

**Hashemite Kingdom of Jordan**



**Ministry of Water and Irrigation**

**The Amended Guideline of the Water  
Resources Protection for the year of  
2019**



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**The Hashemite Kingdom of Jordan  
Ministry of Water and Irrigation**



**HIS MAJESTY  
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## Introduction

Water availability for various purposes is considered one of the most important factors of development in any country, and is of particular importance as it is closely linked to the quality of life in the areas of water scarcity, such as Jordan. Climate change affect in Jordan like other countries in the region as more extreme weather events, such us; changing precipitation patterns (intensity, extremes and duration), succession of drought seasons which become more severe than we knew for decades.

Hence, this patterns will surely affect the environment in the Jordanian Kingdom in general including drought. It also has a direct impact on the groundwater and surface water sources in particular; as a point of fact, the kingdom primarily depends on groundwater sources to provide the needs of all sectors, especially, household usages. That is to say, Jordan has started suffering a serious shortage in its water sources since the last two decades. This suffering has increased in the past decade as a result of successive drought seasons witnessed by Jordan as well as the forced migrations and refugees which have led to increase the demand of water in different ways such as drinking, agriculture and industry in order to keep pace with both progress and technology. This led to the depletion of many groundwater and surface water resources, drought of many springs, and change in the dynamic patterns associated with it. As a fact, the key problem of water shortage in Jordan was not limited to only scarcity, but it also transcended to the deterioration in its quality and salinity resulted by the depletion of groundwater level on one hand, and the various humanitarian practices resulted from urbanization on the other hand.

Accordingly, the protection and conservation of water resources become an urgent and national need by optimally managing the existing scarce sources and maximizing the benefit by implementing a national policy to protect the groundwater and surface water resources. Thus, the first step should be started by identifying the zone for protecting the groundwater resources, applying rules and regulations for this purpose, and amending the needed applicable laws to be mandatorily followed. These Guidelines have to be submitted specifically to the areas and activities that are allowed, restricted, or prohibited in each region with clear maps which will be adopted in preparing comprehensive plans in the kingdom, based on the scientific considerations and technical studies that are taken into account in the re-evaluation and modification of protection zones according to the surrounding local circumstances as well as the prevailing natural and environmental phenomena. These Guidelines are also not related to any legal or compensatory data. They do not address any other authorities in the kingdom in which they provide issuing licenses. But, various parties should refer to these guidelines while obtaining a license to any institution, activity, or project which may threaten the quality of water resources.

## **Requirements for Delineating Protection Zones**

- **Overview**

When delineating the protection zones of the groundwater and surface water sources, it is required to review the available information and studies to demonstrate their adequacy to assess the watersheds located within them. Also, water sources should be reviewed in terms of the geological and hydrological aspects including the groundwater vulnerability maps and maps of protection zones. Further, the needed information is going to be updated when necessary by conducting a field survey.

Moreover, for the purpose of delineating these areas, it is required to consider criteria of selecting determined activities sites that are being planned by the Ministry of Environment as well as the licenses that are issued by the Ministry of Environment in this respect in accordance with the Ministry of Municipal Affairs, Ministry of Agriculture, and the Greater Amman Municipality. The following protection zones were determined according to specific and authentic methods implemented all over the world. The three protected zones, namely the first, second third for water resources; groundwater and surface water.

- **The Fundamental Data for Evaluation Purposes:**

In order to conduct sound evaluation processes, the following data and information that are relevant to water sources must be provided:

1. General information on public and private drinking water sources under protection (the name, the operator, the location, the source height, and the technical description).
2. Basic information related to public and private wells including drilling licenses, extraction licenses.
3. Results of chemical, physical, biological and radiological tests carried out on water sources (raw water) for several years by controlling parties or operating parties. Consequently, these results indicate to the situation of recharge areas, water source productivity, water quality, and contamination possibility.
4. Hydrological, hydrogeological data and environmental isotopes that are relevant to water sources.

The assessment process of the protection zones delineation is based on the information of hydrological, hydrogeological, chemical, physical, biological, and isotope environmental of the water source.

**The Amended Guideline for the Water Resources Protection for the Year of 2019  
(Issued based on the provisions of Articles (4) and (44) of the groundwater monitoring by  
law number (85) for the year of 2002, and its amendments)**

1. These Guidelines are called << The Amended Guideline for The Water Resource Protection for the Year of 2019 >> and they are read as well implemented in accordance with the Water Resources Protection Guideline for the year of 2011 “ as a single unit and it will be effectively launched starting from the time of being published in an official Gazette.
2. The following words and phrases, wherever mentioned, shall have the following meanings unless the context indicates to another meaning or use:

The Ministry:	The Ministry of Water and Irrigation.
The Minister:	The Minister of Water and Irrigation.
The Secretary General	The Secretary-General of Ministry of Water and Irrigation. The Secretary-General of Water Authority. The Secretary-General of Jordan Valley Authority.
Water Authority:	The Water Authority established under the Water Authority Act No. 18 in 1988 and its amendments
Jordan Valley Authority:	The Jordan Valley Authority established under the Jordan Valley Development Act No. 19 in 1988 and its amendments.
Groundwater:	Water existing in the underground that can be extracted upward to the surface through drilling a well.
Surface Water:	All water bodies on the ground surface such as rivers, lakes, seas, permanent and current water, dams, ponds, spring water after flow.
The Spring:	A water source of groundwater origin. It flows to surface due to geological and hydrological factors; either continuous or intermittent.
The Aquifer:	A layer of rock has the ability to store water, this layer is solid cracked or fragmented and it has permeable characteristics that allow the movement and extracting of the groundwater.
Groundwater Aquifer Recharge Area:	Areas where rain and snowfall gather on their surface or pass through and they have permeable properties that allow these waters to infiltrate to recharge the groundwater

The Main Wadi:	The base flow in valley or the direct recharging wadi for the main water resource.
The well:	Any pit or hole drilled by a machine or special tool used to get into the aquifer to extract water mechanically or naturally flow over the earth surface.
The Public Well:	The well owned by the official authorities, municipalities or companies that manage the water facility in the governorates.
The Landfill:	Is a discrete area of land or excavation that receives waste for temporary storage, consolidation and transfer, or processing of waste material (sorting, treatment, or recycling).
The Drinking Water Sources:	The sources used or intended to be used for drinking and house use.
Catchment Area:	It is an area of land that drains all the streams and rainfall to recharge the water resources.
Protected Zones:	The areas of land being prohibited or restricted for various activities and practices to protect water sources from contamination and to reduce the negative impacts of this activity.
The Karst Layers:	It is carbonate rock layers that contain caverns and cracks and they are characterized by high permeability and the heterogeneous movement of water.
The Time of Arriving the Contaminant Bacteria:	The time of arriving the contaminant bacteria or the microbiological bacteria from the pollution sources to the water sources.
The Sealed Cesspools:	It is an impermeable hole constructed from armed concrete or any other non-permeable and insulated material that prevents penetrating of wastewater to reach the water layer being on the accordance of Jordanian specifications.
Public Sanitation Network:	All extensions, installations, and equipment used for transporting wastewater from production sites to treatment stations.
The Septic Tank:	It is the hole dedicated to collecting or disposing of wastewater and draining it through the holes and pores of the soil.
Human Activities:	The activities related to housing, tourism, or trade and they do not include craft or industrial development activities or certain

		other activities such as benzen Stations, car wash, garages or olive presses.
Organic Agriculture:		An integrated agricultural system that promotes organic agricultural production within the economic social environmental framework without the use of chemical compounds and manufactured according to the system of organic farming (No. 133) for the year (2019) with its amendments.
The Monitoring Well:		The well that is used to observe the groundwater level taking into account all the requirements of the well.
Groundwater Vulnerability for Pollution:		The level of ease or difficulty of reaching the contaminants to groundwater or to assess the amount of insulation by natural or human factors which help in keeping the pollutants away from the sources of groundwater.
COP Model:		It is a hydrogeological model commonly used to study the sensitivity of the groundwater in the areas where the cavities (Karst) are found and it depends on the Geographic Information Systems in mapping, combining, concentrating and flowing the contaminants from the surface towards the groundwater (C: Concentration of flow) and nature of the geological layers of the soil (O: Overlying layer) climatic conditions, precipitation rain (P: Precipitation).
Below the Water Source:		The area is located below the water source regarding to the groundwater direction, so the water moves towards it from the water source.
Above the Water Source:		The area is located above the water source regarding the groundwater direction, so the groundwater moves from the upper area towards the water source.

3. The Purposes of implementing the provisions of these guidelines that divide the protection zones into the following:

- A. The protection zones for the groundwater resources.
- B. The protection zones for the surface water resources.

4. The provisions related to the groundwater sources protection zones

A. The Protection Zones:

\* The Protection Zone I:

The exact area that is required for the first protection zone shall be determined to be for the spring at least (50) meters towards upstream and at least (25) meters for the well, respectively. Downstream direction is at least (10) meters and the extension of the zone on both sides of the water source (well/spring) is around (15) meters as shown in figures 1 and 2 . Besides, the existing infrastructure and the current status of the area have to be taken into account.

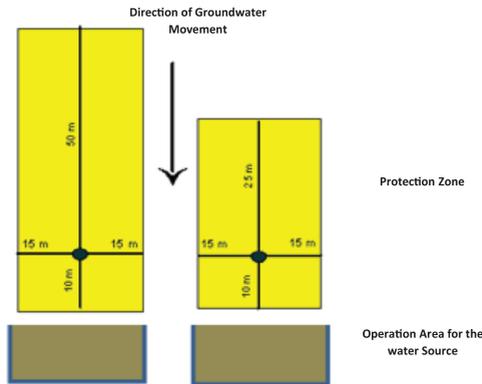


Figure 1: First protection zone of the spring

Figure 2: First protection zone of the well

(1) The protection delineated area of the water source is the area owned by the Ministry of Water and Irrigation, fenced the protection zone, in this area it is prevented to carry any activities except the activities related to operating the water source and to be in operation area at the bottom of the water source, with the need to observe the following rules:

- \* Operator or guard availability at all times and leaving is allowed only when there is an alternative.
- \* Keeping the area clean and beautiful.
- \* Committing the maintenance and regular emptying of the sealed cesspool.
- \* Ensuring the safety of the fence.
- \* Storing the incinerators and chlorine cylinders as well as taking into account the public safety rules to be preserved.

- Each case is studied according its nature to achieve the target purpose including lands allowed to be owned and the existing practices in the region (e.g. the surrounding area of some springs that exceeds (2) dunum and documented within land and survey department, in this case, the whole area is considered as the first protecting zone for the spring).
- Private Wells and springs are not utilized for drinking must comply with the limits of the first protection zone, to fix distance of protection zone to comply with the terms of proposed protection on public wells as a condition for granting new a license and any type of issuing licenses by the wells' relevant authorities. Also, the existing status should be taken into account when licensing wells, and each case should be studied alone.
- If there is cesspool, it should be given the priority either to connect to the sewerage network in accordance with the regulations and guidelines of sanitation or the adoption of technical procedures needed for this cesspool going along with the Jordanian specifications. For this purpose, an intensive supervision should be there over these areas to ensure sound health and environmental conditions in this regard by the concerned parties.
- The well head (monitoring well) must be tightly closed to prevent any external source of a contamination reaching the well.

\* **Protection Zone II:**

- The second protection zone is specified by referring to the existing hydraulic information that is related to flowing groundwater, geological, hydrogeological, and technical studies, as well as reports. Based on this information, the specialists in the Ministry of Water and Irrigation (MWI) will calculate the velocity of groundwater flow and define the boundary of the protection zone "two". The protection zone two comprises the area between the outer limit of zone 1 and a vertical line from where groundwater flow will take 50 days until it reaches the spring or well. In addition, the distance should not exceed (2) kilometers in the upstream direction of the water source (spring/well) and 50 to (150) meters in the downstream direction. In the karst areas, the groundwater vulnerability maps of pollution (if available) are used and based on technician's opinion.

- Distance adopted as maximum for the second protection zone should be recalculated if more detailed information and studies are available regarding the geological and hydrogeological situations represented by the properties of layers, hydraulic parameters, groundwater movement and its velocities, as well as including the remote-sensing studies, structural geology, consider the environmental isotopes and geophysical studies, mathematical models for groundwater reservoirs, and others related useful information.

\* **Protection Zone III:**

Protection Zone III is the entire groundwater catchment area for the well or spring which is delineated based on the hydrological and hydraulic characteristics of the area and the aquifer which are located within the catchment area.

**B. Activities Allowed in Groundwater Protection Zones:**

\* **Activities allowed in Protection Zone I:**

- Activities in the first protection zone shall be limited to those related to operating the well or the water source and they should be installed or constructed downstream the well or water source, as well as for the cesspool, fuel tanks, or chemical storage areas.
- First protection zone has to be implemented on the private wells. These private wells are subject to the same protection conditions as governmental wells. This kind of condition is considered an absolute condition for renewing the licenses of the wells e.g., digging license, annual extracting license, or annual license for selling drinking water or other private licenses. The concerned party of the water source should own the first protection zone where possible.
- There should be committed to the guideline of the first protection zone presented in the signposts inside the well's protection zone. The vandalism should be inspected by concerned parties such as the Ministry of Health, Ministry of Environment and other parties concerned with water source protection in the MWI with its authority.
- Any vandalism in the first protection zone should be stopped (that are explained in the water authority act 18 in 1988 and its amendments) and the protection zone one should be fenced. The activities in this zone are limited to those who operate and manage the

water resource. Furthermore, environmental, healthy, and structural practices and conditions have to be taken into consideration.

- Any needed installations for operating and maintaining water source are to be designed in a way they cannot be hazardous to the groundwater.
- The priority is given to the implementation of sewerage networks in areas of water sources where possible, or to construct sealed cesspools according to the Jordanian specifications.

\* **Activities Allowed in Protection Zone II:**

- Activities in Zone II are limited to residential activities and organic agriculture. The priority is to be given to the establishment of an appropriate sewerage network or a safe sub-surface disposal system (cesspools) to the areas located into the second protection zone of the water source according to the sewerage network by-law number (66) in 1994 where possible, or to construct sealed cesspools according to the Jordanian specifications.
- Intensifying the control on these zones by the Ministry of Environment in coordination with other ministries and institutions according to its legal framework in order to ensure its compliance with environmentally sound practices.
- No license of new establishments, extensions, or changes in use has to be given unless the concerned organizations give permission after referring to related studies and recommendations if available. If there are no studies, new studies have to be conducted or new guidelines have to be existed for example “the guidelines for granting licenses to construct fuel stations”. Every case has to be treated individually and the required correction procedures that aim to prevent any negative impact on the water sources in this zone should be taken.
- Obligating the owners of agricultural development activities or existing industries that produce sewerage network that may affect the environment and water sources to apply the relevant technical rules (e.g., guidelines for wastewater of industries and commercial to the sewage network project and its amendments) and rectifying the situation as it will decided by the concerned authorities<sup>2</sup>.

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<sup>2</sup> Relevant authorities include The Ministry of Interior, The Ministry of Water and Irrigation, Ministry of Environment, Ministry of Local Administration, Ministry of Industry and Trade, Ministry of Agriculture, Greater Amman Municipality, Ministry of Health, Public Security Directorate /RANGERS, The Ministry of Tourism and Antiquities.

\* **Activities Allowed in Protection Zone III:**

All the developmental, industrial, and agricultural activities are permitted by the legislation and adhering with the sound environmental practices issued by the Ministry of Environment and committing with the sound farming practices issued by the Ministry of Agriculture and the foundation of specifications and standards taking into account the outputs of the groundwater Vulnerability map to the contamination in areas with high susceptibility to be polluted.

## 5. The Provisions of Surface Water Protection Zones:

### A. Dams:

#### \* **Protection Zone I:**

- The Currently Existing Dams <sup>3</sup> : protection zone I is the area surrounding the dam which is owned by the Jordan Valley Authority for implementing and operation of the water source .
- Future Dams and Projects: Protection zone I corresponds to the area surrounding the dam which is acquired by Jordan Valley Authority for operating and implementing activities. The fenced distance has to be not less than 100 m or as the topographic condition of the area requires around the embankment of the dam assuming the highest water level according to the original design or plans of future expansion.

#### \* **Protection Zone II:**

Protection zone II begins at the end of the zone I boundary and each case is delineated by depending on the geologic and topographic situation (slope) of the area. The outer boundary of protection zone II should not be less than 2.5 km around the embankment of the dam or its reservoirs.

#### \* **Protection Zone III:**

Protection zone III includes the entire catchment area which is estimated from the hydrogeological and hydrological condition of the area.

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<sup>3</sup> The currently existing and used dams or the ones expected to be used for the purposes of the drinking or artificial recharge are: Mujib Dam, Al Waleh DAM, Wadi Al-Arab Dam, Al Wihda Dam.

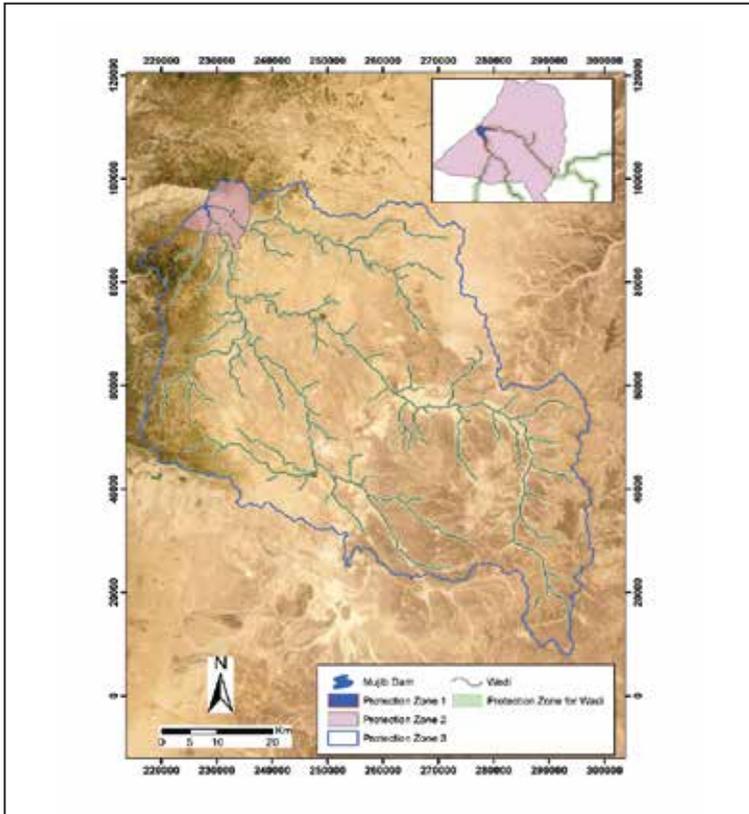


Figure 3: Surface Water Protection Zones (Example: Mujib Dam)

## B. Wadis:

### \* Protection Zone I

Is the path of the wadi (registered or unregistered) in the documents of the department of lands and survey as a property of the government in addition to area of distance of (10) meters on both sides of the wadi with taking the necessary precautionary to prevent the discharge of water into the wadi.

\* **Protection Zone II**

Zone II will be at the sides of wadis that feeding the water body<sup>4</sup> around 350 m on each side and for a distance of 5 km above the water body<sup>5</sup>. These dimensions could be revised based on the geologic and topographic situation of the area and slope factor of the area. Also, engineering or procedural control that will be taken by concerned parties which have activities in the region in accordance to the requirements of adopted licensing and keeping in mind the quality of running water in the wadi and the nature of established activities or proposed activities.

**C. King Abdullah Canal:**

\* **Protection Zone I:**

The currently-owned property of King Abdullah is 40 meters on both sides of the canal, depending on the current status, with tight fencing and intensified surveillance along the channel's route.

\* **Protection zone II:**

The protection zone II starts from the end of the protection zone itself until the (75) meters on both sides of the channel, the determination of allowed activities depend on the nature of the activity and having the consent of the Jordan Valley Authority.

**D. Activities allowed in Surface Water Protection Zones:**

\* **Activities allowed in Protection Zone I:**

The activities in this zone are limited to the first protection zone itself that are related to operating and managing the water resource. In addition, the environmental, healthy, and structural practices have to be taken into considerations.

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<sup>5</sup> Water resource include Dam, Spring, Well, Canal

\* **Activities allowed in Protection Zone II**

- The agricultural activities in this zone are limited to only organic agriculture. This responsibility is undertaken by Ministry of Environment in accordance with the applicable legal frames.
- When issuing licenses of any development activities, artisanal, commercial or industrial such as fuel stations, washing cars, garages, or olive presses, in addition to free zones and industrial zones, not to produce and throw hazardous wastes.
- The priority is given to implement a sewerage networks in the inhabited protection zone II where water sources are available whenever possible, or the priority is given to construct cesspools according to national codes and specifications in this regard.
- Intensifying control on these concerned parties that grant licenses, to be adhered to environmental sound practices issued by the Ministry of Environment.
- No licenses of new establishments, extensions, or changes in use can be given unless the responsible organization gives permission after referring to related studies and recommendations if available. If there are no studies, new studies have to be conducted and each case should be studied alone to obtain the needed recommendation to prevent any negative impact on the water sources in this zone.
- The required correction should be taken by the owner of the establishment according to the recommendations prepared by the licensing committee.
- The existing developmental, industrial, and agricultural activities, which produce wastes that may negatively impact the environment and water sources, are obliged to implement environmental sound practices and to carry out corrective measures decided by the responsible parties .

\* **Activities allowed in the third protection zone:**

All developmental activities are allowed in this zone by providing commitment to sound environment practices issued by Ministry of Environment.

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6 Concerned parties include: ministry of interior, Ministry of Water and Irrigation, Ministry of Environment, Ministry of Municipalities, Ministry of Industry and Trade, Ministry of Agriculture, Greater Amman Municipality.

## 6. Groundwater Vulnerability Map

- All Relevant authorities shall consider the outputs of the Groundwater Vulnerability Map attached to these guidelines within the basic criteria to select locations of activities provided and planned by the Ministry of Environment and Licenses issued for this purpose, the Ministry of Local Administration, Ministry of Agriculture, Ministry of Energy and Mineral Sources, and the Greater Amman Municipality.
- Groundwater Vulnerability for contamination is divided into five areas: areas with very low, low, medium, high and very high vulnerable to get contaminated.
- The Groundwater Vulnerability Map aims to improve the protection of groundwater sources, assist in the development of strategies for groundwater protection, and identify the areas that need to be placed upon the conditions and limitations of land-use.
- The concerned official authorities including the free zones area and zones of industrial cities, when licensing any activity (developmental, vocational, investing or industrial, especially, heavy and chemical industries) should not allow such activities in regions with very high and high contamination vulnerability for groundwater and should require adherence to technical studies for each case to prevent any negative impact on the water source in this region.
- In the case of old institutions and industrially organized that may fall within the boundaries of the area of high or very high sensitivity to pollution, the technical studies shall be referred to or conducting necessary studies and considering each case individually in order to prepare the necessary recommendations to correct the situation or the imposition of certain requirements such as not to increase the productive capacity or expansion.
- No licenses of new establishments, extensions, or changes in use can be given unless the responsible organization gives permission after referring to related studies and recommendations and groundwater vulnerability map and conducting studies and committing with the guidelines of the organization for this purpose, each case studied aside, the corrective actions needed are taken to prevent any negative impact on the water source in this region.
- If an abandoned well is found near a project that should be licensed, they shall refer to the technical studies and recommendations and the groundwater vulnerability map and perform the needed studies to take all the geological and hydrogeological information like the static water level and the corrective action needed.

**7. Despite what is stated in these guidelines, the minister may allow mining activities and energy production that will be generated under the agreements concluded by the government with any entity of the public or private sector including the following:**

- Engaging in mining activities and energy production in the protection zones with a condition to apply sound environmental practices identified during the Environmental Impact Assessment (EIA) procedures covered in the report of the EIA for the project approved by the Ministry of the environment.
- The diversion of wadis path to change the course of water mining in the wadis after the change of course by building dams to collect rainwater and surface water and the subsequent usage of it, and the exercise of other activities related to the mining and energy production in the protection zones with changing the plan of changing the path of wadi as a part of the EIA procedures of the project and that includes the EIA report for the project which all information related to the plan change the course of the wadis will be submitted for approval. No activities will be allowed in accordance with the provisions of this paragraph if they affect the drainage of the main wadi recharge the dam source in the project area.
- The project shall, due to the scarcity of water, quest for technical solutions to enable water conservation to the extent feasible from the technical and economic sides.

**8. The Water Resources Protection Guideline for The Year of 2006 is Repealed**

**9. Control and Implementation:**

- Ministry of Water and Irrigation, Water Authority of Jordan, and Jordan Valley Authority implement the requirements needed for the first protection zone including possessing lands that are surrounding the public water resource. Also, the aforementioned entities should address the Ministry of Municipal Affairs, Greater Amman Municipality, and Aqaba Special Economic Zone regarding the regulation of lands around the water sources to consider these guidelines within the organizational restructuring, and detailed schemes relating to the lands that are surrounding the water sources.
- Concerned parties in the Ministry of Environment coordinate with the concerned official parties to control the second and third water sources protection zones, and should take the necessary procedures according to the applicable laws.

- Ministry of Agriculture coordinates with the concerned official parties to control the agricultural activities and the necessary protection requirements, especially, within the second and third protection zones.
- All private wells' owners should committed to apply the protection zone one and Guideline provisions of the public wells.

Secretaries General of the Ministry of Water and Irrigation, Water Authority of Jordan, and Jordan Valley Authority should circulate these guidelines and all concerned and the competent departments should committed to its contents, and apply these guideline, immediately, after they are published in the national official gazzette.

## **Minister of Water and Irrigation**

**Eng. Raed Abu Al Saud**

