

# Legal Certainty for The Accuracy of Measuring Air Pollution Standard Level Through the Implementation of Legal Metrology

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## ABSTRACT

Air pollution badly affects the human rights to get a clean and healthy environment. This study aims at finding out the legal certainty for the accuracy of measuring the quality standard level of air pollution. This study used a normative legal approach as the research method and the data were collected using a literature review. The results indicate that the level of standard criteria for air pollution is regulated in Government Regulation of the Republic of Indonesia Number 41 of 1999 concerning Air Pollution Control. The accuracy of standard criteria measurement can be guaranteed through the application of Law Number 2 of 1981 concerning Legal Metrology. Furthermore, the obligation of calibration and re-calibration against measuring, dosing, weighing devices and their outfits further guarantees the legal certainty for the society. In conclusion, it was found that by using a precise and accurate measurement method and tool, widespread impacts of environmental damage caused by air pollution can be anticipated. Therefore, the government should always follow technological developments, especially in the field of air pollution measurement.

*Keywords: Pollution, Health, Environment*

## 1. INTRODUCTION

Getting a good and healthy environment is one of the fundamental rights for every citizen as stated in Article 28 H Paragraph 1 of the 1945 Constitution of the Republic of Indonesia. The statement indicates that everyone has the rights to a healthy life both physically and mentally, and the state guarantees a good and healthy environment.

Environmental capability is often known as environmental carrying capacity [1]. Since resources in an environment of an area are limited, every living creature has to adapt to this limitation by population number control and way of living adjustments [2]. If environmental conditions exceed the predetermined threshold (maximum and minimum) values based on environmental quality standards then it can be said that the environment has been polluted.

The environment must be protected from pollution and contamination. Article 69 paragraph (1) a of Law Number 32 of 2009 concerning Environmental Protection and Management states that every individual is prohibited from carrying out actions that cause environmental pollution and/or damage. Air pollution is defined as the decrease in air quality

so that the air experiences a decrease in quality which ultimately cannot be used as it should be.

One of the principles of environmental protection and management contained in Article 2 of the Law Number 32 of 2009 is the principle of "polluter pays" which means that each person whose business and/or activities cause pollution and/or damage to the environment must bear the costs of environmental recovery. Violations to the Law are categorized as crimes. Based on Article 98 to Article 99 of the Law Number 32 of 2009, everyone who intentionally commits an act resulting in exceeding the ambient air quality standard is subject to imprisonment and fine. The length of the sentence varies from 1 to 15 years, and the amount of fine varies from IDR1,000,000,000,00 to IDR15,000,000,000,00.

The basis for determining the exceeded ambient air quality standard is through a measurement. A special measuring instrument should be standardized both nationally and internationally. It is very possible to make an error in determining the standard criteria for air pollution. Errors of the measuring instrument or errors in using a measurement method can result in inaccurate results.

In solving cases of suspected air pollution, errors in obtaining measurement results can lead to two consequences: (i) the release of people who should be subject to criminal liability, or (ii) the indictment of innocent people. These consequences will make the wrong decision far from a sense of justice. Therefore, a guarantee of legal certainty is needed in determining the ambient air quality standard.

## **2. METHOD**

The problem of this research is formulated into the following questions: How is the guarantee of legal certainty for the accuracy of the measurement of air quality standard criteria through the implementation of legal metrology?

This is a legal research using a normative legal method. The data were collected from a number of laws, regulations, and related literature. The data were then analyzed qualitatively. The explanation was then systematically presented in the form of a discussion to answer the statement of problem.

## **3. RESULT AND DISCUSSION**

Air pollution can come from natural processes such as volcanic eruptions, forest fires, biotic decomposition, dust and plant spores. Besides, it can also come from human activities (anthropogenic), such as transportation, industry, garbage burning and household activities [3].

Indonesia began to see an increase of air pollution in 1980s, when there was a rapid industrialization and a population influx into urban areas. The sectors of energy (production/transportation/conversion), civilian, industrial and traffic may be cited as the causes of human-induced air pollution. The main air pollutants include lead, particle matter (PM), carbon monoxide (CO), nitrogen oxide (NO<sub>x</sub>), hydrocarbon (HC), and sulfur dioxide (SO<sub>x</sub>) [4].

Air pollution must be detected as early as possible so that preventive measures can be carried out to avoid a greater impact on losses, i.e. its negative impacts on human health. In this context, the state should protect the environment from the dangers of air pollution and contamination which threaten the public health.

Determining air pollution and measuring its level cannot be carried out in a simple way. A series of control activities to keep the limits of air quality standard is required. Using a

standard measurement makes it possible to formulate and determine air pollution control activities.

No	Item	Measurement Period	Reference Value	Analysis Method	Device
1	SO <sub>2</sub> (Sulfur Dioxide)	1 hour 24 hour 1 year	900 µg/Nm <sup>3</sup> 365 µg/Nm <sup>3</sup> 60 µg/Nm <sup>3</sup>	Pararosanilin	Spectrophotometer
2	CO(Carbon Monoxide)	1 hour 24 hour 1 year	30.000 µg/Nm <sup>3</sup> 10.000 µg/Nm <sup>3</sup>	NDIR	NDIR Analyzer
3	NO <sub>2</sub> (Nitrogen Dioxide)	1 hour 24 hour 1 year	400 µg/Nm <sup>3</sup> 150 µg/Nm <sup>3</sup> 100 µg/Nm <sup>3</sup>	Saltzman	Spectrophotometer
4	O <sub>3</sub> (Ozone)	1 hour 1 year	235 µg/Nm <sup>3</sup> 50 µg/Nm <sup>3</sup>	Chemiluminescent	Spectrophotometer
5	HC (Hydrocarbon)	3 hour	160 µg/Nm <sup>3</sup>	Flame Ionization	Gas Chromatograph
6	PM <sub>10</sub> (Particle <10 µm)	24 hour	150 µg/Nm <sup>3</sup>	Gravimetric	Hi – Vol
	PM <sub>2.5</sub> *	24 hour 1 hour	65 µg/Nm <sup>3</sup> 15 µg/Nm <sup>3</sup>	Gravimetric Gravimetric	Hi – Vol Hi - Vol
7	TSP (Total Suspended Particles)	24 hour 1 hour	230 µg/Nm <sup>3</sup> 90 µg/Nm <sup>3</sup>	Gravimetric	Hi – Vol
8	Pb (Lead)	24 hour 1 hour	2 µg/Nm <sup>3</sup> 1 µg/Nm <sup>3</sup>	Gravimetric Extractive Ignition	Hi – Vol AAS
9	Fall Dust	30 day	(Residential Area) 10 t/km <sup>2</sup> /month (Industrial Area) 20 t/km <sup>2</sup> /month	Gravimetric	Cannister
10	Fluorides (as F)	24 hour 90 day	3 µg/Nm <sup>3</sup> 0,5 µg/Nm <sup>3</sup>	Specific ion Electrode	Impinger or Continuous Analyzer
11	Fluor Index	30 day	(Caustic lime filter paper) 40 µg/100 cm <sup>3</sup>	Colourimetric	Limed Filter Paper
12	Chlorine dan Chlorine Dioxide	24 hour	150 µg/Nm <sup>3</sup>	Specific ion Electrode	Impinger or Continuous Analyzer
13	Sulphate Index	30 day	1 mg SO <sub>2</sub> /100 cm <sup>3</sup> from Lead Peroxide	Colourimetric	Lead Peroxide Candle

**Figure 1.** Ambient Air Quality Standards according to PP41/99.

The standard criteria for air pollution is regulated in Government Regulation of the Republic of Indonesia Number 41 of 1999 concerning Air Pollution Control (PP41/99) which explains that the ambient air quality standard is a measure of the limit or content of substances, energy, and/or components that exist or should exist and/or pollutant elements tolerated in the ambient air. This Regulation prescribes particles in its environmental standards, and also describes the analytical methods and analytical equipments used.

Law Number 2 of 1981 concerning Legal Metrology (UUML) aims at protecting the public interest in terms of the correctness of measurement, legal order, and legal certainty of measurement units, unit standards, measurement methods and Measuring, Dosing, Weighing Devices and their outfits. Metrology covers all theoretical and practical aspects of measurement. Article 1 points (a) and (b) of the Law on Legal Metrology state that metrology is a science of measuring in a broad sense. Meanwhile, Legal Metrology manages units of measurement, methods of measurement and measuring instruments, relating to technical requirements and regulations with the aim of protecting the public interest in terms of the correctness of measurement.

According to the International Vocabulary of Basic and General Terms in Metrology (VIM), metrology includes all activities in measuring that are correct, traceable and recognizably true at national, regional and international levels, which will ultimately be able to create mutual trust between those who do or have an interest in measurement [5]. The basic

infrastructure to ensure the accuracy, reliability and traceability of measurement results in the International System of Units (Système International d'Unités or SI) which is internationally known as metrology infrastructure. In addition, the use of SI units Indonesia has been affirmed in Article 2 of UUML.

To get the correct and accurate results, the government has appointed the Metrological Authority to be a reference. Metrological authority is divided into three fields: (i) the field of scientific metrology; for scientific truth, is the responsibility of the Indonesian Science Institute's Center for Calibration, Instrumentation and Metrology Research; (ii) the field of legal metrology; for measurements, is the responsibility of the Ministry of Trade's Directorate of Metrology; and (iii) the field of laboratory accreditation; for defining the competency of a laboratory for measurement (either examination or calibration) is the authority of the National Accreditation Committee (NAC).

A law must be essentially certain and fair. Certainty serves as a guide to behavior; and, fairness because of such guide to behavior must support an order which is considered reasonable. Only due to fair behavior and certain implementation, a law can carry out its functions properly. Certainty and fairness are not only moral requirements, but they factually characterize a law. An uncertain and unfair law is not only a bad law, but it is not a law at all because both characteristics construct the definition of a law itself (den begriff des Rechts) [6].

A certain law leads to justice and a fair law benefits many people. Orderliness is the ultimate goal of any law. The need for orderliness is the fundamental requirement for an orderly human society. In addition to orderliness, another goal of a law is to achieve justice that varies in its content and size, in accordance with a society and its times. In order to achieve orderliness in a society, it is necessary to have certainty in the relationship among the community members. A certain and fair law is very important not only for an orderly community life, but it is an absolute requirement for a living organization that gets beyond current boundaries [7].

The measurement of ambient quality standards is intended to obtain accurate data on the level of air pollution. The results can then be used to make the right decision for proper environment care. Early detection of air pollution, particulates and certain forms of radiation will ensure certain preventive actions to be taken.

In accordance with the provisions of Article 12 of UUML, Measuring, Dosing, Weighing Devices and their outfits must be calibrated and re-calibrated. One of the devices that must be calibrated and re-calibrated, according to Article 2 of Government Regulation Number 2 of 1985 concerning Compulsory and Exemption for Calibration and/or Re-calibration and Requirements for Measuring, Dosing, Weighing Devices and their outfits, is a device used for the public interest, such as security, health, safety and environment. The Measuring, Dosing, Weighing Devices and their outfits experiencing a decrease in their accuracy are obliged to re-calibrate. Conducting calibration and re-calibration will certainly protect the public interest, which should be conducted by using the correct measurement and by the existence of legal certainty and orderliness in using Measuring, Dosing, Weighing Devices and their outfits.

#### **4. CONCLUSION**

Air pollution is defined as the decrease in air quality thus reducing its usability. Such condition makes the air losing its proper use. The next impact is health disruption which is obviously contrary to the rights of citizens guaranteed by the 1945 Indonesian Constitution which states that everyone has the rights to a health life both physically and mentally, and that the state guarantees a good and healthy environment. The results of measuring air pollution

standard criteria set forth in the PP 41/1999 are obtained through the implementation of legal metrology. In addition to providing legal certainty, a certainty in the measurement results helps making the right decision for proper environment care.

Therefore, it is recommended to maintain the accuracy of measurements that guarantees a legal certainty. Besides, the government should keep abreast of technological developments, particularly in the field of legal metrology.

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