

The regulatory issue of outfall discharge in Brazil

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Abstract

Nowadays, Brazilian law does not mention the disposal through ocean outfalls. Resolution CONAMA 357/05, which governs the conditions and effluent discharge standards, does not establish the standard and the level of treatment required for sewage to be disposed in the ocean through outfalls. Thus, during the licensing process for ocean disposal system, environmental agencies confirm the design and establish the criteria for discharge and for monitoring the effluent and receiving water body.

In 2008, a new resolution to CONAMA 397/08 amended limit of some parameters of the Resolution CONAMA 357/05, and established the creation of Working Group to submit proposals about additional conditions and effluent discharge standards.

Regarding the sanitation sector was discussed and approved the following proposal: “The discharge of sewage through outfalls must comply the quality standards of the receiving body, after the limit of the mixing zone and the standard of bathing, in according with the standards and laws existing. This discharge must be preceded by the treatment that ensures the attendance of the following conditions and specific standards, safeguarding all other applicable requirements: I - pH between 5 and 9; II - temperature: below 40 ° C; III - after desanding; IV - coarse solids and floating material: virtually absent, and V - total suspended solids: minimum efficiency of removal of 20% after desanding”.

Thus, this new resolution establishing viable and possible limits to be reached served by sanitation companies in the country. In preparing this draft resolution, it was understood that, because it is a federal law, it must have as its premise the viability of attendance for all states, within the limits of its possibilities and its different stages of development in terms of sanitation basics. One goal of the revised Resolution CONAMA is to reach the universal sanitation.

Keywords

Regulatory; outfall discharge; quality standards.

INTRODUCTION

How is basic sanitation in Brazil? In terms of collection and transport of waste, the current state of sanitation in Brazil is precarious. According to the SNIS - National Information System on Sanitation in 2007 the national rate of collection of sewage from service providers in Brazil was only 42% and from the total sewage generated, only 32.5% were treated (SNIS, 2009). The rest of the sewage generated is disposed into the environment, contaminating soil, rivers, reservoirs and beaches across the country, causing direct harm to public health. We have to consider also the large discrepancy between the attendance rates of different regions of the country. The North and Northeast have rates of 5% and 18% of sewage collection, respectively, while the Southeast and Midwest had rates of 65.3% and 43.9% respectively. In the figure below is presented the thematic map of the indices of service with wastewater collection in Brazil.

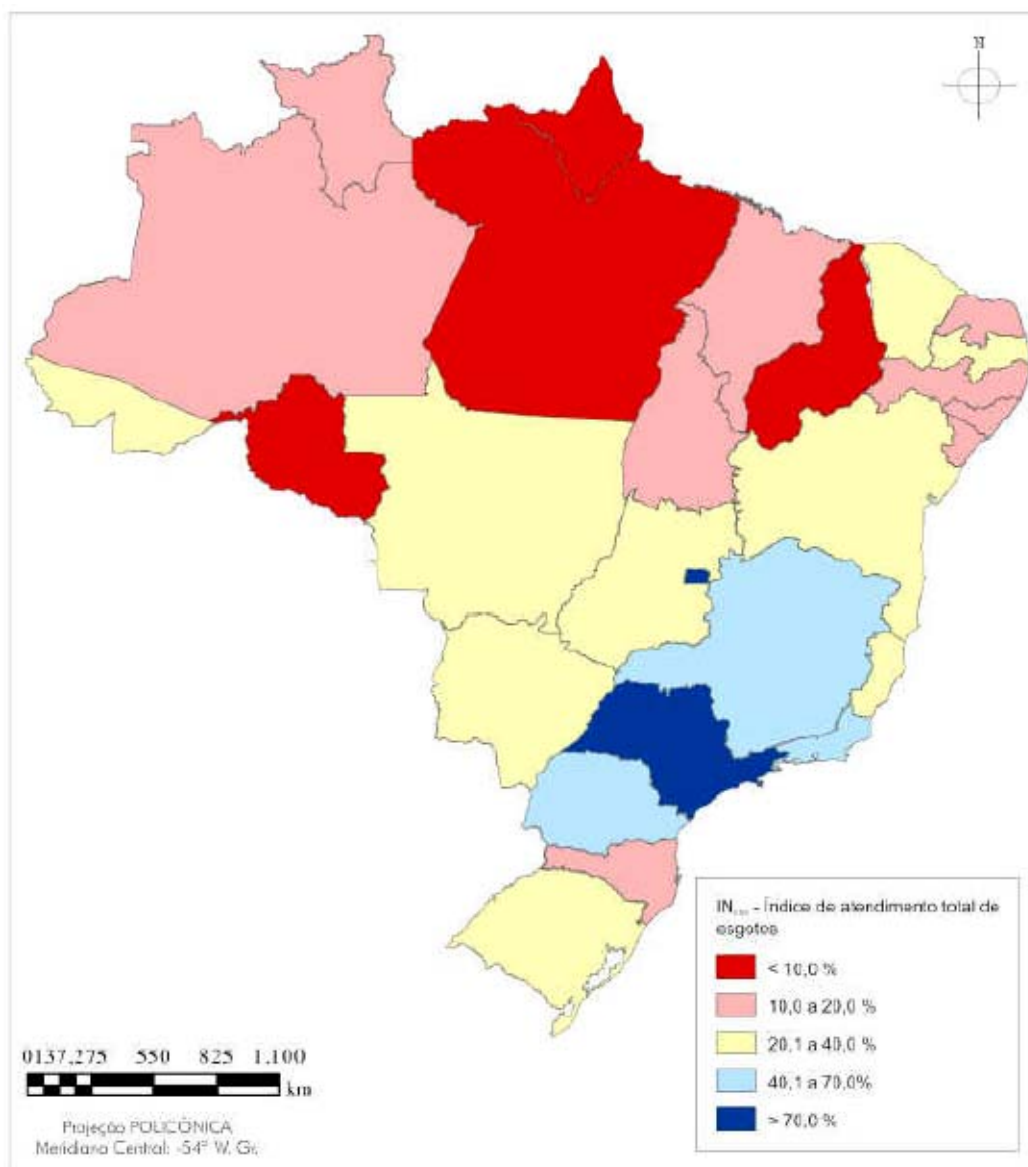


Figure 1 - Index of service to total sewage collection (SNIS, 2009)

Given this situation, a recent law that established national guidelines for basic sanitation, Law 11.445/07 (Brazil, 2007), points out:

I - Universal access;

III - water supply, sanitation, urban sanitation and solid waste management performed in a manner appropriate to public health and environmental protection;

V - adoption of methods, techniques and processes that consider the local and regional peculiarities;

VII - Use of appropriate technologies, considering the payment capacity of users and the adoption of gradual and progressive solutions, (Brazil, 2007, p. 1)

Based on fundamental principles highlighted, it is clear the desire to improve the current conditions of basic sanitation in Brazil.

More specifically with regard to wastewater treatment units, we have:

Article 44. The environmental licensing of treatment facilities for sewage and effluents generated in the processes of water treatment efficiency will consider steps to progressively achieve the standards set by environmental legislation, according to the payment capacity of users. (Brazil, 2007, p. 14).

It is understood, therefore, that the law 11.445/07 (Brazil, 2007) establishes national guidelines that would require a company (sanitation) comply with the general conditions to provide of basic sanitation services and it has as a premise to attend parameters and quality standards and causing minimal environmental damage. Several concepts should be clear that there is this understanding, especially those regarding environmental legislation and the establishment of conditions and effluent discharge standards. Thus, within the theme, is intended to present and justify the environmental regulations and the recent revision approved in plenary at the Ministry of Environment. This review established for the first time in the country, discharge standards for effluent outfalls.

THE CURRENT BRAZILIAN REGULATORY

Added to Sanitation Law, Law 11.445/07, quoted above, the entire framework of environmental laws and resolutions establishing the standards of water quality and conditions of sewage discharge.

As environmental legislation, this work presents items of Resolution CONAMA 357/05 (Brazil, 2005), which provides for the classification of water bodies and establishes the conditions and standards for effluent discharge, and CONAMA 397/08 (Brazil, 2008) amending the section II of § 4 and Table X of § 5, both of art. 34 CONAMA 357/05.

Nowadays, Brazilian law does not mention the disposal through ocean outfalls. Resolution CONAMA 357/05, which governs the conditions and effluent discharge standards, establishes that "the effluent from any source of pollution can only be discharge, directly or indirectly into water bodies, after appropriate treatment and complying with the conditions, standards and requirements that are in this Resolution and other applicable regulations." Nevertheless, the resolution does not establish the standard and the level of treatment required for sewage to be disposed in the ocean through outfalls. Thus, during the licensing process for ocean disposal system, environmental agencies confirm the design and establish the criteria for discharge and for monitoring the effluent and receiving water body.

One important item of CONAMA 397/08 (Brazil, 2008) is:

"Article 2 CONAMA will create working group, within 180 (one hundred and eighty) days, submit proposals on complementary conditions and effluents discharge standards for the sanitation sector. "

Thus was constituted in September 2008 the Working Group on conditions and standards for effluent discharge with the 1st meeting of the Working Group on October 7, 2008. The last meeting of this Working Group took place on the 5 and 6 November 2009 and the latest proposed revision is discussed below (MMA, 2009).

Discussion in the GT and justifications for the proposal from AESBE

At meetings of the Working Group discussions were heated around a few themes, namely: a proposal for inclusion of the parameter Biochemical Oxygen Demand ($BOD_{5, 20}$, 5 days to 20), all tests should be performed by laboratories accredited by INMETRO; obligation and establishment of standard ecotoxicity tests, and setting conditions and specific standards for discharge of sewage through outfalls.

The conditions and specific standards for discharge of sewage through outfalls, because the little-known technology of technicians in the sanitation sector, the discussions were extensive, but finally clarifying, remaining, at last, two proposals: the AESBE (Association of State Basic Sanitation Companies) and CNI (National Confederation of Industry) in opposition to CETESB (Environmental Company of São Paulo) and CRQ (Regional Council of Chemistry).

Conceptually, the outfalls have as main objective the provision of sewerage of coastal municipalities in order to protect the area from bathroom and mitigate the impacts of the discharge through the optimal and rapid dilution through diffusers. By the Brazilian legislation for the protection of bathing water, the ocean disposal must meet the limits of the bathing CONAMA Resolution 274/00 (Brazil, 2000), and the effluent discharge must attend the CONAMA Resolution 357/05.

AESBE's proposal was intended to establish conditions and discharge standards for outfalls than those established for the wastewater treatment plants, precisely because of the specific technology of ocean disposal. This proposal largely meets the emissaries already settled in the coastal region of Brazil are currently around 20 units, necessitating the immediate adequacy of some of them. It was understood that, because it is a federal law, it must have as its premise the viability of attendance by all states, within the limits of its possibilities and its different stages of development in terms of basic sanitation.

The question was brought up not to discuss what type of treatment should be applied to ocean disposal, given that each site presents its own peculiarities, and therefore the solutions should be separated and analyzed on a case under the environmental regulatory bodies States. It was intended to establish here a minimum treatment to be given before the proper launch ocean, considered approach at the national level. What was intended with the establishment of minimal processing, is that this is sufficient in general situations and more favorable disposition in coastal waters.

Importantly, it is understood by general situations and coastal environments favorable to the open sea, with the hydrodynamics of ocean currents and depths of launch capacity of dilution and dispersion of the effluent. Situations such as bays, inlets, channels and low dynamic environments must be examined in particular cases.

Regarding the necessity of higher treatment levels, treatment systems should be studied case by case basis. Studies of ocean disposal of sewage through outfalls require knowledge of geometrical characteristics and dynamics of receiving bodies. The geometric characteristics are established through knowledge of bathymetry and bottom contours of the coastline. The dynamic characteristics are established through knowledge of the hydrodynamics of ocean currents, as well as full understanding of the inherent variability of the oceans and their long-term trends.

Thus, each system being deployed has a characteristic in relation to the effluent to be released and oceanographic aspects, which gives a combination of solutions that can only be considered on a case by case basis. Assessments of the degree of impact of ocean disposal must be done through the

environmental monitoring programs, so that corrective measures can be taken if the launch conditions significantly affect the local ecosystem.

It should be remembered that, besides meeting the proposed emission standard, the concentration of pollutants in the effluent released through the outfall must attend the class standard set by CONAMA 357/05, outside the mixing zone law.

THE NEW BRAZILIAN LAW

Therefore, in September 2008 the Working Group was constituted to propose changes in conditions and standards for effluent discharge. The last meeting of this Working Group was on 5 and 6 November 2009 and its discussion was closed at the Technical Chamber and adopted at 101^a Meeting of 30 and 31 March 2011 (CONAMA, 2011).

Articles relating to ocean disposal are presented below:

In its Article 1, is defined: "This resolution supplements and amends the CONAMA 357/05, determining the conditions, parameters and standards for direct discharge of effluent in the receiving body".

In SECTION II - Conditions and Standards for effluent discharge, we have:

“Article 19. The sewage discharge effected through outfalls should take proper after treatment standards and discharge conditions set out in this resolution, grade standards of the receiving body, after the limit of the mixing zone, and the standard of bathing, in accordance with rules and legislations.

Sole Paragraph. The disposal of sewage by outfall at disagreement with the conditions and discharge standards set forth in this Resolution may be authorized by the competent environmental authority as provided for in Article 5, and the environmental study as defined in section III should contain at least:

- I - The conditions and specific standards at the entrance of the emissary;
- II - The study of dispersion in the mixing zone, with two scenarios:
 - a) First scenario: meeting the recommended values in Table I of this resolution;
 - b) the second scenario, conditions and standards proposed by the entrepreneur,
- and
- III - Program of environmental monitoring.”

In SECTION III - Conditions and Standards for Wastewater Treatment Systems Sewage, we have:

“Article 21. The discharge of sewage through outfalls must comply the quality standards of the receiving body, after the limit of the mixing zone and the standard of bathing, in according with the standards and laws existing .

Sole Paragraph. This discharge must be preceded by the treatment that ensures the attendance of the following conditions and specific standards, safeguarding all other applicable requirements:

- I - pH between 5 and 9;
- II - temperature: below 40 ° C, the temperature variation of the receiving body must not exceed 3 ° C at the limit of the mixing zone;

III - after desanding;
IV - coarse solids and floating material: virtually absent, and
V - total suspended solids: minimum efficiency of removal of 20% after desanding.”

CONCLUSION

Thus, this new resolution establishing viable and possible limits to be reached served by sanitation companies in the country. In preparing this draft resolution, it was understood that, because it is a federal law, it must have as its premise the feasibility of attendance for all states, within the limits of its possibilities and its different stages of development in terms of sanitation basics. We must remember that, in according to the SNIS - National Information System on Sanitation, in 2007 the national rate of sewage collection in Brazil was only 42% and the total sewage generated only 32.5% were treated. The rest of the sewage generated is dumped in the environment, contaminated soil, rivers, reservoirs and beaches of the whole country causing direct harm to public health.

The necessity of establishing a federal law covering the ocean disposal systems is essential for the legalization and adequacy of systems in operation, so as to provide the minimum guidelines for future project development. Therefore, it was necessary to define a minimum treatment and the establishment of general criteria for discharge of effluent by outfalls.

The term preconditioning should not be understood as low efficiency, but in the widest sense of previous treatment. The adequacy of effluent to be discharged in accordance with the conditions of self-purification potential of the receiving body to be used.

Thus, the minimum treatment proposed in the review CONAMA is sufficient to attend the technical, environmental and economic Brazilian aspects for the ocean disposal in good conditions of dilution and dispersion.

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