

**SUBSIDIARY LEGISLATION 549.53**

**PROTECTION OF GROUNDWATER AGAINST  
POLLUTION AND DETERIORATION  
REGULATIONS**

16th January, 2009

*LEGAL NOTICE 108 of 2009, as amended by Legal Notice 223 of 2015;  
and Act XXV of 2015.*

1. (1) The title of these regulations is the Protection of Groundwater against Pollution and Deterioration Regulations. Citation and scope.

(2) The scope of these regulations is to transpose Directive 2006/118/EC and to establish specific measures in order to prevent and protect groundwater against pollution and deterioration. These measures include in particular:

- (a) criteria for the assessment of good groundwater chemical status; and
- (b) criteria for the identification and reversal of significant and sustained upward trends and for the definition of starting points for trend reversals.

2. (1) Unless otherwise stated in these regulations, the definitions of the Malta Resources Authority Act shall apply. Interpretation.  
Amended by:  
XXV. 2015.50.

(2) In these regulations, unless the context otherwise requires:

"Act" means the Malta Resources Authority Act; Cap. 423.

"background level" means the concentration of a substance or the value of an indicator in a body of groundwater corresponding to no, or only very minor, anthropogenic alterations to undisturbed conditions;

"baseline level" means the average value measured at least during the reference years 2007 and 2008 on the basis of monitoring programmes implemented under the Water Policy Framework Regulations or, in the case of substances identified after these reference years, during the first period for which a representative period of monitoring data is available; S.L. 549.100

"groundwater" means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil;

"groundwater quality standard" means an environmental quality standard expressed as the concentration of a particular pollutant, group of pollutants or indicator of pollution in groundwater, which should not be exceeded in order to protect human health and the environment;

"input of pollutants into groundwater" means the direct or indirect introduction of pollutants into groundwater as a result of human activity;

"officer" means and includes any person engaged by, detailed for duty with, or in any manner whatsoever performing duties for or on behalf of the Unit;

"significant and sustained upward trend" means any statistically and environmentally significant increase of concentration of a pollutant, group of pollutants, or indicator of pollution in groundwater for which trend reversal is identified as being necessary in accordance with these regulations;

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"the Unit" means the Sustainable Energy and Water Conservation Unit established under regulation 3 of the Sustainable Energy and Water Conservation Unit (Establishment as an Agency) Order;

"threshold value" means a groundwater quality standard set by the Unit in terms of these regulations.

Applicability.

3. These regulations shall also apply to measures in order to prevent the deterioration of the status of all bodies of groundwater. The Water Policy Framework Regulations shall also apply unless they are inconsistent with these regulations.

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Criteria for  
assessing  
groundwater  
chemical status.  
*Amended by:*  
*XXV. 2015.50.*

4. (1) The following criteria shall be used for the purposes of the assessment of the chemical status of a body or a group of bodies of groundwater:

(a) groundwater quality standards as referred to in the First Schedule;

(b) threshold values to be established by the Unit in accordance with the procedure set out in Part A of the Second Schedule for the pollutants, groups of pollutants and indicators of pollution which, within the Maltese territory, have been identified as contributing to the characterisation of bodies or groups of bodies of groundwater as being at risk, taking into account the list contained in Part B of the Second Schedule.

(2) The threshold values applicable to good chemical status shall be based on the protection of the body of groundwater in accordance with points 1, 2 and 3 of Part A of the Second Schedule, having particular regard to its impact on, and inter-relationship with, associated surface waters and directly dependent terrestrial ecosystems and wetlands and shall *inter alia* take into account human toxicology and ecotoxicology knowledge.

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(3) The Unit shall establish and publish threshold values in the river basin management plans to be submitted in accordance with the Water Policy Framework Regulations, which shall include a summary of the information set out in Part C of the Second Schedule.

(4) The Unit, shall where it deems necessary, amend the list of threshold values whenever new information on pollutants, groups of pollutants, or indicators of pollution indicates that a threshold value should be set for an additional substance, that an existing threshold value should be amended, or that a threshold value previously removed from the list should be re-inserted, in order to protect human health and the environment. Any such amendments to the list of threshold values shall be reported in the context of the

periodic review of the river basin management plans.

5. (1) The Unit shall use the procedure mentioned in sub-regulation (2) in order to assess the chemical status of a body of groundwater. The Unit shall establish that a body or a group of bodies of groundwater is considered to be of good chemical status when:

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- (a) the relevant monitoring demonstrates that the conditions set out in Table 2.3.2 of the Fifth Schedule of the Water Policy Framework Regulations are being satisfied; or S.L. 549.100
- (b) the values for the groundwater quality standards listed in the First Schedule and the relevant threshold values established in accordance with regulation 4 and the Second Schedule are not exceeded at any monitoring point in that body or group of bodies of groundwater; or
- (c) the value for a groundwater quality standard or threshold value is exceeded at one or more monitoring points but an appropriate investigation in accordance with the Third Schedule confirms that:
  - (i) on the basis of the assessment referred to in paragraph 3 of the Third Schedule, the concentrations of pollutants exceeding the groundwater quality standards or threshold values are not considered to present a significant environmental risk, taking into account, where appropriate, the extent of the body of groundwater which is affected;
  - (ii) the other conditions for good groundwater chemical status set out in Table 2.3.2 in the Fifth Schedule of the Water Policy Framework Regulations are being satisfied in accordance with paragraph 4 of the Third Schedule; S.L. 549.100
  - (iii) for bodies of groundwater identified in accordance with the Water Policy Framework Regulations, the requirements of such regulations are being satisfied in accordance with paragraph 4 of the Third Schedule; S.L. 549.100
  - (iv) the ability of the body of groundwater or of any of the bodies in the group of bodies of groundwater to support human uses has not been significantly impaired by pollution.

(2) The choice of the groundwater monitoring sites shall satisfy the requirements of Section 2.4 of the Fifth Schedule of the Water Policy Framework Regulations, on being designed so as to provide a coherent and comprehensive overview of groundwater chemical status and to provide representative monitoring data. S.L. 549.100

(3) The Unit shall publish a summary of the assessment of groundwater chemical status in the river basin management plans in accordance with the Water Policy Framework Regulations. Such S.L. 549.100

summary, established at the level of the river basin district or the part of the international river basin district falling within the Maltese territory, shall also include an explanation as to the manner in which exceedances of groundwater quality standards or threshold values at individual monitoring points have been taken into account in the final assessment.

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(4) The Unit shall take such measures as may be necessary in accordance with the Water Policy Framework Regulations, to protect aquatic ecosystems, terrestrial ecosystems and human uses of groundwater dependent on the part of the body of groundwater represented by the monitoring point or points at which the value for a groundwater quality standard or the threshold value has been exceeded, where a body of groundwater is classified as being of good chemical status in accordance with subregulation (1)(c).

Identification of significant and sustained upward trends and the definition of starting points for trends reversals.  
*Amended by:  
XXV. 2015.50.*

6. (1) The Unit shall identify any significant and sustained upward trend in concentrations of pollutants, groups of pollutants or indicators of pollution found in bodies or groups of bodies of groundwater identified as being at risk and define the starting point for reversing that trend, in accordance with the Fourth Schedule.

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(2) The Unit shall, in accordance with Part B of the Fourth Schedule, reverse trends which present a significant risk of harm to the quality of aquatic ecosystems or terrestrial ecosystems, to human health, or to actual or potential legitimate uses of the water environment, through the programme of measures referred to in the Water Policy Framework Regulations, in order to progressively reduce pollution and prevent deterioration of groundwater.

(3) The Unit shall define the starting point for trend reversal as a percentage of the level of the groundwater quality standards set out in the First Schedule and of the threshold value established pursuant to regulation 4, on the basis of the identified trend and the environmental risk associated therewith, in accordance with Part B, point 1 of the Fourth Schedule.

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(4) The Unit shall, in the river basin management plans to be submitted in accordance with the Water Policy Framework Regulations, summarise:

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(a) the way in which the trend assessment from individual monitoring points within a body or a group of bodies of groundwater has contributed to identifying, in accordance with Section 2.5 of the Fifth Schedule to the Water Policy Framework Regulations, that those bodies are subject to a significant and sustained upward trend in concentration of any pollutant or a reversal of that trend; and

(b) the reasons for the starting points defined pursuant to regulation 4.

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(5) The Unit shall, where it is deemed necessary to assess the impact of existing plumes of pollution in bodies of groundwater that may threaten the achievement of the objectives in the Water Policy Framework Regulations, and in particular, those plumes resulting from point sources and contaminated land, carry out

additional trend assessments for identified pollutants, in order to verify that plumes from contaminated sites do not expand, do not deteriorate the chemical status of the body or group of bodies of groundwater, and do not present a risk for human health and the environment. The results of these assessments shall be summarised in the river basin management plans to be submitted in accordance with the Water Policy Framework Regulations.

7. (1) The Unit shall ensure, for the purpose of preventing and, or limiting inputs of pollutants into groundwater already established in the Water Policy Framework Regulations, that the programme of measures set out in such regulations includes:

Measures to prevent or limit inputs of pollutants into groundwater.  
*Amended by:*  
*XXV. 2015.50.*  
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- (a) all necessary measures in order to prevent inputs into groundwater of any hazardous substances, without prejudice to sub-regulation (2). In identifying such substances, the Unit shall also, in particular, take account of hazardous substances belonging to groups of pollutants referred to in points 1 to 6 of the Eighth Schedule to the Water Policy Framework Regulations, as well as of substances belonging to groups of pollutants referred to in points 7 to 9 of such Schedule, where these are considered to be hazardous;
- (b) for pollutants listed in such Schedule, which are not considered hazardous, and any other non-hazardous pollutants not listed in such Schedule and which are considered by the Unit to present an existing or potential risk of pollution, all necessary measures in order to limit inputs into groundwater in order to ensure that such inputs do not cause deterioration or significant and sustained upward trends in the concentrations of pollutants in groundwater. Such measures shall, at least, take account of established best practice, including the Best Environmental Practice and Best Available Techniques.

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(2) The Unit shall, whenever such is technically possible, take into account the inputs of pollutants from disseminated sources of pollution which have an impact on the chemical status of groundwater.



First Schedule  
(Regulations 4 and 5)

GROUNDWATER QUALITY STANDARDS

1. For the purposes of assessing groundwater chemical status in accordance with regulation 5, the following groundwater quality standards will be the quality standards referred to in Table 2.3.2 in the Fifth Schedule to the Water Policy Framework Regulations, and established in accordance with such regulations.

Pollutant	Quality standards
Nitrates	50 mg/l
Active substances in pesticides, including their relevant metabolites, degradation and reaction products <sup>1</sup>	0,1 µg/l 0,5 µg/l (total) <sup>2</sup>
<p>1 'Pesticides' means plant protection products and biocidal products as defined in Article 2 of Directive 91/414/EEC and in Article 2 of Directive 98/8/EC, respectively.</p> <p>2 'Total' means the sum of all individual pesticides detected and quantified in the monitoring procedure, including their relevant metabolites, degradation and reaction products.</p>	

2. The results of the application of the quality standards for pesticides in the manner specified for the purposes of these regulations will be without prejudice to the results of the risk assessment procedures required by Directive 91/414/EEC or Directive 98/8/EC.

3. Where, for a given body of groundwater, it is considered that the groundwater quality standards could result in failure to achieve the environmental objectives specified in the Water Policy Framework Regulations, for associated bodies of surface water, or in any significant diminution of the ecological or chemical quality of such bodies, or in any significant damage to terrestrial ecosystems which depend directly on the body of groundwater, more stringent threshold values will be established in accordance with regulation 4 and the Second Schedule. Programmes and measures required in relation to such a threshold value will also apply to activities falling within the scope of Directive 91/676/EEC.

*Amended by:*  
*L.N. 223 of 2015;*  
*XXV. 2015.50.*

Second Schedule  
(Regulations 4 and 5)

THRESHOLD VALUES FOR GROUNDWATER POLLUTANTS  
AND INDICATORS OF POLLUTION

Part A

Guidelines for the establishment of threshold values by Unit in accordance with regulation 4

The Unit will establish threshold values for all pollutants and indicators of pollution which, pursuant to the characterisation performed in accordance with the Water Policy Framework Regulations, characterise bodies or groups of bodies of groundwater as being at risk of failing to achieve good groundwater chemical status.

Threshold values will be established in such a way that, should the monitoring results at a representative monitoring point exceed the thresholds, this will indicate a risk that one or more of the conditions for good groundwater chemical status referred

to in regulation 5(1)(c)(ii), (iii) and (iv) are not being met. When establishing threshold values, the Unit will consider the following guidelines:

- (1) the determination of threshold values should be based on:
  - (a) the extent of interactions between groundwater and associated aquatic and dependent terrestrial ecosystems;
  - (b) the interference with actual or potential legitimate uses or functions of groundwater;
  - (c) all pollutants which characterise bodies of groundwater as being at risk, taking into account the minimum list set out in Part B;
  - (d) hydro-geological characteristics including information on background levels and water balance;
- (2) the determination of threshold values should also take account of the origins of the pollutants, their possible natural occurrence, their toxicology and dispersion tendency, their persistence and their bioaccumulation potential;
- (3) wherever elevated background levels of substances or ions or their indicators occur due to natural hydro-geological reasons, those background levels in the relevant body of groundwater shall be taken into account when establishing threshold values. When determining background levels, the following principles should be taken into account:
  - (a) the determination of background levels should be based on the characterisation of groundwater bodies in accordance with Schedule II to the Water Policy Framework Regulations (S.L. 549.100) and on the results of groundwater monitoring in accordance with Schedule V to those regulations. The monitoring strategy and interpretation of the data should take account of the fact that flow conditions and groundwater chemistry vary laterally and vertically;
  - (b) where only limited groundwater monitoring data are available, more data should be gathered and in the meantime background levels should be determined based on those limited monitoring data, where appropriate by a simplified approach using a subset of samples for which indicators show no influence of human activity. Information on geochemical transfers and processes should also be taken account of, where available;
  - (c) where insufficient groundwater monitoring data are available and the information on geochemical transfers and processes is poor, more data and information should be gathered and in the meantime background levels should be estimated, where appropriate based on statistical reference results for the same type of aquifers in other areas having sufficient monitoring data;
- (4) the determination of threshold values should be supported by a control mechanism for the data collected, based on an evaluation of data quality, analytical considerations, and background levels for substances which may occur both naturally and as a result of human activities.

#### Part B

Minimum list of pollutants and their indicators for which Unit have to consider establishing threshold values in accordance with regulation 4

1. Substances or ions or indicators which may occur both naturally and/or as a result of human activities

Arsenic

Cadmium

Lead

Mercury

Ammonium

Chloride

Sulphate

Nitrites

Phosphorus (total)/Phosphates

2. Man-made synthetic substances

Trichloroethylene

Tetrachloroethylene

3. Parameters indicative of saline or other intrusions\*

Conductivity

Part C

Information with regard to the pollutants and their indicators for which threshold values have been established

The Unit shall include in the water catchment management plan to be submitted in accordance with regulation 12 of the Water Policy Framework Regulations (S.L. 549.100), information on the way the procedure set out in Part A of this Schedule has been followed.

In particular, the Unit shall provide:

- (a) information on each of the bodies or groups of bodies of groundwater characterised as being at risk, including the following:
  - (i) the size of the bodies;
  - (ii) each pollutant or indicator of pollution which characterises bodies of groundwater as being at risk;
  - (iii) the environmental quality objectives to which the risk is related, including the actual or potential legitimate uses or functions of the groundwater body, and the relationship between the bodies of groundwater and the associated surface waters and directly dependent terrestrial ecosystems;
  - (iv) in the case of naturally-occurring substances, the natural background levels in the bodies of groundwater;
  - (v) information on the exceedances where threshold values are exceeded;
- (b) the threshold values, whether they apply at the national level, at the level of the river basin district or the part of the international river basin district falling within the territory of Malta, or at the level of a body or a

\*With regard to saline concentrations resulting from human activities, the Unit may decide to establish threshold values either for sulphate and chloride or for conductivity.

- group of bodies of groundwater;
- (c) the relationship between the threshold values and each of the following:
    - (i) in the case of naturally-occurring substances, the background levels;
    - (ii) associated surface waters and directly dependent terrestrial ecosystems;
    - (iii) the environmental quality objectives and other standards for water protection that exist at national, Union or international level;
    - (iv) any relevant information concerning the toxicology, ecotoxicology, persistence, bioaccumulation potential, and dispersion tendency of the pollutants;
  - (d) the methodology for determining background levels based on the principles set out in item 3 of Part A;
  - (e) the reasons for not having established threshold values for any of the pollutants and indicators identified in Part B;
  - (f) key elements of the groundwater chemical status assessment, including the level, method and period of aggregation of monitoring results, the definition of the acceptable extent of exceedance, and the method for calculating it, in accordance with regulation 5(1)(c)(i) and paragraph 3 of the Third Schedule. Where any of the data referred to in paragraphs (a) to (f) are not included in the water catchment management plan, the Unit shall provide the reasons for this in that plan.

*Amended by:  
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Third Schedule  
(Regulations 4 and 5)

ASSESSMENT OF GROUNDWATER CHEMICAL STATUS

1. The assessment procedure for determining the chemical status of a body or a group of bodies of groundwater will be carried out in relation to all bodies or groups of bodies of groundwater characterised as being at risk and in relation to each of the pollutants which contribute to the body or group of bodies of groundwater being so characterised.

2. In undertaking any investigations referred to in regulation 5(1)(c), the Unit will take into account:

- (a) the information collected as part of the characterisation to be carried out in accordance with the Water Policy Framework Regulations, and with Sections 2.1, 2.2 and 2.3 of the Second Schedule thereto;
- (b) the results of the groundwater monitoring network obtained in accordance with Section 2.4 of the Fifth Schedule of the Water Policy Framework Regulations; and
- (c) any other relevant information including a comparison of the annual arithmetic mean concentration of the relevant pollutants at a monitoring point with the groundwater quality standards set out in the First Schedule and the threshold values set by the Unit in accordance with regulation 4 and the Second Schedule.

3. For the purposes of investigating whether the conditions for good groundwater chemical status referred to in regulation 5(1)(c)(i) and (iv) are met, the Unit will, where relevant and necessary, and on the basis of appropriate aggregations of the monitoring results, supported where necessary by concentration estimations based on a conceptual model of the body or group of bodies of groundwater, estimate the extent of the body of groundwater having an annual arithmetic mean concentration of a pollutant higher than a groundwater quality standard or a threshold value.

4. For the purposes of investigating whether the conditions for good groundwater chemical status referred to in regulation 5(1)(c)(ii) and (iii) are met, the Unit will, where relevant and necessary, and on the basis of relevant monitoring results and of a suitable conceptual model of the body of groundwater, assess:

- (a) the impact of the pollutants in the body of groundwater;
- (b) the amounts and the concentrations of the pollutants being, or likely to be, transferred from the body of groundwater to the associated surface waters or directly dependent terrestrial ecosystems;
- (c) the likely impact of the amounts and concentrations of the pollutants transferred to the associated surface waters and directly dependent terrestrial ecosystems;
- (d) the extent of any saline or other intrusions into the body of groundwater; and
- (e) the risk from pollutants in the body of groundwater to the quality of water abstracted, or intended to be abstracted, from the body of groundwater for human consumption.

5. The Unit will present the groundwater chemical status of a body or a group of bodies of groundwater on maps in accordance with Sections 2.4.5 and 2.5 of the Fifth Schedule of the Water Policy Framework Regulations. In addition, the Unit will indicate on these maps all monitoring points where groundwater quality standards and/or threshold values are exceeded, where relevant and feasible.

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Fourth Schedule  
(Regulations 4 and 6)

*Amended by:  
XXV. 2015.50.*

IDENTIFICATION AND REVERSAL OF SIGNIFICANT  
AND SUSTAINED UPWARD TRENDS

Part A

Identification of significant and sustained upward trends

The Unit will identify significant and sustained upward trends in all bodies or groups of bodies of groundwater that are characterised as being at risk in accordance with the Second Schedule of the Water Policy Framework Regulations, taking into account the following requirements:

- (1) in accordance with Section 2.4 of the Fifth Schedule of the Water Policy Framework Regulations, the monitoring programme will be so designed as to detect significant and sustained upward trends in concentrations of the pollutants identified pursuant to regulation 4;

- (2) the procedure for the identification of significant and sustained upward trends will be based on the following elements:
  - (a) monitoring frequencies and monitoring locations will be selected such as are sufficient to:
    - (i) provide the information necessary to ensure that such upward trends can be distinguished from natural variation with an adequate level of confidence and precision;
    - (ii) enable such upward trends to be identified in sufficient time to allow measures to be implemented in order to prevent, or at least mitigate as far as practicable, environmentally significant detrimental changes in groundwater quality. This identification will be carried out for the first time by 2009, if possible, and will take into account existing data, in the context of the report on trend identification within the first river basin management plan referred to in the Water Policy Framework Regulations, and at least every six years thereafter;
    - (iii) take into account the physical and chemical temporal characteristics of the body of groundwater, including groundwater flow conditions and recharge rates and percolation time through soil or subsoil;
  - (b) the methods of monitoring and analysis used will conform to international quality control principles, including, if relevant, CEN or national standardised methods, to ensure equivalent scientific quality and comparability of the data provided;
  - (c) the assessment will be based on a statistical method, such as regression analysis, for trend analysis in time series of individual monitoring points;
  - (d) in order to avoid bias in trend identification, all measurements below the quantification limit will be set to half of the value of the highest quantification limit occurring in time series, except for total pesticides;
- (3) the identification of significant and sustained upward trends in the concentrations of substances which occur both naturally and as a result of human activities will consider the baseline levels and, where such data are available, the data collected before the start of the monitoring programme in order to report on trend identification within the first river basin management plan referred to in the Water Policy Framework Regulations.

#### Part B

##### Starting points for trend reversals

The Unit will reverse identified significant and sustained upward trends, in accordance with regulation 6, taking into account the following requirements:

- (1) the starting point for implementing measures to reverse significant and sustained upward trends will be when the concentration of the pollutant reaches 75% of the parametric values of the groundwater quality standards set out in the First Schedule and of the threshold values established pursuant to regulation 4, unless:
  - (a) an earlier starting point is required to enable trend reversal

- measures to prevent most cost-effectively, or at least mitigate as far as possible, any environmentally significant detrimental changes in groundwater quality;
- (b) a different starting point is justified where the detection limit does not allow for establishing the presence of a trend at 75% of the parametric values; or
  - (c) the rate of increase and the reversibility of the trend are such that a later starting point for trend reversal measures would still enable such measures to prevent most cost-effectively, or at least mitigate as far as possible, any environmentally significant detrimental changes in groundwater quality. Such later starting point may not lead to any delay in achieving the deadline for the environmental objectives.

For activities falling within the scope of Directive 91/676/EEC, the starting point for implementing measures to reverse significant and sustained upward trends will be established in accordance with such Directive and with the Water Policy Framework Regulations and, in particular, adhering to environmental objectives for water protection as set out in the Water Policy Framework Regulations;

- (2) once a starting point has been established for a body of groundwater characterised as being at risk in accordance with Section 2.4.4 of the Fifth Schedule of the Water Policy Framework Regulations, and pursuant to point (1) above, it will not be changed during the six-year cycle of the river basin management plan required in accordance with the Water Policy Framework Regulations;
  - (3) trend reversals will be demonstrated, taking into account relevant monitoring provisions contained in Part A, point 2.
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