

The 13th WEPA Annual Meeting and the WEPA
International Workshop on
Industrial Wastewater Management
26-28 Sept. 2017, Jakarta, Indonesia

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1. Overview of industrial wastewater regulations

A. Law on Environmental Protection and Natural Resource Management (24/12/1996)

- The purpose of this law:
 - ✓ Protect and enhance the quality of the environment and human health by preventing and reducing pollution
 - ✓ Ensure the conservation, development, management and use of reasonable and sustainable natural resources
 - ✓ Encourage participation in the protection and conservation of natural resources.

B. Sub-Decree on Water Pollution Control(6-9-1999)

- Purpose : Regulate the water pollution control in order to prevent and reduce the water pollution of the public water areas so that the protection of human health and the conservation of bio-diversity should be ensured.
- Scope: Applies to all sources of pollution and all activities that cause pollution of the public water areas.

Annex 2: Effluent standard for pollution sources discharging wastewater to public water areas or sewer

№	Parameters	Unit	Allowable limits for pollutant substance discharging to	
			Protected public water area	Public water area and sewer
1	Temperature	°C	< 45	< 45
2	pH		6 – 9	5 - 9
3	BOD ₅ (5 days at 20 °C)	mg/l	< 30	< 80
4	COD	mg/l	< 50	< 100
5	Total Suspended Solids	mg/l	< 50	< 80
6	Total Dissolved Solids	mg/l	< 1000	< 2000
7	Grease and Oil	mg/l	< 5.0	< 15
8	Detergents	mg/l	< 5.0	< 15
9	Phenols	mg/l	< 0.1	< 1.2
10	Nitrate (NO ₃)	mg/l	< 10	< 20
11	Chlorine (free)	mg/l	< 1.0	< 2.0
12	Chloride (ion)	mg/l	< 500	< 700
13	Sulphate (as SO ₄)	mg/l	< 300	< 500
14	Sulphide (as Sulphur)	mg/l	< 0.2	< 1.0
15	Phosphate (PO ₄)	mg/l	< 3.0	< 6.0
16	Cyanide (CN)	mg/l	< 0.2	< 1.5
17	Barium (Ba)	mg/l	< 4.0	< 7.0
18	Arsenic (As)	mg/l	< 0.10	< 1.0

Annex 2: Effluent standard.....

19	Tin (Sn)	mg/l	< 2.0	< 8.0
20	Iron (Fe)	mg/l	< 1.0	< 20
21	Boron (B)	mg/l	< 1.0	< 5.0
22	Manganese (Mn)	mg/l	< 1.0	< 5.0
23	Cadmium (Cd)	mg/l	< 0.1	< 0.5
24	Chromium (Cr) ⁺³	mg/l	< 0.2	< 1.0
25	Chromium (Cr) ⁺⁶	mg/l	< 0.05	< 0.5
26	Copper (Cu)	mg/l	< 0.2	< 1.0
27	Lead (Pb)	mg/l	< 0.1	< 1.0
28	Mercury (Hg)	mg/l	< 0.002	< 0.05
29	Nickel (Ni)	mg/l	< 0.2	< 1.0
30	Selenium (Se)	mg/l	< 0.05	< 0.5
31	Silver (Ag)	mg/l	< 0.1	< 0.5
32	Zinc (Zn)	mg/l	< 1.0	< 3.0
33	Molybdenum (Mo)	mg/l	< 0.1	< 1.0

Annex 2: Effluent standard.....

34	Ammonia (NH ₃)	mg/l	< 5.0	< 7.0
35	DO	mg/l	>2.0	>1.0
36	Polychlorinated Biphenyl	mg/l	<0.003	<0.003
37	Calcium	mg/l	<150	<200
38	Magnesium	mg/l	<150	<200
39	Carbon tetrachloride	mg/l	<3	<3
40	Hexachloro benzene	mg/l	<2	<2
41	DTT	mg/l	<1.3	<1.3
42	Endrin	mg/l	<0.01	<0.01
43	Dieldrin	mg/l	<0.01	<0.01
44	Aldrin	mg/l	<0.01	<0.01
45	Isodrin	mg/l	<0.01	<0.01
46	Perchloro ethylene	mg/l	<2.5	<2.5
47	Hexachloro butadiene	mg/l	<3	<3
48	Chloroform	mg/l	<1	<1
49	1,2 Dichloro ethylene	mg/l	<2.5	<2.5
50	Trichloro ethylene	mg/l	<1	<1
51	Trichloro benzene	mg/l	<2	<2
52	Hexachloro cyclohexene	mg/l	<2	<2

C. Sub-Decree on EIA Process

The main objectives of this sub-decree are:

- To determine an EIA upon every private and public project or activity, and it must be reviewed by the MoE, prior to the submission for a decision from the RGC.
- To determine the type and size of the proposed project and activities, including existing and ongoing activities in both private and public prior to undertaking the process of EIA.
- Encourage public participation in the implementation of EIA process and take into account of their conceptual input and suggestion for re-consideration prior to the implementation of any project

D. Monitoring

- In the managing procedure, it is suggested to classify factories and/or enterprises into 02 types as follows:
 - ✓ Factories are not use chemicals or chemical compound in production process – it's so-called Non-chemical used factories
 - ✓ Factories use chemicals or chemical compound in the production process including in the wastewater treatment process, or we can call as Chemical-used factories

D. Monitoring(cont.)

- To conduct routine(3 months) monitoring at Chemical-used factories
- To take wastewater samples at the outlets of pollution sources ;
- If found mistake, release the administrative order letter to:
 - ✓ correct small fault within a specific period,
 - ✓ correct fault within a specific period but fine or stop process,
 - ✓ collect and detain evidence of such offense for making statement and forward the case file to the competent agency in case of serious pollution
- Conduct an inspection/investigation at pollution sources if necessary (Complain).

E. Challenges in monitoring

- Lacking of:
 - ✓ Law enforcement is still limited, and need to revise (Ex. Law on Environmental Protection and Natural Resource Management 24/12/1996, Sub Decree on water pollution control- 06, 09,1999)
 - ✓ Expertise officials
 - ✓ Field equipment, transportation facility, budget
 - ✓ Poor documentation of data and related information
 - ✓ Willingness of factory's owner (Ex. they run WWTP at the daytime, but stopping during the nighttime).

2. Situation and challenges for the problematic industries and countermeasures

Overview of the problematic industry

- Industrial wastewater are not properly treated prior to discharge into receiving sources, except chemical used factories are strictly recommended to treat by the MoE
- Offense still occurred (discharged effluent without treatment or treated not conform to national standard)
- Doing a penalty for 7 cases whose violated the environmental legislations/regulations

Impact to the environment of wastewater emitted from industry

- Many complain from public during the public forum at :
 - Svay Rieng Province : Tapov Stream were polluted by industrial wastewater (SEZs) discharging
 - Phnom Penh : Toektla river were polluted by industrial wastewater discharging
 - Preah Sihanouk Province: sea water changed in color by industrial wastewater discharging

The reason for non-compliance

- Factory 's owner have to choose the appropriate method or technology for constructing, installation and running their WWTP properly and discharged effluent must conform to national standard
- However, a few of them select only focus base on:
 - ✓ Cheap price
 - ✓ Old equipment
 - ✓ Low cost operation without qualified operator
- Intact, electricity price is higher than neighbor country, so they do not want to run their WWTP fully.

Current mitigation measures

- In recently, MoE has established the permanently inter-ministerial working group (30 December, 2016) for carry out solutions to environmental pollution issues from factories
- The composition of working group as following:
 - ✓ Representative from MoE (Under Secretary of state) Chair
 - ✓ Representative from MoI (Under Secretary of state) Vice Chair
 - ✓ Representative from MoIH (Under Secretary of state) Vice Chair
 - ✓ Representative from MoLVT (Under Secretary of state) Vice Chair
 - ✓ Representative from CDC (Deputy General Secretariat) Vice Chair
 - ✓ Representative from MoE (Director General) Permanently Vice Chair
 - ✓ Representative from relevant departments (14 people) Member

Role and Responsibility

- Set up procedures and countermeasures for solving issues related to serious pollution caused by factories
- Inspect and collect information from factories that cause serious pollution or causing harm to health or people's interests.
- Solve serious environmental issues by factory sources in accordance with legal and regulation in force.
- Identifying potential high-polluting factory must be applying mitigation and precaution measures
- Introduce, advise, and encourage factory owners to focus on waste management and waste disposal according to environmental safety rules.

Circular on the introduction of measures for environmental protection from factories (03 March 2017)

- 1) Interim fines to factory owners by mistake and suspend the authorization to import state-owned taxpayers or suspension of business operations temporarily or permanently
- 2) Educate and advise factory owners to make technical adjustments to the manufacturing sector that pollutes the environment.
- 3) Send technical experts team to guide factory owners to make technical adjustments to the manufacturing sector that pollutes the environment.

Circular on the introduction of measures for environmental protection from factories

- 5) Make public the factory name and factory owner's name that does not comply with existing environmental standards and legal normative regulations.
- 6) Enter factory name and factory owner's name on the list of polluting factories (Blacklist).
- 7) To use the court mechanism to compensate the environmental damage by calculating the actual size from the date it happened.

Prakas on Self Monitoring and Report (01 sept. 2017)

- Purpose: This Prakas aims to prevent and reduce environmental pollution from potentially high pollution sources to ensure public health, biodiversity and environmental protection.
- Scope: This Prakas is applicable to self monitoring control activities in potentially high pollution sources.

Annex 2: Type of factory and parameter to be measured by automatic equipment

No	Type of Factory	Parameter	Time
1	Leather manufacturing	Flow, T , pH, TSS , COD	24/24h
2	Textile and Dying factory	Flow, T , pH, TSS , COD	24/24h
3	Washing and Dying Costumes factory	Flow, T , pH, TSS , COD	24/24h
4	Special Economic Zone (WWTP)	Flow, T , pH, TSS , COD	24/24h
5	Plating factory	Flow, T , pH, TSS , COD	24/24h
6	Steel or Metal factory	Flow, T , pH, TSS , COD	24/24h
7	Chemical Product Factory	Flow, T , pH, TSS , COD	24/24h
8	Central Sewage Treatment Plant	Flow, T , pH, TSS , COD	24/24h
9	Coal Power Plant	Flow, T , pH	24/24h
10	Pulp and paper manufacturing	Flow, T , pH, TSS , COD	24/24h

Technologies and needs for addressing the challenges

- Technology of conventional wastewater treatment is required for industries at some provinces and cities, while Phnom Penh Capital requires advanced wastewater treatment due to high densities population and urban growth.
- A self wastewater treatment, monitoring and reporting at chemical-used industries is firmly needed

Technologies and needs for addressing the challenges

- Field visit and exchanging experiences with experienced/successful countries or partners is recommended
- It is suggested to WEPA Secretariat to hold the training of trainers (ToT) as providing opportunity to member countries to relevant technologies in response the sound industrial wastewater management