CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

**REPORT TO: CITY MANAGER** [OFFICIALS TRAVELLING OVERSEAS FOR COUNCIL RELATED ACTIVITIES]

## 1. ITEM NUMBER

## 2. SUBJECT

FEEDBACK ON THE INTERNATIONAL 2022 SWAN SMART WATER CONFERENCE (INCLUDING ADVANCED METERING INFRASTRUCTURE) AS WELL AS DC WATER INSTALLATION VISIT, 23 - 26 MAY 2022 IN WASHINGTON DC, USA.

**ISIHLOKO**

INGXELO ENGOHAMBO OLUYA PHESHEYA KWINKOMFA YESIZWE KA2022 YESWAN SMART WATER (KUQUKA IZISEKO EZIPHUCULIWEYO ZOKUBALA IIMITHA) KUNYE NOTYELELO KUMBONISO ENGOKUFAKELWA KWEDC WATER AMI NGOWAMA23-26 KUCANZIBE 2022 EWASHINGTON DC, USA.

**ONDERWERP**

TERUGVOERING OOR DIE INTERNASIONALE REIS NA WASHINGTON DC, VSA VIR DIE BYWONING VAN DIE 2022- SWAN SMART WATER-KONFERENSIE (GEVORDERDE METINGSINFRASTRUKTUUR INGESLUIT) ASOOK 'N BESOEK AAN DIE DC WATER AMI-AANLEG VAN 23 TOT 26 MEI 2022.

LSU: N4023

## 3. EVENT SUMMARY

| **EVENT DETAILS** | |
|---|---|
| CONFERENCE/SEMINAR | *2022 SWAN Smart Water Conference in DC Washington* |
| OTHER | *Also attending DC Water Site Visit* |
| DATE | *23-26 May 2022* |
| VENUE | **Georgetown Marriot hotel, Washington DC** |
| TOTAL COST TO THE CITY | *R115 233.20* |
| CITY | **Washington DC** |
| COUNTRY | **USA** |



Sarah Sanders Digitally signed by Sarah Sanders Date: 2022.06.29 06:22:40 +02'00'

| ATTENDEE DETAILS | |
|---|---|
| NAME AND SURNAME | DESIGNATION |
| Siyabulela Bashe (at City cost) | Director: Commercial Services, Water & Sanitation |
| Jaco de Bruyn (at City cost) | Manager: Water Demand Management, Regulation & Planning, Technical Services, Water & Sanitation |
| Tertius Rust (contracted specialist at his own cost) | AMI and Digital Transformation Specialist, Commercial Services, Water & Sanitation |
| **PROVIDE SUMMARY OF HOST ORGANISATION / CITY** | |
| The Smart Water Networks Forum (SWAN) is the leading international hub for the smart water sector. A UK-based non-profit organisation, it brings together leading global water utilities, solution providers, academics, investors, regulators, and other industry experts to accelerate the awareness and adoption of "smart", data-driven solutions in water, wastewater, and stormwater networks worldwide. The event attended was the SWAN annual conference, which more than 350 water stakeholders attend each year.<br><br>DC Water provides water and sanitation to the City of Washington DC and has been using AMI metering for more than a decade. | |

## 4. OBJECTIVE

### 4.1 The purpose of the trip was

- Attend the 2022 Smart Water Networks Forum Conference hosted by SWAN for Smart Water Technologies on 24 to 26 May 2022, as well as an organized site visit to DC Water's established AMI system and engagement with other utilities:
- Engaged in workshops, site visits, panel discussions and face-to-face meetings with utilities that have deployed or are currently busy with Advanced Water Metering Infrastructure.

- Met with the utilities with the intention to reduce the level of uncertainty the City has regarding the feasibility of deploying 680k smart water meters at a cost of more than R3B.

The above-mentioned face-to-face sessions were intended to obtain information and equip the AMI project team and Management towards achieving the below AMI programme objectives. Install a system that:

- Is endorsed by the customer, officials and the relevant agencies and Councillors and political leadership;
- Is delivered safely and in a reliable and timely manner;
- Delivers on the benefits seen in other AMI projects internationally;
- Integrates with other City's digital initiatives and core applications;
- Will enable and be an example for other digital transformation initiatives within the city;
- Will be a beacon in Africa to leverage this technology and share the experience with others.

## 4.2 OUTCOMES

The following outcomes were achieved from **meeting DC Water** at their head office in Washington on 23 May 2022:

- The main driver for AMI was confirmed as customer service improvement, supporting the City's Water Strategy of being a customer orientated utility.
- Critical information was shared regarding and lessons learnt on meter installation and tools development.
- Lessons learnt regarding tools DC water developed over the 20 years of using AMI:
  - Developed meter monitoring tools, various applicatipons (apps) and tools for customer service teams to their efficiency and help customers that call into the call centre.
  - Built some in-house tools and also working towards moving to Software as a Service (SaaS) for other key tasks.
- Lessons learnt regarding the meter installation and replacement programmes:
  - 30 meters per person per day for meter replacement is possible;
  - The radio mounting is the most critical aspect of the deployment as it provides the most improved performance.
  - Loggers used within DC Water were found not be totally waterproof, batteries lasted between 7-10 years, and they tended to break and crack if dropped or left in the sun and with extreme changes in temperature ( the environmental impact).
  - Each meter has triple redundancy, meaning at least 3 data collectors can be used for each meter. They have 93 data collection systems for the 135k meters they have in the area.
  - The utility has 900 meters that struggle to get a signal out. They continue to find a solution for each installation (e.g. running a wire, putting different antennas or using special pit lids to get them to work).
  - It took 2 years to replace 85k AMI meters during their recent meter replacement.
  - DC water shared critical information of the teams structure, lessons learnt and matters to take into consideration during the AMI installations:
  - There are different procedures for different types of change-outs, with a 3-person team needed for validations and installation.
  - They had temporary crews to operate as a sweep-in team to assess, mop up any mistakes or skipped installations.
  - Highlighted some issues to consider when installing, meter loggers, labelling, programmability, mounting, ease of installation, electromagnetic interference, and number of pieces used.
- Lessons learnt regarding meter devices:
  - Retrofitting of devices was considered, also the impact on encoders and pulse output capabilities. DC water prefer encoder units.
  - Raw read and conversion will happen at the back end.
  - Early Data Standardisation was identified as key and clear definition of transmision data units were highlighted, in order to limit errors or allow

for error detection (“fat finger” checks). Kl to 3 decimal places would probably be a preference for the City.
    - A single vendor is recommended, as serial numbers from different vendors might overlap, adding to the complexities in retrofitting and maintaining of devices over time.
    - Meters should have the capability to generate its own system alarms – tamper, poor signal warning, low battery and also alerts which includes abnormal flow scenarios.
    - Meters should have a solution that doesn’t block the view of a single register, meaning it can still be read manually without confusion and only where necessary.
- Lessons learnt regarding communication network:
    - DC water owns and operate their own network but is maintained by a separate entity.
    - Clock Synchronization, coverage requirements and the need to avoid data congestion was all discussed.
    - The 93 Data Collection Units (DCUs) are outsourced. These units use 4G to communicate to the backend, have a 2-3 year battery life and use 450 MHz frequency.
    - Standardisation on which lids and antennas to use was found to be critical.
- Vital lessons were learnt regarding customer engagement:
    - They have around 30k notifications per year where customer have some form of alarm or alert, in relation to their 135k customers.
    - DC water have customer service branch with 124 employees, which includes debt management, call centre and manual validations.
    - DC Water currently have 3.8% estimated readings.
    - 94% are read through AMI with 6% remaining as manual readings.
- Lesson Learnt regarding the meter management team:
    - There is still a team of 35 permanent meter operators/technicians in the utility to maintain the 135k AMI meters (3 meter readers, 16 large meter technicians, etc.)

- Other Digital Transformation projects seen:
    - Near real-time hydraulic model from the Bentley company.
    - “FIDO” used for leak detection.
    - Auto flushers at the end of network arms to ensure water circulation.

**Outcomes from the interactions at the conference. Discussion with Singapore PUB Water utility:**

- PUB had an issue during meter replacement where the logger and the meter wasn’t working well together leading to some readings being missed, and this resulted to misalignments in the meter register and the back-office readings. This was fixed through a firmware update, but a recommendation might be to use a solution that is of the similar brand for the logger and the meter.
- Due to the high density of meters and buildings in Singapore urban centre, it is a problem to ensure each meter has a collector that will not require

meters to connect to the network for long periods, ie avoid queuing before it can communicate its payload. This was identified that it impacts data quality and also battery life. Testing is currently underway to confirm what sufficient density of installing more collectors will be sufficient. Their findings could assist the City's installation plans in more dense areas.

- PUB have opted for a Service Level Agreements (SLAs) in a Network as a Service (NaaS) AMI model.
- Regarding the use of Project Management firms, PUB appointed Jacobs, a fairly experienced player in the market but found that there was a learning curve even for the specialist company to adopt to their city's unique circumstance.

**Outcomes from the proceedings at the conference (23 – 26 May 2022)**

**The 3 day conference (**see attached agenda – Annexure A**) started with a number of workshops:**

- **Data as a Service (DaaS) Workshop** was a preferred workshop for the City's officials with its focus on optimal use of data.
- The process of deciding whether or not to use DaaS was worked through with interactive presentations, roundtable discussions and role playing by groups of conference attendees.
- Day 2 and 3 of the conference proceedings, saw a number of presenters and specialists in their fields covering a number of topics relating to how to respond to the effects of COVID on our operations, way we do business, through effective processes, systems and technology in compliance to the relevant legislations/ requirements.
- A few key technologies and use cases of different sizes and complexity were identified and will be discussed in the Digital Transformation Steering Committee of the Water & Sanitation Directorate. These will also be taken into consideration during the development of the Digital Transformation Strategy.

- **Key relationships built :**

  The City team engaged in discussions regarding building out a more permanent collaborative and mutually-beneficial relationship with key utilities in the field:

  - Anglian Water in the testing and piloting of new technologies;
  - Vitens in the pursuit of introducing AMI;
  - DC Water in sharing best practise in customer engagement;
  - PUB sharing insights regarding the deployment of AMI;
  - Include these partners in an "AMI and Digital Transformation Community of Practice" initiative which the Directorate has started with in 2021.

## 5. ACTIONS REQUIRED

**Vitens as a partner:**

- It is expected that there will be many more engagements with Vitens over the coming years as we will both be embarking on rolling out AMI.
- Our first engagement/workshop has been scheduled for 27 June 2022, where Cape Town sharing the elements that went into Cape Town's Stage Gate Scoping report. Cape Town is expected to obtain pilot performance information as Vitens have been testing AMI on residential meters for a couple of years and have rolled out AMI for larger commercial and industrial users for many years.
- A follow-up workshops will be arranged including the wider Cape Town team, to discuss the key success factors towards AMI.

**PUB as a partner:**

- Engagements are expected as PUB is currently at the beginning phase of their AMI rollout. These engagements will be on 2 fronts:
  - Share technology maturity levels for both Narrow-Band Internet-of-Things (NB-IoT) and Ultrasonic meters which might mean that staff of each utility participate in each other's steering groups for these programmes
  - Continue engagement to follow lessons learnt by PUB during their proposed AMI rollout.

**DC Water as a partner:**

- Involve the Cape Town Metering unit in a more detail level engagement with the DC metering team.
- To establish an enhanced Asset Management System.
  - Reduce the risk of configuration issues later.
  - Ensure that AMI compatibility is achieved, with consideration of retrofitting older technology on existing meters and depending on future hardware tender results, locally.
  - Focus on what the maintenance procedure is going to be and set adequate processes. Configuration during retrofitting different types of meters will need guidance notes.
  - Explore how their Educational and Awareness books for children used in their State schools, which samples were provided, can be adapted, published and used in Cape Town.

**Proposals around future City's participation as an active SWAN member and proposal to host the 2024 Conference:**

- Cape Town to lead the Smart Water Journey within Southern Africa and Africa, be a beacon for other utilities to become SWAN members.

**Drive adoption of Digital Technologies in City of Cape Town:**

- Through a series of Request for Information (RFIs) issued, to enable market research of the different technologies that the City might pursue in the future and give local industry the opportunity to participate in its supply and installation. This will include for Smart Water Networks technologies for Sewer and Clean Water, focused on Internet-of-Things (IoT) and Operational Technologies (OT).

- The City of Cape Town and Water & Sanitation Directorate to consider hosting the 2024 SWAN annual conference, with SWAN's approval, in order to use the platform to find solutions that are suitable and responsive to our and regional needs. If this proposal is considered, supported and approved, a clear plan and programme will have to be developed.

In the journey to host the first SWAN conference in Africa, the City could first consider hosting in person workshops (at least two) which will provide the momentum towards hosting the conference in 2024 but also gaining more knowledge in the identified topics, which one of them could be on deployment of AMI.

## 6. IMPLICATIONS

| | | | |
|---|---|---|---|
| **6.1** | **Constitutional and Policy Implications** | No ☒ | Yes ☐ |
| **6.2** | **Environmental implications** | No ☒ | Yes ☐ |
| **6.3** | **Financial Implications** | No ☒ | Yes ☐ |
| **6.4** | **Legal Implications** | No ☒ | Yes ☐ |
| **6.5** | **Staff Implications** | No ☐ | Yes ☒ |
| **6.6** | **Risk Implications** | No ☒ | Yes ☐ |

**6.7 <u>POPIA Compliance</u>**

☒ It is confirmed that this report has been checked and considered for POPIA Compliance.

The City has a contract in place with XL Embassy Travel for the safekeeping of Travellers' personal information as required by the POPI Act.

## 7. RECOMMENDATIONS

It is recommended that:

a) the feedback report on the trip 2022 SWAN Smart Water Conference and visit to DC Water AMI installation, undertaken by Siyabulela Bashe, Jaco de Bruyn and supported by contracted specialist Tertius Rust and which took place in Washington DC, USA from 23 to 26 May 2022, **be noted**.

b) The report be referred to the Water and Sanitation Portfolio Committee for noting.

**IZINDULULO**

Kundululwe ukuba:

c) **Makuqwalaselwe** ingxelo engohambo oluya kwinkomfa yesizwe ka2022 yeSWAN Smart Water kunye notyelelo kumboniso wokufakelwa kweDC Water AMI oluthatyathwe nguSiyabulela Bashe, Jaco de Bruyn lwaze lwaxhaswa yingcali ekwikhontrakthi uTertius Rust ebanjwe eWashington DC USA ukususela ngowama23 ukuya kowama26 kuCanzibe 2022.

d) Ingxelo mayidluliselwe kwikomiti yeSebe lezaManzi noGutyulo ukuba iyiqwalasele.

**AANBEVELINGS**

Daar word aanbeveel dat:

a) Daar **kennis geneem word** van die terugvoeringsverslag oor die reis na Washington DC, VSA van 23 tot 26 Mei 2022 onderneem deur Siyabulela Bashe, Jaco de Bruyn en ondersteun deur gekontrakteerde spesialis, Tertius Rust, om die 2022 SWAN Smart Water-konferensie by te woon en die DC Water AMI-aanleg te besoek.

b) Die verslag vir kennisname na die portefeuljekomitee oor water en sanitasie verwys word.

## 8. GENERAL DISCUSSION

The trip is considered to have been highly successful, due to:

- the focused scope of interest of attendees on the specific subject matter;
- the structure and varied content put in place by SWAN organisers;
- the face-to-face contact made with utility staff on the same journey;
- industry knowledge and contact network enabled by the specialist contractor.

Furthermore, the attached media release on SWAN membership and conference experience (see annexure B) will be issued on Friday, 24 June 2022.

## 9. ANNEXURES

Annexure A: Conference agenda
Annexure B: Media release final draft

## FOR FURTHER DETAILS, CONTACT:

| | | | |
|---|---|---|---|
| DATE | 21 June 2022 | | |
| NAME | Siyabulela Bashe | CONTACT NUMBER | 021 400 3610 |
| E-MAIL ADDRESS | Siyabulela.Bashe@capetown.gov.za | | |
| DIRECTORATE | Water & Sanitation | FILE REF NO | |
| SIGNATURE : | Digitally signed by Siyabulela Bashe Date: 2022.06.21 15:43:13 +02'00' | | |

**EXECUTIVE DIRECTOR**

MICHAEL JOHN WEBSTER

The ED's signature represents support for report content and confirms POPIA compliance.

SIGNATURE: Digitally signed by Michael John Webster Date: 2022.06.22 12:27:43 +02'00'

NAME

DATE

COMMENT: I'm satisfied with the trip report. AMI is an important -- but also risky - new technology that the City is contemplating. Ensuring we learn lessons from others that have (or are) implementing this is important. I encourage the team to follow up on potential partnerships with Vitens, PUB and DC water

**MANAGER: INTERNATIONAL RELATIONS**

DR. DENVER VAN SCHALKWYK

DATE Dr Denver van Schalkwyk Digitally signed by Dr Denver van Schalkwyk Date: 2022.06.28 07:38:29 +02'00'

COMMENT:



Sarah Sanders Digitally signed by Sarah Sanders Date: 2022.06.29 06:24:40 +02'00'

Sarah Sanders Digitally signed by Sarah Sanders Date: 2022.06.29 06:25:06 +02'00'

**LEGAL COMPLIANCE**

☐ REPORT COMPLIANT WITH THE PROVISIONS OF COUNCIL'S DELEGATIONS, POLICIES, BY-LAWS AND ALL LEGISLATION RELATING TO THE MATTER UNDER CONSIDERATION.

☐ NON-COMPLIANT

NAME

TEL

DATE

COMMENT:

Certified as legally compliant based on the contents of the report.

Digitally signed by Lungelo Mbandazayo
Date: 2022.06.29 07:51:23 +02'00'

**CITY MANAGER**

☐ SUPPORTED

☐ NOT SUPPORTED

☐ REFERRED BACK

DATE

COMMENT:

For onward transmission to MAYCO and relevant PC

**PLEASE NOTE THAT THE ABOVEMENTIONED SIGNATURE IS ONLY TO BE OBTAINED FOR OFFICIALS TRAVELLING AND NOT COUNCILLORS.**