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POLICY OF WASTE MANAGEMENT OF HAZARDOUS TOXIC (WASTE B3)

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Abstract

Mining activities have the potential to affect the health of the ecosystem and reduces its ability to provide goods and services needed for human welfare and the environment. The importance of a healthy environment for future generations is a pillar of sustainable development. To be more environmentally friendly, more mining operations carried out in a manner that minimizes its impact on the surrounding environment. A number of management strategies and technologies are being developed and used by the mining industry to reduce the environmental impact of mining. One of the potential considerable environmental pollutions may occur in the mining sector is pollution due to hazardous wastes and toxic (it's called B3 waste). Compliance with the Indonesian Government Regulation number 101 of 2014 has been a challenge for the coal mining company given the B3 waste management requirements are very detailed and rigorous. B3 waste management challenges become more complex than other business sectors because of the typical mining company-wide working area and the number of workers involved lots. The mining company must prepare a special strategy in the management of B3 waste to be able to adhere to all requirements. The study was conducted at Mining Company "X" in terms of the effectiveness of the management of B3 waste by using Regulation of the Governor of East Kalimantan, Indonesia number 05 of 2014 concerning Performance Rating Program Activity In Coal Mining Environmental Protection and Management. The purpose of this study are: (1) To determine and analyze the effectiveness of the Waste Management Policy B3 on Mining Company "X" is based on Government Regulation No. 101 of 2014; (2) To determine and analyze the added value of B3 Waste Management Policy in Mining Company "X" (it's called MC "X").

Key words**:** *environment, waste management*

INTRODUCTION

Sustainable development is one of the major tasks facing society today. Sustainable development is most commonly defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs [10]. The principles of sustainable development involve the integration of economic activities with environmental integrity, social issues, and effective governance systems [8]. These principles have a growing influence on the development of environmental and social policies in recent decades and has been adopted and promoted by a number of international organizations, including the UN and the World Bank [22]. Environmental protection is a very important part in achieving this goal. Environmental problems could endanger the lives of future generations. All efforts were made to minimize environmental impacts such as waste reduction and recycling, and waste must be disposed of in an environmentally friendly way [1].

Mining activities have the potential to affect the health of the ecosystem and reduce its ability to provide goods and services needed for human welfare and the environment [9]. These services include air purification, water, and decomposition of waste materials. The importance of a healthy environment for future generations is recognized as the "pillars" of sustainable development. To be more environmentally friendly, more mining operations carried out in a manner that minimizes its impact on the surrounding environment. A number of management strategies and technologies are being developed and used by the mining industry to reduce the environmental impact of mining.

Supervision of the potential environmental impacts that would arise, the Government

requires all mining operations can begin only when the mining operations have had an environmental permit, it's called AMDAL AMDAL or environmental permit refers to the Law of the Republic of Indonesia [2] and Government Regulation of the Republic of Indonesia [3]. This shows that the commitment of environmental management becomes crucial for mining companies both in terms of regulatory compliance, maintain the quality of the environment and to ensure continuity of mine production.

One of the potential considerable environmental pollutions may occur in the mining sector is pollution due to hazardous wastes and toxic (it's called Waste B3). Hazardous and toxic waste (B3) has a different nature and characteristics of the waste in general, mainly because of the nature of unstable, stability B3 material is influenced by several external factors such as temperature, pressure or friction, mixed with other ingredients. This may trigger B3 material properties such as the nature of reactive, explosive, flammable or toxic nature. Given these risks, it is necessary that every industry activities can generate B3 waste to a minimum and prevent the entry of B3 waste into the work environment [2].

In accordance Government Regulation [5] B3 waste is defined as the residue of a business and / or activities that contain hazardous and toxic materials. According to the regulation of the activities of the B3 waste management which includes storage, transport, collection, processing, use and stockpiling must have permission from the government.

Compliance with the Government Regulation [10] has been a challenge for the coal mining company given the B3 waste management requirements are very detailed and rigorous. B3 waste management challenges become more complex than other business sectors because the typical mining company has wide working area and the number of workers involved lots. The mining company must prepare a special strategy in the management of B3 waste to be able to adhere to all requirements. Coal company's called "X" is a coal mining company located in the East Kutai Regency of East Kalimantan Province. B3 waste generated largely in mining activities is derived from mining heavy equipment maintenance activities and some of the activities of laboratories, power plants, clinics, and some minor activities supporting mining activities. Coal mining activities are supported by 46 workshop units generating B3 waste. This indicates that the B3 waste through from 46 unit workshops work. Mining Company "X" managing waste through minimal outlay has 46 gates of B3 waste and could have been more than 46 gates expenditure B3 waste because there are some units that have more than one work location.

The number of a gate of expenditure of B3 has the effect on adherence to regulatory compliance and the cost of waste management B3. In normal conditions the unit cost should increase every year, it is possible because of the increased cost of wages, transportation costs, and wastes management costs. If the predicted waste management costs increased by 10% each year, then it should be the increased unit cost of 0.59 USD / kg in 2009 to 0.95 USD / kg in 2014.

Challenges faced in managing B3 waste of coal mine are:

1) Compliance aspects, namely: (1) Target 100% adherence to regulatory provisions, especially the Government Regulation [5]; (2) to manage all waste B3 generated in the region works included by the Contractor.

2) Complexity, namely: (1) a large amount of B3 waste with different types and characteristics; (2) The amount of waste generated at the point of a considerable distance (46 units); (3) Some differences in waste management systems at several large contractors; (4) The number of people involved, especially as B3 waste; (5) the detailed reporting to the government should be sent every 3 months.

Challenges above makes Mining Company "X" set the one-gate of policy to B3 waste management or one gate policy "Every single hazardous waste generated, either by Mining Company "X" or Contractor must be disposed through Mining Company "X" Licensed Temporary Hazardous Waste Storage. This policy is expected to facilitate the Mining Company "X" to control B3 waste produced

and adhere to Government Regulation [5].

Implementation of a one-gate policy of B3 waste management is expected Mining Company "X" (it's called MC "X") and all contractors working in the concession MC "X" can comply with all requirements of applicable legislation. However, a one-gate policy of B3 waste management at MC "X", whether it has been effective in terms of compliance to rules . Some contractors had proposed to manage B3 waste independently on each unit without following a one-gate policy. The One-gate policy of B3 waste management questioned by employees of MC "X" because it is considered inconvenient. Proposed independent B3 waste management is not implemented because some stakeholders in MC "X" judged that the one gate can still be implemented. The author considers that there is an unstable condition where at any time one-gate policy of B3 waste management at MC "X" may be changed without consideration and in-depth assessment. The One-gate policy of B3 waste management questioned by employees of MC "X" because it is considered inconvenient. Proposed independent B3 waste management is not implemented because some stakeholders in MC "X" judged that the one gate can still be implemented. The policy change could be made if the personnel involved did not understand the main purpose of the implementation of the policy of a gate and the impacts that may arise if the one-gate policy of B3 waste management cancelled.

Based on the description of the background, the problem is formulated as follows:

1) Is the policy of "One Gate Policy" Toxic Waste Management of Hazardous Materials (it's called B3 waste) is effective based on Government Regulation [5] ?

2) Is the policy of "One Gate Policy" B3 Waste Management at MC "X" has given added value?

The research objective is set as follows:

1) To know and analyze the effectiveness of the policy of "One Gate Policy" B3 Waste Management at MC "X" is based on Government Regulation [5].

2) To determine and analyze the added value of the policy of "One Gate Policy" B3 Waste Management at MC "X".

MATERIALS AND METHODS

Research Coverage

One-door policy effectiveness studies MC “X” in terms of waste management B3 author will using criteria as for the B3 waste management Any other criteria such aspects of water quality, air quality, and reclamation are not included in the measurement criteria [8]. Data B3 waste management costs using cost data B3 waste management in MC “X” Sangatta, East Kutai, Indonesia.

The research data used such as: (1) B3 waste management workflow process at MC “X”; (2) Type and volume of waste generated; (3) Facilities and systems supporting one-door policy B3 waste management; (4) The evaluation criteria for success in achieving policy objectives using criteria corresponding Governor Regulation [8]; (5) Data administration and compliance data related technical B3 waste management according to the criteria specified. Sample compliance will be taken at a point that will be set by the author consider the waste type and amount; (6) Other data that support the author to finish this article.

Test equipment effectiveness

The analytical tool used this study is to assess the percentage of achievement of the performance of B3 waste using a proper assessment standard [8] and [29]. Weights, assessment B3 waste management is 15 % of the total value, details of which can be seen in Table 1.

From table weight rating then developed a checklist [29], the checklist can be seen in Table 2.

Appropriate checklist criteria table 3 each question will be divided 4 (four) levels of the following values [11]: (1) A value of 0 for the criteria/questions are not met at all; (2) A value of 1 for the criteria/questions were met fraction; (3) A value of 2 for the criteria/ questions were met mostly; (4) Rated 3 for criteria/questions unanswered whole.

Table 1. Weights appraisal management B3 and B3 Waste

No.	Parameter	Weight (%)	Information
1	Permit Temporary Storage B3	2	
2	Amenities TPS B3	2	
3	TPS designs B3	2	
4	Special storage place B3	0.5	
5	Completeness MSDS B3	0.25	
6	SOP B3 Waste Management	0.25	
7	SOP Emergency Response B3	0.25	
8	Submission B3	0.5	
9	B3 Waste Utilization	2	
10	B3 Waste Treatment	2	
11	conditions Workshop	2	
12	oil Trap	1.25	
	Total	15	

Source: [11]

The division level of value also refers [11]. The division level value like this it would be more objective assessment, assessment methods like this then disobedience in a location made it seem as if another location has also become disobedient. Location devout rated remain obedient but then its value is reduced because there are locations that are not obedient.

Table 2. Rating Criteria Proper associated with Effectiveness

Ranked	Description / Effectiveness
Gold category with a value of 91-100	Mining Activities that have been doing environmental management more than required and have made efforts 3R (Reuse, Recycle, Recovery), implementing environmental management systems that are sustainable, and conduct measures to be useful for the society in the long run. **(Highly Effective)**
Green category with grades 71-90	Mining activity which has conducted environmental management more than required and have had an environmental management system, has a good relationship with the community, including efforts 3R (Reuse, Recycle, Recovery) **(More Effective)**
Blue Rating with grades 41-70	Coal mining has implemented control measures pencemarandan or damage to the environment and to achieve results in accordance with the minimum requirements **(effective)**
Red rank with a value of 21-40	Coal mining has been carrying out measures to control pollution or damage to the environment but do not achieve the results that correspond to As its minimum requirements stipulated in applicable legislation **(Ineffective)**
Black ranked with grades 0-20	Coal mining activities have not been carrying out measures to control pollution or damage to the environment and can cause pollution and environmental damage Atua **(Ineffective)**

Source: [4]

Blue Rating [4], Rating blue has a range of values 41% - 70%, meaning that if the total value of the contribution of the management aspects of B3 and B3 by 6% - 10.5% of the maximum value of 15%, the will get the value of the effectiveness of 41% - 70%.

With a value of 41% -70%, the performance can be said effective because it has met the minimum requirements set.

The higher contribution of the value achieved from the management aspect of B3 and B3 waste means more effective performance.

Added value test equipment

To measure whether the one-door policy B3 waste processing this add value or not, the authors take the following steps: (1) Gather Data B3 waste management costs per year for 5 years, in 2009-2014; (2) Looking for the unit cost by dividing the total cost per year with the amount of waste are managed so obtained waste management costs USD/kg; (3) Comparing unit actual costs incurred each year by the unit cost estimate who assumed management costs increased by 10% every year. The assumption is based on the increased cost of their workers' wage increases, increases in transportation costs and increased costs of waste processing at a third party.

RESULTS AND DISCUSSIONS

Management of hazardous and toxic waste (it's called B3 waste) Mining Company "X" (MC "X").

Most waste **MC "X")** originated from the workshop activity, the rest of B3 waste generated from mining other support facilities are laboratories, power plants, clinics, offices and other operations.

The following types of B3 waste generated from each activity.

Number of workshops and work units generating B3 waste in MC "X".

Corresponding number of units generating B3 waste, there are 46 units, this indicates that the point B3 waste it is very much.

The MC "X" does not impose a one-door policy B3 waste management, MC "X" should have at least 46 doors expenditure B3 waste and could have been more than 46 doors

expenditure B3 waste because there are some units that have more than one work location.

Table 3. Types B3 waste produced by **MC "X"** and Contractors

Activity	Waste type B3
Heavy equipment maintenance workshop / light tools and workshop support	Used oil, used batteries, grease traces, hose contaminated, contaminated filters, contaminated items, fluorescent lamp, chemicals
Laboratory	Waste chemicals
Clinic	Medical waste
Power Plant	coal ash
office complex	Toner, dry battery, lamps TL
Other operating (pumps in mining operations, shipping operations, projects, etc.)	Used oil, used batteries, grease traces, hose contaminated, contaminated filters, contaminated items, fluorescent lamp, chemicals

Source: Department of the Environment MC "X", 2015.

Table 4. List of Workshop and Work Unit Producers B3 waste

No.	Work unit	No.	Work unit
1	MC "X" Excavator Maintenance Workshop D17	24	Workshop fuel stations Pama Pit
2	MC "X" workshop Mainshop	25	Workshop DIRE - Coal terminal
3	Workshop KPC Mobile Equipment	26	Joinery Contractors BUMA
4	MC "X" workshop Supporting Coal Terminal	27	Workshop fuel stations Thiess Contractors
5	MC "X" workshop CPP supporters	28	Joinery Contractor Thiess
6	MC "X" workshop Pit Stars	29	Thiess Contractors Against workshop Workshop
7	MC "X" workshop Pit Jupiter	30	workshop KontraktorTrakindo
8	MC "X" workshop Rebuild D13	31	Joinery Contractors United Tractor
9	MC "X" Solar Workshop	32	ISOS clinic
10	MC "X" workshop Fuel Station (6 locations):	33	Laboratory contractor UT Lab
11	Workshop and generator contractor Sewatama	34	laboratory Sucofindo
12	Workshop and Plant Contractor AEL	35	Operational Camp ISS
13	Workshop and Plant Contractor Orica	36	Operational Contractor TCP
14	Joinery Contractors Darma Henwa	37	BWP Air Operations Contractor
15	Workshop Fuel Station KontraktorDarma Henwa	38	Drill Drilling Operations Section
16	Joinery Contractors DMP	39	Operational Storage and Fuel Station SIC (4 locations)
17	Joinery Contractors Hexindo	40	Operational Repeater (4 location)
18	Joinery Contractors Intraco Penta	41	Tanjung Bara power plant (Power Station and workshops)
19	Joinery Contractors BWP	42	mine Stars
20	Joinery Contractors Liebherr	43	Mine Coal Mining
21	Light Vehicle Repair Service Contractors - TW	44	Hatari Mines AB
22	Pama Main Contractor Joinery Workshop	45	Mine Mining Service
23	Joinery Contractors Pama Soulmate	46	Jupiter Pit Mine

Source: Department of the Environment MC "X" , 2015

Standard Operation Procedure (SOP) Management B3 Waste.

MC "X" has developed a complete waste management procedures called Waste Management Handbook [7] , known as WMP or Waste Management Procedure. This handbook refers [6] on the protection and environmental management, waste management B3 [5], Government Regulation No. 74 of 2001 concerning hazardous and toxic materials, a ministerial regulation [5] and waste management "best practice" common enterprise.

One Door Policy B3 Waste Management MC "X"

Challenge MC "X" manage B3 waste are:

(a)Compliance aspects: (1) Target 100% adherence to regulatory provisions, in particular, Government Regulation no. 101 of 2014; (2) MC "X" is responsible for managing all of the B3 waste generated in the working area by KPC or by Contractor

(b)Kompleksitas: (1) B3 with a great number of types and different characteristics; (2) The amount of waste generated point by a considerable distance; (3) Some differences in waste management systems in some large contractors; (4) The number of people involved, especially as a producer of waste B3; (5) Detailed reporting to the government should be sent every 3 months.

Challenges above makes MC "X" set the one-door policy B3 waste management or one gate policy "Every single hazardous waste generated inside the which MC "X" lease, either by MC "X" or Contractor must be disposed of through KPC Licensed Temporary Hazardous Waste Storage". This policy is expected to facilitate the KPC to control B3 produced and adhere to Regulation 101/2014. B3 waste management concept of the door can be in Fig. 1.

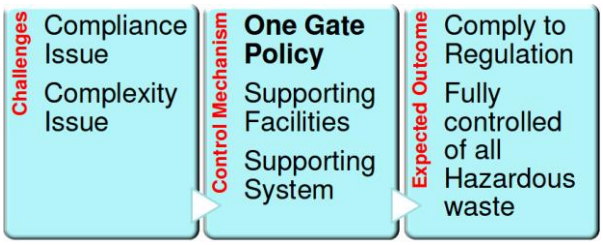

Fig.1. Waste Management Concept One Door MC "X"
Source: Ministry of Environment MC "X", 2015

Image flow above shows that the one-door policy is a tool for B3 waste management companies to face the challenges of compliance and complex conditions so that the target [5] can be achieved, in addition to

the MC "X" can control very well the whole affair related to the management of B3 waste.

Assessment of compliance according to decree of the head of the environment no. 660.2 /K44 / 2014

Compliance Storage Temporary (TPS) B3.

Assessment of compliance with Temporary Storage Sites (TPS) B3 waste unlicensed conducted in eight (8) locations which are the exit B3 corresponding one-door policy B3 waste management at MC "X". In general, the overall polling rated obedient except for items eyewash facilities TPS in coal ash are not yet available. Some of the criteria included in the category, not applicable / NA, NA criteria will be assessed to obey.

Compliance B3 Waste Processing and Utilization

Assessment of compliance with the criteria of the B3 waste treatment is done at the facility Incinerator and processing facilities bioremediation of contaminated soil. Assessment of compliance with the utilization of B3 waste liquid is done on the utilization of used oil as a fuel substitute in blasting activities.

While the assessment of compliance with solid waste utilization B3 conducted on the use of coal ash as a mix of adobe, a mixture of concrete and road base.

Results of assessment of compliance with the processing and utilization of B3 waste are explained that processing and utilization of hazardous and toxic waste (B3) were considered adherent overall.

Compliance Storage of Liquid Fuels.

Assessment of compliance with a liquid fuel tank facility performed on seven (7) Department / Contractor is responsible for the storage and distribution of liquid fuels.

Some Department / Contractor has a liquid fuel storage locations of more than 1 (one) location.

Results of assessment of compliance with storage tanks of liquid fuel tank are explained that the storage facilities of liquid fuel tank rated obedient overall.

Compliance Warehouse Hazardous and Toxic Materials (B3) Special.

Assessment of compliance with warehouse facilities specifically B3 done on eight (8) locations that store hazardous materials and toxic waste (B3) in large numbers. Results of assessment of compliance with special B3 warehouse are explained that warehouse facility hazardous and toxic material (B3) specifically assessed adherent overall.

Compliance Workshop

Assessment of compliance with workshop facilities / workshop conducted on 27 (twenty-seven) depot location.

Results of assessment of compliance with workshop facilities are explained that the facilities workshop / garage rated obedient overall. Housekeeping at each workshop into the category of good to very good.

Compliance Oil Trap

Assessment of compliance against oil facilities trap performed on 27 (twenty-seven) depot location.

Results of assessment of compliance with special B3 warehouse is explained that oil facilities trap rated obedient except for wastewater utilization parameter oil trap with the closed circuit, the item is only 11 workshop adherent of a total of 27 workshops.

Cost management of hazardous and toxic waste (B3)

B3 waste management costs of nonhydrocarbon and grease

B3 waste management costs of nonhydrocarbon and grease in 5 years.

Table 5. Costs of Management of B3 Waste NonHydrocarbons and Grease on Period 2009-2014

Year	Total Waste (Kg)	Total Cost (USD)	Cost Unit B3 Waste Management of Non Hydrocarbon (USD / kg)	Cost Prediction of Non B3 Waste Management Hydrocarbon (USD / kg)
2009	83,130	49,053	0.59	0.59
2010	100,300	57,880	0.58	0.65
2011	111,240	61,508	0.55	0.71
2012	127,840	62,796	0.49	0.79
2013	252,450	115,944	0.46	0.86
2014	137,768	63,030	0.46	0.95

Data source: Environment Department MC "X", 2015.

Cost of B3 Waste Management Hydrocarbons

B3 hydrocarbon waste management costs in 5 years (2009-2014) are presented in Table 6.

Table 6. Management Costs of B3 Waste Hydrocarbon on Period 2009-2014

Year	Total Waste (Kg)	Total Cost (USD)	Cost Unit B3 Waste Management of Non Hydrocarbon (USD / kg)	Cost Prediction of Non B3 Waste Management Hydrocarbon (USD / kg)
2009	768,800	403,972	0.39	0.39
2010	957,130	319,609	0.30	0.43
2011	1,365,180	391,793	0.27	0.47
2012	1,589,740	406,281	0.24	0.52
2013	1,510,960	467,033	0.29	0.57
2014	1,467,830	424,440	0.27	0.62

Data source: Environment Department MC "X", 2015

Discussion

Analysis of Compliance

Summary results of the study on the value of compliance achieved at each place Temporary Storage (TPS) waste Hazardous and Toxic Materials (B3 waste), processing and utilization of B3 waste, storage of hazardous and toxic (B3) records, storage of Liquid Fuels (BBC), workshop / garage and Oil Trap / Traps oil.

According to the results, the summary was found that almost all the parameters have met the criteria set up so that the full value of a value of 3 (three).

There are only two (2) parameters are not entirely meet the parameter i.e. complete facilities TPS in the form of eyewash in TPS Coal Ash / ash coal and utilization of waste water oil trap with the closed circuit, while the other parameters obedient in all locations.

A percentage value is set according to Decree of Environmental Center no. 660.2 / K44 / 2014.

To get the percentage in accordance with Decree of Environmental Center no. 660.2 SK / K44 / 2014 then use the following formula:

Value Percentage = (Value Compliance X Weight specified): 3

Value for compliance based on research results is then compared with the maximum weight corresponding analytical tools are delivered in the research analysis tools.

The results show the value compliance of B3 management and B3 waste was 14:30% of the maximum value of 15%, this means that for the aspects of the management of B3 and B3 scored 14.30 / 15, equivalent to 95.33% adherence to aspects of the management of B3 and B3 waste.

Table 7. Comparison of Maximum Weight with Research Result

No.	Parameter	Thickness Maximum (%)	Rating result (%)
1	Permit Temporary Storage B3	2	2
2	Amenities TPS B3	2	1.97
3	TPS designs B3	2	2
4	Special storage place B3	0.5	0.5
5	Completeness MSDS B3	0:25	0:25
6	SOP B3 Waste Management	0:25	0:25
7	SOP Emergency Response B3	0:25	0:25
8	Submission B3	0.5	0.5
9	B3 Waste Utilization	2	2
10	B3 Waste Treatment	2	2
11	conditions Workshop	2	2
12	oil Trap	1:25	0:58
	Total	15	14:30

Source: Research Result.

Value 95.33% indicates B3 and B3 waste management in MC "X" is very effective. This refers to the regulation 05 in 2004, mentioned criteria Ranked Proper in Category Gold with a value of 91-100 means that mining activity has made environmental management more than required and has made efforts 3R (Reuse, Recycle, Recovery), implementing management systems sustainable environment, and conduct measures to be useful for the society in the long term (Highly Effective).

Analysis of Value Added NonHydrocarbon Waste delivery and Grease

B3 waste management costs are included in the category of NonHydrocarbon and Grease sent to a licensed business in the last 5 years and predictions of waste management costs assuming that each year there is a 10% increase in costs is presented in Table 5 and Figure 2.

Based on Table 8, which is also illustrated in Figure 2 can be seen that the unit costs (USD / kg) for the management of non-hydrocarbon waste and grease tends to decrease.

Cost management in 2009 was 0.59 USD / kg, the rate dropped to 0.58 USD / kg in 2010 and back down to number 0.55 USD / kg in 2011.

In 2012 unit costs continue to drop to 0.49 USD / kg, and fell back to the year 2013. 0:46 figures Unit cost 0.46 USD / kg persist in 2014.
Unit costs in normal conditions should have been increasing every year, it is possible because of the increased cost of wages, transportation costs, and wastes management costs. If the predicted waste management costs increased by 10% each year, then it should be the increased unit cost of 0.59 USD / kg in 2009 to 0.95 USD / kg in 2014.
By comparing the actual cost of the unit with the unit cost predictions assuming a 10% increase per year in the five years (2009-2014), the company managed to cut costs as presented in Table 8.

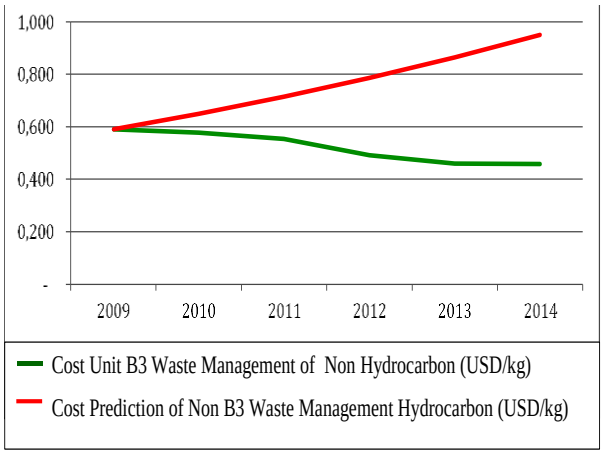

Fig. 2. Graph NonHydrocarbon Waste Management Cost and Actual Grease and Predictions
Source: Research Findings

According to table 8, the company managed to save the cost of USD 232,797 within 5 years (2009-2014), this is equivalent to a saving of 36% of the costs that should be incurred.
Cost management in 2009 0.39 USD / kg, the rate dropped to 0.30 USD / kg in 2010 and fell back to number 0.27 USD / kg in 2011. In 2012 unit costs back down to number 0.24 USD / kg, then experience the increase in the year 2013 where the unit cost is 0.29 USD / kg.
In 2014 the unit cost stands at 0.27 USD / kg. Unit costs in normal conditions should have been increasing every year, it is possible because of the increased cost of wages, transportation costs, and wastes management costs.

Table 8. Cost Savings Calculation of NonHydrocarbon Waste Management and Grease.

Year	Total Waste (Kg)	Total Cost (USD)	Cost Unit B3 Waste Management of Non Hydrocarbon (USD / kg)	Cost Prediction of Non B3 Waste Management Hydrocarbon (USD / kg)	Total Cost Prediction (USD)	Total Cost Prediction (USD)	Presentage Saving Cost (%)
2009	83,130	49,053	0.59	0.59	49,053	7,223	11
2010	100,300	57,880	0.58	0.65	57,880	17,917	23
2011	111,240	61,508	0.55	0.71	61,508	37,608	37
2012	127,840	62,796	0.49	0.79	62,796	102,155	47
2013	252,450	115,944	0.46	0.86	115,944	67,895	52
2014	137,768	63,030	0.46	0.95	63,030	232,797	36

Source: Research Findings

Delivery of Solid Waste Hydrocarbons

Waste management costs B3 category of solid waste hydrocarbons are sent to a licensed business in the last 5 years and predictions of waste management costs assuming that each year there is a 10% increase in costs is presented in Table 6 and Fig. 3.

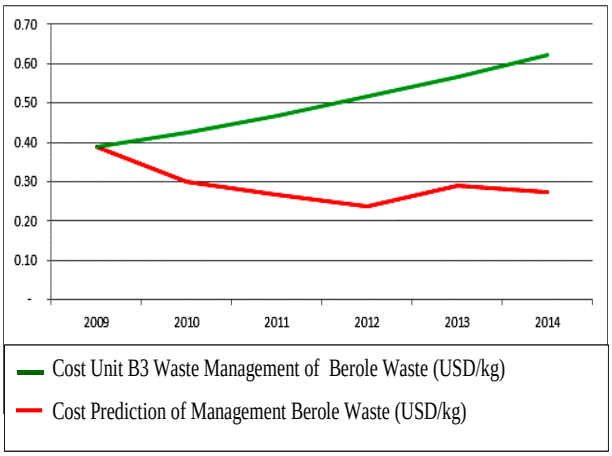

Fig. 3. Graph of Solid Waste Management Fee Actual Hydrocarbons and Predictions
Source: Research Findings

If the predicted waste management costs increased by 10% per year, then the unit cost of waste management amounted to 0.39 USD / kg in 2009 should be 0.62 USD / kg in 2014.
Comparing the actual cost unit with a unit cost predictions assuming a 10% increase per year in the five years (2009-2014), the company managed to cut costs as presented in Table 9.
According to Table 9, the company managed to save the cost of USD 1,899,293 within 5 years (2009-2014), this is equivalent to a saving of 44% of the costs that should be

incurred.

Table 9. Calculation of Solid Waste Management Cost Savings Hydrocarbons

Year	Total Waste (Kg)	Total Cost (USD)	Cost Unit B3 Waste Management of Non Hydrocarbon (USD / kg)	Cost Prediction of Non B3 Waste Management Hydrocarbon (USD / kg)	Total Cost (USD)	Saving Cost (USD)	Presentage Saving Cost (%)
2009	768,800	403,972	0.39	0.39	403,972	-	-
2010	957,130	319,609	0.30	0.43	319,609	136,163	30
2011	1,365,180	391,793	0.27	0.47	391,793	300,178	43
2012	1,589,740	406,281	0.24	0.52	406,281	472,527	54
2013	1,510,960	467,033	0.29	0.57	467,033	444,203	49
2014	1,467,830	424,440	0.27	0.62	424,440	546,221	56

Source: Research Findings

Discussion Compliance

According to the results of compliance assessment across TPS B3 scored 14:30%, this means that for the aspects of the management of B3 and B3 scored 95.33% adherence to aspects of the management of B3 and B3. 14:30% by value, equivalent to 95.33% of compliance, the management aspects of B3 and B3 is considered very effective. It can be concluded that the one-door policy B3 Waste Management in MC "X" is considered very effective in fulfilling pp101 / 2014.

B3 waste management and highly effective is a positive point for the company's operations. With the fulfilment of all the requirements in accordance Government Regulation no.101 / 2014, the potential for the company to get operational constraints resulting from a mismatch of environmental management in the aspect of management of B3 waste to be small or non-existent.

Some important things are the key to success in the One Stop Waste Management Policy B3 so it is very effective in fulfilling Government Regulation no. 101 / 2014, are as follows:

(1) The number of polling stations was only 8 pieces make the achievement of compliance with the rules is relatively easier than if the number of polling stations owned more ie at least 46 polling stations (assuming each B3 waste has 1 polling stations). Control of the 8 polling stations much easier than the control of the 46 polling stations. Probability to comply with 8 polling stations is 1/8 or 0.125 or 12.5%. This means 1 polling stations obedient will receive the value of 12.5%. Meanwhile, if the number of polling stations by 46 then the probability obedient to every polling station is 1/46 or 0.022 or 2.2%. This means that if 1 polling stations obedient then only got 2.2%. This illustrates that the number of polling stations is less than the company easier to obey.

(2) One Door Policy B3 Waste Management requires that all waste producers follow an integrated waste management system. Thus the regulatory compliance easier to achieve.

(3) One Door Policy B3 waste management easier for the company to physically control the whole of B3 waste managed, not only to control the documents alone. This makes quality control over the management of B3 waste be much better.

(4) For the record, the procedure has not been set explicitly KPC terms TPS terms whether the addition should be done, if it is allowed what are the considerations and requirements. Besides a good understanding of the implementation of Single Window Policy B3 Waste Management should continue to be disseminated in particular to the party who is responsible for the management of B3 waste.

Discussion on the Value Added

Results of analysis show that the implementation of the One Stop Waste Management Policy B3 succeeded in providing added value in the form of cost savings amounting to USD 232,797 of the costs should be for Non Hydrocarbon waste and grease during the years 2009-2014, this is equivalent to saving 36%. As for the solid waste hydrocarbons which can be done cost savings of USD 1,899,293 or saving of 44% of the cost should be.

The added value provided by the imposition of one-door policy B3 Waste Management was very big that total savings of $ 2,132,089 within 5 years. Some important points to note One Door Policy B3 Waste Management can provide added value so great is:

(1)The amount of B3 that more would increase the bargaining power of companies that produce waste against third parties who carry out management of B3 waste. Thus

unlicensed B3 waste manager will give management the most competitive price.
(2)B3 waste shipments are more optimal, as it is well known in the B3 waste storage period polling stations restricted 90 days while the amount of B3 that is sent in one 20 ft container is 80 drum. With the one-door policy, the amount of B3 will always attained one full container when sent to a licensed manager. If MC "X" did Policies One Stop Waste Management B3 B3 then perhaps that is not the full one (1) container to be sent, because the storage time is up. This will increase the cost of shipping.
(3)B3 waste handling jobs at the polling stations become more efficient because of the number of polling stations would require labor slightly less well.

CONCLUSIONS

Based on the results and discussion, we conclude the hypothesis is rejected for the following reasons:
(1) Policy One Stop Waste Management B3 in MC "X" has effectively towards the fulfillment of rules based on Government Regulation No. 101 of 2014. This is evidenced by the achievement of a Compliance value 95.33% to aspects of the management of B3 and B3
(2) One Door Policy B3 Waste Management in MC "X", adding value to the company. The added value is given in the form of savings of USD 2.132.089 of its reality costs incurred within 5 years (2009-2014).

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