

SPECIAL RELEASE

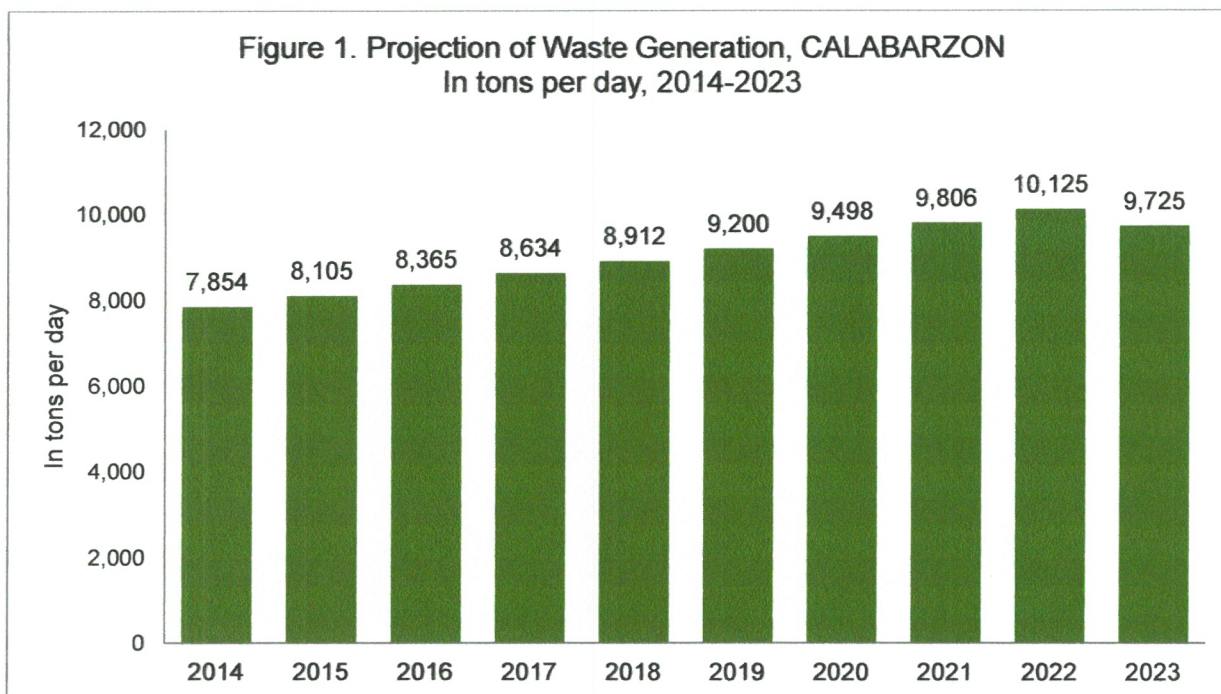
Compendium of CALABARZON Environment Statistics Component 3: Residuals

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Generation and Management of Waste

From 2014 to 2022, there was a consistent increase in the volume of projected waste generation, rising from 7,854 tons per day in 2014 to 10,125 tons per day in 2022. However, in 2023, the trend recorded a reversal with a decrease to 9,725 tons per day, marking a 4.0 percent reduction from the previous year. The projection of waste generation is derived by waste generation rate per capita multiplied by the population.



Source: Environmental Management Bureau

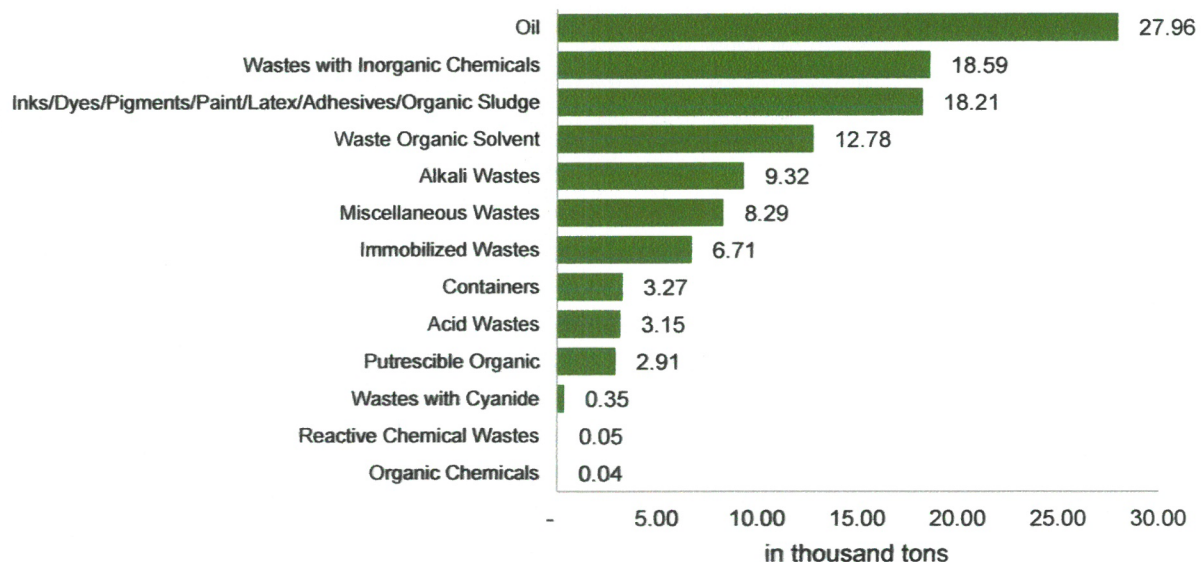
Hazardous waste is a special group of waste that, due to its toxic or other hazardous character, requires special management and is controlled by law in many countries (UN FDES, 2013). In the Philippines, the management of hazardous wastes is governed by the

Republic Act No. 6969, known as the “Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990”.

In 2023, the country generated a total of 238.26 thousand tons of hazardous waste. CALABARZON generated a total of 111.61 thousand tons of hazardous waste, which accounts for approximately 46.8 percent of the total hazardous waste in the Philippines.

Among the 13 types of generated hazardous waste, oil was the largest comprising 25.1 percent share or 27.96 thousand tons. It was followed by waste with inorganic chemicals such as selenium, arsenic, barium, cadmium, mercury, fluoride, and their compounds, which made up 16.7 percent or about 18.59 thousand tons and Inks/Dyes/Pigments/Paint/Latex/Adhesives/ Organic Sludge, which constituted 16.3 percent or 18.21 thousand tons. Meanwhile, organic chemicals like wastes with specific halogenated and non-halogenated toxic organic chemicals, ozone depleting substances and polychlorinated biphenyl wastes had the lowest amount of waste generated in the region with 0.04 thousand tons.

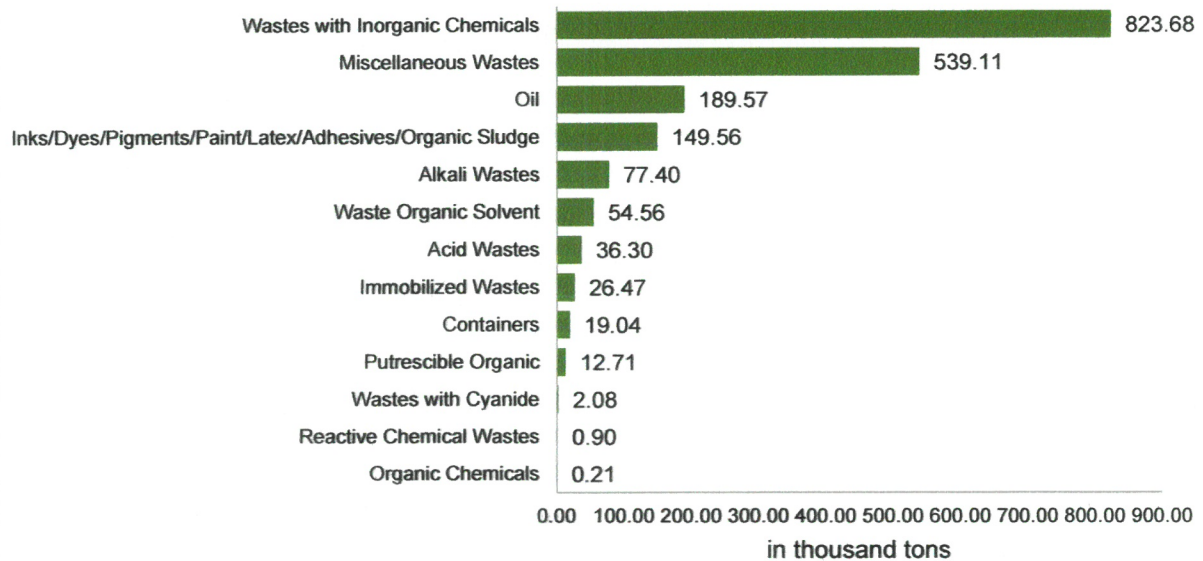
**Figure 2. Amount of Generated Hazardous Waste by Type,
CALABARZON: 2023
(in thousand tons)**



Source: Environmental Management Bureau

From 2014 to 2023, about 823.68 thousand tons of wastes containing inorganic chemicals were treated, making it the largest category among the 13 types of generated hazardous waste in the region. Miscellaneous wastes, such as pathological or infectious wastes, pharmaceuticals and drugs, pesticides, and waste electrical and electronic equipment, followed comprising about 539.11 thousand tons, and oil at 189.57 thousand tons.

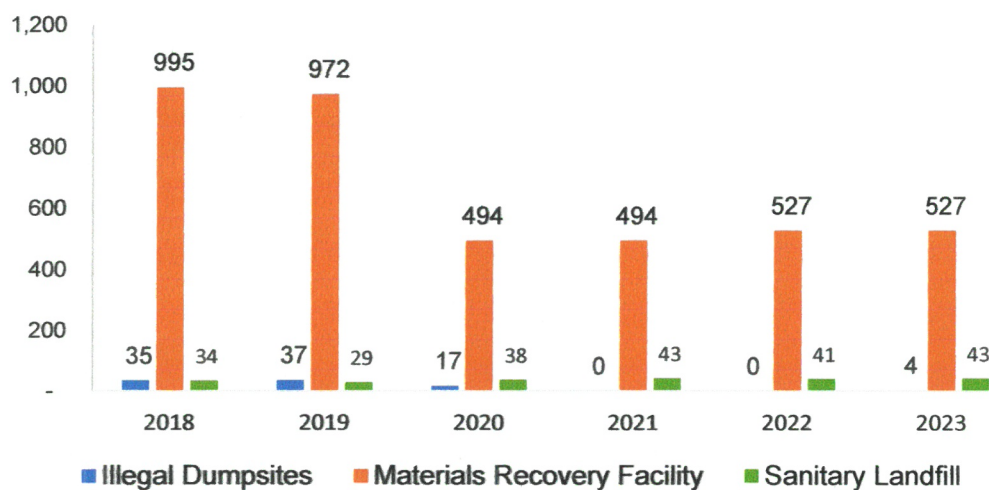
**Figure 3. Amount of Treated Hazardous Waste by Type, CALABARZON:
2014-2023
(in thousand tons)**



Source: Environmental Management Bureau

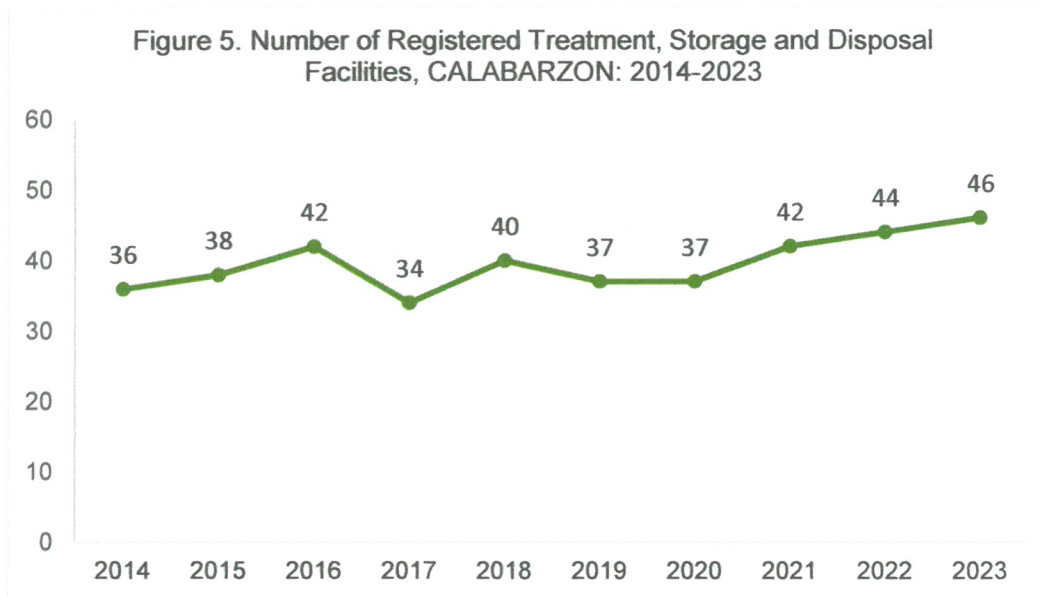
There are various solid wastes disposal facilities in CALABARZON including illegal dumpsites, materials recovery facilities and sanitary landfills. In 2023, CALABARZON recorded 527 material recovery facilities, a decrease of 47.0 percent compared to 995 facilities operating in 2018. Likewise, the number of illegal dumpsites in the region decreased from 34 in 2018 to only 4 recorded in 2023. Meanwhile, the number of sanitary landfills in the region increased to 43.

**Figure 4. Number of Solid Wastes Disposal Facilities by Type,
CALABARZON: 2018-2023**



Source: Environmental Management Bureau

Over the past decade, the number of registered treatment, storage and disposal (TSD) facilities in the region has shown an increasing trend. As of 2023, 46 TSD facilities were registered in the region. TSD facilities are facilities where hazardous wastes are transported, stored, treated, recycled, or disposed of.



Source: Environmental Management Bureau


CHARITO C. ARMONIA
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COB/LOM

TECHNICAL NOTES

The Component 3: Residuals of the Compendium of CALABARZON Environment Statistics compiles statistics on the amount and characteristics of residuals generated by human production and consumption processes, their management, and their final release to the environment. Residuals are defined as flows of solid, liquid, and gaseous materials, and energy that are discarded, discharged, or emitted by establishments and households through processes of consumption, production, or accumulation. Residuals may be discarded, discharged or emitted directly to the environment or be captured, collected, treated, recycled or reused (UN FDES, 2013).

The subcomponent on the generation and management of waste covers statistics on the amount and characteristics of waste. Waste includes discarded materials, in solid or liquid state, that are no longer needed by the owner or user. Statistics on the generation and management of waste aid the formulation of programs that aim to reduce waste generation through prevention, reduction, recycling, and reuse.

Generation of waste – describes the amount of waste generated according to the type of waste and the generator. Another statistics is the amount of hazardous waste generated. Hazardous waste is a special group of waste that requires special management due to its toxic character. The amount of generated waste can be estimated with high reliability when the waste management system is well developed.

Management of waste – contains statistics on the amount of waste collected and transferred to treatment facilities or to their final disposal, amount of waste treated and disposed by type of treatment and disposal, the number and capacity of treatment and disposal plants and other relevant information. Relevant statistics such as the amount of recycled waste, imports and exports of waste and imports, and exports of hazardous waste may come from waste collection systems, treatment and disposal facilities operated by public or private companies that provide service for the waste generator.

Treated hazardous waste refers to hazardous waste that has undergone a process to neutralize or remove its dangerous properties, rendering it safer for disposal or further handling. The treatment can involve physical, chemical, or biological methods to reduce the waste's toxicity, reactivity, corrosivity, flammability, or infectiousness.

CLASSIFICATION OF HAZARDOUS WASTES

Class	Description
A: Wastes with Cyanide	
Wastes with Cyanide	Waste containing cyanide with concentration > 70 mg/L in liquid waste. Refer to CCO.
B: Acid Wastes	
Sulfuric Acid	Sulfuric acid with pH ≤ 2.0
Hydrochloric Acid	Hydrochloric acid with pH ≤ 2.0
Nitric Acid	Nitric acid with pH ≤ 2.0
Phosphoric Acid	Phosphoric acid with pH ≤ 2.0
Hydrofluoric Acid	Hydrofluoric acid with pH ≤ 2.0
Mixture of sulfuric and hydrochloric acid	Mixture of sulfuric and hydrochloric acid with pH ≤ 2.0
Other inorganic acid	Other inorganic acid with pH ≤ 2.0
Organic acid	Organic acid with pH ≤ 2.0
Other acid wastes	Acid wastes other than B201 to B208 with pH ≤ 2.0
C: Alkali Wastes	
Caustic soda	Caustic soda with pH ≥ 12.5
Potash	Potash with pH ≥ 12.5
Alkaline cleaners	Alkaline cleaners with pH ≥ 12.5
Ammonium hydroxide	Ammonium hydroxide with pH ≥ 12.5
Lime slurries	Lime slurries with pH ≥ 12.5
Other alkali waters	Alkali waste other than C301 to C305 with pH ≥ 12.5
D: Wastes with inorganic Chemicals	
Selenium and its compounds*	Includes all wastes with a total Se concentration > 1 mg/L based on analysis of an extract
Arsenic and its compounds*	Includes all wastes with a total As concentration > 1 mg/L based on analysis of an extract
Barium and its compounds*	Includes all wastes with a total Ba concentration > 70 mg/L based on analysis of an extract
Cadmium and its compounds*	Includes all wastes with a total Cd concentration > 0.3 mg/L based on analysis of an extract
Chromium compounds*	Includes all wastes with a total Cr concentration > 5 mg/L based on analysis of an extract
Lead compounds*	Includes all wastes with a total Pb concentration > 1 mg/L based on analysis of an extract
Mercury and mercury compounds*	Includes all wastes with a total Hg concentration > 0.1 mg/L based on analysis of an extract. These also includes organomercury compounds. Refer to CCO.
Fluoride and its compounds*	Includes all wastes with a total F concentration > 100 mg/L based on analysis on extract
Other wastes with inorganic chemicals	Wastes having as constituents or contaminants any of the following: <ul style="list-style-type: none"> • Antimony: antimony compounds • Beryllium: beryllium compounds • Tellurium: tellurium compounds • Thallium: thallium compounds • Metal carbonyls • Hexavalent chromium compounds • Copper compounds • Zinc compounds

Class	Description
E: Reactive Chemical Wastes	
Oxidizing agents	<p>Includes all wastes that are known to contain oxidizing agents in concentration that cause the waste to exhibit any of the following properties:</p> <ul style="list-style-type: none"> • It is normally unstable and readily undergoes violent change without detonating • It reacts violently with water • It forms potentially explosive mixtures with water • When mixed with water, it generates toxic gases, vapor or fumes in a quantity sufficient to present a danger to human health <p>It is a cyanide (CN) or sulfide (S) bearing wastes, which when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors and fumes in a quantity that poses a danger to human health.</p>
Reducing agents	<p>Includes all wastes that are known to contain reducing agents in concentration that cause the waste to exhibit any of the following properties:</p> <ul style="list-style-type: none"> • It is normally unstable and readily undergoes violent change without detonating • It reacts violently with water • It forms potentially explosive mixtures with water • When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health <p>It is a cyanide (CN) or sulfide (S) bearing wastes, which when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors and fumes in a quantity that poses a danger to human health.</p>
Explosive and unstable chemicals	Includes all wastes that are 1) capable of detonating or explosive reaction when subject to a strong initiating source or when heated under confinement, or 2) capable of detonating or explosive decomposition at temperature of 20°C and pressure of 1 atm.
Highly reactive chemicals	Includes all other wastes that exhibit any of the properties described above
F: Inks/Dyes/Pigments/Paint/Resins/Latex/Adhesives/Organic Sludge	
Solvent based	Includes all solvent based wastes that also meet one or more of the subcategories
Inorganic pigments	Includes all wastewater treatment sludge from the production of inorganic pigments
Ink formulation	Includes all solvent washings and sludge, caustic washings and sludge or wastewater and sludge from cleaning of tubs and equipment used in the formulation of ink from pigment, driers, soaps, and stabilizers containing Chromium and Lead.
Resinous materials	Waste resins generated, but not limited to, water purification processes
Other mixed	Other mixtures with above constituents other than aqueous

Class	Description
G: Waste Organic Solvents	
Halogenated organic solvents	Includes but not limited to the following spent halogenated solvents as well as those listed in the Priority Chemical List (PCL): Tetrachloroethylene; Trichloroethylene Methylene chloride; 1,1,2-Trichloroethane; Carbon Tetrachloride; Chlorobenzene; 1,2,2-Trichloroethane; chlorinated fluorocarbons if they contain a total of 10% of more (by volume) of one or more of the above before use; it also includes all still bottoms from recovery of these solvents and solvent mixtures
Non-halogenated organic solvents	Includes, but not limited to the following spent on-halogenated solvents as well as those listed in the Priority Chemical List (PCL): xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl, ketone, n-butyl alcohol, cyclohexanol, methanol, cresol, cresylic acid, nitrobenzene, toluene, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxy ethanol, and 2-nitropropane and other non-halogenated organic solvents if they contain a total of 10% or more (by volume) of one or more of these solvents before use; it also includes all still bottoms from recovery of these solvents and solvent mixtures
H: Organic Wastes	
Grease wastes	Includes all grease wastes generated from establishments such as industrial, commercial, and institutional facilities
I: Oil	Used industrial oil including sludge
Used or waste oil	Vegetableoil including sludge Tallow Oil-contaminated materials
J: Containers	Containers that used to hold hazardous wastes and toxic chemical substances
Containers previously containing toxic chemical substances	Containers that used to contain polychlorinated biphenyl (PCB) are categorized as L404 and excluded from this sub-category
K: Stabilized Waste	
Solidified wastes	Wastes whose hazardous substances are physically immobilized by consolidation to reduce the surface area of the wastes in order to meet the waste acceptance criteria of the disposal facility
Chemically fixed and polymerized wastes	Wastes whose hazardous substances are chemically immobilized through chemical bonds to an immobile matrix or chemical conversion to meet the waste acceptance criteria of the disposal facility
Encapsulated wastes	Wastes whose hazardous substances are physically immobilized by enveloping the waste in a non-porous, impermeable material in order to store or dispose of hazardous wastes in a registered disposal facility

Class	Description
L: Organic Chemicals	
Wastes with specific halogenated toxic organic chemicals	Solid organic chemical wastes listed in the Priority Chemical List (PCL)
Wastes with specific non-halogenated toxic organic chemicals	Solid organic chemical wastes listed in the Priority Chemical List (PCL)
Ozone depleting substances (ODS)	All ODS wastes (refer to CCO)
Polychlorinated Biphenyl (PCB) wastes	All PCB wastes (refer to CCO and Memorandum Circular on the Code of Practice for PCB)
M: Miscellaneous Wastes	
Pathological or infectious wastes	Includes healthcare wastes from hospitals, medical centers and clinics containing pathological, pathogenic and infectious wastes, sharps, and others
Asbestos wastes	All asbestos wastes (refer to CCO)
Pharmaceuticals and drugs	Expired pharmaceuticals and drugs stocked at producers and retailers' facilities which contain hazardous constituents harmful to the environment such as antibiotics, veterinary, and phyto pharmaceuticals and others
Pesticides	Waste pesticides other than M505. Includes all wastewater sludge with hazardous constituents from production of pesticides other than those listed in M505.
Persistent Organic Pollutants (POPs) wastes	Wastes listed in Stockholm Convention on POPs such as, but not limited to, aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, and dichlorodiphenyl trichloroethane (DDT)
Waste electrical and electronic equipment (WEEE)	Polychlorinated Biphenyl (PCB) wastes are categorized as L404 and excluded from this sub-category Include all waste electrical and electronic equipment that contain hazardous components such as lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) that includes its peripherals i.e., ink cartridges, toners, etc.
Special Wastes	Household hazardous wastes such as paints, thinners, household batteries, lead-acid batteries, spray, canisters and the like that are consolidated by Material Recovery Facilities (MRFs). These include wastes from residential and commercial sources that comprise of consumer electronics, white goods (i.e. refrigerators, washing machines, air conditioners, etc.) batteries, oil, and busted lamps

* TCLP limits for arsenic, barium, cadmium, chromium, fluoride, lead, mercury and selenium are correlated with the 2007 Philippine National Standards for Drinking Water.

Source: DENR Administrative Order No. 2013-22