Mandatory in the entire country	Non-reimbursable	LTL 0 per field	LTL 100 per field	1.5 (in the root zone) in agricultural land (or 5 in overfertilised zone)	Farmers' funds	2-75	Agricultural land owned by farms with 10-150 ha of utilised agricultural land	100 %	Acceptability is insufficient, may entail the risk of failure to achieve objectives. An important condition – education of farmers.
Increase in the manure absorption capacity coefficient	Adjustment of the coefficient in the methodology for development of fertilisation plans	Mandatory in the entire country	Non-reimbursable	LTL 0 per LSU	LTL 0 per LSU	8 (in the root zone)	Farmers' funds	0	Livestock in farms > 10 LSU	100 %	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 in 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.
Implementation of RDP measures providing for better conditions for the use of support under RDP 2007-2013 for farmers in	Amendment and validation of financing rules in respect of the specified schemes of support programmes	Optional in identified areas	Reimbursable	LTL 0 (approved budget of RDP)	LTL 0		Funds already provided for under RDP 2007-2013	0	Depending of measures introduced by farmers		It is assumed that the measure will reduce diffuse pollution by 0.5 kg/ha on average.

<sup>32</sup> Assumptions used for the calculations.

<sup>33</sup> The cost estimation method is provided in the section on the description of the measures under each individual measure.

<sup>34</sup> The effect estimation method is provided in the section on the description of the measures under each individual measure.

<sup>35</sup> The indicator is calculated separately (for the entire basin or RBD) because the measure is also mandatory for areas where reduction of agricultural pollution is not required. In such case the effectiveness indicator equals to zero. The same is true for the measure of fertilisation plans.

Measure	Necessary legal and organisational changes	Mandatory everywhere/ Optional in identified areas	Reimbursable/non-reimbursable	Investment costs, unit/LTL	Operating costs, unit/LTL/year <sup>33</sup>	Effect of a unit, N kg <sup>34</sup>	Source of financing	Effectiveness LTL/kg	Applicable for	Feasibility (% from J)	Acceptability, attainability, other assumptions and comments
the identified areas											
Reduction of fertilisation norms by 20 %	Legal basis setting out the requirements to apply fertilisation norms lower by 20 % in fertilisation plans for identified areas	Optional in identified areas	Reimbursable in the case of losses	LTL 0 per ha	LTL 0 per ha	8 (in the root zone)	State/EU funds (about LTL 20-20 per ha)	0	Agricultural land owned by farms larger than 10 ha	50 %	Acceptability is insufficient, entails the risk of failure to achieve objectives. An important condition – training courses for farmers about the most efficient methods of utilising nutrients accumulated in the soil.
Sowing of sandy and mixed land with catch crops	A new support scheme prepared and related organisational actions	Optional in identified areas	Reimbursable	LTL 0 per ha	LTL 350 per ha +10 % <sup>36</sup>	Respectively 37 (in the root zone) and 25 (in the root zone)	State/EU funds	Respectively 11-14 and 18-20	Sandy or mixed agricultural land	50 % of agricultural land where summer crops are grown in identified areas	Acceptability is sufficient, provided the amount of compensation covers the costs. The risk of failure to achieve objectives is posed by the fact that this measure is appropriate only in specific areas, which is very difficult to control.
Growing of short rotation woody energy crops	Adjustment to the support scheme increasing the amount of payment and giving priority to use the support in the identified areas, restricting fertilising possibilities and sizes of plantations	Optional in identified areas	Reimbursable	Extra payment in addition to the present EU support: LTL 1000 per ha	Extra payment in addition to the present EU support: LTL 100 per ha	38 (in the root zone)	Funds under RDP 2007-2013	6-7	Wet places with especially high nitrogen concentrations	-	Acceptability is sufficient, provided the amount of compensation is acceptable to farmers. At present, compensations are too low.
<b>Measures recommended to be postponed until 2015 (except for pilot wetland projects)</b>											
Artificial wetlands/ sedimentation catchments	-	-	-	45 000	1 800	500 (in the flow)	State/EU funds	11	Everywhere with drainage systems in place and large diffuse pollution loads	-	Limited acceptability because the measure has never been tested in Lithuania and requires large investments
Restoration of wetlands <sup>37</sup>	-	-	-	600-93 000	300-4 500		State/EU funds	7-5 400	Maps are provided in the study	-	Limited acceptability because the measure is not well known in Lithuania and demands large investments

<sup>36</sup> Since it is difficult to achieve the exact objectives of the non-mandatory (optional) measures in respect of their place and scope, additional 20 % is added to the calculated costs in order to reduce the risk of failure to achieve the objectives, i.e. it is proposed that allocations are 10 % higher than the actual need when the measures are implemented in a specified place and to the estimated extent.

Measure	Necessary legal and organisational changes	Mandatory everywhere/ Optional in identified areas	Reimbursable/non-reimbursable	Investment costs, unit/LTL	Operating costs, unit/LTL/year <sup>33</sup>	Effect of a unit, N kg <sup>34</sup>	Source of financing	Effectiveness LTL/kg	Applicable for	Feasibility (% from J)	Acceptability, attainability, other assumptions and comments
Alternative measures to be encouraged without allocating additional funds											
Grassing of arable sandy land	Adjustment to the support scheme increasing the amount of payment and giving priority to use the support in the identified areas	Optional in identified areas	Reimbursable	Extra payment in addition to the present EU support: LTL 0 per ha	Extra payment in addition to the present EU support: LTL 200 per ha	61 (in the root zone)	Néra	3-6	Arable sandy land		Acceptability is sufficient, provided the amount of compensation is acceptable to farmers. At present, compensations are too low.
Grassing of mixed and clayey arable soil	-	-	-	LTL 550 per ha	22	31 (in the root zone)	Funds already provided for under RDP 2007-2013	7-10	Mixed and clayey arable land (priority is given to intensively used land)	-	
Afforestation of arable land	-	-	-	LTL 20 000 per ha	LTL 0 per ha (included in investment costs)	Up to 42 % or 30-60 (in the root zone)	Funds already provided for under RDP 2007-2013	7-17	Arable land (priority is given to sandy land)	-	

<sup>37</sup> More detailed information is provided in the study *Feasibility study and recommendations on construction/restoration of wetlands aiming to reduce input of organic and biogenic substances into water bodies*, 2009

### **Measures for improving the hydromorphological status**

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

- 1) large reservoirs,
- 2) hydropower plants,
- 3) straightened rivers.

With a view to eliminate these causes or mitigate their impact, the following measures are proposed:

- 1) Restoring/ensuring river continuity and discharge;
- 2) Reduction of the impact of hydropower plants;
- 3) Naturalisation of river beds.

#### **Restoring/ensuring river continuity and discharge**

185. The most important measure which mitigates consequences of interrupted river continuity is construction of fish bypass channels. 21 fish migration facilities were constructed by 2008: sluices, rock channels with weirs, and vertical-slot pool fish passes.

Fish bypass channels should be first of all installed in rivers which are the most important for fish migration.

Fish bypass channels should be constructed following the results of special feasibility studies conducted to select the most suitable technological solution of a bypass channel in question. The construction of a facility should also take into account the data of monitoring performed both before and after the construction of such facilities to be able to assess an impact thereof on the ecological status of the river and thus select the best option. However, no such information is currently available in Lithuania hence an impact analysis should be postponed for the second stage of the development of the Nemunas River Basin Plan, i.e. the planning cycle from 2015.

Today, the most important supplementary priority measures in respect of fish migration include fish bypass channels to be constructed approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September of 2007 (*Valstybės žinios*, 2007, No. 102-4180) (specifying those which are located in the Nemunas River Basin District). The number of the bypasses to be built totals to 18. Also, the remains of former dams should be removed. There are 29 such dams subject to decommissioning in the Nemunas River Basin District pursuant to the said Order of the Minister of Agriculture. However, it should be noted that in some places fish passes have already been constructed and barriers have been removed, however, such necessity has arisen in new places. Hence, the present Programme of Measures provides a list of sites requiring certain measures to improve fish migration on the basis of the latest available data. Fish bypass channels should be first of all installed and remains of rock weirs should be removed in rivers which are the most important for fish migration. There are five places in the Nemunas River Basin District requiring priority measures to improve fish migration: rock weir of Pagraumena mill in the Šalpė River, a weir of Gargždai mill in the Miniža River, Anykščiai dam on the Šventoji River, Rokantiškės

dam on the Vilnia River and Tauragė dam on the Jūra River. Paragraph 2.3 provides a detailed analysis of the situation in each sub-basin and proposes supplementary measures mitigating hydromorphological changes for each individual sub-basin in the order of priority.

### **Remeandering of rivers**

186. Natural river beds are characterised by varying cross-section areas and water capacity, meandering, changes in the longitudinal slope of the bed, variation in flow rates, depths, aquatic flora and river bed roughness, as well as changing shorelines and sedimentation. All these features determine more sudden floods and uneven water flow in beds.

In regulated flows, practically a new river bed is formed and the flow regime is modified: beds are straightened, stable cross- and longitudinal profiles of the bed are formed, allowed rates are selected (slopes and the bottom may not be washed) and water head is eliminated.

187. The main principles of naturalisation of regulated river beds are as follows: 1) to restore the original cross-section of the bed, 2) to ensure its stability, and 3) to restore the original functions of the bed (biological productivity, transformation of substances, habitats for water and land life). Naturalisation methods can differ a lot depending on a specific river or river section and are applied according to the existing conditions and targets set. However, all these methods can be grouped as follows:

187.1. Remeandering of straightened river stretches;

187.2. Formation of meanders in straightened river stretches and ditches;

187.3. Reformation (re-profiling) of the cross-section of the river bed by application of various measures;

187.4. Restoration or formation of the heights and slopes of the river bed bottom;

187.5. Reinforcement of river banks;

187.6. Restoration and formation of small bays and coves in the neighbourhood of the river bed and in the floodplain;

187.7. Restoration and/or increasing abundance of flora and fauna.

188. Using GIS methods, it has been established that the total length of straightened rivers and streams in the Nemunas RBD is around 3 119 km. Naturalisation of river beds is an expensive process and can be not cost-efficient as compared to its benefits. Hence the present Programme of Measures recommends the following:

188.1. to leave the stretches of rivers flowing in the upper reaches of rivers, in hilly, springy, laky and protected areas which are already in the process of natural regaining of their original state for complete self-naturalisation;

188.2. 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;

188.3. to carry out a pilot project in stretches of the Grūda (the Merkys Sub-basin) in order to assess an impact of the renaturalisation on the river status.

### **Reduction of impacts of hydropower plants**

189. River stretches downstream of hydropower plants exerting a significant impact (33 HPP) are proposed to be assigned to water bodies at risk due to unnatural fluctuation of their water level and runoff.

Such impact on water status can be mitigated by replacing old-type turbines with modern ones which require lower water pressure thus preventing impacts of significant fluctuations of the water level on the ecological status of water and contributing to the attainment of good ecological water status.

Replacement of turbines in recently built hydropower plants is not a suitable measure. However, the owners of hydropower plants must be obligated to introduce an environmentally friendly turbine when the need of replacement arises. A permit for construction of new HPP should require observance of the best available techniques, i.e. introduction of modern turbines. The present Programme of Measures has provided for development of a funding scheme for the replacement of HPP turbines which cause damage on the environment.

Order No. 68 of the Minister of the Environment of the Republic of Lithuania of 23 February 2000 on fish protection measures in small hydropower plants, *Valstybės žinios*, 2000 No. 19-471; 2003, No. 78-3583) recommends that electricity generators select turbines with the minimum potential impact on hydrobionts when constructing new or reconstructing old hydropower plants. Additional fish protection measures can include fish diversion screens with 100-150 mm spacing between the wires, electric field barriers and other effective measures which repel or protect fish, and stopping hydropower plants which are operated only in the daytime for the night until the sunset (especially during the period of peak fish migration in spring from 1 April to 1 June).

HPP may affect not only fluctuations of the water level and flow but also parameters indicative of physico-chemical quality elements and transportation of suspended particles. The extent of changes can be identified by measuring the base values of all said parameters upstream of the HPP pond (in the river bed upstream of the HPP where the hydrological regime has not changed yet due to the impact of the HPP pond, i.e. where the head does not affect the natural flow) and comparing these values with the values measured in operational monitoring sites downstream of the HPP pond (the measurements upstream of the HPP must be taken on the same day and observing the same frequency and regularity as in the operational monitoring sites downstream of the HPP). Measurements of the base values of parameters for quality elements are proposed to be carried out upstream of the below-listed most representative HPP ponds which differ in the water pressure height, flow-through capacity and the ratio between the installed discharge and multiannual discharge.

Table 141. HPP where measurements of the base values parameters indicative of the quality elements are proposed

No.	Place name	River	The main river	Pressure height of the HPP (m)	Flow-through capacity of the pond (K)	Q installed/ Q multi-annual
1	Godinga	Babrungas	Minija	11.5	25.7	1.36

2	Antanavas	Šešupė	Nemunas	5.3	203	0.98
3	Balskai	Jūra	Nemunas	14.5	29.2	1.83
4	Būbliai	Strėva	Nemunas	7.35	574.5	1.38
5	Jundeliškės	Verknė	Nemunas	6	421.9	0.86
6	Lakinskai	Šešupė	Nemunas	3.4	2696.7	1.02
7	Bartkuškis	Musė	Neris	8	36.3	1.35
8	Kavarskas	Šventoji	Neris	4.3	697.3	1.39
9	Angiriai	Šušvė	Nevėžis	14.5	12.2	1.87
10	Motiejūnai	Širvinta	Šventoji	5.3	45.2	2.01

It is planned to collect this information during investigative monitoring of water bodies affected by HPP upstream of the respective dams.

### Measures for reducing pollution of lakes and ponds/reservoirs

190. The status of water bodies in the categories of lakes and ponds was assessed on the basis of the national monitoring data (in total 108 lakes and ponds), the data provided in the study *Identification of the Lithuanian lakes subject to restoration and preliminary selection of restoration measures for such lakes in order to improve their status*, and mathematical modelling results (MIKE BASIN). The latter results were also used to assess concentrations of total phosphorus determined by diffuse and point pollution loads in water bodies under the categories of lakes and ponds in the Nemunas RBD.

64 lakes of 243 ones larger than 50 ha situated in the Nemunas RBD were assigned to water bodies at risk. No data is available on the status of two lakes (Gilūšis and Ūdrija).

26 ponds out of 42 ones larger than 50 ha situated in the Nemunas RBD were assigned to the water bodies at risk. No data is available on the status of one pond (Jurgionių pond).

### Lakes

191. Lake ecosystems are able to resist pollution for a certain time. Depending on hydrophysical – hydrochemical characteristics, lakes have their a specific buffer capacity – excessive phosphorus (phosphates) is adsorbed by calcium carbonates, bind with aluminium, iron cations and precipitate forming insoluble sediments. However, in the event of continuous significant impact input of phosphorus, the buffer system of the lake is not able to settle all phosphorus which enters the hydrosystem, which results in rapid eutrophication of the lake. In addition, when oxygen-free zones are formed in the near-bottom layer of the lake, insoluble phosphorus forms again convert into soluble ones, which intensifies the eutrophication process. Self-removal of pollutants from the lake lasts for a very long time (open lakes) or cannot happen at all (closed lakes). Eutrophication can be stopped only by removing excessive nitrogen (in the form of plants, fish biomass or bottom sediments) from the ecosystem of the lake or binding it into insoluble forms (e.g. with polialuminium chloride), i.e. using restoration measures. A relatively “simple” (hower, very costly) measure, pumping out/excavation of the lake silt, cannot be automatically applied to all lakes (as it is suitable only for very shallow lakes); besides, removal of sludge disbalances the ecosystem of the lake (which becomes even more unbalanced than it was before the clean-up). To be able to achieve good water quality, hydrochemical conditions must be stabilised after the clean-up as well as the community of hydrobiont species must be restored (or created anew) and

inter-relations of its components must be balanced. In some case the use of polialuminium chloride for the precipitation of phosphorus can also have only a temporary positive effect (only phosphates in water are bound; however, as already said, under certain conditions phosphates migrate from deeper bottom layers). All the said activities require high costs and restoration methods and measures have to be selected for each individual lake depending on its hydrophysical-hydrochemical characteristics. Lake restoration regulations tailored for individual lakes should be drawn up by restoration experts.

However, first of all leaching of biogenic substances from the catchment should be stopped, i.e. pollution reduction measures should be provided for and implemented: Measures are required:

191.1. to stop pollution from settlements or homesteads which are not connected to wastewater treatment facilities;

191.2. to optimise the land use in the catchment (to minimise leaching of biogenic substances from agriculture);

191.3. to manage lake shore areas (to restore water protective (buffer) zones of woody riparian vegetation).

192. Lake restoration can be started only after the implementation of the pollution reduction measures.

Following modelling results and the data provided in the lake study, the present-day pollution from diffuse pollution sources conditions that the status of 35 lakes within the Nemunas RBD is poorer than good. All these lakes are subject to basic and supplementary pollution reduction measures. Two of the lakes affected by pollution, namely, Lake Ilgė and Lake Žaslių, must also be subject to control over water uptake for the needs of fish farms.

The lake study indicates that the critical status of one lake (Lake Pravalas) is determined by fluctuation of its water level due to activities of Arnionys fish farm. Good ecological status of this lake should be ensured by regulating uptake of water for the purposes of the fish farm and thus reducing fluctuation of the water level.

The main cause of the status poorer than good in 17 lakes may be historic pollution. Following modelling results and the data provided in the lake study, the status of these lakes varies between moderate and bad (problematic and critical-status lakes), however, the results of the modelling of the input of biogenic substances show that the status of these lakes should be high. It is recommended to carry out more detailed studies in the lakes to make sure whether the only problem is historic pollution because no status improvement measures can be provided for until the precise cause is identified. The same studies are also required for six more lakes which, according to the modelling results and the lake study findings, should not be affected by historic pollution but these lakes were designated as water bodies at risk on the basis of the monitoring data (four lakes) or the lake study data (two lakes). Summing up, 23 lakes are to be designated as water bodies at risk due to a potential impact of historic pollution.

The lake study has not identified any problems in 5 lakes out of 64 ones designated as water bodies at risk within the Nemunas RBD; however, modelling results indicate that their status is moderate as a result of diffuse pollution. Indicators of the water quality

have not been monitored in these lakes. Hence monitoring would be the measure validating the designation of the said lakes as water bodies at risk.

Table 142. Lakes subject to pollution reduction measures

Causes	Number of lakes	Measures
Present pollution	35	Pollution reduction measures
Fluctuation of water level	1	Control over water uptake
Historic pollution	17	Investigative monitoring with a view to identify the sources of pollution
Causes are not clear (pollution sources have not been identified, potential impact of historic pollution)	6	Investigative monitoring with a view to identify the causes
No monitoring data available; no problems were identified in the lake study but modelling results indicate an impact of pollution	5	Monitoring

193. Investigative monitoring, including inventory of near-bottom and pollution sources, with a view to identify the origin of pollution of these lakes at risk (lakes which are subject to anthropogenic pressures either of historic or present pollution) are proposed for the following lakes:

- 193.1. Dusia (Lazdijai distr.);
- 193.2. Didžiulis (Trakai distr.);
- 193.3. Draudenių (Tauragė distr.);
- 193.4. Dviragis (Rokiškis distr.);
- 193.5. Gelvanės (Širvintos distr.);
- 193.6. Kavalys (Alytus distr.);
- 193.7. Kemešys (Utena distr.);
- 193.8. Kiementas (Molėtai distr.);
- 193.9. Kretuonykštis (Švenčionys distr.);
- 193.10. Luksnėnų (Alytus distr.);
- 193.11. Niedus (Lazdijų distr.);
- 193.12. Orija (Kalvarija distr.);
- 193.13. Paežerių (Vilkaviškis distr.);
- 193.14. Širvys (Vilnius distr.);
- 193.15. Spėra (Širvintos distr.);
- 193.16. Urkis (Molėtai distr.);
- 193.17. Veisiejis (Lazdijai distr.).

194. Investigative monitoring and inventory of pollution sources with a view to confirm or reject the justification of their designation as water bodies at risk (due historic pollution or natural ageing) is proposed for the following lakes:

- 194.1. Antakmenių (Trakai distr.);
- 194.2. Juodas Kauknoris Lazdijai distr.);
- 194.3. Šlavantas (Lazdijai distr.);
- 194.4. Zapsys (Lazdijai distr.);
- 194.5. Gauštvinis (Kelmė distr.);
- 194.6. Latežeris (Druskininkai distr.).

195. Strict control over water uptake for fishery needs has been provided for in respect of the following lakes:

- 195.1. Žašlių (Kaišiadorys distr.);
- 195.2. Ilgės (Elektrėnai distr.);
- 195.3. Pravalas (Vidugiris) (Molėtai distr.).

### Ponds

196. There are 26 ponds at risk within the Nemunas RBD. These have been designated as water bodies at risk on the basis of monitoring data and modelling results.

Poorer status than good in nine ponds is conditioned by diffuse pollution (indicated both by monitoring and modelling results). These ponds are subject to the same pollution reduction measures as the ones applied for lakes. Following the monitoring results, good status can be achieved in four ponds (out of nine) provided that buffer plant zones are established at least for 40 % of the water bodies.

The status of nine more ponds is poorer than good according to the monitoring data but good or even high (insignificant impact of pollution) following the modelling results. Studies are required for the said ponds to identify the reasons of such mismatch (potential impact of historic pollution).

No monitoring data is available in respect of the water quality indicators of the remaining eight ponds which fall within the category of water bodies at risk on the basis of the modelling results. Hence monitoring would be the measure validating the designation of the said ponds as water bodies at risk.

Table 143. Ponds subject to pollution reduction measures

Causes	Number of ponds	Measures
Diffuse pollution	9	Pollution reduction measures
Causes are not clear (modelling results indicate only a minor impact of pollution; potential impact of historic pollution)	9	Investigative monitoring
No monitoring data available; modelling results indicate an impact of pollution	8	Monitoring

197. Investigative monitoring and inventory of pollution sources with a view to identify the causes of poor status is proposed for the following ponds:

- 197.1. pond of the factory *Ekranas*,
- 197.2. Angirių pond,
- 197.3. Barkuškių pond,
- 197.4. Bublių pond,
- 197.5. Janušonių pond,
- 197.6. Kadrėnų pond,
- 197.7. Krivėnų pond,
- 197.8. Stepanonių pond,
- 197.9. Vaitiekūnų pond.

### Supplementary measures for reducing the impact by the industrial sector

198. There is little information on impacts by Lithuanian industrial enterprises on water bodies because companies usually discharge their effluents into centralised wastewater treatment facilities of towns and settlements.

An analysis of the data of water quality monitoring conducted in 2005-2008 was carried out in order to determine pollution with hazardous substances. The analysis identified all places where concentrations of hazardous substances exceeded the established limits during a year of the period in question. The results of the analysis are given in Table 144 below. The table specifies the places where exceeded concentrations of hazardous substances were detected in 2005-2008.

Table 144. Exceedances of concentrations of hazardous substances detected during 2005-2008; NM – not measured, MAC – maximum allowed concentration; values which exceed MAC are given in orange cells

Monitoring site	2005	2006	2007	2008
<b>Zn (MAC=100 µg/l)</b>				
Graumena at Pakalniškiai	103.50	NM	NM	NM
Nemunas – upstream of Rusnė, upstream of the Leitė	NM	4.55	192.25	0
<b>Trichloromethane (MAC=12 µg/l)</b>				
Šušvė - in the mouth	48.25	NM	NM	NM
Nemunas – upstream of Rusnė, upstream of the Leitė	NM	319.08	0	0
Nemunas at Pagėgiai, next to Road No. A12	NM	170.25	0	0
<b>Cr hexavalent (MAC=1 µg/l)</b>				
Nemunas - Skirvytė – upstream of Rusnė	0.64	1.09	0.5	NM
Nemunas - upstream of Rusnė, upstream of the Leitė	NM	1.00	0.5	NM
Akmena - Danė - in the mouth	0.98	1.09	0.67	NM
Nemunas at Pagėgiai, next to Road No. A12	NM	0.3	1.075	NM
Šešupė upstream of Kalvarija	NM	NM	NM	2.025
<b>Pb (MAC=5 µg/l)</b>				
Nevezis - upstream of Raudondvaris	2.4	0.25	8.64	0
Neris - upstream of Kaunas	0.44	0.93	11.5	0
<b>Endrin (MAC=0.005 µg/l)</b>				
Miniija - at Suvernai	0	0.083	NM	NM
Akmena-Danė – in the mouth	0	0.067	0	0

The rivers where pollutant concentrations in breach of the established MAC were registered should be assigned to the category of rivers suffering from a significant impact of pollution. However, it was noticed during the analysis of the data that in many cases a high average annual concentration of hazardous substances was determined by the results of a single measurement. Such individual steep leaps raise doubts concerning representativeness of certain results. In many cases, exceedances of MAC detected in certain places in one year were no longer observed in another year. Thus the water quality monitoring data alone is not sufficient for proving that rivers do suffer a significant impact of pollution with hazardous substances. Hence, it is recommended to continue monitoring of hazardous substances in places where exceeded concentrations were registered.

The assessment of significant pollution with hazardous substances also took account of the results of the study *Identification of substances dangerous for the aquatic environment in Lithuania* carried out in 2006. On the basis of the said study results, five places with potentially significant pollution by hazardous substances were identified. A list of these places is provided in Table 145.

Table 145. A list of places where concentrations of priority hazardous substances which pose risk to the aquatic environment were detected (following the project *Identification of substances dangerous for the aquatic environment in Lithuania, 2007*)

Basin/ sub-basin	River	Monitoring site	Hazardous substance detected
Nemunas Small Tributaries	Nemunas	downstream of Sovietsk	di(2-ethylhexyl) phthalate
Nevėžis	Nevėžis	downstream of Panevėžys	tributyltin
Nemunas Small Tributaries	Nemunas	at Rusnė	di(2-ethylhexyl) phthalate
Nemunas Small Tributaries	Nemunas	downstream of Kaunas	tributyltin
Neris Small Tributaries	Neris	at Buivydžiai	di(2-ethylhexyl) phthalate
Lithuanian Coastal Rivers	Akmena-Danė	in the mouth	di(2-ethylhexyl) phthalate

In addition, a number of wastewater treatment plants were identified in the discharges whereof hazardous substances were detected. Summing up all available information on potential pollution with hazardous substances, the rivers Neris, Nevėžis, Nemunas and Akmena-Danė were identified as the ones which suffer from significant pollution with such substances because both the monitoring data and the project results indicate potential exceedances of concentrations of hazardous substances in the said rivers.

Since practically no data is available on impacts of specific industrial enterprises on water bodies, it is proposed to introduce stricter control over the use of hazardous substances and to identify the causes of their entry into water during the present planning stage. To this end, a piece of legislation laying down recommendations for the assessment of toxicity of wastewater for wastewater treatment facilities and a piece of legislation laying down recommendations for the inventory of hazardous substances for economic entities subject to IPPC permits and state authorities which issue such permits will be drafted.

### **Training of employees of industrial enterprises**

199. A recent project carried out in the Baltic Sea area (Ahrens et al. 2007) established that trade companies, industrial enterprises and public authorities still lack a sufficient understanding of problems caused by hazardous substances. Lithuania is no exception. Apart from heavy metals and dioxines, priority substances are still considered “exotic” and not very relevant.

Even information available today on well-known hazardous substances used and discharged into the environment does not help to assess achievements in reducing discharges and to prepare appropriate measures. The main reason of this is lack of information and understanding by companies of hazardous substances used in their business and discharged into the environment (Ahrens et al. 2007).

Building capacities of employees to identify hazardous substances in raw materials used in their enterprises and raising awareness through trainings on correct filling out of safety data sheets

It is proposed to arrange in-house workshops for building capacities of employees to identify hazardous substances in raw materials used in their companies and raising awareness of pollution of the aquatic environment with priority substances. The objective is to draw up adequate inventories of substances used in enterprises and to identify where these substances are used or produced in the production process.

Establishment of direct communication between different links of production and provision of adequate training to all relevant parties in order to be able to request submission of correct information on raw materials by suppliers

Enterprises are facing certain problems in obtaining correctly filled out safety data sheets. This is especially true for suppliers outside the EU. It is proposed to arrange workshops which emphasise the importance of correct filling out of safety data sheets and to request submission of adequate information. Workshop participants should also include suppliers in order to establish communication between different links of the production chain and to demonstrate that provision of adequate information is one of the criteria for selecting suppliers and products.

### **Supplementary measures for recreation**

200. Although recreation has not been included among the drivers of significant pressures on the ecological status of water bodies, it is suggested that part of funds allocated for the development of recreation and already provided for in respective governmental documents are put aside for measures intended for the enhancement of the ecological status. This means that creation of any new object of infrastructure related to recreation should be permitted only in the event that measures to counterbalance the ecological damage done by such objects have been provided for.

Such measures should also be envisaged for the implementation of the National Special Plan of Water Tourism Routes which has already been prepared and which aims at expansion of knowledge-oriented and recreational water tourism as well as the infrastructure of tourism and recreation. The measures of the National Plan and their costs are provided in the chapter on economic analysis of the Nemunas RBD Management Plan.

Countryside tourism, as a separate load type, is not expected to have any negative impact on the environment provided that the established requirements are observed. Countryside tourism farmsteads are subject to regulations on treatment of household wastewater. Farmsteads should be regarded as point pollution sources which have treatment facilities and which are supposed to treat effluents at least to the following standards: BOD<sub>7</sub> - 29 mg/l, TP - 10 mg/l, and TN - 40 mg/l. When issuing permits to these objects, the status of a receiving water body in question should be taken into account.

## **SECTION II. ASSUMPTIONS UNDERLYING ESTIMATION OF THE COSTS OF THE SUPPLEMENTARY MEASURES**

### **General assumptions**

201. The following general assumptions were made for the purpose of estimations of the costs of the supplementary measures:

201.1. The number of population in cities and villages was taken from the website of the Department of Statistics, data of 1 January 2008;

201.2. According to the Statistical Yearbook, the average monthly income of a household member in 2008 was 986.8 litas (LTL 1 074 in towns, LTL 811.2 in rural areas, LTL 1 201 in large cities, and LTL 885.8 in other towns);

201.3. The size of an average household in an individual sub-basin is equated to the average size of a household in the region or municipality dominating in a sub-basin in question;

201.4. The actual discount rate is 6 % (since no social discount rate has been officially established in Lithuania, the one suggested by the European Commission was used<sup>38</sup>);

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

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

I = investment costs

r = annual interest (discount) rate

n = service life of the investment

EK = annual operating costs

202. 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.

## **SECTION III. ESTIMATION OF THE COSTS OF THE SUPPLEMENTARY MEASURES BY INDIVIDUAL SUB-BASINS**

203. The sub-sections below describe supplementary measures to reduce the impact of economic activities in the individual sub-basins of the Nemunas RBD.

### **The Minija Sub-basin**

#### **Measures for reducing point pollution**

204. No supplementary measures for reducing point pollution are envisaged for this sub-basin.

---

<sup>38</sup> Guide to COST-BENEFIT ANALYSIS of investment projects. Structural Funds, Cohesion Fund and Instrument for Pre-Accession. Final Report, 16/06/2008

### Measures for reducing diffuse pollution

205. Diffuse pollution does not have any significant impact on the quality of rivers in the Minija Sub-basin hence the implementation costs will be related only to the measures recommended for the whole of Lithuania. Since there is no nitrogen surplus in the sub-basin, these measures would be preventive ones providing protection from excessive amounts of nutrients in the soil and water bodies in future. In addition, the application of these measures would in a way result in the implementation of the polluter pays principle.

Table 146. Costs of reduction of diffuse pollution in the Minija Sub-basin

Measure	Measure application scope, ha or LSU	Impact of the measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	21 388 LSU	0	213 880	farmers
Validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha	93 820 ha	0	1 330 289	farmers
Additional controls	-	-	14 684	state
<b>Total ~:</b>		<b>0</b>	<b>1 559 000</b>	

The annual costs of preventive measures in respect of diffuse pollution in the Minija Sub-basin amount to LTL 1.6 million. According to the suggested scheme, the state would have to cover less than 1 % of this amount and these costs would be related to additional control. The major part of the costs – those of the development of fertilisation plans in farms larger than 10 ha and manure management in small farms – would have to be covered by farmers.

### Measures for improving the hydromorphological status

#### Construction of fish bypass channels

206. Fish bypass channels should be first of all constructed and remains of rock weirs rearranged in rivers which are the most important for fish migration. In the Minija Sub-basin, the following places have been identified: the rock weir of Pagraumenos mill in the Šalpė River where the remains of the rock weir have to be rearranged and the weir of the mill situated in Gargždai town where a fish pass is required. The rearrangement of the remains of the rock weir of Pagraumenos mill would cost around LTL 46 thousand. The fish migration facility at the weir of Gargždai mill was estimated to be LTL 212 thousand at 2001 prices. Since no later data is available, this amount was recalculated by applying ratios of the consumer price index. As a result, the implementation of this measure in 2009 would cost around LTL 270 thousand.

A fish migration facility is also required at the dam situated in Žlibinai village and will cost about LTL 126 thousand. However, this pass should be constructed only after having rearranged the remains of the rock-concrete dam of Vainaičių mill situated downstream (otherwise such facility at Žlibinai dam would not have the expected effect on fish migration).

Construction of fish bypass channels 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 Nemunas River Basin, i.e. the planning cycle from 2015.

At present, construction of fish bypass channels and removal of the remains of former dams approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180) may be deemed to be supplementary measures.

Having checked whether the remains of the dams are listed among objects of heritage or not, the following barriers have to be removed in the Minija Sub-basin (Table 147):

Table 147. Dam remains to be removed in the Minija Sub-basin and costs of the measures, LTL

River	Dam location	Measure	District	Notes	Investment costs*
Minija	Medingėnai	to rearrange remains of the rock weir	Rietavas		16 000
Šalpė	Pagraumenos mill	to rearrange remains of the rock weir	Klaipėda distr.	Veiviržas ichtiological reserve	45 700
Sausdravas	Vainaičių mill	to rearrange remains of the rock-concrete dam	Plungė distr.	Minija ichtiological reserve	35 600

Source: Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180)

\* - 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

The construction of a fish pass at the weir of the dam Gargždai mill and removal of the remains of the old dams would require about LTL 500 thousand of investment costs. If more or less similar amounts are allocated during the period from 2011 to 2015, the annual amount would be approximately LTL 100 thousand. The annual total costs at the average lifecycle of 50 years would be roughly LTL 43 thousand.

### Replacement of HPP turbines

207. Ramučių pond located in the Minija Sub-basin has been leased out for the construction of a hydropower plant. Should this plant be actually constructed, the new facility would have to have a more modern and environmentally friendly turbine. The costs of this measure are not included in the total demand of costs because these will be private expenses which have already been provided for. A construction permit for such HPP has to require introduction of the best available techniques, i.e. modern turbines.

There is one HPP in the Minija Sub-basin, Gondinga HPP, the turbine of which should be replaced due to its current impact. The power capacity of the hydropower plant is 950 kW and the approximate demand for investment costs would be LTL 3.8 million.

### Remeandering of rivers

208. Straightened rivers at risk in the Miniija Sub-basin stretch for 22.7 km. They flow over plains and require supplementary measures.

The study *Feasibility study and development of recommendations for establishment/restoration of wetlands aiming to reduce the input of organic and biogenic substances into water bodies* analysed costs of remeandering. The demand of investment costs for one kilometre is about LTL 100 thousand as indicated in the section on the assumptions.

Remeandering of the straightened water bodies at risk in the Miniija Sub-basin to the maximum extent would cost approximately LTL 2.3 million. The operating costs can be equated to zero. The total annual costs would be LTL 140 thousand.

#### Total costs of the measures for mitigating the impact of hydromorphological changes

209. Table 148 below provides the general measures for the mitigation of the impact of hydromorphological changes and their costs.

Table 148. Measures for mitigating the impact of hydromorphological changes in the Miniija Sub-basin

Measure	Amount	Investment costs, LTL	Operating costs, LTL/year	Total annual costs, LTL/year
Fish passes and removal of dam remains	2 fish passes and remains of 3 dams	493 000	12 000	43.000
Construction of a modern HPP turbine	2	3 800 000	114 000	241.000
Remeandering	22.7 km	2 270 000	0	137.000
<b>Total</b>		6 560 000	126 000	420 000

Source: Consultant

#### Supplementary measures for recreation

210. There is one official bathing site in the Miniija Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to maintenance of the bathing waters have been included in the Programme of Measures.

#### The Merkys Sub-basin

##### Measures for reducing point pollution

211. The achievement of the proposed good ecological status objectives in the Merkys Sub-basin requires additional reduction of pollution of wastewater with BOD<sub>7</sub>, nitrogen and phosphorus in treatment facilities of Šalčininkai. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 149 below.

Table 149. Costs of measures for reducing the impact of point pollution sources in the Merkys Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Šalčininkai WWTP	Additional tertiary treatment	1 200 000	60 000	140,000
<b>Total</b>		<b>1 200 000</b>	<b>60 000</b>	<b>140 000</b>

Source: Consultant

As shown in the table, annualisation of all investment costs and further addition of operating costs which total to 5 % of the investment costs of the WWTP would result in roughly LTL 0.14 million per year throughout the lifecycle of an infrastructure for the maintenance of the new infrastructure and preparation for upgrading when it wears out.

### Measures for reducing diffuse pollution

212. Agricultural activity in the Merkys Sub-basin is not intensive so rivers conform to the good ecological status requirements regarding an impact of diffuse pollution. Since some of the measures for reducing diffuse pollution are recommended for the whole of Lithuania, certain costs will have to be covered by farmers in the Merkys Sub-basin. The farmers would have to develop and implement fertilisation plans and manage manure in a suitable way thus preventing excessive amounts of nitrogen in the soil and water bodies in future. In addition, the application of these measures would in a way result in the implementation of the polluter pays principle.

Table 150. Costs of reduction of diffuse pollution in the Merkys Sub-basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	17 435 LSU	0	174 350	farmers
Development and validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha	64 289 ha	0	595 196	farmers
Additional controls	-	-	9 035	state
<b>Total ~:</b>		<b>0</b>	<b>779 000</b>	

The annual costs of preventive measures in respect of diffuse pollution in the Merkys Sub-basin amount to LTL 779 thousand. According to the suggested scheme, the state would have to cover less than 1 % of this amount and these costs would be related to additional control. The major part of the costs – those of the development of fertilisation plans in farms larger than 10 ha and manure management in small farms – would have to be covered by farmers (Table 150).

### Measures for improving the hydromorphological status

#### Construction of fish bypass channels

213. Fish migration facilities should be first of all constructed in rivers which are the most important for fish migration. Three such places have been identified in the Merkys Sub-basin: the dam of the resort *Merkys* in the Duobupis, the dam in Rudnia in the Ūla-Pelesa and the regulating sluice of the Merkys-Vokė Canal. The construction of the first

two migration facilities at 2001 data would cost respectively LTL 650 thousand and LTL 107 thousand. Since there is no later data available, this amount was recalculated by applying ratios of the consumer price index. As a result, the implementation of this measure in 2009 would cost about LTL 83 700 and LTL 136 thousand respectively. A fish migration facility of the regulating sluice of the Merkys-Vokė Canal should cost around LTL 105 thousand.

Construction of fish bypass channels should be based on specific feasibility studies which should select the most suitable technological solution for the bypass.

At present, construction of fish bypass channels and removal of the remains of former dams approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 may be deemed to be supplementary measures. There are no such barriers to be removed in the Merkys Sub-basin.

Thus, the improvement of conditions for fish migration in the Merkys Sub-basin would require about LTL 325 thousand of investment costs. If more or less similar amounts are allocated during the period from 2011 to 2015, the annual amount would be about LTL 65 thousand. The total annual costs at the average lifecycle of 50 years would be approximately LTL 31 thousand.

### **Replacement of HPP turbines**

214. Eišiškės HPP located in the Merkys Sub-basin is one those few in Lithuania which were built more than 50 years ago. It is recommended to replace three of its turbines with modern ones which are less harmful for fish. Since the costs of such turbine can vary to a very large extent, an assumption was made for the whole Nemunas RBD that the price of a new turbine is about LTL 4 000 per one kW<sup>39</sup>. Hence, the replacement of the turbines in Eišiškės HPP would cost approximately LTL 700 thousand. If operating costs account for about 3 % of the investment costs per year, the total annual costs would be LTL 44 thousand provided the lifecycle is 50 years.

HPP construction permits should require introduction of the best available techniques, i.e. modern turbines.

### **Remeandering of rivers**

215. Straightened rivers at risk in the Merkys Sub-basin flowing over plains stretch for 74.2 km. Remeandering of such sections to the maximum extent would cost approximately LTL 7.4 million. The operating costs can be equated to zero. The total annual costs would be LTL 0.5 million.

### **Total costs of the measures for mitigating the impact of hydromorphological changes**

216. Table 151 below provides the general measures for the mitigation of the impact of hydromorphological changes and their costs.

---

<sup>39</sup> <http://www.mokslai.lt>: An analysis of newly constructed small HPP shows that an average price of 1 kW of a HPP built on an existing pond may be around USD 1,500. The investment payback period is 13 years provided the electricity price is LTL 0.15 LTL per kWh.

Table 151. Measures for mitigating the impact of hydromorphological changes in the Merkys Sub-basin

Measure	Amount	Investment costs, LTL	Operating costs, LTL/year	Total annual costs, LTL/year
Fish passes and removal of dam remains	3 fish passes	325 000	9 700	31,000
Construction of a modern HPP turbine	1 HPP 180 kW, 3 turbines	700 000	21 000	44,000
Remeandering	74.2 km	7 400 000	0	471,000
<b>Total</b>		<b>8 340 000</b>	<b>31 000</b>	<b>550 000</b>

Source: Consultant

### Supplementary measures for recreation

217. The rivers Merkys and Ūla are included on the List of National Water Tourism Routes. The measures for the establishment of these routes and their costs are given in the section on the basic measures. There are two official bathing sites in the Merkys Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to the maintenance of the bathing waters have been included in the Programme of Measures.

### The Žeimena Sub-basin

#### Measures for reducing point pollution

218. The achievement of the recommended good ecological status objectives in the Žeimena Sub-basin requires reconstruction of the entire old Švenčionys WWTP. The proposed measures to improve clean-up of wastewater and their costs are given in Table 153 below.

Table 153. Costs of measures for reducing the impact of point pollution sources in the Žeimena Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Švenčionys WWTP	Reconstruction of the WWTP	8 000 000	400 000	930,000
	<b>Total</b>	<b>8 000 000</b>	<b>400 000</b>	<b>930 000</b>

Source: Consultant

As shown in the table above, annualisation of all investment costs and further addition of operating costs which total to 5 % of the investment costs of the WWTP would result in roughly LTL 0.93 million per year throughout the lifecycle of an infrastructure for the maintenance of the new infrastructure and preparations for upgrading when it wears out. It is not recommended to reconstruct Švenčionys WWTP at the present stage of the Programme of Measures because it is likely that the restrictions imposed on the use of phosphorus in domestic and industrial detergents would result in decreased loads of phosphorus emissions without having to reconstruct the facilities.

#### Measures for reducing diffuse pollution

219. Agricultural activity in the Žeimena Sub-basin is not intensive so diffuse pollution does not have any significant impact on the quality of its rivers. Since some of the measures to reduce diffuse pollution are recommended for the whole of Lithuania,

certain costs will have to be covered by farmers in the Žeimena Sub-basin. The farmers would have to develop and implement fertilisation plans and manage manure in a suitable way thus preventing excessive amounts of nutrients in the soil and water bodies in future. In addition, the application of these measures would in a way result in the implementation of the polluter pays principle

Table 154. Costs of reduction of diffuse pollution in the Žeimena Sub-basin

<b>Measure</b>	<b>Measure application scope, ha or LSU</b>	<b>Impact of measure on reduction of N, kg/year</b>	<b>Annual costs, LTL/year</b>	<b>Costs to be borne by</b>
Management of manure in small farms	11 714 LSU	0	117 140	farmers
Validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha	48 055 ha	0	385 642	farmers
Additional controls	-	-	5 985	state
<b>Total ~:</b>		<b>0</b>	<b>509 000</b>	

The annual costs of preventive measures in respect of diffuse pollution in the Žeimena Sub-basin amount to LTL 509 thousand. According to the suggested scheme, the state would have to cover less than 1 % of this amount and these costs would be related to additional control. The major part of the costs – those of the development of fertilisation plans in farms larger than 10 ha and manure management in small farms – would be covered by farmers.

### **Measures for improving the hydromorphological status**

#### **Construction of fish bypass channels**

220. Fish bypass channels should be first of all constructed in rivers which are the most important for fish migration. A facility for fish migration was built in Jusinė in 2008. Also, a fish pass in the dam in Lake Kertuojai should be reconstructed, which would cost around LTL 12 thousand.

There are no remains of former dams in the Žeimena Sub-basin and thus no relevant costs have been provided for.

Also, monitoring is required at the migration facility. However, these costs are included in the total costs planned for the Nemunas RBD.

#### **Replacement of HPP turbines**

221. There are no turbines to be replaced in the Žeimena Sub-basin.

Construction permits for hydropower plants must require introduction of the best available techniques, i.e. modern turbines.

#### **Remeandering of rivers**

222. Straightened rivers at risk that flow over plains in the Žeimena Sub-basin stretch for 15 km.

Remeandering of the straightened water bodies at risk in the Žeimena Sub-basin to the maximum extent would cost approximately LTL 1.5 million. The operating costs can be equated to zero. The total annual costs would be LTL 0.095 million.

### **Total costs of the measures for mitigating the impact of hydromorphological changes**

223. Table 155 below provides general measures for the mitigation of the impact of hydromorphological changes and their costs.

Table 155. Measures for mitigating the impact of hydromorphological changes in the Žeimena Sub-basin

<b>Measure</b>	<b>Amount</b>	<b>Investment costs, LTL</b>	<b>Operating costs, LTL/year</b>	<b>Total annual costs, LTL/year</b>
Fish passes and removal of dam remains	1	12 000	360	1 100
Construction of a modern HPP turbine	0	0	0	0
Remeandering	15 km	1 500 000	0	95 000
<b>Total</b>		<b>1 512 000</b>	<b>360</b>	<b>96 000</b>

Source: Consultant

### **Supplementary measures for recreation**

224. There are four official bathing sites in the Žeimena Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to maintenance of the bathing waters have been included in the Programme of Measures.

### **The Šventoji Sub-basin**

#### **Measures for reducing point pollution**

225. The achievement of the proposed good ecological status objectives in the Šventoji Sub-basin requires additional reduction of pollution of wastewater discharged from point pollution sources in Utena with phosphorus. However, to date it is not clear which source(s) is the main cause of the failure to achieve the good ecological status. Consequently, it is suggested that the first stage of the implementation of the WFD is limited to identification of the pollution sources

#### **Measures for reducing diffuse pollution**

226. Although agricultural activity in the Šventoji Sub-basin is not intensive, concentrations of nitrate nitrogen in the rivers Mūšia and Armona which flow over areas where more intensive agricultural activity is practiced fail to conform to the good ecological status requirements due to diffuse agricultural pollution. Water quality monitoring data of 2008 shows potential exceedance of BOD<sub>7</sub> concentrations as well; however, no specific reason has been identified with the help of mathematical modelling yet. No significant impact of diffuse agricultural pollution is exerted on the remaining rivers in the Šventoji Sub-basin.

The total area in the sub-basin where pollution has to be reduced is 34 770 ha and the total amount of nitrogen to be removed is 45 200 kg. Only two problematic catchments (units used for the assessment of agricultural pollution in a mathematical model) have been identified. Measures proposed for the entire country are not sufficient in this sub-basin. Supplementary reduction of the approved fertilisation norms by 20 % is recommended in the zone where excessive amounts of nitrogen will persist (assuming that normative standards will be validated and fertilisation plans will be obligatory for farms larger than 10 ha).

Table 156. Costs of reduction of diffuse pollution in the Šventoji Sub-basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	42 658 LSU	3 546	426 576	farmers
Development, validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha (including increase of the manure absorption efficiency coefficient)	190 529 ha	41 261 (13 312)	2 090 997	farmers
Implementation of measures of RDP 2007-2013 under more favourable conditions	-	7 171	0	state
Reduction of optimal fertilisation norms by 10 %	4 258 ha	17 033	0	state
Additional controls	-	-	27 090	state
<b>Total</b>	-	<b>62 000</b>	<b>2 545 000</b>	

The annual costs of measures to to reduce diffuse pollution in the Šventoji Sub-basin amount to roughly LTL 2.5 million. According to the suggested scheme, the state would have to cover less than 1 % of this amount and these costs would be related to additional control. The major part of the costs – those of the development of fertilisation plans in farms larger than 10 ha and manure management in small farms – would have to be covered by farmers.

### Measures for improving the hydromorphological status

#### Construction of fish bypass channels

227. Fish migration facilities should be first of all constructed in rivers which are the most important for fish migration. One such place has been identified in the Šventoji Sub-basin – the dam in Anykščiai on the Šventoji River. At 2001 data, the construction of migration facilities in Anykščiai dam would cost LTL 66 thousand. Since there is no later data available, the amount was recalculated by applying ratios of the consumer price index. As a result, the implementation of this measure in 2009 would cost about LTL 84 thousand.

Construction of fish bypass channels should be based on specific feasibility studies which should select the most suitable technological solution for the bypass. At present, both construction of fish bypass channel and removal of the remains of former dams approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of

Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180) may be deemed to be supplementary measures. There are three such barriers to be removed in the Šventoji Sub-basin (Table 157).

Table 157. Dam remains to be removed in the Šventoji Sub-basin and costs of the measures, LTL

River	Dam location	Measure	District	Notes	Investment costs*
Siesartis	Siesartis mill	to clean the river bed	Ukmergė distr.	Siesartis landscape reserve	6 600
Siesartis	mill in Kazliškis and Ciesarkos mill	to remove rock weirs	Ukmergė distr.		29 000
Virinta	mill in Klabiniai	to remove remains of the dam	Anykščiai distr.		6 000

Source: Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180)

\* - 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

Consequently, the improvement of conditions for fish migration in the Šventoji Sub-basin would require about LTL 128 thousand of investment costs. If more or less similar amounts are allocated during the period from 2011 to 2015, the annual amount would be about LTL 26 thousand. The total annual costs at the average lifecycle of 50 years would be approximately LTL 11 thousand.

### Replacement of HPP turbines

228. The age of all hydropower plants in the Šventoji Sub-basin is not old, but the turbines of Gabrėlai and Motiejūnai HPP on the Nevėža (Virinta) and (Šventoji) should be replaced due to their current impact. The costs would amount to slightly more than LTL 1 million. The annual operating costs would be around LTL 32 thousand and the annual costs – LTL 69 thousand.

### Remeandering of rivers

229. Straightened rivers at risk which flow over plains in the Šventoji Sub-basin and which have not been designated as HMWB stretch for 88.1 km.

Remeandering of these water bodies at risk to the maximum extent would cost approximately LTL 8.8 million. The operating costs can be equated to zero. The total annual costs would be LTL 0.6 million.

### Total costs of the measures for mitigating the impact of hydromorphological changes

230. Table 158 below provides general measures for the mitigation of the impact of hydromorphological changes and their costs.

Table 158. Measures for mitigating the impact of hydromorphological changes in the Šventoji Sub-basin

Measure	Amount	Investment costs, LTL	Operating costs, LTL/year	Total annual costs, LTL/year
Fish passes and removal of dam remains	1 pass and 3 barriers	128 000	2 600	11 000
Construction of a modern HPP turbine	2 HPP	1 000 000	32 000	69 000
Remeandering	88.1 km	8 800 000	0	560 000
<b>Total</b>		<b>10 000 000</b>	<b>35 000</b>	<b>640 000</b>

Source: Consultant

### Supplementary measures for recreation

231. The Šventoji stands on the List of National Water Tourism Routes. The measures planned for the establishment of these routes are defined in the Draft Management Plan for the Nemunas RBD. No additional costs for recreation have been envisaged.

There are nine official bathing sites in the Šventoji Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to maintenance of the bathing waters have been included in the Programme of Measures.

### Neris Small Tributaries Sub-basin

#### Measures for reducing point pollution

232. The achievement of the proposed good ecological status objectives in the Neris Small Tributaries Sub-basin requires additional reduction of pollution of wastewater with nitrogen and phosphorus in Kaišiadorys treatment facilities. The proposed measures to improve clean-up of wastewater and their costs are given in Table 159 below.

Table 159. Costs of measures for reducing the impact of point pollution sources in the Neris Small Tributaries Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Kaišiadorys WWTP	Additional treatment of N and P	3 960 000	198 000	460,000
<b>Total</b>		<b>3 960 000</b>	<b>198 000</b>	<b>460 000</b>

Source: Consultant

As shown in the table above, annualisation of all investment costs and further addition of operating costs which total to 5 % of the investment costs of the WWTP would result in about LTL 0.5 million per year throughout the lifecycle of an infrastructure for the maintenance of the new infrastructure and preparations for upgrading when it wears out.

#### Measures for reducing diffuse pollution

233. Rivers in the Neris Small Tributaries Sub-basin do not suffer from a significant impact diffuse agricultural pollution. The total area in the sub-basin where pollution has to be reduced is 26 030 ha, and the amount of nitrogen to be removed totals to 41 648 kg. Two problematic catchments (units used for the assessment of agricultural pollution

in a mathematical model) have been identified. Measures for the removal of the excessive amount of nitrogen proposed for the entire country are sufficient in this sub-basin.

Table 160. Costs of reduction of diffuse pollution in the Neris Small Tributaries Sub-basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	1 433 LSU	1 789	14 330	farmers
Development, validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha (including increase of the manure absorption efficiency coefficient)	62 094 ha	34 267 (24 885)	588 914	farmers state
Additional controls	-	-	4 355	
<b>Total</b>	-	<b>36 056</b>	<b>608 000</b>	

The annual costs of preventive measures in respect of diffuse pollution in the Neris Small Tributaries Sub-basin amount to LTL 608 thousand. According to the suggested scheme, the state would have to cover less than 1 % of this amount and these costs would be related to additional control. The major part of the costs – those of the development of fertilisation plans in farms larger than 10 ha and manure management in small farms – would have to be covered by farmers.

### Measures for improving the hydromorphological status

#### Construction of fish bypass channels

234. Fish migration facilities should be first of all constructed in rivers which are the most important for fish migration. One such place has been identified in the Neris Small Tributaries Sub-basin – dam in Rokantiškės on the Vilnia River.

Four more places have been given the second priority. The cost of the construction of these migration facilities was estimated in 2001. Since there is no later data available, this amount was recalculated by applying ratios of the consumer price index (Table 161).

At present, construction of fish bypass channels and removal of the remains of former dams approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180) may be deemed to be supplementary measures. There are six such barriers to be removed in the Neris Small Tributaries Sub-basin.

Reconstruction of the dam in Vaidotai on the Vokė would not have the expected effect on fish migration if fish migration passes are not constructed at the dams of Grigiškės HPP and in Mūro Vokė.

Table 161. Fish migration facilities and dam remains to be removed in the Neris Small Tributaries Sub-basin and costs of these measures, LTL

River	Dam location	Measure	District	Notes	Investment costs*
<i>Fish migration facilities</i>					
Vilnia	Rokantiškės	to reconstruct a fish pass	Vilnius city		177 910
Vokė	Grigiškės HPP	fish pass	Vilnius city	Operating small HPP	182 993
Vokė	Mūro Vokė	fish pass	Vilnius city		247 803
Strėva	Strėva	to repair a fish pass	Kaišiadorys distr.		25 000
Riešė	Žemutinė Riešė	Fish pass	Vilnius city	Verkiai regional park	93 000
<i>Barriers to be removed</i>					
Vokė	Vaidotai	to rearrange remains of the rock weir	Vilnius distr.		85 000
Bražuolė	Kragžliai	to remove remains of the concrete weir	Trakai distr.	Neris regional park	5 000
Musė	mill in Musninkai	to construct additional rock weirs	Širvintos distr.		50 000
Nemenčia	mill in Nemenčinė	to remove remains of the concrete dam	Vilnius distr.		14 000
Žalesa	Skirgiškės (Tartokai) mill	to rearrange remains of the dam	Vilnius city		35 000
Bezdonė	Gamernio dam	to fully open the water pass	Vilnius distr.		0
<b>TOTAL ~</b>					<b>915 000</b>

Source: Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180)

\* - Costs taken from the study *Improvement of Fish Migration Conditions in Ichthyologically Important Rivers* (Gedilieta and Institute of Ecology, 2001) and adjusted for 2009 taking into account the inflation

Consequently, the improvement of conditions for fish migration in the Neris Small Tributaries Sub-basin would require about LTL 1 million of investment costs. If more or less similar amounts are allocated during the period from 2011 to 2015, the annual amount would be around LTL 200 thousand. The annual operating costs for fish passes would be around LTL 26 thousand and the total annual costs at the average lifecycle of 50 years would be approximately LTL 80 thousand.

### **Replacement of HPP turbines**

235. None of the hydropower plants in the Neris Small Tributaries Sub-basin is very old and it has not been established that any of them would be exerting an impact which would require impact mitigation measure in the nearest future. Hence, there is no need to replace HPP turbines in this sub-basin in the nearest future.

Construction permits for hydropower plants must require introduction of the best available techniques, i.e. modern turbines.

### Remeandering of rivers

236. Straightened rivers at risk which flow over plains in the Neris Small Tributaries Sub-basin and which have not been designated as HMWB stretch for 19.4 km. To be able to achieve the good ecological status objectives, these rivers should be remeandered to regain as natural bed as possible. This would cost almost LTL 2 million. The operating costs can be equated to zero. The total annual costs would be around LTL 120 thousand.

#### Total costs of the measures for mitigating the impact of hydromorphological changes

237. Table 162 below provides the general measures for the mitigation of the impact of hydromorphological changes and their costs.

Table 162. Measures for mitigating the impact of hydromorphological changes in the Neris Small Tributaries Sub-basin

Measure	Amount	Investment costs, LTL	Operating costs, LTL/year	Total annual costs, LTL/year
Fish passes and removal of dam remains	5 fish passes and 6 barriers to be removed	915 000	22 000	80.000
Construction of a modern HPP turbine	0	0	0	0
Remeandering	19.4 km	1 940 000	0	123 000
<b>Total ~</b>		<b>2 860 000</b>	<b>22 000</b>	<b>203 000</b>

Source: Consultant

### Supplementary measures for recreation

238. The Neris River stands on the List of National Water Tourism Routes. The measures for the establishment of these routes and their costs are given in the section on the basic measures.

There are nine official bathing sites in the Neris Small Tributaries Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to maintenance of the bathing waters have been included in the Programme of Measures.

### The Nevėžis Sub-basin

#### Measures for reducing point pollution

239. The achievement of the proposed good ecological status objectives in the Nevėžis Sub-basin requires additional reduction of pollution of wastewater discharged from point pollution sources in at least eight settlements. However, to date the pollution source or pollution reduction possibilities are not clear enough in five of these settlements therefore reduction of effluent pollution on the higher level than provided for in the Wastewater Regulation is required in three settlements, as identified after the so-called confidence analysis described in the Nemunas RBD Management Plan. Measures proposed for the improvement of wastewater treatment and their costs are provided in Table 163 below.

Table 163. Costs of measures for reducing the impact of point pollution sources in the Nevėžis Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Baisogala WWTP	Construction of new WWTP	4 000 000	200 000	466 000
Pakiršinis WWTP	Reonstruction of the WWTP	1 500 000	75 000	206 000
Bukonys WWTP		500 000	25 000	58 000
<b>Total</b>		<b>6 000 000</b>	<b>300 000</b>	<b>730 000</b>

Source: Consultant

As shown in the table above, annualisation of all investment costs and further addition of operating costs which total to 5 % of the investment costs of the WWTP would result in more than LTL 700 thousand per year throughout the lifecycle of an infrastructure for the maintenance of the new infrastructure and preparations for upgrading when it wears out.

### Measures for reducing diffuse pollution

240. Agricultural pollution in the Nevėžis Sub-basin is a highly important factor which exerts a significant impact on the quality of the rivers in the Nevėžis Sub-basin. These rivers suffer from one of the largest pollution loads in the entire Nemunas RBD. Accordingly, concentrations of nitrate nitrogen fail to conform to the good ecological status requirements nearly in all rivers of the sub-basin. According to the mathematical modelling results, the exceedance of these concentrations and good ecological status requirements is not very high in the rivers in the upper reaches of the Nevėžis Sub-basin where agricultural activities are not that intensive. Meanwhile in the remaining rivers (especially smaller one) the good status requirements may be exceeded more than twice.

Pollution in the Nevėžis Sub-basin has to be reduced in the area of 529 530 ha, and the total amount of nitrogen to be removed is 1 748 thousand kg. 31 problematic catchments (a unit used in the mathematical model for the assessment of diffuse pollution) have been identified.

Measures proposed for the entire country are not sufficient in this sub-basin. As in other respective sub-basins, supplementary reduction of the approved fertilisation norms by 20 % is recommended in the zones where excessive amounts of nitrogen will persist. After the implementation of these measures, 16 catchments where excessive nitrogen has to be removed would still remain in this sub-basin. Taking into account cost-effectiveness of the measure, the following measure is proposed: to plant catch crops in part of intensively used (sandy and mixed) land. Still, even after the application of the said measure excessive nitrogen amounts will persist in 10 catchments.

Due to intensive agricultural activities in the Nevėžis Sub-basin, pollution is likely to be rather concentrated, especially in water discharged through drainage systems. Hence, measures designed to capture large nitrogen amounts are proposed for the removal of the remaining pollution. One of such measures is artificial wetlands. As the efficiency of artificial wetlands in the reduction of excessive nitrogen as well as the costs of this measure largely depend on the conditions of a place in question, first of all, it is recommended to conduct a detailed analysis of the area selecting the most suitable sites for this measure as well as comparing its effectiveness with alternative measures, such

as controlled drainage systems. The application of one of such measures would enable reducing pollution so that it meets the good status requirements in the entire sub-basin and thus all problematic catchments will be eliminated.

It is proposed to compensate all measures which are intended only for the Nevėžis Sub-basin.

Table 164. Costs of reduction of diffuse pollution in the Nevėžis Sub-basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	36 048 LSU	61 117	360 478	farmers
Validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha (including increase of the manure absorption efficiency coefficient)	288 414 ha	898 365 (390 854)	1 263 529	farmers
Implementation of measures of RDP 2007-2013 under more favourable conditions	-	200 817	0	state
Reduction of fertilisation norms by 20 %	167 018 ha	507 511	0	state
Planting of catch crops in the sandy soil	230 ha	6 396	88 410	state
Planting of catch crops in the mixed soil	290 ha	5 612	111 817	state
Additional controls	-	-	29 267	state
<b>Total</b>		<b>1 692 000</b>	<b>1 946 000</b>	

The annual costs of elimination of diffuse pollution in the Nevėžis Sub-basin amount to LTL 1 946 thousand, the major part of which would have to be covered by farmers (LTL 1 624 thousand). The rest of the costs would be borne by the state because the measures would be implemented exclusively in the Nevėžis Sub-basin.

### Measures for improving the hydromorphological status

#### Construction of fish bypass channels

241. No fish bypass channels are required in the Nevėžis Sub-basin hence no costs related to the improvement of migration conditions have been provided for.

#### Replacement of HPP turbines

242. None of the hydropower plants in the Nevėžis Sub-basin is very old but the turbines in two HPP in the Nevėžis Sub-basin, the HPP of Vaitiekūnai and Angiriai with respective capacities of 370 kW and 1300 kW, should be replaced due to their current impact on the river ecosystems.

Table 165. Costs of the upgrading of hydropower plants in the Nevėžis Sub-basin

Hydropower plant	Investment costs, LTL	Operating costs, LTL/year	Total annual costs, LTL
------------------	-----------------------	---------------------------	-------------------------

Vaitiekūnai	1 480 000	44 400	138 000
Angiriai	5 200 000	156 000	486 000
<b>Total</b>	<b>6 680 000</b>	<b>200 400</b>	<b>624 000</b>

Source: Consultant

As shown in the table above, the total demand of the costs for such measures in the Nevėžis Sub-basin would be nearly LTL 7 million and the annual costs (i.e. the actual long-term burden) would amount to approximately LTL 600 thousand.

### **Remeandering of rivers**

243. Straightened rivers at risk which flow over plains in the Nevėžis Sub-basin and which have not been designated as HMWB stretch for 171.9 km. These rivers should be remeandered to regain as natural bed as possible.

This would cost about LTL 17 million. The total annual costs would be around LTL 1 million.

### **Total costs of the measures for mitigating the impact of hydromorphological changes**

244. Table 166 below provides general measures for the mitigation of the impact of hydromorphological changes and their costs.

Table 166. Measures for mitigating the impact of hydromorphological changes in the Nevėžis Sub-basin

Measure	Amount	Investment costs, LTL	Operating costs, LTL/year	Total annual costs, LTL/year
Fish passes and removal of dam remains	0	0	0	0
Construction of a modern HPP turbine	2	6 680 000	200 400	624,000
Remeandering	171.9 km	17 000 000	0	1 100 000
<b>Total</b>		<b>24 000 000</b>	<b>200 000</b>	<b>1 700 000</b>

Source: Consultant

### **Supplementary measures for recreation**

245. The Nevėžis is not included in the List of National Water Tourism Routes.

There are two official bathing sites in the Nevėžis Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to maintenance of the bathing sites have been included in the Programme of Measures.

### **Measures for assessing the status of groundwater**

246. It has been determined that abnormally high concentrations of two indicators – sulfates (SO<sub>4</sub>) and chlorides (Cl) – in the problematic Stipinai groundwater body of Upper Devonian deposits, which is almost equally situated in the Nevėžis, Dubysa and

Jūra Sub-basins, are of natural origin, therefore the status of water is considered to be “good” following the environmental criteria and coloured in green in groundwater status maps as required by the WFD.

However, there is a number of groundwater deposits/wellfields (in Bedančiai, Anžiliai, Skėmiai and Šiauliai (Bubiai)) in which concentrations of the said two indicators (SO<sub>4</sub> and Cl) fail to conform to the requirements set for the drinking water quality. In our opinion, such deposits/wellfields should be assigned to a risk group, although on the other hand, the available monitoring data is far from sufficient for the assessment of changes/trends determined by human activity nearly in all wellfields.

It is recommended to draft a piece of legislation which would obligate water supply companies abstracting > 10 m<sup>3</sup> of groundwater per day to perform monitoring of the problematic quality indicators (Cl and SO<sub>4</sub>) and provide the data to the Lithuanian Geological Survey. The LGS would analyse the data and decide whether the wellfields identified should be classified as being at risk. No costs are envisaged for this measure because the groundwater monitoring will be performed in the procedure laid down in the legislation and the data will be analysed in the procedure established by the Lithuanian Geological Survey.

### The Šešupė Sub-basin

#### Measures for reducing point pollution

247. The achievement of the proposed good ecological status objectives in the Šešupė Sub-basin requires additional reduction of pollution of wastewater with nitrogen and phosphorus in treatment facilities in five settlements. However, to date the pollution source or pollution reduction possibilities are not clear enough in at least three of these settlements therefore supplementary measures are proposed only for two settlements. The measures proposed for the improvement of wastewater treatment and their costs are provided in Table 167 below.

Table 167. Costs of measures for reducing the impact of point pollution sources in the Šešupė Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Šakiai WWTP	1. Chemical precipitation of P and sand filters or microscreens	150 000	7 500	17 500
Kybartai WWTP	Additional link of denitrification	1 000 000	50 000	116 000
<b>Total</b>		<b>1 150 000</b>	<b>57 500</b>	<b>134 000</b>

Source: Consultant

As shown in the table above, annualisation of all investment costs and further addition of operating costs which total to 5 % of the investment costs of the WWTP would result in about LTL 0.134 million per year throughout the lifecycle of an infrastructure for the maintenance of the new infrastructure and preparation for upgrading when it wears out. It is not recommended to reconstruct Šakiai WWTP at the present stage of the Programme of Measures because it is likely that the restrictions imposed on the use of phosphorus in domestic and industrial detergents would result in decreased loads of phosphorus emissions without having to reconstruct the facilities.

### Measures for reducing diffuse pollution

248. Agricultural activity in the Šešupė Sub-basin is intensive, and even though its impact is not significant for the quality of the Šešupė itself, many of its tributaries are polluted due to the impact of diffuse pollution from agricultural sources, i.e. concentrations of nitrate nitrogen in this area fail to meet the requirements for good ecological status. However, it should also be noted that the said concentrations in the tributaries of the Šešupė are not as high as the ones in the Nevėžis Sub-basin, which is also an area of intensive agriculture.

Pollution in the Šešupė Sub-basin has to be reduced in the area of 206 710 ha, and the total amount of nitrogen to be removed is 392 749 kg. 14 problematic catchments (a unit used in a mathematical model for the assessment of diffuse pollution) have been identified. The common measures proposed for the entire country are not sufficient in this sub-basin. Supplementary reduction of the approved fertilisation norms by 20 % is recommended in the zones where excessive amounts of nitrogen will persist after the implementation of the measures on the national level.

Table 168. Costs of reduction of diffuse pollution in the Šešupė Sub-basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	43 566 LSU	39 935	435 660	farmers
Validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha (including increase of the manure absorption efficiency coefficient)	198 084 ha	318 308 (139 388)	2 203 130	farmers
Implementation of measures of RDP 2007-2013 under more favourable conditions	-	62 150	0	state
Reduction of fertilisation norms by 20 %	18 703 ha	50 137	0	state
Additional controls	-	-	38 538	
<b>Total</b>		<b>470 500</b>	<b>2 677 000</b>	

Source: Consultant

249. The annual costs of measures for the reduction of diffuse pollution in the Šešupė Sub-basin amount to LTL 2 677 thousand. According to the suggested scheme, the state would have to cover around 1 % of this amount and these costs would be related to additional control. The major part of the costs – those of the development of fertilisation plans in farms larger than 10 ha and manure management in small farms – would be covered by farmers.

## Measures for improving the hydromorphological status

### Construction of fish bypass channels

250. Fish bypass channels should be first of all constructed in rivers which are the most important for fish migration. One such place has been identified in the Šešupė Sub-basin – the dam in Kudirkos Naumiestis. The construction of the dam in 2001 cost LTL 175 000 and the funds required in 2009 would total to around LTL 220 000. The builder of the HPP on this dam has been obligated to construct the fish migration pass using its own funds.

### Replacement of HPP turbines

251. Two hydropower plants in the Šešupė Sub-basin are rather old, built in 1951-1952. These are Antanavas and Netičkapis power plants. Their total installed capacity is 400 kW+240 kW= 640 kW. However, these HPP do not exert any impact on water systems as compared to the other ones included in the list of priority HPP and hence the replacement of their turbines could be planned for later future, after the expiry of the first period of the implementation of the WFD.

The investment costs required for both HPP total to about LTL 2 560 thousand; however, they are not included in the list of the hydromorphological measures for the Nemunas RBD to be implemented during the first stage. These measures should be included into the Programme of Measures for the second stage of the implementation of the WFD.

### Remeandering of rivers

252. Straightened rivers at risk which flow over plains in the Šešupė Sub-basin and which have not been designated as HMWB stretch for 130.6 km. These water bodies should be remeandered to regain as natural beds as possible.

The remeandering would cost approximately LTL 13 million. The operating costs can be equated to zero. The total annual costs would be LTL 830 thousand.

### Total costs of the measures for mitigating the impact of hydromorphological changes

253. Table 170 presents the measures for mitigation of the impact of the hydromorphological changes and their costs.

Table 170. Measures for mitigating the impact of the hydromorphological changes in the Šešupė Sub-basin

Measure	Amount	Investment costs, LTL	Operating costs, LTL/year	Total annual costs, LTL/year
Fish passes and removal of dam remains	1	220 000	6 600	21 000
Construction of a modern turbine	0	0	0	0
Remeandering	130.6 km	13 000 000	0	830 000
Total:		<b>13 300 000</b>	<b>6 600</b>	<b>850 000</b>

Source: Consultant

### **Supplementary measures for recreation**

254. The Šešupė Sub-basin is not included in the List of National Water Tourism Routes.

There are five official bathing sites in the Šešupė Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to the maintenance of the bathing waters have been included in the Programme of Measures.

### **Supplementary measures for assessing the status of groundwater**

255. There are a number of groundwater deposits/wellfields in the Šešupė Sub-basin in which concentrations of chlorides (Cl) fail to conform to the requirements for the drinking water quality. The available data is not sufficient to prove any impact of water use on deterioration of the water quality therefore there is no basis for their designation as water bodies at risk. It is recommended to draft a piece of legislation which would obligate water supply abstracting  $> 10 \text{ m}^3$  of groundwater per day to perform monitoring of the problematic quality indicator (Cl) and provide the data to the Lithuanian Geological Survey. The LGS would analyse the data and decide whether the wellfields identified should be classified as being at risk. No costs are envisaged for this measure because the groundwater monitoring will be performed in the procedure laid down in the legislation and the data will be analysed in the procedure established by the Lithuanian Geological Survey.

### **The Dubysa Sub-basin**

#### **Measures for reducing point pollution**

256. The measures in the Dubysa Sub-basin include improvement of the operation of Tytuvėnai WWTP to be able to achieve the concentrations required for the implementation of the WFD. The upgrading of Tytuvėnai WWTP in this Programme has been identified as a supplementary measure; however, since the reconstruction of these facilities has already been planned, the most efficient solution would be to carry out this reconstruction in a way to implement both the requirements of the Wastewater Regulation and more stringent ones which ensure good status of a receiving water body. No additional costs should be required.

#### **Measures for reducing diffuse pollution**

257. According to the mathematical modelling results, diffuse agricultural pollution does not exert any significant impact on the quality of the main river Dubysa. However, the concentrations of nitrate nitrogen in some of its tributaries may be slightly below the good ecological status requirements.

The total area in the sub-basin where pollution has to be reduced is 74 590 ha and the total amount of nitrogen to be removed is 34 311 kg. Only two problematic catchments (units used for the assessment of agricultural pollution in a mathematical model) have been identified. The common measures proposed for the entire country are sufficient in this sub-basin.

Table 171. Costs of reduction of diffuse pollution in the Dubysa Sub-basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	14 006 LSU	10 002	140 062	farmers
Development, validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha (including increase of the manure absorption efficiency coefficient)	78 534 ha	100 959 (37 459)	972 317	farmers
Additional controls	-	-	13 912	state
<b>Total</b>		<b>63 000</b>	<b>1 126 291</b>	

Source: Consultant

The annual costs of the reduction of diffuse pollution in the Dubysa Sub-basin amount to LTL 1 126 thousand. According to the suggested scheme, the state would have to cover around 1 % of this amount and these costs would be related to additional control. The major part of the costs – those of the development of fertilisation plans in farms larger than 10 ha and manure management in small farms – would be covered by farmers (Table 171).

### Measures for improving the hydromorphological status

#### Construction of fish bypass channels

258. Fish bypass channels should be first of all constructed in rivers which are the most important for fish migration. One such place has been identified in the Dubysa Sub-basin – the dam in Kelmė on the Kražantė. The cost of the migration facility in 2001 was LTL 88 thousand and the costs required in 2009 would amount to about LTL 112 thousand.

At present, construction of fish bypass channels and removal of the remains of former dams approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180) may be deemed to be supplementary measures. There are two such barriers to be removed in the Dubysa Sub-basin (Table 172).

Table 172. Dam remains to be removed in the Dubysa Sub-basin and costs of the measures, LTL

River	Dam location	Measure	District	Notes	Investment costs*
Dubysa	Klumpės	to rearrange the stone dam	Jurbarkas	Dubysa ichtiological reserve	36 000
Dubysa	Maslauskiškės	to rearrange the stone dam	Raseiniai	Dubysa Regional Park	18 000
<b>TOTAL</b>					<b>54 000</b>

Source: Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180)

\* - 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

Consequently, the improvement of the conditions for fish migration in the Dubysa Sub-basin would require about LTL 165 thousand of investment costs. If more or less similar amounts are allocated during the period from 2011 to 2015, the annual demand would be about LTL 33 thousand. The annual total costs at the average lifecycle of 50 years would be approximately LTL 10 thousand.

### **Replacement of HPP turbines**

259. Two hydropower plants in the Dubysa Sub-basin located in Plikiai (98 kW) and in Kaulakiai (165 kW) are not very old but since their impact on water systems is more significant than the impact of other HPP, it is proposed to replace their turbines during the first stage of the hydromorphological measures.

The replacement of the turbine in Plikiai hydropower plant would cost almost LTL 400 thousand and the replacement of the one in Kaulakiai – more than LTL 660 thousand.

### **Remeandering of rivers**

260. Straightened rivers which flow over plains in the Dubysa Sub-basin and which have not been designated as HMWB stretch for 61.3 km. Such water bodies should be remeandered to regain as natural bed as possible.

This would cost about LTL 6.1 million. The total annual costs would be around LTL 0.4 million.

### **Total costs of the measures for mitigating the impact of hydromorphological changes**

261. Table 173 below provides general measures for the mitigation of the impact of hydromorphological changes and their costs.

Table 173. Measures for mitigating the impact of hydromorphological changes in the Dubysa Sub-basin

<b>Measure</b>	<b>Amount</b>	<b>Investment costs, LTL</b>	<b>Operating costs, LTL/year</b>	<b>Total annual costs, LTL/year</b>
Fish passes and removal of dam remains	6	192 400	3 400	12 200
Construction of a modern HPP turbine, kW	263	1 050 000	31 600	99 000
Remeandering, km	61.3 km	6 130 000	0	390 000
<b>Total</b>		<b>7 400 000</b>	<b>35 000</b>	<b>500 000</b>

Source: Consultant

### **Supplementary measures for recreation**

262. The Dubysa River stands on the List of National Water Tourism Routes. The measures for the establishment of these routes and their costs are given in the Nemunas RBD Management Plan where the basic measures for recreation are defined.

There are seven official bathing sites in the Dubysa Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs

related to the maintenance of the bathing waters have been included in the Programme of Measures.

### **Supplementary measures for assessing the status of groundwater**

263. The Dubysa Sub-basin contains a larger part of the problematic Kėdainiai-Dotnuva groundwater body and about one third of Stipinai groundwater body of Upper Devonian deposits. Abnormally high concentrations of chlorides (Cl) and sulfates (SO<sub>4</sub>) are registered in both groundwater bodies. It has been established that these anomalies are of a natural origin. Poor chemical composition of groundwater in individual bore wells is determined by the geological structure of the territory. The area consists of Upper Devonian aquifers and aquifer separating layers, the most important of which are gypseous water-containing deposits as well as those consisting of sand and clay strata. In the southern part of this groundwater body, chloride (and a little of sulfate) water intrusion occurs through tectonic faults from below into the lower parts of the aquiferous complexes.

The monitoring information currently available is not sufficient to be able to evaluate changes/trends determined by water exploitation and to assign the groundwater bodies to a risk group.

It is recommended to draft a piece of legislation which would obligate water supply abstracting > 10 m<sup>3</sup> of groundwater per day to perform monitoring of the problematic quality indicator (Cl and SO<sub>4</sub>) and provide the data to the Lithuanian Geological Survey. The LGS would analyse the data and decide whether the wellfields identified should be classified as being at risk. No costs are envisaged for this measure because the groundwater monitoring will be performed in the procedure laid down in the legislation and the data will be analysed in the procedure established by the Lithuanian Geological Survey.

### **The Jūra Sub-basin**

#### **Measures for reducing point pollution**

264. The achievement of the proposed good ecological status objectives in the Jūra Sub-basin requires additional reduction of pollution of wastewater with nitrogen and phosphorus in treatment facilities in a few settlements. However, an analysis of the level of confidence showed that during the first stage of the implementation of the WFD the pollution reduction measure is worthwhile introducing only in one settlement. The proposed measures for the improvement of the clean-up of wastewater and their costs are given in Table 174 below.

Table 174. Costs of measures for reducing the impact of point pollution sources in the Jūra Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Raseiniai WWTP	1. Extended aeration (nitrification), chemical precipitation of P with sand filters or microscreens	800 000	40 000	93 000

Source: Consultant

265. As shown in the table above, annualisation of all investment costs and further addition of operating costs which total to 5 % of the investment costs of the WWTP would result in roughly LTL 0.09 million per year throughout the lifecycle of an infrastructure for the maintenance of the new infrastructure and preparation for upgrading when it wears out.

### Measures for reducing diffuse pollution

267. Diffuse agricultural pollution does not have any significant impact on the quality of rivers in the Jūra Sub-basin where concentrations of nitrate nitrogen meet the good status criteria in many rivers.

The total area where pollution has to be reduced in the sub-basin is 18 990 ha and the total amount of nitrogen to be removed is 18 990 kg. Three problematic catchments (units used for the assessment of agricultural pollution in a mathematical model) have been identified. The common measures for removal of nitrogen surplus proposed for the entire country are sufficient in this sub-basin.

Table 175. Costs of reduction of diffuse pollution in the Jūra Sub-basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	32 151 LSU	3 946	321 506	farmers
Drafting and validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha	153 656 ha	25 844	848 462	farmers
Additional controls	-	-	15 785	state
<b>TOTAL:</b>		<b>30 000</b>	<b>1 186 000</b>	

Source: Consultant

The annual costs of the measures to reduce diffuse pollution in the Jūra Sub-basin amount to LTL 1 186 thousand. According to the suggested scheme, the state would have to cover about 2 % of this amount and these costs would be related to additional control. The major part of the costs – those of the development of fertilisation plans in farms larger than 10 ha and manure management in small farms – would be covered by farmers (Table 175).

### Measures for improving the hydromorphological status

#### Construction of fish bypass channels

268. Fish bypass channels should be first of all constructed in rivers which are the most important for fish migration. Three such places have been identified in the Jūra Sub-basin: the rivers Jūra, Šuniņa and Ančia. The construction costs of these migration facilities were estimated in 2001. Since there is no later data available, this amount was recalculated by applying ratios of the consumer price index. The resulting costs are provided in Table 176. The priority should be given to the reconstruction of the fish bypass at the dam in Tauragė. This measure would determine a stronger effect of the implementation of other fish migration improvement measures in the Jūra Sub-basin

At present, construction of fish bypass channels and removal of the remains of former dams approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180) may be deemed to be supplementary measures. There is one such barrier to be removed in the Jūra Sub-basin (Table 176).

Table 176. Fish migration facilities and dam remains to be removed in the Jūra Sub-basin and costs of the measures, LTL

River	Dam location	Measure	District	Notes	Investment costs*, LTL
<i>Fish migration facilities</i>					
Jūra	dam in Tauragė with a fish elevator	to reconstruct a fish bypass channel	Tauragė distr.		104 204
Ančia	Skaudvilė	fish pass (ladder)	Tauragė distr.	Ančia Landscape Reserve	499 418
Šunija	Lomiaiai	fish pass (ladder)	Tauragė distr.		249 073
<i>Barriers to be removed</i>					
Aitra	Girėnų mill	to rearrange remains of the rock weir	Rietavas	Aitra Hydrographical Reserve	17 791
<b>TOTAL</b>					<b>870 486</b>

Source: Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180)

\* - Costs taken from the study *Improvement of Fish Migration Conditions in Ichthyologically Important Rivers* (Gedilieta and Institute of Ecology, 2001) and adjusted for 2009 taking into account the inflation

Consequently, the improvement of conditions for fish migration in the Jūra Sub-basin would require about LTL 870 thousand of investment costs. If more or less similar amounts are allocated during the period from 2011 to 2015, the annual amount would be about LTL 174 thousand. The annual total costs at the average lifecycle of 50 years would be approximately LTL 80 thousand.

### **Replacement of HPP turbines**

269. The turbine of the single hydropower plant located in the Jūra Sub-basin is not proposed to be replaced during the first stage of the implementation of hydromorphological measures.

### **Remeandering of rivers**

270. Straightened rivers which flow over plains in the Jūra Sub-basin and which have not been designated as HMWB stretch for 28.2 km. Such water bodies should be remeandered to regain as natural bed as possible.

This would cost almost LTL 3 million. The operating costs can be equated to zero. The total annual costs would be about LTL 180 thousand.

### **Total costs of the measures for mitigating the impact of hydromorphological changes**

271. Table 177 below provides the general measures for the mitigation of the impact of hydromorphological changes and their costs.

Table 177. Measures for mitigating the impact of hydromorphological changes in the Jūra Sub-basin

Measure	Amount	Investment costs, LTL	Operating costs, LTL/year	Total annual costs, LTL/year
Fish passes and removal of dam remains	4	870 500	26 000	81 000
Construction of a modern HPP turbine, kW	0	0	0	0
Remeandering	28.2 km	2 820 000	0	179 000
<b>Total</b>		<b>3 700 000</b>	<b>25 600</b>	<b>260 000</b>

Source: Consultant

### Supplementary measures for recreation

272. The Jūra River stands on the List of National Water Tourism Routes. The measures for the establishment of these routes and their costs are given in the Draft Nemunas RBD Management Plan where the basic measures for recreation are defined.

There are two official bathing sites in the Jūra Sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to maintenance of the bathing waters have been included in the Programme of Measures.

### Supplementary measures for assessing the status of groundwater

273. It has been established that the abnormally high concentrations of two problematic indicators – sulfates (SO<sub>4</sub>) and chlorides (Cl) – in the problematic Stipinai groundwater body of Upper Devonian deposits, which is more or less equally situated in the Nevėžis, Dubysa and Jūra Sub-basins, are of a natural origin. However, there are a few groundwater deposits/wellfields where the concentrations of the above-said indicators (SO<sub>4</sub> and Cl) fail to conform to the drinking water quality requirements. Such wellfields should be assigned to water bodies at risk; however, the monitoring information (data) currently available is not sufficient to be able to evaluate changes/trends determined by water exploitation.

It is recommended to draft a piece of legislation which would obligate water supply abstracting > 10 m<sup>3</sup> of groundwater per day to perform monitoring of the problematic quality indicator (Cl) and provide the data to the Lithuanian Geological Survey. The LGS would analyse the data and decide whether the wellfields identified should be classified as being at risk. No costs are envisaged for this measure because the groundwater monitoring will be performed in the procedure laid down in the legislation and the data will be analysed in the procedure established by the Lithuanian Geological Survey.

### The Lithuanian Coastal Rivers Basin

#### Measures for reducing point pollution

274. The achievement of the proposed good ecological status objectives in the Lithuanian Coastal Rivers Basin requires additional reduction of pollution of wastewater with nitrogen and phosphorus in treatment facilities in several settlements. However, studies on more accurate identification of pollution sources are required for

Klaipėda and Palanga and so one measure is currently proposed for the improvement of wastewater treatment. Its costs are provided in Table 178 below.

Table 178. Costs of the measure to reduce the impact of point pollution sources in the Lithuanian Coastal Rivers sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Kretinga WWTP	1. Extended aeration (nitrification), chemical precipitation of P with sand filters or microscreens	2 340 000	117 000	273 000

Source: Consultant

As shown in the table above, annualisation of all investment costs and further addition of operating costs which total to 5 % of the investment costs of the WWTP would result in roughly LTL 270 thousand per year throughout the lifecycle of an infrastructure for the maintenance of the new infrastructure and preparation for upgrading when it wears out.

The general part of the Programme recommends paying a special attention to rivers where dangerous substances have been detected in their water. Such places have also been identified in the Lithuanian Coastal Rivers Basin.

### Measures for reducing diffuse pollution

275. No specific measures are required for reduction of diffuse pollution in this sub-basin hence the costs will be related only to the common measures recommended for the whole of Lithuania. Since there is no excessive nitrogen in the sub-basin, these measures would be preventive ones providing protection from excessive amounts of nutrients in the soil and water bodies. In addition, the application of these measures would in a way result in the implementation of the polluter pays principle.

Table 179. Costs of reduction of diffuse pollution in the Coastal Rivers Basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	5 984 LSU	0	321 506	farmers
Drafting and validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha	34 061 ha	0	848 462	farmers
Additional controls	-	-	4 013	state
<b>Total:</b>		<b>0</b>	<b>420 000</b>	<b>420 000</b>

Source: Consultant

The annual costs of preventive measures in respect of diffuse pollution in the Lithuanian Coastal Rivers Basin amount to LTL 420 thousand. According to the suggested scheme, the state would have to cover less than 1 % of this amount and these costs would be related to additional control. The major part of the costs would have to be covered by farmers (Table 179).

## Measures for improving the hydromorphological status

### Construction of fish bypass channels

276. A list of dams where fish migration facilities should be constructed was approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180). Pursuant to this list, there are no rivers where fish migration facilities have to be constructed or former dams where migration barriers have to be removed in the Lithuanian Coastal Rivers Basin.

### Replacement of HPP turbines

277. There are no hydropower plants which should be subject to any special supplementary hydromorphological measures in the Lithuanian Coastal Rivers Basin.

### Remeandering of rivers

278. There are no straightened rivers at risk which flow over plains and which have not been designated as HMWB in the Lithuanian Coastal Rivers Basin.

### Total costs of the measures for mitigating the impact of hydromorphological changes

279. No measures for the mitigation of the impact of hydromorphological changes are required in the Lithuanian Coastal Rivers Basin.

### Supplementary measures for recreation

280. The Lithuanian Coastal Rivers Basin is not on the List of National Water Tourism Routes.

There is one official bathing site in this basin. So far the municipality has not been planning any new bathing waters and hence no supplementary costs related to maintenance of the bathing waters have been included in the Programme of Measures.

## The Nemunas Small Tributaries Sub-basin

### Measures for reducing point pollution

281. The achievement of the proposed good ecological status objectives in the Nemunas Small Tributaries Sub-basin requires additional reduction of pollution of wastewater with BOD<sub>7</sub>, nitrogen and phosphorus in treatment facilities in Pravieniškės, Klausučiai, Šilutė, and Lekėčiai. The proposed measures to improve clean-up of wastewater and their costs are given in Table 180 below. It should also be pointed out that there is a juice company in Klausučiai which needs facilities for primary treatment of wastewater.

Table 180. Costs of measures to reduce the impact of point pollution sources in the Nemunas Small Tributaries Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Pravieniškės WWTP	Reconstruction of WWTP	15 000 000	750 000	1 750 000
Klausučiai WWTP	Reconstruction of WWTP	1 500 000	75 000	175 000

Lekėčiai WWTP	Construction of new WWTP	600 000	30 000	70,000
<b>Total</b>		<b>17 000 000</b>	<b>850 000</b>	<b>2 000 000</b>

Source: Consultant

As shown in the table above, annualisation of all investment costs and further addition of operating costs which total to 5 % of the investment costs of the WWTP would result in roughly LTL 0.9 million per year throughout the lifecycle of an infrastructure for the maintenance of the new infrastructure and preparation for upgrading when it wears out.

### Measures for reducing diffuse pollution

282. Diffuse pollution does not have any significant impact on the quality of rivers in the Nemunas Small Tributaries Sub-basin hence the costs will be related only to the measures recommended for the whole of Lithuania. Since there is no nitrogen surplus in the sub-basin, these measures would be preventive ones providing protection from excessive amounts of nutrients in the soil and water bodies in future. In addition, the application of these measures would in a way result in the implementation of the polluter pays principle.

Table 181. Costs of reduction of diffuse pollution in the Nemunas Small Tributaries Sub-basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	63 802 LSU	0	638 020	farmers
Validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha	303 863 ha	0	3 159 283	farmers
Additional controls	-	-	38 950	state
<b>Total ~:</b>	<b>-</b>	<b>0</b>	<b>3 836 253</b>	

The annual costs of preventive measures in respect of diffuse pollution in the Nemunas Small Tributaries Sub-basin amount to LTL 3.8 million. According to the suggested scheme, the state would have to cover less than 1 % of this amount and these costs would be related to additional control. The major part of the costs would have to be covered by farmers (Table 181).

### Measures for improving the hydromorphological status

#### Construction of fish bypass channels

283. Fish bypass channels should be first of all constructed in rivers which are the most important for fish migration. One such place has been identified in the Nemunas Small Tributaries Sub-basin – the Verknė River. The construction costs of these migration facilities were estimated in 2001. Since there is no later data available, this amount was recalculated by applying ratios of the consumer price index. The resulting costs are provided in Table 182.

At present, construction of fish bypass channels and removal of the remains of former dams approved by Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007 (*Valstybės žinios*, 2007, No. 102-4180) may be deemed

to be supplementary measures. There are three such barriers to be removed in the Nemunas Small Tributaries Sub-basin.

Table 182. Fish migration facilities required and dam remains to be removed in the Nemunas Small Tributaries Sub-basin, LTL

River	Dam location	Measure	District	Notes	Investment costs*
<i>Fish migration facilities</i>					
Verknė	Jundeliškės HPP	Fish pass (ladder)	Birštonas town	Regional Park of the Nemunas Loops	277 030
<i>Barriers to be removed</i>					
Samė	Alesiškių mill	to remove remains of the rock weir	Trakai distr.	Aukštadvaris Regional Park	10 170
Strėva	Tadarava	to remove remains of the rock weir	Kaišiadorys distr.	Regional Park of Kaunas Lagoon	5 340
Šyša	mill in Katyčiai	to remove remains of the rock weir	Šilutė distr.		5 850
<b>TOTAL</b>					<b>298 400</b>

Source: Order No. 3D-427 of the Minister of Agriculture of the Republic of Lithuania of 25 September 2007

\* Costs taken from the study Improvement of Fish Migration Conditions in Ichthyologically Important Rivers (*Gedilieta and the Institute of Ecology, 2001*) and adjusted for 2009 taking into account inflation

Note: The table above does not include fish bypass channels in the Viešvilė (dams in Viešvilė I and Gulbinai) and Šyša rivers (Šilutė dam) because the list of dams where fish migration facilities are required indicates that these measures have already been implemented.

Thus, the improvement of conditions for fish migration in the Nemunas Small Tributaries Sub-basin would require about LTL 300 thousand of investment costs. If more or less similar amounts are allocated during the period from 2011 to 2015, the annual amount would be about LTL 60 thousand. The annual total costs at the average lifecycle of 50 years would be about LTL 19 thousand.

### **Replacement of HPP turbines**

284. The majority of hydropower plants in the Nemunas Small Tributaries Sub-basin are not very old, except for the one in Kapčiamiestis, which was built 50 years ago. However, the turbines in five HPP in this sub-basin should be replaced due to their current impact on the river ecosystems, i.e. the HPP in Semeliškės, Aukštadvaris, Bagdanonys, Jundeliškės, and Baltoji Ančia.

This measure would require LTL 5.3 million. If operating costs account for about 3 % of all investments, they would amount to LTL 158 thousand provided the lifecycle is 50 years. In such case the total annual costs would be around LTL 491 thousand.

Construction permits for hydropower plants should require introduction of the best available techniques, i.e. modern turbines.

### **Remeandering of rivers**

285. Straightened rivers at risk which have not been designated as HMWB in the Nemunas Small Tributaries Sub-basin stretch for 108 km.

Remeandering of the straightened water bodies at risk in the Nemunas Small Tributaries Sub-basin to the maximum extent would cost approximately LTL 11 million. The operating costs can be equated to zero. The total annual costs would be LTL 0.7 million.

#### **Total costs of the measures for mitigating the impact of hydromorphological changes**

286. Table 183 below provides general measures for the mitigation of the impact of hydromorphological changes and their costs.

Table 183. Measures for mitigating the impact of hydromorphological changes in the Nemunas Small Tributaries Sub-basin, LTL

<b>Measure</b>	<b>Amount</b>	<b>Investment costs</b>	<b>Operating costs</b>	<b>Total annual costs</b>
Fish passes and removal of dam remains	4	298 400	8 300	18 900
Construction of a modern turbine, kW	1 315	5 260 000	157 800	491 000
Remeandering	108	10 800 000	0	685 000
Total:		<b>16 400 000</b>	<b>166 000</b>	<b>1 200 000</b>

Source: Consultant

### **Supplementary measures for recreation**

287. The Nemunas Small Tributaries Sub-basin stands on the List of National Water Tourism Routes.

There are ten official bathing sites in this sub-basin. So far the municipalities have not been planning any new bathing waters and hence no supplementary costs related to maintenance of the bathing waters have been included in the Programme of Measures.

### **Supplementary measures for fisheries**

288. As already indicated earlier in the Programme, the Jiesia River has been designated as a water body at risk due to pollution from fisheries. At the moment no investment measures (i.e. construction and/or equipment) are proposed. First of all, the specific reasons of the pollution should be identified and only then a decision should be taken on whether only controls are sufficient or whether investments would be required for, e.g., automatic pollution measurement devices and/or extended aeration and/or biological ponds.

### **The Prieglius Basin**

289. The only supplementary measures needed in the Prieglius Basin are those intended to reduce agricultural pollution to be applied throughout Lithuania. No other supplementary measures are required.

### Measures for reducing diffuse pollution

290. Diffuse pollution does not have any significant impact in the Prieglius Basin and hence the costs will be related only to the measures recommended for the whole of Lithuania. Since there is no excessive nitrogen in the sub-basin, these measures would be preventive ones providing protection from excessive amounts of nutrients in the soil and water bodies in future. In addition, the application of these measures would in a way result in the implementation of the polluter pays principle.

Table 184. Costs of reduction of diffuse pollution in the Prieglius Basin

Measure	Measure application scope, ha or LSU	Impact of measure on reduction of N, kg/year	Annual costs, LTL/year	Costs to be borne by
Management of manure in small farms	716 LSU	0	321 506	farmers
Drafting and validation of normative standards and mandatory development of fertilisation plans for farms with more than 10 ha	4 261 ha	0	848 462	farmers
Additional controls	-	-	434	state
<b>Total:</b>	-	<b>0</b>	<b>43 000</b>	

The annual costs of preventive measures in respect of diffuse pollution in the Prieglius Basin amount to LTL 43 thousand. According to the suggested scheme, the state would have to cover less than 1 % of this amount and these costs would be related to additional control. The major part of the costs would have to be covered by farmers (Table 184).

### Transitional and coastal waters

291. Having analysed all available information on anthropogenic loads which affect the ecological stats of coastal and transitional waters as well as the measures discussed in the section of the Lithuanian Coastal Rivers Basin, pollution reduction and prevention measures have been proposed until 2015 and these are provided in Table 185. Also, preliminary costs of the measures proposed have been estimated. For the calculation of the total costs, it was assumed that the lifecycle of a piece of legislation is 10 years.

Table 185. Measures for improving the status of transitional and coastal waters

Measure	Institution responsible for the implementation of the measure	One-time costs, LTL	Operating costs, LTL/year	Total annual costs, LTL/year	Comments / assumptions
To develop a methodology for the monitoring of the invasive species specified in Order No. D1-663 of the Minister of the Environment of 9 November 2009 in surface water bodies	Environmental Protection Agency	30 000		4 000	Grounded tasks for the monitoring of invasive species, suitable measures and methodologies for the implementation of these tasks will be developed and the monitoring of invasive species will be included into the National Environmental Monitoring Programme. Though the existing National Environmental Monitoring Programme does provide for relevant parameters (vectors and rate of spread of Ponto-Caspian crustacean, Chinese crabs and other recently detected invasive species), but the monitoring programmes for the environment of the Curonian Lagoon and the Baltic Sea are basically not adjusted for the registration of invasive species and determination of their spread vectors and rates.
To conduct a detailed study on identification of the causes of water status problems in the water area of Klaipėda Seaport and selection of measures for addressing the water status problems	Ministry of the Environment, Ministry of Transport of the Republic of Lithuania	340 000		46 000	The objective of the measure is to identify potential causes of pollution in the water area of Klaipėda Seaport (pollution transported from the basin, pollution by port companies) and dispersion of the soil pollution. The study will assess pollution and changes thereof in the water area of the port taking into account the amounts of polluting substances emitted and their concentrations in the environment. Modelling will be engaged to assess pollution from the basin and dispersion of the soil pollution in the port.
To organise clearing of macrophyte overgrowth in the coastal zone of the Curonian Lagoon	Relevant municipalities in the Nemunas RBD	0	300 000	300 000	When vegetation (macrophytes) is mown and removed in the Curonian Lagoon on a seasonal basis following the proposed methodologies, the amount of biogens accumulated in the biomass is removed as well. The area where vegetation could be mown without any significant restrictions related to protected areas totals to about 158 ha. The average amount of biogens removed: N total – 552 kg/ha; P total – 45.5 kg/ha. The clearing of macrophyte overgrowth would cost about LTL 1920 per ha but both the area and the costs will be changing from

<b>Measure</b>	<b>Institution responsible for the implementation of the measure</b>	<b>One-time costs, LTL</b>	<b>Operating costs, LTL/year</b>	<b>Total annual costs, LTL/year</b>	<b>Comments / assumptions</b>
					year to year.
To develop a methodology for the growing and collection of filtering molluscs (Dreissenidae) intended for removing biogenic substances from water bodies	Ministry of the Environment of the Republic of Lithuania	60 000		8 000	Simulations of the population of Dreissenidae mussels have demonstrated that the amount of biomass which can be additionally grown in the Lagoon each year can be as high as 25 % of the biomass of the present population (up to 1 300 t). When collecting this biomass, up to 89 t of nitrogen and 15 t of phosphorus would be removed. This measure could be implemented in the central part of the Curonian Lagoon. However, the effectiveness and costs thereof can be assessed only after having performed an experimental test of the methodology of growing of collection. While implementing this measure, the methodology for the growing and collection of filtering molluscs (Dreissenidae) will be developed and tested as well as the amounts of biogenic substances transported from the Curonian Lagoon and further possibilities to apply the methodology will be assessed.
<b>TOTAL:</b>		<b>430 000</b>	<b>300 000</b>	<b>360 000</b>	

## **SECTION IV. OTHER SUPPLEMENTARY MEASURES**

292. In addition to the supplementary measures already discussed above, a list of other ones which may be adopted by the Member States in their programmes of measures for river basin districts is provided in Part B of Annex VI to the WFD:

- 292.1. legislative instruments,
- 292.2. administrative instruments,
- 292.3. economic or fiscal instruments,
- 292.4. negotiated environmental agreements,
- 292.5. emission controls,
- 292.6. codes of good practice,
- 292.7. re-creation and restoration of wetlands areas,
- 292.8. abstraction controls,
- 292.9. demand management measures: promotion of adapted agricultural production,
- 292.10. efficiency and re-use measures, e.g. promotion of water efficient technologies in industry and water saving irrigation techniques,
- 292.11. construction projects,
- 292.12. desalination plants,
- 292.13. rehabilitation projects,
- 292.14. artificial recharge of aquifers,
- 292.15. educational projects,
- 292.16. research, development and demonstration projects.

293. Some of the above-listed measures are not relevant for Lithuania and hence not applicable (such as desalination plants, artificial recharge of aquifers), meanwhile the other ones constitute part of the supplementary measures proposed in this Programme of Measures.

This Programme of Measures cannot be implemented without respective legal, administrative, economic and fiscal instruments.

Negotiations are required in order to reach relevant agreements on and coordination of joint environmental actions in respect of international water bodies with the neighbouring countries, such as Poland and, especially, Russia and Belarus.

Application of emission controls and codes of good practice are recommended for reduction of point and diffuse pollution. A number of such codes have already been adopted, e.g. regulations and guidelines of good farming, BAT requirements for industrial enterprises, and so have to be observed.

Re-creation and restoration of wetlands, promotion of relevant agricultural crops, and abstraction controls are analysed in the sub-sections on measures intended to reduce agricultural impacts. The following paragraph considers educational projects on the implementation of the WFD and proposed research and demonstration projects.

### **Educational measures**

294. Measures of education, information and consultation are often very effective, only their impact cannot be measured directly, especially because the effect is produced indirectly and after some time.

Education, information and consultation are necessary for all stakeholders that currently participate in the management of water bodies, or will take part in future, such as farmers, representatives of industries and the environmental sector, or ordinary citizens and youth. Activities of information and education on agricultural issues, including protection of the environment, have already been carried out. Provision of agricultural information and education is provided for in the Rural Development Programme for 2007-2013 and in the schemes of state aid for agriculture.

295. A number of educational projects on the improvement of the status of water bodies have also been run in the Lithuanian environmental sector. In 2009, 170 environmental specialists from various Lithuanian institutions (Environmental Protection Agency, Marine Research Centre, all REPD) took part in trainings on the following subjects:

- 295.1. Assessment of the status of surface water bodies;
- 295.2. Hydromorphological characteristics, physico-chemical conditions and biological elements of water bodies as indicators of their status;
- 295.3. Physico-chemical parameters of surface water bodies and hazardous substances as indicators of the status of water bodies;
- 295.4. Assessment of the status of transitional and coastal water bodies;
- 295.5. Theoretical and practical training on sampling of lake water and bottom sediments and sewage sludge;
- 295.6. Statistical analysis of water monitoring data;
- 295.7. Economic aspects of the Water Framework Directive.

It is recommended to continue education and information projects providing for the required funds in the budgets of environmental institutions or special programmes.

### **Research and demonstration projects**

296. The descriptions of the measures above have already mentioned various studies and research projects identified as priority measures intended to select the best methods for the achievement of good ecological status of water bodies in the Nemunas RBD.

All supplementary measures provided in the sub-section on transitional and coastal waters, except of the clearing of macrophyte overgrowth, are related to studies, research or tests, hence the present section which provides an overview of the required studies, research and demonstration projects excludes research on transitional and coastal waters (Table 186).

Table 186. Studies, research and pilot projects required within the Nemunas RBD during the first cycle of the implementation of the WFD and their costs, LTL

Study, research or another measure	Required costs		
	Investment /one-time, LTL	Operating, LTL/year	Annual, LTL/year
<b>For establishment of stricter controls over the use of hazardous substances and identification of reasons of their entry in water bodies</b>			
To draft a piece of legislation setting out recommendations on the assessment of wastewater toxicity for WWTP	0	0	0
To draft a piece of legislation setting out recommendations on inventory of hazardous substances for economic entities subject to IPPC permits and state institutions which issue IPPC permits	0	0	0
To organise trainings and workshops on hazardous substances, identification of such substances in raw materials and control of hazardous substances, including trainings on correct filling out of safety data sheets	0	0	0
<b>For restoration of hydromorphology</b>			
To carry out a pilot project on renaturalisation of rivers in the Merkys Sub-basin (in the Grūda River)	200 000		27 000
To perform investigative monitoring of water bodies affected by HPP upstream of dams	70 000	0	10 000
To develop a funding scheme for the replacement of HPP turbines with environmentally-friendly ones	0	0	0
<b>For assessment of groundwater</b>			
To perform investigative monitoring of the problematic quality indicators (Cl and SO <sub>4</sub> ) in groundwater bodies at risk and to provide data to the Lithuanian Geological Survey. The LGS would analyse the data and decide whether the wellfields identified should continue to be classified as being at risk.	0	0	0
<b>For assessment of the status of water bodies and the origin and sources of a negative impact</b>			
To perform investigative monitoring in rivers at risk with unidentified sources of pollution	220 000	0	30 000
To perform investigative monitoring (including monitoring of the near-bottom layer) and inventory of pollution sources in order to identify the origin of pollution of 17 lakes at risk (lakes which are subject to anthropogenic pressures either of historic or present pollution)	40 000	0	5 000
To perform investigative monitoring and draw up inventory of pollution sources in order to confirm or reject the justification of designation of 6 lakes as water bodies at risk (due historic pollution or natural ageing)	15 000	0	2 000
To exercise strict control over water uptake for fishery needs in lakes Žaslių, Ilgė and Pravalas.	0	0	0

Study, research or another measure	Required costs		
	Investment /one-time, LTL	Operating, LTL/year	Annual, LTL/year
To perform investigative monitoring and draw up inventory of pollution sources in order to identify the reasons which determine poor status in 9 ponds.	20 000	0	3 000
To conduct additional studies in order to identify concentrations of biogenic substances, suspended matter, oil substances in surface runoff discharged into the Vyžuona River on the territory of Utena town, into the Šeimena River on the territory of Vilkaviškis town, into the Nevėžis River on the territory of Panevėžys city, into the rivers Smeltalė, Akmena-Danė, Ražė and into the Curonian Lagoon on the territories of Klaipėda city, Palanga and Neringa towns and Klaipėda Seaport area. In Klaipėda Seaport area, concentrations of hazardous substances should be measured in addition to those of biogenic substances, suspended matter and oil substances taking into account the type of activities of the companies operating in the port. To assess the demand of expansion of surface runoff treatment systems on the basis of the study findings.		40 000	40 000
<b>For reduction of diffuse pollution</b>			
To prepare and implement a pilot project for assessment of the effectiveness of capturing pollutants emitted with drainage water under the Lithuanian conditions. To perform investigative monitoring where the projects has been implemented.	400 000	0	54 000
<b>For improvement of the status of transitional and coastal waters</b>			
All studies, research and pilot projects.	430 000	300 000	360 000
<b>Other measures</b>			
To organise annual training courses, information campaigns for farmers on the maximum allowed fertilisation norms, the procedure of the development of fertilisation plans and their benefits		15 000	15 000
To organise annual training courses for drafters (natural and legal persons) of fertilisation plans.		15 000	15 000
To organise, on a yearly basis: - information campaigns on mandatory management of manure and slurry observing Good Farming Rules and guidelines for farmers who keep up to 10 LSU throughout Lithuania; - training courses (including demonstration activities) on the implementation of these requirements		15 000	15 000
To organise information campaigns for farmers participating in the activities under the measures "Agri-Environmental payments" of the Rural Development Programme 2007-2013		15 000	15 000

Study, research or another measure	Required costs		
	Investment /one-time, LTL	Operating, LTL/year	Annual, LTL/year
To organise annual information campaigns for implementers of programmes of measures, the public and various stakeholders on the Programme of Measures for the Nemunas RBD, the measures provided for therein, institutions in charge as well as the role of the society and its individual groups in the implementation and enforcement of the measures		15 000	15 000
To organise annual information campaigns for farmers in regions on measures envisaged for individual areas (including incentives) and problems to be addresses by the measures, implementers in charge and the role of the society in regulating the function of the measures		15 000	15 000
To organise engagement of the society in the process of identification of water protection problems (registration of illegal pollution sources, etc.) using modern interactive on-line information technologies (maps.lt or similar systems)		10 000	10 000
To prepare a feasibility study on impacts of the reduction / banning of the use of phosphorus in detergents on the quality of wastewater evaluating a potential effect of the reduction or banning of the use of phosphorus on the economic and social environment	50 000		7 000
<b>Total:</b>	<b>1 445 000</b>	<b>455 000</b>	<b>628 0001</b>

### Groundwater

297. Evaluation of groundwater bodies at risk is also included in the category of research. As already said, a preliminary assessment of the status of groundwater in the problematic groundwater bodies in the Nemunas RBD – Suvalkija, Kėdainiai-Dotnuva and Upper Devonian Stipinai (Nemunas) – revealed that abnormally high concentrations of two problematic indicators, sulfates (SO<sub>4</sub>) and chlorides (Cl), are of natural origin in all these groundwater bodies and therefore the status of water is considered to be “good” following the environmental criteria.

Nevertheless, there are a number of groundwater wellfields in the said problematic groundwater bodies where the concentrations of the two indicators (SO<sub>4</sub> and Cl) fail to conform to the drinking water quality requirements (maximum 250 mg/l for both ions) and sometimes to the estimated environmental criteria (500 mg/l for SO<sub>4</sub> and 350 mg/l for Cl) not only due to their natural origin but also because of intrusions of substandard water activated by the operation of those wellfields. Attempts have been made to clarify the type/tendencies of these groundwater quality trends (increasing, decreasing, absence of any trend) relating changes in the trends with water quality (good, bad, good-decreasing). Unfortunately, it appeared that the amount of the available data is clearly insufficient to be able to assess such changes/trends nearly in all wellfields.

In such situation it is proposed to obligate water supply companies abstracting > 10 m<sup>3</sup> of groundwater per day which are situated in groundwater bodies at risk to perform

monitoring of the problematic quality indicators (Cl and SO<sub>4</sub>) and to provide the data to the Lithuanian Geological Survey, in order to avoid potential big mistakes and unnecessary expenses trying to take certain decisions already today. The LGS would analyse the monitoring data, identify the tendencies of water quality deterioration and decide whether the wellfields identified should be classified as being at risk or not.

### **Restoration and re-creation of wetland areas**

298. A large territory of Lithuania was drained. Measures designed for restoration of wetlands aim at re-creating former natural bogs and marshes. The proposed measures include the following:

298.1. Creation of wetlands in drained and seasonally flooded meadows;

298.2. Restoration of wetlands in low-lying and mixed peat bogs which are currently in use or no longer used/abandoned;

298.3. Restoration of wetlands in abandoned raised peat bogs;

298.4. Restoration of wetlands in raised peat bogs which are currently in use or no longer used;

298.5. Restoration/re-creation of wetlands in wet forests;

298.6. Restoration of drained low-lying and intermediate marshes in areas the economic characteristics whereof make them unsuitable for agricultural use.

If required, creation of wetlands in reclaimed areas could also be considered.

### **Renaturalisation of straightened rivers**

299. Naturalisation or renaturalisation of streams aims at restoration of as natural as possible morphological conditions thereof and improvement of the ecological status of straightened rivers. The total length of straightened rivers and streams in the Nemunas RBD is about 3 119 km. The simplest solution is self-renaturalisation, when the natural balance is attained through natural processes in a stream without any artificial corrections. This method does not involve any costs but it may last for hundreds of years.

There were a few pilot projects on the renaturalisation of straightened rivers carried out in Lithuania (in the rivers Smeltalė, Jūra, and Agluona); however, the information available is not sufficient to determine the impact of the remeandering on the status of water bodies. Hence, it is recommended to implement a pilot study (demonstration) project on restoration of the Grūda River (the Merkys Sub-basin). When sufficient experience has been gained, the measure can be adapted for other rivers.

Study projects can also be proposed for the assessment of other anthropogenic activities impacts of which are not clear enough.

## **CHAPTER IV. SUMMARY COSTS OF THE IMPLEMENTATION OF SUPPLEMENTARY MEASURES WITHIN THE NEMUNAS RBD**

300. A summary of all supplementary measures required for the implementation of the WFD and their costs which have been estimated herein is provided in Table 187 below.

The summary cost lines provide the total costs and the costs of the priority measures for the first WFD implementation cycle. As demonstrated in the chapter on affordability, the measures of the upgrading of HPP turbines, renaturalisation of river beds and reduction of diffuse pollution are not to be implemented during the first cycle both due to lack of funds and acceptability.

Table 187. Preliminary costs of the implementation of supplementary measures within the Nemunas RBD: maximum scenario

Sub-basin / basin	Group of measures	Investment costs until 2015, LTL	Operating costs, LTL/year	Annual costs, LTL/year
MINIJA	HPP	3 800 000	114 000	241 000
	Fish passes	493 300	11 880	43 000
	Renaturalisation	2 270 000	0	137 000
	Point pollution sources	0	0	0
	Measures against diffuse pollution	0	1 558 853	1 558 853
	Groundwater	0	0	0
<b>Total</b>		<b>6 563 000</b>	<b>1 685 000</b>	<b>1 980 000</b>
MERKYS	HPP	700 000	21 000	44 000
	Fish passes	324 700	9 741	31 000
	Renaturalisation	7 420 000	0	471 000
	Point pollution sources	1 200 000	60 000	140 000
	Measures against diffuse pollution	0	778 581	778 581
	Groundwater	0	0	0
<b>Total</b>		<b>9 645 000</b>	<b>869 000</b>	<b>1 465 000</b>
ŽEIMENA	HPP	0	0	0
	Fish passes	12 000	360	1 100
	Renaturalisation	1 500 000	0	95 000
	Point pollution sources	8 000 000	400 000	932 000
	Measures against diffuse pollution	0	508 766	508 766
	Groundwater	0	0	0
<b>Total</b>		<b>9 512 000</b>	<b>909 000</b>	<b>1 537 000</b>
ŠVENTOJI	HPP	1 080 000	32 400	69 000
	Fish passes	127 600	2 580	10 640
	Renaturalisation	8 810 000	0	559 000
	Point pollution sources	0	0	0
	Measures against diffuse pollution	0	2 544 663	2 544 663
	Groundwater	0	0	0
<b>Total</b>		<b>10 018 000</b>	<b>2 580 000</b>	<b>3 183 000</b>
NERIS SMALL TRIBUTARIES	HPP	0	0	0
	Fish passes	915 327	21 800	80 000
	Renaturalisation	1 940 000	0	123 000
	Point pollution sources	3 960 000	198 000	461 000
	Measures against diffuse pollution	0	607 599	607 599
	Groundwater	0	0	0
<b>Total</b>		<b>6 815 000</b>	<b>827 000</b>	<b>1 272 000</b>
NEVĖŽIS	HPP	1 480 000	44 400	138 000
	Fish passes	0	0	0
	Renaturalisation	17 190 000	0	1 091 000

Sub-basin / basin	Group of measures	Investment costs until 2015, LTL	Operating costs, LTL/year	Annual costs, LTL/year
	Point pollution sources	6 000 000	300 000	730 000
	Measures against diffuse pollution	0	1 946 122	1 946 122
	Groundwater	0	0	0
<b>Total</b>		<b>24 670 000</b>	<b>2 291 000</b>	<b>3 905 000</b>
ŠEŠUPĖ (incl. Prieglius)	HPP	0	0	0
	Fish passes	220 000	6 600	21 000
	Renaturalisation	13 060 000	0	829 000
	Point pollution sources	1 150 000	57 500	133 500
	Measures against diffuse pollution	0	2 719 934	2 719 934
	Groundwater	0	0	0
<b>Total</b>		<b>14 430 000</b>	<b>2 784 000</b>	<b>3 661 000</b>
DUBYSA	HPP	1 052 000	31 600	99 000
	Fish passes	165 400	3 400	10 500
	Renaturalisation	6 130 000	0	389 000
	Point pollution sources	0	0	0
	Measures against diffuse pollution	0	1 126 291	1 126 291
	Groundwater	0	0	0
<b>Total</b>		<b>7 347 000</b>	<b>1 161 000</b>	<b>1 625 000</b>
NEMUNAS SMALL TRIBUTARIES	HPP	80 000	2 400	7 000
	Fish passes	298 380	8 300	18 900
	Renaturalisation	10 800 000	0	685 000
	Point pollution sources	17 100 000	855 000	1 992 000
	Measures against diffuse pollution	0	3 836 253	3 836 253
	Groundwater	0	0	0
<b>Total</b>		<b>28 278 000</b>	<b>4 702 000</b>	<b>6 539 000</b>
JŪRA	HPP	0	0	0
	Fish passes	870 486	25 600	80 800
	Renaturalisation	2 820 000	0	179 000
	Point pollution sources	800 000	40 000	93 000
	Measures against diffuse pollution	0	1 185 754	1 185 754
	Groundwater	0	0	0
<b>Iš viso</b>		<b>4 490 000</b>	<b>1 251 000</b>	<b>1 539 000</b>
COASTAL RIVERS	HPP	0	0	0
	Fish passes	0	0	0
	Renaturalisation	0	0	0
	Point pollution sources	2 340 000	117 000	273 000
	Measures against diffuse pollution	0	420 154	420 154
	Groundwater	0	0	0
<b>Total</b>		<b>2 340 000</b>	<b>537 000</b>	<b>693 000</b>
<b>Total (maximum scenario)</b>	<b>Hydropower plants</b>	<b>8 192 000</b>	<b>245 800</b>	<b>598 000</b>
	<b>Fish passes</b>	<b>3 427 200</b>	<b>90 300</b>	<b>297 000</b>
	<b>Renaturalisation</b>	<b>71 940 000</b>	<b>0</b>	<b>4 558 000</b>
	<b>Point pollution sources</b>	<b>40 550 000</b>	<b>2 027 500</b>	<b>4 754 500</b>
	<b>Measures against diffuse pollution</b>	<b>0</b>	<b>17 230 000</b>	<b>17.230.000</b>
	<b>Groundwater</b>	<b>0</b>	<b>0</b>	<b>0</b>

Sub-basin / basin	Group of measures	Investment costs until 2015, LTL	Operating costs, LTL/year	Annual costs, LTL/year
	Reduction of pollution of coastal and transitional waters	430 000	300 000	360.000
	Research, studies and pilot projects (excl. studies coastal waters)	1 015 000	155 000	268.000
<b>Total (maximum scenario)</b>		<b>125 550 000</b>	<b>20 050 000</b>	<b>28 070 000</b>
<b>Grand total until 2015 (excl. replacement of turbines and river naturalisation)</b>		<b>45 418 000</b>	<b>19 804 200</b>	<b>22 914 000</b>

Source: Consultant

The table above demonstrates that in the event of the scenario which excludes investments into HPP and river renaturalisation the investment costs would go down by almost three times. The costs of the total set of the measures do not constitute a large amount on the national scale. According to the data of November 2009, the amount “saved” on investment projects which are on the list of national investment projects on water supply and wastewater management due to decreased prices of construction totals to LTL 600 million. Therefore, the burden of investments for the implementation of the supplementary measures under the WFD is not big as compared to the implementation costs of various existing environmental measures. However, as demonstrated in the affordability analysis, only the supplementary measures under the minimum scenario are proposed for the first implementation cycle because funds for 2007-2013 have already been distributed and in many cases it would be problematic to utilise funds in due time, as well as because municipalities have limited possibilities to afford the said measures.

It should be noted that exclusion of the measures for hydropower plants and renaturalisation practically does not result in any significant change in the operating costs and hence the annual burden of maintenance of the supplementary measures remains the similar to the one under the maximum scenario.

Table 188 below provides costs to be borne by the public sector – the state or municipalities.

Table 188. Preliminary costs of the implementation of measures within the Nemunas RBD to be borne by the state and municipalities

Group of measures	Investment costs until 2015, LTL	Operating costs, LTL/year	Annual costs, LTL/year
HPP	0	0	0
Fish passes	3 207 205	83 661	275 940
Renaturalisation	0	0	0
Point pollution sources	40 550 000	2 027 500	4 754 500
Measures against diffuse pollution	0	293 000	293 000
Measure implementation control		200 000	200 000
Groundwater	0	0	0
Reduction of pollution of coastal and transitional waters	430 000	300 000	360 000

Research, studies and pilot projects (excl. studies on coastal waters)	1 015 000	455 000	568 000
<b>Total</b>	<b>45 200 000</b>	<b>3 100 000</b>	<b>6 200 000</b>

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

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

The said two sub-basins are situated in the Nemunas RBD so the benefit derived therein may be directly transferred into other sub-basins due to highly similar geographical and social conditions in all sub-basins of the Nemunas Basin.

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

302. The *Study on willingness to pay for the improvement of the Neris river water quality to achieve good status* identified four scenarios:

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

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

302.3. Willingness to pay for the improvement of the water quality of Lake Riešė to achieve good ecological status;

302.4. Willingness to pay for the improvement of the water quality of Lake Riešė and Lake Didžiulis to achieve good ecological status.

303. 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 LTL 0), the payment for the improvement of water quality and re-meandering of rivers totals averagely to more than 30 % of people's water bills.

There are 2.643 million inhabitants in the Nemunas RBD. According to the said study, the annual benefit of the achievement of good ecological status in the bodies of water would total to about LTL 48.65 million.

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

At the present stage of the development of the Programme of Measures for the Nemunas RBD, 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 WFD. Other measures cannot be introduced because of insufficient affordability and/or acceptability and therefore a cost-benefit analysis and the figures illustrating the benefit which are given in this section were not required at this stage.

### **AFFORDABILITY ANALYSIS**

304. The Programme of Supplementary Measures will require both investment and operating costs. In addition, various studies, research or continuous monitoring will need one-off or annual costs. The aim of the affordability analysis is to find out whether the institutions responsible for the introduction of the measures will have enough funds for this purpose. The affordability analysis also addresses the burden of the measures on private persons and their ability to take it on.

305. According to the type of costs of the supplementary measures and institutions in charge of the implementation thereof, the following affordability is assessed:

- 305.1. affordability to the state,
- 305.2. municipal affordability and
- 305.3. affordability to private persons – farmers and households.

### **THE MINIJA SUB-BASIN**

#### **Affordability to the state**

#### **Wastewater management**

306. Plans have already been made to reconstruct two wastewater treatment plants and to construct 51.1 km of new sewerage networks in the Minija Sub-basin. No investments into sludge treatment facilities have been provided for. The total investment costs in the Minija Sub-basin are estimated at LTL 59.06 million.

#### **Measures for restoring hydromorphology**

307. Fish migration facilities and removal of old dams in the Minija Sub-basin require about LTL 550 thousand of investment costs. Though 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 take advantage of the EU assistance. Following the Operational Programme for the Lithuanian Fisheries Sector

for 2007-2013, the assistance envisaged for the protection and development of aquatic fauna and flora totals to approximately LTL 7 million (data of the beginning of 2010). Such support should be sufficient for all measures designed to improve fish migration conditions provided for under this Programme of Measures.

Remeandering costs in the Minija Sub-basin would total to about LTL 2.3 million. If these investment costs are distributed for a five years' period (until 2015), the annual demand of additional costs would be about LTL 0.45 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.

### **Recreation**

308. No need of supplementary measures for ensuring good ecological status has been identified in the sector of recreation, hence no assessment of the actual affordability is required.

### **Agriculture**

309. As already said in the sub-section on supplementary agricultural measures for the Minija Sub-basin, diffuse pollution does not have any significant impact in this sub-basin. However, the key measure – development of fertilisation plans – has been envisaged and proposed for the whole of Lithuania, hence additional state funds for controls over the implementation of this measure would amount to about LTL 15 thousand every year. This means a demand of an additional half-time employee. Should this function be divided between two municipalities which occupy the largest areas in the Minija Sub-basin, the employees responsible for the supervision of fertilisation plans of the respective environmental agencies in each of these municipalities would have to devote an additional quarter of their working time for this task. It is proposed to provide for such additional funds in the budget of the Ministry of the Environment. 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.

### **Municipal affordability**

#### **Wastewater management**

310. Since there is no demand of additional treatment of wastewater in the Minija Sub-basin, no additional municipal funds will be required.

### **Measures for restoring hydromorphology**

311. As already said, construction of fish passes and removal of dam remains in the Minija Sub-basin require about LTL 550 thousand of investment costs. If this amount is invested evenly, the annual demand would be about LTL 110 thousand, which is the cost of the construction of two new fish passes and removal of the remains of three old

dams. These costs should be divided among the municipalities of Plungė, Rietavas and Klaipėda districts.

In 2008, funds of a special Environmental Assistance Programme for Klaipėda district totalled to about LTL 2.4 million, for Plungė district – slightly over LTL 300 thousand. In 2009, and especially in 2010, these amounts are most likely to go down. Despite that, it is suggested that respective municipalities consider a possibility to cover at least a certain amount of the required costs from the Environmental Assistance Programme, with the major amount to be covered by the EU assistance funds for fisheries.

### **Recreation**

312. The Minija is included in the Special Plan of the National Water Tourism Routes, which provides for measures for developing knowledge-oriented and recreational water tourism as well as the infrastructure of tourism and recreation. It is expected that the development of this route should be funded by municipal administrations, administrations of regional parks, and private persons.

The above-said measures are deemed to be the basic measures of the implementation of the WFD; however, no relevant funds have been provided for by the municipalities at the moment.

No additional measures for recreation have been planned for the Minija Sub-basin.

### **Affordability to households**

313. No additional costs for wastewater management are required in the Minija Sub-basin, hence the affordability of households has not been considered.

There are no other supplementary measures which would contribute to the burden of households.

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

314. There is one HPP in the Minija Sub-basin, Godinga HPP, the turbine of which should be replaced with a modern one. The total required amount of investments would be around LTL 3.8 million. The owner would not be able to replace the turbine (which is not old) without the EU funds. However, no support for the hydropower sector has been envisaged for the period 2007-2013. The only option is to plan the implementation of this measure for the next stage, i.e. after 2013.

### **Affordability to the agricultural sector**

315. Achievement of good ecological status of water bodies in the Minija Sub-basin does not require any specific supplementary measures. However, development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Minija Sub-basin totals to about 2.7 thousand. It is assumed that development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the gross profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Minija Sub-basin will have to spend approximately LTL 1.3 million for this activity.

The annual costs of all small farms in the Minija Sub-basin total to about LTL 214 thousand. This amount has been based on the assumption that the annual costs of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

## THE MERKYS SUB-BASIN

### Affordability to the state

#### Wastewater management

317. Planned measures in the Merkys Sub-basin include construction of one new and reconstruction of one existing wastewater treatment plant, and construction 25.2 km of new sewerage networks. The investment costs provided in Table 189 below also cover the costs of implementation of the Drinking Water Directive. The total investment costs in the Merkys Sub-basin are estimated at LTL 60.905 million.

Table 189. National projects on renovation and development of water supply and wastewater management systems in the Merkys Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Šalčininkai distr.	Eišiškės		1						8.0
	Šalčininkai			1.7		1.7			
Trakai distr.	Rūdiškės	1		1.1		0.9			29.9
Varėna distr.	Varėna			22.4		3.7			23.005
<b>TOTAL</b>		<b>1</b>	<b>1</b>	<b>25.2</b>	<b>0</b>	<b>6.3</b>	<b>0</b>	<b>0</b>	<b>60.905</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008.

Note:

Development of Rūdiškės water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Trakai district*. The project also includes development of the infrastructure in Trakai and Lentvaris towns (the Neris Small Tributaries Sub-basin). The total value of the project is LTL 59.8 million. It is assumed that half of the project amount will be invested in the Merkys Sub-basin.

No investments for sludge treatment facilities have been planned for the Merkys Sub-basin.

The achievement of the proposed good ecological status objectives in the Merkys Sub-basin requires additional reduction of pollution of wastewater in Šalčininkai treatment facilities. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 190 below.

Table 190. Costs of supplementary measures to reduce the impact of point pollution sources in the Merkys Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investments until 2015, LTL	Operating, LTL/year	Total annual, LTL/year
Šalčininkai WWTP	Additional tertiary treatment	1 200 000	60 000	140 000

Source: Consultant

If the investment amount is distributed for the period from 2010 to 2015 (when the WFD will have to be implemented), the resulting annual demand of investment funds during the period 2010-2015 is about LTL 0.24 million in addition to the amount of about LTL 12 million (60/5) which has already been allocated.

The investments for the supplementary measures in the Merkys Sub-basin account for approximately 2 % of the costs of the basic water supply and wastewater management measures planned for the period 2007-2013. Such amount is not big as compared to the share of the supplementary measures in other sub-basins or basins; however, it is not easy to find LTL 240 thousand every year if such sum has not been provided for in advance. On the other hand, it should be noted that in this case all supplementary measures are required in the same settlement as the basic measures, hence it would be worth while performing all works within the framework of one project. Accordingly, like in other sub-basins, both public authorities and municipalities should be flexible and have a reserve plan for financing the supplementary measures intended for the reduction of point pollution if a possibility shows up. In the event of an unsuccessful attempt to include the upgrading of Šalčininkai wastewater treatment facilities among the EU-supported projects, the assistance provided to the water sector measures by the Lithuanian Environmental Investment Fund should be used to a larger extent.

The state's/municipal affordability of the supplementary measures to reduce point pollution in the Merkys Sub-basin is deemed to be more positive than negative and hence efforts should be made to combine the implementation of the supplementary measures with the basic ones which are financed with the EU funds.

### Measures for restoring hydromorphology

318. Fish migration facilities and removal of old dams in the Merkys Sub-basin require about LTL 325 thousand of investment costs. If this amount is distributed on a yearly basis until 2015, the annual demand would be about LTL 65 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 take advantage of the EU assistance. Following the Operational Programme for the Lithuanian Fisheries Sector for 2007-2013, the assistance envisaged for the protection and development of aquatic fauna and flora totals to approximately LTL 7 million (data of the beginning of 2010). Such support should be sufficient for all measures designed to improve fish migration conditions provided for under this Programme of Measures.

Remeandering costs in the Merkys Sub-basin would total to LTL 7.4 million. If this amount is distributed for a five years' period (until 2015), the additional annual demand would be about LTL 1.5 million.

It is not clear, however, where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At the present day, 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 river bed renaturalisation. Such project is proposed for the Grūda River in the Merkys Sub-basin.

### **Recreation**

319. No need of supplementary measures for ensuring ecological status has been identified in the sector of recreation, hence no assessment of the actual affordability is required.

### **Agriculture**

320. As already said in the sub-section on supplementary agricultural measures for the Merkys Sub-basin, diffuse pollution does not have any significant impact in this sub-basin. However, the key measure – development of fertilisation plans – has been envisaged and proposed for the whole of Lithuania, hence additional state funds for the control over the implementation of this measure in the Merkys Sub-basin would amount to about LTL 9 000 every year. This means a demand of one-third of an additional employee's time. Should this function be divided between two municipalities which occupy the largest areas in the Merkys Sub-basin, the employees responsible for the supervision of fertilisation plans of the respective environmental agencies in each of these municipalities would have to devote an additional one sixth of their working time for this task. It is proposed to provide for such additional funds in the budget of the Ministry of the Environment. 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 the 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. In this case, this is a feasible option.

### **Municipal affordability**

#### **Wastewater management**

321. There are two municipalities with the major parts of their areas lying in the Merkys Sub-basin: the municipalities of Varėna and Šalčininkai districts. Should the latter municipality wish to implement the supplementary measures to reduce point pollution, it would need about LTL 1.2 million from its own budget or from the budgets of water supply companies. However, Šalčininkai municipality cannot afford allocating such additional amount. On the other hand, the municipal borrowing limits (following 2009 data of the Ministry of Finance) would allow borrowing such amount.

#### **Measures for restoring hydromorphology**

322. As already said, the construction of fish passes and removal of dam remains in the Merkys Sub-basin require about LTL 325 thousand of investment costs, which is the

cost of fish migration facilities at the dam of the resort *Merkys*, the dam in Rudnia and in the Merkys-Vokė Canal (in the regulating sluice). Although this amount is rather small as compared to other supplementary measures, it is difficult to find a funding source. Hence it is proposed to take advantage of the EU assistance granted to the fisheries sector through the National Paying Agency. The municipal budgets could co-finance the measure from the Environmental Assistance Programme. The total budget of the Environmental Assistance Programme for Šalčininkai district during the last couple of years was about LTL 300 thousand, and for Varėna district – approximately LTL 150 thousand.

### **Recreation**

323. No additional measures for recreation have been planned for the Miniija Sub-basin.

### **Affordability to households**

#### **Point pollution sources**

324. Planned measures in the Merkys Sub-basin include construction of one new and reconstruction on one existing wastewater treatment plant, and construction 25.2 km of new sewerage networks before 2013.

These are so-called basic measures. Since they have already been planned for the period 2007-2013, it is assumed that the measures are acceptable. However, to be able to analyse the burden of the supplementary measures for households, the burden of the basic measures should be taken into account as well.

Supplementary measures to reduce point pollution are required for Šalčininkai WWTP.

It should be emphasised that so far the funding of the investment costs has been secured only for the said basic measures meanwhile the funding source for the supplementary measures is not clear yet. As mentioned before, neither the state nor municipalities have the required amount.

Should a funding source be identified, ultimately the burden will have to be taken by the population and companies which discharge wastewater into the central sewerage networks of Šalčininkai district.

Table 191 below provides the costs of the supplementary measures and their impact on households. Since the population of Šalčininkai is serviced by Vilnius water company Vilniaus vandenys, the additional burden of the investments for wastewater management would be distributed among all inhabitants serviced by the said company. This means that the costs of the supplementary measures in average and median household income in Šalčininkai and other relevant areas would constitute only a minor share of the total costs, which would not have any negative impact of the general household affordability.

Table 191. Impact of supplementary investment measures on household expenditure, LTL

Settlement	Investments	Annual costs	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member, %	Share of the annual costs in median income of one household member*, %
Šalčininkai	1 200 000	139 800	0.26	0.02	0.002	0.002

Source: Consultant

\* The indicator of median household income is used here and in the following tables because median income is better able to reflect the actual ability of households to afford certain services in societies with a significant difference between households with large and low income than average income.

### Affordability to the energy sector

325. There is one rather old Eišiškės HPP, which was built in 1951-1952. Replacement of its three turbines included among supplementary measures. The cost of a new turbine is about LTL 4 000 per one kW, hence the total demand of the investment costs for the private sector is estimated at about LTL 700 thousand.

However, no support for the hydropower sector has been envisaged in any of the EU assistance programmes. It is highly recommended to include the funding of the environmental measures for hydropower into a later financing period so this measure could be implemented after 2015.

### Affordability to the agricultural sector

326. Achievement of good ecological status of water bodies in the Merkys Sub-basin does not require any specific supplementary agricultural measures. However, the development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Merkys Sub-basin totals to about 1.2 thousand. It is assumed that development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the gross profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Merkys Sub-basin will have to spend approximately LTL 600 thousand for this activity.

The annual costs of all small farms in the Merkys Sub-basin total to about LTL 174 thousand. This amount has been based on the assumption that the annual costs of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

## THE ŽEIMENA SUB-BASIN

### Affordability to the state

#### Wastewater management

327. Planned measures in the Žeimena Sub-basin include reconstruction of one wastewater treatment plant and construction of 16.5 km of new sewerage networks. The

investment costs provided in Table 192 below also cover the costs of implementation of the Drinking Water Directive. The total investment costs in the Žeimena Sub-basin are estimated at LTL 18.664 million.

Table 192. National projects on renovation and development of water supply and wastewater management systems in the Žeimena Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Ignalina distr.	Ignalina			2.3		1.0			2.31
Švenčionys distr.	Pabradė		1	3.2		3.2			16.354
	Švenčionys			11.0		7.7			
<b>TOTAL</b>			<b>1</b>	<b>16.5</b>		<b>11.9</b>			<b>18.664</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008.

No investments for sludge treatment facilities have been planned for the Žeimena Sub-basin.

The achievement of the recommended good ecological status objectives in the Žeimena Sub-basin would require additionally reducing pollution of discharges from Švenčionys WWTP. The treatment facility is old so the best result would be achieved by reconstructing it or building a new plant. This measure, if needed, is proposed for the next stage of the Programme of Measures when it becomes clear whether additional reduction of phosphorus will be required after the introduction of restrictions on the use of phosphorus in domestic and industrial detergents. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 193 below.

Table 193. Costs of measures to reduce the impact of point pollution sources in the Žeimena Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment	Operating	Total annual
Švenčionys WWTP	Reconstruction of the WWTP/construction of a new WWTP	8 000 000	400 000	932 000

Source: Consultant

If the investment amount is distributed for the period from 2010 to 2015 (when the WFD will have to be implemented), the resulting annual demand of investment funds during the period 2010-2015 is about LTL 1.6 million in addition to the amount of LTL 3.2 million (15.87/5) which has already been allocated.

The investments for the supplementary measures in this sub-basin account for as much as 50 % of the costs of the basic wastewater management measures planned for the period 2007-2013. This is a substantial percentage as compared to the share of the supplementary measures in other sub-basins. The most rational solution would be to include this measure in the project on water supply and wastewater management planned for 2007-2013 using potentially saved money. All documentation required for the reconstruction for the wastewater treatment facilities will have to be prepared.

Also, the assistance provided to the water sector measures by the Lithuanian Environmental Investment Fund should be used to a larger extent.

### **Measures for restoring hydromorphology**

328. One fish pass which has to be reconstructed in the Žeimena Sub-basin is located in Kertuojai dam. This will require about LTL 12 thousand. Following the Operational Programme for the Lithuanian Fisheries Sector for 2007-2013, the assistance envisaged for the protection and development of aquatic fauna and flora totals to approximately LTL 7 million (data of the beginning of 2010). Such support should be sufficient for all measures designed to improve fish migration conditions provided for under this Programme of Measures.

Remeandering costs in the Žeimena Sub-basin would total to about LTL 1.5 million. If this amount is distributed for a five years' period (until 2015), the additional annual demand would be about LTL 300 thousand.

It is not clear, however, where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At the present day, 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. Therefore it is recommended that actions are limited to the implementation of a pilot project in the Grūda River in the Merkys Sub-basin.

### **Recreation**

329. No need of supplementary measures for the achievement of good ecological status has been identified in the sector of recreation, hence no assessment of the actual affordability is required.

### **Agriculture**

330. As already said in the sub-section on supplementary agricultural measures for the Žeimena Sub-basin, diffuse pollution does not have any significant impact in this sub-basin. However, the key measure – development of fertilisation plans – has been envisaged and proposed for the whole of Lithuania, hence additional state funds for controls over the implementation of this measure would amount to about LTL 6 000 every year. This means a demand of 0.2 of an additional employee's time. It is proposed to provide for such additional funds in the budget of the Ministry of the Environment. 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 the 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. This is deemed to be a feasible option.

### **Municipal affordability**

#### **Wastewater management**

331. There is one municipality with a major part of its area lying in the Žeimena Sub-basin – the municipality of Švenčionys. Should this municipality wish to implement the supplementary measures to reduce point pollution, it would need about LTL 8 million

from its budget or from the funds of water supply companies. However, Švenčionys municipality cannot afford allocating such additional amount.

On the other hand, the wastewater treatment plant of Švenčionys belongs to the Vilnius water company and hence reconstruction of the plant is a matter of concern not only for Švenčionys municipality. It is recommended to include this object, like other measures designed to reduce point pollution, in a reserve list of projects to be financed by the state in 2007-2013.

If no EU assistance could be received, taking a credit would not be a feasible option because Vilnius city municipality, which owns Vilnius water company, has exceeded its borrowing limits and may not take any more loans.

### **Measures for restoring hydromorphology**

332. There is one fish pass subject to reconstruction in the Žeimena Sub-basin, which is located in Kertuojai dam. This will require about LTL 12 thousand. Molėtai municipality should be easily able to afford this amount by 2015 using, if necessary, the EU assistance granted to the fisheries sector through the National Paying Agency.

### **Recreation**

333. No new national water tourism routes or bathing waters have been planned in the Žeimena Sub-basin.

### **Affordability to households**

#### **Point pollution sources**

334. Planned measures in the Žeimena Sub-basin include reconstruction of one wastewater treatment plant and construction of 16.5 km of new sewerage and 11.9 km of water supply networks by 2013. These are so-called basic measures. Since they have already been planned for the period 2007-2013, it is assumed that the measures are acceptable. However, to be able to analyse the burden of the supplementary measures for households, the burden of the basic measures should be taken into account as well.

Supplementary measures to reduce point pollution are required for Švenčionys WWTP (if restrictions for the use of phosphorus are not set). Affordability of the costs for the supplementary measures to the population living in respective municipalities and serviced by respective water supply companies can be assessed by estimating the additional burden.

However, first of all, it should be emphasised that so far the funding of the investment costs has been secured only for the above-said basic measures meanwhile the funding source for the supplementary measures is not clear yet. As mentioned before, neither the state nor municipalities have the required amount.

Table 194 below provides the costs of the supplementary measures and their impact on households. Since the population of Švenčionys is serviced by Vilnius water company Vilniaus vandenys, the additional burden of the investments for wastewater management in Švenčionys would be distributed among all inhabitants serviced by the said company. This means that the costs of the supplementary measures in average and median household income in Švenčionys and other relevant areas would constitute only

a minor share of the total costs which would not have any negative impact of the general household affordability, although the investment itself is quite large for the town.

Table 194. Impact of supplementary investment measures on household expenditure, LTL

Settlement	Investments	Annual costs	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member, %	Share of the annual costs in median income of one household member, %*
Švenčionys	8 000 000	932 000	1.72	0.14	0.013 %	0.016 %

Source: Consultant

### Affordability to the energy sector

335. There are no old HPP turbines to be replaced in the Žeimena Sub-basin.

### Affordability to the agricultural sector

336. The achievement of good ecological status of water bodies in the Žeimena Sub-basin does not require any specific supplementary measures. However, development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Žeimena Sub-basin totals to about 770. It is assumed that the development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Žeimena Sub-basin will have to spend approximately LTL 390 thousand for this activity.

The annual costs of all small farms in the Žeimena Sub-basin total to about LTL 120 thousand. This amount has been based on the assumption that the annual cost of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

## THE ŠVENTOJI SUB-BASIN

### Affordability to the state

#### Wastewater management

337. Planned measures in the Šventoji Sub-basin include reconstruction of three wastewater treatment plants and construction of 23 km of new sewerage networks. The investment costs provided in Table 195 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Šventoji Sub-basin are estimated at LTL 49.32 million.

Table 195. National projects on renovation and development of water supply and wastewater management systems in the Šventoji Sub-basin in 2007-2013

Municipality	Settlement	Planned works						Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	
Anykščiai	Anykščiai		1	3.1		3.1		22.24
Ukmergė	Ukmergė		1	5.7		4.7		9.4
Utena	Utena			6.2		6.2		8.68
Zarasai	Dusetos-Padusetėlis Užtiltė		1	8.0		1.6		9.0
<b>TOTAL:</b>			<b>3</b>	<b>23.0</b>		<b>15.6</b>		<b>49.32</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008

The planned investments for sludge treatment facilities in the Šventoji Sub-basin total to about LTL 30 million.

These basic measures will practically result in the achievement of good ecological status in the Šventoji Sub-basin and no additional investment measures will be required for the time being. However, an excessive amount of phosphorus has been observed in the receiving water body in the location of Utena WWTP and a few neighbouring dischargers. Hence, it is recommended to conduct additional research/study in order to determine the cause of such exceedance. Although the regulation of the use of phosphates in detergents should contribute to the solution of this problem, findings of respective studies are also required.

### Measures for restoring hydromorphology

338. Fish migration facilities and removal of old dams in the Šventoji Sub-basin require about LTL 128 000 of investment costs. If this amount is distributed on a yearly basin until 2015, the annual demand would be about LTL 26 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 take advantage of the EU assistance. Following the Operational Programme for the Lithuanian Fisheries Sector for 2007-2013, the assistance envisaged for the protection and development of aquatic fauna and flora totals to approximately LTL 7 million (data of the beginning of 2010). Such support should be sufficient for all measures designed to improve fish migration conditions provided for under this Programme of Measures.

Remeandering costs in the Šventoji Sub-basin would total to LTL 8.8 million. If this amount is distributed for a five years' period (until 2015), the additional annual demand would be almost LTL 1.8 million.

It is not clear, however, where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At the present day, 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. Therefore, it is recommended that actions are limited to the implementation of a pilot project on renaturalisation in the Grūda River in the Merkys Sub-basin.

### **Recreation**

339. No need of any specific supplementary measures for the achievement of good ecological status has been identified in the sector of recreation, hence no assessment of the actual affordability is required.

### **Agriculture**

340. As already said in the sub-section on supplementary agricultural measures for the Šventoji Sub-basin, pollution problems in relevant catchments can be solved by applying the following measures: mandatory development of fertilisation plans, correction of the coefficient of the absorption of substances from manure, storage of manure and slurry in accordance with good farming practice, and reduction of optimal fertilisation norms by 20 %.

The said measures will cost about LTL 2.5 million per year. About LTL 27 thousand of this amount will be required for administration and control. This is the sum to be allocated by the state through its divisions which regulate agricultural activities, or through regional or local environmental divisions for the control over the development of normative standards and fertilisation plans and manure management in small farms.

This means a demand of almost one additional full-time employee for the control of the implementation of agricultural measures. Having in mind that there are almost six municipalities with the major parts of their areas situated in the Šventoji Sub-basin, the regional environmental agencies or agricultural sub-divisions should designate 0.16 of an employee's time for the fulfilment of the said additional control function in each municipality. It is proposed to allocate such additional funds for control from the state budget through the Ministry of the Environment of the Republic of Lithuania. If no such additional funds could be allocated, the only solution of the issue related to the inspection of the development and implementation of fertilisation plans would be to revise and supplement the present functions of the specialists in charge of control with the ones proposed in the Programme. This is deemed to be a feasible option.

### **Municipal affordability**

#### **Wastewater management**

341. There are six municipalities with the major parts of their areas lying in the Šventoji Sub-basin: the municipalities of Zarasai, Anykščiai, Utena, Molėtai, Širvintos, and Ukmergė districts. None of them requires any supplementary measures at the moment, so the municipal burden is not expected to increase.

#### **Measures for restoring hydromorphology**

342. As already said, construction of fish passes and removal of dam remains in the Šventoji Sub-basin require about LTL 214 thousand of investment costs, which is the cost of the construction of fish migration facilities at the dam on the Šventoji in Anykščiai and at the dam of Klabinų mill on the Virinta. Also, remains of old dams should be removed in four more places. The annual demand of investment costs until 2015 is about LTL 43 thousand. No state funds have been allocated for this purpose

despite the fact that this is a function of the Ministry of Agriculture, and the municipal budgets would afford such measures only by taking advantage of the EU assistance granted to the fisheries sector. Co-financing could be allocated from the Environmental Assistance Programmes. The total budget of the Environmental Assistance Programme for Molėtai district during the last couple of years was about LTL 100 thousand, for Anykščiai – LTL 150 thousand, and for Ukmergė – about LTL 260 thousand. These are the districts where fish bypass channels should be built or dam remains should be removed.

### **Recreation**

343. No additional measures for recreation have been planned for the Šventoji Sub-basin.

### **Affordability to households**

344. No supplementary measures are required in the Šventoji Sub-basin, hence there will be no additional burden for households.

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

345. There are no HPP turbines to be replaced in the Šventoji Sub-basin hence no supplementary measures have been envisaged.

### **Affordability to the agricultural sector**

346. The reduction of diffuse pollution down to the level needed for the achievement of good ecological status in water bodies of the Šventoji Sub-basin first of all requires implementation of two basic measures: validation of normative standards for fertilisation and introduction of a requirement to develop and implement fertilisation plans, and introduction of a requirement to observe good farming practice applicable for farmers with less than 10 LSU. In addition, the optimal fertilisation norm in problematic catchments should be reduced by 20 %.

Development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Šventoji Sub-basin totals to more than 4 000. It is assumed that the development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Šventoji Sub-basin will have to spend more than LTL 2 million for this activity.

The annual costs of all small farms in the Šventoji Sub-basin total to about LTL 430 thousand. This amount has been based on the assumption that the annual cost of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

The reduction of fertilisation norms by 20 % should not require any additional costs.

## THE NERIS SMALL TRIBUTARIES SUB-BASIN

### Affordability to the state Wastewater management

347. Planned measures in the Neris Small Tributaries Sub-basin include construction of one new and reconstruction of two existing wastewater treatment plants, construction of 161 km of new and reconstruction of 4.6 km of the existing sewerage networks. The investment costs provided in Table 196 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Neris Small Tributaries Sub-basin are estimated at LTL 179.686 million.

Table 196. National projects on renovation and development of water supply and wastewater management systems in the Neris Small Tributaries Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Elektrėnai	Elektrėnai - Vievis			2.1		2.0			8.47
	Elektrėnai – Elektrėnai – northern part of Vievis agglomeration (Kazokiškės)	1		3.9		3.8			
Jonava distr.	Jonava			7.3		2.0			10.1
	Rukla		1						
Kaišiadorys distr.	Kaišiadorys			8.1		7.6			5.933
Kaunas distr.	Karmėlava and Ramučiai			20.1		8.8			8.152
Trakai distr.	Trakai-Lentvaris			26.7	0.4	18.3		1	29.9
Vilnius city	Vilnius			47.8	4.2	32.9	4.6		62.65
Vilnius distr.	Avižieniai			6.4		2.1			54.481
	Juodšiliai			6.1		1.5			
	Kalveliai		1	3.5		2.2			
	Nemenčinė			2.6		2.0			
	Nemėžis			3.0					
	Pagiriai			6.9		5.2			
	Rudamina			9.9		7.2			
	Skaidiškės			5.5		5.5			
Valčiūnai			1.1						
<b>TOTAL</b>		<b>1</b>	<b>2</b>	<b>161</b>	<b>4.6</b>	<b>101.1</b>	<b>4.6</b>	<b>1</b>	<b>179.686</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008.

Notes:

1. Development of Kaišiadorys water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaišiadorys district*. The project also includes development of the infrastructure in Rumšiškės and Žiežmariai settlements

- (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 17.8 million. It is assumed that one third of the project amount will be invested in the Neris Small Tributaries Sub-basin.
2. Development of Karmėlava and Ramučiai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Karmėlava and Ramučiai, Neveronys, Raudondvaris, Vilkija, and Šlienava*. The project also includes development of the infrastructure in Raudondvaris (the Nevėžis Sub-basin), Neveronys, Vilkija and Šlienava (the Nemunas Small Tributaries Sub-basin) settlements. The total value of the project is LTL 40.76 million. It is assumed that one fifth of the project amount will be invested in the Neris Small Tributaries Sub-basin.
  3. Development of Trakai-Lentvaris water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Trakai district*. The project also includes development of the infrastructure in Rūdiškės settlement (the Merkys Sub-basin). The total value of the project is LTL 59.8 million. It is assumed that half of the project amount will be invested in the Neris Small Tributaries Sub-basin.

Table 197 below provides planned investment projects on development of a sludge management infrastructure in towns located in the Neris Small Tributaries Sub-basin. The total investment costs amount to LTL 184.835 million.

Table 197. Projects on development of a sludge management infrastructure in 2007-2013 in the Neris Small Tributaries Sub-basin

Municipality	Expected project outputs	Preliminary investment costs, million LTL
Vilnius city	1 rotting and air drying facility	175.735
Jonava distr.	1 composting site	5.7
Kaišiadorys distr.	1 composting site	3.4
<b>TOTAL</b>		<b>184.835</b>

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 9 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913)

Accordingly, the amount allocated for wastewater and sludge treatment as well as water supply facilities in the Neris Small Tributaries sub-basin totals to around LTL 340 million until 2013.

The achievement of the proposed good ecological status objectives in the Neris Small Tributaries Sub-basin requires additional reduction of pollution (namely, the amount of phosphorus and nitrogen) of wastewater in Kaišiadorys treatment facilities. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 198 below.

Table 198. Costs of measures to reduce the impact of point pollution sources in the Neris Small Tributaries Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investments	Operating	Total annual
Kaišiadorys WWTP	Additional treatment of wastewater	3 960 000	200 000	460 000

Source: Consultant

If the investment amount is distributed for the period from 2010 to 2015 (when the WFD will have to be implemented), the resulting annual demand of investment funds during the period 2010-2015 is about LTL 800 thousand in addition to the amount of LTL 68 million (340/5) which has already been allocated.

The investments for the supplementary measures in the Neris Small Tributaries Sub-basin account for approximately 1.2 % of the costs of the basic water supply and wastewater management measures planned for the period 2007-2013. Though this is a small amount as compared to the share of supplementary measures in other sub-basins or basins, it has not been provided for in advance. The most rational option would be to include this measure in the project on water supply and wastewater networks in Kaišiadorys planned for 2007-2013.

Also, the assistance provided to the water sector measures by the Lithuanian Environmental Investment Fund should be used to a larger extent.

There is one measure relevant for Kaišiadorys which has not been included in the Programme of Measures due to shortage of information and which, however, must be considered by the municipality of Kaišiadorys together with the managers of operating poultry farms, namely, primary wastewater treatment facilities in poultry farms, where specifically polluted wastewater can have an adverse impact on normal operation of the municipal wastewater treatment plant.

### **Measures for restoring hydromorphology**

348. Fish migration facilities and removal of old dams in the Neris Small Tributaries Sub-basin require about LTL 1 million of investment costs. However, though 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 take advantage of the EU assistance. Following the Operational Programme for the Lithuanian Fisheries Sector for 2007-2013, the assistance envisaged for the protection and development of aquatic fauna and flora totals to approximately LTL 7 million (data of the beginning of 2010). Such support should be sufficient for all measures designed to improve fish migration conditions provided for under this Programme of Measures.

Remeandering costs in the Neris Small Tributaries Sub-basin would total to about LTL 1.9 million, which is a very large amount. More remeandering activities would be required only in the Nevėžis and Nemunas Small Tributaries sub-basins. If these investments costs are distributed for a five years' period (until 2015), the annual demand would be about LTL 400 thousand.

It is not clear, however, where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At the present day, 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. Therefore, it is recommended that actions are limited to the implementation of a pilot project in the Grūda River in the Merkys Sub-basin by 2015.

### **Recreation**

349. No need of specific supplementary measures for ensuring ecological status has been identified in the sector of recreation, hence no assessment of the actual affordability is required.

## **Agriculture**

350. As already said in the sub-section on supplementary agricultural measures for the Neris Small Tributaries Sub-basin, pollution problems in catchments can be solved by applying the following measures: mandatory development of fertilisation plans, correction of the coefficient of the absorption of substances from manure, storage of manure and slurry in accordance with the best farming practice, and reduction of optimal fertilisation norms by 20 %.

The said measures will cost about LTL 600 thousand per year both for farmers and for the state. About LTL 4 000 of this amount will be required for administration and control. This is the sum to be allocated by the state through local environmental agencies for controlling the development of normative standards and fertilisation plans and manure management in small farms. This means a demand of about 0.16 of an additional employee's time for the control of the implementation of agricultural measures. Having in mind that there are four municipalities with the major parts of their areas situated in the Neris Small Tributaries Sub-basin, the district environmental agencies or respective agricultural sub-divisions should additionally designate 0.04 of an employee's time for the fulfilment of the said additional control function in each municipality. This is a feasible option by optimising the present functions of the specialists who are currently in charge of control issues.

### **Municipal affordability**

#### **Wastewater management**

351. A water supply and sewerage network construction project has already been planned for Kaišiadorys, which will require about LTL 5 million, or LTL 1 million of investment costs per year on average.

There are four municipalities practically all the area of which is situated in the Neris Small Tributaries Sub-basin: the municipalities of Vilnius city, Vilnius district, Jonava and Kaišiadorys districts. Should the latter municipality wish to implement the supplementary measures of the WFD to reduce point pollution, it would need about LTL 300 thousand per year until 2015. However, neither the municipality nor the water supply company can afford allocating such amount.

Nevertheless, an analysis of household affordability has shown that one option could be taking a credit. According to the data of October 2009, the borrowing limit of Kaišiadorys municipality has not been exceeded.

### **Measures for restoring hydromorphology**

352. As already said, fish migration facilities and removal of old dams in the Neris Small Tributaries Sub-basin require about LTL 1.1 million of investment costs, which is the cost of the construction of six new fish migration facilities in Vilnius city and removal of the remains of eight old dams in Vilnius, Trakai and Širvintos districts. Different from other sub-basins, this amount is rather significant as compared to other supplementary measures. As mentioned before, it is proposed to take advantage of the EU assistance granted to the fisheries sector, with co-financing allocated from the Environmental Assistance Programme. The total budget of the Environmental Assistance Programme for Vilnius city during the last couple of years was almost LTL

2 million, for Vilnius district – about LTL 800 thousand, for Trakai district – more than LTL 200 thousand, and for Širvintos district – about LTL 184 thousand.

### Recreation

353. No national water tourism routes and no new bathing waters have been planned for the Neris Small Tributaries Sub-basin

### Affordability to households

#### Point pollution sources

354. Planned measures in the Neris Small Tributaries Sub-basin include construction of one new and reconstruction of two existing wastewater treatment plants, construction of 161 km of new and reconstruction of 4.6 km of the existing sewerage networks. In addition, construction of sludge management facilities has been planned in Vilnius, Trakai and Kaišiadorys districts. These are so-called basic measures. Since they have already been envisaged for the period 2007-2013, it is assumed that the measures are acceptable.

However, to be able to analyse the burden of the supplementary measures for households, the burden (in monetary terms) of the basic measures should be taken into account as well.

Supplementary measures to reduce point pollution are required for Kaišiadorys WWTP. Affordability of the costs for the supplementary measures to the population living in respective municipalities and serviced by respective water supply companies can be assessed by estimating the additional burden.

However, first of all it should be emphasised that so far the funding of the investment costs has been secured only for the above-said basic measures meanwhile the funding source for the supplementary measures is not clear yet. As mentioned before, neither the state nor municipalities have the required amount.

Should a funding source be identified, ultimately the burden of new investments will have to be taken by the population and companies which discharge wastewater into the central sewerage networks of the said districts.

Table 199 below provides the costs of the supplementary measures and their impact on households.

Table 199. Impact of supplementary investment measures on household expenditure, LTL

Settlement	Investments	Annual costs	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member,	Share of the annual costs in median income of one household member*,
Kaišiadorys	3 960 000	461 200	27.81	2.32	0.23 %	0.28 %

Source: Consultant

Table 200 below demonstrates the burden of the basic measures on an average household in Kaišiadorys, including a demand of investments for water supply and wastewater and sludge management.

Table 200. Impact of basic investment measures on household expenditure, LTL

Settlement	Investments	Annual costs *	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member	Share of the annual costs in median income of one household member *
Kaišiadorys	5 933 000	453 600	27.36	2.28	0.22 %	0.28 %

\* Operating costs which are part of the annual costs are estimated to constitute 1 % of the investments because the water supply and sewerage networks comprise the major share.

Table 201 provides the aggregate total financial burden – consisting of both the present burden and the burden of the basic and supplementary measures – on households for the current accessibility to the water supply and sewerage network and availability of the improved system in future.

Table 201. Aggregate impact of the present, basic and supplementary investment measures on household expenditure

Settlement	Current price, LTL/m3	Water consumption, l/day/capita	Monthly amount paid by one household member today, LTL	Monthly amount paid by one household member, including the basic and supplementary measures, LTL	Share of the annual costs in the average income of one household member,	Share of the annual costs in the median income of one household member,
Kaišiadorys	3.71	62	6.88	11.48	1.13 %	1.39 %

Source: Consultant

It should be borne in mind that, following the Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015, expenditure for drinking water supply and wastewater management services should not exceed 4 % of the household income both in towns and rural areas. As demonstrated in the tables above, the inhabitants of Kaišiadorys should not feel any significant additional burden. However, since the total fee for water services should go up almost twice on average, it is recommended that the water price is increased gradually until it reaches the required level in a couple of years.

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

355. No HPP turbines to be replaced during the first stage of the implementation of the WFD have been identified in the Neris Small Tributaries Sub-basin.

### **Affordability to the agricultural sector**

356. The achievement of good ecological status of water bodies in the Neris Small Tributaries Sub-basin does not require any specific agricultural measures. However, development and implementation of fertilisation plans is proposed for all farms in

Lithuania which are larger than 10 ha. The number of such farms in the Neris Small Tributaries Sub-basin totals to more than 1 000. It is assumed that the development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Neris Small Tributaries Sub-basin will have to spend approximately LTL 590 thousand for this activity

The annual costs of all small farms in the Neris Small Tributaries Sub-basin total to more than LTL 14 thousand. This amount has been based on the assumption that the annual cost of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

## THE NEVĖŽIS SUB-BASIN

### Affordability to the state

#### Wastewater management

357. Planned measures in the Nevėžis Sub-basin include construction of 69.1 km of new sewerage networks. The investment costs provided in Table 202 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Nevėžis Sub-basin are estimated at LTL 76.503 million.

Table 202. National projects on renovation and development of water supply and wastewater management systems in the Nevėžis Sub-basin in 2007-2013.

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Kaunas distr.	Domeikava			23.9		13.3			14.805
Kaunas distr.	Raudondvaris			7.2		2.8			8.152
Kėdainiai distr.	Kėdainiai			2.6		2.6			3.64
Panevėžys city	Panevėžys			31.4		31.4			43.96
Panevėžys distr.	Ramygala			2.0		2.0			2.8
Radviliškis distr.	Baisogala			2.0		0.9			3.146
<b>TOTAL</b>				<b>69.1</b>		<b>53</b>			<b>76.503</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008

Notes:

1. Development of Domeikava water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Akademija, Domeikava, Garliava, Ringaudai)*. The project also includes development of the infrastructure in Akademija, Garliava and Ringaudai settlements (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 59.22 million. It is assumed that one fourth of the project amount will be invested in the Nevėžis Sub-basin.

2. Development of Raudondvaris water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Karmėlava, Ramučiai, Neveronys, Raudondvaris, Vilkija, Šlienava)*. The project also includes development of the infrastructure in Karmėlava settlement (The Neris Small Tributaries Sub-basin) and in Ramučiai, Neveronys, Vilkija, and Šlienava settlements (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 40.76 million. It is assumed that one fifth of the project amount will be invested in the Nevėžis Sub-basin.
3. Two investment projects are planned to be implemented in Kaunas district. In the table, the information on these two projects is given in separate lines.
4. Development of Baisiogala water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Radviliškis district*. The project also includes development of the infrastructure in Radviliškis town. The total value of the project is LTL 76.291 million. It is assumed that half of the project amount will be invested in the Nevėžis Sub-basin.

Also, approximately LTL 41.3 million from the same funding sources have been envisaged for sewage sludge management (two rotting-air drying facilities) in Kėdainiai and Panevėžys districts, where sludge from other neighbouring wastewater treatment facilities will be handled as well.

The total allocations for wastewater and sludge management and water supply facilities in the Nevėžis Sub-basin until 2013 are estimated at about LTL 106.326 million.

The achievement of the proposed good ecological status objectives in the Nevėžis Sub-basin requires additional reduction of pollution (namely, the amount of phosphorus and nitrogen) of wastewater in the treatment facilities of at least three settlements. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 203 below.

Table 203. Costs of measures to reduce the impact of point pollution sources in the Nevėžis Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investments until 2015	Operating, LTL/year	Total annual
Baisogala WWTP	Construction of new facilities	4 000 000	200 000	466 000
Pakiršinis WWTP	Reconstruction of the WWTP	1 500 000	75 000	206 000
Bukonys WWTP	New biological treatment line	500 000	25 000	58 000
<b>Total</b>		<b>6 000 000</b>	<b>300 000</b>	<b>730 000</b>

Source: Consultant

If the investment amount is distributed for the period from 2010 to 2015 (when the WFD will have to be implemented), the resulting annual demand of investment funds during the period 2010-2015 is LTL 1.2 million in addition to the amount of LTL 21 million (106/5) which has already been allocated.

The investments for supplementary measures in the Nevėžis Sub-basin account for approximately 6 % of the costs of the basic water supply and wastewater management measures planned for the period 2007-2013, which is a significant share. Accordingly, as in the case of other sub-basins, if a relevant possibility to take advantage of “saved” EU assistance funds for wastewater management shows up, both public authorities and

municipalities should be flexible and have a reserve plan for financing the supplementary measures intended for the reduction of point pollution, as required by the WFD, in relevant places. Also, the assistance provided to the water sector measures by the Lithuanian Environmental Investment Fund should be used to a larger extent.

### **Measures for restoring hydromorphology**

358. No fish migration facilities and removal of old dams are required in the Nevėžis Sub-basin.

Remeandering costs in the Nevėžis Sub-basin would total to about LTL 17.2 million. If this amount is distributed for a five years' period (until 2015), the additional annual demand would be about LTL 3.4 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 the present day, 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. Therefore, it is recommended that actions are limited to the implementation of a pilot remeandering project in the Grūda River in the Merkys Sub-basin.

### **Recreation**

359. No need of supplementary measures for the ensuring of ecological status has been identified in the sector of recreation, hence no assessment of the actual affordability is required.

### **Agriculture**

360. As already shown in the sub-section on the supplementary agricultural measures for the Nevėžis Sub-basin, problems related to diffuse pollution can be solved by applying the maximum number of agricultural measures as compared to other sub-basins, such as mandatory development of fertilisation plans, correction of the coefficient of the absorption of substances from manure, storage of manure and slurry in accordance with good farming practice, reduction of optimal fertilisation norms by 20 %, planting of catch crops, grassing or fallowing of a certain area of land. Apart from that, it is also recommended to consider application of other measures in this sub-basin.

The said measures will cost about LTL 1.9 million per year for each farmers and the state. About LTL 30 thousand of this amount will be required for administration and control. This is the sum to be allocated by the state for the control of the development of normative standards and fertilisation plans and for manure management in small farms through local environmental agencies. This means a demand of one additional employee's time for the control of the implementation of agricultural measures. Having in mind that there are four municipalities with the major parts of their areas situated in the Nevėžis Sub-basin, the district environmental agencies should additionally designate 0.25 of an employee's time for the fulfilment of the said additional control function in each municipality. It is proposed to provide for such additional funds from the state the budget through the Ministry of the Environment of the Republic of Lithuania. If no such highly needed funds could be allocated, the only solution would be to optimise the present functions of the specialists who are currently in charge of control issues so that these also include control of the development of fertilisation plans and fulfilment of the

best farming requirements. However, this would most probably have a negative impact on the work quality having in mind the present work load of environmental inspectors.

### **Municipal affordability**

#### **Wastewater management**

361. There are four municipalities practically all the area of which is situated in the Nevėžis Sub-basin: the municipalities of Panevėžys city, Panevėžys district, Kalvarija, Kėdainiai and Radviliškis districts. The share of the municipality of Jonava in this sub-basin is very small but there are a couple of towns in this municipality which require supplementary measures and which are situated in the Nevėžis Sub-basin. Should Jonava municipality wish to implement the supplementary measures, it would have to allocate about LTL 500 thousand for investments until 2015. The borrowing limits are not exceeded in these municipalities, so a loan could be considered. However, the most rational solution would be to include the projects of Baisogala, Pakiršinis and Bukonys WWTP among the candidates to receive the EU support for 2007-2013.

#### **Measures for restoring hydromorphology**

362. As already said, no fish migration facilities and removal of old dams is required in the Nevėžis Sub-basin.

#### **Recreation**

363. No additional measures for recreation have been planned for the Nevėžis Sub-basin.

### **Affordability to households**

#### **Point pollution sources**

364. Planned measures in the Nevėžis Sub-basin include construction of 69 km of new sewerage networks and 53 km of new water supply networks. These are so-called basic measures. Since they have already been planned for the period 2007-2013, it is assumed that the measures are acceptable.

Supplementary measures for the reduction of point pollution are required in Baisogala, Pakiršinis and Bukonys WWTP. Affordability of the costs for the supplementary measures to the population living in respective municipalities and serviced by respective water supply companies can be assessed by estimating the additional burden.

It should be emphasised, however, that so far the funding of the investment costs has been secured only for the basic measures meanwhile the funding source for the supplementary measures is not clear yet. As mentioned before, neither the state nor municipalities have the required amount.

Should a funding source be identified, ultimately the burden will have to be taken by the population and companies which discharge wastewater into the central sewerage networks in the respective districts.

Table 204 below provides the costs of the supplementary measures and their impact on households.

Table 204. Impact of supplementary investment measures on household expenditure, LTL

Settlement	Investments	Annual costs	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member
Baisogala	4 000 000	465 800	186.32	15.53	1.70 %	1.88 %
Pakiršinis	1 500 000	174 700	145.58	12.13	1.33 %	1.47 %
Bukonys	500 000	58 200	72.75	6.06	0.66 %	0.73 %

Source: Consultant

No basic measures have been envisaged for the settlements in question, therefore only the current burden and the burden of supplementary measures is considered in this analysis.

Table 205 provides an aggregate total financial burden – consisting of both the present burden and the burden of the basic and supplementary measures – on households for the current accessibility to the water supply and sewerage network and availability of the improved system in future.

Table 205. Aggregate impact of the current, basic and supplementary investment measures on household expenditure

Settlement	Current price, LTL/m3	Water consumption, l/day/capita	Monthly amount paid by one household member today, LTL	Monthly amount paid by one household member, including the basic and supplementary measures, LTL	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member*
Baisogala	3.30	34	3.41	18.94	2.25 %	2.76 %
Pakiršinis	3.30	34	3.41	15.55	1.85 %	2.27 %
Bukonys	4.86	57	8.25	14.32	1.53 %	1.88 %

Source: Consultant, Bukonys municipality and company Baisogalos bioenergija

It should be borne in mind that, following the Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015, expenditure for drinking water supply and wastewater management services should not exceed 4 % of the household income both in towns and rural areas. As demonstrated in the table above, the share of the water costs in the income of the three settlements will not exceed the said percentage. However, it should be pointed out that the monthly payment, e.g. in Baisogala, will increase as many as five times and therefore the cost of water supply and wastewater management services should be increased gradually.

### Affordability to the energy sector

365. There are two HPP in the Minija Sub-basin, Vaitiekūnai and Angiriai HPP, the turbines of which should be replaced due to their environmental impact.

The total demand of the investment costs for the new turbines is estimated at about LTL 7 million. Since no support for such measure has been envisaged for the period 2007-2013, it is proposed to include the funding option into the next planning period.

It is recommended to take advantage of future EU assistance allocated through the Ministry of Economy or the Ministry of Energy of the Republic of Lithuania.

No supplementary investment measures have been planned in the sector of industry until 2015.

### **Affordability to the agricultural sector**

366. The achievement of good ecological status in water bodies in the Nevėžis Sub-basin requires a number of measures intended for reducing diffuse pollution.

Development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Nevėžis Sub-basin totals to more than 2.5 thousand. It is assumed that the development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Nevėžis Sub-basin will have to spend approximately LTL 2.9 million for this activity.

The annual costs of all small farms in the Nevėžis Sub-basin total to about LTL 360 thousand. This amount has been based on the assumption that the annual cost of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

## **THE ŠEŠUPĖ SUB-BASIN**

### **Affordability to the state**

#### **Wastewater management**

367. Planned measures in the Šešupė Sub-basin include reconstruction of five wastewater treatment facilities, construction of 64.5 km of new and reconstruction of 0.5 km of the existing sewerage networks. The investment costs provided in Table 206 below also cover the costs of implementation of the Drinking Water Directive. The total investment costs in the Šešupė Sub-basin are estimated at LTL 102.179 million.

Table 206. National projects on renovation and development of water supply and wastewater management systems in the Šešupė Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Alytus distr.	Simnas		1	2.6		3.0			7.46
Kalvarija	Kalvarija			4.6		1.8			4.48
Kazlų Rūda	Kazlų Rūda		1	6.0		5.0			13.42
Lazdijai distr.	Lazdijai			4.7		4.3			8.728
Marijampolė	Marijampolė		1	10.7		8.9			26.7

Prienai distr.	Veiveriai				0.5				2.192
Šakiai distr.	Šakiai			2.3					17.0
	Kudirkos Naumiestis		1	11.7		3.8			
	Kybartai			5.6		4.7			22.2
Prienai distr.	Vilkaviškis		1	12.1		6.9			
<b>TOTAL</b>			<b>5</b>	<b>62.3</b>	<b>0.5</b>	<b>38.4</b>			<b>102.18</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008.

Notes:

1. Development of Lazdijai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Lazdijai district*. The project also includes development of the infrastructure in Veisėjai settlement (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 17.455 million. It is assumed that half of the project value will be invested in the Šešupė Sub-basin.
2. Development of Veiveriai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Prienai district*. The project also includes development of the infrastructure in Prienai town and in Balbieriškis and Išlaužas settlements (the Nemunas Small Tributaries Sub-basin). The total value of the project is LTL 8.766 million. It is assumed that one fourth of the project value will be invested in the Šešupė Sub-basin.

Also, approximately LTL 28.3 million from the same funding sources have preliminary been envisaged for sewage sludge management (one rotting-air drying facility) in Marijampolė, where sludge from other neighbouring wastewater treatment facilities will be handled as well.

The total allocations for wastewater and sludge management and water supply facilities in the Šešupė Sub-basin are estimated at about LTL 120 million until 2013.

The achievement of the proposed good ecological status objectives in the Šešupė Sub-basin requires additional reduction of pollution (namely, the amount of phosphorus and nitrogen) of wastewater in the wastewater treatment facilities of two settlements. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 207 below. It should be noted that the reconstruction of Šakiai WWTP should be carried out only after the introduction of the restrictions on the use of phosphorus in domestic and industrial detergents.

Table 207. Costs of measures to reduce the impact of point pollution sources in the Šešupė Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investments	Operating, LTL/year	Total annual
Šakiai WWTP	Chemical precipitation of P	150 000	7 500	17,500
Kybartai WWTP	Additional denitrification link	1 000 000	50 000	116,000
<b>Total</b>		<b>1,150,000</b>	<b>57 500</b>	<b>133 500</b>

Source: Consultant

If the investment amount is distributed for the period from 2010 to 2015 (when the WFD will have to be implemented), the resulting annual demand of investment funds during the period 2010-2015 is about LTL 230 thousand in addition to the amount of LTL 24 million (120/5) which has already been allocated.

The investments for supplementary measures in the Šešupė Sub-basin account for approximately 1 % of the costs of the basic water supply and wastewater management measures planned for the period 2007-2013. Although this is a small amount, about LTL 230 thousand per year, it has not been provided for in advance. Accordingly, as in the case of other sub-basins, if a relevant possibility shows up to implement additional projects using saved EU support and co-financing funds for 2007-2013, both public authorities and municipalities should be flexible and have a reserve plan in place for the financing of the supplementary measures intended for the reduction of point pollution. Also, the assistance provided to the water sector measures by the Lithuanian Environmental Investment Fund should be used to a larger extent.

### **Measures for restoring hydromorphology**

368. Fish migration facilities and removal of old dams in the Šešupė Sub-basin require about LTL 220 thousand of investment costs. The required funds will be allocated by the builder of the HPP from its own sources.

Remeandering costs in the Šešupė Sub-basin would total to LTL 13 million. If this amount is distributed for a five years' period (until 2015), the annual demand would be about LTL 2.6 million.

It is not clear, however, where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At the present day, 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. Therefore, it is recommended that actions are limited to the implementation of a pilot project in the Grūda River in the Merkys Sub-basin by 2015.

### **Recreation**

369. No need of supplementary measures for ensuring ecological status has been identified in the sector of recreation, hence no assessment of the actual affordability is required.

### **Agriculture**

370. As already said in the sub-section on supplementary agricultural measures for the Šešupė Sub-basin, diffuse pollution problems can be solved by applying the following measures: mandatory development of fertilisation plans, correction of the coefficient of the absorption of substances from manure, storage of manure and slurry in accordance with good farming practice, and reduction of optimal fertilisation norms by 20 %.

The said measures will cost about LTL 2.7 million per year for each farmers and the state. About LTL 40 thousand of this amount will be required for administration and control. This is the sum to be allocated by the state through its environmental agencies for controlling the development of normative standards and fertilisation plans and manure management in small farms. This means a demand of about 1.4 of an additional employee's time for the control of the implementation of agricultural measures. Having in mind that there are five municipalities with the major parts of their areas situated in the Šešupė Sub-basin, the district environmental agencies should additionally provide for 0.3 of an employee's time for the fulfilment of the said additional control function in each municipality. It is proposed to grant such additional funds from the state budget

through the Ministry of the Environment of the Republic of Lithuania. If no such highly needed funds could be allocated from the state budget, the only solution would be to optimise the present functions of the specialists who are currently in charge of control issues so that these also include control of the development of fertilisation plans and fulfilment of the good farming requirements. However, this would most probably have a negative impact on the work quality having in mind the present work load of environmental inspectors.

### **Municipal affordability**

#### **Wastewater management**

371. There are five municipalities which are practically entirely situated in the Šešupė Sub-basin: the municipalities of Marijampolė, Kalvarija, Kazlų Rūda, Šakiai, and Vilkaviškis districts. Should the latter municipality wish to implement the supplementary measures to reduce point pollution, it would have to allocate about LTL 1 million from its budget or from the funds of water supply companies. However, the municipality cannot afford allocating such additional amount. As demonstrated further in the household affordability analysis, an option would be taking a loan because the borrowing limit of Vilkaviškis municipality for 2010 has not been exceeded. However, as in the case of other respective measures in other sub-basins, the most rational solution would be use a possibility to apply for “saved” EU assistance funds.

#### **Measures for restoring hydromorphology**

372. As already said, fish migration facilities and removal of old dams in the Šešupė Sub-basin require about LTL 220 thousand, which is the cost of the construction of a fish migration facility in the dam of Kudirkos Naumiestis in Šakiai district.

The builder of the hydropower plant has taken on the obligation of construct the fish migration facility with its own funds, hence no municipal funds will be required.

### **Recreation**

373. No national water tourism routes and no new bathing waters have been planned for the Šešupė Sub-basin.

### **Affordability to households**

#### **Point pollution sources**

374. Planned measures in the Šešupė Sub-basin include reconstruction of five existing wastewater treatment plants, construction of 64.5 km of new and reconstruction of 0.5 km of the existing sewerage networks before 2013. These are so-called basic measures. Since they have already been planned for the period 2007-2013, it is assumed that the measures are acceptable. However, household affordability was not assessed before, hence an impact of the measures on household has been estimated in order to analyse the burden of the proposed supplementary measures.

Supplementary measures for the reduction of point pollution are required in Šakiai and Kybartai WWTP (if the restrictions on the use of phosphorus in domestic and industrial detergents are not introduced). Affordability of the costs for the supplementary measures to the population living in respective municipalities and serviced by respective water supply companies can be assessed by estimating the additional burden.

It should be emphasised, however, that so far the funding of the investment costs has been secured only for the basic measures meanwhile the funding source for the supplementary measures is not clear yet. As mentioned before, neither the state nor municipalities have the required amount.

Should a funding source be identified, ultimately the burden will have to be taken by the population and companies which discharge wastewater into the central sewerage networks in the respective districts.

Table 208 below provides the costs of the supplementary measures and their impact on households.

Table 208. Impact of supplementary investment measures on household expenditure, LTL

Settlement	Investments	Annual costs	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member
Šakiai	150 000	17 500	0.71	0.06	0.01 %	0.01 %
Kybartai	1 000 000	116 500	3.95	0.33	0.04 %	0.05 %

Source: Consultant

Table 209 provides an aggregate total financial burden – consisting of both the present burden and the burden of the basic and supplementary measures – on households for the current accessibility to the water supply and sewerage network and availability of the improved system in future.

Table 209. Aggregate impact of the present, basic and supplementary investment measures on household expenditure

Settlement	Current price, LTL/m <sup>3</sup>	Water consumption, l/day/capita	Monthly amount paid by one household member today, LTL	Monthly amount paid by one household member, including the basic and supplementary measures, LTL	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member
Šakiai (+Kudirkos Naumiestis)	3.44	58	6.03	10.50	1.21 %	1.48 %
Kybartai (+Vilkaviškis)*	5.03	50	7.56	12.69	1.46 %	1.80 %

Source: Consultant

\*Kybartai is serviced by Vilkaviškis water company Vilkaviškio vandenys

It should be borne in mind that, following the Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015, expenditure for drinking water supply and wastewater management services should not exceed 4 % of the household income both in towns and rural areas. As demonstrated in the table above, the burden should be affordable to the households, although the costs might go up one and a half

time. Accordingly, the water price should be increased gradually until it reaches the cost recovery level.

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

375. Private funds for the fish migration facility in the Šešupė Sub-basin will be allocated by the constructor of the HPP in Kudirkos Naumištis. The average investment costs of the facility total to LTL 220 thousand.

### **Affordability to the agricultural sector**

376. The reduction of diffuse pollution down to the level needed for the achievement of good ecological status in water bodies of the Šešupė Sub-basin first of all requires implementing two basic measures: validation of normative standards for fertilisation and introduction of a requirement to develop and implement fertilisation plans as well as introduction of a requirement to observe the best farming practice applicable for farmers with less than 10 LSU. In addition, the optimal fertilisation norm in a few problematic catchments should be reduced by 20 %.

Development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Šešupė Sub-basin totals to more than 4.4 thousand. It is assumed that the development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Šešupė Sub-basin will have to spend approximately LTL 2.2 million for this activity.

The annual costs of all small farms in the Šešupė Sub-basin total to about LTL 440 thousand. This amount has been based on the assumption that the annual cost of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

## **THE DUBYSA SUB-BASIN**

### **Affordability to the state**

#### **Wastewater management**

377. Planned measures in the Dubysa Sub-basin include reconstruction of one existing wastewater treatment plant and construction of 14.5 km of new sewerage networks. The investment costs provided in Table 210 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Dubysa Sub-basin are estimated at LTL 23.333 million.

Table 210. National projects on renovation and development of water supply and wastewater management systems in the Dubysa Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Kelmė distr.	Kelmė			7.2		6.7			19.9
	Tytuvėnai		1	5.5		2.9			
Raseiniai distr.	Ariogala			1.8		1.8			3.433
<b>TOTAL</b>			<b>1</b>	<b>14.5</b>		<b>11.4</b>			<b>23.333</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008.

Note:

Development of Ariogala water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Raseiniai district*. The project also includes development of the infrastructure in Raseiniai town and Viduklė settlement (the Jūra Sub-basin). The total value of the project is LTL 10.3 million. It is assumed that one third of the project amount will be invested in the Dubysa Sub-basin.

Also, approximately LTL 6.6 million from the same funding sources have been envisaged for sewage sludge management (one composting site) in Kelmė.

The total allocations for wastewater and sludge management and water supply facilities in the Dubysa Sub-basin are estimated at about LTL 30 million until 2013.

The achievement of the proposed good ecological status objectives in the Dubysa Sub-basin does not require further additional reduction of wastewater pollution. It is assumed that a new wastewater treatment plant which is currently constructed in Tytuvėnai will treat wastewater to the required level.

### Measures for restoring hydromorphology

378. Fish migration facilities and removal of old dams in the Dubysa Sub-basin require about LTL 192 thousand of investment costs. If this amount is distributed on a yearly basin until 2015, the annual demand would be about LTL 38 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 take advantage of the EU assistance. Following the Operational Programme for the Lithuanian Fisheries Sector for 2007-2013, the assistance envisaged for the protection and development of aquatic fauna and flora totals to approximately LTL 7 million (data of the beginning of 2010). Such support should be sufficient for all measures designed to improve fish migration conditions provided for under this Programme of Measures.

Remeandering costs in the Dubysa Sub-basin would total to LTL 6 million. If this amount is distributed for a five years' period (until 2015), the annual demand would be about LTL 1.2 million.

It is not clear, however, where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At the present day, 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. Therefore, it is recommended that actions until 2015 are limited to the implementation of a pilot remeandering project in the Grūda River in the Merkys Sub-basin.

### **Agriculture**

379. According to the mathematical modelling results, diffuse agricultural pollution does not exert any significant impact on the quality of the main river Dubysa. However, concentrations of nitrate nitrogen in some of its tributaries may be slightly below the good ecological status requirements.

The key measures proposed for the whole of Lithuanian – development and implementation of fertilisation normative standards and plans – are sufficient in this sub-basin. Additional state funds for controls over the implementation of this activity in the Dubysa Sub-basin would amount to about LTL 14 thousand every year. This means a demand of one additional half-time employee. Should this function be divided between two municipalities which occupy the largest areas in the Dubysa Sub-basin, the employees responsible for the supervision of fertilisation plans in each of these municipalities would have to devote an additional quarter of their working time for this task. It is proposed to provide for such additional funds from the state budget through the Ministry of the Environment of the Republic of Lithuania. If no such highly needed funds could be allocated, the only solution would be to redistribute the present functions of the specialists who are currently in charge of control issues so that these also include control of the development of fertilisation plans and fulfilment of the best farming requirements.

### **Municipal affordability**

#### **Wastewater management**

380. No supplementary measures for wastewater management are required in the Dubysa Sub-basin, hence the two municipalities with the major parts of their areas lying in the Dubysa Sub-basin – the municipalities of Kelmė and Raseiniai – do not need any additional funds for these measures.

#### **Measures for restoring hydromorphology**

381. As already said, construction of fish passes and removal of dam remains in the Dubysa Sub-basin by 2015 require about LTL 165 thousand of investment costs, which is the cost of the construction of one fish pass and removal of two barriers for fish migration. The municipalities would be able to implement such measures by taking advantage of the EU assistance for the fisheries sector. Co-financing could be allocated from the Environmental Assistance Programme. The total budgets of the Environmental Assistance Programme for Kelmė and Raseiniai districts during the last couple of years were about LTL 140 thousand and LTL 200 thousand respectively.

### **Affordability to households**

#### **Point pollution sources**

382. No supplementary investment measures are required in the Dubysa Sub-basin and thus households will not have to face an additional burden.

### Affordability to the energy sector

383. There are two HPP in the Dubysa Sub-basin, Kaulakiai and Plikiai HPP, the turbines of which should be replaced due to their environmental impact.

The total demand of the investment costs for the new turbines is estimated at about LTL 1 million. Since no support for such measure has been envisaged for the period 2007-2013, it is proposed to include the funding option into the next planning period.

It is recommended to take advantage of future EU assistance allocated through the Ministry of Economy or the Ministry of Energy of the Republic of Lithuania.

### Affordability to the agricultural sector

384. Development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Dubysa Sub-basin totals to about 2 000. It is assumed that the development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Dubysa Sub-basin will have to spend approximately LTL 970 thousand for this activity.

The annual costs of all small farms in the Dubysa Sub-basin total to about LTL 140 thousand. This amount has been based on the assumption that the annual costs of manure management following the good practice requirements will be as low as LTL 10 LTL per one livestock unit. Such burden for farms is also deemed to be acceptable.

## THE JŪRA SUB-BASIN

### Affordability to the state

#### Wastewater management

385. Planned measures in the Jūra Sub-basin include construction one new wastewater treatment plant and reconstruction of the existing wastewater treatment facilities, and construction of 61.2 km of new sewerage networks. The investment costs provided in Table 211 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Jūra Sub-basin are estimated at LTL 79.267 million.

Table 211. National projects on renovation and development of water supply and wastewater management systems in the Jūra Sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LT
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Raseiniai distr.	Raseiniai			2.6		1.8			6.867
	Viduklė		1	1.8		0.9			
Šilalė distr.	Šilalė			14.5		12.4			37.2
	Kvėdarna		1	11.0		11.0			

Tauragė distr.	Tauragė			13.1		12.2			35.2
	Skaidvilė	1		18.2		3.9			
<b>TOTAL</b>		<b>1</b>	<b>2</b>	<b>61.2</b>		<b>42.2</b>			<b>79.267</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008.

Note:

Development of Raseiniai and Viduklė water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Raseiniai district*. The project also includes development of the infrastructure in Ariogala settlement (the Dubysa Sub-basin). The total value of the project is LTL 10.3 million. It is assumed that two thirds of the project amount will be invested in the Jūra Sub-basin.

Also, approximately LTL 23.8 million have been envisaged for the construction of one composting site and one rotting-air drying facility in Raseiniai and Tauragė districts.

The total allocations for wastewater and sludge management and water supply facilities in the Jūra Sub-basin are estimated at about LTL 103 million until 2013.

The achievement of the proposed good ecological status objectives in the Jūra Sub-basin requires additional reduction of wastewater pollution (namely, the amount of phosphorus and nitrogen) in Raseiniai treatment facilities. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 212 below.

Table 212. Costs of measures to reduce the impact of point pollution sources in the Jūra Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment until 2015	Operational, LTL/year	Total annual
Raseiniai WWTP	Air-blowers and additional removal of phosphorus	800 000	40 000	93 000

Source: Consultant

If the investment amount is distributed for the period from 2010 to 2015 (when the WFD will have to be implemented), the resulting annual demand of investment funds during the period 2010-2015 is about LTL 160 thousand in addition to the amount of LTL 21 million (103/5) which has already been allocated.

The investments for supplementary measures in the Jūra Sub-basin account for only 0.8 % of the costs of the basic water supply and wastewater management measures planned for the period 2007-2013.

It should be emphasised, however, that although the upgrading of Raseiniai WWTP is identified as a supplementary measure in this Programme of Supplementary Measures, the construction of water supply and sewerage networks has already been planned as a basic measure. The most rational solution would be to include the costs of the air-blower and phosphorus removal so as to encompass the implementation both of the Wastewater Regulation and of more stringent requirements which would ensure good status in the receiving water body, i.e. at the same time to implement both the basic and the supplementary measures.

### Measures for restoring hydromorphology

386. Fish migration facilities and removal of old dams in the Jūra Sub-basin require about LTL 870 thousand of investment costs. If this amount is distributed on a yearly

basin until 2015, the annual demand would be about LTL 174 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 take advantage of the EU assistance. Following the Operational Programme for the Lithuanian Fisheries Sector for 2007-2013, the assistance envisaged for the protection and development of aquatic fauna and flora totals to approximately LTL 7 million (data of the beginning of 2010). Such support should be sufficient for all measures designed to improve fish migration conditions provided for under this Programme of Supplementary Measures.

Remeandering costs in the Jūra Sub-basin would total to about LTL 2.8 million. If this amount is distributed for a five years' period (until 2015), the annual demand would be about LTL 0.6 million.

It is not clear, however, where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At the present day, 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. Therefore, it is recommended that actions until 2015 are limited to the implementation of pilot project in the Grūda River in the Merkys Sub-basin.

### **Agriculture**

387. The total area where pollution has to be reduced in the sub-basin is 199 km<sup>2</sup> and the total amount of nitrogen to be removed is estimated to be 19 887 kg. Three problematic catchments (units used in a mathematical model) have been identified. The common measures proposed for the entire country are sufficient for the elimination of nitrogen surplus in this sub-basin, i.e. development and implementation of fertilisation normative standards and plans.

Additional state funds for controls over the implementation of this activity in the Jūra Sub-basin would amount to about LTL 16 thousand every year. This means a demand of 0.6 of an additional employee's time. Should this function be divided among three municipalities which occupy the largest areas in the Jūra Sub-basin, the employees responsible for the supervision of fertilisation plans in each of these municipalities would have to devote additionally 0.2 of their working time for this task. It is proposed to provide for additional funds from the state budget through the Ministry of the Environment of the Republic of Lithuania. If no such highly needed funds could be allocated, the only solution would be to redistribute the present functions of the specialists who are currently in charge of control issues so that these also include control of the development of fertilisation plans and fulfilment of the best farming requirements. However, this would most probably have a negative impact on the work quality having in mind that the present work load of environmental inspectors.

### **Municipal affordability**

#### **Wastewater management**

388. There are three municipalities with the major parts of their areas lying in the Jūra Sub-basin: the municipalities of Rietavas, Šilalė and Tauragė. Additional investments for the implementation of the WFD would be required only in Raseiniai. The major part of Raseiniai district is situated in another sub-basin. The municipality of Raseiniai

would have to allocate LTL 0.8 million for the investments until 2015 if it has to finance the total amount of the costs of the supplementary measure. However, if it takes advantage of the EU assistance for national investment projects for 2007-2013, the municipal share would be 25 % of the said amount. Should the municipality fail to find such amount during five years, it could take a loan because its borrowing limits have not been exceeded.

### **Measures for restoring hydromorphology**

389. As already said, fish migration facilities and removal of old dams in the Jūra Sub-basin require about LTL 870 thousand of investment costs, which is the cost of the construction of three fish passes and removal of one barrier for fish migration.

The municipalities would be able to implement such measures by making use of the EU assistance for the fisheries sector. Co-financing funds could be allocated from the Environmental Assistance Programme. The total budget of the Environmental Assistance Programme for Raseiniai district during the last couple of years amounted to about LTL 200-250 thousand.

### **Affordability to households**

#### **Point pollution sources**

390. Planned measures in the Jūra Sub-basin include construction of 61.2 km of new sewerage networks and 42.2 km of new water supply networks before 2013. These are so-called basic measures. Since they have already been planned for the period 2007-2013, it is assumed that the measures are acceptable.

Supplementary measures to reduce point pollution are required for Raseiniai WWTP. An estimation of the affordability of the additional burden to the inhabitants serviced by the water company Raseinių vandenys has been conducted.

Table 213 below provides the costs of the supplementary measures and their impact on households.

Table 213. Impact of supplementary investment measures on household expenditure, LTL

<b>Settlement</b>	<b>Investments</b>	<b>Annual costs</b>	<b>Annual costs per one household member</b>	<b>Annual costs per one household member per month</b>	<b>Share of the annual costs in the average income of one household member</b>	<b>Share of the annual costs in the median income of one household member</b>
Raseiniai	800 000	93 200	3.47	0.29	0.03 %	0.03 %

Source: Consultant

Table 214 below demonstrates the impact of the basic measures on household water bills.

Table 214. Impact of basic investment measures on household expenditure, LTL

Settlement	Investments	Annual costs *	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member *
Raseiniai	9 967 000	762 100	28.23	2.35	0.23 %	0.28 %

Source: Consultant

\*- Including investments for sludge management

Table 215 provides an aggregate total financial burden – consisting of both the present burden and the burden of the basic and supplementary measures – on households for the current accessibility to the water supply and sewerage network and availability of the improved system in future.

Table 215. Aggregate impact of the present, basic and supplementary investment measures on household expenditure

Settlement	Current price, LTL/m <sup>3</sup>	Water consumption, l/day/capita	Monthly amount paid by one household member today, Lt	Monthly amount paid by one household member, including the basic and supplementary measures, LTL	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member
Raseiniai	5.55	49	8.17	10.82	1.06 %	1.31 %

Source: Consultant and data of the water company Raseinių vandenys

It should be reminded that, following the Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015, expenditure for drinking water supply and wastewater management services should not exceed 4 % of the household income both in towns and rural areas. As demonstrated in the tables above, the inhabitants serviced by the company Raseinių vandenys should not feel any significant additional burden.

### Affordability to the energy sector

391. There are no hydropower plants in the Jūra where supplementary investment measures would be recommended.

### Affordability to the agricultural sector

392. Development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Jūra Sub-basin totals to about 1 700. It is assumed that the development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be acceptable. Altogether, farmers in the Jūra Sub-basin will have to spend approximately LTL 850 thousand for this activity.

The annual costs of all small farms in the Jūra Sub-basin total to about LTL 320 thousand. This amount has been based on the assumption that the annual cost of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

## THE LITHUANIAN COASTAL RIVERS BASIN

### Affordability to the state Wastewater management

393. Planned measures in the Lithuanian Coastal Rivers Basin include reconstruction of four existing wastewater treatment facilities, construction of 28.7 km of new and reconstruction of 4.4 km of the existing sewerage networks. The investment costs provided in Table 216 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Lithuanian Coastal Rivers Basin are estimated at LTL 121.411 million.

Table 216. National projects on renovation and development of water supply and wastewater management systems in the Lithuanian Coastal Rivers Basin sub-basin in 2007-2013

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement facilities	
Klaipėda city	Klaipėda			13.0		9.0		1	52.0
Klaipėda distr.	Kretingalė		1	4.0		1.2		1	10.92
Kretinga distr.	Kretinga		1						18.911
	Vydmantai		1	4.3		4.3		1	
Neringa	Neringa			1.2	4.4	1.8	14.5		24.48
Palanga town	Palanga		1	6.2		6.2			15.1
<b>TOTAL</b>			<b>4</b>	<b>28.7</b>	<b>4.4</b>	<b>22.5</b>	<b>59.6</b>	<b>3</b>	<b>121.411</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008.

Notes:

1. Development of Kretingalė water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Klaipėda district*. The project also includes development of the infrastructure in Vėžaičiai settlement (the Minija Sub-basin). The total value of the project is LTL 21.84 million. It is assumed that half of the project amount will be invested in the Lithuanian Coastal Rivers Basin.
2. Development of Kretinga and Vydmantai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kretinga district*. The project also includes development of the infrastructure in Salantai settlement (the Minija Sub-basin). The total value of the project is LTL 28.366 million. It is assumed that two thirds of the project amount will be invested in the Lithuanian Coastal Rivers Basin.

Also, approximately LTL 27.5 million have been envisaged for the construction of one sludge rotting-air drying facility in Klaipėda.

The total allocations for wastewater and sludge management and water supply facilities in the Lithuanian Coastal Rivers Basin until 2013 are estimated at about LTL 149 million.

The achievement of the proposed good ecological status objectives in the Lithuanian Coastal Rivers Basin requires additional reduction of wastewater pollution (namely, the amount of phosphorus and nitrogen) in Kretinga treatment facilities. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 217 below.

Table 217. Costs of measures to reduce the impact of point pollution sources in the Lithuanian Coastal Rivers Basin, LTL, 2009

Settlement	Measure	Costs		
		Investment until 2015	Operating, LTL/year	Total annual, LTL/year
Kretinga WWTP	Additional treatment and removal of phosphorus	2 340 000	117 000	273 000

Source: Consultant

If the investment amount is distributed for the period from 2010 to 2015 (when the WFD will have to be implemented), the resulting annual demand of investment funds during the period 2010-2015 is about LTL 470 thousand in addition to the amount of LTL 30 million (149/5) which has already been allocated.

The investments for supplementary measures in the Lithuanian Coastal Rivers Basin account for approximately 1.6 % of the costs of the basic water supply and wastewater management measures planned for the period 2007-2013.

It should be emphasised, however, that although the upgrading of Kretinga WWTP is identified as a supplementary measure in the Programme of Measures, the reconstruction of Kretinga WWTP has already been planned as a basic measure. The most efficient solution would be to tighten the requirements for the level of wastewater clean-up pursued by the reconstruction. In this way the requirements of the supplementary measure would also be met. The objective should be to implement both the provisions of the Wastewater Regulation and more stringent requirements which would ensure good status in the receiving water body, i.e. to implement both the basic and the supplementary measures at the same time.

### **Measures for restoring hydromorphology**

394. No fish migration facilities or removal of old dams and no remeandering of rivers is required in the Lithuanian Coastal Rivers Basin.

### **Agriculture**

395. The only pollution reduction measures applicable in the Lithuanian Coastal Rivers Basin are those proposed for the entire country, i.e. development and implementation of fertilisation normative standards and plans. Additional state funds for controls over the implementation of this activity in this basin would amount to about LTL 4 000 every year. This means a demand of 0.14 of an additional employee's time. This function should actually be assigned to employees of Klaipėda district institutions responsible for the control of the application of agricultural measures. Since no additional allocations

can be expected from the state budget at the moment, an alternative solution would be to revise the functions of the specialist in charge of the control of the implementation of agricultural measures and to redistribute these functions in a way to include control over the development and implementation of fertilisation plans. This is considered to be a feasible option.

### **Municipal affordability**

#### **Wastewater management**

396. There are two municipalities with the major parts of their areas lying in the Lithuanian Coastal Rivers Basin: the municipalities of Klaipėda city and Neringa town. Investments for the WFD would be required only in Kretinga. The larger part of Kretinga district is situated in another sub-basin. Kretinga municipality would have to allocate LTL 2.3 million for the investments, but it cannot afford such amount. Since borrowing limits are not exceeded, a loan could be considered. The most realistic and the most efficient solution, however, would be to implement both the basic and supplementary measures coordinating these measures in the list of national projects for 2007-2013. In such case the co-financing share by the state until 2015 would be less than LTL 1 million.

#### **Measures for restoring hydromorphology**

397. No such measures are required in this basin.

### **Affordability to households**

#### **Point pollution sources**

398. Planned measures in the Lithuanian Coastal Rivers Basin include reconstruction of four existing wastewater treatment plants, construction of 28.7 km of new and reconstruction of 4.4 km of the existing sewerage networks. These are so-called basic measures. Since they have already been planned for the period 2007-2013, it is assumed that the measures are acceptable.

Supplementary measures to reduce point pollution are required for Kretinga WWTP. An estimation of the affordability of the additional burden to the inhabitants serviced by the water company Kretingos vandenys has been conducted

Table 218 below provides the costs of the supplementary measures and their impact on households.

Table 218. Impact of supplementary investment measures on household expenditure, LTL

<b>Settlement</b>	<b>Investments</b>	<b>Annual costs</b>	<b>Annual costs per one household member</b>	<b>Annual costs per one household member per month</b>	<b>Share of the annual costs in the average income of one household member</b>	<b>Share of the annual costs in the median income of one household member *</b>
Kretinga	2 340 000	272 500	9.58	0.80	0.08 %	0.10 %

Source: Consultant

Table 219 below demonstrates the impact of the basic measures on household water bills.

Table 219. The impact of basic investment measures on household expenditure, LTL

Settlement	Investments	Annual costs	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member *
Kretinga	18 911 000	1 446 000	49.86	4.16	0.44 %	0.54 %

Source: Consultant

Table 220 provides an aggregate total financial burden – consisting of both the present burden and the burden of the basic and supplementary measures – on households for the current accessibility to the water supply and sewerage network and availability of the improved system in future

Table 220. Aggregate impact of the present, basic and supplementary investment measures on household expenditure

Settlement	Current price, LTL/m <sup>3</sup>	Water consumption l/day/capita	Monthly amount paid by one household member today, LTL	Monthly amount paid by one household member, including the basic and supplementary measures, LTL	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member
Kretinga	4.44	57	7.64	12.60	1.34 %	1.64 %

Source: Consultant and data of the water company Raseinių vandenys

It should be borne in mind that, following the Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015, expenditure for drinking water supply and wastewater management services should not exceed 4 % of the disposable household income both in towns and rural areas. As demonstrated in the tables above, the inhabitants serviced by the company Kretingos vandenys would not feel any significant additional burden provided that the water price is increased gradually until it reaches the cost recovery level.

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

399. There are no hydropower plants in the Lithuanian Coastal Rivers Basin where supplementary measures would be recommended.

### **Affordability to the agricultural sector**

400. Development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Lithuanian Coastal Rivers Basin totals to more than 700. It is assumed that the development of one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than 1 %, hence this measure is deemed to be

acceptable. Altogether, farmers in the Lithuanian Coastal Rivers Basin will have to spend around LTL 360 thousand for this activity.

The annual costs of all small farms in the Lithuanian Coastal Rivers Basin total to about LTL 60 thousand. This amount has been based on the assumption that the annual cost of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

## THE NEMUNAS SMALL TRIBUTARIES SUB-BASIN

### Affordability to the state

#### Wastewater management

401. Planned measures in the Nemunas Small Tributaries Sub-basin include construction of two new and reconstruction of three existing wastewater treatment plants, construction of 177.1 km of new and reconstruction of 6.5 km of the existing sewerage networks. The investment costs provided in Table 221 below also cover the costs of the implementation of the Drinking Water Directive. The total investment costs in the Nemunas Small Tributaries Sub-basin are estimated at LTL 277.127 million.

Table 221. National projects on renovation and development of water supply and wastewater management systems in the Nemunas Small Tributaries Sub-basin in 2007-2013

Municipality	Settlement	Planned works						Project value, million LTL	
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km		New/renovated water improvement
Alytus town	Alytus			28.9	5.0	31.3			49.764
Birštonas	Birštonas			3.2		3.0			4.34
Druskininkai	Druskininkai			2.1		1.5			2.52
Jurbarkas distr.	Jurbarkas			9.8		9.1			12.9
Kaunas city	Kaunas			44.5		39.8			72.8
Kaunas distr.	Ežerėlis			1.1		0.1			6.417
	Neveronys				0.3				
	Šlienava			4.0					
Kaunas distr.	Akademija			2.8		2.8			44.415
	Garliava			17.5		13.1			
	Ringaudai			5.6		5.6			
Kaunas distr.	Neveronys			5.8		4.9			24.456
	Vilkija			3.7					
	Šlienava			0.8					
Kaišiadorys	Rumšiškės			6.7		1.2			11.867
	Žiežmariai			0.9		0.9			
Lazdijai distr.	Veisiejai		1	3.6		2.3			8.728
Pagėgiai	Pagėgiai			2.6		2.6			3.64
Prienui distr.	Prienui			4.1	1.2	4.2			6.575
	Balbieriškis	1							
	Išlaužas		1						
Prienui distr.	Prienui			2.3		1.3			4.338

Municipality	Settlement	Planned works							Project value, million LTL
		New WWTP, unit	Renovated WWTP, unit	New sewerage networks, km	Renovated sewerage networks, km	New water supply networks, km	Renovated water supply networks, km	New/renovated water improvement	
	Jieznas			1.3		1.3			
Šilutė distr.	Šilutė			17.9					13.067
	Rusnė		1	0.9		0.9			
Šakiai distr.	Gelgaudiškis	1		7.0		2.0			11.3
<b>TOTAL</b>		<b>2</b>	<b>3</b>	<b>177.1</b>	<b>6.5</b>	<b>127.9</b>	<b>0</b>	<b>0</b>	<b>277.127</b>

Source: Order No. D1-462 of the Minister of the Environment of the Republic of Lithuania of 9 September 2008 (as amended by Order No. D1-172 of 17 April 2009).

Notes:

1. Development of Akademija, Domeikava and Ringaudai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Akademija, Domeikava, Garliava, Ringaudai)*. The project also includes development of the infrastructure in Domeikava settlement (the Nevėžis Sub-basin). The total value of the project is LTL 59.22 million. It is assumed that three fourths of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.
2. Development of Neveronys, Vilkija and Šlienava water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaunas district (Karmėlava and Ramučiai, Neveronys, Raudondvaris, Vilkija, Šlienava)*. The project also includes development of the infrastructure in Karmėlava and Ramučiai settlements (the Neris Small Tributaries Sub-basin) and in Raudondvaris. The total value of the project is LTL 40.76 million. It is assumed that three fifths of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.
3. Three investment projects are planned to be implemented in Kaunas district: *Development of the water supply and wastewater management infrastructure in Kaunas district (Ežerėlis, Neveronys, Šlienava)*, *Development of the water supply and wastewater management infrastructure in Kaunas district (Akademija, Domeikava, Garliava, Ringaudai)*, and *Development of the water supply and wastewater management infrastructure in Kaunas district (Karmėlava and Ramučiai, Neveronys, Raudondvaris, Vilkija, Šlienava)*. In the table above, the information on these three projects is given in separate lines.
4. Development of Rumšiškės and Žiežmariai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Kaišiadorys district*. The project also includes development of the infrastructure in Kaišiadorys town (the Neris Small Tributaries Sub-basin). The total value of the project is LTL 17.8 million. It is assumed that two thirds of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.
5. Development of Veisiejai water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Lazdijai district*. The project also includes development of the infrastructure in Lazdijai town (the Šešupė Sub-basin). The total value of the project is LTL 17.455 million. It is assumed that half of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.
6. Development of Prienai, Balbieriškis and Išlaužas water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Prienai district*. The project also includes development of the infrastructure in Veiveriai settlement (the Šešupė Sub-basin). The total value of the project is LTL 8.766 million. It is assumed that three fourths of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.

7. Two investment projects are planned to be implemented in Prienai district: *Development of the water supply and wastewater management infrastructure in Prienai district* and *Development of the water supply and wastewater management infrastructure in Prienai*. In the table above, the information on these projects is given in separate lines.
8. Development of Šilutė and Rusnė water supply and wastewater infrastructure is included in the project *Development of the water supply and wastewater management infrastructure in Šilutė district*. The project also includes development of the infrastructure in Švėkšna settlement (the Minija Sub-basin). The total value of the project is LTL 19.6 million. It is assumed that two thirds of the project amount will be invested in the Nemunas Small Tributaries Sub-basin.

Also, about LTL 107 million from the same funding sources have been preliminary envisaged for sewage sludge management in the municipalities of Alytus town, Alytus district, Kaunas city and Šilutė district.

Table 222 below provides planned investment projects on the development of a sludge management infrastructure in towns located in the Nemunas Small Tributaries Sub-basin. The total investment costs amount to LTL 107.83 million.

Table 222. Projects on the development of a sludge management infrastructure in the Nemunas Small Tributaries Sub-basin in 2007-2013

Municipality	Expected project outputs	Preliminary investment costs, million LTL	Operating costs, million LTL/year
Alytus town, Alytus distr.	1 rotting and air drying facility	41.53	
Druskininkai	1 composting site	4.3	
Kaunas city	1 rotting and air drying facility	49.0	
Šilutė distr.	1 rotting and air drying facility	13.0	
<b>TOTAL</b>		<b>107.83</b>	

Source: Order No. D1-667 of the Minister of the Environment of the Republic of Lithuania of 9 December 2008 (*Valstybės žinios*, 2008, No. 6-188; 2009, No. 48-1913)

Accordingly, about LTL 358 million have been allocated for the wastewater and sewage sludge management and water supply objects in the Nemunas Small Tributaries Sub-basin until 2013, which is a very large amount.

The achievement of the proposed good ecological status objectives in the Nemunas Small Tributaries Sub-basin requires additional reduction of pollution of wastewater with nitrogen and phosphorus in treatment facilities in Pravieniškės, Klausučiai, Šilutė and Lekėčiai. The proposed measures to improve the clean-up of wastewater and their costs are given in Table 223 below.

Table 223. Costs of measures to reduce the impact of point pollution sources in the Nemunas Small Tributaries Sub-basin, LTL, 2009

Settlement	Measure	Costs		
		Investment until 2015	Operating, LTL/year	Total annual, LTL/year
Pravieniškės WWTP	Reconstruction of WWTP	15 000 000	750 000	1 750 000
Šilutė WWTP	Reconstruction of WWTP	1 500 000	75 000	175 000
Klausučiai WWTP	Reconstruction of WWTP	600 000	30 000	70,000
<b>TOTAL:</b>		<b>17 100 000</b>	<b>855 000</b>	<b>1 992 000</b>

Source: Consultant

If the investment amount is distributed for the period from 2010 to 2015 (when the WFD will have to be implemented), the resulting annual demand of investment funds during the period 2010-2015 is about LTL 3.4 million (17.1/5) in addition to the amount of LTL 77 million (385/5) which has already been allocated.

The investments for the supplementary measures in the Nemunas Small Tributaries Sub-basin account for approximately 4.4 % of the costs of the basic water supply and wastewater management measures planned for the period 2007-2013. The resulting amount of LTL 3.4 million per year is practically impossible to ensure if it has not been included in any funding plans in advance. Accordingly, as in the case of other sub-basins, if a relevant possibility to use “saved” EU assistance funds for wastewater management shows up, both public authorities and municipalities should be flexible and have a reserve plan for the financing of the supplementary measures intended for the reduction of point pollution as required by the WFD in relevant places. Also, the assistance provided to the water sector measures by the Lithuanian Environmental Investment Fund should be used to a larger extent.

### **Measures for restoring hydromorphology**

402. Fish migration facilities and removal of old dams in the Nemunas Small Tributaries Sub-basin require about LTL 300 thousand of investment costs. If this amount is distributed on a yearly basis until 2015, the annual demand would be around LTL 60 thousand. However, although 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. Following the Operational Programme for the Lithuanian Fisheries Sector for 2007-2013, the assistance envisaged for the protection and development of aquatic fauna and flora totals to approximately LTL 7 million (data of the beginning of 2010). Such support should be sufficient for all measures designed to improve fish migration conditions provided for under the Programme of Measures.

Remeandering costs in the Nemunas Small Tributaries Sub-basin would total to roughly LTL 10.8 million. If this amount is distributed for a five years' period (until 2015), the additional annual demand would be about LTL 2.2 million.

It is not clear, however, where such additional funds could be obtained because it has been established that potential funding sources already have their respective investment objects planned. At the present day, 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. Therefore it is recommended that actions until 2015 are limited to a pilot project in the Grūda River in the Merkys Sub-basin.

### **Agriculture**

403. Diffuse pollution does not have any significant impact on the quality of rivers in the Nemunas Small Tributaries Sub-basin, hence the costs will be related only to the measures recommended for the whole of Lithuania. Since there is no excessive nitrogen in the sub-basin, these measures would be preventive ones providing protection from excessive amounts of nutrients in the soil and water bodies in future. In addition, the application of these measures would in a way result in the implementation of the polluter pays principle.

In the Nemunas Small Tributaries Sub-basin, additional state funds for the control of the implementation of the measures applicable in the entire country - development and implementation of fertilisation normative standards and plans - would amount to about LTL 39 thousand per year. This would demand almost one and a half additional employee. As compared to other sub-basins, this seems to be a large amount. However, the Nemunas Small Tributaries Sub-basin situates as many as 12 municipalities. Should the said function be divided among the twelve municipalities, the employees responsible for the supervision of fertilisation plans in each of these municipalities would have to devote additional 12 % of their working time for this task. It is proposed to provide for such additional funds in the budget of the Ministry of the Environment. If no such funds could be allocated, an alternative solution would be to revise the functions of the specialist in charge of the 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. However, this would most probably have a negative impact on the work quality having in mind the present work load of environmental inspectors.

### **Municipal affordability**

404. There are 12 municipalities with the major parts of their areas lying in the Nemunas Small Tributaries Sub-basin: the municipalities of Alytus town and district, Druskininkai, Kaunas city, Birštonas, Elektrėnai, Lazdijai, Prienai, Kaišiadorys, Šilutė, Jurbarkas, and Pagėgiai.

Additional investments for the implementation of the WFD would be required in three settlements. The municipality of Kaišiadorys district would have to allocate LTL 15 million for the investments in Pravieniškės WWTP until 2015 (having transferred the wastewater treatment plant to the water company Kaišiadorių vandenys), the municipality of Jurbarkas district – LTL 1.5 million for Klausučiai WWTP, and the municipality of Šakiai district – LTL 0.6 million for Lekėčiai WWTP.

None of the municipalities can afford such investments. Since their borrowing limits have not been exceeded, loans could be considered. However, the most rational solution, like in other sub-basins, would be to provide for investments required for these settlements in the budget for national projects for 2007-2013 co-financed with the EU assistance. In such case the municipal share would be 20-30 %, depending on the support percentage.

### **Measures for restoring hydromorphology**

405. As already said, construction of fish passes and removal of old dam remains in the Nemunas Small Tributaries Sub-basin require around LTL 300 thousand of investment costs, which is the cost of the construction of one fish pass and removal of three barriers for fish migration. Municipalities would be able to implement these measures by taking advantage of the EU assistance for the fisheries sector. Co-financing funds could be allocated from the Environmental Assistance Programme. The total budget of the Environmental Assistance Programme for Birštonas municipality where Jundeliškės HPP is located during the last couple of years was about LTL 85 thousand, for Trakai district municipality where Alešiškės mill is situated – LTL 250 thousand, for Kaišiadorys district municipality where Tadarava mill is situated – LTL 200 LTL, and for Šilutė district municipality where Katyčiai mill is located – around LTL 400

thousand. The construction of a fish pass at the hydropower plant could also be co-financed with the EU and private funds.

### Affordability to households

#### Point pollution sources

406. Planned measures in the Nemunas Small Tributaries Sub-basin include construction of two new and reconstruction of three existing wastewater treatment plants, construction of 177.1 km of new sewerage networks and reconstruction of 6.5 of the existing sewerage networks before 2013. These are so-called basic measures. Since they have already been planned for the period 2007-2013, it is assumed that the measures are acceptable.

Supplementary measures to reduce point pollution are required in four settlements. Affordability of the costs for the supplementary measures to the population serviced by respective water supply companies is assessed by estimating the additional burden.

Should a funding source be identified, ultimately the burden will have to be taken by the population and companies which discharge wastewater into the central sewerage networks of the respective districts.

Table 224 below provides the costs of the supplementary measures and their impact on households.

Table 224. Impact of supplementary investment measures on household expenditure, LTL

Settlement	Investments	Annual costs	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member
Pravieniškės	15 000 000	1 746 900	134.38	11.20	1.10 %	1.35 %
Klausučiai	1 500 000	174 700	10.52	0.88	0.10 %	0.13 %
Lekėčiai	600 000	69 900	2.84	0.24	0.03 %	0.03 %

Source: Consultant

Table 225 below demonstrates the impact of the basic measures on household water bills.

Table 225. The impact of supplementary investment measures on household expenditure, LTL

Settlement	Investments	Annual costs	Annual costs per one household member	Annual costs per one household member per month	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member
Pravieniškės	0	0	0.00	0.00	0.00 %	0.00 %
Klausučiai	12 900 000*	986 400	59.40	4.95	0.57 %	0.71 %
Lekėčiai	17 000 000**	1 299 800	52.89	4.41	0.51 %	0.62 %

\* Investment of the water company Jurbarko vandenys because Klausučiai is serviced by this company

\*\* Investment of the water company Šakių vandenys because Lekėčiai is serviced by this company

Table 226 provides an aggregate total financial burden – consisting of both the present burden and the burden of the basic and supplementary measures – on households for the current accessibility to the water supply and sewerage network and availability of the improved system in future.

Table 226. Aggregate impact of the present, basic and supplementary investment measures on household expenditure

Settlement	Current price, LTL/m <sup>3</sup>	Water consumption, l/day/capita	Monthly amount paid by one household member today, LTL	Monthly amount paid by one household member, including the basic and supplementary measures, LTL	Share of the annual costs in the average income of one household member	Share of the annual costs in the median income of one household member
Pravieniškės	2.00	62	3.71	14.91	1.47 %	1.80 %
Klausučiai	5.71	61	10.49	16.32	1.90 %	2.33 %
Lekėčiai	3.44	58	6.03	10.67	1.23 %	1.51 %

Source: Consultant

It should be pointed out that, following the Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015, expenditure for drinking water supply and wastewater management services should not exceed 4 % of the disposable household income both in towns and rural areas. As demonstrated in the tables above, the inhabitants of Klausučiai and those living in other settlements which are serviced by the water company Jurbarko vandenys will have to pay more than 2 % of their disposable income. For the poorest population, this figure would go up even more, and this has to be taken into consideration when preparing a detailed plan for the implementation of the measure.

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

407. There are five HPP in the Nemunas Small Tributaries Sub-basin the turbines of which should be replaced due to their environmental impact.

The total investment costs of the new turbines would be about LTL 5.3 million. However, no support for the hydropower sector has been envisaged for the period 2007-2013, so the proposal is to plan the implementation of this measure for the next stage.

It is recommended to take advantage of future EU assistance allocated through the Ministry of Economy or the Ministry of Energy of the Republic of Lithuania.

#### **Affordability to the agricultural sector**

408. Development and implementation of fertilisation plans is proposed for all farms in Lithuania which are larger than 10 ha. The number of such farms in the Nemunas Small Tributaries Sub-basin totals to more than 6 300. It is assumed that the development of

one fertilisation plan for an average farm costs about LTL 500, which is about 1.5 % of the total profit of a farm of such size, excluding subsidies. This share in variable, fixed costs and profit including subsidies is lower than one %, hence this measure is deemed to be acceptable. Altogether, farmers in the Nemunas Small Tributaries Sub-basin will have to spend approximately LTL 360 thousand for this activity.

The annual costs of all small farms in the Nemunas Small Tributaries Sub-basin total to about LTL 60 thousand. This amount has been based on the assumption that the annual cost of manure management following the good practice requirements will be as low as LTL 10 per one livestock unit. Such burden for farms is also deemed to be acceptable.

### **TRANSITIONAL AND COASTAL WATERS**

409. There are four supplementary measures for coastal and transitional waters which require additional funds. Three of these have been assigned to the Ministry of the Environment or the Ministry of Transport of the Republic of Lithuania, namely: development of a methodology for the monitoring of invasive species, development of a methodology for the growing and collection of filtering molluscs (Dreissenidae) intended to remove biogenic substances from water bodies, and conducting of a detailed study on pollution of the water area of Klaipėda Seaport. These measures will require LTL 430 thousand as one-off expenditure. The implementation of the fourth measure, clearing of macrophyte overgrowth in the coastal zone of the Curonian Lagoon, should be organised by the respective municipalities situated at the coast of the Curonian Lagoon. However, funds for this activity should also be allocated from the budget of the Ministry of the Environment of the Republic of Lithuania. This measure will require recurrent annual costs estimated at LTL 300 thousand.

Consequently, all supplementary measures for coastal and transitional waters are related to state funds. The ability of the state to afford these and other measures are discussed in the following sub-section.

### **THE NEMUNAS RBD: AFFORDABILITY TO THE STATE**

410. The affordability of investment measures to the state, municipalities or private sector by individual sub-basins within the Nemunas RBD has already been analysed above. However, there are also common measures applicable to the entire Nemunas RBD (mainly studies, research, monitoring, public information, and pilot projects), which would need LTL 1.445 million as one-off expenditure and LTL 0.455 million of recurrent annual costs.

Also, as already indicated before, state funding will also be required for controlling the implementation of agricultural measures – about LTL 500 thousand per year. Hence, the total annual demand of state funds for the implementation of the Programme of Supplementary Measures until 2015 is estimated to be LTL 300 thousand of one-off expenditure (1.445/5) and about LTL 1 million of recurrent annual costs.

These measures are very important and highly necessary because they are indispensable for taking next steps required for the attainment of the WFD objectives during the subsequent stages of the implementation of the Directive and therefore such additional amount should be envisaged for the implementation of the Programme of Measures for the Nemunas RBD in the budget of the Ministry of the Environment of the Republic of

Lithuania.

## **SOCIO-ECONOMIC IMPACTS OF THE PROGRAMME OF MEASURES**

411. A detailed analysis of the impacts of the measures on the state and municipal funds and the private sector has been discussed in the chapter on affordability. The present section provides a summary of the socio-economic impacts of the Programme of Measures. The Programme of Supplementary Measures consists of measures which will be required in addition to the planned ones in order to achieve good ecological status in water bodies. Supplementary measures have been discussed and proposed for the following key areas:

- 411.1. Reduction of the impact of domestic wastewater;
- 411.2. Mitigation of the impact of agricultural pollution;
- 411.3. Mitigation and regulation of hydromorphological changes;
- 411.4. Improvement of the status of lakes and ponds;
- 411.5. Mitigation of the impact of recreation;
- 411.6. Improvement of the status of groundwater bodies;
- 411.7. Improvement of the status of coastal and transitional waters
- 411.8. Reduction of the impact of the industrial sector.

412. Some of the measures require additional investment and operating or administrative funds, other will use the funds of respective ministries and/or agencies. Good ecological status will not be achieved in all water bodies by 2015 due to a number of reasons: vague pollution sources or effectiveness of the proposed measures, insufficient acceptability or insufficient funding. The measures which are proposed in the Programme of Measures submitted for approval should ensure attainment of good ecological status in 16 % water bodies at risk by 2015.

This objective will require upgrading or substantial reconstruction of wastewater treatment plants in 11 settlements, construction of 18 fish passes, and removal of barriers for fish migration in 18 dams. Also, a number of measures reducing agricultural pollution will be required. A significant part of measures for the attainment of good ecological status during the first stage of the implementation of the Programme (i.e. until 2015) will consist of various studies, research, enforcement of legislation, and pilot projects the outputs of which will enable planning further targeted investment measures.

412. The implementation of the Programme until 2015 would require about LTL 45 million of investment funds at 2009 prices. Hence, the annual demand would be approximately LTL 9 million. Operating/administrative costs are estimated at about LTL 20 million per year. The amount of funds allocated for environmental investments during the recent years has been gradually going up comprising almost LTL 600 million per year in each 2008 and in 2009. The water sector receives around LTL 400 million annually. The impacts of the Programme can be grouped as follows:

- 412.1. Impact on the state budget: a financial burden on the state and municipal budgets as a result of the co-financing of measures intended to reduce point pollution in settlements, implementation of fish migration measures, and commissioning of various studies;

412.2. Impact on economy and social environment: a financial burden on the private sector (households and farmsteads) as a result of the enforcement of new legislation and implementation of new measures;

412.3. Impact on the environment: improvement of the quality of water bodies and information on causes of water pollution.

414. The said impacts will differ in respect of time, space, and individual socio-economic groups.

The investment costs of the supplementary measures to be implemented by 2015 account for as little as 2.5 % of the investments planned for the basic measures until 2015. Thus the total demand of funds for the Programme would not be very significant. The costs of the groups of the supplementary measures and their percentage in the total costs of these measures are provided in the table below:

Table 227. Costs of the groups of the supplementary measures

Groups of supplementary measures	Investments		Annual operating costs	
	LTL	%	LTL	%
Improvement of fish migration conditions	3 427 200	7.55	90 300	0.5
Upgrading of treatment of point pollution	40 550 000	89.28	2 028 000	10.2
Reduction of diffuse (agricultural) pollution	0	0	17 230 000	87.0
Reduction of groundwater pollution	0	0	0	0
Reduction of pollution of coastal and transitional waters	430 000	0.95	300 000	1.5
Research, pilot projects (excl. studies on coastal and transitional waters)	1 015 000	2.23	155 000	0.8
<b>Total</b>	<b>45 418 000</b>	<b>100</b>	<b>19 800 000</b>	<b>100</b>

Funds for the upgrading of wastewater treatment facilities in settlements account for the largest share of investments – 89 %. Various studies on identification of pollution sources and facilities to improve fish migration conditions in rivers take up about 10 % of investment costs. Recurrent annual expenditure will be mainly required for measures to reduce agricultural pollution, which account for as much as 87 % of all operating and administrative costs. It should be pointed out that the major share will be covered by private farmers' funds. Operating costs of wastewater treatment plants will account for 10 % and costs of research (mainly investigative monitoring) and other annual costs – about 3 % of all operating costs of the supplementary measures.

### IMPACT ON THE STATE AND MUNICIPAL BUDGETS

415. The major share of costs will have to be covered by the public/municipal sector, i.e. all tax payers. The investment funds of the upgrading of point pollution treatment facilities account for 2.3 % of the investment funds allocated for the water management sector for 2007-2013. In the event of rational use of the EU assistance and co-financing funds and especially having in mind potential saving of the funds, the funding of the supplementary measures is not expected to have any negative impact on the budgets of the state (as the distributor of the EU assistance) and municipalities.

The table below provides the amount of investments required for the upgrading of wastewater treatment facilities under this Programme in each individual municipality. Depending on the individual EU assistance scheme, every municipality or the state will have to take responsibility for the allocation of a certain percentage of the necessary amount. For example, if the state or municipalities have to cover 25 % of all investments, the total amount until 2015 will be about LTL 10 million.

Table 228. Impact of point pollution reduction measures on municipal budgets

Municipality	Wastewater treatment plant	Investments, LTL	25 % of investments
Šalčininkai	Šalčininkai	1 200 000	300 000
Švenčionys*	Švenčionys	8 000 000	2 000 000
Kaišiadorys	Kaišiadorys	3 960 000	990 000
Radviliškis	Baisogala	4 000 000	1 000 000
Radviliškis	Pakiršinis	1 500 000	375 000
Jonava	Bukonys	500 000	125 000
Šakiai*	Šakiai	150 000	37 500
Vilkaviškis	Kybartai	1 000 000	250 000
Kaišiadorys	Pravieniškės	15 000 000	3 750 000
Jurbarkas	Klausučiai	1 500 000	375 000
Šakiai	Lekėčiai	600 000	150 000
Raseiniai	Raseiniai	800 000	200 000
Kretinga	Kretinga	2 340 000	585 000

\* If the requirements to restrict the use of phosphorus in domestic and industrial detergents are introduced, it is likely that reconstruction or construction of WWTP will not be required.

Measures designed to improve fish migration conditions, which fall under the responsibility of municipalities, will need a little over LTL 3.2 million during this stage (a private owner has undertaken a commitment to construct one fish migration facility using its own funds) meanwhile the EU assistance for a respective funding measure of the fisheries sector might be as high as LTL 7 million (data of the beginning of 2010). Hence, the budget should not feel any significant burden in relation to this measure. Implementation of measures related to the construction of fish migration facilities in 19 municipalities will foster creation of temporary job places.

The table below lists the municipalities which will have to ensure fish migration in certain river stretches and thus will need relevant investments.

Table 229. Impact of measures designed to improve fish migration conditions on municipal budgets

Municipality	Migration facility required at	Investments, LTL	25 % of investment, LTL
Klaipėda	Gargždai mill	270 000	67 500
Plungė	Žlibinai dam	126 000	31 500
Rietavas	Medingėnai	16 000	4 000
Klaipėda	Pagraumenos mill	45 700	11 400
Plungė	Vainaičių mill	35 600	8 900
Varėna	Resort <i>Merkys</i>	83 700	20 900

Municipality	Migration facility required at	Investments, LTL	25 % of investment, LTL
Varėna	Rudnia dam	136 000	34 000
Šalčininkai	Regulatory sluice of the Merkys-Vokė Canal	105 000	26300
Molėtai	Reconstruction of the fish pass at Kertuojai dam	12 000	3 000
Anykščiai	Anykščiai dam	86 000	21 500
Ukmergė	Siesartis mill	6 600	1 700
Ukmergė	Kazliškio mill	29 000	7 300
Molėtai	Klabinių mill	6 000	1 500
Vilnius city	Vilnia, Rokantiškės	177 910	44 500
Vilnius city	Vokė, Grigiškės HPP	183 000	45 800
Vilnius city	Vokė, Mūro Vokė	247 800	62 000
Vilnius city	Riešė, Žemutinė Riešė	93 000	23 300
Vilnius city	Žalesa, to rearrange remains of Skirgiškės (Tartokai) mill	35 000	8 800
Kaišiadorys	Strėva, to repair a fish pass at Strėva dam	25 000	6 300
Vilnius distr.	Bezdonė, Gamernio dam	0	0
Vilnius distr.	Vaidotai	85 000	21 300
Vilnius distr.	Nemenčinė mill	14 000	3 500
Širvintos	Musinkai mill	49 600	12 400
Trakai	Kragžliai	5 100	1 300
Šakiai*	Kudirkos Naumiestis	0	0
Kelmė	Kelmė	111 800	28 000
Jurbarkas	Klumpė	35 600	8 900
Raseiniai	Maslauskiškės	18 000	4 500
Birštonas	Jundeliškės HPP	277 000	69 300
Trakai	Alesiškių mill	10 200	2 600
Kaišiadorys	Tadarava	5 300	1 300
Šilutė	Katyčiai mill	5 800	1 500
Tauragė	Tauragė dam with a fish elevator	104 200	26 100
Tauragė	Lomiai	249 100	62 300
Tauragė	Skaudivilė	499 400	124 900
Rietavas	Girėnų mill	17 800	4 500
<b>Total</b>		<b>3 427 210</b>	<b>856 800</b>
<b>Total excl. Kudirkos Naumiestis</b>		<b>3 207 210</b>	<b>801 800</b>

\*- Investments for the fish migration facility in Kudirkos Naumiestis (the Šešupė Sub-basin) should be allocated by the builder of the HPP.

The aggregate demand of investment costs of the two said measures by individual municipalities is provided in the table below.

Table 230. Impact of the Programme of Measures on municipal budgets

Municipality	Demand of investments, total, LTL	25 % of investments, LTL	25 % of investments annually in 2011-2015, LTL
Šalčininkai	1 305 000	326 300	65 260
Švenčionys	8 000 000	2 000 000	400 000
Kaišiadorys	18990300	4 747 600	949 520
Jonava	5 00000	125 000	25 000
Šakiai	75 0000	187 500	37 500
Vilkaviškis	1 000 000	250 000	50 000
Kelmė	111 800	28 000	5 600
Šilutė	5 800	1 500	300
Jurbarkas	1 535 600	383 900	76 780
Raseiniai	818 000	204 500	40 900
Kretinga	234 0000	585 000	117 000
Klaipėda	315 700	78 900	15 780
Plungė	161 600	40 400	8 080
Rietavas	33 800	8 500	1 700
Varėna	219 700	54 900	10 980
Anykščių	86 000	21 500	4 300
Ukmergės	35 600	9 000	1 800
Molėtų	18 000	4 500	900
Vilniaus m.	736 710	184 400	36 880
Vilniaus raj.	99 000	24 800	4 960
Širvintų	49 600	12 400	2 480
Trakų	15 300	3 900	780
Birštono	277 000	69 300	13 860
Tauragės	852 700	213 300	42 660
<b>Total (~)</b>	<b>43 760 000</b>	<b>11 000 000</b>	<b>2 200 000</b>

Measures designed to improve the quality of coastal and transitional water bodies will require LTL 90 thousand from the Ministry of the Environment of the Republic of Lithuania until 2015, or around LTL 18 thousand per year. The Ministry of Transport of the Republic of Lithuania will have to allocate LTL 340 thousand for the study of the sea port water area. Consequently, the annual demand until 2015 totals to LTL 68 thousand. Such studies do not constitute any significant share of the funds of the said municipalities allocated for various research and thus the said supplementary measures are deemed to be feasible.

The Ministry of the Environment of the Republic of Lithuania will have to spend about LTL 200 thousand per year for controls over newly validated agricultural measures. This means that about seven new full-time positions will be required in environmental agencies, which are responsible for controls over environmental measures in agriculture, under the Regional Environmental Protection Departments within the Nemunas RBD.

Annual allocations for additional compensations by the Ministry of Agriculture will total to almost LTL 300 thousand.

In addition, various studies, research, monitoring, public information, and pilot projects would need LTL 1.445 million as one-off expenditure and LTL 0.455 million of recurrent annual costs.

Thus, the total annual demand of funds from the state budget for the implementation of the Programme of Supplementary Measures until 2015 is LTL 300 thousand as one-off expenditure (1.445/5) and about LTL 0.8 million of recurrent annual costs.

If the EU assistance comprises 75 % of the value of investment projects on average, the national budget would have to co-finance LTL 3.3 million per year for investments, other one-off expenditure and maintenance.

### **IMPACT ON THE PRIVATE SECTOR**

416. The major input to the reduction of water pollution during the period until 2015 will be made by the sector of **agriculture**, which also constitutes the largest share of the impact of the Programme on the private sector. As a result of the mandatory implementation of the most effective pollution reduction measures, annual expenses of an average farm with a size up to 10 ha will be LTL 50 and of a farm from 10 to 150 ha – about LTL 550 for proper manure management and preparation of fertilisation plans. For farms up to 10 ha, such costs account for 0.5 % and 0.3 % of their gross profit respectively without and with subsidies, meanwhile for farms larger than 10 ha – 0.4 % and 0.1 % of their gross profit respectively without and with subsidies. The total amount to be paid by farmers per year is estimated at about LTL 16.7 million.

No significant additional burden due to the upgrading or reconstruction of wastewater treatment plants is forecasted for households in 11 settlements either. The analysis of the share of payments for water services in median household income in respective counties demonstrated that the highest share after the implementation of the supplementary measures in 11 settlements will be paid by the inhabitants in Baisogala where the amount will account for 2.8 % of median household income. Following the Drinking Water Supply and Wastewater Management Development Strategy for 2008-2015, expenditure for drinking water supply and wastewater management services should not exceed 4 % of the disposable household income both in towns and rural areas.

It should be emphasised that the benefit of the implementation of the Programme of Measures until 2015 will be long-term, namely: benefit for people's health and recreational, landscape, cultural, scientific and existential benefit provided by water bodies as natural resources. Studies of the benefit in monetary terms which will be derived after the implementation of all measures required for achieving good ecological status were conducted in two sub-basins of the Nemunas RBD using relative assessment methods. When the benefit is transferred to the entire Nemunas RBD, estimations show that it would total to about LTL 48.6 million per year at 2008 prices. Of course, this figure cannot be compared to the costs of the Programme of Measures to be incurred by 2015 but it indicates how the population in the Nemunas RBD view improvement of the quality in water bodies to the level of good ecological status.

Summing up, the implementation of the measures envisaged for the first stage of the Programme of Measures is not expected to have any negative impact on the country's economy, financial situation and social environment. On the contrary, the benefit of the

implementation of all measures needed in order to attain good ecological status during other stages after 2015 for the environment, human health and social environment should be higher than the economic Programme implementation costs.

## SUMMARY

417. The Law of the Republic of Lithuania on Water transposing the provisions of the EU Water Framework Directive requires that all water bodies, i.e. rivers, lakes, groundwater, transitional waters and coastal waters, achieve good ecological status, and heavily modified water bodies and artificial water bodies – good ecological potential by the year 2015. For groundwater bodies, in addition to the requirements of good status, any significant and sustained upward trend in the concentration of any pollutant should be reversed.

When drawing up the Nemunas RBD Management Plan, 584 water bodies falling within the category of rivers, 276 lakes and ponds with the surface area over 50 ha, 12 groundwater bodies, 4 coastal water bodies and 2 transitional water bodies have been identified. It has been established that at present the requirements of high or good ecological status or good ecological potential are met by 240 rivers with the total length of 4 556 km (41 % of the total length of all the water bodies in the category of rivers) 186 water bodies in the category of lakes and ponds larger than 50 ha satisfy the requirements of good ecological status or good ecological potential. 9 groundwater bodies are at good chemical and quantitative status. Other water bodies – rivers, lakes, ponds, transitional and coastal waters – are classified as worse than good status.

For the purpose of achieving water protection objectives, the Lithuanian Law on Water commits the Environmental Protection Agency, as the competent authority, to develop and approve an integrated programme of measures.

Having assessed the current status of water bodies, natural and anthropogenic reasons for this status and established criteria for achieving good status, as well as analysed pressures of economic activity and their impacts on water bodies identified as being at risk of failing to achieve good status by the deadline (hereinafter – water bodies at risk), the Environmental Protection Agency and the Lithuanian Geological Survey has drawn up this Programme of Measures for the Nemunas RBD. The Programme analyses the effects of the basic measures and proposes supplementary measures which are necessary in order to achieve good status for water bodies.

The basic measures include the implementation of all the measures, actions and programmes which have already been envisaged in water legislation and financed or included in financing programmes (construction of wastewater treatment facilities in agglomerations with a p.e. of more than 2 000, installation of manure storage facilities on large farms, compliance with recommendations of good agricultural practice, solution of drinking water quality problems, etc.).

Supplementary measures are proposed for those water bodies where the basic measures are not enough to achieve good status. Supplementary measures comprise the improvement of the operation of the existing wastewater treatment facilities, mandatory and voluntary (optional) measures aimed at reducing adverse effects of agricultural activities, research intended to specify pollution sources and/or the environmental effect

of the measures being implemented, feasibility studies examining pollution causes, as well as legal, educational, remedial and other measures.

The analysis of the state of the environment upon the implementation of the basic measures by means of modern technologies (mathematical-computational models) allowed assessing the effects of their implementation on the status of water bodies. The analysis revealed that the basic measures will not improve the status of water bodies significantly. The root cause lies in the fact that most large agglomerations (with a p.e. of more than 2 000) which are subject to these basic measures (most of these measures are related to the development or reconstruction of water supply and wastewater systems) already comply with the wastewater quality requirements. In fact, the allowable concentrations are still exceeded in discharges from certain agglomerations, but usually only slightly. Moreover, wastewater dischargers usually release wastewater into large rivers which are capable of diluting discharges.

The implementation of the basic measures aimed at reducing agricultural impacts which are mainly related to the requirements of the Nitrates Directive will not make any significant contribution to the improvement of the status of water bodies either. This is due to the fact that 14.5 % of all livestock are already kept on farms having manure storage facilities, thereby not damaging the environment. This number reaches 34 % in some basins and sub-basins within the Nemunas RBD. The implementation of the key measures envisaged in the Nitrates Directive should increase the number of livestock kept on farms having manure storage facilities within the Nemunas RBD to 48 %.

418. It has been established that even after the implementation of the basic measures, there will be 320 rivers with the total length of 5 267 km, 64 lakes, 26 ponds, 3 groundwater bodies, 4 transitional water bodies and 2 coastal water bodies within the Nemunas RBD still at risk of failing to achieve good status by 2015. With the view to improve the ecological status of these water bodies, supplementary measures are envisaged in the Programme of Measures. Groups of supplementary measures have been proposed for:

- 418.1. reducing point pollution – (re)construction of wastewater treatment facilities;
- 418.2. reducing diffuse (agricultural) pollution;
- 418.3. mitigating hydromorphological changes;
- 418.4. various studies, research and pilot projects; and
- 418.5. legal and administrative changes.

419. Having implemented supplementary measures, good water status will be achieved only by 56 river water bodies and 1 lake by 2015. However, these measures will help to maintain the current high or good status and/or good potential in 240 water bodies falling within the category of rivers and 186 water bodies falling within the category of lakes, as well as the current good chemical status in 9 groundwater bodies and good qualitative status in all 12 groundwater bodies, and will also prevent deterioration of status in transitional and coastal waters.

Supplementary measures have been prioritised by singling out mandatory measures which are necessary for the whole of Lithuania and will contribute to pollution prevention and the implementation of the polluter pays principle. Other measures are optional, but compensatory mechanisms should be foreseen to support their implementation. Preconditions for achieving the set objectives include well-formulated

conditions for the granting of support, attractive compensations and control over the implementation of measures.

Supplementary measures have been chosen on the basis of such indicators as effectiveness and applicability. The agricultural sector was most favourable for such analysis since the list of potential measures identified for the agricultural sector was longer than necessary to achieve the objectives. Measures in the agricultural sector for every problematic basin were chosen on the basis of the ratio between the pollution reduction effect of a particular measure (e.g. reduction of kgN per hectare) and the costs of that effect. Relatively cheapest measures are proposed to be taken in the first place. Where that measure, taking into account the potential area of its application, is not sufficient, other more expensive measures are further suggested.

Two alternative pollution reduction techniques have been proposed in the area of diffuse pollution reduction. The first technique is based on a wider application of mechanical/automatic measures which are more power consuming, but ensure higher reliability of treatment and may be controlled as needed. The second one is based on natural measures which are energy efficient, but require a larger area, and the treatment process is more difficult to control. Costs have been calculated according to average prices. In each specific case, selection of a technique for a particular settlement is subject to detailed local studies and the analysis of its applicability.

Measures aimed at mitigating hydromorphological changes have been chosen according to specific proposals by technical experts. There have been no alternatives to the calculation of costs in these cases. However, the costs of one measure – renaturalisation – will be known after study (pilot) projects which are proposed in the first phase of the implementation of the Management Plan.

Along with the said measures, it is important to take supportive measures, namely, education and information, as well as control measures. Even though they do not produce direct effects, they are very important in implementing other measures. Their implementation is recommended throughout the whole territory of Lithuania, focusing on areas affected by significant pollution from agriculture or wastewater treatment facilities.

The Programme has assessed the investment costs required for the implementation of all necessary supplementary measures by the year 2015. Both maximum and minimum scenarios have been evaluated. The investment costs of the maximum scenario, which covers measures for reduction of diffuse and point pollution, improvement of the status of coastal and transitional waters, construction of fish passes, replacement of HPP turbines, and renaturalisation of straightened rivers, total to approximately LTL 126 million. The costs of the minimum scenario are only LTL 5.2 million; however, the measures of this scenario would solve only the issues of reduction of diffuse pollution, construction of fish passes, and improvement of the status of coastal and transitional waters, as well as research and education.

The implementation of the basic and supplementary measures will still fail to achieve good status in a number of water bodies. The extension of the deadline for achieving water protection objectives will be requested in respect of 264 river bodies, 63 lakes and 26 ponds, 2 coastal water bodies, and 4 transitional water bodies.

Upon the accomplishment of the tasks set for the first stage, the level of achievement of water protection objectives will be measured. The monitoring and assessment of developments in the status of water bodies to be carried out in the first stage of the implementation of the Programme will help to better understand the objectives to be pursued and the tasks to be set in the second and third stages. Tasks for the second stage will be set depending on the actual outcomes of the first phase, while tasks for the third stage will be based on the results of the first two stages.

The Programme of Measures will be updated every six years.

## MEASURES FOR IMPROVING THE STATUS OF WATER BODIES

420. Explanations:

420.1.\* Monitoring:

420.1.1. 1 – monitoring intended for the revision of the status; HS – hazardous substances have been detected, chemical status has to be revised;

420.1.2. 2 – monitoring intended for identification of impacts of hydromorphological factors (i.e. bed straightening and HPP);

420.1.3. 3 – monitoring intended for the revision of impacts of point pollution; the point pollution sources given in brackets are those the impact of which has to be further analysed.

420.2. \*\* Measures to reduce diffuse pollution:

420.2.1. 1 - Measures common for the whole of Lithuania:

420.2.1.1. Drafting and validation of normative standards;

420.2.1.2. Mandatory development and implementation of fertilisation plans in farms which have 10 and more ha of utilised agricultural land;

420.2.1.3. Mandatory application of the recommendations for manure and slurry management provided for in Good Farming Rules and other decisions on farms up to 10 LSU;

420.2.2. 2 – Provision of more favourable conditions to use support schemes under RDP;

420.2.3. 3 - Application of fertilisation norms lower than the ones specified in the approved methodology of the development of fertilisation plans by 20 %;

420.2.4. 4 - Encouragement of growing catch crops in sandy arable land as well as grassing and fallowing of such land;

420.2.5. 5 – Encouragement of growing catch crops in mixed arable land.

Green colour in the table below indicates water bodies where good ecological status or good ecological potential will be achieved by 2015 upon the implementation of the said measures.

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
120111410	Neris Small Tribut	Strūna	12.9		YES							
100100011	Nemunas Small Tribut	Nemunas	27.2	YES								
100100012	Nemunas Small Tribut	Nemunas	31.3	YES								
100100013	Nemunas Small Tribut	Nemunas	168.3	YES								
100100014	Nemunas Small Tribut	Nemunas	224.9	YES (HS)								
100100201	Nemunas Small Tribut	Gauja	19.8		YES							
100102403	Nemunas Small Tribut	Baltoji Ančia	4.5		YES							
100102411	Nemunas Small Tribut	Šlavantėlė	4.7		YES							
100102561	Nemunas Small Tribut	Morkavas stream	4.5		YES							
100102791	Nemunas Small Tribut	Rina	8.7		YES							
100102961	Nemunas Small Tribut	Seira	10.2		YES							
100105302	Nemunas Small Tribut	Strauja	20.9		YES							
100106501	Nemunas Small Tribut	Zembrė	9.1		YES							
100106801	Nemunas Small Tribut	Alovė	4.2		YES							
100108601	Nemunas Small Tribut	Peršėkė	4.0		YES							
100108603	Nemunas Small Tribut	Peršėkė	7.6		YES							
100108605	Nemunas Small Tribut	Peršėkė	3.5		YES							
100108841	Nemunas Small Tribut	Paežerėlė	4.7		YES							
100109131	Nemunas Small Tribut	Dūmė	7.3		YES							
100110504	Nemunas Small Tribut	Verknė	9.8		YES							
100110611	Nemunas Small Tribut	Samė	13.4		YES							
100110731	Nemunas Small Tribut	Obeltis	7.0		YES							
100110831	Nemunas Small Tribut	Alšia	9.8		YES							
100113702	Nemunas Small Tribut	Strėva	7.8		YES							
100113703	Nemunas Small Tribut	Strėva	10.2		YES							
100113705	Nemunas Small Tribut	Strėva	3.1		YES							
100113706	Nemunas Small Tribut	Strėva	12.5		YES							

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
100113708	Nemunas Small Tribut	Strėva	8.0		YES							
100113721	Nemunas Small Tribut	Margis	3.6		YES							
100114221	Nemunas Small Tribut	Limšius	6.0		YES							
100114371	Nemunas Small Tribut	Praviena	12.7		YES							
100114372	Nemunas Small Tribut	Praviena	9.1									Reconstruction of Pravieniškės WWTP
100115101	Nemunas Small Tribut	Jiesia	25.6		YES							
100115102	Nemunas Small Tribut	Jiesia	25.2		YES	YES (pisciculture companies: subsidiary in Šilavotas)	YES					
100115391	Nemunas Small Tribut	Šventupė	15.4		YES							
100115491	Nemunas Small Tribut	Girmuonys	11.6		YES							
100116801	Nemunas Small Tribut	Dievogala	6.5		YES							
100117601	Nemunas Small Tribut	Liekė	7.8		YES							
100117603	Nemunas Small Tribut	Liekė	8.2									Reconstruction of Lekėčiai WWTP
100118901	Nemunas Small Tribut	Armena	12.6		YES							
100118903	Nemunas Small Tribut	Armena	7.4									Reconstruction of Klausučiai WWTP
100121201	Nemunas Small Tribut	Mituva	16.6		YES							
100121206	Nemunas Small Tribut	Mituva	9.0		YES							
100121291	Nemunas Small Tribut	Gausantė	19.1		YES							
100121591	Nemunas Small Tribut	Alsa	25.2		YES							
100121811	Nemunas Small Tribut	Vidauja	8.7		YES							
100122011	Nemunas Small Tribut	Antvardė	14.4		YES							
100123201	Nemunas Small Tribut	Šventoji	11.1		YES							
100124371	Nemunas Small Tribut	Vilka	11.5		YES							
100124373	Nemunas Small Tribut	Vilka	17.0		YES							
100124641	Nemunas Small Tribut	Kamona	11.7		YES							

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
100125601	Nemunas Small Tribut	Veižas	10.3		YES							
100125603	Nemunas Small Tribut	Veižas	7.5		YES							
100125801	Nemunas Small Tribut	Leitė	21.0	YES	YES							
100125802	Nemunas Small Tribut	Leitė	6.7	YES								
100126202	Nemunas Small Tribut	Šyša	8.0		YES							
100126431	Nemunas Small Tribut	Šustis	15.5		YES							
100700021	Nemunas Small Tribut	Skirvytė	10.4	YES (HS)								
110100401	Merkys	Mažoji Kena	4.7		YES							
110100403	Merkys	Mažoji Kena	4.5		YES							
110101442	Merkys	Žvirgždė	5.1		YES							
110101501	Merkys	Cirvija	14.2		YES							
110101801	Merkys	Graužupis	10.1		YES							
110102001	Merkys	Geluža	12.6		YES							
110102201	Merkys	Šalčia	21.9									Reconstruction of Šalčininkai WWTP
110102202	Merkys	Šalčia	16.5									Reconstruction of Šalčininkai WWTP
110102203	Merkys	Šalčia	6.4									Reconstruction of Šalčininkai WWTP
110102361	Merkys	Visinčia	11.6		YES							
110102901	Merkys	Spengla	16.8		YES							
110103201	Merkys	Verseka	18.6		YES							
110103202	Merkys	Verseka	17.3		YES							
110103271	Merkys	Nezdilė	7.1		YES							
110104251	Merkys	Žižma	9.4		YES							
110104351	Merkys	Abista	10.7		YES							
110105211	Merkys	Vinksninė	18.3		YES							
110105501	Merkys	Ūla - Pelesa	5.9		YES							
110105551	Merkys	Nočia	15.0		YES							

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
110105681	Merkys	Uosupis	14.3		YES							
110106201	Merkys	Grūda	18.4		YES							
120100011	Neris Small Tribut	NERIS	22.7	YES (PM)								
120100012	Neris Small Tribut	NERIS	101.3	YES (PM)								
120100013	Neris Small Tribut	NERIS	38.8	YES (PM)								
120100014	Neris Small Tribut	NERIS	74.9	YES (PM)								
120103101	Neris Small Tribut	Nemenčia	19.7		YES							
120103401	Neris Small Tribut	Žalesa	10.4		YES							
120103801	Neris Small Tribut	Riešė	12.3		YES							
120104201	Neris Small Tribut	Vilnia	23.0		YES							
120105101	Neris Small Tribut	Vokė	4.3		YES							
120105141	Neris Small Tribut	Asdrė	12.9		YES							
120105181	Neris Small Tribut	Rudamina	12.8		YES							
120105421	Neris Small Tribut	Galainė	18.7		YES							
120106301	Neris Small Tribut	Bražuolė	11.0	YES								
120106501	Neris Small Tribut	Dūkšta	20.3		YES							
120107901	Neris Small Tribut	Žiežmara	32.1	YES	YES							
120108101	Neris Small Tribut	Musė	15.1		YES							
120108103	Neris Small Tribut	Musė	38.1		YES							
120108111	Neris Small Tribut	Daulia	7.6		YES							
120108701	Neris Small Tribut	Laukysta	7.4		YES							
120109401	Neris Small Tribut	Lomena	9.0		YES		YES					
120109402	Neris Small Tribut	Lomena	9.0		YES		YES					Reconstruction of Kaišiadorys WWTP
120109403	Neris Small Tribut	Lomena	18.1				YES					Reconstruction of Kaišiadorys WWTP
120110101	Neris Small Tribut	Lokys	24.6				YES					
120111401	Neris Small Tribut	Šešuva	19.1		YES							
121100071	Žeimena	Gelainė	13.2		YES							

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
121101151	Žeimena	Lapavartė	4.7		YES							
121101172	Žeimena	Vyžinta	10.3		YES							
121101601	Žeimena	Šventelė - Dėmė	10.8		YES							
121102801	Žeimena	Mera - Kuna	4.7		YES							
121102802	Žeimena	Mera - Kuna	13.8									Reconstruction of Švenčionys WWTP
121102803	Žeimena	Mera - Kuna	12.5									Reconstruction of Švenčionys WWTP
121103271	Žeimena	Stirna	6.9		YES							
121103361	Žeimena	Arina	7.4		YES							
121104201	Žeimena	Jusinė	14.6		YES							
122100013	Šventoji	Šventoji	5.9		YES							
122100015	Šventoji	Šventoji	6.1		YES							
122100019	Šventoji	Šventoji	12.4		YES							
122100061	Šventoji	Ld - 4	6.8		YES							
122100151	Šventoji	Ligaja	8.4		YES							
122101131	Šventoji	Audra	8.8		YES							
122101133	Šventoji	Audra	12.1		YES							
122101171	Šventoji	Biržupys	4.6		YES							
122101241	Šventoji	Kriaunėnu upelė	3.9		YES							
122102121	Šventoji	Indraja	7.4		YES							
122102123	Šventoji	Indraja	5.4		YES							
122103102	Šventoji	Vyžuona	15.3			YES (Utena WWTP and dischargers of storm water runoff in Utena town)						
122103111	Šventoji	Krašuona	6.0		YES							

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
122103211	Šventoji	Utenaitė	8.1		YES							
122103701	Šventoji	Nasvė	17.6		YES							
122104302	Šventoji	Aknysta	10.8		YES							
122104501	Šventoji	Jara - Šatekšna	9.9		YES							
122104503	Šventoji	Jara - Šatekšna	16.6		YES							
122104751	Šventoji	Ilgė	4.3		YES							
122104821	Šventoji	Aluotis	7.3		YES							
122105401	Šventoji	Pelyša	11.5		YES							
122107502	Šventoji	Virinta	11.9		YES							
122107571	Šventoji	Vastapa	7.2		YES							
122107651	Šventoji	Alanta	10.8		YES							
122107731	Šventoji	Nevėža	12.2		YES							
122109202	Šventoji	Siesartis	10.4		YES							
122110101	Šventoji	Mušia	21.5	YES			YES	YES	YES			
122111301	Šventoji	Armona	7.5		YES		YES					
122111302	Šventoji	Armona	11.2		YES		YES					
122111303	Šventoji	Armona	10.0				YES					
122111701	Šventoji	Žuvintė	5.1		YES							
122111801	Šventoji	Geležė	9.5		YES							
122112102	Šventoji	Širvinta	9.9		YES							
122112104	Šventoji	Širvinta	19.5		YES							
122112261	Šventoji	Vilkesa	12.2		YES							
122112311	Šventoji	Mielkupis	7.9		YES							
130100011	Nevėžis	Nevėžis	17.5		YES		YES					
130100012	Nevėžis	Nevėžis	36.9				YES					
130100013	Nevėžis	Nevėžis	7.6				YES					
130100014	Nevėžis	Nevėžis	56.4	YES (PM)			YES					
130100015	Nevėžis	Nevėžis	87.0	YES (PM)			YES					
130100302	Nevėžis	Pienia	7.4		YES		YES					

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
130101101	Nevėžis	Alanta	21.9				YES	YES				
130101121	Nevėžis	Alanta	4.0		YES		YES	YES				
130101141	Nevėžis	Bikilys	15.5		YES		YES	YES				
130101301	Nevėžis	Juoda	13.2				YES					
130101302	Nevėžis	Juoda	16.0				YES	YES	YES			
130101303	Nevėžis	Juoda	6.0				YES	YES	YES			
130101431	Nevėžis	Apteka	18.8				YES	YES	YES			
130102102	Nevėžis	Juosta	25.2				YES					
130102171	Nevėžis	Juostinas	19.2		YES		YES					
130102801	Nevėžis	Molaina	20.7				YES					
130103101	Nevėžis	Sanžilė	8.0				YES					
130103601	Nevėžis	Kiršinas	13.3				YES	YES	YES	YES	YES	
130103602	Nevėžis	Kiršinas	10.9				YES	YES	YES	YES	YES	Reconstruction of Baisogala and Pakiršinys WWTP
130103603	Nevėžis	Kiršinas	24.0				YES	YES	YES	YES	YES	Reconstruction of Baisogala and Pakiršinys WWTP
130103681	Nevėžis	Šuoja - Kūrys	25.1				YES	YES	YES	YES	YES	
130103682	Nevėžis	Šuoja - Kūrys	18.5				YES	YES	YES	YES	YES	
130103731	Nevėžis	Liulys	25.1				YES	YES	YES	YES	YES	
130104601	Nevėžis	Upytė	19.7				YES	YES	YES			
130104602	Nevėžis	Upytė	10.2		YES		YES	YES	YES			
130105301	Nevėžis	Linkava	25.2				YES	YES	YES			
130105302	Nevėžis	Linkava	3.7	YES	YES		YES	YES	YES			
130105303	Nevėžis	Linkava	10.2	YES			YES	YES	YES			
130105801	Nevėžis	Liaudė	9.1		YES		YES	YES	YES			
130105802	Nevėžis	Liaudė	28.8				YES	YES	YES			
130106501	Nevėžis	Kruostas	16.6				YES	YES	YES	YES		

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
130106502	Nevėžis	Kruostas	13.4	YES			YES	YES	YES	YES		
130107101	Nevėžis	Dotnuvėlė	8.9				YES	YES	YES			
130107102	Nevėžis	Dotnuvėlė	10.7				YES	YES	YES			
130107103	Nevėžis	Dotnuvėlė	31.0				YES	YES	YES			
130107401	Nevėžis	Smilga	32.1				YES	YES				
130107451	Nevėžis	Smilgaitis	35.4		YES		YES	YES				
130107481	Nevėžis	Jaugila	33.2		YES	YES (Akademija WWTP)	YES	YES				
130107701	Nevėžis	Obelis	15.7				YES	YES	YES			
130107702	Nevėžis	Obelis	16.2	YES			YES	YES	YES			
130107703	Nevėžis	Obelis	11.3	YES	YES	YES (sedimentation ponds of AB Lifosa)	YES	YES	YES	YES	YES	
130107831	Nevėžis	Šumera	25.8				YES	YES				
130107951	Nevėžis	Lankesa	42.0				YES	YES	YES	YES	YES	Reconstruction of Bukonys WWTP
130107952	Nevėžis	Lankesa	7.2				YES	YES	YES	YES	YES	
130109401	Nevėžis	Barupė	24.6			YES (Batėgala and Kulva WWTP)	YES	YES	YES	YES	YES	
130109402	Nevėžis	Barupė	15.3				YES	YES	YES	YES	YES	
130109403	Nevėžis	Barupė	4.7		YES		YES					
130109461	Nevėžis	Mekla	21.3				YES					
130109462	Nevėžis	Mekla	5.6				YES					
130109551	Nevėžis	Urka	22.6		YES							
130110101	Nevėžis	Šušvė	23.1		YES		YES					
130110102	Nevėžis	Šušvė	15.8				YES					
130110103	Nevėžis	Šušvė	26.8				YES					
130110104	Nevėžis	Šušvė	25.7		YES		YES					

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
130110105	Nevėžis	Šušvė	25.5		YES		YES (plus measures in tributaries)					
130110211	Nevėžis	Gomerta	20.6		YES		YES	YES	YES			
130110231	Nevėžis	Beržė	6.8		YES		YES	YES	YES	YES	YES	
130110232	Nevėžis	Beržė	4.8		YES		YES	YES	YES	YES	YES	
130110233	Nevėžis	Beržė	21.2		YES	YES (Linkaičiai WWTP)	YES	YES	YES	YES	YES	
130110241	Nevėžis	Švėmalis	15.9		YES		YES	YES	YES	YES	YES	
130110281	Nevėžis	Banko kanalas	11.6		YES		YES	YES	YES	YES	YES	
130110361	Nevėžis	Žadikė	17.9		YES		YES					
130110491	Nevėžis	Ažytė	10.5		YES		YES					
130110492	Nevėžis	Ažytė	9.4				YES					
130111501	Nevėžis	Aluona	32.2		YES		YES	YES	YES			
130111541	Nevėžis	Žąsinas	12.5		YES		YES	YES	YES			
130111701	Nevėžis	Striūna	23.0		YES		YES					
130111901	Nevėžis	Gynia	14.7		YES	YES (Eigirgala and Voškonys WWTP)						
140100012	Dubysa	Dubysa	8.1		YES							
140101301	Dubysa	Šiaušė	31.4		YES		YES					
140101921	Dubysa	Vilbėnas	10.1		YES							
140102301	Dubysa	Gryžuva	15.1				YES					
140102801	Dubysa	Dratvuo	5.2		YES							
140102901	Dubysa	Lapišė	11.6		YES							
140103501	Dubysa	Luknė	19.7		YES							

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
140103503	Dubysa	Luknė	6.0		YES							
140103551	Dubysa	Sandrava	19.2		YES							
140104801	Dubysa	Kirkšnovė	11.3				YES					
140104802	Dubysa	Kirkšnovė	16.3				YES					
140105301	Dubysa	Gynėvė	15.4		YES		YES					
140105302	Dubysa	Gynėvė	20.8		YES		YES					
140106501	Dubysa	Lazduona	18.3		YES		YES					
150100013	Šešupės	Šešupė	57.2		YES							
150100014	Šešupė	Šešupė	19.1		YES							
150100016	Šešupė	Šešupė	51.8	YES								
150101231	Šešupė	Raišupis	10.0		YES	YES (Lazdijai WWTP)						
150101331	Šešupė	Gasda	15.3		YES							
150101701	Šešupė	Sūduonia	19.5		YES		YES					
150101902	Šešupė	Dovinė	13.9	YES								
150102051	Šešupė	Kiaulyčia	18.0		YES							
150102141	Šešupė	Amalvė - Šlavanta	21.1		YES							
150102142	Šešupė	Amalvė - Šlavanta	4.4		YES							
150102901	Šešupė	Sasna	17.7		YES		YES					
150103701	Šešupė	Rausvė	20.2		YES		YES	YES	YES			
150103702	Šešupė	Rausvė	10.1				YES	YES	YES			
150103703	Šešupė	Rausvė	23.6		YES		YES	YES	YES			
150103781	Šešupė	Paikis	17.0		YES		YES	YES	YES			
150104101	Šešupė	Pilvė	6.0		YES							
150104103	Šešupė	Pilvė	13.5		YES							
150104131	Šešupė	Bartupė	15.4		YES							
150104221	Šešupė	Vabalkšnė	14.7		YES							

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
150104501	Šešupė	Višakis	10.0		YES							
150104503	Šešupė	Višakis	12.1		YES							
150104661	Šešupė	Jūrė	9.6		YES							
150104663	Šešupė	Jūrė	24.1			YES (discharger Kazlų-Rūda WWTP)						
150105201	Šešupė	Milupė	14.1				YES	YES				
150105603	Šešupė	Širvinta	22.9				YES					Reconstruction of Kybartai WWTP
150105682	Šešupė	Liepona	5.1		YES							
150105684	Šešupė	Liepona	9.1									Reconstruction of Kybartai WWTP
150105861	Šešupė	Šeimena	19.4		YES		YES	YES				
150105862	Šešupė	Šeimena	33.4			YES (Vilkaviškis WWTP and dischargers of storm water runoff)	YES					
150105941	Šešupė	Vilkauja	6.7		YES		YES	YES				
150105942	Šešupė	Vilkauja	7.3				YES	YES				
150106012	Šešupė	Širvinta	37.7				YES					
150106082	Šešupė	Aista	11.8		YES							
150106601	Šešupė	Nova	5.5		YES		YES					
150106602	Šešupė	Nova	30.0				YES					
150106603	Šešupė	Nova	39.6	YES			YES					
150106604	Šešupė	Nova	5.9	YES			YES					
150106791	Šešupė	Nopaitys	21.1		YES		YES					
150106841	Šešupė	Penta	22.9				YES	YES				
150106842	Šešupė	Penta	3.4				YES	YES				

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
150106901	Šešupė	Aukspirta	10.4				YES					
150106902	Šešupė	Aukspirta	11.6				YES					
150107201	Šešupė	Siesartis	33.7				YES	YES	YES			Reconstruction of Šakiai WWT
150107202	Šešupė	Siesartis	30.9				YES	YES	YES			Reconstruction of Šakiai WWT
150107501	Šešupė	Jotija	15.0				YES					
150107502	Šešupė	Jotija	11.5				YES					
150107503	Šešupė	Jotija	23.1				YES					
150107521	Šešupė	Orija	27.8				YES	YES	YES			
160100015	Jūra	Jūra	7.5		YES							
160100801	Jūra	Letausas	19.7		YES							
160101601	Jūra	Aitra	2.9		YES							
160101721	Jūra	Ymežė	11.4		YES							
160102801	Jūra	Lokysta	12.8		YES							
160102802	Jūra	Lokysta	35.0	YES								
160105271	Jūra	Yznė	10.9		YES							
160105471	Jūra	Bremena	8.8		YES							
160107461	Jūra	Balčia	5.2		YES							
160107841	Jūra	Trisiūkštė	19.3		YES	YES (Adakavas WWTP)						
160107961	Jūra	Ančia	7.9		YES							
160107963	Jūra	Ančia	20.0	YES								
160108021	Jūra	Pluščia	12.7		YES							
160108291	Jūra	Šaltuona	37.2		YES		YES					
160108292	Jūra	Šaltuona	12.6									Reconstruction of Raseiniai WWT
160108461	Jūra	Šlyna	31.8		YES		YES					Reconstruction of Raseiniai WWT

VB code	Basin /sub-basin	River	WB length, km	Monitoring*			Measures to reduce diffuse pollution**					Measures to reduce point pollution
				1	2	3	1	2	3	4	5	
160108611	Jūra	Bebirva	16.8		YES							
160108991	Jūra	Ikojis	8.5		YES							
160109021	Jūra	Agluona	5.2		YES							
160109072	Jūra	Agluona	19.1	YES								
160110121	Jūra	Balčia	6.2		YES							
170100011	Minija	Minija	6.4		YES							

170100801	Minija	Pala	11,0		YES							
170101501	Minija	Sausdravas	5,6		YES							
170102402	Minija	Babrungas	15,3		YES							
170104601	Minija	Alantas	48,4	YES	YES							
170105801	Minija	Žvelsa	10,8		YES							
170105892	Minija	Trumpė	8,3		YES							
170106401	Minija	Skinija	5,5		YES							
170107501	Minija	Agluona	11,5		YES							
170109111	Minija	Aisė	17,5		YES							
170110601	Minija	Tenenys	12,0		YES							
200103102	Lithuanian Coastal Rivers	Smeltalė	1,8			YES YES (dischargers of storm water runoff of UAB Klaipėdos vanduo)						
200104102	Lithuanian Coastal Rivers	Akmėna - Danė	11,6	YES (PM)								
200104103	Lithuanian Coastal Rivers	Akmėna - Danė	16,9	YES (PM)								
200105801	Lithuanian Coastal Rivers	Tenžė	18,6		YES							

200105802	Lithuanian Coastal Rivers	Tenžė	1,7		YES						
200106301	Lithuanian Coastal Rivers	Eketė	9,3		YES						
200107202	Lithuanian Coastal Rivers	Ražė	4,7			YES (dischargers of storm water runoff of UAB Palangos komunalinis ūkis)					

