وزارة البيئة والمياه والزراعة
Ministry of Environment Water & Agriculture
Kingdom of Saudi Arabia المملكة العربية السعودية

Executive Regulations

For the Protection of Aqueous Media from Pollution

For the Environmental Law issued by the Royal Decree

No. (m/165), dated 19/11/1441 Hijri

National Center for Archives & Records

***** Note: In the event of any discrepancy between the Arabic original version of this Executive Regulations and its English translation, the Arabic version prevails *****

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Article (1) – Definitions

The following terms and expressions - wherever they appear in this Executive Regulations – shall have the meanings set forth below, except where it is therein expressly otherwise:

Law: Environmental Law.

Executive Regulations: The Executive Regulations for the Protection of Aqueous Media from Pollution

Executive Regulations: The Executive Regulations for the Environmental Law.

Ministry: Ministry of Environment, Water and Agriculture.

Minister: Minister of Environment, Water and Agriculture.

Center: National Center for Environmental Compliance.

Supervising Authority: Any governmental body that is legally authorized to supervise the activity, and that is mandated to issue licenses for the undertaking of activities, with an adverse impact on the aqueous media, under its jurisdiction.

Activity: Any industrial, commercial, or service-related facility, project, business, or other activities that are expected to have an adverse environmental impact.

Person: Any public or private natural or legal person.

Permit: A document issued by the Center to a person before undertaking any activity expected to have an adverse environmental impact.

License: A document issued by the Center authorizing a person to undertake an environmental activity.

Permittee: A person who is granted a permit permit in accordance with the provisions of this Executive Regulations.

Licensee: A person who is granted a license license in accordance with the provisions of this Executive Regulations.

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Surface Water: Above-ground bodies of water that include lakes, wetlands, waterways, swamps, marshes, streams and dams, except seas and oceans.

Waterbodies: Accumulation of water on the earth's surface or underground; including oceans, seas, lakes, ponds, wetlands, and other geographical components in which water is transported from one place to another.

Water Resources: Renewable and non-renewable surface and groundwater, which includes wells, sources, springs, dams, and rainwater.

Aqueous Media: Surface water, waterbodies, and water resources.

Environment/Environmental Domains: All that surrounds a person, animals, plants or any other living organism, such as water, air, land, soil, organisms, biodiversity, atmospheric gases,

waterbodies and all the contents of these milieus such as inanimate objects, various forms of energy, habitats, and natural processes, and their interaction with each other.

Environmentally Sensitive Areas: Areas that have environmental significance and whose degradation has negative repercussions for the environment. They include protected areas, parks, forests, wetlands, significant bird habitat, mangroves, landscaped sites, watersheds, water catchment and run-off areas, beaches, waterways, aquifers or any other area(s) identified or declared as environmentally sensitive areas by the State, the Ministry or national environmental centers.

Sensitive Receptors: Receptors that are likely to be severely affected by an activity or project due to their geographical proximity or sensitive nature. They include environmental elements, living species, archeological, cultural and religious sites, and community groups (such as endangered species, hospitals, elder care centers, schools, residential complexes, and others).

Standards: Maximum allowable limits or percentages of pollutants or emissions that must not be exceeded to ensure the quality of environmental media.

Pollutants: The presence of one or more substances or agents in certain quantities or properties for a period of time, which causes degradation of the environmental media, either directly or indirectly.

Liquid Substances: Any liquid or oily material that causes pollution in the environmental media, including pollutants resulting from ballast water and dissolved antifouling paint particles.

Harmful Substances: Any solid, liquid, or gaseous substance that causes pollution or deterioration of waterbodies, either directly or indirectly.

Environmental Degradation: Severe damage to the environment caused by the depletion of natural resources, or the destruction of habitats, or the pollution of environmental media and the deterioration of their quality.

Cooling Water: Water from cooling towers and chillers.

Wastewater: Water which use has changed its color, taste, odor, or level of health or environmental security. This includes water used for health, industrial or agricultural purposes, including cooling water and water from desalination plants (brine).

Treated Wastewater: Wastewater emerging from a treatment plant or a treatment process, which was treated to reduce the adverse environmental impact in compliance with specific environmental standards and requirements.

Ambient Water: Coastal marine water, groundwater, and surface water such as lakes and waterways, excluding the distribution, drainage or collection networks for treated water and wastewater.

Ambient Water Quality: The properties of the ambient water, which are evaluated based on the standards and requirements set by the Ministry.

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Water Injection: Injection of treated wastewater into aquifers.

Dewatering: Lowering groundwater to a safe level to allow excavation below natural groundwater level in dry and stable conditions, and drawing collected water from the surface layer of the soil in the event that this water appears as a result of digging and establishing development projects in coastal cities.

Receiving Water: Surface or marine waters into which treated wastewater effluents are discharged.

Mixing Zone: The area where the treated wastewater effluent is mixed with the receiving water.

Compensation: Monetary amount paid by the person who causes the damage, pollution or environmental degradation, to compensate for or eliminate the deterioration resulting from such damage, pollution or environmental degradation. The compensation includes rehabilitation expenses in the event that rehabilitation was not carried out by the person causing damage, pollution, or environmental degradation.

Article (2) – Scope of Application

The provisions contained herein shall apply to all persons and activities related to aqueous media within the territory of the Kingdom of Saudi Arabia, including the territorial sea, the adjacent area, and the special economic zone of the Kingdom.

Article (3) – The Center's Scope of Work Regarding the Protection of Aqueous Media from Pollution

The Center shall undertake the tasks related to the protection of aqueous media from pollution, including:

(1) Proposing standards, requirements and controls, pertaining to the protection of aqueous media from pollution, including injection of water into ground wells, and dewatering, and submitting them to the Ministry for approval.

(2) Developing and executing national plans to prevent and mitigate aqueous media pollution.

(3) Monitoring and evaluating environmental indicators pertaining to aqueous media on a regular basis.

(4) Developing and monitoring environmental indicators pertaining to aqueous media.

(5) Determining the procedures and measures that must be taken when a person is close to exceeding the standards related to aqueous media.

(6) Developing and reviewing national environmental reports pertaining to the aqueous media in the Kingdom.

(7) Issuing the controls and requirements pertaining to licenses or permits for businesses or

environmental activities with potential adverse environmental impact on aqueous media.

(8) Issuing permits and licenses for the protection of aqueous media from pollution and collecting the financial dues pertaining thereto.

(9) Inspecting and apprehending violations of this Executive Regulations, imposing sanctions, and coordinating with the security authorities at the Ministry of Interior whenever necessary to apprehend violators in accordance with the provisions of the law and Executive Regulations.

(10) Coordinating with the relevant government stakeholders to ensure that aqueous media are protected from pollution, and that the Executive Regulations is implemented.

(11) Coordinating with the Ministry to apply all of the relevant international and regional conventions on the protection of aqueous media from pollution to which the Kingdom is a party.

(12) Proposing and carrying out various studies and research programs related to the protection of aqueous media from pollution.

(13) Organizing environmental awareness activities related to the protection of aqueous media from pollution, including courses, seminars, specialized work sessions, and media campaigns.

Article (4) – Ambient Water Quality

First: Classification of Waterbodies

(1) Waterbodies shall be classified as shown in Table (1).

(2) The Center may suggest amendments to this classification and submit them to the Ministry for adoption when needed.

Table (1) - Classification of Waterbodies

Classification	Subdivision	Definition
Underground Water	-	Water stored underground in porous areas of soil or in cracks of geological formations
Surface Water	-	Includes all forms of water on earth, including rivers, waterways, lakes, wetlands, swamps, marshes, valleys, and dams
Coastal Water	Public	The coastal waters, including the territorial sea, the adjacent area, and the special economic zone of the Kingdom All coastal waters are classified as "public" unless they are "high-value" or "industrial"
	High-Value	Coastal waters that have been declared protected areas locally or internationally by any competent authority (Including but not limited to: National Center for Wildlife Development and/or the

Classification	Subdivision	Definition
		Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) and/or the Regional Organization for The Protection of The Aqueous Media (ROPME) in coordination with the relevant international organizations)
	Industrial	Coastal waters located near areas classified as industrial zones or in unclassified areas with industrial activities

Second: Ambient Water Quality Standards and Requirements

(1) The Center shall monitor the ambient water environmental components and indicators listed in Appendix (1) of this Executive Regulations by developing and implementing the necessary programs and taking the necessary measures in the event of detection of any exceedances to the standards in accordance with section (Third) of this article.

(2) The Center shall set the controls and requirements for monitoring ambient water environmental components and indicators.

(3) Waterbodies, which properties are altered as a result of their natural composition, or due to natural incidents, are exempt from ambient water quality standards, in which case, the Center sets exceptional revised standards for these waterbodies.

Third: Program for Monitoring and Surveilling the Components and Properties of Ambient Water in the Kingdom

(1) The Center shall develop and implement a monitoring and surveillance program for the components and properties of ambient water in the Kingdom, including the following at a minimum:

a. Environmental monitoring indicators.
b. Sampling locations and periods.
c. Sampling schedules.
d. Specifications and locations of stations, monitoring devices, and equipment used.
e. Requirements for verification and interpretation of results.
f. Staff responsibilities and necessary qualifications.
g. Requirements for documentation and management of records.
h. Quality assurance and quality checks for monitoring operations.
i. Reporting requirements.

(2) When detecting exceedances of the ambient water quality standards, the Center shall carry out investigations and technical studies to determine the source of water pollution, and shall take

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the necessary measures, including the following:

a. If it is determined, during the investigation or the study conducted, that these violations are caused by the natural concentrations of components in the waterbodies or as a result of natural incidents, the Center may propose exceptional modified standards for these waterbodies and submit them to the Ministry for approval.

b. If it is determined, during the investigation or the study conducted, that these violations are caused by a specific source(s) in violation of the environmental law and its Executive Regulations, standards, environmental requirements and controls, the Center shall take the necessary legal measures to stop the violation(s) identified as the source of pollution and impose the appropriate penalty, including treatment, rehabilitation, and payment of compensations.

c. If it is determined, during the investigation, that these violations are caused by the contribution of multiple sources that operate within the limits of the requirements and conditions of their environmental permits and licenses, the Center shall take the appropriate measures – in coordination with the supervising authority(s) (licensor of the activity) – including the following:

- Develop and implement a monitoring program to identify all related sources.
- Develop an action plan with the participation of the relevant sources in order to reduce aqueous media pollution.
- Follow up on the implementation of the action plan.

Article (5) – Prohibitions

The following activities are prohibited:

(1) Discharging wastewater or any liquid substances - untreated - or draining it or injecting it into ground wells, or in any environmental media, or in any area of the rocky outcrops of the aquifers for any reason whatsoever.

(2) Dumping or discharging any of the pollutants resulting from ballast water, cargo residues, wastes, liquid substances, and dissolved antifouling paint particles.

(3) Dumping or discharging hazardous waste into the aqueous media.

(4) Any other activities that would pollute, damage, or adversely affect the aqueous media.

Article (6) – Controls for the Discharge of Treated Wastewater into Environmental Media

First: Standards of Treated Wastewater before its Discharge into Environmental Media

(1) All persons must adhere to the standards listed in Appendices (2) and (3) of the Executive

Regulation before discharging treated wastewater into soil, land, or waterbodies.

(2) The Center may set controls and requirements for the monitoring of environmental components and indicators for treated wastewater before discharging it into environmental media.

(3) The Center may grant a temporary exception from complying with the standards and specify the controls and requirements necessary for this in accordance with Article (8) of the Executive Regulation.

Second: Standards Related to Wastewater Treatment Technologies

(1) All persons must adhere to the wastewater treatment technologies requirements set out in Appendix (4) of this Executive Regulations.

(2) The Center may suggest amendments to these requirements and submit them to the Ministry for approval.

Third: Standards for Treated Sewage Effluent (TSE) Outfalls and Mixing Zones

(1) All persons must abide by the requirements for TSE outfalls that achieve the maximum dispersal of wastewater from cooling plants, salty sea water desalination plants, and wastewater treatment plants in accordance with the international best practices adopted by the Center, and any other relevant standards, controls, and requirements set by the Center.

(2) All persons must adhere to the calculations of the mixing zones set out in Appendix (5) of this Executive Regulations, and adhere to the standards, controls, and requirements for the design of the mixing zones set by the Center based on the properties of each site, taking into consideration the following:

a. Maintaining a safe distance from environmentally sensitive areas.
b. Maintaining a safe distance from wild animal breeding areas, fishing areas, and other sensitive areas such as coral reefs.
c. Avoiding disruption to the migration of marine organisms.
d. Precluding overlap between adjacent mixing zones.
e. Precluding discharge of any substances that are harmful to the mixing zones and its living and non-living components.
f. Precluding use of the mixing zones as a substitute for wastewater treatment facilities or for emergency responses.

Fourth: Monitoring and Surveillance

(1) The following activities shall implement monitoring, measurements, and surveillance programs on the water that is directly discharged to the environmental media in accordance with the controls and requirements set by the Center, and provide the Center with data and information

on a regular basis:

a. Wastewater treatment plants with a production capacity of more than (60) cubic meters per day.
b. Industrial wastewater treatment plants.
c. Industrial activities that have industrial wastewater treatment units.
d. Salty water desalination plants.
e. Any activities with an environmental permit to inject treated wastewater into ground wells.

(2) All activities that are not mentioned in Clause (1) of this section and that are granted a permit to discharge water into the environmental media, shall perform the necessary measurements and analysis in accordance with the controls and requirements set by the Center.

(3) All persons must seek the assistance of a service provider approved by the Center to develop and implement monitoring programs and make the necessary measurements and analysis for water before discharging it.

(4) All activities must inform the Center immediately after detecting any exceedances of standards that occur within the activity as a result of an emergency situation, accident, or the ordinary operations of the activity, and must stop the source of pollution and develop a plan to treat pollution in accordance with the Executive Regulation for the environmental rehabilitation of degraded sites and treatment of polluted sites.

(5) All persons must keep monitoring, surveillance, measurements, and analysis data for a period of no less than five (5) years and present them to the Center whenever requested. The Center may extend the period for some activities for additional five (5) years.

Article (7) – Operational Controls for Emergencies

(1) All activities that treat wastewater or discharge it to central treatment plants must be equipped with tanks to provide containment in emergency situations.

(2) Tanks must possess a capacity equivalent to the volume of wastewater treated in the facility for thirty-six (36) hours and must be lined with an impermeable material such as high-density polyethylene (HDPE) to ensure that no leaks occur to the environment.

(3) All activities that store wastewater in emergency situations must treat it before discharging it, in accordance with the standards listed in Appendices (2) and (3) of this Executive Regulations.

Article (8) – Licenses and Permits for the Protection of Aqueous Media from Pollution

First: General Controls

(1) It is prohibited to practice any of the following activities unless a license or permit is obtained from the Center for this purpose:
   a. Installation and operation of ambient water monitoring and surveillance networks
   b. Temporarily exceeding treated wastewater standards
   c. Discharge of treated wastewater into environmental media

(2) The Center shall make its decision on license or permit applications within thirty (30) working days as of the date of meeting all application requirements, and the Center may, if needed, extend the period for an additional ten (10) working days.

(3) The Center issues its decision regarding the permit or license application after the collection of corresponding dues.

(4) The licensee or permittee shall abide by the requirements stated in the license or permit.

Second: Licensing the Installation and Operation of Ambient Water Monitoring and Surveillance Networks

(1) Any person requiring a license to install and operate networks to monitor and surveil ambient water must submit an application to the Center using the template issued by the Center, accompanied by a technical study exhibiting the following:
   a. Boundaries of the region included in the monitoring and surveillance network.
   b. Specifications and components of the region included in the monitoring and surveillance network (for example the number, types, and locations of the activities in case of an industrial area).
   c. Specifications of stations, monitoring devices, and equipment used.
   d. Maps clarifying the locations of monitoring stations and devices.

(2) The licensee must install and operate monitoring and surveillance networks for ambient water through a service provider licensed by the Center.

(3) The Center may request additional - pertinent - data and documents.

(4) In the event that the license application is denied, the decision shall be justified.

(5) In case the license application is approved, the Center shall issue the license, including the requirements for the installation and operation of ambient water monitoring and surveillance networks, and the validity period of the license, provided it does not exceed three (3) years.

(6) The licensee must periodically provide the Center with data and digital reports on the results of the ambient water quality monitoring as determined by the license requirements, along with all documents for quality assurance of measurements and technical analysis.

(7) The licensee must notify the Center of any detected exceedances and specify - if possible - the source of these violations.

(8) The licensee must not publish any data or information on the quality of ambient water without the written consent of the Center.

Third: Permits for Temporarily Exceeding the Standards

(1) Any person requiring a permit to temporary exceed the standards listed in Appendices (2) and (3) of this Executive Regulations must submit an application to the Center using the template issued by the Center, accompanied by a technical study ascertaining that those exceedances will cause no severe and permanent harm to the environment, and exhibiting the following:

a. Assessment of water components and properties at the discharge site and mixing zones.
b. Assessment of the locations of environmentally sensitive areas and receptors that could be harmed by the discharge of treated wastewater.
c. Concrete technical evidence that complying with the standards stipulated in the Executive Regulations is not practically feasible, and identifying indicators, the quantity and duration of the exceedances, and the environmental impacts of these exceedances.
d. Cost-benefit analysis showing that the required treatment procedures are ineffective during the implementation period.
e. Proposed action plan to comply with the standards stipulated in the Executive Regulations, including the time period and cost for its implementation.

(2) In case the permit request is rejected, the rejection shall be justified and the applicant must comply with the standards specified in this Executive Regulations.

(3) In case the permit application is approved, the Center shall issue the permit, including the controls and requirements of discharge and the permissible percentages of excess for each parameter or modified parameters, and its validity period, provided that it does not exceed six (6) months. The Center may - if necessary - extend the validity of the permit for another four (4) months, provided that the extension period will cause no severe harm to the receiving environmental domain.

(4) The permittee must submit periodic reports to the Center on the progress made in implementing the proposed action plan to comply with the standards of treated wastewater, as determined by the permit's controls and requirements.

Fourth: Permits for the Discharge of Treated Wastewater into Environmental Media

(1) Any person requiring a permit to discharge water into the environmental media, including ground wells, must submit an application to the Center, accompanied by the documents specified by the Center, and a technical study demonstrating the following:

a. An explanation of the need to discharge water into environmental media.
b. Quantities, source, and properties of the water to be discharged.

c. A map showing the location of the discharge site and the details of the surrounding area, including the waterbodies.
d. An assessment of the environmental properties of the discharge site.
e. An assessment of the locations of environmentally sensitive areas and sensitive receptors that could be affected by the discharge of treated wastewater.
f. An Environmental impact of the discharge of water into the environmental media.
g. A compliance mechanism for all Center-issued controls on water discharge into environmental media.

(2) In case the permit application is rejected, the rejection shall be justified.

(3) In case the permit application is approved, the Center shall issue the permit, including the controls, requirements, and standards of discharge and the permit's validity period, provided that it does not exceed six (6) months. The Center may - if necessary - extend the permit's validity period for another six (4) months, provided that the extension period does not result in severe harm to the receiving environmental domain.

Article (9) – Violations Apprehension and Penalties Imposition

Violations of the provisions of the Executive Regulations shall be apprehended, and the penalties listed in Table (2) shall be imposed in accordance with the Executive Regulations for Apprehension of Violations and Imposition of Penalties related to the Environmental Law, taking into account the following:

(1) Serious violations shall be prescribed a penalty proportional to the degree of damage, the size and inherent importance of the damaged site, and the economic and social implications arising therefrom.

(2) The estimation of the penalty for significant violations referred to in Clause (1) of this article shall be made by a committee formed of experts and qualified persons, established through a decision of the Center's CEO.

(3) Violations shall be deemed serious if they involve any of the following acts:
a. Acts stipulated in Article *(35)* of the law.
b. Acts that lead to environmental degradation.
c. Acts that harm sensitive receptors or environmentally sensitive areas.

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Table (2) – Violations and Penalties

Number	Violation	Penalty (Saudi Riyals)	Comments
1.	Performing any of the prohibitions set forth in article (5) of the Executive Regulations.	From 10,000 to 20,000,000	Based on the amount of wastewater, the amount of pollution, the duration, and the affected area, in addition to obligating the violator to interrupt the discharge, treat the damages, and pay compensation, as well as referring environmental offenses violations to the Public Prosecution to complete the investigation and prosecution procedures.
2.	Failure to comply with the standards of treated wastewater before discharging it into the environmental media	From 10,000 to 5,000,000	Based on the number and amount of pollutants, the duration, and the affected area, in addition to obligating the violator to interrupt the discharge, treat the damages, and pay compensation
3.	Failure to comply with the requirements related to wastewater treatment technologies	From 50,000 to 5,000,000	Based on the number and amount of pollutants, the duration, and the affected area, in addition to obligating the violator to interrupt the discharge, treat the damages, and pay compensation
4.	Failure to comply with the requirements and controls related to outfalls and mixing zones	From 50,000 to 5,000,000	Based on the amount of treated wastewater, the amount of pollution, the duration, and the affected area, in addition to obligating the violator to interrupt the discharge, treat the damages, and pay compensation
5.	Failure to comply with the controls and requirements of	From 50,000 to 200,000 (For	Based on the amount of treated wastewater, the amount of

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Number	Violation	Penalty (Saudi Riyals)	Comments
	monitoring and surveillance in accordance with clause four (4) of article (6)	each notification by the Center)	pollution, the duration, and the area to which it is discharged
6.	Failure to provide the Center with records and data related to monitoring, surveillance, measurements, and analysis programs for wastewater upon request	50,000 (For each notification by the Center)	
7.	Failure to comply with the operational controls for emergencies specified in article (7)	50,000 (For each item)	
8.	Performing any of the activities specified in (b, c) of clause (1) of section (first) of article (8) without obtaining a permit	From 50,000 to 20,000,000	Based on the amount of treated wastewater, the amount of pollution, the duration, and the environmental impacts, in addition to obligating the violator to interrupt the discharge, treat the damages, and pay compensation (when necessary)
9.	Installing and operating ambient water monitoring and surveillance networks without obtaining a license	50,000	
10.	Failure to comply with the requirements and controls of licenses for the installation and operation of ambient water monitoring and surveillance networks	10,000 (For each requirement)	
11.	Publishing any data related to the quality of the ambient water without the approval of the Center	From 10,000 to 5,000,000	Based on the amount and importance of the data
12.	Failure to comply with the requirements and controls of the permits to inject treated	From 10,000 to 20,000,000	Based on the number and amount of pollutants, the duration, and the damages

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Number	Violation	Penalty (Saudi Riyals)	Comments
	wastewater into ground wells		caused by the pollution, in addition to obligating the violator to treat the damages and pay compensation (when necessary)
13.	Failure to comply with the provisions of the temporary exception permit for standards	From 10,000 to 20,000,000	Based on the number and amount of pollutants, the duration, and the damages caused by the pollution, in addition to obligating the violator to treat the damages and pay compensation (when necessary)
14.	Failure to comply with submitting periodic reports to the Center when requested	10,000 (For each notification by the Center)	
15.	Failure to comply with the controls and requirements of the permit to discharge water into environmental media	From 10,000 to 20,000,000	Based on the number and amount of pollutants, the duration, and the damages caused by the pollution, in addition to obligating the violator to treat the damages and pay compensation (when necessary)
16.	Failure of the licensee operating networks to monitor and surveil the ambient water to inform the Center of any violations monitored	50,000	
17.	Failure to inform the Center as soon as pollution (exceedances) in waterbodies is detected as part of the activities' operations	From 10,000 to 100,000	In addition to the penalties for exceeding the standards and obligating the violator to treat the damages and pay compensation

Appendix (1): Ambient Water Quality Standards

Component / Indicator	Unit	Coastal Water			Surface Water (Unsuitable for Drinking)	Ground Water (Potable unless NBL* specified)
		Normal	High-value	Industrial		
Physical Standards						
Color		N/A	5	5	-	-
Temperature Δ(1)	Celsius	3	2	4	NBL*	NBL*
Total Dissolved Solids (TDS)	mg/L	NBL*	NBL*	NBL*	5,000	NBL*
Turbidity		3	2	5	30	NBL*
Chemical Standards						
Aldrin	mg/L	$2.2x10^{-6}$	$2.2x10^{-6}$	$2.2x10^{-6}$	$2.2x10^{-6}$	$2.2x10^{-6}$
Aluminum	mg/L	0.2	0.2	1	0.2	0.2
Ammonia	mg/L	0.1	0.05	1	0.1	0.3
Arsenic	mg/L	0.05	0.05	0.069	0.15	0.0075
Barium	mg/L	0.5	0.5	1	0.5	1
Benzene	mg/L	0.05	0.05	0.05	0.05	0.002
Biological Oxygen Demand(BOD)	mg/L	15	10	20	10	-
Cadmium	mg/L	0.008	0.008	0.04	0.000025	0.003
Calcium	mg/L	NBL*	NBL*	NBL*	NBL*	NBL*
Carbon Tetrachloride	mg/L	0.001	0.001	0.001	0.002	0.005
Chlordane	mg/L	$4x10^{-6}$	$3.2x10^{-7}$	0.00009	$4.3x10^{-6}$	$3.1x10^{-7}$ [e]
Chloride	mg/L	NBL*	NBL*	NBL*	NBL*	NBL*
Chlorine	mg/L	0.0075	0.0075	0.013	0.019	0.01
Chloroform	mg/L	0.13	0.13	0.13	0.13	0.06
Chromium	mg/L	0.05	0.002	0.05	0.05	0.037
Cobalt	mg/L	0.05	0.05	1	0.05	0.05

Component / Indicator	Unit	Coastal Water			Surface Water (Unsuitable for Drinking)	Ground Water (Potable unless NBL* specified)
		Normal	High-value	Industrial		
Chemical Oxygen Demand(COD)	mg/L	25	20	40	25	-
Copper	mg/L	0.003	0.003	0.0135	0.05	1.5
Cyanide (free)	mg/L	0.001	0.001	0.001	0.01	0.001
Dichloro-diphenyl-trichloroethane (DDT)	mg/L	$1.7x10^{-5}$	$1.7x10^{-5}$	$1.7x10^{-5}$	$1.7x10^{-5}$	$1.7x10^{-5}$
Dieldrin	mg/L	$4x10^{-6}$	$4x10^{-6}$	$4x10^{-6}$	$4x10^{-6}$	$4x10^{-6}$
Dissolved Oxygen	mg/L	Minimum: 5	Minimum: 5	Minimum: 4	Minimum: 5	N/A
Endrin	mg/L	$6 x10^{-6}$	$6 x10^{-6}$	$6 x10^{-6}$	$8.6 x10^{-5}$	$3 x10^{-5}$
Fluoride	mg/L	1.5	1.5	1.5	0.4	0.2
Furans	mg/L	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$
Heptachlor	mg/L	$5x10^{-6}$	$5x10^{-6}$	$5x10^{-6}$	$5x10^{-6}$	$5.9 x10^{-9}$
Hexachlorobenzene	mg/L	$2.9x10^{-7}$	$2.9x10^{-7}$	$2.9x10^{-7}$	$5x10^{-5}$	$2.9x10^{-7}$
Iron	mg/L	0.5	0.1	1	0.5	0.2
Lead	mg/L	0.008	0.005	0.21	0.01	0.0075
Lindane	mg/L	$1.2x10^{-5}$	$1.2x10^{-5}$	$1.2x10^{-5}$	$1.2x10^{-5}$	0.0002
Manganese	mg/L	0.01	0.01	0.1	0.1	0.05
Mercury	mg/L	0.0004	0.0004	0.0001	0.00007	0.00075
Mirex	mg/L	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-6}$
Methyl tert-butyl ether (MtBE)	mg/L	5	5	5	10	0.02
Nickel	mg/L	0.05	0.05	0.2	0.05	0.02
Oil & Grease	mg/L	2	Maximum: 1	3	3	0
Polycyclic Aromatic Hydrocarbon (PAH)	mg/L	0.003	0.003	0.003	0.003	0.0002
Polychlorinated Biphenyls (PCBs)	mg/L	$1.9x10^{-6}$	$1.9x10^{-6}$	$1.9x10^{-6}$	$1.9x10^{-6}$	$1.9x10^{-6}$
Pentachlorophenol	mg/L	0.00004	0.00004	0.005	0.019	0.00003

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Component / Indicator	Unit	Coastal Water			Surface Water (Unsuitable for Drinking)	Ground Water (Potable unless NBL* specified)
		Normal	High-value	Industrial		
pH [2]	pH	6.5 - 8.5 Maximum: Δ0.2	6.5 -8.5 Maximum: Δ0.1	6.5 -8.5 Maximum: Δ0.3	6.5 -9	6.5 -9
Total Petroleum Hydrocarbons	mg/L	0.3	0.2	0.5	0.3	0.2
Phenols	mg/L	0.05	0.05	0.1	0.05	0.005
Silvex (2,4,5-TP)	mg/L	-	-	-	-	0.05
Total Organic Carbon (TOC)	mg/L	10	10	15	10	NBL*
Salinity	%	0	0	3	NBL*	NBL*
Selenium	mg/L	0.071	0.071	0.29	-	0.007
Silver	mg/L	0.0019	0.0019	0.2	0.0032	0.0032
Sodium	mg/L	NBL*	NBL*	NBL*	150	150
Sulfate	mg/L	NBL*	NBL*	NBL*	200	NBL*
Sulfide	mg/L	0.002	0.002	1	0.002	0.002
Tetrachlorodibenzodioxin (TCDD)	mg/L	3x10-8	3x10-8	3x10-8	3x10-8	3x10-8
Toluene	mg/L	0.002	0.001	0.002	0.002	0.002
Toxaphene	mg/L	$2x10^{-7}$	$2x10^{-7}$	$2.1x10^{-5}$	$2.1x10^{-6}$	$7x10^{-7}$
Trichloroethane	mg/L	0.01	0.01	0.01	0.01	0.001
Vinyl Chloride	mg/L	0.002	0.002	0.002	0.002	0.001
Xylenes	mg/L	0.005	0.005	0.005	0.005	0.005
Zinc	mg/L	0.08	0.08	0.09	0.12	0.02
Microbiological Standards						
Cyanobacteria	mg/L	5,000	5,000	5,000	5,000	-

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Component / Indicator	Unit	Coastal Water			Surface Water (Unsuitable for Drinking)	Ground Water (Potable unless NBL* specified)
		Normal	High-value	Industrial		
Ecoli	Number / 100 ml	Maximum: 500	Maximum: 250	Maximum: 500	Maximum: 600	0
Intestinal Enterococci	Number / 100 ml	Maximum: 200	Maximum: 100	Maximum: 200	Maximum: 230	0

(*) NBL: Natural Background Level, not affected by any human activity, of the component in nature. **Note:** The NBL does not necessarily have to be lower than the levels that are considered safe for humans or wildlife species.

(1) **Differences in Temperature** (Δ **T):** It is the maximum temperature difference between the mixing zone – measured on the mixing zone's borders which are determined in accordance with Appendix (5) of this Executive Regulations – and the water near the mixing zone – measured outside the industrial coastal water, for example, where the mixing zone is in the nearby public or high-value coastal water. In case the mixing zone is in a non-industrial coastal water, the temperature difference between the direct source of discharge and the mixing zone's borders is measured. The Center may propose amendments to the requirements for measuring differences in temperature in ambient water, for the Ministry's approval.

(2) **Differences in Acidity Level** (Δ **pH):** It is the maximum difference in acidity level between the mixing zone - measured on the mixing zone's borders which are determined in accordance with Appendix (5) of this Executive Regulations – and the water near the mixing zone – measured outside the industrial coastal water where the mixing zone is, for example, in the nearby public or high-value coastal water. In case the mixing zone is in a non-industrial coastal water, the difference in acidity level between the direct source of discharge and the mixing zone's borders is measured. The Center may propose amendments to the requirements for measuring differences in acidity level in ambient water, for the Ministry's approval.

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Appendix (2): Standards Pertaining to Treated Wastewater Prior to Discharge to Coastal and Marine Waters

Component	Unit	Average Interval	**Parameter Average Value** (Maximum for any Sample)
Physical Standards			
Fat Oil and Grease (FOG) (Total Extractable)	mg/L	Sample	(2)
Turbidity	Turbidity Unit	Sample	(5)
Δ Temperature[(1)]	Δ °C	Sample	(5)
Total Suspended Solids (TSS)	mg/L	30 days	25 (40)
Chemical Standards			
Biological Oxygen Demand (BOD_5)	mg/L	30 days	10 (25)
Chemical Oxygen Demand (COD)	mg/L	30 days	20 (50)
Dissolved Oxygen (DO)	mg/L	Sample	(Minimum: 2.0)
Ammoniacal Nitrogen (NH_3, NH_4-N)	mg/L	30 days	1.9
Nitrate Nitrogen (NO_3-N)	mg/L	30 days	10
Phosphate (PO_4)	mg/L	30 days	1
Free Chlorine	mg/L	Sample	(Minimum: 0.1)
Phenols (Total)	mg/L	Annual Average of Monthly Samples	0.1
pH	-	Sample	(6.5 - 9)
Aluminium (Al)	mg/L	Annual Average of Monthly Samples	5
Arsenic (As)	mg/L	Annual Average of Monthly Samples	0.036
Barium (BA)	mg/L	Annual Average of Monthly Samples	1
Cyanide (Cy)	mg/L	Annual Average of Monthly Samples	0.05

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Component	Unit	Average Interval	**Parameter Average Value** (Maximum for any Sample)
Cadmium (Cd)	mg/L	30 days	0.005
Chromium (Cr)	mg/L	Annual Average of Monthly Samples	0.01
Cobalt (Co)	mg/L	Annual Average of Monthly Samples	0.05
Copper (Cu)	mg/L	Annual Average of Monthly Samples	0.5
Fluoride (F)	mg/L	Annual Average of Monthly Samples	15
Iron (Fe)	mg/L	30 days	1
Mercury (Hg)	mg/L	Annual Average of Monthly Samples	0.001 (0.005)
Lead (Pb)	mg/L	30 days	0.008
Manganese (Mn)	mg/L	Annual Average of Monthly Samples	0.2
Nickel (Ni)	mg/L	Annual Average of Monthly Samples	0.008
Selenium (Se)	mg/L	30 days	0.07
Zinc (Zn)	mg/L	Annual Average of Monthly Samples	0.08
Microbiological Standards			
Total Coliform Bacteria	Most Probable Number per 100 ml	30 days	1000
Enterococci bacteria (per 100 ml)	Colony-forming Unit per 100 ml	30 days	35
E. Coli (per 100 ml)	Colony-forming Unit per 100 ml	30 days	126

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(1) Differences in Temperature (Δ Temperature):

A. **In cases of suction and discharge of cooling water:** It is the maximum temperature difference between sucked and discharged cooling water.

B. **In cases of discharge of treated wastewater:** It is the maximum temperature difference between discharged treated wastewater and the mixing zone's borders in ambient water, in accordance with Appendix (5) of this Executive Regulations.

The Center may propose amendments to the requirements for measuring the differences in temperature of treated wastewater in accordance with the coastal and marine water classifications and their characteristics, for the Ministry's approval.

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Appendix (3): Standards Pertaining to Treated Wastewater Prior to Discharge to Soil, Land, or Surface Water

Component	Unit	Average Interval	Parameter Average Value (Maximum for any Sample)	
			Soil / Land	Surface Water
Physical Standards				
Fat Oil and Grease (FOG) (Total Extractable)	mg/L	Sample	(0)	(5)
Total Suspended Solids (TSS)	mg/L	30 days	35 (50)	25 (40)
Total Dissolved Solids (TDS)	mg/L	Sample	(2000)	(2000)
Turbidity	Turbidity Unit	Sample	(5)	(5)
Δ Temperature [1]	Δ °C	Sample	(NBL*)	(NBL*, provided that the temperature in any part of the waterbody within 15 meters from the downstream of treated wastewater does not exceed 40 degrees Celsius)
Chemical Standards				
Biological oxygen demand (BOD_5)	mg/L	30 days	25 (40)	15 (20)
Dissolved Oxygen (DO)	mg/L	Sample	(NBL*)	(Minimum: 2)
Ammoniacal Nitrogen (NH_3, NH_4-N)	mg/L	30 days	5	1.9
Nitrate Nitrogen (NO_3-N)	mg/L	30 days	15	10
Phosphate (PO_4)	mg/L	30 days	30	20
Free Chlorine	mg/L	Sample	(0.1 – 0.5)	(0.1 – 0.5)

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Component	Unit	Average Interval	Parameter Average Value (Maximum for any Sample)	
			Soil / Land	Surface Water
Phenols (Total)	mg/L	Annual Average of Monthly Samples	0.002	0.002
pH		Sample	(6 – 8.4)	(6 – 8.4)
Aluminium (Al)	mg/L	Annual Average of Monthly Samples	5	5
Arsenic (As)	mg/L	Annual Average of Monthly Samples	0.1	0.1
Beryllium (Be)	mg/L	Annual Average of Monthly Samples	0.1	0.1
Boron (B)	mg/L	Annual Average of Monthly Samples	0.75	0.75
Cadmium (Cd)	mg/L	30 days	0.1	0.01
Chromium (Cr)	mg/L	Annual Average of Monthly Samples	0.1	0.1

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Component	Unit	Average Interval	Parameter Average Value (Maximum for any Sample)	
			Soil / Land	Surface Water
Cobalt (Co)	mg/L	Annual Average of Monthly Samples	0.05	0.05
Copper (Cu)	mg/L	Annual Average of Monthly Samples	0.4	0.2
Fluoride (F)	mg/L	Annual Average of Monthly Samples	1	1
Iron (Fe)	mg/L	Annual Average of Monthly Samples	5	5
Mercury (Hg)	mg/L	Annual Average of Monthly Samples	0.001	0.001
Lead (Pb)	mg/L	Annual Average of Monthly Samples	0.1	0.1
Lithium (Li)	mg/L	Annual Average of Monthly Samples	2.5	2.5

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Component	Unit	Average Interval	Parameter Average Value (Maximum for any Sample)	
			Soil / Land	Surface Water
Manganese (Mn)	mg/L	Annual Average of Monthly Samples	0.2	0.2
Molybdenum (Mo)	mg/L	Annual Average of Monthly Samples	0.01	0.01
Nickel (Ni)	mg/L	Annual Average of Monthly Samples	0.2	0.2
Selenium (Se)	mg/L	Annual Average of Monthly Samples	0.02	0.02
Vanadium (V)	mg/L	Annual Average of Monthly Samples	0.1	0.1
Zinc (Zn)	mg/L	Annual Average of Monthly Samples	4	2
Microbiological Standards				
Total Coliform Bacteria	Most Probable Number per 100 ml	30 days	2,000	1,000

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Component	Unit	Average Interval	Parameter Average Value (Maximum for any Sample)	
			Soil / Land	Surface Water
Viable Oval Nematode	Live Oval (Number/L)	30 days	1	1

(*) NBL: Normal Background Level, not affected by any human activity, of the component in nature. **Note:** The NBL does not necessarily have to be lower than the levels that are considered safe for humans or wildlife species.

(1) **Differences in Temperature** (Δ **T):** It is the maximum temperature difference between treated wastewater being discharged and the receiving water. The Center may propose amendments to the requirements for measuring temperature differences in treated wastewater in accordance with the types of surface water (sewage, ponds, etc.) and their characteristics, for the Ministry's approval.

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Appendix (4): Requirements Pertaining to Wastewater Treatment Levels and Techniques

First: Wastewater Treatment Techniques

Level of Treatment	Substance to be Removed	Treatment Example
A- Pre-treatment	Solids	Filtration of solids
B- Primary Treatment	Solids and materials that will easily settle	Primary settling
C- Secondary Treatment	Most solids and Biochemical Oxygen Demand (BOD)	Biological treatment, chemical treatment, ponds
D- Removal of Nutrients	Nutrients after the removal of solids	Biological and chemical settling
E- Disinfection	Bacteria and viruses	Use of ultraviolet radiation, chlorination

Second: Treated Wastewater Discharge or Injection Options

Treated Wastewater Discharge or Injection Options	Minimum Level of Treatment	Recommended Level of Treatment
Treated Wastewater Discharge to Soil / Land		
Evaporation Ponds	C	C
Irrigation: - Agricultural land - Irrigated green spaces - Injection to groundwater	C	C and E
Discharged into: - Natural soil - Groundwater	C	C and D
Treated Wastewater Discharge to Coastal or Marine Water		
Discharge into marine water through outfalls	C	C and D
Tidal range in coastal areas	C	C and D
Coastal waters near the shores (other than bays and estuaries)	C and D	C, D and E
Bays and estuaries	C and D	C, D and E
Treated Wastewater Discharge to Waterbodies		
Rivers, waterways, and lakes	C	C and D
	C	C, D and E
	C	C, D and E
	C	C
	C	C

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Appendix (5): Calculations Pertaining to Mixing Zones

Key screening model to determine the maximum horizontal extension of the mixing zone:

SD_{ave} = Horizontal extension of the mixing zone

Where:

D_{ave} =Average water depth at discharge location [(1)]

S = See the table below

Table (1): "S" Values for the Red Sea

S	Classification
2	High-value
5	Public area
8	Industrial area

Table (2): "S" Values for the Arabian Gulf

S	Classification
4	High-value
10	Public area
16	Industrial area

Notes:

1. This method is the key screening model to determine the maximum horizontal extension of the mixing zone.
2. When the models indicate that the maximum mixing range is unattainable, the Center shall be consulted for approval on a case-by-case basis.
3. The maximum horizontal extension of the mixing zone's radius is 100 meters at any time.

Table (3): Model Table Showing the Radius of the Mixing Zone for Specific "S" and "D_{ave}" Values Pertaining to the Red Sea and the Arabian Gulf

Depth of the Red Sea (Meter)	2	5	8	Depth of the Arabian Gulf (Meter)	4	8	12

Depth of the Red Sea (Meter)	2	5	8	Depth of the Arabian Gulf (Meter)	4	8	12
	Radius of the Mixing Zone				Radius of the Mixing Zone		
5 or less	10	25	40	**5 or less**	20	40	60
6	12	30	48	**6**	24	48	72
7	14	35	56	**7**	28	56	84
8	16	40	64	**8**	32	64	96
9	18	45	72	**9**	36	72	**100**
10	20	50	80	**10**	40	80	
11	22	55	88	**11**	44	88	
12	24	60	96	**12**	48	96	
13	26	65	**100**	**13**	52	**100**	
14	28	70		**14**	56		
15	30	75		**15**	60		
16	32	80		**16**	64		
17	34	85		**17**	68		
18	36	90		**18**	72		
19	38	95		**19**	76		
20	40	**100**		**20**	80		
21	42			**21**	84		
22	44			**22**	88		
23	46			**23**	92		
24	48			**24**	96		
25	50			**25**	**100**		
26	52			**26**			
27	54			**27**			
28	56			**28**			
29	58			**29**			
30	60			**30**			
31	62			**31**			
32	64			**32**			
33	66			**33**			
34	68			**34**			
35	70			**35**			
36	72			**36**			

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Depth of the Red Sea (Meter)	2	5	8	Depth of the Arabian Gulf (Meter)	4	8	12
37	74			**37**			
38	76			**38**			
39	78			**39**			
40	80			**40**			
41	82			**41**			
42	84			**42**			
43	86			**43**			
44	88			**44**			
45	90			**45**			
46	92			**46**			
47	94			**47**			
48	96			**48**			
49	98			**49**			
50	100			**50**			

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