

TECHNICAL COOPERATION
PROJECT NO. PN 2001.2132.7

Groundwater Resources Management

**Hydrogeological Proposal for the Delineation of a
Groundwater Protection Area for the Wadi Al Arab Well Field**

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Summary

The well field in Wadi Al Arab in the northwestern part of Jordan, about 3 - 5 km east of North Shouneh in the Jordan Valley, is very important for the domestic water supply of Irbid and many villages in the northern highland. In order to safeguard the water quality in this well field, proposals for the establishment of a groundwater protection area have been elaborated within the framework of the Jordanian–German technical cooperation project “Groundwater Resources Management”. The proposed groundwater protection area has been subdivided into three zones, which require different degrees of protection. The draft of the Jordanian by-law for groundwater protection (not yet ratified) has been used as a guideline for the delineation of these zones. WAJ has purchased the land in the immediate surroundings of the production wells in the Wadi Al Arab well field and has fenced those areas. These fenced-in areas generally fulfill the requirements for the immediate protection zone (Zone I). Evaluation of the available data, field investigations, and groundwater model calculations indicate that it is not necessary to establish an inner protection zone (Zone II) around the Wadi Al Arab wells No. 1 - 4 and 7 - 8 in the northern part of the well field. These wells are sufficiently protected by the overlying

marly sediments of the B3 aquitard. In the southern part of the well field, near the Wadi Al Arab wells No. 5 – 6 and 9, the B2 aquifer crops out in Wadi Zahar, immediately upstream of the wells. These outcrop areas and part of the slopes of the wadi have to be included in Zone II for a minimum distance of 2 km southeast of the wells. In addition, two small areas at the bottom of deeply incised wadis east of the well field should also be declared as Zone II. The outer protection zone (Zone III) includes the entire groundwater recharge area of the well field and reaches until the western outskirts of Irbid city in the east and from there, further south to the Al Mazar area. Within Zone III, the outer protection zone of the well field, are several wells for the domestic water supply of some villages. Though the water abstraction from these wells is much smaller than in the Wadi Al Arab well field, the wells are of high importance for the local domestic water supply. For those wells, especially the ones in the outcrop areas of the B2/A7 aquifer, individual protection zones should be delineated as soon as possible in order to safeguard the water quality.

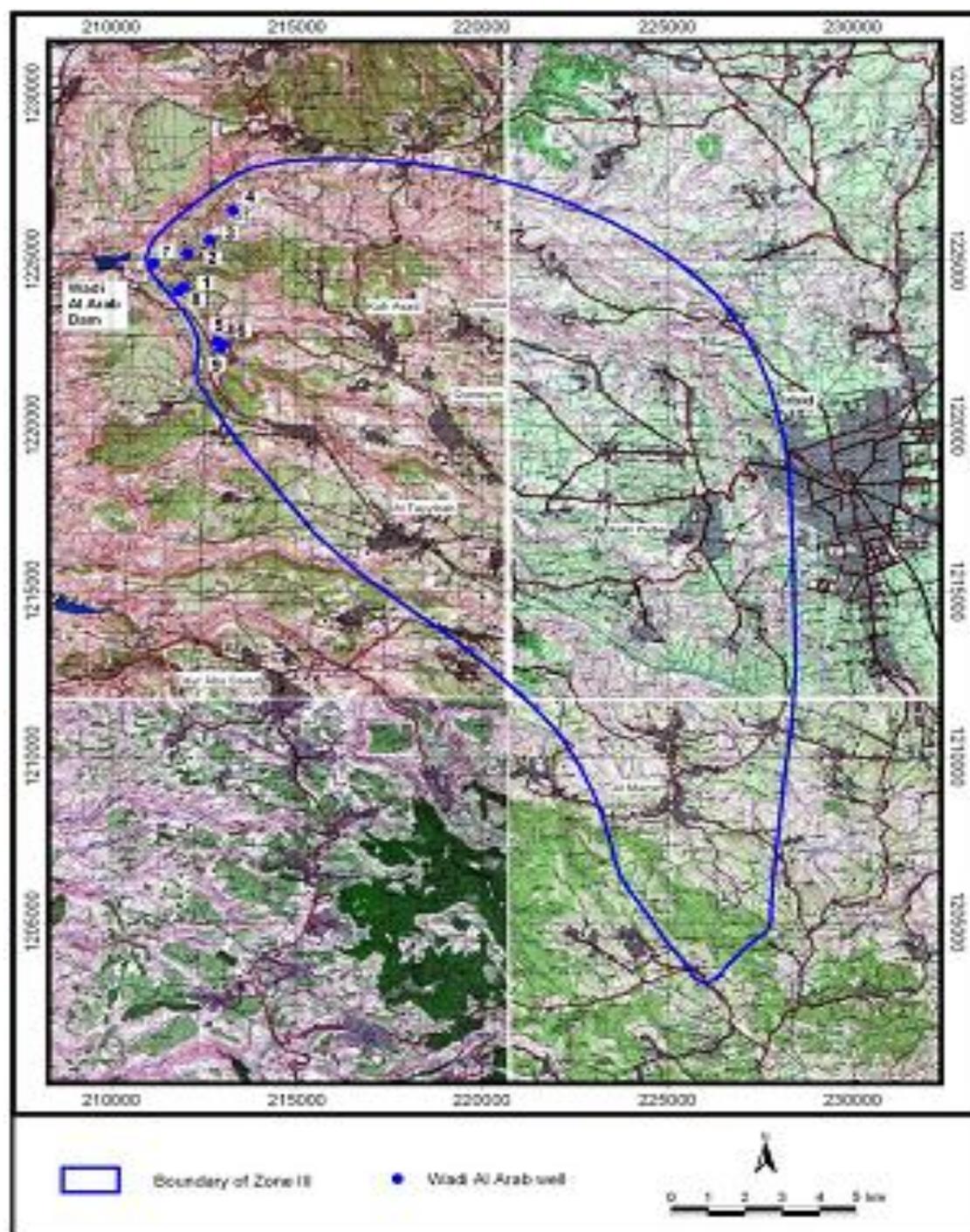


Figure 17 : Proposed Outer Groundwater Protection Zone (Zone III) of the Wadi Al Arab Wellfield

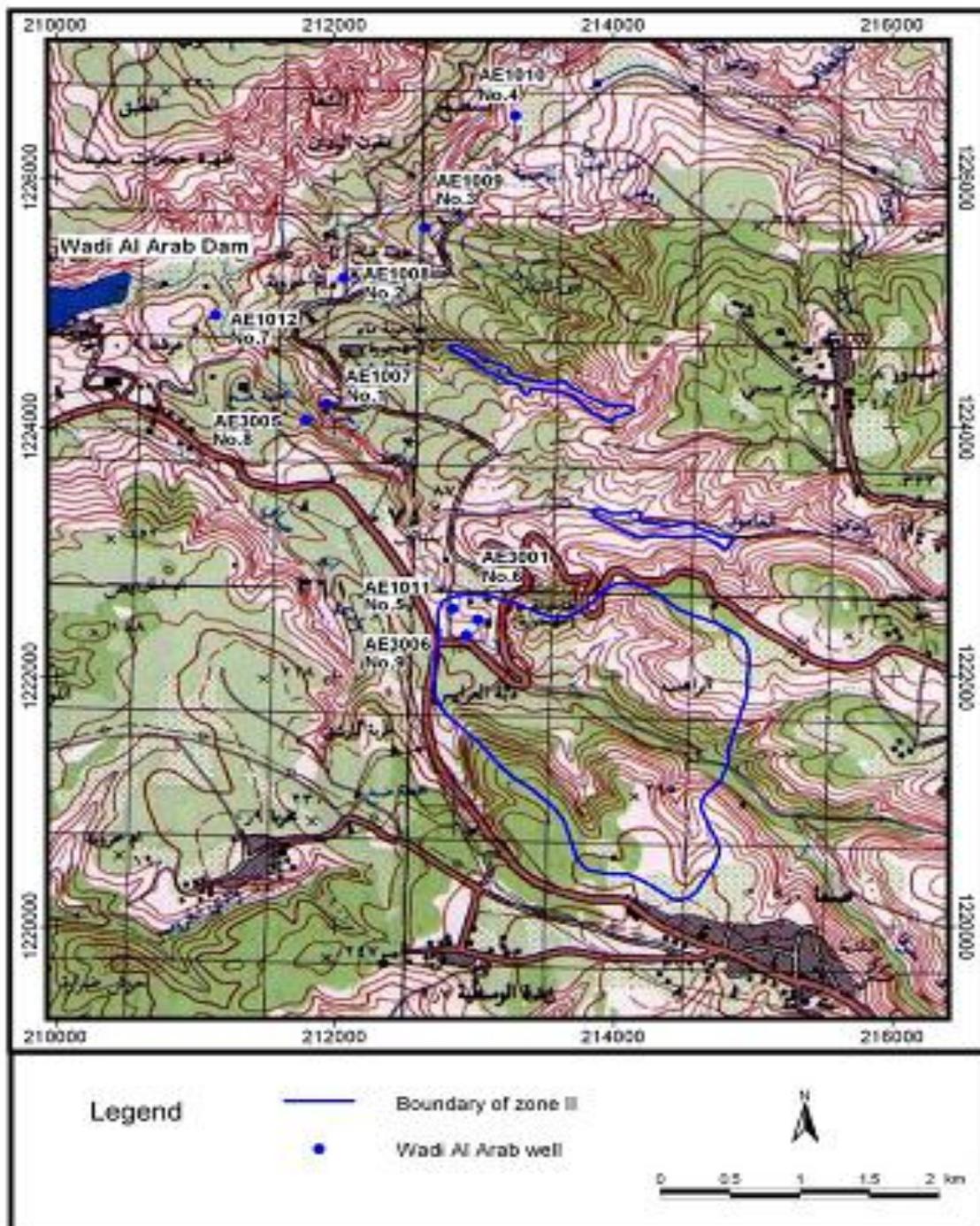


Figure 18 : Proposed Inner Groundwater Protection Zone (Zone II) of the Wadi Al Arab Wellfield