Annex 15 – Response to Lenders' Environmental and Social Comments

(Lender's Review – November 2025)

Project: Environmental & Social Impact Assessment (ESIA) for Drilling New Wells and Associated Infrastructure Works – Dubaydib Well Field / Disi

Proponent: DIWACO (Disi Water Company)
Implementing Authority: Ministry of Water and Irrigation (MWI), Hashemite Kingdom of Jordan
Consultant: Arabtech Jardaneh for Water & Environment
Date: November 2025

Preface
This annex provides the formal responses of DIWACO, AJI and MWI to the comments and clarifications raised by the European Investment Bank (EIB) and other lenders during the review of the Environmental and Social Impact Assessment (ESIA) for the Disi Water Conveyance Project – Dubaydib Wellfield Expansion.
The responses are based on the ESIA (Final, July 2025) and supported by updated technical documentation, including:

- BRGM (2023) – Additional Production Well Targeting and Well Design – Final Report, and
- Dubaydib Groundwater Model Recalibration Results (2022) – Hydrogeological Model Update.

This annex forms an integral part of the final ESIA package and should be read in conjunction with Chapter 8 (Impact Assessment), Chapter 10 (Environmental and Social Management), and the Executive Summary and the MWI ESMF.

No.	Lender's Comment	Response and Clarification	Supporting Reference
1	Transboundary Aquifer	There has been no change in the status of the Memorandum of Understanding (MoU) or Agreement between the Government of Jordan (GoJ) and the Government of the Kingdom of Saudi Arabia (GoKSA) concerning the joint management of the transboundary Disi–Saq Aquifer. The MoU defines a	ESIA Chapter 8.3 ESIA Chapter 10 MWI ESMF Annex 14

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		management area within Jordan and a *no-drill zone* along the border, which are fully respected by all existing and proposed production wells. No new drilling is planned within the restricted zone, in full compliance with the 2015 Agreement. According to this MoU, the Hashemite Kingdom of Jordan is not required to obtain prior approval from, or formally notify, the Government of Saudi Arabia regarding changes in abstraction volumes within its national territory. Coordination between the Ministry of Water and Irrigation (MWI) / Water Authority of Jordan (WAJ) and their Saudi counterparts continues through the established Joint Technical Committee, under which annual abstraction and groundwater-level data are shared for monitoring purposes. While no recent formal coordination meetings have been reported specifically on the proposed expansion of the Disi wellfield to 120 MCM/year, both parties remain committed to efficient management, responsible investment, and the sustainability of the shared aquifer system, consistent with Article 2 of the Jordan–KSA Agreement. With respect to potential transboundary impacts, the only anticipated effect concerns variations in groundwater levels, which have been incorporated into BRGM's ongoing transboundary hydrogeological modelling for both countries. According to the latest BRGM analyses, continued wellfield development is projected to deepen the piezometric depression within the wellfield by approximately 20 m under the 100 MCM scenario and up to 25 m under the 120 MCM scenario by 2038, relative to current groundwater levels. The BRGM (2023) model further indicates that, relative to the 100 MCM case, the incremental deepening within the Jordanian management area is only about 5 m, with no significant drawdown extending across the border.	

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		Accordingly, abstraction under the 120 MCM/year scenario remains within Jordan's allocation and consistent with both the cooperative provisions of the Jordan–KSA MoU and the institutional responsibilities defined in the MWI Environmental and Social Management Framework (ESMF) for long-term transboundary resource management.	
2	Drawdown & Sustainability	In relation to the sustainability of the 120 MCM/year abstraction scheme, the BRGM (2023) analysis and 2022 Dubaydib model recalibration confirm that, compared to the baseline (100 MCM/year) scenario, this level of annual abstraction will result in an additional drawdown of approximately 5 m by 2038 and up to 10 m by 2065. Current decline rates (1.4–4.2 m/year) remain within the range of long-term historical observations. The modelling shows that, under both the 100 MCM and 120 MCM abstraction scenarios, continued drawdown of the aquifer is expected beyond 2038, reflecting the fossil and non-recharging nature of the Disi aquifer. Within the project period, all production wells remain operational with sufficient water levels above the pumps; however, groundwater levels in several wells are projected to approach current operational thresholds toward the end of the concession. Operational adjustments—such as lowering pumps, modifying pump design, or optimizing flow rates—will therefore be required in selected wells to maintain efficiency. To sustain the current operational setup and provide redundancy across three existing wells, the development of three additional production wells will be required before 2030. Beyond 2038, further wells may be needed under both abstraction scenarios to maintain production continuity as part of national groundwater management.	ESIA Baseline / hydrogeological section ESIA Chapter 8.3 Wellfield Groundwater Extraction Scenarios & Chapter 10 Environmental and Social management plan

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		The BRGM findings confirm that the 120 MCM scheme remains hydrogeologically sustainable through 2038–2040. These results have been provided to and endorsed by the Ministry of Water and Irrigation (MWI), which is aware of the associated long-term operational and resource-management requirements. The long-term sustainability and cumulative management of the Disi aquifer are under the exclusive mandate of MWI, as defined in the ESIA (Chapter 10) and the MWI Environmental and Social Management Framework (ESMF), which governs strategic resource planning beyond project hand-back in 2038.	

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3	Farmers	The ESIA acknowledges that regional drawdown from groundwater abstraction could affect agricultural users in the broader Disi and Al Mudawwarah areas over the long term. Based on the updated BRGM and 2022 model results, increasing abstraction from 100 to 120 MCM/year will cause only 2–8 m of additional drawdown by 2038–2040, which is within normal operational variability and will not measurably affect farmer wells or yields during the project lifetime. Potential agricultural impacts are projected beyond 2065, well after the project term, as part of the cumulative depletion of the fossil aquifer. Management of these long-term, basin-wide effects—including livelihood considerations—falls under the Ministry of Water and Irrigation's mandate, as outlined in the ESIA conclusion and the MWI Environmental and Social Management Framework (ESMF). The Project Company's role is limited to routine monitoring and reporting of groundwater levels and community feedback through DPAC, enabling MWI to manage future policy or livelihood responses at the national level. Stakeholder engagement and information-sharing on groundwater and community matters are facilitated through the DPAC, a coordination platform that includes DIWACO/DOAM, MWI/WAJ, and other governmental bodies. DIWACO/DOAM continues to participate in DPAC meetings to support transparent communication and community dialogue, while overall management and continuity of the committee are the responsibility of MWI/WAJ.	ESIA Executive summary 1.4.2 abstraction scenarios ESIA Conclusion MWI ESMF Annex 14
4	Water Quality	From the early stages of the project, the water quality of the Disi supply and the associated blending procedures were addressed and agreed upon following detailed studies conducted by the Laboratory Affairs Directorate of MWI/WAJ. Water quality has been continuously managed and	ESIA Section 5.2.7.2 The Quality of Groundwater Discharge Wells

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		monitored since project inception, with full traceability through MWI/WAJ laboratory records. The Environmental and Social Management Plan (ESMP2) was originally executed in 2009, and an updated redline version was circulated during 2017–2018, at the time of constructing the cross-connection from AA R1 to the Al-Khaw pipeline. Although this updated version does not appear to have been formally executed, its provisions remain embedded within current MWI/WAJ operational practices for water quality management and monitoring. In terms of water quality and natural radioactivity, MWI has confirmed that the current 117–118 MCM/year supply from the Disi wellfield is blended at two main locations to maintain natural radioactivity within permissible levels: • Dabouq Reservoir: approximately 50 MCM/year blended at a 75% ratio with Zay water; • Abu Alanda Reservoir: approximately 10 MCM/year blended at a 20% ratio with Zara–Ma'en water. Routine WAJ monitoring confirms that, following blending, radioactivity levels remain within safe regulatory limits and in full compliance with both Jordanian and WHO drinking-water standards. On rare occasions when blending water availability is constrained, minor temporary variations may occur but remain within acceptable thresholds. To strengthen blending reliability and sustain water quality, MWI and WAJ have implemented several improvement measures: • The Abu Alanda Reservoir will shortly receive additional supply from the Al-Halabat wells, fully resolving blending challenges at that site;	& Potential Natural Radioactivity MWI answer

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		• The Dabouq Reservoir is being supported by nearby Miyahuna wells, which are being integrated to stabilize blending capacity; and • The National Conveyor Project (expected 2029) will provide a sustainable, high-quality desalinated water source for Amman, ensuring a permanent and reliable supply that will maintain optimal blending ratios and remove blending as a critical operational constraint. The BRGM (2023) report further confirms that all proposed production wells target potable-quality aquifer zones, with potential radionuclide-bearing strata avoided through spectral gamma logging and appropriate casing design. These measures ensure long-term compliance with natural radioactivity standards and guarantee that the Disi water supply remains safe for blending and distribution throughout the project period and beyond.	

Summary and Conclusion

All lenders' comments have been reviewed and addressed through this annex. The clarifications provided herein confirm that:

- The Project remains in full compliance with the Jordan–Saudi Arabia MoU.
- Abstraction at 120 MCM/year is technically sustainable throughout the project lifetime.
- Local agricultural users are not affected during the project period; any long-term, cumulative issues fall under MWI's national mandate.
- Water quality remains safe and compliant with all national and WHO standards.

These responses are supported by the BRGM (2023) and 2022 model recalibration studies, which form part of the technical documentation submitted to lenders.

No further material changes to the ESIA impact ratings are required.