

Innovation in Irrigation Solutions Competition Participant Guidelines

1. Introduction

The Government of the Kingdom of Bahrain is pleased to invite all interested parties – including Bahraini youth, researchers, engineers, entrepreneurs, environmental experts, and community members – to participate in the Innovation in Irrigation Solutions Competition. This national initiative welcomes everyone with a creative idea or practical solution for improving the efficiency of irrigation and the reuse of treated water across the Kingdom.

As part of the directives of His Royal Highness Prince Salman bin Hamad Al Khalifa, the Crown Prince and Prime Minister, the Innovation in Irrigation Solutions Competition was launched as part of Tree Week 2025 to encourage innovative, sustainable, and scalable ideas that contribute to the optimal use of surplus treated sewage effluent (TSE). These efforts directly support the National Afforestation Plan, which represents one of the Kingdom's key strategic initiatives to expand green coverage, enhance environmental sustainability, and advance Bahrain's commitment to carbon neutrality.

This competition forms an integral part of Bahrain's broader vision to align innovation with sustainability, promoting cost-effective irrigation solutions that ensure efficient resource utilization and long-term operational sustainability. By channeling creative ideas into practical, cost-effective solutions, the initiative seeks to empower individuals and institutions to contribute effectively to the National Afforestation Plan, enabling the reuse of treated water for irrigating trees, landscapes, and green corridors throughout the Kingdom.

Through this initiative, the Government aims to foster collaboration, creativity, and environmental responsibility, strengthening the foundations for a greener, more resilient Bahrain and ensuring that today's innovation leads to a sustainable and flourishing environment for future generations.

2. General Context and Objectives

The Innovation in Irrigation Solutions Competition has been established to promote the development of creative, sustainable, and cost-efficient irrigation systems that contribute directly to the National Afforestation Plan and Bahrain's broader environmental and sustainability goals.

The competition aims to:

- Encourage innovation in developing sustainable and economical irrigation solutions.
- Support the expansion of green coverage by utilizing the surplus treated sewage water for tree planting and landscape irrigation across the Kingdom.

- Enable collaboration between government entities, the private sector, academia, and the public to exchange ideas and solutions.
- Provide an opportunity for Bahraini youth, engineers, researchers, and entrepreneurs to participate actively in national environmental programs.

3. Eligibility Criteria for Participation

The Competition is open to all individuals, teams, and organizations from any background or field of expertise. Participation is not limited by profession, affiliation, or sector — anyone with a creative and practical idea that supports sustainable irrigation and the reuse of treated sewage effluent (TSE) in the Kingdom of Bahrain is encouraged to participate.

Participants may represent the public, private, or academic sectors, or take part as independent individuals or open groups.

4. Information and Requirements for Participants

- **Eligibility Review**

Only submissions that meet the eligibility criteria will be evaluated.

- **Participants are required to submit the following three documents as part of their official entry:**

- **Technical Report:**

A comprehensive report including all relevant technical details, references, and supporting evidence demonstrating that the proposed idea is constructible, operational, and sustainable. Participants may choose their own report format and structure, provided it clearly addresses sustainability, feasibility, cost efficiency, innovation, aesthetics, and presentation quality.

- **Presentation Template:**

All submissions must be prepared using the official PowerPoint presentation template provided. This ensures consistency and fairness in the evaluation process.

- **Supporting Materials (Optional):**

Any design drawings, photographs, or visual materials that help illustrate the proposal and support the technical report.

- **Competition Program and Timeline**

Activity	Date
Registration Opens	23 October 2025
Registration Closes	6 November 2025
Submission Deadline	10 February 2026
First Assessment Stage	11 – 21 February 2026
Second Assessment Stage	22 February – 15 March 2026
Announcement of Results	22 March 2026

5. Technical Information and Reference Data

To support participants in preparing their proposals, this section provides essential technical reference materials describing the existing Treated Sewage Effluent (TSE) infrastructure, related procedures, and key coordination requirements across the Kingdom of Bahrain. These materials are intended to help participants understand the current network, identify opportunities for improvement, and ensure their ideas are technically feasible and well-coordinated.

The following reference materials are provided:

- Comprehensive TSE Network Map:**
 Included in the appendix, showing the existing TSE transmission lines and the locations of sewage treatment plants (STPs).
- Description of Major TSE System Components:**
 The appendix provides a summary of the main elements of the TSE transmission system — including pump stations, reservoirs, control valves, main transmission lines, and distribution branches.
- Wayleave Procedure and Coordination Support:**
 To assess the constructability of proposed ideas, participants are required to obtain a wayleave — an official permission issued by the Government of Bahrain to coordinate works with existing and planned utilities and prevent conflicts or service interruptions. The Central Planning Office (CPO) will support participants throughout this process. Detailed steps are provided in the appendix.
- Preliminary Estimate of Irrigation Water Requirements:**

The appendix presents a preliminary estimate of irrigation water requirements for various plant types, which should be considered when developing proposals to ensure appropriate water allocation and design efficiency.

6. Submission and Formatting Requirements

The competition includes two categories. The first category focuses on major roads in Bahrain—King Hamad Highway, Gulf of Bahrain Avenue, and Sheikh Jaber Al-Ahmad Al-Sabah Highway. Participants choosing this category must propose an innovative conceptual solution covering all three roads, showing how each can be implemented.

The second category is more flexible, allowing participants to propose solutions for any area within Bahrain. Each participant may submit one or two proposals. If two are submitted, each must include a separate report, presentation, and supporting documents.

There will be one winner per category, and each winner will collaborate with the relevant public entity to further develop and implement their idea, with implementation details to be decided later.

The submission must follow the designated PowerPoint presentation format provided for the competition. Participants may prepare their accompanying technical report in any structure or style they deem appropriate, as long as it includes all the required information and clearly presents the proposed idea. Once their submission is complete, participants should upload their materials through the official submission link, which will be announced and shared at a later stage.

7. Support and Coordination

All inquiries or requests for clarification from participants shall be accepted after the registration period. During the preparation and implementation stages of their ideas, participants may submit their questions via a dedicated email address, which will be announced at a later stage. To ensure transparency and equal access to information, all official responses and clarifications will be shared with all registered participants. This approach aims to maintain fairness and consistency throughout the competition process, ensuring that every participant benefits from the same level of guidance and information.

A dedicated orientation day will also be organized, and its date will be announced at a later stage. During this session, the competition's objectives, procedures, and participation requirements will

be thoroughly explained to all participants. At the end of the session, a Question-and-Answer segment will be held to address any inquiries or clarifications.

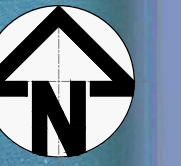
8. Legal and Administrative Notes

All information, data, maps, and documents provided by public entities for the purpose of this competition are strictly confidential and are to be used exclusively for preparing and submitting competition proposals. Any unauthorized use, disclosure, or publication of such materials is strictly prohibited and may result in legal action in accordance with the laws of the Kingdom of Bahrain.

The ownership and usage rights of all submitted materials remain with the participants; however, the organizing authority reserves the right to further develop, refine, or implement any submitted idea, concept, or solution that demonstrates potential public benefit.

All information and maps provided are intended for conceptual and planning purposes only. They shall not be used for detailed design, construction, or implementation without prior verification and approval from the relevant authorities. Participants are responsible for verifying all data and site conditions prior to submission and must ensure proper acknowledgment of data sources where applicable.

Appendix



LEGEND:

- TSE TRANSMISSION LINES PHASE 1 (EXISTING)
- TSE TRANSMISSION LINES PHASE 2 (EXISTING)
- TSE TRANSMISSION LINES (RECENTLY CONSTRUCTED)
- CMC-LANDSCAPE IRRIGATION LINES PHASE 2 (EXISTING)
- TSE DISTRIBUTION LINE PHASE 2 (EXISTING)
- EXISTING RESERVOIRS
- PROPOSED RESERVOIR
- EXISTING STP

Technical Information and Abbreviation Definition of the TSE component:

1. TSE:

It's the treated water that comes out as a result of treating process from the sewage treatment plant (STP). (treated wastewater). It's applicable to be used for irrigation, and industrial use and any other use based on the quality and the specifications.

2. Sewage Treatment Plants (STPs)

To treat raw sewage (wastewater) through physical, biological, and chemical processes to produce TSE. The treated wastewater is converted to reusable treated sewage effluent (TSE) that is suitable for non-potable applications.

3. Major TSE Transmission Line

These are large-diameter pipelines designed to transport treated sewage effluent (TSE) from sewage treatment plants (STPs) to regional reservoirs or distribution points. The Materials that should be used must be approved by MOW such as GRP and etc.

4. TSE Pump Stations

Equipped with mechanical pumps that provide the necessary pressure to transport the TSE flow through the transmission and distribution pipeline to Ensures continuous flow and pressure regulation across varying elevations and distances. This TSE pump station will consist of structural components such as the sump (wet well) and mechanical components such Pumps, backup generators, motors and electrical components: control panels, and SCADA systems.

5. Regional TSE Reservoirs

Required to construct a structure that allow for a Large-capacity storage located strategically to serve multiple zones or districts. This should be located, designed and constructed to connect at the end point of the

transmission line and it could include level sensors, inlet/outlet valves, and disinfection systems.

6. Distribution TSE Reservoirs

Smaller reservoirs are located closer to the point of use, such as agricultural fields, parks, or industrial zones. The main material that could be used is GRP or any other material that is approved by MOW and Ministry of Municipality and Agriculture Affaires. This will allow localized storage and pressure management for efficient distribution. Items such as booster pumps, control valves should be considered during the design and construction stage.

7. Control Valves

It's a mechanical device that is installed in the pipelines to regulate flow, pressure, and direction of TSE. The main facilitation of it is to maintain system stability, prevent backflow, and enable isolation for maintenance. The Types of this control valves are varied to gate valves, butterfly valves, pressure reducing valves (PRVs), non-return valves (NRVs), and solenoid valves.

General Notes:

- Direct tapping or connection from the transmission pipeline is not allowed.
- Tapping points for irrigation and other non-potable applications shall only be established downstream of the reservoirs, via the main distribution pipeline and associated distribution reservoirs.

Wayleave Issuance Procedure

A wayleave is an official permission issued by the Government of Bahrain to obtain approvals from all relevant utility entities before any construction or excavation works take place. It ensures that proposed works are coordinated with existing and planned future utility networks, to avoid any conflicts, service interruptions, or damage to existing infrastructure, and to maintain the constructability and safety of proposed projects.

The procedure for obtaining a wayleave under this competition is as follows:

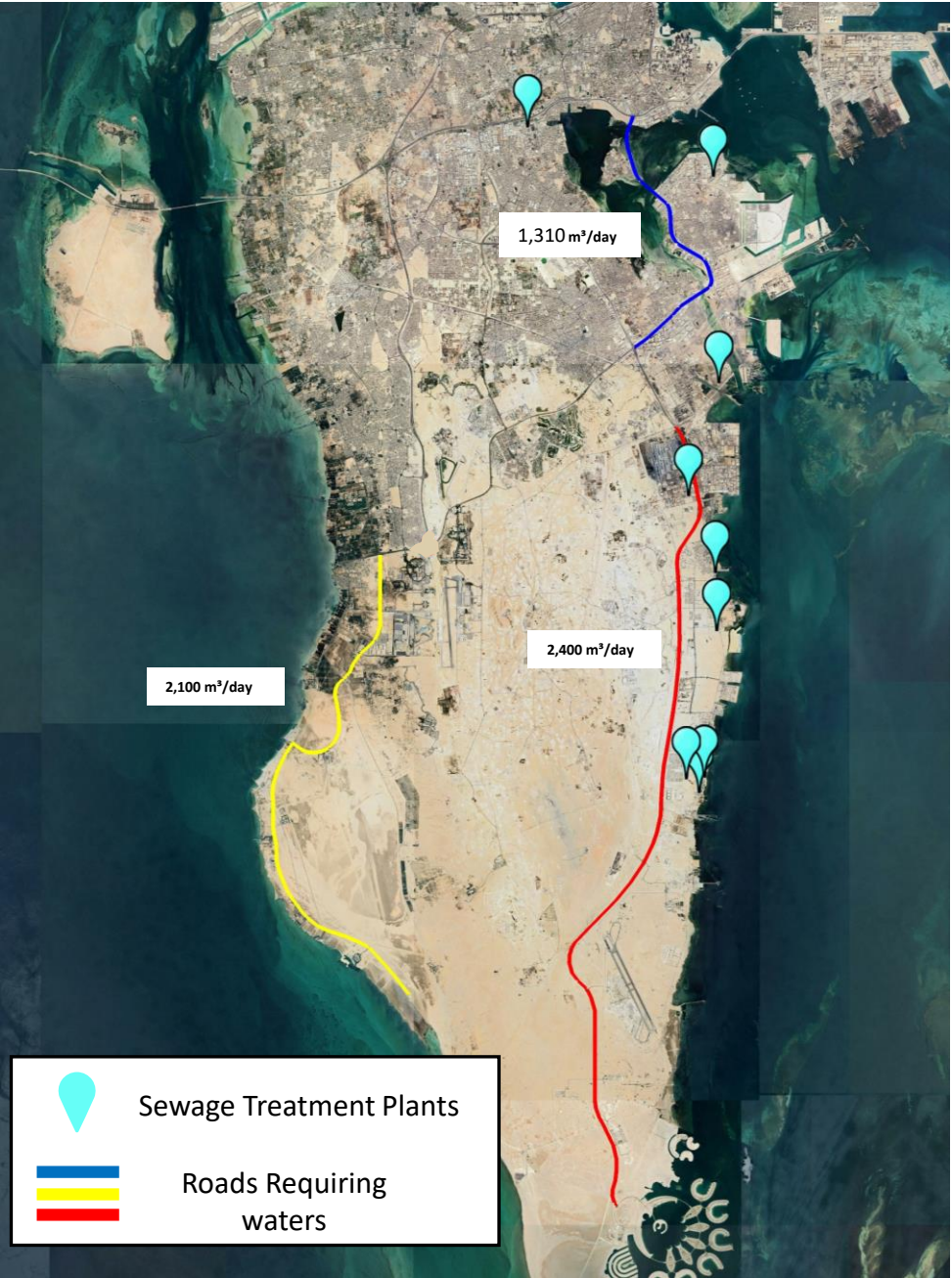
- Participants must first identify and highlight the area of the proposed site where their idea or project is intended to be implemented. The required information shall be submitted via email to AlyaYY@works.gov.bh, and for coordination purposes, participants may contact Alya Yusuf Yahya on 17545702. It is recommended that this procedure be completed within the first month of the submission period.
- File Preparation by CPO: The Central Planning Office (CPO) will prepare an electronic file in DGN format, in coordination with the participants showing the layout of the proposal within the relevant network area, taking into account both existing utility levels and future planned projects
- Submission of Supporting Information: The participant must then provide basic information about the proposal, including supporting drawings, a brief introduction, and relevant technical reports.
- Coordination by CPO: The CPO will coordinate directly with relevant utilities providers, Urban Planning and Development Authorities and the Survey and Land Registration Bureau (SLRB) as part of the wayleave review process to ensure proper spatial coordination and compliance with planning standards. CPO will inform the participant with the results and advise on the wayforward.
- Tasareeh System Upload: Once the required information is complete, the CPO representative will upload the proposal to the Tasareeh System to obtain official approvals from other concerned entities.
- Review and Approval: The approval process typically requires three to five working days, depending on the complexity of the proposal and the number of entities involved.

This process guarantees that every proposed idea is constructible, coordinated, and aligned with current and future infrastructure planning, ensuring safe and efficient implementation in accordance with national utility and development regulations.

Preliminary Estimate of Irrigation Water Requirements for Various Plant Types Which Should be Considered

Item	Description	Units	Water allowance: liters/ day
1	Date Palms	No	120
2	Washingtonia Palms	No	120
3	Ornamental trees	No	80
4	Specimen shrubs	No	60
5	Shrubs	No	10
6	Hedges	m ²	15
7	Grass	m ²	12
8	Ground Cover	m ²	10
9	Ornamental Grass	m ²	15
10	Succulent	m ²	10

Water Requirements Per Day Per Road



 Sh. Jaber Al Ahmad Al Subah Highway	10.9 Km	 1,310 m ³ /day
 Gulf Of Bahrain Avenue	18 Km	 2,100 m ³ /day
 King Hamad Highway	20 Km	 2,400 m ³ /day