Notification of Ministry of Industry

Industrial Effluent Standards

B.E. 2560

Whereas it deemed appropriate to improve the industrial effluent standards and their examination methods to be more appropriate and compliance to the international standards as well as to control the discharge of wastewater effluent from a factory, by the virtue of the provisions prescribed in Clause 14 of the Ministerial Regulation No. 2 (B.E. 2535), which is prescribed under the Factory Act B.E. 2535, specifying that "Discharge of wastewater effluent from a factory shall be prohibited unless there is any treatment, other than dilution, applied to such wastewater so that its characteristics meets what prescribed by the Minister of Industry in the Government Gazette", the Minister of Industry has prescribed the Notification hereof;

Article 1 This Notification is entitled as "Notification of Ministry of Industry regarding Industrial Effluent Standards B.E. 2560".

Article 2 This Notification shall take into effect from June 7, 2017 onward.

Article 3 The Notification of Ministry of Industry (No. 2) B.E. 2539 issued under the Factory Act B.E. 2535 regarding Industrial Effluent Standards dated June 14, 1996 shall be revoked.

Article 4 In this Notification;

"Factory" means Category 1 Factory, Category 2 Factory, Category 3 Factory according to the Factory Act.

"Wastewater" means water generated from factory activities, workers' activities or other activities in a factory that will be discharged to from a factory or an industrial operation zone.

Article 5 The characteristics of effluent discharging from a factory shall be as follows::

5.1 **pH** not lower than 5.5 but not exceeding 9.0

5.2 **Temperature** not exceeding 40°C

5.3 **Colo**r not exceeding 300 ADMI

5.4 **Total Dissolved Solids or TDS** as followings;

(1) when discharged to receiving water, TDS must not exceed 3,000 mg/l

(2) when discharged to receiving water having TDS > 3,000 mg/l, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/l.

5.5 **Total Suspended Solids (TSS)** not exceeding 50 mg/l

5.6 **BOD (Biochemical Oxygen Demand)** not exceeding 20 mg/l

5.7 **COD (Chemical Oxygen Demand)** not exceeding 120 mg/l

5.8 **Sulfide** not exceeding 1 mg/l

5.9 **Cyanides (CN)** not exceeding 0.2 mg/l

5.10 **Oil and Grease** not exceeding 5 mg/l

5.11 **Formaldehyde** not exceeding 1 mg/l

5.12 **Phenols** not exceeding 1 mg/l

5.13 **Free Chlorines** not exceeding 1 mg/l

5.14 **Pesticide** must not be detected

5.15 **TKN (Total Kjeldahl Nitrogen)** not exceeding 100 mg/l

5.16 **Heavy Metals** must be as followings;

(1) **Zinc (Zn)** not exceeding 5.0 mg/l

(2) **Hexavalent Chromium** not exceeding 0.25 mg/l

(3) **Trivalent Chromium** not exceeding 0.75 mg/l

(4) **Arsenic (As)** not exceeding 0.25 mg/l

(5) **Copper (Cu)** not exceeding 2.0 mg/l

(6) **Mercury (Hg)** not exceeding 0.005 mg/l

(7) **Cadmium (Cd)** not exceeding 0.03 mg/l

(8) **Barium (Ba)** not exceeding 1.0 mg/l

(9) **Selenium (Se)** not exceeding 0.02 mg/l

(10) **Lead (Pb)** not exceeding 0.2 mg/l

(11) **Nickle (Ni)** not exceeding 1.0 mg/l

(12) **Manganese (Mn)** not exceeding 5.0 mg/l

Article 6 Analysis of parameters prescribed in the industrial effluent standard in Article 5 shall be conducted as follows:

6.1 Determination of **pH** shall be conducted by using a pH meter having pH resolution ≥ 0.1.

6.2 Determination of **Temperature** shall be conducted during sampling by using a thermometer.

6.3 Determination of **Color** shall be conducted by the ADMI Method.

6.4 Determination of **TDS** shall be conducted by evaporating the sample that was filtered by Glass Fiber Filter Disk and drying at 180°C for at least 1 hour.

6.5 Determination of **TSS** shall be conducted by filtering using Glass Fiber Filter Disk and drying at temperature between 103-105°C for at least 1 hour.

6.6 Determination of **BOD** shall be conducted by incubation at 20°C for 5 consecutive days. Dissolved oxygen shall be determined by Azide Modification Method or Membrane Electrode Method.

6.7 Determination of **COD** shall be conducted by digestion using Potassium Dichromate.

6.8 Determination of **Sulfide** shall be conducted by Iodometric Method or Methylene Blue Method.

6.9 Determination of **Cyanides** shall be conducted by distillation and Colorimetric Method or Flow Injection Analysis.

6.10 Determination of **Oil and Grease** shall be conducted by solvent extraction by Liquid-Liquid Extraction or Soxhlet Extraction followed by separate mass determination of oil and grease.

6.11 Determination of **Formaldehyde** shall be conducted by Colorimetric Method.

6.12 Determination of **Phenols** shall be conducted by distillation and Colorimetric Method.

6.13 Determination of **Free Chlorines** shall be conducted by Titrimetric Method or Colorimetric Method.

6.14 Determination of **Pesticides** shall be conducted by Gas-Chromatographic Method or High-Performance Liquid Chromatographic Method.

6.15 Determination of **TKN** shall be determined by Kjeldahl Method.

6.16 Determination of **Heavy Metals** shall be as follows;

(1) Determination of **Zinc, Copper, Cadmium, Barium, Lead, Nickle and Manganese** shall be conducted by acid digestion and Atomic Absorption Spectrometry – AAS or Inductively Coupled Plasma.

(2) Determination of **Chromium** shall be as follows;

a) Determination of **Total Chromium** shall be conducted by acid digestion and Atomic Absorption Spectrometry – AAS or Inductive Coupled Plasma.

b) Determination of **Hexavalent Chromium** shall be conducted by Colorimetric Method or Atomic Absorption Spectrometry – AAS or Inductively Coupled Plasma.

c) Determination of **Trivalent Chromium** shall be conducted by calculation for a difference between total chromium and hexavalent chromium.

(3) Determination of **Arsenic and Selenium** shall be conducted by Atomic Absorption Spectrophotometry: Hydride Generation Method, or Inductively Coupled Plasma.

(4) Determination of **Mercury** shall be conducted by Cold Vapor Atomic Absorption Spectrometry or Cold Vapor Atomic Fluorescence Spectrometry or Inductively Coupled Plasma.

Article 7 Analysis of parameters prescribed in the industrial effluent standard in Article 6 shall be performed in consistent with the Manual for Water and Wastewater Analysis by the Environmental Engineering Association of Thailand or the Standard Methods for the Examination of Water and Wastewater by America Public Health Association, American Water Work Association, and Water Environment Federation or as determined by the Department of Industrial Works.

Article 8 Sampling of wastewater for the analysis under Article 5 shall be conducted as follows:

8.1 Sampling shall be taken at a point where wastewater is discharged from a factory regardless of the numbers of wastewater discharge points or at other point regarded as a point where wastewater is discharged from a factory. In case where there is more than one wastewater discharge point, sampling shall be taken at every discharge point.

8.2 Wastewater sampling method at a wastewater discharge point according to 8.1 shall be Grab Sample Method.

Article 9 Determination of wastewater effluent standards to be different from the standards specified in Article 5 for any specific type or kind of factory shall be in accordance with the Notification of Department of Industrial Works.

Article 10 Notification of Ministry of Industry regarding lenient values of Industrial Effluent Standard from those prescribed in the Notification of Ministry of Industry No. 2 (B.E. 2539 (1996)) regarding Industrial Effluent Standard dated February 18, B.E. 2540 shall continue to be in effective until it is revoked.

Issued on 30th May B.E. 2560 (2017)

Mr. Uttama Savanayana

Minister of Industry