

SENATE

S. No. 225

10 JUL -6 11:19

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Introduced by Senator Antonio "Sonny" F. Trillanes IV

**EXPLANATORY NOTE**

Waste management has become an issue and has posed serious problems in the country. Evidently, we need an approach that can deal with the worsening problem of waste disposal, which at the same time, can also contribute to the conservation of the environment. This not only means that waste must be properly disposed of; this also requires that waste should be disposed of in a manner such that it would not become a significant environmental burden.

Existing technology permits the incineration of waste as a mode of waste disposal while at the same time generating much needed electric power.

Although there are serious environmental concerns about incineration, advances in emission control designs, along with strict standards and monitoring system have caused large reduction of pollution in the atmosphere. In Japan, concerns over the health effects of dioxin and furan emissions from incinerators have been proven to be significantly lessened by advances in emission control designs and very stringent new governmental regulations that have resulted in large reductions in the amount of dioxins and furans emissions<sup>1</sup>.

Incineration reduces the volume of waste very effectively and destroys disease-causing bacteria. This is suitable for use in the country since it is difficult to secure final disposal sites due to our becoming limited land space. It is estimated that when incinerated, waste shall be reduced to approximately one-tenth of its weight and one-twentieth of its volume<sup>2</sup>. More importantly, incinerators can be used for generating electricity or to provide energy in other forms such as generating steam for heating. Such a use is known as waste-to-energy (WTE) or energy recovery.

This bill aims to amend Republic Act 8749, otherwise known as the Clean Air Act of 1999, by repealing the original Section 20 thereof and revising the same to take advantage, promote and/or permit the use of recent advances in waste-to-energy technology. Through incineration, the most common waste-to-energy (WTE) implementation, this bill intends to promote WTE technology. This technology provides for the safe disposal of waste without harmful emissions to the atmosphere, and at the same time, offers maximum benefits from the recovery of the valuable contents of the wastes from our cities.

In view of the foregoing, the immediate approval of this bill is earnestly sought.

  
ANTONIO "SONNY" F. TRILLANES IV  
Senator

<sup>1</sup> Turning Trash into Cash. Asian Cover Story. 2003. Retrieved 25 September 2008 from [www.businessweek.com/magazine/content/03\\_43/b3855017.htm](http://www.businessweek.com/magazine/content/03_43/b3855017.htm)

<sup>2</sup> Technologies to Support a Sound Material-Cycle Society. Ministry of Environment, Government of Japan.2007.

10 JUL -6 1979

SENATE

S. No. 225

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Introduced by Senator Antonio "Sonny" F. Trillanes IV

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AN ACT  
PROMOTING AND PERMITTING THE USE OF WASTE-TO-ENERGY  
TECHNOLOGY, AMENDING FOR THIS PURPOSE REPUBLIC ACT NUMBERED  
8749, OTHERWISE KNOWN AS THE CLEAN AIR ACT OF 1999

*Be in enacted by the Senate and House of Representatives of the Philippines in Congress assembled:*

1           **SECTION 1. *Definition of Terms.*** – Section 5 of Republic Act No. 8749, otherwise  
2 known as “The Clean Air Act of 1999”, and herein referred to as the Act, is amended to read as  
3 follows:

4  
5           “SEC. 5. *Definitions.* - As used in this Act:

6           a) “*Air pollutant*” means any matter found in the atmosphere other than oxygen,  
7           nitrogen, water vapor, carbon dioxide, and the inert gases in their natural or  
8           normal concentrations, that is detrimental to health or the environment, which  
9           includes, but not limited to smoke, dust, soot, cinders, fly ash, solid particles of  
10           any kind, gases, fumes, chemical mists, steam and radioactive substances;

11           b) “*Air pollution*” means any alteration of the physical, chemical and biological  
12           properties of the atmospheric air, or any discharge thereto of any liquid,  
13           gaseous or solid substances that will or is likely to create or to render the air  
14           resources of the country harmful, detrimental, or injurious to public health,  
15           safety or welfare or which will adversely affect their utilization for domestic,  
16           commercial, industrial, agricultural, recreational, or other legitimate purposes;

1 c) "*Ambient air quality guideline values*" means the concentration of air over  
2 specified periods classified as short-term and long-term which are intended to  
3 serve as goals or objectives for the protection of health and/or public welfare.  
4 These values shall be used for air quality management purposes such as  
5 determining time trends, evaluating stages of deterioration or enhancement of  
6 the air quality, and in general, used as basis for taking positive action in  
7 preventing, controlling, or abating air pollution;

8 d) "*Ambient air quality*" means the general amount of pollution present in a  
9 broad area; and refers to the atmosphere's average purity as distinguished from  
10 discharge measurements taken at the source of pollution;

11 e) "*Certificate of Conformity*" means a certificate issued by the Department of  
12 Environment and Natural Resources to a vehicle manufacturer / assembler or  
13 importer certifying that a particular new vehicle or vehicle type meets the  
14 requirements provided under this Act and its rules and regulations;

15 f) "*Department*" means the Department of Environment and Natural Resources;

16 g) "*Eco-profile*" means the geographic-based instrument for planners and decision  
17 makers which present an evaluation of the environment quality and carrying  
18 capacity of an area. It is the result of the integration of primary data and  
19 information on natural resources and antropogenic activities on the land which  
20 were evaluated by various environmental risk assessment and forecasting  
21 methodologies that enable the Department to anticipate the type of  
22 development control necessary in the planning area;

23 h) "*Emission*" means any air contaminant, pollutant, gas stream or unwanted  
24 sound from a known source which is passed into the atmosphere;

- 1 i) "*Greenhouse gases*" means those gases that can potentially or can reasonably  
2 be expected to induce global warming, which include carbon dioxide, oxides of  
3 nitrogen, chloroflourocarbons, and the like;
- 4 j) "*Hazardous substances*" means those substances which present either: (1)  
5 short-term acute hazards such as acute toxicity by ingestion, inhalation, or skin  
6 absorption, corrosivity or other skin or eye contact hazard or the risk of fire  
7 explosion; or (2) long-term toxicity upon repeated exposure, carcinogenicity  
8 (which in some cases result in acute exposure but with a long latent period),  
9 resistance to detoxification process such as biodegradation, the potential to  
10 pollute underground or surface waters;
- 11 k) "*Infectious waste*" means that portion of medical waste that could transmit an  
12 infectious disease;
- 13 l) "*Medical waste*" means the materials generated as a result of patient diagnosis,  
14 treatment, or immunization of human beings or animals;
- 15 m) "*Mobile source*" means any vehicle propelled by or through combustion of  
16 carbon-based or other fuel, constructed and operated principally for the  
17 conveyance of persons or the transportation of property goods;
- 18 n) "*Motor vehicle*" means any vehicle propelled by a gasoline or diesel engine or  
19 by any means other than human or animal power, constructed and operated  
20 principally for the conveyance of persons or the transportation of property or  
21 goods in a public highway or street open to public use;
- 22 o) "*Municipal waste*" means the waste materials generated from communities  
23 within a specific locality;

1 p) "*New vehicle*" means a vehicle constructed entirely from new parts that has  
2 never been sold or registered with the DOTC or with the appropriate agency or  
3 authority, and operated on the highways of the Philippines, any foreign state or  
4 country;

5 q) "*Octane Rating or the Anti-Knock Index(AKI)*" means the rating of the anti-  
6 knock characteristics of a grade or type of automotive gasoline as determined  
7 by dividing by two (2) the sum of the Research Octane Number (RON), plus  
8 the Motor Octane Number (MON); the octane requirement, with respect to  
9 automotive gasoline for use in a motor vehicle or a class thereof, whether  
10 imported, manufactured, or assembled by a manufacturer, shall refer to the  
11 minimum octane rating of such automotive gasoline which such manufacturer  
12 recommends for the efficient operation of such motor vehicle, or a substantial  
13 portion of such class, without knocking;

14 r) "*Ozone Depleting Substances (ODS)*" means those substances that  
15 significantly deplete or otherwise modify the ozone layer in a manner that is  
16 likely to result in adverse effects of human health and the environment such  
17 as, but not limited to, chloroflourocarbons, halons and the like;

18 s) "*Persistent Organic Pollutants (POPs)*" means the organic compounds that  
19 persist in the environment, bioaccumulate through the food web, and pose a  
20 risk of causing adverse effects to human health and the environment. These  
21 compounds resist photolytic, chemical and biological degradation, which shall  
22 include but not be limited to dioxin, furan, Polychlorinated Biphenyls (PCBs),  
23 organochlorine pesticides, such as aldrin, dieldrin, DDT, hexachlorobenzene,  
24 lindane, toxaphere and chlordane;

1 t) *"Poisonous and toxic fumes"* means any emissions and fumes which are  
2 beyond internationally - accepted standards, including but not limited to the  
3 World Health Organization (WHO) guideline values;

4 u) *"Pollution control device"* means any device or apparatus used to prevent,  
5 control or abate the pollution of air caused by emissions from identified  
6 pollution sources at levels within the air pollution control standards established  
7 by the Department;

8 v) *"Pollution control technology"* means the pollution control devices, production  
9 process, fuel combustion processes or other means that effectively prevent or  
10 reduce emissions or effluent;

11 w) *"Standard of performance"* means a standard for emissions of air pollutant  
12 which reflects the degree of emission limitation achievable through the  
13 application of the best system of emission reduction, taking into account the  
14 cost of achieving such reduction and any non-air quality health and  
15 environmental impact and energy requirement which the Department  
16 determines, and adequately demonstrates; and

17 x) *"Stationary source"* means any building or immobile structure, facility or  
18 installation which emits or may emit any air pollutant;

19 Y) BIOCHEMICAL PROCESS – CONSISTS OF ANAEROBIC DIGESTION,  
20 HYDROLYSIS, AND FERMENTATION USING ENZYMES THAT  
21 PRODUCE LOW HEAT IN SLOW REACTION TIMES;

22 Z) BOILER - A CLOSED VESSEL IN WHICH WATER OR OTHER FLUID  
23 IS HEATED. THE HEATED OR VAPORIZED FLUID EXITS THE  
24 BOILER FOR USE IN VARIOUS PROCESSES OR HEATING  
25 APPLICATIONS;

- 1 AA) BOTTOM ASH – ONE OF THE RESIDUES GENERATED IN THE  
2 COMBUSTION OF COAL, GENERALLY-CAPTURED FROM THE  
3 BOTTOM OF THE FURNACE;
- 4 BB) BUBBLING FLUIDIZED-BED – A COMBUSTION TECHNOLOGY  
5 USED TO SUSPEND SOLID FUELS ON UPWARD-BLOWING JETS  
6 OF AIR DURING THE COMBUSTION PROCESS. THE RESULT IS A  
7 TURBULENT MIXING OF GAS AND SOLIDS. THE TUMBLING  
8 ACTION, MUCH LIKE A BUBBLING FLUID, PROVIDES MORE  
9 EFFECTIVE CHEMICAL REACTIONS AND HEAT TRANSFER;
- 10 CC) CAUSTIC SODA - USED TO DRIVE CHEMICAL REACTIONS AND  
11 ALSO FOR THE NEUTRALIZATION OF ACIDIC MATERIALS;
- 12 DD) ECONOMIZER - MECHANICAL DEVICES INTENDED TO REDUCE  
13 ENERGY CONSUMPTION, OR TO PERFORM ANOTHER USEFUL  
14 FUNCTION LIKE PREHEATING A FLUID;
- 15 EE) FABRIC FILTER BAGHOUSE - FABRIC COLLECTORS USE  
16 FILTRATION TO SEPARATE DUST PARTICULATES FROM DUSTY  
17 GASES;
- 18 FF) FLUE GAS - GAS THAT EXITS TO THE ATMOSPHERE VIA A  
19 FLUE, WHICH IS A PIPE OR CHANNEL FOR CONVEYING  
20 EXHAUST GASES FROM A FIREPLACE, OVEN, FURNACE,  
21 BOILER OR STEAM GENERATOR;
- 22 GG) FLY ASH – ONE OF THE RESIDUES GENERATED IN THE  
23 COMBUSTION OF COAL. FLY ASH IS GENERALLY CAPTURED  
24 FROM THE CHIMNEYS OF COAL-FIRED POWER PLANTS;
- 25 HH) GASIFICATION AND MELTING FURNACE - A FACILITY THAT  
26 THERMALLY DECOMPOSES WASTE INTO GAS AND CARBIDE IN

1 A GASIFICATION FURNACE AND BURNS THESE IN A MELTING  
2 FURNACE TO CONVERT THEM INTO WASTE GAS AND SLAG;

3 II) PARTICULATE MATTER – REFERS TO THE GENERIC TERM  
4 USED FOR A TYPE OF AIR POLLUTION THAT CONSISTS OF  
5 COMPLEX AND VARYING MIXTURES OF PARTICLES  
6 SUSPENDED IN THE AIR;

7 JJ) ROTARY FURNACE TYPE INCINERATORS (ROTARY KILNS) – A  
8 HORIZONTAL CYLINDRICAL INCINERATOR, THE INNER  
9 SURFACE OF WHICH IS COVERED WITH REFRACTORY  
10 MATERIAL THAT IS ROTATED AND WHERE WASTE IS DRIED  
11 AND BURNT;

12 KK) SELECTIVE CATALYTIC REDUCTION – CATALYTIC OXIDATION  
13 USING METAL OXIDE CATALYSTS THAT ARE PRESENTLY  
14 COMMONLY USED FOR REDUCING NO<sub>x</sub> EMISSIONS;

15 LL) SLAG - THE BY-PRODUCT OF SMELTING ORE TO PURIFY  
16 METALS;

17 MM) SMELTING – A CHEMICAL REDUCTION USED TO PRODUCE A  
18 METAL FROM ITS ORE;

19 NN) SUPERHEATER – A DEVICE THAT HEATS THE STEAM  
20 GENERATED BY THE BOILER, INCREASING ITS THERMAL  
21 ENERGY AND DECREASING THE LIKELIHOOD THAT IT WILL  
22 CONDENSE INSIDE AN ENGINE;

23 OO) THERMOCHEMICAL TECHNIQUE – CONSISTS OF COMBUSTION,  
24 GASIFICATION, AND PYROLYSIS THAT PRODUCE HIGH HEAT  
25 IN FAST REACTION TIMES;

26 PP) WASTE-TO-ENERGY TECHNOLOGY – REFERS TO:



1                   1) TECHNOLOGY THAT INVOLVES THE CONVERSION OF  
2                   VARIOUS ELEMENTS OF MUNICIPAL SOLID WASTE SUCH  
3                   AS PAPER, PLASTICS, AND WOOD TO GENERATE ENERGY  
4                   BY EITHER THERMOCHEMICAL OR BIOCHEMICAL  
5                   PROCESSES;

6                   2) ANY WASTE TREATMENT THAT IS ABLE TO PRODUCE  
7                   ENERGY FROM A WASTE;

8                   3) TECHNOLOGY WHICH REDUCES OR ELIMINATES WASTE  
9                   THAT OTHERWISE WOULD BE TRANSFERRED TO A  
10                  GREENHOUSE GAS;

11                 QQ) WASTE TREATMENT – ACTIVITIES WHICH SEEK TO ENSURE  
12                 (NECESSITATE) THAT WASTE HAS THE LEAST PRACTICABLE  
13                 IMPACT ON THE ENVIRONMENT.

14  
15                 **SEC. 2.** Section 15 of The Act is hereby amended to read as follows:  
16

17                 “SEC. 15. *Air Pollution Research and Development Program.*- The Department,  
18                 in coordination with the Department of Science and Technology (DOST), other agencies,  
19                 the private sector, the academe, NGO’s and PO’s, shall establish a National Research  
20                 and Development Program for the prevention [and], control of air pollution AS WELL  
21                 AS WASTE-TO-ENERGY TECHNOLOGY UTILIZATION. The Department shall give  
22                 special emphasis to research on and the development of improved methods having  
23                 industry-wide application for the prevention [and], control of air pollution AND  
24                 WASTE-TO-ENERGY TECHNOLOGY UTILIZATION.

25                 Such a research and development program shall develop air quality guideline  
26                 values and standards in addition to internationally-accepted standards of maintaining

1 environmentally-sound practices in waste treatment. It shall also consider the socio-  
2 cultural, political and economic implications of air quality management [and], pollution  
3 control AND WASTE-TO-ENERGY TECHNOLOGY UTILIZATION.”

4  
5 **SEC. 3.** Section 15 of The Act is hereby further amended by adding a sub-section to  
6 read as follows:

7  
8 **SEC. 15-A. WASTE-TO-ENERGY TECHNOLOGY.** – PURSUANT TO  
9 SECTION 15 OF THIS ACT, WASTE-TO-ENERGY TECHNOLOGY IS HEREBY  
10 PROMOTED WITH THE FOLLOWING OBJECTIVES:

- 11 A) REDUCE THE VOLUME OF ORIGINAL WASTE AND AT THE  
12 SAME TIME PRODUCE ENERGY FROM THE SAME;
- 13 B) CONDUCT WASTE STREAM ANALYSIS THAT AVOIDS A  
14 SITUATION WHERE ASH BECOMES HAZARDOUS WASTE;
- 15 C) TREAT ALL TYPES OF WASTE, INCLUDING HAZARDOUS  
16 AND TOXIC MATERIALS, WITHOUT LEAVING BEHIND  
17 WASTE RESIDUES AND HARMFUL EMISSIONS TO THE  
18 ATMOSPHERE;
- 19 D) RECOVER ALL VALUABLE CONTENTS OF WASTES AT  
20 HIGHLY ECONOMIC CONDITIONS;
- 21 E) RECYCLE VALUABLE MATERIALS AND RECOVER MORE  
22 ENERGY;
- 23 F) CONTINUOUSLY PROMOTE DEVELOPED TECHNOLOGY  
24 THAT PRODUCES NO HARMFUL EMISSIONS OR RESIDUES,  
25 COMPLYING WITH THE STANDARDS AND REGULATIONS  
26 WHICH PROTECT THE ENVIRONMENT.

1           **SEC. 4.** The Act is hereby further amended by repealing the original Section 20 of the  
2 said Act and amending and revising the same to read as follows:

3  
4                   **“SEC. 20. ALLOWING INCINERATION. –**  
5           INCINERATION SHALL BE ALLOWED FOR THE  
6           TREATMENT OF WASTE, AND IN EFFECT, THE  
7           CONVERSION OF SUCH WASTE INTO ENERGY. TO  
8           CONTROL AIR POLLUTION, THE INCINERATOR SHALL  
9           BE DESIGNED IN SUCH A WAY THAT PRODUCT  
10          COMBUSTION GASES SHALL BE PROPERLY TREATED  
11          AND HARMFUL EMISSIONS SHALL BE REMOVED  
12          BEFORE GASES ARE RELEASED INTO THE ATMOSPHERE.  
13          ADVANCED EMISSION CONTROL DESIGN AND  
14          STRINGENT REGULATION SHALL ENSURE THAT  
15          WASTES ARE DISPOSED OF WITHOUT DETRIMENTAL  
16          IMPACT TO THE ENVIRONMENT.

17  
18                   **(1) INCINERATION AS AN INTERMEDIATE TREATMENT**  
19                   **TECHNOLOGY. –** INCINERATION SHALL BE GENERALLY  
20          USED FOR INTERMEDIATE WASTE MANAGEMENT.  
21          COLLECTED DOMESTIC WASTE SHALL BE  
22          TRANSPORTED DIRECTLY TO AN INTERMEDIATE  
23          TREATMENT FACILITY – THE INCINERATION PLANT.  
24          AFTER BEING COLLECTED AND TRANSPORTED, WASTE  
25          SHALL BE SUBJECTED TO INTERMEDIATE TREATMENT  
26          TO BECOME SUITABLE FOR FINAL DISPOSAL.

1           THERE SHALL BE AN ENFORCEMENT REGULATION  
2           DETERMINED BY THE DEPARTMENT THAT SHALL  
3           DEFINE A STRUCTURAL STANDARD FOR INCINERATION  
4           PLANTS FOR DOMESTIC WASTE, IN WHICH, IT SHALL BE  
5           REQUIRED TO KEEP COMBUSTION GAS TEMPERATURES  
6           ABOVE 800°C FOR INCINERATION, TO KEEP THE  
7           TEMPERATURE OF GAS FLOWING IN THE DUST  
8           CHAMBER BELOW 200°C AND TO PROVIDE A WASTE  
9           GAS TREATMENT FACILITY.

10  
11           WASTE INCINERATION SHALL BE CLOSELY RELATED TO  
12           THE MEASURES ADOPTED AGAINST HAZARDOUS  
13           SUBSTANCES CONTAINED IN WASTE GAS, ESPECIALLY  
14           DIOXINS, AND THE RECOVERY OF HEAT (THERMAL  
15           RECYCLING) FROM INCINERATION PLANTS. TO REDUCE  
16           THE GENERATION OF DIOXIN WITH COMPLETE HIGH-  
17           TEMPERATURE COMBUSTION, GASIFICATION AND  
18           MELTING FURNACE SHALL BE INTRODUCED. THIS  
19           SHALL ENSURE THAT:

- 20           A. THE AMOUNT OF HEAT HELD IN THE WASTE IS  
21           UTILIZED TO MELT AND SOLIDIFY ASH AND  
22           THEREFORE RENDER THE ASH HARMLESS AND  
23           THE MOLTEN SLAG UTILIZED EFFECTIVELY; AND  
24           B. ONLY A SMALL AMOUNT OF AIR IS REQUIRED  
25           FOR COMBUSTION SO THAT HIGH-EFFICIENCY  
26           HEAT RECOVERY WITH A SMALL AMOUNT OF  
27           EXHAUST GAS IS POSSIBLE.

1           (2) *MODERN INCINERATION.* – THE INCINERATION  
2 PLANT SHALL BE EQUIPPED WITH TWO 200 T/D  
3 ATMOSPHERIC BUBBLING FLUIDIZED BED (BFB)  
4 INCINERATION BOILERS. A BFB UNIT SHALL OPERATE  
5 BY COMBINING FUEL AND COMBUSTION AIR IN HOT  
6 SAND UNDER VIGOROUS MIXING. THERE SHALL BE  
7 BASICALLY THREE ZONES IN THE VERTICALLY-  
8 ORIENTED INCINERATOR: THE FLUIDIZED BED, THE  
9 FREEBOARD AND THE BOILER. AT THE BOTTOM OF THE  
10 VESSEL SHALL BE THE DENSE BED, WHERE FLUIDIZING  
11 AIR SHALL ENTER THROUGH A HORIZONTAL TUBING  
12 GRID (DISTRIBUTOR) JUST ABOVE THE INCINERATOR  
13 FLOOR. AT A HIGHER ELEVATION IN THE FLUIDIZED  
14 BED, PRIMARY COMBUSTION AIR (APPROXIMATELY  
15 7,550 NM<sup>3</sup>/H) SHALL BE INJECTED. TEMPERATURE IN THE  
16 BED SHALL BE MAINTAINED AT ABOUT 550-630°C, HOT  
17 ENOUGH TO DRIVE OFF VOLATILES AND FULLY  
18 COMBUST THE MUNICIPAL SOLID WASTE (MSW), WHICH  
19 SHALL BE FED AT THE TOP OF THE BED.

20  
21 IN CASE THE TEMPERATURE RISES ABOVE 630°C,  
22 COOLING WATER SPRAYS SHALL BE ACTIVATED  
23 AUTOMATICALLY. ASH AND SAND THAT PERIODICALLY  
24 MIGRATE DOWNWARD SHALL BE REMOVED AT THE  
25 INCINERATOR BOTTOM. SAND SHALL BE SEPARATED  
26 FROM THE ASH, GRADED, AND RETURNED TO THE TOP  
27 OF THE DENSE BED. EACH INCINERATOR SHALL

1           CONTAIN 57 M<sup>3</sup> OF SAND (90 T), SOME OF WHICH SHALL  
2           BE LOST AS FINES THROUGH FLUE GAS STREAM AND  
3           WITH FABRIC FILTERS AT A TEMPERATURE LESS THAN  
4           2000°C.

5  
6           ABOVE THE DENSE BED SHALL BE A TALL REGION  
7           KNOWN AS THE FREEBOARD, WHERE SECONDARY  
8           COMBUSTION AIR (APPROXIMATELY 28 800 NM<sup>3</sup>/H)  
9           SHALL BE INJECTED AT SEVERAL LEVELS TO  
10          COMPLETELY BURN OFF THE VOLATILES. IN THIS  
11          REGION, THE TEMPERATURE RISES STEADILY FROM  
12          ABOUT 710°C TO 1030°C (AUTOMATIC COOLING WATER  
13          SPRAYS ARE ACTIVATED SHOULD THE TEMPERATURE  
14          EXCEED 1070°C), AND GAS VELOCITY IS SUCH THAT A  
15          RESIDENCE TIME (AT 850°C) OF AT LEAST TWO  
16          SECONDS SHALL BE ACHIEVED, FOR DIOXIN  
17          DESTRUCTION. IN ADDITION TO FLY ASH, SOME SAND  
18          FINES MAY STILL BE CARRIED BY THE GASES IN THE  
19          FREEBOARD, BUT THESE ARE MINIMIZED BY PRUDENT  
20          VELOCITY CONTROL.

21  
22          ABOVE THE FREEBOARD IS THE BOILER. WITH NO  
23          COMBUSTIBLES REMAINING IN THE GAS, AND WITH  
24          THE AID OF COOLER AIR INJECTION, TEMPERATURE  
25          SHALL DROP RAPIDLY PRIOR TO CONTACT WITH THE  
26          BOILER TUBES (APPROXIMATELY 480-580°C). THIS  
27          NATURAL CIRCULATION WATER-TUBE BOILER SHALL

1           CONTAIN 57 M<sup>3</sup> OF SAND (90 T), SOME OF WHICH SHALL  
2           BE LOST AS FINES THROUGH FLUE GAS STREAM AND  
3           WITH FABRIC FILTERS AT A TEMPERATURE LESS THAN  
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26          BOILER TUBES (APPROXIMATELY 480-580°C). THIS  
27          NATURAL CIRCULATION WATER-TUBE BOILER SHALL

1 BE EQUIPPED WITH A SUPERHEATER. STEAM SHALL BE  
2 GENERATED AT A MAXIMUM RATE OF 33.3 T/H FROM  
3 EACH UNIT, USUALLY AT 3.14 MPA (ABS) AND 300°C.  
4 THE HIGH-PRESSURE STEAM SHALL BE ROUTED TO A  
5 HIGH-PRESSURE STEAM HEADER, WHILE THE FLUE  
6 GASES SHALL EXIT THE BOILER THROUGH AN  
7 ECONOMIZER TO A QUICK-QUENCH COOLING TOWER.

8  
9 **(3) AIR POLLUTION CONTROL SYSTEM.** – FLUE GAS  
10 TREATMENT SHALL BEGIN AT THE EXIT OF THE  
11 ECONOMIZER, WHERE A WATER SPRAY COOLING  
12 TOWER QUICKLY QUENCHES THE GASES TO 150°C,  
13 MINIMIZING DIOXIN FORMATION. AT THE ENTRANCE  
14 TO THE FABRIC FILTER BAGHOUSE, SLAKED LIME AND  
15 POWDERED ACTIVATED CARBON SHALL BE INJECTED  
16 INTO THE FLUE GASES TO REMOVE HEAVY METALS,  
17 DIOXINS/FURANS AND NON-COMBUSTED ORGANICS,  
18 WHILE THE BAGHOUSE SHALL REMOVE PARTICULATES.  
19 THE DESIGN GAS TREATMENT RATE IN THE BAGHOUSE  
20 SHALL BE ABOUT 75,000 – 109,000 NM<sup>3</sup>/H (DRY).

21  
22 ONCE LEAVING THE BAGHOUSE THROUGH AN INDUCED  
23 DRAFT FAN, THE FLUE GASES ENTER A WET CAUSTIC  
24 SODA SCRUBBING TOWER WHICH SHALL REMOVE ACID  
25 GASES (SULPHURIC AND HYDROCHLORIC ACIDS), AT A  
26 GAS TREATMENT RATE SIMILAR TO THE BAGHOUSE.



1 UPON EXITING THE SCRUBBER, THE FLUE GASES SHALL  
2 BE DRIED AND HEATED, BY HEAT EXCHANGE WITH  
3 STEAM GENERATED IN THE PLANT, TO 210°C BEFORE  
4 ENTERING THE SELECTIVE CATALYTIC REDUCTION  
5 (SCR) REACTOR. HERE, AMMONIA SHALL BE INJECTED  
6 INTO THE GAS STREAM AS IT PASSES THROUGH A  
7 HONEYCOMB CATALYST TO REMOVE NITROGEN  
8 OXIDES (NOX).

9  
10 FROM THE SELECTIVE CATALYTIC REDUCTION (SCR),  
11 FLUE GASES ENTER THE STACK CONTAINING TWO  
12 FLUES (ONE FOR EACH INCINERATOR) AND AN  
13 ELEVATOR (FOR MAINTENANCE). THE INLET  
14 TEMPERATURE TO THE SCR SHALL BE CHOSEN FOR  
15 TWO REASONS: TO IMPROVE THE RATE OF CATALYTIC  
16 CONVERSION OF NOX (ALTHOUGH A TEMPERATURE OF  
17 250-350°C WOULD HAVE BEEN MORE APPROPRIATE);  
18 AND TO ENSURE AN INVISIBLE PLUME EMANATING  
19 FROM THE STACK.

20  
21 ***(4) LAWS AND ORDINANCES RELATED TO POLLUTION. –***  
22 TO TREAT WASTE PROPERLY, IT SHALL BE NECESSARY  
23 TO PREVENT SECONDARY POLLUTION FROM WASTE  
24 MANAGEMENT FACILITIES. THE TREATMENT OF WASTE  
25 MUST THEREFORE COMPLY WITH THE EMISSION  
26 STANDARDS, SUCH AS THE NATIONAL EMISSION  
27 STANDARDS AND AMBIENT AIR QUALITY STANDARDS,

1 EMISSION STANDARDS INDICATED IN THE  
2 IMPLEMENTING RULES AND REGULATIONS OF THE  
3 CLEAN AIR ACT OF 1997, AND OTHER EMISSION  
4 STANDARDS SET AND MAY BE PRESCRIBED BY THE  
5 DEPARTMENT AND/OR BOARD AND/OR THE  
6 APPROPRIATE LGU.

7  
8 WASTE INCINERATORS, MUST, AS FACILITIES WHICH  
9 EMIT SOOT AND SMOKE, COMPLY WITH THE EMISSION  
10 STANDARDS RELATED TO DUST, NITROGEN OXIDE AND  
11 OTHERS.

12  
13 *(5) MEASURES AGAINST HAZARDOUS SUBSTANCES. –*  
14 WASTE CONTAINS A HAZARDOUS SUBSTANCE AND A  
15 HAZARDOUS SUBSTANCE MAY BE UNINTENTIONALLY  
16 GENERATED IN THE COURSE OF WASTE MANAGEMENT,  
17 WHICH MAY RESULT IN SECONDARY POLLUTION. AS  
18 SUCH, IT SHALL BE NECESSARY TO REMOVE  
19 HAZARDOUS SUBSTANCES CONTAINED IN WASTE  
20 DURING DISPOSAL AND TO PREVENT SECONDARY  
21 POLLUTION FROM OCCURRING IN THE TREATMENT  
22 PROCESS. MEASURES AGAINST HAZARDOUS  
23 SUBSTANCES SHALL REQUIRE VARIOUS  
24 TECHNOLOGIES, ADAPTED TO INDIVIDUAL HAZARDOUS  
25 SUBSTANCES. SUCH MEASURES INCLUDE THE  
26 FOLLOWING:

- 1 A. WASTE THAT IS EXPLOSIVE, TOXIC OR  
2 INFECTIOUS OR THAT MAY BE HARMFUL TO  
3 HUMAN HEALTH OR THE LIVING  
4 ENVIRONMENT SHALL BE DESIGNATED AS  
5 WASTE UNDER SPECIAL CONTROL.
- 6 B. CONCRETELY, PARTS FROM HOME ELECTRIC  
7 APPLIANCES THAT CONTAIN  
8 POLYCHLORINATED BIPHENYLS (PCB), SOOT  
9 AND DUST GENERATED IN MUNICIPAL WASTE  
10 INCINERATORS AND INFECTIOUS WASTE  
11 GENERATED IN MEDICAL INSTITUTIONS  
12 SHALL BE DESIGNATED AS GENERAL WASTE  
13 UNDER SPECIAL CONTROL.
- 14 C. WASTE PCB, PCB-CONTAMINATED MATTER,  
15 WASTE ASBESTOS AND MATTER CONTAINING  
16 CONCENTRATED HAZARDOUS SUBSTANCES,  
17 SUCH AS MERCURY, THE CRITERIA  
18 CONCENTRATIONS OF WHICH EXCEED A  
19 CERTAIN VALUE, SHALL BE DESIGNATED AS  
20 INDUSTRIAL WASTE UNDER SPECIAL  
21 CONTROL.
- 22 D. COUNTERMEASURE TECHNOLOGIES AGAINST  
23 HAZARDOUS SUBSTANCES SHALL BE  
24 INTRODUCED, TAKING AS EXAMPLES  
25 MERCURY, PCB AND ASBESTOS AS  
26 REPRESENTATIVE HAZARDOUS SUBSTANCES  
27 CONTAINED IN WASTE, DIOXINS AS

1 SECONDARY POLLUTANT SUBSTANCES  
2 GENERATED IN THE WASTE MANAGEMENT  
3 PROCESS, AND INFECTIOUS WASTE.

4 E. VARIOUS TECHNOLOGIES SHALL BE USED AS  
5 COUNTERMEASURES AGAINST EXHAUST GAS  
6 IN ORDER TO CONTROL SULFUR OXIDES,  
7 NITROGEN OXIDES, AND OTHER SUBSTANCES  
8 THAT ARE GENERATED BY INCINERATION  
9 FACILITIES OR TO TREAT DRAIN WATER FROM  
10 INCINERATION FACILITIES AND LANDFILL  
11 SITES, THUS PREVENTING THE OCCURRENCE  
12 OF SECONDARY POLLUTION IN THE WASTE  
13 MANAGEMENT SYSTEM.

14  
15 IN ORDER FOR THE SITE SELECTION FOR A WASTE  
16 MANAGEMENT FACILITY TO BE ACCEPTED BY THE  
17 PEOPLE LIVING IN THE AREA, SECONDARY POLLUTION  
18 PREVENTION MEASURES, TO BE DETERMINED BY THE  
19 DEPARTMENT, SHALL ALSO BE NEEDED TO BE TAKEN.  
20 MEASURES AGAINST HAZARDOUS SUBSTANCES SHALL  
21 COMPLY WITH ALL LAWS AND ORDINANCES RELATED  
22 TO POLLUTION, AS INDICATED IN SECTION 20-D  
23 HEREOF.

24  
25 *(6) INFECTIOUS WASTE.* – FOR INFECTIOUS WASTE, IT  
26 SHALL BE REQUIRED TO REMOVE INFECTIOUSNESS  
27 WITH AN INCINERATOR AND MELTING FACILITY. IT

1 SHALL ALSO BE MANDATORY TO USE AN INCINERATOR  
2 OR A MELTING FACILITY THAT CAN COMPLETELY  
3 INCINERATE OR MELT WASTE AND TO PREVENT THE  
4 LIVING ENVIRONMENT FROM BEING POLLUTED BY THE  
5 EXHAUST GASES OF SUCH FACILITY.

6  
7 IN ORDER TO APPROPRIATELY TREAT INFECTIOUS  
8 WASTE, A ROTARY KILN TYPE INCINERATOR SHALL BE  
9 USED, IN WHICH INFECTIOUS WASTE SHALL BE BURNED  
10 TOGETHER WITH OTHER INDUSTRIAL WASTE THAT  
11 PLAYS THE ROLE OF COMBUSTION IMPROVER, TO  
12 DESTROY INFECTIOUS BACTERIA, TO DETOXIFY  
13 INFECTIOUS WASTE, AND TO REDUCE ITS VOLUME.

14  
15 ***(7) REINFORCEMENT OF THE RESPONSIBILITY.*** – THE  
16 WASTE MANAGEMENT ACT, CLEAN AIR ACT AND ITS  
17 RELATED LAWS AND ORDINANCES SHALL ACCELERATE  
18 THE DEVELOPMENT AND INTRODUCTION OF  
19 TECHNOLOGIES RELATED TO THE PROPER TREATMENT  
20 OF WASTE BY DEFINING STANDARDS FOR THE  
21 INSTALLATION OF TREATMENT FACILITIES FOR  
22 GENERAL WASTE AND INDUSTRIAL WASTE TO ENSURE  
23 PROPER TREATMENT.

24  
25 A CLASSIFICATION OF WASTE THAT MAY INFLICT  
26 HARM ON HUMAN HEALTH OR THE LIVING

1 ENVIRONMENT DUE TO HAZARDOUS CHARACTERISTICS  
2 SUCH AS EXPLOSIVENESS, TOXICITY AND  
3 INFECTIOUSNESS AS SPECIAL MANAGEMENT WASTE  
4 SHALL BE PROMOTED FOR THE DEVELOPMENT AND  
5 INTRODUCTION OF TECHNOLOGIES FOR THE PROPER  
6 TREATMENT OF SPECIAL MANAGEMENT WASTE.

7  
8 IN ORDER TO PREPARE A SYSTEM FOR THE PROPER  
9 TREATMENT OF WASTE AND TO PREVENT IMPROPER  
10 TREATMENT, PROHIBITION OF ANY INCINERATION OF  
11 WASTE OTHER THAN INCINERATION ACCORDING TO  
12 THE WASTE MANAGEMENT STANDARDS SHALL BE PUT  
13 FORWARD.”

14  
15 **SEC. 5. *Separability Clause.*** – If any provision of this Act shall at any time be found to  
16 be unconstitutional or invalid, the remainder thereof not affected by such declaration shall  
17 remain in full force and effect.

18 **SEC. 6. *Repealing Clause.*** – All laws, decrees, rules or regulations inconsistent with the  
19 provisions of this Act are hereby repealed or modified accordingly.

20  
21 **SEC. 7. *Effectivity Clause.*** – This Act shall take effect after fifteen (15) days following  
22 its complete publication in two (2) newspapers of general circulation.

Approved,