

Air Quality

Ambient Air Quality Standards in IFC Guidelines, European and National Regulations

Parameter	Average Period	WHO Ambient Air Quality Guidelines- IFC General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality (Section 1.1, Table 1.1.1)		Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on Ambient Air Quality and Cleaner Air For Europe	National Regulation (Regulation on Control of Industrial Air Pollution (dated: 03 July 2009, Official Gazette No: 27277))
		General Guidelines (for human health)	Guidelines for Europe (for ecosystem)		Maximum Allowable Concentration Limits
SO₂ (µg/m ³)	Hourly	500 (for 10 minutes - guideline value)		350	350 (for 2019-2023)
	24 hr	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)		125	125 (for 2019-2023)
	Yearly and winter season (Oct1 – March31) (for wildlife and ecosystem)		20 (for forests and natural vegetation) 30 (for agricultural crops)		20
NO₂ (µg/m ³)	Hourly	200 (guideline)		200	250 (for 2019-2023)
	Yearly	40 (guideline)	30	40	40 (for 2019-2023)
PM₁₀ (µg/m ³)	Hourly	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3)		50	50 (for 2019-2023)

Parameter	Average Period	WHO Ambient Air Quality Guidelines- IFC General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality (Section 1.1, Table 1.1.1)		Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on Ambient Air Quality and Cleaner Air For Europe	National Regulation (Regulation on Control of Industrial Air Pollution (dated: 03 July 2009, Official Gazette No: 27277)
		General Guidelines (for human health)	Guidelines for Europe (for ecosystem)		Maximum Allowable Concentration Limits
		50 (guideline)			
	Yearly	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)		40	40 (for 2019-2023)
Settled Dust (mg/m²day)	Short term				390
	Long term				210

Water Quality

Surface water quality criteria defined in the Regulation on Management of Surface Water Quality

Water Quality Parameters	Water Quality Classes			
	Class I	Class II	Class III	Class IV
General Conditions				
Temperature (°C)	≤ 25	≤ 25	≤ 30	> 30
pH	6,5-8,5	6,5-8,5	6,0-9,0	<6.0 or >9.0

Water Quality Parameters	Water Quality Classes			
	Class I	Class II	Class III	Class IV
Conductivity ($\mu\text{S}/\text{cm}$)	< 400	400-1000	1001-3000	> 3000
Colour	Number of Chromaticity 436 nm: 1.5 Number of Chromaticity 525 nm: 1.2 Number of Chromaticity 620 nm: 0.8	Number of Chromaticity 436 nm: 3 Number of Chromaticity 525 nm: 2.4 Number of Chromaticity 620 nm: 1.7	Number of Chromaticity 436 nm: 4.3 Number of Chromaticity 525 nm: 3.7 Number of Chromaticity 620 nm: 2.5	Number of Chromaticity 436 nm: 5 Number of Chromaticity 525 nm: 4.2 Number of Chromaticity 620 nm: 2.8
(A) Oxygenating Parameters				
Dissolved Oxygen ($\text{mg O}_2/\text{L}$) ^a	> 8	6-8	3-6	< 3
Oxygen Saturation (%) ^a	90	70-90	40-70	< 40
Chemical Oxygen Demand (COD) (mg/L)	< 25	25-50	50-70	> 70
Biochemical Oxygen Demand (BOD) (mg/L)	< 4	4-8	8-20	> 20
B) Nutrient Parameters				
Ammonia as N ($\text{mg NH}_4^+-\text{N}/\text{L}$)	< 0,2 ^b	0,2-1 ^b	1-2 ^b	> 2
Nitrite as N ($\text{mg NO}_2^--\text{N}/\text{L}$)	< 0,002	0,002-0,01	0,01-0,05	> 0,05
Nitrate as N ($\text{mg NO}_3^--\text{N}/\text{L}$)	< 5	5-10	10-20	> 20
Total Kjeldahl Nitrogen as N (mg/L)	0.5	1.5	5	> 5
Total Phosphorus ($\text{mg P}/\text{L}$)	< 0,03	0,03-0,16	0,16-0,65	> 0,65

Water Quality Parameters	Water Quality Classes			
	Class I	Class II	Class III	Class IV
C) Trace Elements (Metals)				
Mercury ($\mu\text{g Hg/L}$)	< 0,1	0,1-0,5	0,5-2	> 2
Cadmium ($\mu\text{g Cd/L}$)	≤ 2	2-5	5-7	> 7
Lead ($\mu\text{g Pb/L}$)	≤ 10	10-20	20-50	> 50
Copper ($\mu\text{g Cu/L}$)	≤ 20	20-50	50-200	> 200
Nickel ($\mu\text{g Ni/L}$)	≤ 20	20-50	50-200	> 200
Zinc ($\mu\text{g Zn/L}$)	≤ 200	200-500	500-2000	> 2000
D) Bacteriological Parameters				
Fecal Coliform (EMS/100 mL)	≤ 10	10-200	200-2000	> 2000
Total Coliform (EMS/100 mL)	≤ 100	100-20000	20000-100000	> 100000
Hazardous Materials	Hazardous materials and pollutants that are not given in this table will be evaluated as of January 1, 2015 after the country inventory is formed.			

(a) It is sufficient to satisfy one of the parameters that are Dissolve Oxygen Concentration and Oxygen Saturation Percent

(b) Depending on the pH value the free ammonia nitrogen concentration should not exceed 0.02 mg NH₃-N/L

(c) Usage of the water based on quality classes:

Class I – High Quality Water;

1. Surface waters with a high potential for drinking water
2. Recreations purposes (including swimming)
3. Trout production (fish farming)
4. Livestock raising and farming

Class II – Slightly Contaminated Water;

1. Surface waters with a potential for drinking water
2. Recreations purposes
3. Fish farming except trout farming
4. Can be used for irrigation purposes provided the irrigation water quality criteria is met

Class III – Contaminated Water;

Can be used for industrial water supply with a proper treatment except for food, textile etc. industries that require high quality water

Class IV – Heavily Contaminated Water;

Of lower quality than the quality parameters given for Class III and can be used with improving quality to the other classes

European regulation for inland water quality

DIRECTIVE 2008/105/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008				
Name of substance	Annual average - Environmental Quality Standards(2) Inland surface waters(3)	Annual average - Environmental Quality Standards(2) Other surface waters	Maximum Allowable Concentration - Environmental Quality Standards(4) Inland surface waters(3)	Maximum Allowable Concentration - Environmental Quality Standards (4) Other surface waters
Alachlor	0.3	0.3	0.7	0.7
Anthracene	0.1	0.1	0.4	0.4
Atrazine	0.6	0.6	2.0	2.0
Benzene	10	8	50	50
Brominated diphenylether (5)	0.0005	0.0002	Not applicable	Not applicable
Cadmium and its compounds (depending on water hardness classes) (6)	≤0.08(Class1) 0.08(Class2) 0.09(Class3) 0.15(Class4) 0.25(Class5)	0.2	≤0.45(Class1) 0.45(Class2) 0.6(Class3) 0.9(Class4) 1.5(Class5)	≤0.45(Class1) 0.45(Class2) 0.6(Class3) 0.9(Class4) 1.5(Class5)
Carbon-tetrachloride (7)	12	12	Not applicable	Not applicable
C10-13Chloroalkanes	0.4	0.4	1.4	1.4
Chlorfenvinphos	0.1	0.1	0.3	0.3
Chlorpyrifos (Chlorpyrifos-ethyl)	0.03	0.03	0.1	0.1

DIRECTIVE 2008/105/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008

Name of substance	Annual average - Environmental Quality Standards(2) Inland surface waters(3)	Annual average - Environmental Quality Standards(2) Other surface waters	Maximum Allowable Concentration - Environmental Quality Standards(4) Inland surface waters(3)	Maximum Allowable Concentration - Environmental Quality Standards (4) Other surface waters
Cyclodiene pesticides: Aldrin (7) Dieldrin (7) Endrin (7) Isodrin (7)	$\Sigma=0.01$	$\Sigma=0.005$	Not applicable	Not applicable
DDT total(7)(8)	0.025	0.025	Not applicable	Not applicable
para-para-DDT (7)	0.01	0.01	Not applicable	Not applicable
1,2-Dichloroethane	10	10	Not applicable	Not applicable
Dichloromethane	20	20	Not applicable	Not applicable
Di(2-ethylhexyl)-phthalate (DEHP)	1.3	1.3	Not applicable	Not applicable
Diuron	0.2	0.2	1.8	1.8
Endosulfan	0.005	0.0005	0.01	0.004
Fluoranthene	0.1	0.1	1	1

DIRECTIVE 2008/105/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008

Name of substance	Annual average - Environmental Quality Standards(2) Inland surface waters(3)	Annual average - Environmental Quality Standards(2) Other surface waters	Maximum Allowable Concentration - Environmental Quality Standards(4) Inland surface waters(3)	Maximum Allowable Concentration - Environmental Quality Standards (4) Other surface waters
Hexachloro-benzene	0.01(9)	0.01(9)	0.05	0.05
Hexachloro-butadiene	0.1(9)	0.1(9)	0.6	0.6
Hexachloro-cyclohexane	0.02	0.002	0.04	0.02
Isoproturon	0.3	0.3	1.0	1.0
Lead and its compounds	7.2	7.2	Not applicable	Not applicable
Mercury and its compounds	0.05(9)	0.05(9)	0.07	0.07
Naphthalene	2.4	1.2	Not applicable	Not applicable
Nickel and its compounds	20	20	Not applicable	Not applicable
Nonylphenol(4-Nonylphenol)	0.3	0.3	2.0	2.0
Octylphenol((4-(1.1'.3.3'-tetramethylbutyl)-phenol))	0.1	0.01	Not applicable	Not applicable
Pentachloro-benzene	0.007	0.0007	Not applicable	Not applicable
Pentachloro-phenol	0.4	0.4	1	1
Polyaromatic hydrocarbons(PAH)(10)	Not applicable	Not applicable	Not applicable	Not applicable

DIRECTIVE 2008/105/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008

Name of substance	Annual average - Environmental Quality Standards(2) Inland surface waters(3)	Annual average - Environmental Quality Standards(2) Other surface waters	Maximum Allowable Concentration - Environmental Quality Standards(4) Inland surface waters(3)	Maximum Allowable Concentration - Environmental Quality Standards (4) Other surface waters
Benzo(a)pyrene	0.05	0.05	0.1	0.1
Benzo(b)fluor-anthene	$\Sigma=0.03$	$\Sigma=0.03$	Not applicable	Not applicable
Benzo(k)fluor-anthene				
Benzo(g,h,i)-perylene	$\Sigma=0.002$	$\Sigma=0.002$	Not applicable	Not applicable
Indeno(1.2.3-cd)-pyrene				
Simazine	1	1	4	4
Tetrachloro-ethylene(7)	10	10	Not applicable	Not applicable
Trichloro-ethylene(7)	10	10	Not applicable	Not applicable
Tributyltin compounds(Tributhyltin-cation)	0.0002	0.0002	0.0015	0.0015
Trichloro-benzenes	0.4	0.4	Not applicable	Not applicable
Trichloro-methane	2.5	2.5	Not applicable	Not applicable
Trifluralin	0.03	0.03	Not applicable	Not applicable

(1) CAS: Chemical Abstracts Service.

(2) This parameter is the EQS expressed as an annual average value (AA-EQS). Unless otherwise specified, it applies to the total concentration of all isomers.

(3) Inland surface waters encompass rivers and lakes and related artificial or heavily modified water bodies.

- (4) This parameter is the EQS expressed as a maximum allowable concentration (MAC-EQS). Where the MAC-EQS are marked as 'not applicable', the AA-EQS values are considered protective against short-term pollution peaks in continuous discharges since they are significantly lower than the values derived on the basis of acute toxicity.
- (5) For the group of priority substances covered by brominated diphenylethers (No 5) listed in Decision No 2455/2001/EC, an EQS is established only for congener numbers 28, 47, 99, 100, 153 and 154.
- (6) For cadmium and its compounds (No 6) the EQS values vary depending on the hardness of the water as specified in five class categories (Class 1: < 40 mg CaCO₃/l, Class 2: 40 to < 50 mg CaCO₃/l, Class 3: 50 to < 100 mg CaCO₃/l, Class 4: 100 to < 200 mg CaCO₃/l and Class 5: ≥ 200 mg CaCO₃/l).
- (7) This substance is not a priority substance but one of the other pollutants for which the EQS are identical to those laid down in the legislation that applied prior to 13 January 2009.
- (8) DDT total comprises the sum of the isomers 1,1,1-trichloro-2,2 bis (p-chlorophenyl) ethane (CAS number 50-29-3; EU number 200-024-3); 1,1,1-trichloro-2 (o-chlorophenyl)-2-(p-chlorophenyl) ethane (CAS number 789-02-6; EU number 212-332-5); 1,1-dichloro-2,2 bis (p-chlorophenyl) ethylene (CAS number 72-55-9; EU number 200-784-6); and 1,1-dichloro-2,2 bis (p-chlorophenyl) ethane (CAS number 72-54-8; EU number 200-783-0).
- (9) If Member States do not apply EQS for biota they shall introduce stricter EQS for water in order to achieve the same level of protection as the EQS for biota set out in Article 3(2) of this Directive. They shall notify the Commission and other Member States through the Committee referred to in Article 21 of Directive 2000/60/EC of the reasons and basis for using this approach, the alternative EQS for water established including the data and the methodology by which the alternative EQS were derived, and the categories of surface water to which they would apply.
- (10) For the group of priority substances of polyaromatic hydrocarbons (PAH) (No 28), each individual EQS is applicable, i.e. the EQS for Benzo(a)pyrene, the EQS for the sum of Benzo(b)fluoranthene and Benzo(k)fluoranthene and the EQS for the sum of Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene must be met.

PARAMETER	UNIT	Turkish Regulation on Water Pollution Control (31.12.2004 Nr. 25687)								Turkish Urban Wastewater Treatment Regulation (08.01.2006 Nr.26047)		Council Directive 91/271/EEC of 21 May 1991 Concerning Urban Wastewater Treatment		IFC General EHS Guidelines
		Table 21										(amended by Commission Directive 98/15/EC, Regulation (EC) No 1882/2003, Regulation (EC) No 1137/2008)		Table 1.3.1
		Domestic Wastewater Discharge Standards												Indicative Values for Treated Sanitary Sewage Discharges*
		for equivalent population of 84-2,000		for equivalent population of 2,000 – 10,000		for equivalent population of 10,000-100,000		for equivalent population greater than 100,000		(limits to be applied after 31.12.2014)				
		Composite Sample	Composite Sample	Composite Sample	Composite Sample	Composite Sample	Composite Sample	Composite Sample	Composite Sample	Concentration	Minimum Treatment Efficiency (%)	Concentration	Minimum Treatment Efficiency (%)	
2 Hour	24 Hour	2 Hour	24 Hour	2 Hour	24 Hour	2 Hour	24 Hour	(mg/L)	(%)	(mg/L)	(%)			
Oil and grease	mg/l												10	
Total coliform bacteria	MPN* * / 100 ml												400*	

* Not applicable to centralized, municipal wastewater treatment systems which are included in EHS Guidelines for Water and Sanitation.

** MPN = Most Probable Number

Note: Regulation on Water Pollution Control - Table 21 and Table 22 indicate domestic wastewater discharge standards for equivalent population of 84 - 2,000 and equivalent population of 2,000 - 10,000, respectively. However, the provisions set in Turkish Urban Wastewater Treatment Regulation, of which the discharge quality standards will be valid by 31.12.2014, are exactly the same with the provisions set in EU Directive 91/271/EEC on Urban Wastewater Treatment. The EU Directive 91/271/EEC sets the general rule of; secondary treatment in all areas, and tertiary treatment with enhanced removal of nutrient is required for sensitive areas

National and European regulations for drinking water

	COUNCIL DIRECTIVE 98/83/EC of 3 November 1998 on the quality of water intended for human consumption	National Legislation (Regulation Concerning Water Intended for Human Consumption. dated: 17 Feb. 2005, Official Gazette No. 25730)
For Domestic Use (Drinking water and Tap water)		
Microbiological Parameters	Microbiological Parameters	
Parameter	Parameter value/100 ml	Parameter value/100 ml
Escherichia Coli (E.Coli)	0/100 ml	0/100 ml
Enterococcus	0/100 ml	0/100 ml
Coliform bacteria		0/100 ml
Coliform Index (the gut bacteria in 1 liter of water)		
Microorganisms (Colonies in 1 ml sample of water)		0/100 ml
Chemical Parameters	Chemical Parameters	
Parameter	Parameter Value	Parameter Value
Acrylamide	0.1 µg/l	0.1 µg/l
Antimony	5 µg/l	5 µg/l
Arsenic	10 µg/l	10 µg/l
Benzene	1 µg/l	1 µg/l
Benzopyrene	0.01 µg/l	0.01 µg/l
Boron	1 mg/l	1 mg/l
Bromate	10 µg/l	10 µg/l
Cadmium	5 µg/l	5 µg/l

	COUNCIL DIRECTIVE 98/83/EC of 3 November 1998 on the quality of water intended for human consumption	National Legislation (Regulation Concerning Water Intended for Human Consumption. dated: 17 Feb. 2005, Official Gazette No. 25730)
Chromium	50 µg/l	50 µg/l
Copper	2 mg/l	2 mg/l
Cyanide	50 µg/l	50 µg/l
1,2-Dichloroethane	3 µg/l	3 µg/l
Epichlorhydrin	0.1 µg/l	0.1 µg/l
Fluoride	1.5 mg/l	1.5 mg/l
Lead	10 µg/l	10 µg/l
Mercury	1 µg/l	1 µg/l
Nickel	20 µg/l	20 µg/l
Nitrate	50 mg/l	50 mg/l
Nitrite	0.5 mg/l	0.5 mg/l
Pesticides	0.1 µg/l	0.1 µg/l
Total pesticides	0.5 µg/l	0.5 µg/l
Polycyclic aromatic hydrocarbons	0,1 µg/l	0.1 µg/l
Selenium	10 µg/l	10 µg/l
Tetrachloroethane and Trichloroethane	10 µg/l	10 µg/l
Trihalomethanes-total	100 µg/l	100 µg/l
Vinyl chloride	0.5 µg/l	0.5 µg/l
Chlorides		250 mg/L
Phosphates		250 mg/L
Aluminium	200 µg/l	200 µg/l

	COUNCIL DIRECTIVE 98/83/EC of 3 November 1998 on the quality of water intended for human consumption	National Legislation (Regulation Concerning Water Intended for Human Consumption. dated: 17 Feb. 2005, Official Gazette No. 25730)
Iron	200 µg/l	200 µg/l
pH		6.5-9.5

Soil Quality

Allowable Concentrations of Heavy Metals in Soil in National Regulations

Heavy Metals	Maximum Allowable Concentration (mg/kg)*
Arsenic	471
Barium	433702
Cadmium	1124
Chrome	24
Cobalt	225
Copper	3129
Lead	400
Mercury	23
Nickel	1564
Vanadium	548
Cyanide	1564
Zinc	23464
Selenium	391

*Regulation on Soil Pollution Control and Point Source Contaminated Sites (Official Gazette ("O.G." number: 27605, dated: 8 June 2010)

Noise

National Noise Limits*

Receptor		L _{Aeq} (dBA) Day-time 07:00 – 23:00	L _{Aeq} (dBA) Night-time 23:00 – 07:00
Residential areas		65	55
Commercial areas		65	55
Industrial areas		70	60
Sensitive Areas	Schools, libraries and conference rooms, Hospitals and health centres	60	50

* Regulation on Evaluation and Management of Environmental Noise (dated: 04 June 2010, O.G. No: 27601)

National Noise Limits for Construction Site*

Activities (Construction, demolition and renovation)	L _{Aeq} (dBA) Day-time 07:00 – 23:00
Building	70
Road	75
Other sources	70

* Regulation on Evaluation and Management of Environmental Noise (OG dated: 04 June 2010, number: 27601)

IFC guidelines for noise

IFC General EHS Guidelines - Noise Standards based on WHO Guidelines (Section 1.7 Table 1.7.1)		
Receptor	One Hour L _{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Night time 22:00 - 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70