

Executive Memo

FROM: Innovation & Impact

TO: WRC EXCO Via MANCO

DATE OF MANCO MEETING: September 10, 2021.

DATE OF EXCO MEETING: September 17, 2021

For Approval

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For Noting

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SUBMISSION TO EXECUTIVE COMMITTEE

SUBJECT: TERMS OF REFERENCE (TORs) FOR PLANNED PROJECTS

SUMMARY	The purpose of this submission is to seek Exco approval for project terms of reference and the subsequent publication of their respective Calls and receipt of and evaluations of project proposals. This memo also seeks to advertise the terms of reference for the demonstration of malodor counteractant in schools and household toilets.					
BACKGROUND	The WRC implements new project contracts from ToRs directed research, development, and innovation (RDI) proposals. This also enables the WRC to fulfil its mandate and to address identified research priority areas.					
MOTIVATION / TO BE NOTED	The 66 th Manco has considered, debated, and resolved to recommend the terms of reference (ToRs) whose details appear below. This memorandum should be read together with separate documents of the respective terms of references that are accompanying this memorandum and forms part hereof. The TOR will be advertised for 14 days on the WRC website.					
	KSA	Thrust	Programme	Title	Budget	Duration
	KSA 9: BD&I	3: Business Development	31: SASTEP	Demonstration of malodor counteractant in schools and household toilets.	R1 500 000	12 Months
COMMENTS BY GE	That EXCO notes the progress thus far.					
SIGNATURE: GE	Signature: <u>M. D. [Signature]</u> Date: <u>14/09/2021</u>					
APPROVED / NOTED BY EXCO	Signature: <u>[Signature]</u> Date: <u>17/09/2021</u>					



TERMS OF REFERENCE FOR A DIRECTED WRC PROJECT

KEY STRATEGIC AREA	KSA 9: Business Development and Innovation
THRUST	3: Business Development
PROGRAMME	13: SASTEP
TITLE	Demonstration of malodor counteractant in schools and household toilets.

Objectives:

1. Demonstrate malodor counteractant technology (schools and household) in Gauteng, KZN, Limpopo and Eastern Cape.
2. Undertake a status quo analysis of sanitation interventions, behaviours, hygiene practices and use of hygiene products at the selected sites.
3. Develop a technique and framework for assessing the impact of malodor counteractant technology – capturing issues of user behaviour change, perception, acceptance, interests, and willingness to pay.
4. Assess and analyse the impact of malodor counteractant technology on toilet usage at identified sites (using segmented user groups, and technical performance data).
5. Evaluate the Amka malodor counteractant technology in its efficacy to reduce faecal material, using the WRC protocol.

Background

More than 40% of the world's population still practice unsafe sanitation or lack access to improved sanitation facilities. Associated challenges, in terms of public health and environmental protection, can therefore not be overstated. Consequently, the international community has set itself an ambitious goal to improve the situation through the Sustainable Development Goal (SDG) number 6. SDG 6.2 aims to improve access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030. Despite laudable efforts by the South African government, about 18% of South African households only have access to either an unimproved form of sanitation or practice open defecation (StatSA, 2018). Sanitation encompasses both the 'hardware' (the infrastructure) and the 'software' (where infrastructure meets the end-user). Understanding how both work together is instrumental in stopping the illness cycle that occurs when human excreta and waste are not appropriately managed (DWAF, 2001). While government's continued policies and investments ensure people move up the sanitation ladder, soft issues such as bad toilet odour often drive households to revert to open defecation despite having access to "improved" sanitation. Bad odour from human waste raises so many social, moral, aesthetic, and disease-related problems that it is a major impediment to the adoption of sanitation solutions (Rheinlander, et al., 2013).

Malodours are offensive odours, which are encountered in the air and on many substrates such as fabrics, hard surfaces, skin, and hair. Malodours have either personal or environmental origin. For example, sweat, urine, odour, and faeces malodours are personal in origin, whereas, kitchen, gasoline, cooking, tobacco smoke, etc. malodours are of environmental origin. While personal malodours are easily deposited on fabric, hair, and skin, environmental malodours also have a propensity to deposit on these substrates. (McGee, et al., 2007). Several approaches have been used to counteract malodours. These approaches include masking by superimposing the malodor with a pleasant stronger odour, cross-adaptation by blocking of the malodor olfactory receptors, suppression of the malodor by mixing with an ingredient that causes a negative deviation

of Raoult's law, elimination of the malodor by chemical reaction, absorption of the malodor by a porous or cage-like structure, and avoidance of the formation of malodours by such routes as antimicrobials and enzyme inhibitors.

The Bill and Melinda Gates Foundation teamed up with Firmenich and Archipel&Co, a Geneva based fragrance and flavour company, to create a novel anti-odour technology. The Firmenich malodor counteractant technology captures malodorous molecules such as volatile fatty acids and malodorous gases and in turn releases a pleasant fragrance. The technology can be incorporated into a product such as a cleaning liquid product, air freshener pad, etc.) The technology has subsequently been licensed to a South African based cosmetics and chemicals manufacturer, Amka. The malodor counteractant is marketed by Amka as Organico, and it is incorporated into a cleaning liquid. The Organico marketing literature states "Organico uses natural micro-organisms and enzymes to eliminate odors, reduce waste, and prevent ground water contamination. It further claims that "it promotes water saving, by reducing the number of daily flushes." While these latter claims are contentious, if deployed appropriately, Organico, can be a valuable tool to address a major impediment to the adoption of sanitation solutions. Therefore, it would benefit from a scientific assessment and evaluation to provide better insight into its efficacy, user acceptability as well as providing clear value proposition for its use in a local context (i.e., can it change user perception on the toilet experience improving cleanliness in toilets and improving the use of low-tech toilet systems). It would also be prudent to assess the claims of water savings, waste reduction and prevention of groundwater contamination.

The South African Sanitation Technology Enterprise Programme (SASTEP), an initiative driven by the Water Research Commission (WRC) aims to foster a local sanitation industry (manufacturing and services) that would increase access to proper sanitation, reduce pollution, improve water security, support job creation and entrepreneurial opportunities, contributing to South Africa's economic growth. The programme is aligned to the Department of Trade, Industry and Competition (DTIC) Master Plan to address commercialization, localization, and manufacturing by bringing on board capable commercial partners to provide an industrial support base for the local and regional markets. The intent of the programme is to support and accelerate the application and uptake of the new sanitation technologies through demonstration, testing and science-based improvements towards localization and industrialization. The development of market intelligence, strategy and tactical plans are crucial to the realization of the SASTEP's goals and objective. The understanding of the market factors such as comparative pricing against other technology types, understanding of the market environment and other factors that affect the sanitation value chain are important to assisting SASTEP commercial partners in getting their innovations to the market.

Specific Aims:

1. Understand prevailing conditions or factors that promote or deter the use of sanitation facilities at identified sites.
2. Assess the efficacy of the Amka malodor counteractant technology in shifting and improving sanitation behaviours and promoting sanitation facility usage at selected sites. (*Focus on indigent households and communities lower on the sanitation ladder*)
3. Assess both on a laboratory and field scale, claims that the Amka malodor counteractant can reduce waste and number of flushes and improve user experience.
4. Laboratory assessment using the WRC pit additive protocol. This should include detailed composition analysis and assessing environmental and health risks and impact.

Rationale:

The SASTEP platform supports technology and commercial partners with the commercialization of their technology and matchmaking with investors to empower the partners to manufacture their products locally. The platform provides support for each technology in its portfolio to be demonstrated in the field to ensure the technology is safe for use and performs optimally in the end-user environment. The partners are further assisted

to develop market and revenue models, and a bankable business plan to enable matchmaking with suitable investors for commercialization and local manufacturer. This study will generate required market and commercial information necessary to provide business advisory support and to develop commercialization strategies for this technology category. This research project would help in gathering complimentary data that would assist in better articulating the value proposition and end-user acceptability of the malodor countering product.

Deliverables:

1. Identify demonstration sites in low-income communities in Gauteng, KZN, Limpopo and the Eastern Cape to assess technical and user claims and assess consumer testing methodologies to unpack behaviour changes when using such a product
2. Detailed project plan.
3. Review and assessment of sanitation behaviours, needs and aspirations of identified communities using a significant sample size of appropriate user segments.
4. Methodology and plan for administering the malodor additive.
5. Laboratory results - (Testing claims that the product can reduce waste and number of flushes as per agreed methodologies).
6. Baseline and post demo survey – survey to investigate factors that promote or deter the use of sanitation facilities at identified sites, investigate whether malodor is a factor, efficacy, and user acceptance of malodor counteractant product – assess willingness to pay (price points) for communities at low-income households and develop models that municipalities could use to supplement such products in communal/public toilets and toilets used by indigent populations.

Note: Methodologies must include appropriate approaches to handling of community data and information as per POPI Act.

Time Frame: 12 months

Budget: R1, 500,000 (Including VAT)

Approved

On behalf of executive
Mr. Dhesigen Naidoo – CEO
Date: