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PUBLIC GUIDE

PERMIT
ANNUAL DISCHARGE FEE CALCULATION

1 PURPOSE

This document provides guidance in calculating the **Annual Discharge Fee associated with Water Pollution Permits (WPP)**.

The Water Pollution (Fees) Regulations 2019 (WPFR) specifies a tiered application fee, determined by discharge volume, as well as a discharge fee calculation to determine the annual fee.

The Annual Discharge Fee is calculated using the following formula:

$$DF = MI + B - U$$

DF	is the annual discharge fee;
MI	is the annual monitoring and inspection fee per facility;
B	is the pollutant discharge fee considering the sensitivity of the receiving environment (annual for all relevant pollutants and for all discharge points);
U	is the savings fee from the beneficial use of effluent (annual for all discharge points used for irrigation or other beneficial use)

2 APPLYING THE FORMULA

The DF is calculated for all the effluent discharges from the facility as identified in the issued permit. It is calculated at the end of each monitoring year, for example the DF for 2017 discharge is calculated and prescribed in 2018. A calculation example is included in Appendix I.

Monitoring and Inspection Fee (MI)

This is calculated by adding the costs associated with monitoring and inspection, which includes, the costs for direct labour hours and materials related to site visits.

Facility Type	Effluent Discharge Volume (m^3/day)	M.I. Fee per annum TT$
micro-/mini	<10	5,000
small	10-100	15,000
medium	100-500	50,000
large	>500	100,000

The MI is applied only once, for example if the facility has 3 effluent discharge points, the MI is applied once in the calculation.

Calculation of Pollutant Discharge Fee (B)

Firstly, for each parameter, **p**, the pollutant load ($\mathbf{L}_p$) (in tonnes) for the calendar year is calculated by averaging the concentrations ($\mathbf{C}_i$) and multiplying this by the total volume that is discharged for the year (or part thereof):

Pollutant Load (L_p) = [$C_{i1} + C_{i2} + \ldots\ldots\ldots C_{ix}$]/x Total Volume Discharged (for the year or part thereof)

Secondly, the pollutant load for each parameter is multiplied by the per tonne discharge fee rate ($\mathbf{R}_p$) and summed to give the pollutant discharge fee, **B**:

$$B = L_p R_p$$

Parameters	Fee Rate (R)
Temperature (fee is per 1 million litres) where >Permissible Level 40	40
pH (fee is per 1 million litres) pH <6 or >9	335
Five Day Biological Oxygen Demand (BOD5 at 20°C)	150
Sulphide (H_2S)	150
Total Residual Chlorine (as Cl_2)	150
Dissolved Hexavalent Chromium (Cr^{6+})	3500
Chloride (as Cl^-)	75
Total Petroleum Hydrocarbons (TPH)	250
Phenolic Compounds (as phenol)	250
Chemical Oxygen Demand (COD)	75
Ammoniacal Nitrogen (as $NH_{3-}N$)	250
Total Phosphorous (as P)	250
Total Oil and Grease (TO&G) or n-Hexane Extractable Material (HEM)	250
Total Suspended Solids (TSS)	75
Total Arsenic (As)	150
Total Cadmium (Cd)	3500
Total Chromium (Cr)	250
Total Copper (Cu)	100
Total Nickel (Ni)	100
Total Iron (Fe)	100
Total Lead (Pb)	350
Total Mercury (Hg)	10,000
Total Zinc (Zn)	50
Total Cyanide (CN^-)	10,000
Faecal Coliform (fee rate is in $/1,000,000 litres)	
a) 400 – 5000 counts per 100 ml	250
b) 5000 – 20000 counts per 100 ml	500
c) More than 20000 counts per 100 ml	750

This is calculated per effluent discharge. Only the parameters outside the Second Schedule of the WPR 2019 will be used to determine '**B**'. This information is derived from the monthly monitoring data provided as per the issued WPP.

For calculation of the fee associated with Faecal Coliform, pH and Temperature please refer to **Appendix II.**

Dissolved Oxygen, Toxicity and Radioactivity are the only parameters which are not included in the Rate Fee Table.

Beneficial Use (U)

The discounting for the beneficial use of the discharge, means that the discharge generated meets a specified standard that can be used for irrigation or some other approved use. Beneficial use should only be applied in instances where it has been demonstrated and verified that the effluent is having the desired effect.

3 NOTIFICATION OF ANNUAL DISCHARGE FREE

The EMA will utilise the Discharge Monitoring Data Reports (DMDRs) to calculate the Annual Discharge Fee. Once completed, the facility will be notified by the EMA of the amount and payment process.

APPENDIX I

DF CALCULATION EXAMPLE

Facility information:

1. Medium Size Facility
2. Three Discharge Points (DPs)
3. Number of Parameters exceeding Schedule II in 2017 based on yearly average values:
    a. DP1 – Five (5)
    b. DP2 – One (1)
    c. DP3 – One (1)
4. Discharge into Municipal Corporation

STEP 1: Discharge Fee for 2017 = MI + B - U

Facility Type	Effluent Discharge Volume (m^3/day)	M.I. Fee per annum TT$
micro-/mini	<10	5,000
small	10-100	15,000
medium	100-500	**50,000**
large	>500	100,000

STEP 2: Discharge Fee for 2017 = MI + B - U

In this example there are three (3) DPs with the following in exceedence of Schedule II:

1. DP1 – Total Suspended Solids (TSS), Total Oil and Grease (TO&G), Five Day Biological Oxygen Demand (BOD_5), Ammoniacal Nitrogen ($NH_{3-}N$) and Faecal Coliform;

2. DP2 – pH; and

3. DP3 – Temperature

ANNUAL POLLUTANT LOAD DP1

A. Calculate the Annual Pollutant Load

From the monitoring reports for TSS:

- TSS average concentration for the year = 305 mg/L
- Average discharge volume at DP1 = 99 m^3/day

Convert m3/day to L/day	99 m^3/day x 1000 = 99000 L/day
Calculate Pollutant Load (mg/L/day) **(average daily flow x average concentration)**	99000 L/day x 305 mg/L =30195000 mg/day
Convert mg/day to mg/year	30195000 mg/day x 365 = 11021175000 mg/year
Pollutant Load in tonnes/year	11021175000 mg per year ÷ 109 = 11 tonnes/year

REPEAT FOR REMAINING FOUR (4) PARAMETERS

B. Apply Discharge Rate Fee

Parameter	Annual Pollutant Load (NL)	Discharge Fee Rate (R) $TT/tonne (Faecal Coliform in $/1,000,000 litres)	Net Pollution Load (B)
TSS	11 tonne/year	75	825
TO&G	2 tonne/year	250	500
BOD5	17 tonne/year	150	2550
NH3-N	0.14 tonne/year	250	35
Faecal Coliform	36.135million L*	250	9,034
		TOTAL NET POLLUTION LOAD Fee	TT$12,944

*See Appendix II for Faecal Coliform Calculation

Therefore, Annual Pollutant Load Fee at DP1 = $12, 944

ANNUAL POLLUTANT LOAD DP2

From the monitoring reports for pH:

- pH average for the year = 4
- Average discharge volume at DP2 = 100m3/day

Volume discharge per year	100 m^3/day x 1000 x 365 = 36500000 L/year
Convert to million L	36500000/106 = 36.5
pH difference **pH range below 6 or above 9 pH units**	6 – 4 = 2
Apply discharge rate fee ($335)	2 x 335 = 670
Pollutant Load Fee	36.5 million L x 670 = 24455/year

Therefore, Annual Pollutant Load Fee at DP2 = $24,455

ANNUAL POLLUTANT LOAD DP3

From the monitoring reports for temperature:

- Temperature average for the year = 40 °C
- Average discharge volume at DP3 = 100 m^3/day

Volume discharge per year	100 m^3/day x 1000 x 365 = 36500000 L/year
Convert to million L	36500000/106 = 36.5
Temperature difference **Permissible limit for Inland Surface is 35 °C**	40 – 35= 5
Apply discharge rate fee ($40)	5 x 40= 200
Pollutant Load Fee	36.5 million L x 200 = 7,300/year

Therefore, Annual Pollutant Load Fee at DP3 = $7,300

STEP 3: **Annual Discharge Fee for 2017 = MI + B - U**

Not applicable in this example. When applicable, the EMA will provide Beneficial Use Guidelines.

STEP 4: **Annual Discharge Fee for three (3) DPs in 2017**

MI + B - U

M.I.	50000
B (sum of DP1, DP2 and DP3)	12944 + 24455 + 7300=44,699
U	0
Annual Discharge Fee for 2017	$94,699

APPENDIX II

FAECAL COLIFORM, pH & TEMPERATURE PARAMETER FEE CALCULATION

CALCULATION FOR FAECAL COLIFORM

Faecal Coliforms (counts per 100ml)	Discharge Fee Rate ($) per 1000000L
a) 200 to 5,000 organisms per 100 ml	250
b) 5,000 to 20,000 organisms per 100 ml	500
c) more than 20,000 organisms per 100 ml	750

Formula: (Annual Discharge Volume / 1,000000) x Discharge Fee Rate

STEP 1: **Convert m3 to L**

1 m^3 = 1,000 L

Flow rate (m^3/day) x 1000 (L/day)

STEP 2: **Convert daily value to Annual Discharge Volume (L/year)**

Daily Discharge Volume (L/day) x 365 days

STEP 3: **Convert to million L**

Annual Discharge Volume (L/year) / 10^6

STEP 4: **Apply Discharge Fee Rate**

Annual Discharge Volume (million L/year) x Discharge Fee Rate

For Example:

Average discharge volume at DP1	99 m^3/day
Average Faecal Coliforms	1600 counts per 100 ml
Convert m^3/day to L/day	99 m^3/day x 1000 = 99000 L/day
Convert daily value to Annual Discharge Volume (L/year)	99000 L/day x 365 days =36135000 L/year
Convert to million L	36135000/10^6 = 36.135
Apply discharge rate fee	Average Faecal Coliforms is 1600 counts per 100 ml
Therefore fee rate: $250	
Pollutant Load Fee	36.135 x 250 = **9033.75/year**

CALCULATION FOR pH

pH calculation ($335 for each pH Unit where pH is below 6 or above 9 pH units). Fee is calculated per $1x10^6$ litres

STEP 1: Determine volume discharged per year (vol/day x 365)

STEP 2: Where discharge is reported in m^3/year, convert to litres/year (1 m^3 = 1,000 L)

STEP 3: Divide discharge volume by 106, as fee rate is calculated per every 1 million litres

STEP 4: Calculate difference between the reported pH value and the permissible limit. For example, if pH reported is 4, then subtract 4 from 6 to get a difference of 2 pH Units. If pH reported is 12, then subtract 9 from 12 to give a difference of 3 pH Units

STEP 5: Multiply the difference calculated in Step 4 by $335 (the fee per pH Unit)

STEP 6: Multiply the result from Step 5 by the result from Step 3, to give the discharge fee

CALCULATION FOR TEMPERATURE

Temperature calculation ($40 for each degree Centigrade where temperature is above the permissible limit). Fee is calculated per 1 x 10^6 litres.

STEP 1: Determine volume discharged per year (vol/day x 365)

STEP 2: Where discharge is reported in m^3/year, convert to litres/year (1m^3 = 1,000 L)

STEP 3: Divide discharge volume by 106, as fee rate is calculated per every 1 million litres

STEP 4: Calculate difference between the reported temperature value and permissible limit. For example, if temperature reported is 40°C and the permissible limit is 35°C, then subtract 35 from 40 to get a difference of 5 degrees.

STEP 5: Multiply the difference calculated in Step 4 by $40 (the fee per °C)

STEP 6: Multiply the result from Step 5 by the result from Step 3, to give the discharge fee

NOTES


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