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Industrial waste pollution based on law no. 32 of 2009 concerning protection and management environment and republic government regulations indonesia no. 27 of 2012 concerning environmental permits in rancaekek district, bandung regency

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Abstract

Environmental Pollution Law is a law that regulates the prevention and control of pollution. The form of this legal pattern of environmental pollution includes water, air and soil pollution, such as PP No. 12 of 1995 concerning Hazardous Waste Management. The Law on Environmental Disputes is a law that regulates procedures for exercising rights and obligations due to environmental cases as stipulated in Law no. 23 of 1997 in conjunction with Law no. 32 of 2009 concerning Environmental Management. The aims of this study are: (1) to find out and analyze the implementation of Law no. 32 of 2009 concerning Protection and Management of the Environment with the occurrence of industrial waste pollution in Rancaekek District, Bandung Regency; and (2) to find out the solution to the problem of industrial waste pollution in Rancaekek District, Bandung Regency after the enactment of Law no. 32 of 2009 concerning Environmental Protection and Management. The approach method used is normative juridical, which is a method in normative legal research using primary sources of secondary data or

library materials. The research results obtained that: (1) PT. The existence of Kahatek in the Sumedang Regency area creates textile waste which is waste produced in the starching process, the process of removing starch, bleaching, cooking, mersirasi coloring, printing and refinement processes, the cotton refinement process produces more waste and is stronger than the synthetic material refinement waste. . Provisions governing, coaching and supervision have been carried out optimally, but the impact of textile waste is still being felt, especially by the people of Rancaekek Village, Bandung Regency; and (2) The existence of PT. Kahatek in the Sumedang Regency area is in a dilemma, on the profit side it can open jobs for the surrounding community, on the other hand it has an impact on textile waste. To overcome this through the action of State Administrative Law, namely re-examination to grant permits for waste management or through repressive measures, namely the enforcement of criminal law in the environmental sector.

Keywords

Pollution, Industrial Waste, Environment

1. Introduction

At this time the need for water is increasing, because the use of water is very high, mainly used by textile industry companies, especially the textile/dyeing industry (Dye House) which utilizes water as a source of their production process. The water used in the production process will be released after the production process in the form of liquid waste, where the water contains chemical substances or liquids that are dangerous for the safety of the soul for the health of the human body, animals and plants and at the same time can reduce the quality of water in rivers or rivers. in agricultural lands. What are the consequences if the waste is discharged directly into nature/environment without properly processing the waste in accordance with the provisions stipulated by the government of the Republic of Indonesia.

As an effort to manage and control the quality of the waste water discharged by companies, it must be processed first so as not to cause a negative impact on natural resources and the surrounding environment. In this regard, the government issued Government Regulation of the Republic of Indonesia No. 20 of 1990, and Law no. 32 of 2009 and Government Regulation of the Republic of Indonesia Number 27 of 2012 Environmental Management Protection which explains in detail that water must be used in a sustainable manner according to the quality expected, so controlling environmental pollution is very important as an effort to protect and manage the environment.

Waste management is one of the efforts to eliminate or minimize the levels of pollutant contained, as substances that are harmful to natural or environmental safety, so that it is feasible and meets the standards as a condition for waste water that is ready to be disposed of and safe for the environment, in this case the district

government. Bandung has special authority in supervising and continuously checking wastewater treatment at companies around its jurisdiction. However, the system implemented is still not optimal according to the standards set by the government, so management must be carried out properly, intensively supported by the latest and sophisticated equipment through the Wastewater Treatment Plant (WWTP) which is carried out using chemical, biological and physical methods.

Basically, this research aims to avoid pollution of the natural environment, and at the same time overcome public complaints as the root of the problem caused by industrial waste pollution on the biological environment, causing a lot of losses and causing damage to the preservation of nature followed by the death of various types of animals, plants and soil. agriculture is barren. After the writer describes the descriptions mentioned above, the following problems can be formulated: (1) How is the implementation of Law No. 32 of 2009 concerning Protection and Management of the Environment with the occurrence of industrial waste pollution in Rancaekek District, Bandung Regency?; and (2) How to solve the problem of industrial waste pollution in Rancaekek District, Bandung Regency after the enactment of Law no. 32 of 2009 concerning Environmental Protection and Management?

The objectives to be achieved in this legal research are: (1) Want to research and study how the implementation of Law No. 32 of 2009 concerning Protection and Management of the Environment with the occurrence of industrial waste pollution in Rancaekek District, Bandung Regency; and Want to research and learn how to solve the problem of industrial waste pollution in Rancaekek District, Bandung Regency after the enactment of Law no. 32 of 2009 concerning Environmental Protection and Management.

2. Theoretical foundation

1. Licensing System as an Instrument for Environmental

Control One of the norms in the 1982 UULH, namely Article 7, cannot be relied upon, if permits in the licensing system are instruments of environmental control, because the 1982 UULH, which was originally intended as an "umbrella" provision for other laws, did not place and regulate permits as a system. licensing. The provisions of Article 7 paragraphs 2 and 3, which in their implementation/often involve various kinds of agencies, which can lead to overlapping authorities, various permits, complicated and bureaucratic procedures, which in turn presents permits as an obstacle, not an allowance; preventive juridical; especially as a control instrument.[1] It is even very worrying that there is a tendency that permits are used to seek sources of funds and this in turn creates higher economic costs. Argumentum a contraric interpretation of Article 7 paragraphs 1 and 2 that a permit

[1] Sjachran Basah, Paper in Environmental Law Seminar, Organized by KLH in Collaboration with Legal Mandate Compliance and Enforcement Program from BAPEDAL, 1-2 May 1996 in Jakarta. Original title "Environmental Licensing System as an Instrument of the Environmental Court".

is not required for a non-business sector, even though this is not always the case. In operations through the principle of obedience, it is rarely easy to return permits as a type of stipulation, which is individual-concrete in nature as a result of the normativization of the process to its "master" provisions, especially to Article 4 of Law No. 4 of 1982 (LN 1982: TLN No. 3215) Jo Law 32 of 2009 Jis Law 27 of 2012.

In this paper there are a few additions. The licensing system as an environmental control instrument mandates that the environment can be controlled in realizing Article 4 UULH 1982 Jo Law No 32 of 2009 Jis UU 27 of 2012 by permits in a system that has sub-systems and in turn the permit itself becomes a sub-system from the environment. In the end, environmental law (life) is a sub-system of law. The licensing sub-systems, which are related to one another, constitute a unit or a package.[2]

2. Environmental Management Institutions in the Regions in Efforts to Improve the Quality of Development in the Regions

Damage to natural resources and environmental pollution are generally caused by development activities that pay little attention to the carrying capacity of the environment. Industrial and household waste that is directly disposed of into rivers and natural waters or into the air creates greater social costs for society, both in the form of costs for health, decreased productivity and income due to illness, and the non-functioning of rivers to support fishing activities and water supply. drink, and so on. Moreover, the result of Hazardous and Toxic Wastes that are disposed of carelessly into the environment/surrounding nature will kill the ability and function of the environment in supporting life.

In this regard, community participation in the management of Hazardous and Toxic Waste is prioritized to convince the public whether a procedure in the regulation has been implemented correctly or not. If not, is there community "power" to correct it? This community power is based on the fact that the environment is a public domain, so that environmental management efforts are not solely a matter of one group, but are more of a public interest. In this context environmental management is not limited to the management of Hazardous and Toxic Wastes. It is unfortunate that the destruction of the environment in the form of air and water pollution.

It is regrettable that environmental destruction in the form of air and water pollution and various other environmental damages has caused a valueless loss impact. This impact damages the living environment/surrounding nature whose value has never been shown in the calculation of funding policies for environmental improvement. The next problem is, if the pollution causes harm to the sufferer, for example the victim has to go to the doctor, is unable to carry out his work, or becomes disabled and so on, then in accordance with the polluter pays principle, the polluter is obliged to replace to sufferers whose rights to a good and healthy

[2] Sjachran Basah, License as an Instrument for Environmental Control, Lecture at UNAIR, Surabaya, 1997.

environment have been violated, in other words the victim has the right to sue for compensation in the amount of the loss suffered.

Law No. 32 of 2009 concerning Environmental Protection and Management Article 98 paragraph (1) states that:[3]

Any person who intentionally commits an act which results in exceeding the ambient air quality standard, water quality standard, seawater quality standard, or environmental damage standard criteria, shall be punished with imprisonment for a minimum of 3 (three) years and a maximum of 10 (ten) years and a fine of at least IDR 3,000,000,000.00 (three billion rupiahs) and a maximum of IDR 10,000,000,000.00 (ten billion rupiahs).

In cases of pollution due to B3 waste, sufferers are generally ordinary people who are economically weak and have relatively lower education, so it is difficult to be expected to have sufficient ability to prove the wrongdoing of polluters.

In this regard, with the development of industrialization which results in greater risks and more complex causal relationships, legal theory has abandoned the concept of "error" and turned to the concept of "risk". Thus the element of error does not become the basis of evidence for compensation.

Environmental law enforcement is actually not the only means of organizing. Arrangements can be made through other means such as economic instruments, effective public pressure, company's rating, approaches through negotiation and mediation mechanisms, analysis of environmental impacts and permits. It should be emphasized here that coercive measures through the application of sanctions do not have to go through the courts. The use of administrative sanctions includes the lightest sanctions such as written warnings, warnings, administrative orders up to temporary or permanent suspension of part or all of the activities.

Companies operating in the industrial sector, in addition to producing useful products, also sometimes produce B3 waste, so these companies have an obligation to have B3 waste processing equipment. However, if every B3 waste producing company had to have B3 waste processing equipment, this would result in ineffectiveness and inefficiency and require quite high costs. On the other hand, this type of B3 waste must be handled specifically. Because if B3 waste is dumped into rivers and seas, or even just left in mud pools or stored in leaky and rusty drums, the possibility for this B3 waste to contaminate water, air and soil is enormous, thereby reducing the carrying capacity of the environment, which will eventually disrupt the health of living things.

To avoid the above, a company has been established that provides facilities to manage B3 waste. In this regard, researchers will take an example from PT PPLI (Prasadha Pamunah Waste Industry) as a reference material for companies that manage B3 waste.

Waste Management or a B3 waste management facility is a B3 waste management process that includes B3 waste treatment and B3 waste minimization. Management of B3 waste consists of stages of storage, collection, transportation,

[3] Law No. 32 of 2009 concerning Environmental Protection and Management

processing and landfilling. Meanwhile, minimization of B3 waste consists of reducing waste at the source and re-using it which is determined under certain conditions.[4]

All of these stages form a series that cannot be broken and should be in one Waste Management activity container. Each of these stages means:

1. Storage of B3 waste is an activity of storing B3 waste carried out by producers and/or collectors and/or users and/or processors and/or landfillers of B3 waste with the intention of temporarily storing
2. Collection of B3 waste is the activity of collecting B3 waste from the producer of B3 waste with the intention of storing it temporarily before being handed over to the beneficiary and/or processor and/or landfiller of the B3 waste.
3. Transportation of B3 waste is an activity of moving B3 waste from producers and/or from collectors and/or from users and/or from processors to collectors and/or to users and/or to processors and/or to landfills of B3 waste
4. B3 waste treatment is a process to change the characteristics and composition of B3 waste to eliminate and/or reduce its hazardous and/or toxic properties.
5. B3 waste storage is an activity of placing B3 waste in a landfilling facility with the intention of not endangering human health and the environment
6. Utilization of B3 waste is an activity of recovery and/or reuse and/or recycling which aims to convert B3 waste into a product that can be used and must also be safe for the environment and human health.

So in Waste Management activities it does not only reach the landfill stage but also includes processing as well as utilizing the results of B3 waste processing so that the B3 waste that has been processed can be reused.

The process of Waste Management includes 2 major activities namely: Management of B3 waste and Minimization of B3 waste.[5]

With the existence of B3 waste management programs in Waste Management, it can be seen the efforts that have been, are being, and will be carried out in order to create a clean, healthy and sustainable living environment.

3. Research method

The approach method used is normative juridical, which is a method in normative legal research using primary sources of secondary data or library materials.[6] The secondary data referred to include primary legal materials, secondary legal materials and tertiary legal materials. In addition, primary data is also used to support research and support existing secondary data sources. This

[4] Paper About, Center for Industrial Waste Management of Hazardous and Toxic Materials, PT. PPPLI Cileungsi, Bogor 1997.
[5] Paper About, Center for Industrial Waste Management of Hazardous and Toxic Materials, PT. PPPLI Cileungsi, Bogor 1997.
[6] Soerjono Soekanto, Normative Legal Research, A Brief Overview, Jakarta, Raja Grafindo Persada, 1995, p. 13; See also Abdulkadir Muhammad, Law and Legal Research, Bandung, PT. Citra Aditya Bakti, 2004, p. 98.

research was conducted in 2 (two) stages, namely library research, carried out with the aim of obtaining secondary data as the main data source.

4. Discussion

3. Implementation of Law no. 32 of 2009 concerning Protection and Management of the Environment with Industrial Waste Pollution in Rancaekek District, Bandung Regency

Rancaekek District, Bandung Regency is one of the sub-districts in West Java Province which has experienced the environmental impact of PT. Kahatek whose existence is PT. Kahatek in the Sumedang Regency area. Therefore, in the development of industrial estates, it must be in accordance with its designation (location permit) so that the development of environmentally sound industrial estates will be seen. Thus the development of industrial estates is in line with the regulation, guidance and supervision carried out by the government, both central and regional (Sumedang Regency).

Development is a conscious effort made by humans to achieve a better life. The essence of development is how to make future life better/better than today. However, it cannot be denied that development will always be in contact with the environment, including four main situations, namely (a) change, (b) complexity, (c) uncertainty, conflict.

Development with projects that are studied from the aspect of environmental feasibility can be called environmentally sound development. Environmentally sound development is essentially carried out to realize sustainable development. The instrument for achieving sustainable development is the Environmental Impact Assessment (AMDAL).

According to PP 29/1986, which was later refined by PP 27/1999, which originally only had one EIA model, developed and had one EIA model, developed several forms of EIA and had the meaning:

(1) Environmental Impact Analysis (AMDAL) is a study of the major and significant impacts of a planned business/activity on the environment, which is required for the decision-making process regarding the implementation of a business/activity. This study produced the documents Terms of Reference for Environmental Impact Analysis, Environmental Impact Analysis, Environmental Management Plan and Environmental Monitoring Plan. Meanwhile, the definition of Andal is as follows.

(2) Environmental Impact Analysis (ANDAL) is a careful and in-depth study of the major and significant impacts of a planned activity.

Based on the applicable provisions, there are several EIA models, namely Individual Project EIA, Integrated Activity EIA, Regional EIA, and Regional EIA: The definitions of the three EIAs are:

(1) Analysis of the environmental impact of integrated/multi-sectoral activities is the result of a study on the significant impact of planned integrated

businesses or activities on the environment in a single ecosystem expanse unit and involving the authority of more than one responsible agency.

(2) An analysis of the environmental impact of an area is the result of a study on the significant impact of a planned business or activity on the environment in a single ecosystem expanse and concerns the authority of a responsible agency.

(3) Analysis of regional environmental impact is the result of a study on the significant impact of a planned business or activity on the environment in a unified expanse of ecosystem zones of regional development plans in accordance with the general regional spatial layout plan and involving the authority of more than one responsible agency.

The outline of the AMDAL procedure regarding Environmental Impact Analysis is as follows.

1. The initiator of the activity plan submits Environmental Information Presentation (PIL) to the responsible agency. The PIL is made based on the guidelines set by the Minister assigned to manage the environment. In the description below, what is meant by the Minister of KLH is "the Minister assigned to manage the environment". The responsible agency is the agency authorized to make decisions regarding the implementation of activity plans, with the understanding that the authority rests with the Minister or the Head of a Non-Departmental Government Institution in charge of the activity in question and on the Governor of the Level I Region (Province) for activities that are under their authority.
2. If the location as stated in the PIL is deemed inappropriate, then the agency responsible will reject the location and provide instructions about other possible locations with the obligation for the initiator to make a new PIL. If a location can cause a conflict of interest between sectors, the responsible agency shall hold consultations with the Minister of KLH and the Minister or Head of the relevant Non-departmental Government Institution.
3. If the results of the PIL assessment determine that an ANDAL is required, due to the significant impact of the planned activities on the environment, both the geobiophysical and socio-cultural environment, then the initiator together with the responsible agency shall prepare a Terms of Reference (KA) for the preparation of the ANDAL.
4. If the ANDAL does not need to be prepared for an activity plan, since there are no significant impacts, then the initiator is required to prepare an Environmental Management Plan (RKL) and an Environmental Monitoring Plan (RPL) for the activity. The letter K in RKL is “Manage” and the letter P in RPL is "Monitor".
5. If it is known from the outset that there will be a significant impact, then there is no need to make a PIL in advance, but can immediately prepare the TOR for the ANDAL maker.
6. The ANDAL is a component of the feasibility study of the activity plan so

that there are three feasibility studies in development planning, namely: technical, economical and environmental (TEL). The cost of the activity plan as stated in the feasibility study of the activity plan also includes the cost of mitigating negative impacts and developing positive impacts.

7. General guidelines for preparing the ANDAL are made by the Minister of KLH. The technical guidelines for preparing the ANDAL are stipulated by the Minister or the Head of a Non-Departmental Government Institution in charge of the activity concerned based on the general guidelines for preparing the ANDAL made by the Minister of KLH.
8. If the ANDAL concludes that the negative impacts that cannot be overcome based on science and technology are greater than the positive impacts, then the responsible agency decides to reject the activity plan in question. Against this refusal, the initiator may submit an objection to a higher official from the responsible agency no later than 14 (fourteen) days after receiving the decision of refusal. The higher official makes a decision on the objection no later than 30 (thirty) days after receiving the objection statement, after receiving consideration from the Minister of KLH. This decision is the final decision.
9. If the ANDAL is approved, the initiator prepares the RKL and RPL using the RKL and RPL preparation guidelines made by the Minister of KLH or the responsible Department.
10. The ANDAL approval decision is declared expired if the activity plan is not implemented within 5 (five) years of the stipulation of the decision. The initiator is required to resubmit the application for approval of the ANDAL. With regard to this request, the responsible agency decides that the ANDAL, RKL and RPL that have been prepared can be reused or that these documents must be updated.
11. The decision to approve the ANDAL is declared null and void, if there is a very basic change in the environment due to natural events or due to other activities, before the planned activities are implemented. The initiator needs to create a new ANDAL based on the new environmental zone.

The textile industry is an industry that converts raw materials in the form of fibers into finished textile goods. The industry may use plant fibers, such as cotton; animal fibres, such as wool and silk; and synthetic mated, such as nylon, polyester, and acrylic. Natural fiber production is generally the same amount as synthetic fiber production. The stages of the textile production process consist of fiber production, fiber processing and spinning, yarn preparation, fabric production, bleaching, dyeing, and printing and finishing. Each stage requires good management. The raw materials for the textile industry generally consist of water, substrate (yarn, cloth, fiber), process chemicals, treatment chemicals, and dyes.

1. Quantity of Textile Industry Liquid Waste

In the production process of making cloth, a lot of chemicals and water are needed, the chemicals used are synthetic dyes. The liquid waste produced by the

batik industry has the characteristics of being cloudy, frothy, has a high pH, contains alkaline oil, organic content (BOD, COD, and TSS), compounds produced by dyes, and the highest metal content is Cr, Cu. and Pb. An indication of contamination of liquid waste can be seen based on the color change in the water.[7] The synthetic dyes used have characteristics that are difficult to decompose and have a high content of dyes, so that the resulting liquid waste is dangerous when directly discharged into the environment.[8] Characteristics and composition of textile industry wastewater as follows.[9] Water consumed by each fiber category is shown in table 1.

Table 1 About Average Water Consumption for Each Type of Fiber

Fiber Type (Sub-Category Processing)	**Water consumption (m3/tons of fiber material)**		
	Minimum	Median	Maximum
Wol	111	285	659
Woven	5	114	508
Knit	20	84	377
Carpet	8,3	47	163
Stock/yarn	3,3	100	558
Nonwoven	2,5	40	83
Felted fabric finishing	33	213	933

The characteristics of the liquid waste from each stage of the textile operation process will be different. Liquid waste from printing and dyeing units usually contains a lot of color which consists of chemical reactive residues and coloring and requires special treatment before being discharged into the environment. The characteristics and quantity of effluent from the textile industry will differ from one textile industry to another because it depends on the production process being carried out. Generally, textile industry wastewater is alkaline (alkaline) and has a BOD in the range of 700 to 2000 mg/L.[10] The characteristics of textile wastewater are shown in Table H3; per unit of production.

Table 2 Regarding the Characteristics of Liquid Waste in the Textile Industry

Process and Unit (U)	**Waste Volume (m3/U)**	**Bod(Kg/U)**	**TTS(kg/U)**	**Another pollutant (kg/U)**	
Wool processing (production:1 ton of wool)					
Average unscoured stock	544	314	196	Oil	191

[7] Riyanto. (2013). Electrochemistry and its Applications. In Graha Ilmu (Vol. 1, Issue 1).
[8] Kiswanto, Wintah, & Maulana, J. (2015). Reduction of Color, TSS, COD, and Cr in Electrolyzed Hand-drawn Batik Waste and Biosand in Kalipucang Wetan Village, Batang Regency. RISTEK: Journal of Research, Innovation and Concentrated Technology, 5, 7–17.
[9] Al-Kdasi, A., Idris, A., Saed, K., & Guan, C. T. (2004). Treatment of textile wastewater by advanced oxidation processes– A review. Global Nest Journal, 6(1), 222–230.
[10] www.ifc.org/ehsguidelines.

Stock scoured average	537	87	43	Cr	1,33
Specific Process				Fenol	0,17
Scouring	17	227	153	Cr	1,33
Dyeing	25	27		Fenol	0,17
Washing	362	63			
Carbonizing	138	2	44	Oil	191
Bleaching	12,5	1,4		Cr	1,33
				Fenol	0,17
Cotton processing (production:1 ton cotton/pads)					
Compounded average	265	11	70		
Specific Process	4,2	2,8			
Yarn sizing	22	58	30		
Desizing	22	58	30		
Kiering	100	53	22		
Bleaching	100	8	5		
Mercerizing	35	8	2,5		
Dyeing	50	60	25		
Printing	14	54	12		
Other fibers (production: 1 ton of product)					
Rayon processing	42	30	55		
Acetate processing	75	45	43		
Nylon processing	125	45	30		
Arylic processing	210	125	87		
Polyester processing	100	185	95		

Waste that is difficult to treat consists of colored waste, metals, phenols, toxic organic compounds and phosphates. Colored and metallic wastes originate primarily from dyeing and printing processes, although a source of metals is occasionally present in other processes. Phosphates are mainly used in the preparation and coloring processes. In addition, wastes that are difficult to treat include wastes containing non-biodegradable organic matter such as certain surfactants, solvents, and others. This waste is resistant to treatment and can increase the toxicity of the effluent in the water. Therefore, these wastes can be categorized as hazardous and toxic wastes.

There are several ways to reduce the amount of waste that is difficult to process, from the point of view of reduction at the source, namely:

1. Chemical substitution, control, and conservation,
2. Catching waste then reuse/recycle, and
3. Sorting

Based on the ease with which a waste is degraded by microorganisms, textile wastewater can be divided into organic and inorganic waste.

a. Organic Elements in Textile Industry Liquid Waste

Textile wastewater contains a number of organic compounds that are both easily biodegradable and difficult to degrade (non-biodegradable). The amount of organic compound content can be represented as Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). BOD is the amount of oxygen needed by microorganisms to oxidize organic compounds, while COD is the amount of oxygen needed to chemically oxidize organic compounds.

Because textile wastewater contains dyes, it is generally difficult to be degraded by microorganisms or biological treatment. The organic content in the waste will be more easily degraded biologically if the BOD/COD ratio is higher. Therefore, to be able to reduce BOD and COD, biological treatment is used with special treatment so that the process can be maintained properly. In general, the textile industry uses oxidation ponds when land is available or uses other aerobic processes. This process can reduce BOD by up to 95%. The main sources of BOD are chemicals, starch from the sizing process, oils for weaving, and biodegradable surfactants.

b. Inorganic Elements in Textile Industry Liquid Waste

In the textile industry, the inorganic elements in the textile industry effluent are metals, chlorinated solvents, non-biodegradable surfactants and other non-degradable materials. This type of waste is difficult to degrade through conventional biological treatment and can escape the treatment so that it can add to the toxic effects of receiving water bodies. In this study, will be focused on heavy metals.

c. Metal Content

Metals are produced from several sources in the textile process, generally from:

1) Yarn
2) Clean water supply
3) Oxidizing and reducing chemicals (agents), electrolytes, acids, and bases
4) Dyes and pigments
5) Multiple finishing processes
6) Herbicides and pesticides,
7) Maintenance chemicals

Textile Yarn

Metals are present in natural threads, such as cotton, which come from absorption from the environment during their growth period. The metal content in cotton thread is 75 to 100 ppm. This means that it can be estimated that these sources contribute up to 10 ppm of the total metal present in the effluent. In addition, metal contamination can occur from machine tools. Catalysts from polymerization and other sources can be contributed from synthetic yarns/fibers.

Clean Water Supply

In general, the concentration of heavy metals in the supply of clean water is not at a significant value (> 1 ppm), for example copper, iron and zinc. Copper

is often added in drinking water distribution systems to prevent algae growth in tanks and ponds. Aluminum, in the form of alum, is also a metal that is intentionally added to drinking water supplies. These metals can result in ion exchange with plumbing systems (especially lead joints), valves, and pumps, which produce metal or electro-negative metals in factory effluents.

Oxidation and Reduction

Chemicals Until the 1960s, dichromate was used as an oxidizing agent for vat dyes. This of course has an impact on the high chromium content in the effluent. Another use of chromium as an oxidizing agent is as a cleaning solution in the laboratory. This solution has the characteristics of being a strong oxidizer so it is a useful solution in the lab, but its use can cause several problems, for example:

1. Chromium is not rinsed from laboratory equipment so that it can endanger microbiological work,
2. Chromium is toxic in the aquatic environment
3. Chromium is toxic in biological waste treatment facilities

To avoid this problem, non-dichromate solution substitutes can be used so that they can generate non-toxic waste. Several other agents containing metals include reducing agents, namely zinc stabilized sulfoxylate. This material can be replaced with Sodium Hydrosulfite.

Metals in the Finishing Process

There are several organo-metallic chemicals in the finishing process, such as water repellent, flame retardant, anti-fungal, and anti-odor. This ingredient can contain antimony, tin and zinc. To reduce the source of these metals in wastewater streams, it is best to store the remaining materials for later reuse, or dispose of them separately and not mix them with routine process effluents.

Dyes

Some dyes may contain copper or another metal as an integrated part of the dye molecule. In general, the Color Index indicates that the dye containing the metal is blue or green. There are many kinds of dyes, nearly 74000 series of chemicals, including pthalocyanine dyes and pigments. Examples of these chemicals are shown in Table 3.

Table 3 About the Types of Dyes

Dye Type	**Contained Metal**
Vat Blue 29	Cobalt
Pigment Blue 15	Copper
Ingrain Blue 14	Nickel
Ingrain Blue 5	Cobalt
Ingrain Blue 13	Copper
Direct Blue 86	Copper
Direct Blue 87	Copper
Acid Blue 249	Copper, Barium
Ingrain Blue 1	Copper

Pigment Blue 15	Copper
Pigment Blue 15	Copper
Pigment Green 37	Copper
Pigment Green 7	Copper
Ingrain Green 3	Copper
Solvent Blue 25	Copper
Solvent Blue 24	Copper
Solvent Blue 55	Copper
Reactive Blue 7	Copper
Belamibe F Red 3BL	Copper
Purazol F Violet MXD	Copper
Solantine Brown BRL	Copper
Atlantic Blue 8 GLN-K	Copper
Atlantic Resinfast Blue 2R	Copper
Sirius Supra Turquoise LG	Copper
Superlitefast Blue 2 GLL	Copper
Direct Navy OFs	Copper
Belamaine Red 3 BL	Copper
Solophyenyl Brown BRL	Copper
Fastolite Blue L	Copper
Atlantic Black NR	Copper

Each dye contains copper as an internal part of its chromophore molecular structure so that most of the metal will pass through the dye to the thread, except for the direct dye which has a remaining 5-15% dye solution that is not used so that the metal will be wasted as waste. In addition, other metals are also found in other types of dyes which are generally shown in table 4.

Table 4 Regarding Metal Content in Some Dyes

Metal	**Concentration in Class Dyes (ppm)**					
	Sour	Work	Direct	Disperse	Fiber Reactive	Vat
Arsenic	<1	<1	<1	<1	1,4	<1
Cadmium	<1	<1	<1	<1	<1	<1
Chromium	9	2,5	3,0	3,0	24	83
Cobalt	3,2	<1	<1	<1	<1	<1
Copper	79	33	35	45	71	110
Lead	37	8	28	37	52	6
Mercury	<1	0,5	0,5	<1	0,5	1,0
Nothing	<31	32	8	3	4	4

To be able to reduce metals from this source, there are two things that can be done. First, namely substituting non-metallic dyes and using dyes containing

these metals if they are really needed. Especially in the case of cellulose, metal-free fat dyes can be used to substitute green and blue dyes of the direct or fiber-reactive type which generally contain metals.

Second, ensure that the coloring process takes place optimally, for example sufficient contact time, optimization of temperature, pH and salt concentration, fixative, and other coloring parameters. Chemicals for Treatment (maintenance)

Treatment chemicals are often a source of toxic waste. In general, the textile industry has approved procedures and quality control for raw materials used in the production process, but sometimes treatment chemicals do not go through these procedures because they do not directly affect direct costs and quality control. In addition, these materials are not used routinely such as process chemicals. However, the control and evaluation of this material should not be neglected. These chemicals usually contain metals, acids, chlorine, perchlorethylene, and other toxic materials. Other chemicals that are also a source of metals (and toxicity) from wastewater are biocides and herbicides. Biocides are used routinely for cooling tower maintenance and water purification. Biocides are also used for a number of applications, such as the finishing of socks, tents, awnings and tarpaulins. Meanwhile, herbicides are used to control grass, weeds and other plants around storage tanks, for example gas tanks, fuel and varsol.

Another metal source that can occur is photographic processing which is used for screen printing or other operations. This process is usually a significant source of silver metal, but the metal can be recycled from the photo processing waste to reduce the source of pollution and economic benefits.

4. Solving the Problem of Industrial Waste Pollution in Rancaekek District, Bandung Regency After the Enactment of Law no. 32 of 2009 concerning Environmental Protection and Management

The textile and textile product (TPT) industry is one of the most developed industries in Indonesia. This development can be seen from the increasing exports of TPT as a non-oil and gas commodity. In 1991, the value of TPT exports reached US$ 3.98 billion,[11] then there was a continuous increase every year. In 1995/1996 the export value of TPT reached US$ 6.191 billion.

Even though the textile industry is a reliable export commodity, the TPT industry can cause serious problems for the environment, especially the problem of liquid waste which contains high levels of organic and inorganic matter, sometimes also heavy metals. The physical and chemical parameters of textile industry wastewater are generally above the specified threshold of wastewater quality criteria. Therefore textile waste water must be treated before leaving the factory.

Textile industry wastewater treatment can be done by chemical, physical, and biological methods. However, the colors produced from the textile industry

[11] Republika, 11 December 1995

usually come from dyes which are complex aromatic compounds that are difficult to decompose, so that chemical removal of colors will increase operating costs and produce sludge which is categorized as B3 waste in large quantities. The use of activated carbon for waste treatment requires a high cost because the price of activated carbon is relatively expensive, so this process is often unsatisfactory. Biological wastewater treatment is an alternative choice because it has a high potential for treating wastewater containing high levels of biodegradable organic contaminants, besides that the process is more effective, simple, and inexpensive.

According to the use of water, the textile production process is divided into 2 parts, namely the dry process (spinning & weaving) and the wet process (textile finishing). The wet process is a part of the process that needs special attention because it is this process that causes textile industry waste. The textile industry consumes water and chemicals for the wet processes of bleaching, dyeing, printing and finishing. This disposal and process produces solid, liquid and gaseous waste which is a source of pollution for humans and the environment. In general, textile industry wastewater contains high alkalinity, color, high BOD, and contains suspended solids.

Almost all of the dyes used in the textile industry are synthetic dyes, because these types of dyes are easy to obtain with a fixed composition, have a large variety of colors, are easy to use, and the price is relatively not high. Based on chemical structure, azo dyes occupy the top number as the most widely used dyes in industry. Azo dyes have an azo group chromophore system (-N=N-) which binds to an aromatic group.

Based on their application, reactive and dispersion dyes are most widely used in industry. Reactive dyes are dyes that can dye fibers under certain conditions and form covalent reactions with fibers, but besides that, they can easily be hydrolyzed in water. The fundamental problem with reactive dyeing is that the reaction of reactive dyes with water (hydrolysis) competes with the fixation reaction (forming a covalent bond between the dye and the textile fiber).

Waste water treatment can be carried out in physics, chemistry and biology, or a combination of biology-chemistry and chemistry-biology. Physical methods separate part of the pollution load in the form of suspended materials, by means of adsorption, sedimentation and fixation. Adsorption is carried out by utilizing activated carbon as the adsorbent. but the obstacle that arises is the high price of activated carbon. The chemical methods commonly used are coagulation, flocculation, and neutralization. The problem in chemical waste processing is the large amount of sludge that is produced, so it needs further handling.

Discoloration with a biology system is now emerging as a new alternative. Biological waste treatment can be carried out in an anaerobic, aerobic, or combined anaerobic-aerobic manner, based on whether or not oxygen is involved in the treatment process. In principle, biological treatment processes utilize microorganisms that can decompose dissolved organic matter in wastewater into new cellular materials and energy sources. Organic substances are food for

microorganisms. This system is quite effective with relatively low operating costs and produces a high BOD reduction (±85-90%). Another advantage is the sludge produced from the relative waste treatment process.

5. Conclusions and suggestions

After the author describes the description above, it can be concluded and some suggestions, including:

6. Conclusion

1. PT. Kahatek existence in the Sumedang Regency area gives rise to textile waste which is waste produced in the process of reviewing, the process of removing starch, bleaching, cooking, mersirasi coloring, printing and refinement processes, the process of perfecting cotton produces more waste and is stronger than the waste of perfecting synthetic materials
2. Provisions governing, coaching and supervision have been carried out optimally, however, the impact of textile waste is still being felt, especially by the people of Rancaekek Village, Bandung Regency. This has become a polemic for the existence of PT. Kahatek which is in the Sumedang Regency area while the impact of the textile waste is felt by the people of Rancaekek Bandung Regency.

Suggestion

1. The existence of PT. Kahatek in the Sumedang Regency area is in a dilemma, on the profit side it can open jobs for the surrounding community, on the other hand it has an impact on textile waste. Therefore, the authors suggest that the Sumedang Regency government and the Bandung Regency Government must try to coordinate the impact of this textile waste.
2. To overcome the textile waste generated by PT. The Kahatek can take preventive action through State Administrative Law actions, namely re-testing to grant permits for waste management or through repressive measures, namely enforcing criminal law in the environmental sector.

Bibliography

Al-Kdasi, A., Idris, A., Saed, K., & Guan, C. T. (2004). Treatment of textile wastewater by advanced oxidation processes– A review. Global Nest Journal, 6(1), 222–230.

Kiswanto, Wintah, & Maulana, J. (2015). Reduction of Color, TSS, COD, and Cr in Electrolyzed Hand-drawn Batik Waste and Biosand in Kalipucang Wetan Village, Batang Regency. RISTEK: Journal of Research, Innovation and Concentrated Technology, 5, 7–17.

Paper About, Center for Industrial Waste Management of Hazardous and Toxic

Materials, PT. PPPLI Cileungsi, Bogor 1997.

Republika, 11 December 1995

Riyanto. (2013). Electrochemistry and its Applications. In Graha Ilmu (Vol. 1, Issue 1).

Sjachran Basah, Permit as an Instrument for Environmental Control, Lecture at UNAIR, Surabaya, 1997.

Sjachran Basah, Paper in Environmental Law Seminar, Organized by KLH in Collaboration with Legal Mandate Compliance and Enforcement Program from BAPEDAL, 1-2 May 1996 in Jakarta. Original title "Environmental Licensing System as an Instrument for Environmental Courts".

Soerjono Soekanto, Normative Legal Research, A Brief Overview, Jakarta, Raja Grafindo Persada, 1995, p. 13; See also Abdulkadir Muhammad, Law and Legal Research, Bandung, PT. Citra Aditya Bakti, 2004.

Law No. 32 of 2009 concerning Environmental Protection and Management

www.ifc.org/ehsguidelines.