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# General Rules

**CVE 2262867**

**MINISTRY OF ENVIRONMENT**

## ESTABLISHES POLLUTANT EMISSION STANDARD IN PIG FACILITIES WHICH, DEPENDING ON THEIR ODORS, GENERATE DISCOMFORT AND CONSTITUTE A RISK TO THE QUALITY OF LIFE OF THE POPULATION.

No. 9.- Santiago, January 21, 2022.

[PREAMBLE]

The provisions of Law No. 19,300, on General Bases of the Environment; in Law No. 18,575, Constitutional Organic of General Bases of the State Administration, whose revised, coordinated and systematized text was established by decree with force of law No. 1/19,653, of 2000, of the Ministry of the General Secretariat of the Presidency ; in Law No. 19,880, which Establishes the Bases of the Administrative Procedures that Govern the Acts of the Bodies of the State Administration; in Supreme Decree No. 38, of 2012, of the Ministry of the Environment, which approves the Regulations for the Dictation of Environmental Quality and Emission Standards; in exempt resolution No. 440, of 2020, of the Ministry of the Environment, which establishes the Environmental Regulation Program, 2020 - 2021; in exempt resolution No. 1,081, dated November 14, 2018, of the Ministry of the Environment, which begins the preparation of the draft standard for the emission of pollutants in pig farms that, based on their odors, generate discomfort and constitute a risk to the quality of life of the population; in exempt resolution No. 1,405, dated November 5, 2019, and in exempt resolution No. 75, dated January 29, 2020, both of the Ministry of the Environment, which extend the term for the preparation of the aforementioned draft; in the exempt resolution No. 574, of June 30, 2020, of the Ministry of the Environment, which approves the Draft Standard for the Emission of pollutants in pig farms that, based on their odors, generate discomfort and constitute a risk to the quality of life of the population; in exempt resolution No. 1,354, of December 3, 2020, of the Ministry of the Environment, which puts an end to the suspension of the term indicated and submits the aforementioned Draft to public consultation; in the office ord. No. 205180, of December 16, 2020, of the Ministry of the Environment, which requests the opinion of the Draft from the Advisory Council of the Ministry of the Environment; in the Minutes of the first ordinary session of the Advisory Council of the Ministry of the Environment, dated February 23, 2021; in the Minutes of the first ordinary session of the Council of Ministers for Sustainability, and, in Agreement No. 1, both dated

January 13, 2022; in resolution No. 7, of 2019, of the Comptroller General of the Republic, which sets rules on exemption from the process of recording; in the other antecedents that support the contents of this norm and that work in the public file; and,

Considering:

1.- That, article 19 No. 8 of the Political Constitution of the Republic, assures all people the right to live in an environment free of contamination. Likewise, it enshrines the duty of the State to ensure that this right is not affected and to protect the preservation of nature. In addition, it indicates that the law may establish specific restrictions on the exercise of certain rights or freedoms to protect the environment.

2.- That, in accordance with the provisions of the second paragraph of article 40 of Law No. 19,300, on General Bases of the Environment, the Ministry of the Environment is the body of the State Administration that is responsible for proposing, Facilitate and coordinate the issuance of emission standards.

3.- That, the Regulation that establishes the procedure for the issuance of Environmental and Emissions Quality Standards, SD No. 38, of 2012, of the Ministry of the Environment, provides in its Article 4, first paragraph that: "The emission standards are those that establish the quantity maximum allowable for a pollutant, measured in the effluent of the emission source, whose presence in the environment, at certain levels, may constitute a risk to people's health, to the quality of life of the population, to the preservation of nature or to the conservation of the environmental heritage.". Additionally, in its final paragraph it states that "For the purposes of this regulation, the effluent from the emission source will consider not only what is emitted or discharged by the pipes, ducts or chimneys of the source, but will cover what is emitted or discharged by any another way, whenever it is possible to calculate it and impute it to the emission source.".

4.- That odors are considered disturbing elements of human health, The latter is understood by the World Health Organization (WHO) as the "complete physical, mental and social well-being, and not merely the absence of infirmity or disease"[1].

5.- That, among the effects that annoying odors generate on people's health found: insomnia, bad mood, headache, irritation of the mucous membranes, stress, nausea and vomiting. These effects alter people's quality of life and, consequently, their health.

6.- That, likewise, it should be considered that the human olfactory system is highly sensitive and is capable of detecting chemical substances, of a wide range of compounds, in extremely low concentrations. In this sense, the WHO has indicated that: "Some substances possess malodorous properties at

[1] June 19 to July 22, 1946, signed on July 22, 1946 by the representatives of 61 States (Official Records of the World Health Organization, No. 2, p. 100), and entered into force on April 7, 1948

concentrations much lower than those at which toxic effects are produced"[2]. Due to the above, odors and their regulation are not based on the toxicology, since odor detection is performed at a much earlier stage.

7.- That, in Chile, there have been various emblematic cases related to episodes of odors that have caused conflict due to their discomfort, affecting people's quality of life. In relation to environmental problems that afflict citizens, odors occupy the Second place in matters most denounced in the Superintendence of the Environment. From its creation and until 2020, about 13% of the complaints have to do with this matter.

8.- That, in this context, the Ministry of the Environment is implementing the Odor Management Strategy for 2014, updated in 2017, approved by exempt resolution No. 1,536, dated December 29, 2017, of the Ministry of the Environment. The focal points of this Strategy are: regulatory strengthening, gathering information, increasing knowledge, intersectoral coordination and institutional strengthening.

9.- That, from the implementation of the Strategy, the Ministry of the Environment has collected sufficient information for the preparation of this emission standard. In this context, in 2013, the final report of the consultancy "Antecedents for the Regulation of Odors in Chile" carried out by Ecotec Ingeniería Ltda[3]. For its part, in 2014, the study "Generation of Background for the Preparation of a Regulation for Control and Prevention of Odors in Chile" carried out by Aqualogy Medio Ambiente Chile S.A.[4] Likewise, in 2016, the final report of the consultancy "Legal Analysis of Environmental Smells in Chile" carried out by Marcela Fernández Rojas[5]. Additionally, the year 2019, the study "Generation of Technical Background for the Preparation of the Odor Emission Standard for Intensive Animal Husbandry" made by The Synergy Group SpA[6]. Finally, in 2019, the study "Antecedents for the Preparation of the Economic Analysis of the Odor Emission Standard for the Pig Sector" carried out by Dictuc S.A.[7]

10.- That, based on the information collected through these studies, two thousand establishments with twelve different activities potentially generating annoying odors have been identified[8]. Each activity has different production processes, as well as, various types of odor sources.

11.- That, among the activities that show the greatest presence at the national level and number of complaints about odors, there are animal breeding and fattening farms, plants processors of hydrobiological resources, sewage treatment plants, pulp mills, and final waste disposal sites. Although these are not the only

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[2] World Health Organization. Regional Office for Europe. (2000). Air quality guidelines for Europe, 2nd ed. Copenhagen: WHO Regional Office for Europe.
[3] http://metadatos.mma.gob.cl/sinia/articles-55386_InformeFinal12013ECOTEC.pdf
[4] https://olores.mma.gob.cl/wp-content/uploads/2019/03/Informe-Final-Aquology-2014.pdf
[5] https://olores.mma.gob.cl/wp-content/uploasd/2019/04/Estudio-Nacional-Analisis-juridico-Añp-2016.pdf
[6] https://olores.mma.gob.cl/wp-content/uploads/2019/05/P5605-MMA-RF10-28mar19-Publicado.pdf
[7] https://catalogador.mma.gob.cl:8080/geonetwork/srv/spa/resources.get?uuid-5e961dc4-e848-4994-9b5t-t9c5845a6e17&fname-Normol-Informe%20final&20(vf).pdf&access=public.
[8] Informe Final del Estudio "Antecedentes para la Regulación de Olores en Chile", de 2013, realizado por Ecotec.

activities that generate annoying odors, they correspond to the prioritized activities for their regulation in accordance with what is indicated in the Strategy in accordance with the following criteria: number of complaints by sector, number of establishments by sector and socio-environmental conflicts.

12.- That, by virtue of the foregoing, there is a need to develop standards aimed at reducing the emissions of pollutants generated by said sources, which, in depending on their smell, are likely to affect the quality of life of the population. it in a way to grant due protection to people's health and improve their quality of life.

13.- That, based on the foregoing, the Ministry of the Environment resolved to start the preparation of a standard for the emission of pollutants generated by pig farms.

14.- That most of the odorant emissions from a pig herd, and that can derived from this activity, are emitted by emission units (sources) of diffuse type odor, that is, that their emissions are not channeled through ducts or chimneys. In this way, said odorant emissions must be obtained through an odor emission rate, due to its nature of passive and active diffuse and the fact that the sampling of odors from said emission units involves the use of equipment that has special characteristics to sample a determined surface. For this reason, the odor emission limits in this standard are expressed in Odor Emission Rates (ROE) that correspond to the units of odor per unit of time emitted by a certain emission unit, and which allows determining the emissions for all kinds of emission units.

15. That this regulation has a technological focus, so to determine the values established as emission limits, the best available technologies (BAT) have been used applicable to odor emission units, for reduction at the source. In this context, maximum limits are established that imply the reduction of the Odor Emission Rates, through compliance with the maximum odorant impact allowed in the case of new emission sources or from large existing sources, or from the percentage reduction according to emission unit, in the case of existing small and medium sources. In this way it establishes a quantifiable odor emission rate value through measurement under standardized procedures.

16.- It is important to keep in mind that in pig farms, the emissions come from mainly from the slurry treatment and disposal areas. Of these, the records show that the highest emission factors[9] are found in the emission units of composting and facultative lagoons. The aforementioned, according to the study carried out for the background survey "Generation of Technical Background for the Preparation of the Odor Emission Standard for Intensive Animal Husbandry" made by The Synergy Group SpA.[10]

[9] https://olores.mma.gob.cl/wp-content/uploads/2019/05/P5605-MMA-RF10-28mar19-Publicado.pdf
[10] https://olores.mma.gob.cl/wp-content/uploads/2019/05/P5605-MMA-RF10-28mar19-Publicado.pdf

17.- That, within the classifications of best available techniques are the technologies as well as good operational practices. Thus, for the management of odors, it becomes important to clearly identify the emission units that can potentially emit odors at the emission source and operational practices that reduce such emissions, particularly those related to the operating conditions with the most unfavorable effects that may occur at a given emission source.

18.- That the sector to be regulated has two singular characteristics that distinguish it from other potentially odor-generating sectors. First, there is variability in sizes of pig herds to regular, in which the smallest are approximately 750 animals and the largest of approximately 400,000 animals. Second, the heterogeneity in the configuration of pig herds, where odor emission depends of different factors associated with the design and maintenance of each one of the production plants, as well as management and technology. For this reason, the emission limits established by this standard are differentiated according to the size of the emission source, so that emission sources of the same size advance their technological standard for odor reduction at a similar pace. Thus, the regulatory design of odors for the pig sector considers a specific regulation according to the size of the source station and in a staggered manner, which allows taking note of the particularities of each type of source and its production processes.

19.- That the measurement of odors is objectively standardized internationally through technical standards, and the measurement procedures that have been considered for this standard is already officially approved in the country.

20.- That the General Economic and Social Analysis of the Preliminary Project resulted in the standard would reduce the current odor concentration levels, improving the quality of life of approximately 40,600 people. The regulation provides benefits of US$27 million in value present value and costs reach US$30 million in present value, resulting in a benefit/cost ratio of 0.90. AGIES also quantifies the mitigation of other negative externalities such as the generation of greenhouse gases and local atmospheric pollution.

21.- That it is important to highlight within the co-benefits of this regulation the reduction of greenhouse gases, specifically methane, generated in the anaerobic decomposition both in the digestive tract of animals and during storage of droppings of organic matter. In the pig sector most of the methane emitted is related to the storage of manure (slurry), both in lagoons and in interior pits under the pavilions. In these storages, although the anaerobic conditions are not strict, anaerobic fermentations take place, which are source of this gas. The foregoing becomes relevant considering that the Intergovernmental Group of Experts on Climate Change (IPCC) in their latest report[11] indicate that limiting other greenhouse gases and air pollutants, especially methane, could be beneficial both for health and for the climate.

[11] IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the

22.- That, through exempt resolutions No. 177, of March 10, 2016; No. 1,439, of 27 December 2018; and No. 440, of May 26, 2020, all from the Ministry of the Environment, it was established within the programmatic priorities of this Secretary of State, to elaborate a norm that regulates the emission of odors.

23.- That, through exempt resolution No. 1,081, dated November 14, 2018, it was the Beginning of the preparation of the Preliminary Draft Norm for the Emission of Pollutants in Campuses pigs that, based on their odors, generate discomfort and constitute a risk to the quality of life of the population.

24.- That, through exempt resolution No. 574, of June 30, 2020, of the Ministry of Environment, the Draft Pollutant Emission Standard was approved in pig farms that, based on their odors, generate discomfort and constitute a risk to the quality of life of the population and the public consultation was suspended until the business day following the end of the State of Constitutional Exception, of catastrophe due to public calamity.

25.- That, through exempt resolution No. 1,354, of December 3, 2020, of the Ministry of the Environment, the suspension of the period indicated in recital precedent and the Draft was submitted to public consultation.

26.- That the public consultation process was carried out between December 16, 2020 and 12 March 2021, an instance that had an active participation of natural and legal persons, receiving 309 observations. The comments received were analyzed and considered in the elaboration of this decree.

27.- That the Advisory Council of the Ministry of the Environment heard and issued its favorable opinion regarding the text of the Preliminary Draft, in ordinary session No. 1, held on 23 of February 2021, the minutes of which are available on pages 543-552, of the file of the rule.

28.- That the Council of Ministers for Sustainability ruled favorably on the Definitive Draft of the Pollutant Emission Standard in pig farms that, based on their odors, generate discomfort and constitute a risk to the quality of life of the population, in ordinary session No. 1, of January 13, 2022, which is stated in Agreement No. 1, of the same date.

Decree:

Approve the standard for the emission of pollutants in pig farms that, depending on the their odors, generate discomfort and constitute a risk to the quality of life of the population, which is of the following tenor:

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Sixth Assessment Report of the Intergovermental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Pean, S. Berger, N. Caud, Y. Chen, L. Golfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekc, R. Yu, and B. Zhou (eds)]. Cambrigde University Press. In Press.

## TITLE I

## General disposition

**Article 1.** Objective. The purpose of this standard is to protect the health of the population and improve their quality of life. As a result of its application, it is expected to prevent and control the emission of contaminants in pig farms that, depending on their odors, generate discomfort and constitute a risk to the quality of life of the population.

**Article 2.** Territorial Scope. This emission standard will be applied throughout the National territory.

**Article 3.** Definitions. For the purposes of the provisions of this standard, it shall be understood by:

a) Area of influence: is the area that is included within the established radius due to the odor contour range of 1 $ou_E/m^3$, in the 95th percentile for existing emission sources and 98th percentile for new emission sources, determined by odor modeling, according to the technical guidelines issued by the Superintendence of the Environment.

b) Most unfavorable condition: corresponds to the operating conditions of the source station at its maximum real capacity, considering the highest load of animals with the highest rate of odorant emission, the maximum volume of area sources in use, and the operation, in its condition of maximum emission, of all parts and works that generate odor emissions.

c) Emission source: every pig farm whose number of animals is a number equal to or greater than seven hundred and fifty (750), whose physical space consists of one or more sectors of breeding, fattening and/or reproduction of pigs, operated technically and administratively together, whether or not they share a treatment system. In case a shared treatment system by two or more emission sources, and that is not within the sectors that make up these emission sources, the emissions will be attributed to whoever contributes a greater slurry ratio.

To determine if a pig herd has the quality of emission source, they should only considered those pig animals whose weight exceeds 25 kilos.

d) Small emission source: an emission source whose number of pig animals is a number equal to or greater than seven hundred fifty (750) and less than or equal to twenty-five thousand (25,000).

e) Medium emission source: an emission source whose number of pig animals is a number greater than twenty-five thousand (25,000) and less than or equal to fifty thousand (50,000).

f) Large emission source: an emission source whose number of pig animals is a number greater than fifty thousand (50,000).

g) Existing emission source: an emission source that has obtained a resolution of environmental qualification, or is in operation, prior to the entry into force of the present standard.

h) New emission source: an emission source that is not an existing emission source upon the entry into force of this decree.

i) Maximum odorant impact: it is the maximum odor concentration in $ou_E/m^3$ that a receiver can sense, determined by atmospheric dispersion modelling.

j) Lagoon: an in depth deposit, whose purpose is the storage or retention of the pig slurry, resulting from the homogenization and/or separation process. The following are not considered lagoons for the purposes of this standard, the treatment lagoons by biodigesters or the lagoons of post-treatment accumulation of biodigestion. Likewise, the gaps in treatment and post-treatment by aerobic digestion are also not considered lagoons.

k) NCh3190: Official Chilean Standard NCh3190.of2010, from the National Institute of Standardization, called Air Quality - Determination of Odor concentration by Dynamic olfactometry.

l) NCh3386: Official Chilean Standard NCh3386.of2015, from the National Institute of Standardization, called Air Quality - Static sampling for olfactometry.

m) Nch3431-2: Official Chilean Standard NCh3431-2.of2020, from the National Institute of Standardization, called Determination of diffuse emissions by measurements - Part 2: Industrial sheds and livestock farms.

n) Receiver: any person who inhabits, resides or remains in an enclosure, either in a private home or in a workplace, located outside the perimeter of the property of the source station and within its area of influence, that is or may be exposed to odors generated from that source.

o) Sector: physical unit delimited by one or more pavilions, which house porcine animals, that have common sanitary-productive management and biosafety measures and that belong to the same campus.

p) Superintendency or SE: Superintendency of the Environment.

q) Rate of Odor Emission (ROE): amount of odorous substances that pass through a defined area per unit of time. This is the product of the odor concentration, the speed and exit area; or, the product of

the odor concentration and the relevant rate of flow volume, for example, in [$m^3$/h]. This unit is [$ou_E$/h] (or [$ou_E$/min] or ($ou_E$/s]).

r) European Odor Unit ($ou_E$): European odor units, which describes the quantity of odorous substance(s) which, when evaporated in one cubic meter of a neutral gas in normal conditions, causes a physiological response from a panel (detection threshold) equivalent to that produced by a Reference Odor Mass (ROM) evaporated in one cubic meter of a neutral gas under normal conditions[12]. The odor concentration at detection threshold is by definition 1 [$ou_E$ /$m^3$], therefore, it is expressed as multiples of the detection threshold.

s) Odor emission unit: passive diffuse sources, active diffuse, diffuse volume or points that potentially generate odor emissions and that are part of any of the areas that make up an emission source, either from the animal housing, or from the treatment and disposal of manure.

## TITLE II

## Odor emission limits for the indicated emission sources

**Article 4.** Odor emission limit for existing emission sources. The sources from existing emission sources must comply with the values indicated in the following table:

**Table 1. Odor emission limit for existing small and medium emission sources**

| Type of emission source | Emission limit in ROE [$ou_E$/t] | % of reduction associated with the emission limit |
|---|---|---|
| Small | $ROE_{LAGOON\ measure\ year}$ x (1 - $X_{LS}$ / 100) | $X_{LS}$ = 70% in Lagoons |
| Medium | $ROE_{LAGOON\ measure\ year}$ x (1 - $X_L$ / 100)<br><br>$ROE_{COMPOST\ AREA\ measure\ year}$ x (1 - $X_C$ / 100) | $X_L$ = 75% in Lagoons<br><br>$X_C$ = 60% in compost area |

$X_{LS}$ = % of reduction related to lagoon from a small emission source

$X_L$ = % of reduction related to lagoon from a medium emission source

$X_C$ = % of reduction related to compost area from a medium emission source

The limit established for the composting area of the medium existing emission sources will not be applicable to those sources that have technologies for the reduction of odors in said area, which allow compliance with the reduction percentages indicated in table 1, such as trenches.

[12] NCh 3190:2010, Chilean technical standard, determination of odor concentration by olfactometry Dynamic.

Medium and small emission sources that must comply with table No. 1 may be exempted to comply with what is indicated in said Table 1, if they accredit a total ROE that allows compliance with a maximum odorant impact of 8 $ou_E/m^3$ P95.

**Table 2. Odor emission limit for large existing emission sources**

| **Type of emission source** | **Emmission limit in ROE [$ou_E$/t]** |
|---|---|
| Large | $ROE_{TOTAL}$<br>Allows achieving a maximum odorant impact of 8 $ou_E/m^3$ P95 |

The limits indicated in this article must be met within a maximum period of 4 years, counted from the entry into force of this standard.

**Article 5.** Odor emission limit for new emission sources. The emission sources new ones must comply with the values indicated in the following table:

**Table 3. Odor emission limit for new emission sources**

| **Type of emission source** | **Emmission limit in ROE [$ou_E$/t]** |
|---|---|
| Large | $ROE_{TOTAL}$<br>Allows achieving a maximum odorant impact of 8 $ou_E/m^3$ P98 |
| Medium and small | $ROE_{TOTAL}$<br>Allows achieving a maximum odorant impact of 10 $ou_E/m^3$ P98 |

The limits indicated in this article must be complied with as soon as the rule is enacted.

**Article 6.** Verification of compliance with the odor emission limit. The verification of Compliance with the limits indicated in the previous article will be carried out in accordance with the following:

a) For existing small and medium emission sources:

a.1) The owner of the emission source must carry out, during the first year of entry into validity of this decree, a measurement of the ROE through an odor sampling in lagoon for small farms and an odor sampling for medium farms in the lagoon and/or in the area composting, considering the most unfavorable condition, and report the results to the SE, within the same term.

a.2) The SE will verify that the measurement has been carried out in accordance with the methodologies authorized and will establish, through a resolution, the ROE based on which the limit can be calculated odor emission for the emission source, according to Table 1.

a.3) To prove compliance with the applicable emission limits as calculated from according to numeral a.1) above, within a period of 6 months from the expiration of the term of four years referred to in article 4, the owner of the emission source must carry out a measurement of the ROE through an odor sampling in the lagoon and/or the composting area, as appropriate, considering the most unfavorable condition, and report said results to the SE in the same term. The six-month period may be modified by the SE, in case of that the most unfavorable condition of the emission source is verified at a different time, which will be established in the resolution issued by the Superintendency referred to in the literal former.

a.4) To prove compliance with the applicable emission limits as calculated in a.1) above, the following years, after the delivery of the first compliance report, the owner of the emission source must carry out an annual measurement of the ROE through a sample of odor in the lagoon and/or the composting area, as appropriate, considering the most unfavorable, and report their results to the SE within the same year.

b) For large existing emission sources:

b.1) The owner of the emission source must carry out, during the first year of entry into validity of this decree, the measurement of the total ROE, that is, of all the units emitters of odor from the emission source, considering the most unfavorable conditions of operation.

Additionally, you must carry out a modeling of all the odor-emission units to determine the total ROE that allows the maximum odorant impact to be met, considering all those receivers that are within the area of influence of the emission source. For the calculation of the ROE that allows reaching the maximum odorant impact, expressed in $ou_E/m^3$, the impact value will be shortened, that is, the fractional part of that number will be suppressed, to get an integer.

The results of the measurement of the total ROE, as well as of the modeling carried out, including the identification of recipients, must be reported to the SE within the same term.

b.2) The SE will verify that the measurements and modeling of all emission units odor, has been carried out in accordance with the authorized methodologies and will establish through resolution the total

ROE corresponding to the first year and the total ROE that allows compliance with the maximum odorant impact for the emission source.

b.3) To prove compliance with the applicable emission limits as calculated from according to numeral b.1) above, within a period of 6 months from the expiration of the term of four years referred to in article 4, the owner of the emission source must carry out an annual measurement of the total ROE of said source, considering the most unfavorable, and report their results to the SE within the same term. The six month period may be modified by the SE in the event that the most unfavorable condition of the source issuer is verified at a different time, which will be established in the resolution issued by the Superintendence referred to in the previous literal.

b.4) After the delivery of the first compliance report, the owner of the emission source must perform an annual measurement of the total ROE through odor sampling, considering the most unfavorable condition, and report their results to the SE within the same year.

c) For new emission sources:

c.1) Within the first year of the start of the operation of the new emission sources, the holder must perform the measurement of the total ROE of said source, considering the most unfavorable operating conditions. Additionally, the holder must perform a modeling of all the odor emission units to determine the total ROE that allows compliance with the odorant impact maximum, considering all those receivers that are within the area of influence. For the calculation of the ROE that allows reaching the maximum odorant impact, expressed in $ou_E/m^3$, the impact value will be shortened, that is, the fractional part of said number, to get an integer.

The results of the measurement of the total ROE, as well as of the modeling carried out, including receivers, must be reported to the SE within the same term.

c.2) The SE will verify that the measurements and modeling of all emission units odor has been carried out in accordance with the authorized methodologies and will establish through resolution the total ROE corresponding to the first year and the total ROE that allows compliance with the maximum odorant impact for each emission source as calculated according to numeral c.1) former. Based on said information, it will verify compliance with the limits established in the article 5.

c.3) From the second year after the operation of the new emission sources began, the owner of the emission source must carry out an annual measurement of the total ROE through odor sampling, considering the most unfavorable condition, and report their results to the SE within the same year.

**Article 7.** Relationship with odor limit values set in environmental qualification resolutions. Existing emission sources that have odor emission limits set in their respective environmental qualification resolutions, which are more demanding than those indicated in this rule, must comply with the limit established in said resolution.

## TITLE III

## Operational Practices for Emission Control

**Article 8**. Operational practices for the control of odor emissions. For the purpose of minimize odor emissions, all emission sources must inform the Superintendency of the Environment, the following:

a) The conditions in which the cleaning of the pavilions is carried out and its periodicity, reporting the type of construction.

b) The conditions in which the turning of the solid fraction treated by means of composting, if applicable, identifying the most favorable weather conditions for the area for the realization of this. In addition, it will consider a preventive warning mechanism to the community about carrying out this action.

c) The operating conditions of technologies related to odor emissions used in the emission units, including the following information:

i. All emission sources must inform the instructions of the supplier of the equipment and procedures specified in the maintenance plan.

ii. Medium and large emission sources must report the inspection program that include observations of the appearance of the equipment, as well as online monitoring of operational operating parameters. In accordance with its powers and the instructions issued in this regard, the SE may require online monitoring of trace gases from said equipment, such as ammonia, hydrogen sulfide and/or organic compounds total volatiles or similar.

d) The conditions of transport of slurry, guano and/or sludge, including the quantity, the type of transport used, destination of each trip, frequency of travel and routes through which they travel.

e) An odor contingency plan that aims to immediately communicate when a contingency occurs to the Superintendence of the Environment within 24 hours after the contingency occurred, and the municipality to which the emission source belongs, as well as the corrective actions taken.

f) Identification of the operational conditions of all emission units, as well as the most unfavorable operating conditions of the emission source, including number of existing pig animals by type of breeding and installed capacity, among other circumstances that are relevant for said purposes.

Existing sources should provide information on operational practices in the term of 1 year from the entry into force of this decree through the report to which referred to in Article 11. As of the second year, records must be kept that certify compliance with operational practices, which may be required by the Superintendence of the Environment.

For new emission sources, they must provide information on practices operations in the initiation report referred to in article 11. From the second year of operation, records must be kept that certify compliance with the practices operational, which may be required by the Superintendence of the Environment.

## TITLE IV

## Measurement procedures

**Article 9.** Measurement procedures. Measurement procedures and protocols, verification and accreditation of the requirements of this standard will be established by the Superintendence of the Environment considering, at least, the technical standards NCh3190, NCh3386, and NCh3431-2, or those that replace them, for which they will have a period of 6 months counted from the entry into force of this decree.

## TITLE V

## Reporting system and delivery times

**Article 10.** Compliance with and monitoring of the requirements of this standard must be informed to the Superintendence of the Environment, through a reporting system, which will include:

a) Startup report; and,

b) Compliance report.

The Superintendence of the Environment, within a period of 6 months from the entry into force of this decree, will establish the form in which the reports will be presented, It will specify its content, as well as the means for it.

**Article 11.** Commencement report. The emission sources must submit an initiation report, which must contain, at least, the following information:

a) Cadastre and description of all the odor-emission units of the emission source, which are located within the perimeter of the property where said source is located.

b) Operational practices, in accordance with article 8.

Additionally, existing emission sources that must comply with article 4 must include the following information in the startup report:

c) Small emission sources: the result of the ROE measurements in the lagoon.

d) Medium emission sources: the result of the ROE measurements in lagoon or composting area, as appropriate.

e) The emission sources that must evaluate their maximum odorant impact: all the information that allows reproducing the modeling, in accordance with what is indicated in the Guide for the use of Air Quality models of the Environmental Impact Assessment System, approved through exempt resolution No. 1,010 of the Executive Directorate of the SEA, dated August 6, 2015, or the one that replaces or complements it. Existing emission sources must submit this report to the Superintendence of Environment within one year from the entry into force of this decree. For their part, new emission sources must submit this report to the Superintendence of Environment within one year from its entry into operation.

**Article 12.** Compliance report. The emission sources must submit a report of compliance, which must contain, at least, the information related to the results of measurement of the ROE, which allow accrediting compliance with the emission limits, to which Articles 4 and 5 refer.

Existing emission sources must submit this report to the Superintendence of Environment, within a period of 6 months from the expiration of the 4-year term indicated in article 4, or the one that the Superintendence establishes according to the most unfavorable. Subsequently, they will be sent annually.

The new emission sources must submit this report to the Superintendence of the Environment from the second year from the start of operation on an annual basis.

## TITLE VI

## Control and supervision

**Article 13.** Control and Oversight. The control and supervision of this standard will correspond to the Superintendence of the Environment, in accordance with its organic law contained in the second article of Law No. 20,417.

**Article 14.** Sending information to the Ministry of the Environment. For the purpose of collect background information for future revisions of this standard, the Superintendence of the Environment must send annually from the first year of entry into force of this decree, to the Ministry of the Environment the systematized information of:

a) Startup reports.

b) Compliance reports.

c) Contingencies informed by the holders in the period.

d) Complaints received regarding each emission source.

e) Examinations carried out.

f) Initiated sanctioning processes and their results.

## TITLE VII

## Validity

**Article 12.** Validity. This Decree shall enter into force from the date of its publication in the Official Journal.

Write it down, take reason and publish it.- SEBASTIÁN PIÑERA ECHENIQUE, President of the Republic.- Javier Naranjo Solano, Minister of the Environment.

What I transcribe for you for the purposes you deem pertinent.- Maximiliano Proaño U., Undersecretary of the Environment.

COMPTROLLER GENERAL OFFICE OF THE REPUBLIC

Legal Division

**Decree No. 9, of 2022, of the Ministry of the Environment is in scope**

N° E299246/2023.- Santiago, January 16, 2023.

This Control Entity has given effect to the individualized decree in the item, which establishes Standard for the Emission of Pollutants in Pig Farms that, depending on their odors, generate discomfort and constitute a risk to the quality of life of the population, of the Ministry of Environment, insofar as it conforms to the law.

However, it complies with pointing out that the aforementioned ministry must maintain in its website permanently available to the public, the content of the Chilean standards to which that is referred to in

the emission standard in question, by virtue of the principle of publicity enshrined in article 8 of the Political Constitution of the Republic. (Applies criteria of official letter No. 38,112, of 2017).

With the foregoing scope, the document under review has been taken into account.

Yours sincerely, Jorge Andrés Bermúdez Soto, Comptroller General of the Republic.

To the Mrs

Environment Minister

Present.