COMMUNICATION

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BRIEF NOTES ON THE PRESENT WATER POLLUTION CONTROL SITUATION IN ITALY

1. THE ITALIAN LAW CONCERNING WATER PROTECTION AGAINST POLLUTION

The main points of this law (No. 319, May 10th, 1976) are the following:

1. The regulation must be applied to the overall national territory and prescribes the acceptable values of pollutant concentrations in wastewaters (see tab. 1 reporting a summary of tabs. A and C of the law).

Table 1

Acceptable concentrations of some pollutants (from tables A and C of Law No. 319)

Parameter	Concentration (mg/dm^3)	
	Table C	Table A
BOD$_5$	$\leqslant 70\%$ of BOD$_5$ upstream the treatment plant (in any case never $\geqslant 250$ mg/dm^3)	40
COD	idem (in any case never $\geqslant 500$ mg/dm^3)	160
Chromium IV	0.2	0.2
Mercury	0.005	0.005
Lead	0.3	0.2
Cyanide (as CN$^-$)	1	0.5
Phosphorus total (as P)*	10	10
Ammonia nitrogen (as NH$_4^+$)**	30	15
Nitrate nitrogen (as N)**	0.6	0.6
Nitrite nitrogen (as N)**	30	20

* 0.5 mg/dm^3 when wastewaters are directly or not directly discharged into lakes.

** 10 mg/dm^3 (ammonia + nitrate + nitrite as N) when wastewaters are directly or not directly discharged into lakes.

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2. It is forbidden to dilute wastewaters with waters exclusively drawn for the purpose of reaching the acceptable concentrations.

3. No wastewaters can be discharged without permission.

4. Domestic sewage can always be discharged into public sewerages, provided that they are in compliance with the regulation issued by the local authorities managing public sewerages.

5. The regulation concerning domestic wastewaters not discharged into public sewerages must be defined by the Regional Authorities, who, according to the law, are competent to deal with the regional planning of waters reclamation.

6. Wastewaters from the existing industries must comply with the following prescriptions:

when discharged into superficial waters, the concentrations of pollutants therein shall be in conformity with the values of tab. C reported in the law (see tab. 1) within three years from coming into force of the law itself and in compliance with the values of tab. A reported in the law (see again tab. 1) within the following six years, according to the forms and terms established by the regional planning of reclamation;

when discharged into public sewerage, the concentrations of pollutants therein shall be in compliance with values of tab. C reported in the law within three years from coming into force of the law itself and in compliance with the prescriptions of local authorities managing the public service from the start-up date of the sewage treatment centralized plant.

7. Wastewaters from new industrial installations must comply with the following prescriptions:

when discharged in superficial waters, the concentrations of pollutants therein shall comply, since the beginning, with the values of tab. A reported in the law;

when discharged in public sewerage, prior to the start-up of sewage treatment centralized plant, they shall comply with the values of tab. C and, soon after the start-up of the plant, with the prescriptions of local authorities managing the public service.

8. From coming into force of the law up to attaining the final reclamation purposes, all the industrial works entitled to gradually reach such purposes will be obliged to pay local authorities a tax calculated from the following formula:

$$T = KCVr,$$

where:

T — total tax (L/year),

K — quality coefficient,

C — average specific cost of domestic wastewater treatment in middle sized plants (at present $C = 25$ L/m³),

V — volume of discharged wastewaters (m³/year),

r — reduction coefficient (on maturity of the first term provided for in the law, June 13th, 1979, the value of r was 0.7).

Tables 2 and 3 report the numerical values of K; the values of tab. 2 shall be applicable until the limits of tab. C are achieved, the values of tab. 3 must be applied during the six years following the term provided by the law for reaching the limits of tab. C.

Table 2

Values of K to be applied up to the achievement of table C limits

Category	Wastewaters within tab. A limits	Wastewaters within tab. C limits	Wastewaters over tab. C limits
1	0	0.2	0.4 - 0.6
2	0	0.3	0.6 - 1.0
3	0	0.4	1.0 - 2.0

Table 3

Values of K to be applied during the six years following the term provided by
the law to reach limits of table C

Category	Wastewaters within tab. A limits	Wastewaters over tab. A limits		
		First biennium	Second biennium	Third biennium
1	0	0.2	0.4	0.6
2	0	0.3	0.6	1.0
3	0	0.4	1.0	2.0

Table 2 covers a range of values for K, which must be chosen case by case according to various factors depending also on local situations. The categories reported in tabs. 2 and 3 have been defined in relation to the average pollutant load of each specific industry; the category number 1 includes metallurgical industries, mechanical industries (excluding galvanic industries), etc.; the category number 2 includes chemical industries, textile industries, pulp and paper industry, etc.; the category number 3 includes canneries, dairies, tanneries, galvanic industries, etc.

When the first term provided for by the law expired on June 13, 1979 our Government issued a decree extending the term of the law No. 319 up to December 31, 1979 and prescribing that during the adjournment period (June 13–December 31) the reduction coefficient of taxation formula is 2.1 instead of 0.7 (in such a way the taxation is triplicated).

At present a Parliament Commission is studying a new law filling in the programmatic and financial gaps of the law No. 319.

2. PRESENT-DAY SITUATION OF WASTEWATER TREATMENT

1. A study prepared and issued by CONFINDUSTRIA (the General Confederation of Italian Industry) shows that the total amount to be invested in order to get industrial wastewaters within the limits outlined in tab. C will be of about L 1,355 billions, of which L 700 billions have already been spent. Therefore about the 50% of Italian industrial wastewaters can be considered within the limits stated in tab. C.

2. Concerning the domestic wastewaters there are no up-to-date official data, however, it can be reliably deemed that about 50% of domestic wastewater is already treated in purification plants.

3. A survey carried out on 35 treatment plants of domestic wastewaters in Italy by Dagh Watson S.p.A. on behalf of the Water Research Institute (C.N.R., Rome) shows the following frequencies for each unit:

pumping	22,
pretreatment (screening, gritting, deoiling)	23,
primary sedimentation	14,
activated sludge process	19,
trickling filter process	3,
secondary sedimentation	22,
chlorination	16,
aerobic digestion of sludges	13,
anaerobic digestion of sludges	12,
thickening	13,
drying on beds	20,
mechanical dewatering	14,
incineration	4.
tertiary treatment	3.

Therefore a typical treatment line could consist of the following unit operations:

wastewater treatment: pumping, pretreatment, primary sedimentation, activated sludge process, secondary sedimentation, chlorination;

sludge treatment: sludge digestion (aerobic up to 50,000 inhabitants, anaerobic as from 50,000 inhabitants), thickening, mechanical dewatering (drying on beds is used only for small plants).

4. A study carried out by U.I.D.A. (the Italian union of treatment plant builders) gives as result the construction costs reported in tab. 4 and referred to April 1978. The above said costs are to be referred

Table 4

Construction costs (including sludge treatment)

Inhabitants	L/inhabitant
up to 20,000	20,000 - 30,000
20,000 - 50,000	17,000 - 25,000
50,000 - 100,000	15,000 - 21,000
> 100,000	14,000 - 20,000

Table 5

Distribution of construction costs between civil works and electromechanical equipment

Inhabitants	Sludge treatment		Sludge treatment	
	Civil works	Electro-mechanical equipment	Civil works	Electro-mechanical equipment
up to 20,000	40	30	20	10
20,000 - 50,000	35 - 40	30 - 35	20	10
50,000 - 100,000	36	30	19	15
< 100,000	27	31	18	24

to conventional plants (including primary treatment followed by an activated sludge process with a sludge loading of 0.3 kg BOD_5/kg MLSS· d).

Concerning the distribution of costs between civil works and electro-mechanical equipment, tab. 5 reports the approximate values to be adopted. The overheads (personnel, chemicals, maintenance, power) affect the cost of about L 3 000–4 000 inhabitant/year.