Regulation of the Minister of Infrastructure "Regulation No. ... of the Minister of Infrastructure ...
Amendment of the draft 'Requirements and procedure for the construction of drilled wells, boreholes and dug wells'
EXPLANATORY MEMORANDUM

1. Introduction

1.1 Summary of contents

This Regulation is enacted on the basis of Sections 35(6), 43(5), 47(7) and 126(6) of the Building Code.
In 2025, a new complete text of the Minister of Infrastructure Regulation "Requirements and Procedure for the Construction of Drilled Wells, Boreholes and Dug Wells" (hereinafter also referred to as the Drilled Well Regulation) was developed.
The draft regulation was prompted by the need to supplement the regulation of the Minister of Infrastructure, which will come into force at the beginning of 2026, with additional requirements for the construction of boreholes, including drilling methods. Although the requirements for drilling methods were also included in the draft text of the borehole regulation, which was circulated among ministries and interest groups for coordination (EIS: http://eelnoud.valitsus.ee/. Draft file number: 25-1307), it was decided to delete them from the full text. To incorporate these requirements, a draft regulation has been drafted to carry out the procedure for the notification of a technical regulation under Directive (EU) 2015/1535 of the European Parliament and of the Council laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services.

1.2. Author of the Draft Act

The Draft Act and the Explanatory Memorandum were prepared by Kersti Türk, Adviser in the Water Department under the Ministry of Climate (626 2809, kersti.turk@kliimaministeerium.ee) and Hendrik Põldoja, Chief Specialist in the Water Department (626 2861, hendrik.poldoja@kliimaministeerium.ee). The draft was edited by the language editor of the Legislative Drafting Department of the Ministry of Justice and Digital Affairs …. The legal expert assessment of the draft regulation has been carried out by Elina Lehestik, Adviser to the Legal Department of the Ministry of Climate (626 2904, elina.lehestik@kliimaministeerium.ee).

2. Purpose and scope of the Decree

The purpose of the draft regulation is to prevent the deterioration of groundwater conditions, protect the construction of dug wells, boreholes and wells, and ensure the use of drinking water that is safe for human health in the desired quantities. In addition, the regulation aims to contribute to the preservation of good groundwater quality by setting requirements for the construction and design of boreholes and wells.

The explanatory memorandum to the draft regulation on boreholes is available from the draft legislation information system EIS: http://eelnoud.valitsus.ee/. Draft file number: 25-1307.

3. Content and comparative analysis of the Draft

In preparing the draft, consultations were held with the Groundwater Commission, the Commission for the Issuance of Licences for Hydrogeological Work, holders of licences for hydrogeological work, the Estonian Geological Survey and the Environmental Board. The draft regulation has been prepared taking into account the expert opinion of the Estonian Geological Survey dated 19 August 2025, "Opinion of the Estonian Geological Survey on the use of technologies that pull the guide pipe underground during drilling when drilling boreholes" and the expert opinion of Andres Marandi on the proposal of the law firm Sorainen OÜ regarding the draft amendment to Regulation No. 43 of the Minister of the Environment regulating the construction of drilled wells.

The requirements for drilling and construction of drilled wells have been developed taking into account the guidance prepared by the Estonian Geological Survey in 2024 in the framework of the LIFE IP CleanEST integrated water management project ‘Guidelines for taking into account hydrogeological conditions in groundwater monitoring and in the construction, cleaning and conversion of drilled wells’. The recommendations on the establishment and construction of drilled wells given in the report compiled by the Estonian Geological Survey in 2023 as part of the same project, “Summary report on hydrogeological studies carried out within the framework of the LIFE IP CleanEST project (groundwater bodies nos. 1, 5a, 6, 7 and 27; activity C.9 report)”, which was compiled in 2023, have also been taken into account.

During the preparation of the draft regulation on drilled wells, four meetings were held with stakeholders (20.05.2025, 17.06.2025, 17.07.2025 and 30.09.2025) and four meetings of the Groundwater Commission (03.09.2024, 19.02.2025, 22.05.2025 and 29.09.2025) where issues related to the construction of drilled wells and boreholes and the protection of groundwater were discussed. An expanded meeting of the Groundwater Commission was held on 19 February 2025, with the participation of major design and drilling companies. The minutes of the Groundwater Commission meetings are available on the website of the Ministry of the Environment at https://kliimaministeerium.ee/pohjaveekomisjon.

The draft Regulation amends Section 10(7) of the Regulation on Drilled Wells.

For the sake of clarity, we reproduce in the explanatory memorandum the entire text of paragraph 10 and the explanation for it.

§ 10. Requirements for the design and construction of drilled wells and boreholes, including drilling methods

(1) When designing and constructing a drilled well or borehole, the drilling method must be chosen on the basis of a local geological cross-section and hydrogeological conditions in order to ensure the protection of groundwater.
(2) After the completion of a drilled well or borehole, different water layers must not be opened together.
(3) Groundwater protection is deemed to be ensured if the drilling methods and selection criteria set out in Annex E to standard EVS-EN 17522 are followed and the requirements set out in subsections 1, 2 and 6 of this section are met.
(4) Where the standard referred to in paragraph 3 has not been complied with or has been partially complied with in the design or construction of a drilled well, it shall be

demonstrated in the building design documentation or drilling log that the protection of groundwater is ensured and complies with the requirements laid down in paragraphs 1, 2 and 6.
(5) Where appropriate, different drilling methods may be combined for the construction of the same well.
(6) The drilling method used must ensure that compliance with the requirements set out in § 7(1) can be verified and that reliable cementing can be assessed along the entire length of the pipe.
(7) The following conditions must be observed when constructing a drilled well:
1) the final jacketed piping of the drilled well shall be installed only after the borehole has been drilled in its entirety;
2) if a temporary guide pipe has been used during drilling, it shall be removed no later than during the installation and cementing of the final guide pipe;
3) the diameter of the borehole over the entire circumference of the jacketed piping shall be at least 50 mm larger than the outer diameter of the guide pipe to ensure a continuous impermeable insulation layer of cementitious material between the guide pipe and the well wall.
(8) If, during the construction of the heat system borehole, the guide pipe supporting the well is pulled underground during drilling together with the drill, the guide pipe shall be removed from the ground during cementing.

Section 10 sets out the requirements for the design and construction of drilled wells, including drilling methods. During the construction of a well, isolation between the different aquifers shall be ensured in order to avoid the movement of contaminated water into the lower aquifers. When designing and constructing a drilled well or borehole, a suitable drilling method must be chosen on the basis of a local geological cross-section and hydrogeological conditions in order to ensure the protection of groundwater. After the completion of a drilled well or borehole, different water layers must not be opened together.

Several drilling technologies and methods have been developed for the first stage of borehole construction (drilling the borehole), the suitability of which depends primarily on the following factors:
1) the purpose for which the borehole is built – whether it is a drilled well, pile, anchor or geological or geotechnical exploration well;
2) the required depth and diameter of the borehole, which determine the necessary equipment and work procedures;
3) surface and rock properties, which give rise to specific technical requirements, including:
- mechanical energy required to create the hole;
- the amount of material to be removed;
- stability of the borehole wall without or with support.

4)the drilling environment on the ground, including spatial limitations, accessibility and the need for less noisy or smaller-sized equipment;
5) the potential impact of drilling on groundwater layers, which is particularly important in the case of drilled wells – to distinguish them from structural engineering solutions.

Considering all these factors, a suitable drilling technology and method are chosen for the site, each with its own limitations of use and environmental risks. This is precisely why not just any drilling method or technology can be used when constructing drilled wells, simply because it is suitable for some other field of engineering – such as the construction of building piles. In the case of a drilling well as a facility for the extraction of groundwater, the drilling method and technology must be chosen not only on the basis of technical feasibility and drilling speed, but above all on the basis of compliance with groundwater protection

requirements. With the screw drilling method and the double-head drilling method, it is clear that the borehole is stationary, there is a gap, a 50 mm range between the borehole and the jacketed pipe is ensured, and the jacketed pipe goes in.

Each drilling method shall allow:
1) creation of a void behind the jacketed pipe and control of the extent of cementation;
2) secure isolation of groundwater layers;
3) objective controllability of the entire process.

It is presumed that the protection of groundwater is ensured if the drilling methods and the criteria for their selection set out in Annex E to standard EVS-EN 17522 are followed and the requirements laid down in Section 10(1), (2) and (6) of the Regulation are met. In standard EVS-EN 17522 “Design and construction of filled thermal boreholes”, four main drilling methods are set out in Annex E: *auger* drilling, *cable tool drilling, DTH hammer* drilling and spiral drilling. The standard describes the advantages and disadvantages of these drilling methods and the ranges of well depth and diameter when drilling with each drilling method. The same drilling methods are included in the draft standard for water wells (drilled wells) under development, “Wells for water extraction - Part 1: Design” (prEN 18049-1).

If the standard referred to in subsection 3 has not been complied with or has been partially complied with in the design or construction of a drilled well, ensuring the protection of groundwater and compliance with the requirements laid down in subsections 1, 2 and 6 shall be demonstrated in the building design documentation or drilling log.

On the basis of subsection 5, different drilling methods may be combined when constructing the same drilled well. Depending on the geological cross-section and hydrogeological conditions, a combination of different drilling methods may be necessary. For example, in some cases, rotary percussion drilling and spiral drilling methods can be combined to construct the same drilled well or borehole.

Pursuant to paragraph 6, each drilling method must ensure compliance with the requirements for the construction of a drilled well or borehole and verifiability.

Paragraph 7, as amended, sets out the conditions to be observed when constructing a drilled well.
Paragraph 7(1) stipulates that when constructing a drilled well, the final jacketed pipe shall only be installed after the borehole has been drilled in its entirety. The requirement is necessary in order to ensure that the wall of the borehole is maintained until the end of cementation during the construction of the drilled well. The requirement makes it possible to prevent the deterioration of the chemical status of groundwater and the mixing of water from different aquifers. Estonia has complex geological and hydrogeological conditions, with several groundwater layers lying on top of each other. Particularly variable in composition and depth are the crumbly sediments of the Quaternary deposit, which during drilling are often unstable and have a variable water content. Under these conditions, the construction of a drilled well becomes technically complex, and when constructing a drilled well, it must be ensured that the success of the drilled well construction process does not depend solely on the skills or good will of the worker, but can be objectively controlled throughout the entire process. The drilling method used must enable compliance with environmental requirements and their monitoring during drilling; otherwise, its use is not permitted. Only drilling technologies and methods which minimise the risk to the environment, whose safety is verifiable, and whose compliance with the requirements can also be demonstrated in the course of state construction supervision and owner supervision, if necessary, shall be used for

the construction of the drilled wells. Carrying out owner supervision requires additional costs. At the same time, owner supervision during the construction of drilled wells and boreholes helps to prevent subsequent alterations and risks to both groundwater and drinking water. Later in-service costs, including time, will be reduced due to better construction quality. Objective surveillance cannot be ensured in the case of rotary impact drilling, where the guide pipe is moved to the ground with the drill head (in English: *Casing advancing systems – CAS*) and is retained in the drilled well structure as a jacketed pipe.

Based on *the description of the CAS technology,* as well as for all other drilling methods and technologies, owner supervision and state construction supervision can only be carried out if the casing pipe is placed in the full length of the borehole only after the borehole has been completed. Then, during the installation of the jacketed pipe, the supervisor can check the stability of the borehole and its sufficient diameter. The jacketed pipe is inserted to the bottom of the borehole without obstacles, which is a prerequisite for high-quality cementation.

Paragraph 7(2) states that if a temporary guide pipe has been used during drilling, it must be removed no later than during installation and cementing of the final conductor pipe.

A distinction must be made between terms such as guide pipe and jacketed pipe. A guide pipe is understood to be a pipe pushed to the ground during drilling operations, the purpose of which is to support the borehole during the drilling operations. A jacketed pipe refers to a structural element of a drilled well that remains permanently in the ground and is insulated (e.g. cemented), which must ensure the watertightness of the drilled well structure and the insulation of the groundwater layers. The guide pipe and the jacketed pipe perform essentially and technically different functions. Based on the requirements of the draft regulation, it will only be possible to build qualifying wells using *CAS* technology if the following conditions are met:
1)the final jacketed pipe of the drilled well shall be installed only after the borehole has been fully drilled;
2) if a temporary guide pipe has been used during drilling, it shall be removed no later than during the installation and cementing of the final jacketed pipe;
3)The diameter of the drilled well must be at least 50 mm larger than the outer diameter of the jacketed pipe along its entire length to ensure a continuous watertight layer of cement insulation between the jacketed pipe and the borehole wall.

However, if *CAS* technology is applied in such a way that the guide pipe is left in the ground and its installation during drilling is considered to be the installation of the casing pipe, then this approach does not allow compliance with the requirements for watertightness and isolation of groundwater layers set out in the regulation. Most common *CAS* systems are designed and developed in such a way that the borehole created around the guide pipe remains as small as possible in diameter. Its purpose is to restrict the movement of air, water and drill cuttings from the outside of the guide pipe to the ground surface in order to prevent their uncontrolled outflow through the sediments. This situation can cause erosion phenomena resulting in voids or even soil collapse, especially in friable sediments and soft rocks. This is why, *in the case of CAS* technologies, the gap around the drill pipe is usually too small to ensure the watertightness of the structure needed to construct the drilled well. In addition, account should be taken of the fact that wells are never perfectly straight or smooth, but are geologically and mechanically uneven, often slightly curved and rough. Under such conditions, it is highly unlikely that uninterrupted and uniform cementation between the guide pipe and the borehole wall can be achieved. The result is that the installation of the guide pipe as part of *the CAS* system does not allow the creation of a sufficient and continuous insulation layer, which is essential to prevent the flow of water due to pressure and quality differences

between aquifers. It must therefore be concluded that the use of the guide pipe as a jacketed pipe in such a context does not meet the requirements for the construction of a high-quality drilled well.

Pursuant to Paragraph 7(3), the diameter of the borehole must be at least 50 mm larger than the outer diameter of the jacketed pipe throughout the entire length of the jacketed pipe in order to ensure a continuous watertight insulation layer of cement material between the jacketed pipe and the borehole wall.

The *NOVA* technology uses a drill to weld the end of the guide pipe, creating a borehole with a diameter approximately 50 mm greater than the outer diameter of the conductor pipe. For *NOVA* technology the 50 mm requirement is formally met, as the drill head provides the necessary diameter difference. However, it should be noted that technical compliance with the diameter requirement does not in itself guarantee the quality of cementation or the proper watertightness of the drilled well. Geological conditions may cause significant problems during the work:

1) in friable sediments, the wall of the borehole does not remain stable on its own. After drilling, the soil sinks back against the guide pipe, closing part of the area around the pipe before cementing. This prevents the uniform and uninterrupted distribution of the cement mixture around the pipe;

2) in heavier rocks and moraines, it is very common for layers to be uneven, with layers of varying hardness, gravelly components or individual solid cobblestones. Such geological obstacles make the borehole uneven and slightly curved by nature, which is why the guide pipe cannot be expected to be located in the centre of the well after drilling. Even with a 50-mm diameter difference, it is likely that the guide pipe will occasionally touch pieces of rock or the uneven wall of the borehole, creating areas where the cement cannot move around the pipe.

Therefore, it should be emphasised that although the formal minimum requirement for the difference in diameters seems to be met in the case of *NOVA* technology, this does not guarantee compliance with the objective of the regulation, which is the proper isolation of groundwater layers. Uneven contact between the borehole and the pipe with sediment or rock layers prevents cementing and does not allow the creation of a dense, continuous insulation layer around the pipe. The peculiarity of *NOVA* technology is that the crown welded to the end of the guide pipe creates a larger diameter borehole around the pipe, which means that the gap between the guide pipe and the wall is wider than in the *case of the CAS* system. This theoretically allows for cementing, but at the same time opens up the possibility of uncontrolled soil collapse against the guide pipe, which would later be used as a casing pipe.

The use of CAS-type drilling technologies (including *ODEX* and *NOVA)* for the construction of drilled wells is not permitted if the guide pipe used for drilling is subsequently left in the ground as a jacketed pipe. When drilling in this way, it is not possible to ensure the objective controllability of the proper cementing and thereby also the watertightness of the drilled well structure and the isolation of the aquifers as required by the draft regulation (Section 7(1)1) and 4)). The main arguments in support of this position are as follows:

1) there is no objective control of the cementing quality – *the nature of the CAS* technology limits the space around the jacketed pipe, so the cement may not reach evenly and uninterruptedly around the pipe. This may lead to the formation of leakage channels or flow paths, which pose a risk to the protection of aquifers;

2) Difficult geological conditions prevail in Estonia – friable and uneven sediments prevent continuous cementation. Observations by the Estonian Geological Survey have shown that the cement does not cover the entire area around the mantle pipe, which is particularly dangerous from the point of view of groundwater protection;

3) voids and erosion caused by drilling – *when using NOVA* technology, uncontrolled erosion and destabilisation of the drilling environment were observed during the observation, resulting in air and drill cuttings remaining underground. This made cementing technically impossible and the drilling was completed with another technology;

4) compliance with formal measurement limits alone is not sufficient – even if the difference between the diameters of the jacketed pipe and the borehole meets the minimum requirements of the regulation (≥50 mm), this does not automatically guarantee that the cement will be distributed sufficiently and continuously and that there will be no risk of leakage;

5)international practice supports the need for adequate cementation space – European Union standards and, for example, Germany and Canada require a minimum radial gap of 50 mm to allow for sufficient cementation. In the case of CAS technology, this is mostly not achieved.

The use of CAS technology may be permitted as an exception only if:
- the guide pipe is removed after drilling; and
- the jacketed pipe is inserted into a separate guide pipe and
- sufficient cementation space (≥50 mm) is ensured along the entire length of the jacketed pipe. In this case, the *CAS* system shall be used for the well formation phase and not as the final jacketed pipe installation method.

Constitutional analysis
Proposed provision:

(7) The following conditions must be observed when constructing a drilled well:
1) the final jacketed pipe of the drilled well shall be installed only after the borehole has been fully drilled;
2) if a temporary guide pipe has been used during drilling, it shall be removed no later than during the installation and cementing of the final jacketed pipe;
3) the diameter of the borehole must be at least 50 mm larger than the outer diameter of the jacketed pipe throughout the entire length of the jacketed pipe to ensure a continuous watertight layer of cement insulation between the jacketed pipe and the borehole wall.

This is a significant restriction of the freedom to conduct a business as laid down in § 31 of the Constitution, and its constitutional appearance, i.e. proportionality, requires an assessment pursuant to § 43(1)5) of the Code of Good Legislative Practice and Drafting. The fundamental right established in § 31 of the Constitution is a fundamental right with a simple legal reservation, which means that infringement is permitted for any purpose that does not conflict with the Constitution.

1. Appropriateness of the legal provision

1.1. Groundwater protection objectives

Section 53 of the Constitution of the Republic of Estonia stipulates that everyone has a duty to protect the living and natural environment. This means that it must not cause pollution of the environment, including groundwater.

More than 50% of the Estonian population consumes groundwater for drinking water. Thus, the protection of groundwater also ensures the protection of human drinking water and public health.

Articles 4(1)b) and 17 of the European Union Water Framework Directive set out the objectives for groundwater protection, which are good quantitative and chemical status for groundwater. The good chemical status of groundwater is described in Annex V, point 2.3.2, as follows:

The chemical status of the groundwater body is such that the concentration of pollutants:

*— **does not show the consequences of** the influx of saline **or other water** according to the following,*

*— **does not exceed the quality standards applicable under other relevant Community legislation in accordance with Article 17,***

*— **does not cause failure to achieve the environmental objectives established under Article 4 for the associated surface waters** or significant damage to terrestrial ecosystems directly dependent on the groundwater body due to the ecological or chemical status of such bodies.*

*Changes in electrical conductivity do not indicate the inflow of saline **or other water into the groundwater body**.*

Article 6 of the Groundwater Directive specifies that, *for pollutants listed in Annex VIII to Directive 2000/60/EC which are not considered hazardous and for all other non-hazardous pollutants not listed in that Annex which Member States consider to present an existing or potential risk of pollution, all necessary measures must be taken to limit inputs into groundwater, ensuring that such inputs do not lead to deterioration of the status of groundwater or to significant and sustained upward trends in the concentration of the pollutant in groundwater. When implementing such measures, at least established good practices, including good environmental practices and best available techniques as set out in relevant Community legislation, shall be taken into account*.

The objectives of protection of groundwater have been transposed into Estonian law in Section 35 of the Water Act and the prohibition on pollution of groundwater is laid down in Section 116(1). This means that all activities affecting groundwater must be in line with the groundwater protection objectives set out in the Water Framework Directive and the Water Act.

The proposed legislation lays down conditions for drilling technologies in the construction of drilled wells and thermal wells in such a way as to prevent pollution and deterioration of groundwater from the ground. When a drilled well is built, the pipe remains in the ground and the cement is poured around the pipe, but this does not always ensure the insulation of the water layers, and the water layers can mix with each other, and the influx of rainwater or surface water into the drilled well is not excluded. The mixing of water layers or the influx of rainwater or surface water into deep groundwater layers could lead to groundwater contamination and deterioration of its quality, which would mean that Estonia would not meet the objective of groundwater protection set out in the Water Framework Directive.

In its judgement in Case C-461/17, the European Court of Justice found as follows:

1. Article 4(1)a)(i) to (iii) of Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy must be interpreted as meaning that, in the absence of a derogation, Member States must refuse to approve a specific project where it is liable to deteriorate the status of a body of surface water or to jeopardise the achievement of good surface water status or of

good ecological potential and good surface water chemical status at the time provided for in that directive.

2. The term "deterioration of a surface water body" in Article 4(1)a)(i) of Directive 2000/60 is to be interpreted as meaning that deterioration occurs when at least one quality element, within the meaning of Annex V to the Directive, falls below a class, even if that degradation does not lead to a lower classification for the entire surface water body. However, where a relevant quality element, within the meaning of this Annex, is already included in the lowest class, any deterioration of that element shall be understood to mean a 'deterioration' of a surface water body within the meaning of Article 4(1)a)(i).

Although the decision concerns surface water bodies, the same can be said about groundwater, as the protection objectives are similar and interrelated – Member States may not permit activities that degrade the quality of groundwater.

1.2. Potential impact of restricted technology on groundwater quality

The proposed legislation lays down the conditions for the construction of a drilled well. The purpose of the restriction is to avoid the risk of groundwater contamination that may arise upon the construction of a drilled well, since it is not possible to ensure cementation between the ground and the jacketed pipe when using some technologies, if the guide pipe is left in the ground as a jacketed pipe. As a result, soil, surface water, rainwater or water from upper water layers may enter the groundwater, which may contaminate the groundwater layer opened by the drilled well with groundwater that does not belong there (KeÜS [Environmental Protection Act] § 7 lg 5). Such an activity qualifies as an environmental hazard within the meaning of Section 5 of the KeÜS – there is a sufficient likelihood of a significant environmental nuisance (Section 3 of the KeÜS), which must be avoided in accordance with Section 10.

The Estonian Geological Survey has submitted a comprehensive expert opinion on the technologies described above to the Ministry of Climate in a letter dated 19 August 2025, ref. no. 10-3/25-1348, the summary of which is as follows:

According to the evaluation of the Estonian Geological Service (EGT), the use of CAS-type drilling systems, including the NOVA method, in the construction of wells is not permissible if the guide pipe used in the drilling is subsequently left buried in the ground as a jacketed pipe. The reason for this is that it is not possible to ensure the objective controllability of proper cementing when drilling in such a manner, and thereby also the watertightness of the drilled well structure and the isolation of aquifers, as required by Regulation No 43 of the Minister for the Environment (Section 9(1)1) and 3)).

The main arguments in support of this position are:

***1.** There is no objective control of the quality of cementing – the nature of CAS technology limits the space around the jacketed pipe, which means that the cement may not reach the pipe evenly and continuously. This results in the formation of leakage channels or flow paths that threaten the protection of groundwater layers.*

***2.** Difficult geological conditions prevail in Estonia – friable and uneven sediments prevent continuous cementation. Practical observations by EGT have shown that cement does not cover the entire circumference of the casing pipe, which is particularly dangerous from the point of view of groundwater protection.*

***3.** Voids and erosion caused by drilling – When using the NOVA method[1], uncontrolled erosion and destabilisation of the drilling environment were observed in the soil, resulting in air and drill cuttings remaining underground. This made cementing technically impossible and the drilling was completed with another technology.*

[1] The NOVA method is also CAS technology.

4. *Compliance with formal measurement limits alone is not sufficient – even if the difference between the diameters of the jacketed pipe and the borehole meets the minimum requirements of the regulation (≥50 mm), this does not automatically guarantee that the cement will be distributed sufficiently and continuously, thereby eliminating the risk of leakage.*

5. *International practice supports the need for adequate cementation space – EU standards and practices in Germany and Canada, for example, require a minimum radial gap of 50 mm to allow for sufficient cementation. In the case of CAS technology, this is mostly not achieved.*

A guide pipe is a temporary pipe that is forced into the ground during drilling operations and is designed to support the well during drilling. The guide pipe shall not be part of the permanent construction of the well and shall be removed or remain a temporary support during the drilling phase, but shall not perform the function of the final jacketed pipe unless all insulation and cementing requirements of the Regulation are ensured. A jacketed pipe is a structural element of a drilled well that remains permanently in the ground and around which an insulation layer is created (e.g. cementation). The jacketed pipe ensures the watertightness of the drilled well, allows reliable isolation of different aquifers and protects the aquifer from external contamination and mixing of water layers.

On the basis of this expert opinion, it can be argued that the restriction is appropriate as it avoids the risk of groundwater contamination.

2. Necessity of the legal provision

2.1. Threat and risk to the environment and the precautionary principle

The Estonian Geological Survey did not present direct evidence of groundwater contamination, but from the point of view of groundwater protection, a situation where groundwater is contaminated should not arise, because groundwater contamination is irreversible. Pursuant to § 5 and § 10 of the KeÜS, environmental hazards must be prevented and therefore no situation may arise where there is a risk of groundwater contamination. It is not possible to present direct evidence of groundwater contamination because a direct causal relationship between the construction of a drilled well and poor groundwater quality is difficult or sometimes impossible to identify. This would require complex and costly studies, which do not always make it possible to confirm or disprove the causal link.

An assessment by the Estonian Geological Survey shows that groundwater contamination is sufficiently likely, i.e. there is a risk of groundwater contamination that must be prevented. Changes in groundwater may not be immediately noticeable, but will become apparent over a longer period of time as the groundwater layer mixes with water coming in from above. If such changes are identified, this is already an irreversible situation. An average of approximately 1,200 drilled wells are constructed each year. The more this drilling technology is used in the construction of drilled wells, the higher the risk of groundwater contamination.

In such a situation, it is appropriate to apply the precautionary principle, according to which, where an activity presents a risk to human health or the environment, precautionary measures must be taken even if certain aspects of the causal link have not been fully scientifically proven. The obligation to apply this principle is laid down in Article 191 of the Treaty on the Functioning of the European Union, and its application has been justified by the European Court of Justice in several judgements. The Supreme Court has also applied this principle in its judgements.

The analysis to be carried out by the Member State can undoubtedly show that there is a high degree of scientific and experiential uncertainty in this regard. Such uncertainty, which cannot be separated from the concept of prudence, affects the scope of the Member States'

discretion and is reflected in the ways in which the principle of proportionality is applied. It should be recognised that, in such a situation, a Member State may, on the basis of the precautionary principle, take protective measures without waiting for the reality and severity of those risks to be fully established (see, to that effect, judgement of 5 May 1998, C-157/96: National Farmers' Union and Others [1998] page I-2211, point 63. However, the assessment of the risk cannot be based purely on hypothetical considerations (see, in this regard, the judgement of 9 September 2003 in Case C--236/01: Monsanto Agricoltura Italia and Others [2003] ECR page I-8105, point 106 (C-333/08, paragraph 91).

Where it is not possible to determine with certainty the existence or extent of the alleged risk because of the insufficiency, inconclusiveness or inaccuracy of the results of the studies carried out, but the likelihood of actual harm to public health persists on the assumption that that risk materialises, the precautionary principle justifies the adoption of restrictive measures where they are non-discriminatory and objective (judgement of 28 January 2010, Commission *v France,* C-333/08, EU:C:2010:44, point 93).

*...In order to enforce the prohibitions arising from § 55(61) of the LKS [Nature Conservation Act] by means of a precept provided for in § 7(1)3) of the LKS, there need not be absolute certainty or certainty adjoining it. A specific threat is sufficient, i.e. a situation where, based on an objective assessment of the circumstances, it can be considered sufficiently likely that the protected legal interest will be harmed in the near future (cf. § 5 of the General Part of the Environmental Code Act (*KeÜS); KorS [Law Enforcement Act] § 5(2)). *For the purpose of determining the risk, it is not necessary to prove the location of the bird nests on the allocation by direct evidence. In accordance with the precautionary principle, conclusions about nesting can also be drawn indirectly, using general ornithological knowledge and methods that are widely accepted by the scientific community. It is not unreasonable to assume that birds are nesting during the nesting season based on the type of forest and the identification of a few individuals, even if the forest manager did not notice any birds during an observation at some point.* (Supreme Court judgement 3-21-1266, p 25).

Preventive and precautionary measures must be taken to protect groundwater if there is reasonable suspicion that groundwater may be contaminated as a result of the use of a particular drilling technology, and the best measure for this is to restrict the use of such technology. The expert opinion of the Estonian Geological Survey expresses scientifically justified doubts about the risk of groundwater contamination when using the *CAS* technology for drilling drilled wells. The regulation may impose restrictions on activities if the law authorises this and sets out the framework. In addition to the prohibition on groundwater pollution under the Water Act (Section 116(1)), the structure (drilled well) and its construction must also be safe for the environment (Section 8 of the Environmental Protection Act).

The precautionary principle must ensure a high (not the highest) level of protection without unduly impairing economic development and the welfare gains expected from it. At the same time, it is clear to the author that scientific uncertainty, which is at the heart of the precautionary principle, makes "keeping under control" problematic. How, for example, to define appropriate precautionary measures in situations where the long-term effects associated with a certain activity or substance are almost unknown.[2] To this can be added the question of how to define precautionary measures in a situation where the impact of the drilling method on groundwater quality cannot be clearly determined.

CAS technology would be suitable in an area where the soil sediment is not brittle, i.e. the deposition of sediment behind the casing pipe is minimised. Therefore, the method is also available in e.g. Finland, where a large part of the soil forms granite. In Estonia, there may also be areas where the soil could be suitable for the use of *CAS* technology. Unfortunately,

[2] Veinla, H. Precautionary principle. Doctoral thesis. Tartu, 2004. p. 205

there is no comprehensive geological map of Estonia with sufficient accuracy to identify the locations of the suitability of the method. This means that in order to use this technology, a geological survey would have to be carried out at the planned location each time, which would make the method infeasible in terms of time and cost.

Restrictions on the use of drilling technology are based on the precautionary principle and the necessary minimum to ensure the protection of groundwater, and less burdensome conditions do not ensure equivalent protection of groundwater.

1. **Moderation of the provision**

It is reported that in Estonia, *CAS* technology is used by two enterprises for drilling boreholes and wells. The draft regulation provides for a transitional period *of two years for the entry into force of restrictions on the use of CAS* technology. This time will be sufficient for companies to replace (e.g. sell the equipment) the equipment related to the *CAS* drilling technology, if necessary, as the method will continue to be used for the construction of thermal coring.

Considering the objective of protecting groundwater as a natural resource and as a source of drinking water for humans, such interference with two companies can be considered moderate.

Comparison with other countries

At meetings with stakeholders and as a comment from the consultation round, it was pointed out that with the Bill the state is planning to ban one technology on the market in a situation where other EU Member States allow it. Stakeholders indicated that, for example, the CAS drilling technology is used in Finland and Sweden.
The authors of the Bill explain that the main difference between Estonia and Finland and Sweden is that in Estonia the crystalline rocks (granites, gneiss, etc.) of the basic order are covered by thick layers of sedimentary rocks (limestone, sandstone, etc.). In Estonia, crystalline bedrock rocks are not exposed on the surface as much as in Finland. The differences in the geological cross-section also result in differences in hydrogeological conditions. In Estonia, the hydrogeological cross-section consists of several water-rich layers of water standing on top of each other and water bars separating them. In Finland and Sweden, groundwater is mainly located in fissures in the bedrock and in Quaternary sediments (sand, gravel, etc.) covering them. Therefore, comparisons with Finland and Sweden are not relevant.

Paragraph 8 stipulates that if, when constructing a borehole for a geothermal system, the guide pipe supporting the borehole is pulled underground together with the drill during drilling, the guide pipe must be removed from the ground for the duration of the cementing process. This is done because it cannot be guaranteed that the empty space between the borehole and the jacketed pipe will be cemented. The interior of the well in the closed geothermal system shall be cemented and the cementation of the space between the jacketed pipe and the borehole shall not be checked during construction. Therefore, it is necessary that the guide pipes are pulled out of the hole during the cementing process. This reduces the risk of groundwater contamination from upper layers and geothermal borehole, making their construction safer in densely populated areas.

The Regulation shall enter into force on 1 January 2028.

4. Compliance of the Draft with European Union law

The Draft Regulation is not related to the transposition of European Union law. This is a national legislation aimed at ensuring the protection of groundwater in the construction of drilled wells and boreholes.

5. New definitions

The Draft Regulation does not use any new definitions.

6. Impact of the Ordinance

The implementation of the Regulation will affect the contracting entities of drilled wells, builders and officials handling administrative acts related to construction.

Target group: Landowners in the municipalities, and other persons who order drilled wells and boreholes as well as geothermal drilled wells and boreholes.

Impact on subscribers: minor positive impact. With greater legal clarity, those commissioning drilled wells and boreholes can be more confident than before that they will receive a high-quality drilled well or borehole.
With the entry into force of the Regulation, the cost of creating one metre of well may become more expensive up to EUR 24 per metre. An analysis of the price offers for drilled wells submitted under the Distributed Settlement Programme 2025 revealed that the minimum cost of drilling one metre was 50 euros and the maximum cost was 74 euros. Drilled well design, coordination, transportation, water sampling and analysis and pumping works were included in the price quotes. Therefore, the price differences between the quotations were not significant. The standard depth of a drilled well drilled for a single household is 30 metres. For example, the cost of a 30-metre-deep borehole would be between €1,500 and €2,220. However, the cost of building a drilled well is not determined purely by technology, but by a combination of several factors (e.g. labour costs, transport, etc.).

For the construction of a drilled well, it is possible to receive support from the local government within the framework of the sparsely populated area programme.[3] The maximum support amount is EUR 6,500 per one household. The prices for the establishment of a water system (drilled well, piping, water treatment equipment, pump, etc.) for a household vary between EUR 6,000 and EUR 9,000. The financial contribution of the applicant and co-applicant to the eligible costs must be at least 33%. For example, if a water system costs EUR 9,000, the amount of own financing is EUR 3,000; if it costs EUR 6,000, the amount of own financing is EUR 2,000. Therefore, if support is received, the price difference should be up to EUR 1,000, but this price difference is not due to the drilling method, but is the result of the combined effect of several factors.

Target group: entrepreneurs engaged in the design (34) and construction (34) of drilled wells and boreholes.
Impact on business: Minor positive impact. Drillers of drilled wells and boreholes must provide high-quality services, so the regulation will not have any new impact on companies operating in the sector. Clarification of the rules will guide design and drilling companies to design and drilled wells and boreholes that do not endanger groundwater quality and ensure better drinking water quality for consumers.

[3] https://www.riigiteataja.ee/akt/115072023019?leiaKehtiv

Companies that use the so-called *ODEX* and *NOVA* drilling technologies to build wells are the most affected by the Regulation. This concerns only 6 % of drilling companies authorised in the register of economic activities to carry out hydrogeological work in the field of drilling wells and boreholes. In total, as of 9 September 2025, such authorisation was granted to 34 companies, and only two of them have used the *ODEX* and *NOVA* drilling technology for the construction of drilled wells. A total of 6,425 drilled wells and boreholes were drilled in 2022-2024. Drilling companies that used *ODEX* and *NOVA* drilling technology drilled approximately 35% of the drilled wells. In 2024, this percentage was 31 %. At the same time, these companies have drilling technology that allows them to use spiral drilling and dual-rotary drilling, and this technology is also used. Operators *using ODEX* and *NOVA* technology will incur costs due to changes in requirements due to the need to partially replace drilling techniques and equipment. Drilling techniques and equipment that do not meet the requirements for the construction of new drilled wells can be sold to undertakings that build construction piles, geothermal piles and geotechnical boreholes, for which such drilling techniques and equipment have been developed.
The regulation reduces some of the inequality between drilling companies, as it creates legal clarity in the selection and use of different drilling methods and technologies, which helps drilling companies plan investments in new drilling techniques and equipment upgrades.
After the completion of the drilled well and borehole, the submission of data to an undertaking holding an activity licence for hydrogeological works will become faster and easier as a result of the information technology development works of the Estonian nature information system.

Impact on groundwater and drinking water: negligible positive impact. Drilled wells may pose local, rather than regional, risks to groundwater. As a result of compliance with the requirements of the regulation, drilling companies will henceforth construct higher-quality drilled wells and boreholes using appropriate drilling technologies and methods. The risks associated with the use of unsuitable drilling technology and drilling method for drilled wells and boreholes prior to the introduction of the Regulation have been mitigated. The construction of a drilled well or borehole in violation of the requirements set out in the Regulation may result in a negative impact on groundwater quality. Such negative effects are often irreversible for the client, and a new drilled well must be drilled, which makes water availability costly. Drilled wells constructed in accordance with the requirements reduce the risk of negative impact on groundwater quality and result in better quality drinking water.

7. Necessary costs and estimated income from the implementation of the Regulation

The implementation of the Regulation will not lead to additional costs or revenues.

8. Entry into force of the Regulation

The Regulation shall enter into force on 1 January 2028. A transitional period is needed for drilling companies to bring the drilling techniques required for the construction of bore wells and boreholes into line with the requirements of the drilling technology and drilling methods set out in the Regulation.

9. Approval of the Draft Act

The full text of the draft Regulation on wells, which included provisions to be added by this draft, was submitted for approval to the Ministry of Economic Affairs and Communications, the Ministry of Social Affairs and the Ministry of Regional Affairs and Agriculture via the Information System of Draft Regulations (EIS). The draft regulation was also sent for

comment to drilling companies, the Association of Estonian Cities and Rural Municipalities, the Estonian Waterworks Association, the Estonian Environmental Partnership, the Estonian Heat Pump Association, the Estonian Mining Association, the Geological Society of Estonia, the University of Tartu, and the Institute of Geology at Tallinn University of Technology. The law firm Sorainen OÜ, representing the drilling company, submitted comments on the provisions to be added by this draft. The Ministries and other authorities and organisations did not submit comments on these provisions. The comments from the law firm Sorainen OÜ have been replied to by letter No. 1-4/25/5175-4 of the Ministry of Climate of 14 January 2026.