

Annex 1: Draft text of CM Regulation on typology of surface water and characterisation of water

Draft

**REPUBLIC OF LATVIA
CABINET
REGULATIONS No**

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**Typology of surface waters and characterization of surface and
groundwater bodies**

Issued pursuant to
Part 10 of Section 5, clauses 1 and 2
of the Law on Water Management

I GENERAL PROVISIONS

~~1.~~ The present Regulations prescribe:

1.1. procedure for characterization of surface water types, which according to this regulation means:

1.1.1. identification of types for surface water categories established in the Law on Water Management – rivers, lakes, coastal un transitional waters;

1.1.2. division of surface waters into surface water bodies;

1.1.3. identification of those surface water bodies which are at risk to meet the environmental quality objectives named by the Law on Water Management (hereinafter- environmental quality objectives);

1.2. procedure for identification of anthropogenic pressures on groundwater bodies;

1.3. procedure for characterization of groundwater bodies and assessment (review) of groundwater resources (*it is from the LWM, somehow we needed to incorporate this stupid text from LWM*), which according to this regulation means:

- 1.3.1. delineation of groundwaters into groundwater bodies and their initial characterization;
- 1.3.2. identification of those groundwater bodies which are at risk of failing to meet the environmental quality objectives stipulated by the Law on Water Management (hereinafter environmental quality objectives) and their further characterization.
- 1.4. procedure for identification of anthropogenic pressures on groundwater bodies.

II Characterization of surface water body types

State Geological Survey (River basin authorities) in the term prescribed by Article 32 of this regulation divides surface waters of a river basin district into surface water bodies by identifying them as falling under one of the surface water body categories of Annex 1 of this regulation.

3. For division of artificial and heavily modified surface water bodies into types State Geological Survey (River basin authorities) performs in accordance with the description for whichever of the surface water categories that most closely resembles the heavily modified or artificial water body concerned.

4. If necessary, Ministry of Environment based on monitoring results and requirements set by Annex 2 of this regulation may revise typology of surface water categories, setting divergent values for obligatory descriptors or choosing additional optional descriptors or combination of descriptors as required to ensure that type specific biological reference conditions can be reliably derived.

5. If necessary, State Geological Survey (River basin Authorities) based on monitoring results revises characterization of surface water bodies, carried out within the term set by Article 32, as well as programmes of measures. Henceforth State Geological Survey carries out recurrent characterization of surface water bodies after every six years.

6. For pursuance of Article 2 of this regulation Latvian Environmental agency, State Hydrometeorological Agency, regional environmental

boards, as well as other subordinated institutions of other ministries and other state administration institutions provide data disposable that are necessary for characterization of surface water bodies to the State Geological Survey.

III Division of surface waters into surface water bodies

7. In order to meet the environmental quality objectives State Geological Survey (River basin authorities) divide surface waters into surface water bodies that are discrete and significant units forming river basin district and which could be part of the river or lake , as well as grouped a number of rivers or grouped number of lakes belonging to one surface water type, abiding by the requirements of Article 10 of these regulations.

8. Surface waters are divided into a separate water bodies in the following way :

8.1. the boundaries of the surface water categories (rivers, lakes, coastal waters, transitional waters, artificial or heavily modified water bodies) are identified ;

8.2. if waters of one surface water category belong to different water body types, the boundaries between surface water body types shall be identified singling out separate water bodies;

8.3. in order to ensure that the water body is discrete and significant, the physical features, that are likely to be significant in the context of aquatic ecosystem characteristics, shall be assessed and if it is needed the separate water body shall be identified;

8.4. identify boundaries on other relevant criteria as :

8.4.1. anthropogenic pressures and impact to ensure that one water body is assigned to a single ecological class;

8.4.2.using of water as drinking water;

8.4.3. defined protected areas under Law on Water management;

8.4.4.morphological changes.

9. Surface waters are divided into water bodies by taking into account the following minimum requirements:

9.1. river catchment basin area is larger than 100 km². If it is necessary for achievement of environmental quality standards a river with a smaller catchment basin area shall be identified as a separate water body or it shall be included into any of the surface water bodies, following conditions set in Article 10;

9.2. size of a lake is larger or equal to 0.5 km². If it is necessary for achievement of environmental quality standards a lake of a smaller size shall be included into any of surface water bodies following conditions set in Article 10;

9.3. water body is used for human consumption more than 10m³ per day or serving more than 50 persons with water irrespective of other descriptors.

10. The surface water bodies identified shall correspond to the following requirements:

10.1. only surface water bodies belonging to one surface water type shall be grouped into one water body;

10.2. the separated water body does not overlap with another and does not cross the border of another water body;

10.3. water body by its quality is homogenous and such that its quality can be exactly comparable to the type specific reference condition quality established in accordance with the Cabinet of Ministers Regulation on classification of surface waters and groundwaters.

11. Surface waters belonging to protected areas as set by Law on Water Management shall be divided as separate water bodies in accordance with requirements of Article 9. They may not be grouped with other water bodies outside these territories.

12. Latvian Environmental Agency prepares a map or maps in GIS format, where surface water bodies identified according to the procedure of this regulation and their conformity with a particular type is indicated.

IV Procedure for identification of anthropogenic pressures and assessment of anthropogenic impact on surface water bodies

13. In order to identify water bodies at risk of failing to meet the environmental quality objectives, State Geological Survey (River basin authority) identifies the possible anthropogenic pressures following the procedure described:

13.1. identifies those urban, as well as industrial, agricultural and other activities as a result of which:

13.1.1. point source pollution arises;

13.1.2. diffuse source pollution arises;

13.1.3. specific pollutants are discharged into the water;

13.1.4. hydrological regime of surface waters is changed;

13.2. establishes which of the activities identified shall be related to each particular surface water category;

13.3. establishes criteria for evaluation of significance of impact of anthropogenic activities.

14. Within the term set by article 32 by using existing monitoring data on surface water status and available information on anthropogenic impact , State Geological Survey (River basin authorities) following the procedure described, identify those surface water bodies being at risk of failing to meet the environmental quality objectives:

14.1. identifying land use;

14.2. identifying pressures from urban development, as well as from industry , agriculture and other activities;

14.3. assessing the magnitude of pressures mentioned in article 14.2 and assessing susceptibility of the water body to those pressures;

14.4. evaluating the likelihood of failing to meet the objective.

15. Recurrent identification of surface water bodies at risk failing to meet the environmental quality objectives shall be carried out by State Geological Survey (River basin authority) based on monitoring results gathered from implemented monitoring programmers required by the Cabinet of Ministers Regulation on monitoring.

V Characterization of groundwater bodies

16. State Geological Survey within the term set in Article 33 of this regulation carries out initial characterization of groundwaters.

17. Groundwater bodies and their sub-bodies identified in accordance with the procedure set by this regulation shall be described in the particular river basin district management plan and management measures applied shall be co-ordinated with neighbouring EU Member states with which the given groundwater body or sub-body is connected.

18. If characterizing information available is insufficient for initial characterization of groundwaters, groundwater bodies are identified in accordance with their quantitative status and chemical status, anthropogenic activities and possible existence or absence of their impact.

19. If necessary, State Geological Survey based on monitoring results revises identified groundwater bodies and the respective programmes of measures in the term set by Article 33 of the regulation.

20. Following the initial characterization, State Geological Survey carries out further characterization of those groundwater bodies which have been identified as being at risk in order to establish a more precise assessment of the significance of such risk and identification of any measures to ensure securing of environmental quality objectives. Henceforth State Geological Survey carries out recurrent characterization of groundwater bodies after every six years.

21. When carrying out groundwater characterization and establishing natural background levels State Geological Survey may develop typology of groundwater bodies.

VI Delineation of groundwaters into groundwater bodies

22. Groundwaters are divided into separate groundwater body, if:

22.1. groundwater body is used for water supply providing more than 10m^3 per day of water as an average or serving at least 50 persons, and such use of groundwater body is intended in future;

22.2. they are directly connected (dependant) to surface water ecosystems or terrestrial ecosystems.

23. State Geological Survey uses hydrogeological, soil, land use, water abstraction, waste water discharges and other data for division on

groundwater bodies and their initial characterization, as well as information on land use. The initial characterization evaluates:

- 23.1. geological boundaries, horizontally and vertically ;
- 23.2. hydrogeological and hydrodynamic conditions (including groundwater divides, flow direction and water balance, groundwater basin recharge sources, discharge areas and protection from surface water pollution etc.);
- 23.3. the character of the top layers in the catchment areas of groundwater bodies;
- 23.4. importance based on utilization ;
- 23.5. groundwater chemical composition;
- 23.6. pressures of anthropogenic activities.

24. For purposes of the initial characterization and on basis of characterization of hydrogeological conditions, data on soil, land use, waste discharge, water abstraction and other data separate groundwater bodies may be grouped into one.

25. If the results of estimation of anthropogenic pressures obtained according to the Article 30 of this regulation show that further division of groundwater bodies is necessary, groundwater bodies may be divided into smaller units – sub-bodies, and environmental quality objectives and programmes of measures applicable only for those shall be established.

26. For division into sub-bodies State Geological Survey applies the following criteria:

- 26.1. geological composition and particularities of hydrogeological conditions and differences from those prevalent in the groundwater body;
- 26.2. groundwater quality;
- 26.3. anthropogenic activity impact on quantitative status and chemical quality of groundwaters;
- 26.4. significance of water resources for securing of water supply.

27. State Geological Survey prepares a map or maps in GIS format where groundwater bodies and their sub-bodies identified in accordance with the procedure set by this regulation are indicated.

VII Procedure for identification of water bodies at risk of failing to meet environmental quality objectives and procedure for identification of anthropogenic pressures and impact assessment on groundwater bodies

28. Following the initial characterization, State Geological Survey shall carry out further characterization of those groundwater bodies or groups, which have been identified as being at risk under procedure prescribed by this regulation and in order to establish a more precise assessment of the significance of such risk and identification of any measures, which shall be carried out in order to achieve environmental quality objectives.

29. In order to identify and assess impact of anthropogenic activities on groundwater quality and quantity State Geological Survey summarizes and analyses information on impact of anthropogenic activities on groundwater bodies as a result of which:

29.1. point source pollution occurs;

29.2. diffuse source pollution occurs;

29.3. abstraction of water takes place;

29.4. artificial recharge of groundwater resources or lowering of groundwater level takes place.

30. In order to assess significance of anthropogenic pressure impact on groundwater bodies State Geological Survey analyses:

30.1. natural background level;

30.2. infiltration rate;

30.3. natural attenuation and degradation of pollutants in groundwater aquifers.

31. In order to identify groundwater bodies at risk of failing the environmental quality objectives State Geological Survey gathers and analyses information on groundwater bodies and anthropogenic activity impacts on them, including:

31.1. geological characteristics of the groundwater body including the extent and type of geological units;

31.2. hydrogeological characteristics of the groundwater body including hydraulic conductivity, porosity and confinement;

31.3. characteristics of the superficial deposits and soils in the catchment from which the groundwater body receives its recharge, including the

thickness, porosity, hydraulic conductivity, and absorptive properties of the deposits and soils;

31.4. stratification characteristics of the groundwater within the groundwater body;

31.5. an inventory of associated surface systems, including terrestrial ecosystems and bodies of surface water, with which the groundwater body is dynamically linked;

31.6. estimates of the directions and rates of exchange of water between the groundwater body and associated surface systems;

31.7. calculations of the long-term annual average rate of overall recharge, using for this purpose estimation of groundwater balance, as well as hydrogeological models;

31.8. characterization of chemical quality of groundwater indicating what impact has anthropogenic activity.

VIII Concluding provisions

32. Initial characterization of surface water bodies, as stated in Article 2 of this regulation shall be performed by State Geological Survey (river basin authority) by 22 December 2004.

33. Initial characterization of groundwater bodies, as stated in Article 17 of this regulation shall be performed by State Geological Survey by 22 December 2004.

Informative reference

Legal norms consequent from Directive “2000/60/EC” are included into the regulation.

Prime Minister

E. Repse

Minister of Environment

R. Vejonis

Annex 1 to the Cabinet of Ministers
Regulation No
of 2003

Typology of surface waters

1. Rivers

Nr.	Catchment area	Slope (in stretch from 1 – 3 km)	Type	Characterisation of type
1.1.	Small ($< 100 \text{ km}^2$)	Big ($> 1,0 \text{ m/km}$)	Small fast-rhithral stream	Streams are shallow fast-running (velocity is $> 0,2 \text{ m/s}$) and shallow with sandy and stony sediments.
1.2.	Small ($< 100 \text{ km}^2$)	Small ($< 1 \text{ m/km}$)	Small slow-running potomal stream	Streams are slow-running (velocity is $< 0,2 \text{ m/s}$) and shallow with sandy and silty sediments which are covered by organic debris.
1.3.	Medium big (100 up to 1000 km^2)	Big ($> 1 \text{ m/km}$)	Medium fast-rhithral river	Rivers are fast-floting (velocity is $> 0,2 \text{ m/s}$) and medium deep with sandy and stony sediments.
1.4.	Medium big (100 līdz 1000 km^2)	Small ($< 1 \text{ m/km}$)	Slow-running potomal medium river	Rivers are medium deep with current velocity smaller than $0,2 \text{ m/s}$. River-bed substratum is formed from sand covered by organic debris and mud.
1.5.	Big ($> 1001 \text{ km}^2$)	Big ($> 1 \text{ m/km}$)	Big fast-floting rhithral river	Rivers are deep with current velocity bigger than $0,2 \text{ m/s}$. River-bed substratum is formed from sand, gravel and stones.
1.6.	Big ($> 1001 \text{ km}^2$)	Small ($< 1 \text{ m/km}$)	Big slow-running potomal	Rivers are deep with current velocity smaller than $0,2 \text{ m/s}$. River-bed substratum is formed from sand covered by organic debris and mud.

2. Lakes

Nr.	Mean depth	Water hardness	Colour	Type
2.1.	Very shallow (< 2 m)	Hard water (>165mkS/cm)	Oligohumic (<80 Pt-Co)	Very shallow clear water lakes with a high water hardness.
2.2.	Very shallow (< 2 m)	Hard water (>165mkS/cm)	Polyhumic (>80 Pt-Co)	Very shallow colour lakes with a high water hardness.
2.3.	Very shallow (< 2 m)	Soft water (<165 mkS/cm)	Oligohumic (<80 Pt-Co)	Very shallow lakes with a low water hardness
2.4.	Very shallow (< 2 m)	Soft water (<165 mkS/cm)	Polyhumic (>80 Pt-Co)	Very shallow colour lakes with a low water hardness
2.5.	Shallow (2-9 m)	Hard water (>165 mkS/cm)	Oligohumic (<80 Pt-Co)	Shallow clear water lakes with a high water hardness.
2.6.	Shallow (2-9 m)	Hard water (>165 mkS/cm)	Polihumozs (>80 Pt-Co)	Shallow colour lakes with a high water hardness
2.7.	Shallow (2-9 m)	Soft water (<165 mkS/cm)	Oligohumic (<80 Pt-Co)	Shallow clear water lakes with a low water hardness.
2.8.	Shallow (2-9 m)	Soft water (<165 mkS/cm)	Polihumozs (>80 Pt-Co)	Shallow colour lakes with a low water hardness
2.9.	Deep (> 9 m)	Hard water (>165 mkS/cm)	Oligohumic (<80 Pt-Co)	Deep clear water lakes with a high water hardness
2.10.	Deep (> 9 m)	Soft water (<165 mkS/cm)	Oligohumic (<80 Pt-Co)	Deep clear water lakes with a low water hardness

3. Coastal waters

Nr.	Salinity, (per mille)	Mean depth (m)	Wave exposure	Mixing	Retention time (d)	Dominant substratum	Type
3.1.	6< 18-20	< 30	open	absolute	< 7	Sand - gravel	Southeastern open sandy coast
3.2.	6< 18-20	< 30	open	absolute	< 7	Boulders	Southeastern open rocky coast
3.3.	0,5<6	< 30	Medium open	absolute	<7	Sand - gravel	Sandy coast of Riga Gulf
3.4.	0,5<6	< 30	Medium open	absolute	<7	boulders	Rocky coast of Riga Gulf

4. Transitional waters

Nr.	Salinity, (per mille)	Mean depth (m)	Wave exposure	Mixing	Retention time (d)	Dominant substratum
4.1.	0,5 < 5-6	< 30	Medium open	Partly stratified	mud	Transitional water of Riga Gulf

Minister of Environment

Annex 2 to the Cabinet of Ministers
Regulation No
of 2003

1. Obligatory factors elements of which may be revised for further characterization of surface water bodies

1.1. Rivers

Physical and chemical factors that determine the characteristics of the river or part of the river and hence the biological population structure and composition	
Factor	Characteristic
Altitude	
Latitude	55 ⁰ 40' and 58 ⁰ 05' northern latitude
Longitude	20 ⁰ 58' and 28 ⁰ 14' east longitude
Geology	Group of calcium under the class of hydrocarbons
Size of catchment area	< 1000 km ² ≥1000 km ²

1.2. Lakes

Physical and chemical factors that determine the characteristics of the lake and hence the biological population structure and composition	
Factor	Characteristic
Latitude	55 ⁰ 40' and 58 ⁰ 05' northern latitude
Longitude	20 ⁰ 58' and 28 ⁰ 14' east longitude
Mean depth	< 2 m 2-9 m > 9 m
Geology	<165 μS/cm >165 μS/cm
Size	0,5 - 100 km ²

1.3. Transitional waters

Physical and chemical factors that determine the characteristics of the transitional waters and hence the biological population structure and composition	
Factor	Characteristic
Latitude	53°35' and 65°55' northern latitude
Longitude	9°20' and 25°30' east longitude
Tidal range	<1 m
Salinity	< 0,5 pro milles – river mouth ???
	0,5 to 6,0 pro milles - Oligohaline waters

According to the Directive transitional waters are bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows. According to this definition salinity of transitional waters may not be <0,5 psu which is freshwater threshold. Technical Note of the Project suggests in point 6.2. to define the border of transitional waters and freshwaters by <0,5 psu salinity. If the <0,5 psu norm is kept at the Cabinet on Ministers regulation, there is a legal basis to include Daugava lower reach into the transitional waters which according to the opinion of the project participants is incorrect, because biotic communities of river are characteristic to this section.

1.4. Coastal waters

Physical and chemical factors that determine the characteristics of the transitional waters and hence the biological population structure and composition	
Factor	Characteristic
Latitude	53°35' and 65°55' northern latitude 53°35' un 65°55' ziemeļu platumus
Longitude	9°20' and 25°30' east longitude 9°20' un 25°30' austrumu garums
Tidal range	<1 m
salinity	0,5 to 6,0 pro milles - Oligohaline waters

2. Optional factors that can be used for recurrent typology of surface waters

2.1. Rivers

- 2.1.1. distance from river source
- 2.1.2. energy of flow (function of flow and slope)
- 2.1.3. mean water depth

- 2.1.4. mean water slope
- 2.1.5. form and shape of main river bed
- 2.1.6. river discharge (flow) category
- 2.1.7. valley shape
- 2.1.8. transport of solids
- 2.1.9. acid neutralizing capacity
- 2.1.10. mean substratum composition
- 2.1.11. chloride
- 2.1.12. air temperature range
- 2.1.13. mean air temperature
- 2.1.14. precipitation

2.2. Lakes

- 2.2.1. mean water depth
- 2.2.2. lake shape
- 2.2.3. residence time
- 2.2.4. mean air temperature
- 2.2.5. air temperature range
- 2.2.6. mixing characteristics (e.g., monomictic, dimictic, polymictic)
- 2.2.7. acid neutralizing capacity
- 2.2.8. background nutrient status
- 2.2.9. mean substratum composition
- 2.2.10. water level fluctuation

2.3. Transitional waters

- 2.3.1. depth
- 2.3.2. current velocity
- 2.3.3. wave exposure
- 2.3.4. residence time
- 2.3.5. mean water temperature
- 2.3.6. mixing characteristics
- 2.3.7. turbidity
- 2.3.8. mean substratum composition
- 2.3.9. shape
- 2.3.10. water temperature range

2.4. Coastal waters

- 2.4.1. current velocity
- 2.4.2. wave exposure
- 2.4.3. mean water temperature
- 2.4.4. mixing characteristics
- 2.4.5. turbidity
- 2.4.6. retention time (of enclosed bays)
- 2.4.7. mean substratum composition
- 2.4.8. water temperature range

