

ANALYSIS OF ENVIRONMENTAL MANAGEMENT AT THE CONTAINER TERMINAL OF PT PELABUHAN INDONESIA (PELINDO) III SEMARANG

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ABSTRACT

Analysis of Environmental Management at the Container Terminal of PT Pelabuhan Indonesia (Pelindo) III Semarang.

This study employs a qualitative approach using a descriptive method. Primary data is obtained through observation, interviews, and documentation, while secondary data is derived from environmental management implementation reports. The data collected is then evaluated for compliance with environmental management regulations, including Law No. 32 of 2009 on Environmental Protection and Management, Government Regulation No. 101 of 2014 on the Management of Hazardous and Toxic Waste Materials, and ISO 14001:2015 on Environmental Management Systems. According to the research findings, environmental management at PT Pelindo III Container Terminal in Semarang is supervised by a certified environmental expert within the HSSE (Health et al.) department. The company manages hazardous liquid waste, air emissions, and hazardous and non-hazardous solid waste. However, non-hazardous liquid waste and dust emissions have not been monitored and managed. The company received a PROPER certification in 2018 and an ISO 14001:2015 certification in 2015 for its environmental management.

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INTRODUCTION

A port is an area with specially defined boundaries, consisting of land and water, that is used for various government and industrial activities. This area is used to berth ships, boarding and disembarking passengers, transporting goods at the terminal, and providing security and safety facilities in port operations. Apart from that, the port is also used as a place for transfers between modes of transportation ⁽¹⁾.

An environmentally friendly port is one that is sustainable, diligently implements its commitment to managing the environment, and carries out its social obligations to support the continuity of the shipping business. In recent years, international attention has focused on the quality of the environment around ports ⁽²⁾. The quality of the environment in areas around ports experiences a significant decline every year as a result of increasingly dense business traffic, while ports in Indonesia pay less attention to environmental issues. Although port sector operations in Indonesia must continue, it is important to ensure that protecting and maintaining the quality of the environment around ports remains a priority ⁽³⁾.

Minister of Health Regulation No. 44 of 2014 related to the implementation of Healthy Ports emphasizes that environmental management at ports is an effort to create an environment in the port area that is in accordance with established standards. In addition, companies at ports are required to comply with the ISO 14001:2015 standard relating to environmental

management systems. Top management and representatives of the organization concerned have defined roles, responsibilities, and authority to ensure that the environmental management system complies with the requirements set out in the standard and is implemented and maintained ⁽⁴⁾.

Previous research conducted by Kusman, Imami, and Ghaisani stated that the handling and management of liquid waste at ports must pay attention to Minister of the Environment Regulation Number 05 of 2009 concerning Waste Management at Ports and Law Number 32 of 2009 concerning Environmental Protection and Management ^(5, 6, 7). Zavarino's research recommends the concept of a "green" port to combat environmental pollution that arises from the construction and operation of ports ^(8, 9).

The variables studied in this research are what set it apart from previous studies. Previous research has studied the management and pollution of the port environment, especially liquid waste, and then adapted it to regulations. This study examines port environmental management in accordance with international regulations and standards to prevent pollution from liquid waste, air waste, and solid waste. Aside from that, this study also examines responsible organizations and programs supporting environmental management at ports, particularly container ports.

Every day, PT Pelindo III Peti Kemas Semarang engages in several busy activities, each of which has the potential to negatively impact the environment due to the accumulation of both liquid and solid waste at the port, leading to pollution. Environmental pollution in ports may be caused by ship waste, rubbish accumulation, oil spills, and other solid waste ⁽¹⁰⁾. The level of pollution in waters can have a negative impact on aquatic organisms, even resulting in the death of certain species in that water area.

As one of the companies operating in the port sector, particularly container lifting, Pelabuhan Indonesia (Pelindo) III Semarang plays a significant role in achieving an environmentally friendly port. Matter This is due to the significant dangers and risks associated with working conditions and processes in ports, particularly for the environment. Therefore, it has become mandatory for companies to prioritize environmental management by implementing a quality, environmental, and K3 management system, as outlined in ISO 14001:2015, Regulation of the Minister of Health No. 44 of 2014, and Law No. 32 of 2009. Therefore, this research aims to analyze the environmental management of container terminals at PT Pelabuhan Indonesia (PELINDO) III Semarang.

MATERIALS AND RESEARCH METHODS

This research was conducted at PT Pelabuhan Indonesia (Pelindo) III Semarang, especially at the container terminal. The port's address is Jalan Coaster, Tanjung Mas, North Semarang District, Semarang City. This research employs a qualitative approach, utilizing descriptive methods. Descriptive methods are used to describe or explain events or occurrences in the current context in the form of meaningful data ⁽¹¹⁾. In this research, data was collected from two sources, namely primary data and secondary data. Primary data was obtained through observation, interviews, and documentation methods. Meanwhile, secondary data includes waste balance sheets and environmental management implementation reports relating to PT Pelindo III Semarang. Surveys and field reviews were carried out to complete and verify existing secondary data.

The data that has been obtained is then evaluated for its conformity with regulations regarding environmental management, namely Law No. 32 of 2009 concerning Environmental Protection and Management, Government Regulation No. 101 of 2014 concerning the Management of Hazardous and Toxic Waste, and ISO 14001:2015 concerning Environmental Management Systems. This research uses a documentary approach to collect legal material, which involves archival analysis or literature study, such as books, papers, articles, magazines, journals, newspapers, scientific works from experts, and statutory regulations.

Once the legal materials have been gathered, we analyze them to draw conclusions, using the content analysis technique. As previously explained, normative research does not require the collection of field data prior to analysis. In this type of analysis of legal materials, the documents or archives being analyzed are referred to as "texts." Content analysis is an integrative and conceptually oriented analysis method that aims to uncover, identify, evaluate, and analyze legal material to reveal its meaning, significance, and relevance.

RESEARCH RESULTS AND DISCUSSION

PT Pelindo III Semarang Container Terminal carries out its business activities in an open area. Lift-transport aircraft, during the process of loading and unloading containers, produce waste substances that have an impact on the environment. Semarang Container Terminal makes environmental management efforts to reduce the impact of waste produced by storing waste in TPS, both domestic waste and B3 waste. Environmental policy is contained in the K3L policy, which contains the company's commitment to maintaining the work environment and preventing pollution by carrying out two-way communication with stakeholders (eco port). The company's commitment is implemented in the form of organizations and environmental management programs.

The Structure and Accountability of Environmental Management Tasks

The department HSSE (Health, Safety, Security, Environment) already has one person responsible for environmental management activities at PT Pelindo III Semarang Container Terminal. The environmental management part is carried out by a responsible environmental expert who has certified waste management training. The general manager is the main person responsible for environmental management. The scope of environmental management includes identification of environmental aspects and impacts, management of both B3 and non-B3 waste, supervision of the transportation of B3 waste, and environmental monitoring reports to the Environmental Agency.

The HSSE division is responsible for PT Pelindo III Semarang Container Terminal's environmental management efforts. If you want to take care of the environment, you need to follow Law No. 32 of 2009 about Environmental Protection and Management Paragraph 6 about UKL-UPL Article 34 paragraph 1. It says, "Every business and/or activity that is not included in the mandatory AMDAL criteria as intended in Article 23 paragraph 1 is required to have a UKL-UPL."

The company adheres to ISO 14001:2015's Environmental Management Systems clause 4.4.1, which pertains to resources, roles, responsibilities, and authority. This clause states that the top management of the organization must appoint one or more specific management representatives who are independent of other responsibilities and who must have defined roles, responsibilities, and authority to ensure the establishment, implementation, and maintenance of the environmental management system in accordance with this standard.

The results of this research are in line with research conducted by Purwanto and Kurnianto, which states that the ISO 14001:2015 Environmental Management System (MSL) in companies will provide environmental performance benefits, including helping companies comply with current and applicable laws and regulations future (12,13). According to research, Law No. 32 of 2009 concerning Environmental Protection and Management serves as the foundation for environmental management efforts (14,5,15,16).

Waste Management

In its operational activities, PT Pelindo III Semarang Container Terminal produces waste, which is dangerous for the environment if not managed. This waste is divided into solid waste, liquid waste, and air waste, depending on the type of composition. Meanwhile, according to the level of danger, waste is divided into B3 and non-B3 waste.

The types of waste generated in Semarang Container Terminal are liquid waste, air waste, and solid waste. Liquid waste generated in the Semarang Container Terminal is divided into two types: B3 liquid waste and non-B3 liquid waste. Liquid waste refers to liquid pollutant materials or wastewater resulting from various domestic and operational activities ⁽¹⁷⁾.

Table 1. Liquid waste at the PT Pelindo III Semarang Container Terminal

Liquid waste	Identification	Monitoring	Management
B3	Sourced from used maintenance oil and spilled fuel oil.	Collect used oil and then collect it at TPS B3. However, there is no special channel available to channel used oil and only one bundwall is available.	Store it in the B3 Temporary Storage Place (TPS) then transport it by a 3rd party, namely PT. Jasindo every 3 months.
Non B3	It comes from domestic waste, namely leftovers from washing canteens and toilets.	Not yet monitoring non-B3 liquid waste. But the septic tank was drained.	Waste flows through small ditches and culverts to the septic tank.

Source: Observation and Interview Results, 2023.

Previous research supports this study by identifying that the predominant types of liquid waste in the port area are oil and oil spills ⁽⁵⁾. The waste that is included in the B3 category poses a significant risk of causing seawater pollution.

Semarang Container Terminal has managed B3 liquid waste by storing it in the B3 Temporary Storage Place (TPS). Both B3 and non-B3 waste will later be transported by a third party, namely PT. Jasindo, every 3 months. The environment section of the HSSE department periodically conducts B3 waste monitoring inspections to record the collection of used oil at B3 TPSs by vendors. For proper waste management, PT Pelindo III Semarang Container Terminal must comply with applicable environmental regulations. This includes engaging in safe waste management practices, waste treatment where necessary, appropriate reporting, and environmental monitoring to ensure that waste does not pollute the environment ⁽¹⁸⁾. Implementing good waste management practices can help maintain the sustainability of operations and protect the environment around the port ⁽¹⁹⁾.

This effort is in accordance with Government Regulation No. 101 of 2014 concerning the Management of Hazardous and Toxic Waste, Chapter II, Article 3, Paragraph ⁽¹⁾, which reads, "Every person who produces B3 waste is obliged to manage the B3 waste produced." This indicates that the company has complied with the Law of the Republic of Indonesia No. 32 of 2009 concerning Environmental Management, Article 16, Paragraph 1, which states that "Every person responsible for a business and/or activity is obliged to manage waste resulting from the business and/or activity."

Based on Moeller's theory, around 5% of household water needs are used for drinking and cooking purposes, while the majority, namely 95%, turns into liquid waste ⁽²⁰⁾. This has the potential to pose a significant risk because if liquid waste management is not carried out properly, it can have a negative impact on the port environment as well as on sea waters ⁽²¹⁾. Waste air is an air condition that contains chemicals, particles, or other biological materials that can cause discomfort and respiratory problems ⁽²²⁾. The sources of air waste at the Semarang Container Terminal are air emissions and dust emissions. Apart from that, environmental dust also flies around, especially during the dry season.

Table 2. Air Waste at PT Pelindo III Semarang Container Terminal

Air Waste	Identification	Monitoring	Management
Air Emissions	Sourced from generators, RTG engines and Head Truck activities	Monitoring is carried out every 6 months by the Semarang City Health Laboratory and the results are still below the threshold value (NAB)	Carry out routine equipment servicing so that the air emissions released are not harmful to the environment
Dust Emissions	Derived from rail construction activities and the construction of new docks.		This has not been done, only masks are provided for workers and visitors.

Source: Observation and Interview Results, 2023.

PT Pelindo III Semarang Container Terminal produces B3 solid waste and non-hazardous and toxic (B3) solid waste.

Table 3. Solid Waste at PT Pelindo III Semarang Container Terminal

Solid waste	Identification	Monitoring	Management
B3	B3 solid waste in the form of waste from fluorescent and fluorescent lamps, used oil filters, B3-contaminated rags, and used batteries.	Providing special B3 waste bins and carrying out B3 TPS inspections by the environment section of the HSSE department on a regular basis.	Management limbah B3 and non-B3 solids by storing them in Temporary Storage Places (TPS). This solid waste will later be transported by a 3rd party every 3 months.
Non B3	Non-B3 solid waste is divided into two, namely organic waste and inorganic waste. The organic waste produced is leaves that fall from trees and leftover vegetables food and canteen. Meanwhile, inorganic solid waste is in the form of used plastic bottles, plastic bags, electrical cables, tires, damaged containers, used metal plates.	Providing organic and inorganic waste bins. Semarang Container Terminal also collaborates with PT. PDS to carry out cleanliness management.	

Source: Observation and Interview Results, 2023.

The company has identified B3 waste based on source, characteristic tests, and toxicology tests. Government Regulation No. 101 of 2014, Article 3, Paragraph 1, mandates that "Everyone who produces B3 waste is obliged to manage the B3 waste they produce."

Semarang Container Terminal does not manage B3 and non-B3 solids by storing them in Temporary Storage Places (TPS). This solid waste will later be transported by a third party, namely PT. Jasindo, every 3 months. However, since 2019, the Semarang Container Terminal has no longer collaborated with PT. Because the B3 waste management system requires the use of an electronic system, the Semarang Container Terminal has entered into a cooperation contract with PT. Prasadha Pamunah Industrial Waste (PPLI).

The temporary storage facility for B3 waste is in accordance with Government Regulation No. 101 of 2014, Article 13, which states that the B3 Waste Storage Place, as intended in Article 12, paragraph 6, letter D, must meet the following requirements: B3 Waste Storage Location The company's B3 waste storage location adheres to Article 14 (paragraphs 1 and 3), which stipulates that it must be free from flooding and not susceptible to natural disasters. Additionally, it must be under the control of every individual who produces B3 waste, as stipulated in paragraph (1). The TPS location aligns with KEP BAPEDAL 1995-point 3.3 letter b, which specifies the minimum distance of 50 m between the TPS and public facilities for temporary storage of B3 waste. m.

Government Regulation No. 101 of 2014, Article 16, requires TPS building facilities. This regulation states that B3 waste storage facilities, in the form of buildings as intended in Article 15 paragraph (1) letter A, must at least meet the requirements. These requirements include design and construction that can protect B3 waste from rain and sunlight, have lighting and ventilation, and have drainage channels and storage tanks.

Environmental Program

To protect the environment from all kinds of pollution, PT Pelindo III Semarang Container Terminal carries out several environmental programs. The person responsible for environmental management activities is in the HSSE department (Health, Safety, Security, Environment). The company has implemented several environmental programs. The company's environmental programs include the identification of environmental aspects and impacts. The Semarang Container Terminal has implemented a program to identify environmental aspects and impacts into a single unit within IBPR (hazard identification and risk control). Semarang Container Terminal's environmental aspects and impacts have been monitored and controlled. 2) B3: Waste Management. The Semarang Container Terminal handles B3 waste management, which includes source identification, monitoring, and management. Monitoring is carried out at TPS B3, which is in Container Yard 6 (CY6). The B3 TPS is equipped with signs, safety signs, and symbols to aid in the temporary collection of B3 waste generated by maintenance vendors. 3) Planting trees together during the K3-month event is a common activity. Tree planting is an annual event held to commemorate K-3 Month. We typically plant mangrove trees in the vicinity of the port.

The use of information technology in environmental management efforts, such as pollution reporting systems in port areas, has many significant benefits ⁽²³⁾. The use of information technology in environmental management is a positive step that can ensure that ports and companies operating around them can contribute to environmental preservation and sustainable maintenance of natural resources. This is in line with research that shows that the use of information technology can facilitate the management of data and information, as well as assist in decision-making regarding environmental activities ⁽²⁴⁾.

The results of the awards and certification program for environmental management are impressive.

Pelindo III Semarang Container Terminal completed PROPER certification in 2018, but still received red flags. Receiving a red flag on PROPER certification (Company Performance Rating Assessment Program in Environmental Management) indicates that PT. Pelindo III Semarang Container Terminal needs to improve on several environmental aspects. In this context, the reason for the red flag is that the company has not monitored waste in seawater. Apart from PROPER certification, the Semarang Container Terminal also received ISO 14001:2015 certification. This certificate is still valid and is proof of the company's commitment to managing environmental impacts. To achieve its ultimate goal of becoming a company that cares about the environment, the company strives to continuously improve its environmental management system. The company makes efforts to protect the surrounding environment by implementing environmental programs such as B3 Waste Management, Energy Efficiency and Emission Reduction, Implementation of 5R, and Water Conservation/Efficiency ⁽²⁵⁾. This is in accordance with ISO 14001:2004 concerning Environmental Management Systems clause 4.3.3 goals, targets, and programs.

CONCLUSIONS AND RECOMMENDATIONS

PT Pelindo III Semarang Container Terminal already has one person in charge of environmental management within the department HSSE (Health, Safety, Security, Environment). The environmental management part is carried out by an environmental expert in charge who has certified waste management training. Management of B3 liquid waste, air emissions, and B3 and non-B3 solid waste has been carried out by the company uses environmentally friendly management methods, providing B3 Temporary Storage Places (TPS), and collaborating with third parties. However, non-B3 liquid waste and dust emissions have not been monitored and managed. PT. Pelindo III Semarang Container Terminal completed PROPER certification in 2018, but still received red flags. The reason it

still gets red is that waste monitoring in seawater has not been carried out, it still gets red. Apart from PROPER certification, the Semarang Container Terminal also received ISO 14001:2015 certification.

The advice given in this research is that environmental pollution can be avoided, especially that caused by lubricating oil. Industries and companies producing used lubricating oil are required, in accordance with Circular Letter of the Minister of the Environment No. 8 of 1997, to hand over the used lubricating oil produced to used lubricating oil collectors who already have permission from the Environmental Impact Control Agency.

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