
**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

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**Subsidiary
2009/079**

Subsidiary Legislation made under s. 18.

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

(LN. 2009/079)

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Directive 2014/80/EU

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

**Subsidiary
2009/079**

This version is out of date

ARRANGEMENT OF REGULATIONS.

Regulation

1. Title.
2. Interpretation.
3. Threshold values.
4. Assessment of groundwater chemical status.
5. Significant and sustained upward trends and the definition of starting points for trends reversals.
6. Prevention or limitation of inputs of pollutants into groundwater.
7. Exemptions.
- 7A. Liability of bodies corporate - general.
8. Repeal.

SCHEDULE 1

**THRESHOLD VALUES FOR GROUNDWATER POLLUTANTS
AND INDICATORS OF POLLUTION**

SCHEDULE 2

GROUNDWATER QUALITY STANDARDS

SCHEDULE 3

ASSESSMENT OF GROUNDWATER CHEMICAL STATUS

SCHEDULE 4

**IDENTIFICATION AND REVERSAL OF SIGNIFICANT
AND SUSTAINED UPWARD TRENDS**

SCHEDULE 5

INDICATIVE LIST OF THE MAIN POLLUTANTS

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

**Subsidiary
2009/079**

In exercise of the powers conferred on the Government by section 18 of the Environment Act 2005 and in order to transpose into the law of Gibraltar Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration, the Government has made the following Regulations.

Title.

1. These Regulations may be cited as the Environment (Protection of Groundwater) Regulations 2009.

Interpretation.

2. In these Regulations, unless the context otherwise requires—

“aquifer” means a subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater;

“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 on the basis of monitoring programmes implemented under the Water Framework Rules or, in the case of substances, during the first period for which a representative period of monitoring data is available;

“body of groundwater” means a distinct volume of groundwater within one or more aquifers;

“Competent Authority” means the Minister with responsibility for the environment;

“direct input” in relation to groundwater means the introduction of a pollutant into groundwater without percolation through soil or subsoil;

“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;

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009****Subsidiary
2009/079****This version is out of date**

“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;

“indirect input” in relation to groundwater means the introduction of a pollutant into groundwater after percolation through soil or subsoil;

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

“pollutant” means any substance liable to cause pollution;

“pollution” means the direct or indirect introduction, as a result of human activity, of substances or heat into air, water or land which may be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems, which result in damage to material property, or which impair or interfere with amenities and other legitimate uses of the environment;

“river basin” means an area of land from which all surface run-off water flows through a connected sequence of streams, rivers or other watercourses or lakes into the sea at a single river mouth, estuary or delta and includes any body of transitional water in the vicinity of that river mouth, estuary or delta;

“river basin district” means the area of land and sea together with its associated bodies of water which taken together is the unit for the management of the river basin, and in these Regulations, unless otherwise specified, any reference to a river basin district shall be taken to be a reference to the Gibraltar River Basin District as defined in rule 4 of the Water Framework Rules;

“river basin management plan” means the plan prepared under rule 11 of the Water Framework Rules;

“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;

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

**Subsidiary
2009/079**

“starting point” in relation to trend reversal means the point at which measures must be implemented to reverse a significant and sustained upward trend in pollutant concentrations or indicators of pollution;

“surface water” means a stretch of coastal water;

“threshold value” means a groundwater quality standard set by the Competent Authority in accordance with the terms of these Regulations;

“Water Framework Rules” mean the Public Health (Water Framework) Rules 2004 which transpose Directive 2000/60/EC of the European Parliament and the Council of 23rd October 2000 establishing a framework for Community action in the field of water policy.

Threshold values.

3.(1) The Competent Authority shall establish and publish in the river basin management plan, a list of threshold values in accordance with Parts I and II of Schedule 1 to these Regulations on the basis of methodologies approved by it and which shall include a summary of the information set out in Part III of that Schedule.

(2) In order to protect human health and the environment, the list of threshold values shall be amended whenever new information indicates that—

- (a) a threshold value should be set for an additional substance;
- (b) an existing threshold value should be amended; or
- (c) a threshold value previously removed from the list should be reinserted.

(3) Where it is considered that groundwater is no longer at risk from a pollutant, group of pollutants or indicator of pollution, the threshold value for that pollutant, group of pollutants or indicator of pollution may be revoked.

(4) Any amendments made to the list of threshold values under this regulation shall be considered in the context of the periodic review of the river basin management plan.

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009****Subsidiary
2009/079****This version is out of date**

(5) The threshold values shall be applied for the purposes of assessing groundwater chemical status and determining the starting point for trend reversal under regulations 4 and 5 respectively.

Assessment of groundwater chemical status.

4.(1) The Competent Authority shall use the following approach for the purposes of assessing the chemical status of a body of groundwater pursuant to paragraph 2.3 of Schedule 6 to the Water Framework Rules—

- (a) groundwater quality standards as mentioned in Schedule 2 to these Regulations; and
- (b) assessment procedure in accordance with paragraphs 1 to 4 of Schedule 3 to these Regulations.

(2) Groundwater shall be considered to be of good chemical status when—

- (a) the relevant monitoring demonstrates that the conditions set out in paragraph 2.3.2 of Schedule 6 to the Water Framework Rules are being satisfied;
- (b) the values for the groundwater quality standards listed in Schedule 2 to these Regulations and the relevant threshold values established in accordance with regulation 3 and Schedule 1 to these Regulations are not exceeded at any monitoring point in any body of groundwater; or
- (c) the value for a groundwater quality standard or threshold value is exceeded at one or more monitoring points in any body of groundwater but an appropriate investigation in accordance with Schedule 3 confirms that—
 - (i) on the basis of the assessment referred to in paragraph 3 of Schedule 3 to these Regulations, 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 the table at paragraph 2.3.2 of Schedule

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

**Subsidiary
2009/079**

6 to the Water Framework Rules are being satisfied in accordance with paragraph 4 of that Schedule;

- (iii) for bodies of groundwater identified in accordance with rule 7(1) of the Water Framework Rules, the requirements of rule 7(2) of those Rules are being satisfied in accordance with paragraph 4 of Schedule 3 to these Regulations;
- (iv) the ability of the body of groundwater to support human uses has not been significantly impaired by pollution.

(3) The choice of the groundwater monitoring sites shall satisfy the requirements of paragraph 2.4 of Schedule 6 to the Water Framework Rules, on being designed so as to provide a coherent and comprehensive overview of groundwater chemical status and to provide representative monitoring data.

(4) The Competent Authority shall publish a summary of the assessment of groundwater chemical status in the river basin management plan which shall 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.

(5) Where groundwater is classified as being of good chemical status in accordance with this regulation, the Competent Authority shall take such measures as may be necessary in accordance with rule 9 of the Water Framework Rules 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.

Significant and sustained upward trends and the definition of starting points for trends reversals.

5.(1) For the purposes of giving effect to paragraphs 2.4.4 and 2.4.5 of Schedule 6 to the Water Framework Rules, the Competent Authority shall, in relation to each body of groundwater that it has characterised as being at risk of failing to meet the objectives under Schedule 7 to those Rules—

- (a) identify any significant and sustained upward trend in pollutant concentrations, groups of pollutants or indicators of pollution; and

ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009

Subsidiary
2009/079

This version is out of date

- (b) determine the starting point for reversal of each trend so identified.

(2) The Competent Authority shall, in accordance with Part II of Schedule 4 to these Regulations, reverse trends which present a significant risk of harm to human health or the environment, through the programme of measures referred to in rule 9 of the Water Framework Rules, in order to progressively reduce pollution and prevent deterioration of groundwater.

(3) The Competent Authority shall determine the starting point for trend reversal as a percentage of the level of the groundwater quality standards set out in Schedule 2 to these Regulations and of the threshold value established pursuant to regulation 3, on the basis of the identified trend and the environmental risk associated therewith, in accordance with paragraph 2 of Part II of Schedule 4 to these Regulations.

(4) The Competent Authority shall, in the river basin management plans, summarise—

- (a) the way in which the trend assessment from individual monitoring points within any body of groundwater has contributed to identifying, in accordance with paragraph 2.5 of Schedule 6 to the Water Framework Rules that that body is 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 determined under sub-regulation (3).

(5) The Competent Authority shall, where it is deemed necessary to assess the impact of existing plumes of pollution in groundwater which may threaten the achievement of the objectives in Rule 10 of the Water Framework Rules and 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 groundwater, and do not present a risk for human health and the environment.

(6) The results of the assessments under sub-regulation (5) shall be summarised in the river basin management plan.

Prevention or limitation of inputs of pollutants into groundwater.

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

**Subsidiary
2009/079**

6.(1) The Competent Authority shall ensure, for the purpose of preventing or limiting inputs of pollutants into groundwater or for both, that the programme of measures set out in Rule 9 of the Water Framework Rules includes—

- (a) all necessary measures in order to prevent inputs into groundwater of any hazardous substances including hazardous substances belonging to groups of pollutants listed in paragraphs 1 to 6 of Schedule 5 and substances belonging to groups of pollutants referred to in paragraphs 7 to 9 of that Schedule, where these are considered to be hazardous;
- (b) for pollutants listed in that Schedule, which are not considered hazardous, and any other non-hazardous pollutants not listed in that Schedule and which present an existing or potential risk of pollution, all necessary measures in order to limit inputs into groundwater so that they do not cause deterioration or significant and sustained upward trends in the concentrations of pollutants in groundwater.

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

Exemptions.

7.(1) Where efficient monitoring of the groundwater has been established in accordance with Schedule 6 to the Water Framework Rules and the monitoring sites meet the requirements of regulation 4(3), the Competent Authority may exempt inputs of pollutants into groundwater from the requirements of regulation 6(1), where it is satisfied that such inputs of pollutants are—

- (a) the result of direct discharges authorised in accordance with the Water Framework Rules;
- (b) of a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater;
- (c) the consequences of accidents or exceptional circumstances of natural cause that could not reasonably have been foreseen, avoided or mitigated;

ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009

This version is out of date

- (d) the result of artificial recharge or augmentation of bodies of groundwater authorised in accordance with the Water Framework Rules;
- (e) incapable, for technical reasons, of being prevented or limited without using—
 - (i) measures that would increase risks to human health or to the quality of the environment as a whole; or
 - (ii) disproportionately costly measures to remove quantities of pollutants from, or otherwise control their percolation in, contaminated ground or subsoil; or
- (f) the result of interventions in surface waters for the purposes, amongst others, of mitigating the effects of floods and droughts, and for the management of waters.

(2) The interventions under sub-regulation (1)(f), including cutting, dredging, relocation and deposition of sediments in surface water, shall not be conducted in a manner which may threaten the achievement of the objectives of these Regulations or the Water Framework Rules and provided that such inputs do not compromise the achievement of the environmental objectives established for the body of water concerned in accordance with the river basin management plan.

(3) The Competent Authority shall maintain a permanent record of every exemption granted under this regulation and the reasons therefore.

(4) The contents of the record of exemptions may be made available to the public and may be notified to the European Commission upon request.

Liability of bodies corporate - general.

7A.(1) A corporate body shall be liable for an offence under these Regulations where that offence is committed for its benefit by a person, acting either individually or as part of an organ of the corporate body, who has a leading position within the corporate body.

(2) For the purposes of subregulation (1), a leading position shall be deemed to exist where such a person has—

- (a) a power of representation of the corporate body;

ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009

This version is out of date

Subsidiary
2009/079

- (b) an authority to take decisions on behalf of the corporate body;
or
- (c) an authority to exercise control within the corporate body.

(3) A corporate body shall be liable for an offence under these Regulations committed by a person referred to in subregulation (1) where lack of supervision or control by that person has made possible the commission of the offence for the benefit of the corporate body by a person under its authority.

(4) Where a corporate body is guilty of an offence under these Regulations and that offence is proved to have been committed with the consent or connivance of, or to be attributable to any neglect on the part of, any person referred to in subregulation (1), or any person who was purporting to act in any such capacity, that person, as well as the corporate body, shall be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

(5) Where the affairs of a corporate body are managed by its members, subregulation (4) shall apply in relation to the acts and defaults of a member in connection with his functions of management as if he were a director of the corporate body.

(6) A fine imposed on an unincorporated association on its conviction for an offence shall be paid out of the funds of the association.

(7) Where an offence under these Regulations committed by a partnership is proved to have been committed with the consent or connivance of or to have been attributable to any neglect on the part of a partner he as well as the partnership is guilty of the offence and liable to be proceeded against and punished accordingly.

Repeal.

8. The Public Health (Pollution of Groundwater) Regulations, 1995 are repealed.

SCHEDULE 1

Regulation 3

**THRESHOLD VALUES FOR GROUNDWATER POLLUTANTS
AND INDICATORS OF POLLUTION**

PART I

Guidelines for the establishment of threshold values

1. The Competent Authority shall establish threshold values for all pollutants and indicators of pollution which, pursuant to the characterisation performed in accordance with the Water Policy Framework Rules, characterise groundwater as being at risk of failing to achieve good groundwater chemical status.
2. Threshold values shall 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 are not being met.
3. When establishing pollutant quality standards threshold values, the Competent Authority shall consider the following guidelines—
 - (a) the determination of threshold values should be based on—
 - (i) the extent of interactions between groundwater and associated aquatic and dependent terrestrial ecosystems;
 - (ii) the interference with actual or potential legitimate uses or functions of groundwater;
 - (iii) all pollutants which characterise bodies of groundwater as being at risk, taking into account the minimum list set out in Part II;
 - (iv) hydro-geological characteristics including information on background levels and water balance;
 - (b) 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;

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

**Subsidiary
2009/079**

- (c) wherever elevated background levels of substances or ions or their indicators occur due to natural hydro-geological reasons, these background levels in the relevant body of groundwater shall be taken into account when establishing threshold values;
- (d) 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 II

**Minimum list of pollutants and their indicators for establishing
threshold values**

4. Substances or ions or indicators which may occur naturally or as a result of human activities or both—

Arsenic
Cadmium
Lead
Mercury
Ammonium
Chloride
Sulphate

5. Man-made synthetic substances—

Trichloroethylene
Tetrachloroethylene

6. Parameters indicative of saline or other intrusions—*

Conductivity

PART III

**Information to be provided with regard to the pollutants and their
indicators**

7. Information to be provided by the Competent Authority with regard to the pollutants and their indicators for which threshold values have been

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

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009****Subsidiary
2009/079****This version is out of date**

established The Competent Authority shall summarise, in the river basin management plan the way the procedure set out in Part I has been followed.

8 The Competent Authority shall provide, where feasible—

- (a) information on groundwater characterised as being at risk and on the pollutants and indicators of pollution which contribute to this classification, including the observed concentrations/values;
- (b) information on groundwater characterised as being at risk and the associated surface waters and directly dependent terrestrial ecosystems, and, in the case of naturally-occurring substances, the natural background levels in the bodies of groundwater;
- (c) 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 or at the level of groundwater;
- (d) the relationship between the threshold values and—
 - (i) in the case of naturally-occurring substances, the observed background levels,
 - (ii) the environmental quality objectives and other standards for water protection that exist; and
 - (iii) any relevant information concerning the toxicology, ecotoxicology, persistence, bioaccumulation potential, and dispersion tendency of the pollutants.

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

Subsidiary
2009/079

SCHEDULE 2

Regulations 4(2) and 5

GROUNDWATER QUALITY STANDARDS

1. For the purposes of assessing groundwater chemical status, the following groundwater quality standards shall be the quality standards in paragraph 2.3.2 of Schedule 6 to the Water Framework Rules.
2. The results of the application of the quality standards for pesticides shall be without prejudice to the results of the risk assessment procedures required by Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market or Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market.

Pollutant	Quality standards
Nitrates	50 mg/l
Active substances in pesticides*, including their relevant metabolites, degradation and reaction products	0,1 µg/l 0,5 µg/l (total)**

*“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.

**“Total” means the sum of all individual pesticides detected and quantified in the monitoring procedure, including their relevant metabolites, degradation and reaction products.

3. Where it is considered that the groundwater quality standards could result in failure to achieve the environmental objectives specified in the Water Framework Rules 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 groundwater, more stringent threshold values shall be established in accordance with regulation 4 and Schedule I.

2005-27

Environment

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

**Subsidiary
2009/079**

This version is out of date

4. Programmes and measures required in relation to such a threshold value shall apply to activities falling within the scope of Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources.

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

**Subsidiary
2009/079**

SCHEDULE 3

Regulations 4 and 5

ASSESSMENT OF GROUNDWATER CHEMICAL STATUS

1. The assessment procedure for determining the chemical status of groundwater shall be carried out in relation to groundwater characterised as being at risk and in relation to each of the pollutants which contribute to groundwater being so characterised.
2. In undertaking any investigations referred to in regulation 4(1)(c), the Competent Authority shall take into account—
 - (a) the information collected as part of the characterisation to be carried out in accordance with the Water Framework Rules, and with paragraphs 2.1, 2.2 and 2.3 of Schedule 1 therein;
 - (b) the results of the groundwater monitoring network obtained in accordance with paragraph 2.4 of Schedule 6 to the Water Framework Rules; 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 Schedule 2 to these Regulations and the threshold values set by the Competent Authority in accordance with regulation 4 and Schedule 1.
3. For the purposes of investigating whether the conditions for good groundwater chemical status are met, the Competent Authority shall, 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 groundwater, estimate the extent 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 are met, the Competent Authority shall, where relevant and necessary, and on the basis of relevant monitoring results and of a suitable conceptual model of groundwater, assess—
 - (a) the impact of the pollutants in the body of groundwater;

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

**Subsidiary
2009/079**

This version is out of date

- (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 groundwater; and
- (e) the risk from pollutants in groundwater to the quality of water abstracted, or intended to be abstracted, from groundwater for human consumption.

5. The Competent Authority shall present the groundwater chemical status of groundwater on maps in accordance with paragraphs 2.4.5 and 2.5 of Schedule 6 to the Water Framework Rules.

6. The Competent Authority shall indicate on these maps all monitoring points where groundwater quality standards and/or threshold values are exceeded, where relevant and feasible.

SCHEDULE 4

Regulation 5(2)

IDENTIFICATION AND REVERSAL OF SIGNIFICANT AND
SUSTAINED UPWARD TRENDS

PART I

Identification of significant and sustained upward trends

1. The Competent Authority shall identify significant and sustained upward trends in groundwater characterised as being at risk in accordance with Schedule 3 to the Water Framework Rules, taking into account the following requirements—

- (1) in accordance with paragraph 2.4 of Schedule 6 to the Water Framework Rules, the monitoring programme shall 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 shall 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.
 - (iii) the identification carried out for the first time shall take into account existing data, in the context of the report on trend identification

ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009

Subsidiary
2009/079

This version is out of date

within the first river basin management plan,
and at least every six years thereafter;

- (iv) take into account the physical and chemical temporal characteristics of groundwater, including groundwater flow conditions and recharge rates and percolation time through soil or subsoil;
- (b) the methods of monitoring and analysis used shall 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 shall 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 shall 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 shall 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.

PART II

Starting points for trend reversals

2. The Competent Authority shall reverse identified significant and sustained upward trends 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 Schedule 2 to these Regulations and of the established threshold values, unless—

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

**Subsidiary
2009/079**

- (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;
 - (d) such later starting point may not lead to any delay in achieving the deadline for the environmental objectives.
- (2) for activities falling within the scope of Directive 91/676/EEC, the starting point for implementing measures to reverse significant and sustained upward trends shall be established in accordance with such Directive and with the Water Framework Rules and, in particular, adhering to environmental objectives for water protection as set out in those rules.
- (3) once a starting point has been established for groundwater characterised as being at risk in accordance with paragraph 2.4.4 of Schedule 6 to the Water Framework Rules, and pursuant to subparagraph (1), it shall not be changed during the six-year cycle of the river basin.
- (4) trend reversals shall be demonstrated, taking into account relevant monitoring provisions contained in paragraph 1(2) of Part I.

**ENVIRONMENT (PROTECTION OF GROUNDWATER)
REGULATIONS 2009**

This version is out of date

SCHEDULE 5

Regulation 6(1)

INDICATIVE LIST OF THE MAIN POLLUTANTS

1. Organohalogen compounds and substances which may form such compounds in the aquatic environment.
2. Organophosphorous compounds.
3. Organotin compounds.
4. Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment.
5. Persistent hydrocarbons and persistent and bioaccumulable organic toxic substances.
6. Cyanides.
7. Metals and their compounds.
8. Arsenic and its compounds.
9. Biocides and plant protection products.
10. Materials in suspension.
11. Substances which contribute to eutrophication (in particular, nitrates and phosphates).
12. Substances which have an unfavourable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc).