Study on the Permit System of Sewage Discharge Based On Water Pollution

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Abstract. Pollutant discharge standards are a technical legal norm. The essence of emission permit system is to meet the technical standards. Based on the classification of China's two-level and four categories of water pollutant emission standard system, this paper analyses the poor performance of this system. The main reasons are the lack of special laws and regulations, the failure to break through key technical issues and backward management. In view of the key reasons, this paper discusses the feasible solutions. For example, to improve the total amount examination system of the pollutant discharge license, to formulate the relevant technical specifications for the management of the pollutant discharge license, to improve the drainage basin discharge standard with the goal of reaching the water quality standard, and to increase the punishment of illegal discharge.

Keywords: Water Pollutants, Emission Permit System, Total Amount Control, Solutions

1. Introduction
The emission permit system based on water quality refers to the emission permit management system which takes the standard of water environmental quality as the starting point to verify the emission limits of the main pollutants from fixed pollution sources. During the 13th Five Year Plan period, China's emission permit management system has been basically established, relevant laws, regulations, standards and systems have been gradually improved, and the emission permit management will cover all fixed pollution sources nationwide. During the fourteenth Five Year Plan period, it is an inevitable choice to implement the emission permit management system based on the water quality standard.

2. Overview of Technology-Based Discharge Standards in Water Pollutant Discharge License

2.1 China: Water Pollutant Discharge Standard
Article 14 of the law on the prevention and control of water pollution and Article 14 of the law on environmental protection clearly stipulate the national pollutant discharge standards in accordance with the national environmental quality standards and the national economic and technical conditions. Article 9 of the law on the prevention and control of water pollution and article 9 of the law on environmental protection stipulate that when revising the discharge standards of water pollutants, the
local governments shall take these factors into consideration when formulating the standards according to the requirements of water pollution prevention and control and the local economic and technical conditions. Therefore, technical conditions are also important factors to consider in the formulation of water pollutant discharge standards in China. According to Article 10 "discharge standard of water pollutants" and "total discharge control index of key water pollutants" of the law on prevention and control of water pollution, when determining the permitted discharge value of a specific unit, China's discharge license should not only determine the concentration of wastewater through two-level and four types of discharge standards, but also determine the total amount of key pollutants in wastewater by the total discharge control system.

Compared with the United States, China adopts the cognitive model of "general" and "special" for the classification of water pollutants. First of all, in the total amount control, set control indicators of several national key pollutant emission. Secondly, two levels and four categories of emission standards shall be established between the state and local governments. Compared with the model of one-to-one correspondence between American pollutant classification and emission standards, China has not shown a close relationship between the two. Moreover, only 19 provinces and municipalities directly under the central government have formulated local water pollutant discharge standards, which have not achieved the close linkage between national standards and landmarks.

2.2 Class II and Class IV Emission Standards

China's water pollutant discharge standards can be divided into two levels and four categories. According to the effectiveness level and scope of water pollutant discharge standards, they can be divided into national water pollutant discharge standards (hereinafter referred to as "national standards") and local water pollutant discharge standards (hereinafter referred to as "local standards"). In addition, according to the applicable scope, applicable object, regional characteristics and other factors of the standards, the water pollutant discharge standards of each level can be detailed. It is divided into comprehensive water pollutant discharge standard (hereinafter referred to as "comprehensive standard"), industrial water pollutant discharge standard (hereinafter referred to as "industrial standard"), basin water pollutant discharge standard (hereinafter referred to as "basin standard") and specific pollutant discharge standard [1]. There are only two kinds of national water pollutant discharge standard systems, they are comprehensive standard and industrial standard. Although local water pollutant discharge standards are not available in each province or municipality, most provinces and cities have a complete set of four standards.

According to the provisions of the law on the prevention and control of water pollution, when the cross standards of unified pollutants are limited, the stricter standards shall apply, which is the national industrial water pollutant discharge standards (hereinafter referred to as "national industrial standards"). This standards shall prevail over the comprehensive standards, and the stricter local standards shall prevail over the national standards.

The above four categories are aimed at the direct dischargers. In fact, there are indirect discharge standards in China, that is, the receiving standard is implemented according to the water quality standard for sewage discharged into urban sewers (GB/t31962-2015), but it hardly plays a role.

2.2.1 Two Level Standard

As of May 1, 2018, there are 58 effective national water pollutants discharge standards, including 1 comprehensive standard and 57 national industry standards. The trend of national standards can be obtained by counting the number of national standards by year (the old standards that have been replaced by the new standards will be counted in the new standard year, but not repeated in the old standard year). As showed in Figure 1, since 2008, the number of national standards has increased sharply, accounting for 77.6070 of the total number of national standards. In particular, it reached the maximum of 13 items in 2008. The reason for the analysis may be that one of the key points of the water pollution prevention and control law revised and passed in 2008 is to improve the legal requirements for the discharge of water pollutants, which stipulates that "the discharge of water
pollutants shall not exceed the national or local standards for the discharge of water pollutants and the total control indicators for the discharge of key water pollutants." These amendments evoke the national awareness of environmental protection and promote the formulation of industrial water pollutant discharge standards.

Figure 1. Annual Quantity of National Water Pollutant Discharge Standards
As of July 11, 2018, there are 51 current effective local water pollutant emission standards reported to the Ministry of the ecological environment, including 3 indirect emission standards and 4 updated standards. See Figure 2 for the local water pollutant emission standards formulated by each province. Through data analysis, the number of national standards and local standards is roughly the same. Some provinces, such as Henan Province and Shandong Province, give full play to the initiative of local legislation to develop a considerable number of local standards. It can be seen that the national industry standards and local standards are the main force in the development of future emission standards.

Figure 2. Annual Quantity of Local Water Pollutant Discharge Standards
2.2.2 Class IV standards
According to the statistics of current effective local water pollutant discharge standards, there are 20 local industry standards, 13 River Basin standards, 11 comprehensive standards and 7 specific pollutant
standards. Although the hydrological environment is different and the standard setting is different, the overall distribution is relatively average. See Figure 3.

![Classification of current local water pollutant discharge standards](image)

**Figure 3. Classification of Current Local Standards for Discharge of Water Pollutants**

### 2.2.3 Allowable Limits of Wastewater Pollutants

The pollutant concentration of wastewater and the total amount of key pollutants is restricted by the emission permit. The allowable limits are determined as follows.

First, to determine the allowable discharge concentration limits of wastewater pollutants, we need to distinguish the existing pollution sources and new pollution sources, and the existing pollution sources are divided into direct discharge and indirect discharge.

Second, select the standards. The existing pollution sources of direct discharge shall be determined according to the national or local standards, and the indirect discharge of wastewater shall be determined according to the standards through negotiation. Otherwise, it shall be strictly determined according to the comprehensive discharge standard of wastewater. The quality standard of wastewater discharged into urban sewers and the relevant local standards. Newly added pollution sources shall meet the requirements of environmental assessment documents and official reply in accordance with the above areas. With regard to the permitted discharge of wastewater pollutants, the process of determining the concentration limit is similar, but the selection criteria are different. The emission shall take the minimum value for the total amount control requirements and specific formula values (allowable emission of pollutants based on emission standards = allowable emission concentration limit x unit product benchmark displacement x product capacity). If there are specific emission requirements in local areas, they shall be verified according to local requirements. The new pollution sources still meet the requirements of EIA documents.

### 3. Legal and Technological Attributes of China's Emission Standards

#### 3.1 Clear Scientific and Technological Attributes

As Ye Junrong, a jurist in Taiwan, said, "The essence of the principle of promoting science and technology is based on the solution of polluters. When setting environmental protection standards or other regulatory requirements, it is not limited to the existing level of science and technology, or even requires polluters to try to do what today's science and technology cannot do. This dynamic
expectation for the transcendence of science and technology is the essence of the principle of science and technology promotion. "[2]

The setting of environmental standards is a process and result of comprehensive consideration covering complex scientific calculation, data accumulation, model analysis, investigation and research, which show a strong dependence on science and technology [3]. Article 14, 15 of the law on the prevention and control of water pollution and Article 14, 15 of the law on environmental protection clearly stipulate (revise) the environmental standards according to the national (provincial, autonomous region, municipality directly under the central government) environmental quality standards and economic and technical conditions, so the water pollutant discharge standards contain scientific and technological significance.

Not only does the emission standard have the scientific and technological attribute, but also the water pollutant discharge license depends on the setting of the discharge standard, and also reflects the dependence on scientific and technological knowledge. This dependence is manifested in licensing, environmental assessment, monitoring, etc., as well as the absorption of new scientific knowledge and the application of new science and technology.

3.2 Ambiguous Legal Attributes

There are many controversies on the legal nature of environmental standards in China, which can be summarized into three points. Firstly, the affirmation theory that environmental standards are environmental laws. Secondly, the conclusion that environmental standards are not environmental laws. Thirdly, the combination theory that environmental standards are combined with the legal norms of relevant environmental standards to form an organic part of the environmental legal system [4]. The legal nature of Chuanbufang standard is ambiguous. But this article from the existing legal provisions, science and technology law and jurisprudence point of view, more inclined to the first point of view.

Article 9 of the law for the prevention and control of water pollution stipulates the reason why the discharge standard of water pollutants is mandatory [5]. Article 18 of the regulations for the implementation of the standardization law is a compulsory standard. Therefore, the pollutant discharge standard itself has the legal attribute, which is an important basis for environmental law enforcement and a compulsory standard.

Technical legal provisions are defined from the perspective of science and Technology Law of emerging disciplines. As one of the constituent elements of the whole content of science and technology law, technical legal provisions refer to the provisions on specific operation technology in science and technology laws and regulations [6]. For example, the provisions of product quality standard data, brain death standard, clone, etc. are all derived from technical specifications and technical standards, so many of the legal norms involved in science and technology law are the legalization of technical specifications [7].

From the perspective of legal theory, it is believed that the continuous improvement of people's awareness of legal adjustment and the level of law creation, legal concepts, principles and techniques are increasingly unified, specialized and standardized, which are often affirmed by legislators in the form of legal provisions. Therefore, they have actually constituted another kind of legal norms in the sense of "specialized norms" [8].

It is proved that the legal attribute of water pollutant discharge standard can be analyzed from the main body, procedure and standard effectiveness. First of all, according to the law of environmental protection and the law of prevention and control of water pollution, it is inferred that the main body for formulating water pollutant discharge standards is the environmental administrative department of the State Council authorized by law and the people's Government of provinces, autonomous regions and municipalities directly under the central government, that is, the administrative body formulates the rules and regulations. The administrative subject makes the emission standard with universal binding force, which is an abstract administrative act. Even if it is not named "regulation", "method" or "regulation", this fact can be regarded as special administrative legislation. Secondly, it can be seen from Article 11 of the measures for the administration of environmental standards that the formulation
The procedure of emission standards follows the formulation (Revision) of project plan, formulation draft, consultation, deliberation draft, approval draft, preparation number and release, which is similar to the formulation procedure of regulations "initiation, drafting, review, decision and release".

The discharge standard of water pollutants has legal attribute and is mandatory due to authorization. The universal effect of emission standards not only restricts the administrative subject and the administrative counterpart of pollutant emission behavior, but also restricts the court to apply standards to trial environmental tort cases [9]. Therefore, the emission standard has the attribute of legal norms, which are manifested in the normative, legally binding and the same procedure as the regulations.

4. Problems in the Current Emission Permit System in China
At present, China is in a critical period of environmental management system reform. The implementation of "one-certificate" management of emission permits has determined a complete system with clear powers and responsibilities. However, compared with the foreign emission permit system, there are still some problems in China, such as insufficient legal support, imperfect technical specifications and backward management.

4.1 Lack of Special Laws and Regulations
At present, China has not yet issued special laws and regulations to support the implementation of the emission permit system, which causes the lack of unified guidance in the process of the reform and promotion of the emission permit system in all regions, and makes it difficult to fully implement the emission permit system. Although the environmental protection law, the water pollution prevention law and the air pollution prevention law have all made provisions on the pollution discharge license, they have not put forward the operational implementation rules. Especially the restriction measures for the behavior of refusing to obtain the license, which results in the local environmental protection department unable to clearly define the punishment authority for the enterprise in the management process. At the same time, due to the limitation of superior law, the penalty can not be broken. At present, there is no special punishment method for violation and exceeding of emission permits, and there is a upper limit for fines, which cannot form an effective deterrent for unlicensed and over licensed emissions, resulting in difficulty in comprehensive supervision after issuing permits, and difficult to eliminate illegal behaviors of enterprises [10].

4.2 Failure to Break Through Key Technical Problems
There are many sets of data parallel problems in China's environmental management. The datum comes from different caliber, such as environmental statistics, pollution reduction and emission permits. However, due to the traditional material balance algorithm or emission coefficient method for environmental statistics accounting, the application of enterprise executive standards and actual monitoring data is less considered. As a result, there is a big difference between the environmental statistics of the same enterprise and the accounting results of different caliber such as emission permits, which reduces the authority of data.

In addition, limited by the technical specifications for pollutant emission accounting, the scope and types of emission permits are still missing, heavy metals and other toxic and harmful substances are not covered, and some enterprises such as "small three industries" are not included in the management of emission permits, so there are technical difficulties in unified issuance of various media.

4.3 Backward Management
At present, the management mode of pollutant discharge permit is backward, which is mainly reflected in the following aspects.

4.3.1 Management is Mainly Supervision
At present, the management of emission permits in China is still based on the supervision and management of enterprises by government departments. The lack of detailed decomposition of the
company's responsibility and obligation requirements has not achieved the professional and refined management of enterprise pollutant emissions, resulting in the inadequate implementation of the main responsibility of enterprises.

4.3.2 Imperfect Training System
Issuance and supervision of emission permits are a highly technical and professional work, which requires high professional quality of the implementation personnel. At present, there is no emission permit system training for environmental management and enterprise environmental protection personnel in China, which results in the failure of professional management of the emission permit system.

4.3.3 The Positioning of Emission Permits System is not Clear Enough
At present, the implementation of the emission permit system still depends on the total amount control system and the environmental impact assessment system. The daily supervision work often gives way to the tasks such as pollution reduction verification, accounting, and environmental statistics and so on, which leads to the prominent phenomena of "no matter what is issued" or "no compliance is obtained", and the implementation of the emission permit system is just a form. The main reason is that the rights and responsibilities of all parties in the emission permit system are not clear, which leads to the environmental management system of emission permit not fully playing its role in improving environmental quality.

5. Suggestions on Pollution Discharge Permit Management System Based On Water Quality

5.1 Improve the Total Emission Permit Audit System
On the basis of the current national emission permit management system, it is divided into four levels, namely, province, city, county and town, to establish the total emission permit audit system of administrative region, river basin and control unit. On the basis of administrative regions and control units, the list of the maximum allowable quantity of main water pollutants in China is established, and the list is dynamically adjusted according to the response of water quality in each year, which is the basic basis for the review of the total allowable quantity of pollutants in China. For the administrative units that fail to achieve the water quality target of the previous year, the relevant responsible administrative regions shall jointly formulate the water quality standard plan, and propose the total amount reduction target of emission permit limit, as the basis for adjusting the total amount of emission permit limit.

5.2 Formulate Relevant Technical Specifications for Emission Permit Management
Relevant departments carry out relevant technical guidelines for pollution discharge license management based on water quality to realize standardization of pollution discharge license management. Make full use of the scientific research achievements of water projects for many years, such as the water quality standards and standards system based on the health of water ecosystem, the verification technology of pollution discharge permit limit based on water quality, the division technology of mixed area of pollution discharge outlet, the verification technology of ecological flow of surface water, the best feasible technology of pollution source treatment, etc., and combine with the specific problems encountered in the implementation of the pollution discharge permit system Technical methods involved.

5.3 Improve Drainage Standards with Water Quality Reaching the Standard
With the goal of water quality in reaching the standard, the drainage standards should be continued to improve, and provide technical support for the management of water quality based on emission permits. Strengthen the connection between drainage basin discharge standard and water quality based discharge permit management, and give full play to the role of drainage basin discharge standard and discharge permit management to achieve the water quality standard according to the social economy, technological progress and surface water quality.

5.4 Increase Punishment for Illegal Discharge
In the areas where the surface water quality is not up to the standard, the supervision and law enforcement shall be strengthened. A pollution discharge permit supervision system would be actively established that combines self-inspection of enterprises and spot check of ecological environment departments. Clear administrative and economic punishment measures shall be formulated for the fixed pollution sources that fail to discharge pollutants illegally or commit fraud in accordance with the provision.

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