TERMS OF REFERENCE FOR A DIRECTED WRC PROJECT

THEMATIC AREA	**Advisory**
TITLE	**Decentralised Greywater Treatment systems for source separated greywater treatment and reuse**

Background and Rationale

South Africa faces various sanitation service delivery challenges and may be unable to meet the SDG 6 goals. Open defaecation, and unimproved and inadequate sanitation is still a major challenge and sits at a backlog of ca. 19%, with many municipalities failing to provide sanitation services that manage the entire value chain either through a faecal sludge management process or through a blackwater system design. Non-sewered sanitation systems (NSSS) (also referred to as water efficient sanitation systems(WESS) if they incorporate water efficient toilets and full water recycle for flushing) offer promising alternatives for improving sanitation service delivery coverage in schools, informal settlements, social housing and apartments, commercial and communal nodes and new developments. These system options are particularly promising in areas where there are resource-constraints eg water and energy and where no sewer networks exist or where wastewater treatment plants are overloaded.

Water Research Commission (WRC), through its technology accelerator programmes, Water Technologies Demonstration Programme(WADER) and South African Sanitation Technology Enterprise Programme (SASTEP) has been advancing and demonstrating, water and sanitation technologies to address some of the pressing challenges in the water sector. The portfolio of innovations includes, but not limited to, water-efficient toilets and devices, , non-sewered sanitation systems, water efficient sanitation systems (WESS), smart water management, Non-Revenue Water (NRW) systems, digital applications, and rainwater harvesting systems just to name a few.

While WESS offers tangible and appropriate sanitation options, in most communities greywater is generated, and will need to be treated and reused on-site without causing further risk to people and the environment. There still a lack of affordable, simple greywater treatment and management systems to deal with greywater generated for different market segments and for different qualities of greywater that require treatment. Greywater is typically produced from cleaning, washing and hygiene activities and is collected from sinks, showers/baths, and laundry for non-potable use.

We are seeking to identify highly innovative and simple greywater technologies. These technologies can be locally developed or licensed-in and localised. The intent of this call is to identify available innovative greywater technologies that can be further developed and commercialized to meet local sanitation challenges. Successful applicants will be assisted with further development (if required), followed by rigorous field testing and demonstration to evaluate end-user acceptance and commercial viability of the technology. Technologies that are successfully field-tested will then be matched with appropriate funding mechanisms to demonstrate, optimise and commercialise.

OBJECTIVES

General:
The call is seeking to identify and demonstrate highly innovative greywater technologies for households, communal settlements, commercial nodes that meet but not limited to the following criteria:

- Nature-based systems
- Natured based systems retrofitted with appropriate and robust disinfection and polishing processes / technologies
- Modular, off-grid greywater treatment technologies (plug and play systems for typical greywater influent)
- Innovative disruptive green-blue multi-functional technology-based systems

Specific Objectives:

- Assess site and community behaviours and habits and set greywater baselines
- Engage with communities using participatory approaches to assess buy-in and willingness to carry out simple O&M functions and pay for operations
- Manufacture or supply a prototype for demonstration which sits at a readiness level TRL 7 and above.
- Integrate with existing blackwater systems in selected demonstration sites
- Commission and monitor and evaluate systems
- Finalise process and technology trains designs
- Develop training material and train communities and public officials
- Conduct B2B sessions with sanitation systems suppliers to ensure integration
- Handover and close out

SCOPE OF WORK:

This call is aimed at suppliers who have innovative decentralised greywater systems for demonstration. They are also aimed at university departments that may be researching innovative technology packages that are at technology readiness level 7 and above, i.e. technology designs that have a viable prototype for demonstration.

The decentralised greywater reuse systems can use a combination of physical, chemical or biological methods but must be designed with simplicity and affordability of CAPEX and OPEX in mind. Designing the system for reuse (toilet flushing water, irrigation or multi-functional infrastructure such as willows, green roofs and walls , and recreational ponds or water features) would be an advantage.

It would be advantageous if proposed technologies meet fit for purpose water quality standards for reuse (such as GA limits, irrigation etc…). We are looking for technologies that are appropriate for schools, household, communal and commercial buildings, rural, peri-urban, informal and urban settlement types.

The technologies are likely to be demonstrated in a communal setting, an informal settlement or at a new development or commercial building. Performance Monitoring must be done as per agreed sampling protocol and methodologies to ensure data quality and assurance. If you are commercial partner submitting a proposal and you do not have a pre-requisite expertise as set out below, you may want to partner with a suitable university to ensure technical assurance of results.

SELECTION PROCESS:

You are required to submit a proposal that speaks to the following :

1. Technology process
2. Innovation
3. Typical greywater concentrations the technology can treat
4. Technology Readiness level
5. Reuse or blue-green infrastructure opportunities of the system design
6. Any demonstrations or settlement types the technology has been implemented.
7. Overall Project Budget (inclusive of CAPEX and OPEX)
8. Deliverable timelines

If you are successful in the proposal submission stage you will be called to pitch your technology in front of a panel of experts. If you are successful you will be asked to submit a full proposal for approval and contracted.

DELIVERABLES

- A maximum of 3 deliverables is required which should match the objectives of the study.
- The first-year deliverables may NOT include an advance but may be in the form of a detailed inception report (demonstration will be monitored using detailed project plan and Gantt chart).
- The greywater system may need to be demonstrated in a community setting and hence the proposer will be required to work with communities in partnership with public sector partners and commercial partners of decentralised blackwater systems
- The final deliverable of the print-ready final report, valued at 20% of the Budget is required and is required to follow a final report template.

EXPERTISE:

The proposers must have the necessary expertise in engineering (civil, electronics) and science (water quality analysis) to ensure effective project management and install systems in communities and monitor and report on performance.

PROPOSER:

This call is open to suppliers, engineering companies, joint-ventures and collaborative partnerships. Suppliers will be subject to a business, manufacturing and market readiness level assessment to check readiness to enter the public and private sector market.

During the course of the project, universities may be required to secure a commercial partner to work either through a spin-off or partnership agreement to ensure market entry can be assured.

TOTAL FUNDS AVAILABLE:
As per proposal

Expected Duration :

12 to 18 months

REQUIREMENTS

The applicant should be able to demonstrate the underlying scientific principles behind the technology, provide the rationale supporting design features, fabrication and implementation costs, operations and maintenance requirements, level of readiness for operation, target location (rural, peri-urban and/or urban), and detail any previous demonstrations/implementation (number of units installed, performance metrics, location, scale, partners, performance outputs) and desire to commercialise and take technology to market.

Since this demonstration is part of a larger SASTEP programme, the proposer may be required demonstrate their greywater systems on existing demonstration sites in eThekwini, Johannesburg, or Cape Town or other suitable SASTEP demonstration sites

TOTAL BUDGET

R2 million (This budget is to fund between 2 to 3 successful proposal)

Year 1 : budget per project is R500 000 to R600 000

Duration – 2 years

CONTACT

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