10th Pacific Water and Wastewater Annual Conference and EXPO 2017

&

3rd Pacific Water Ministerial Forum

Apia, SAMOA

7-11 August 2017

“Summary of Proceedings”

The overall theme of the conference was “Water Supply in a Changing Environment”; this took recognition of the growing challenges presented by climate change on the Pacific environment and more specifically the threats it poses on the security of safe water supply for our Pacific communities.

About the PWWA

The Pacific Water and Wastewater Association is a not for profit membership body established in 1994 to support the Pacific region in meeting all water challenges. It has developed to become a regional Association of organizations operating in the water and wastewater sectors whose mission is the delivery of quality water related services that enhance the well-being of people in the Pacific Region.

The goals of the Association as defined in its Constitution:

1. To serve as the principal water and wastewater voice of and for the Pacific Island nations and utilities; and
2. To develop expertise in the Pacific for the sustainable management of water and wastewater services by shaping a cohesive, proficient and robust water and wastewater sector.
Address by: Afioga Fiame Naomi Mata'afa Samoa’s Deputy Prime Minister & Minister of Natural Resources & Environment

Lau Susuga ile Faafeagaiga, Lau Susuga Reverend Nuuausala Siaosi, Honourable Ministers of the Cabinet Honourable Ministers and Heads of Delegations of the Water sector from the Pacific Island States and Territories Associate Ministers and Members of Parliament The Chairman of the Pacific Water and Wastewater Association, Mr. Opetaia Ravai Your Excellencies the High Commissioners of Australia and New Zealand Your Excellency the Ambassador of Japan Your Excellency the Ambassador of the People’s Republic of China Members of the Diplomatic Corps Distinguished participants and speakers, all the young water professionals from across the Pacific Distinguished guests, ladies and gentlemen.

On behalf of the Government and the people of Samoa, Talofa lava and welcome to you all on attending this significant occasion, the opening ceremony of not one but two events which are the 3rd Pacific Water and Wastewater Ministerial Forum and the 10th Pacific Water and Wastewater Conference and Expo. This is the second time that Samoa has hosted the Conference; Samoa hosted the first conference 10 years ago and it is befitting that it does so this year to witness a decade later, the coming of age of the organisation in respect of its governance, but more importantly a deeper understanding and appreciation of the complexities and challenges in the in the water and wastewater sectors in our Pacific region. I take this opportunity to extend a special welcome and in particular the Government’s appreciation to PWWA’s partners, the Asian Development Bank, the Government of Australia through its Department of Foreign Affairs and Trade and the Australian Water Partnership, the European Union and the Japan International Cooperation Agency who with their support enabled the Samoa Water Authority in collaboration with the Ministry of Natural Resources and Environment and the Pacific Water and Wastewater Association to organise and host this important event. Furthermore, I wish to make special mention and extend a warm welcome to all the young water professionals from across the Pacific attending this conference; I understand you all started your programme yesterday and I encourage you to make full use of this opportunity to learn from your peers but also from the seasoned leaders in the sector; you are of course the future leaders of this sector. The hosting of the Pacific Water and Wastewater Ministerial Forum in Samoa is a critical opportunity that we as the most vulnerable States to climate change must all utilise to the maximum. In keeping with this year’s theme of “water supply in a changing environment”, it is crucial that we as a region must work together in sustainable and durable partnerships to address issues affecting our water supply, share best practices on the effective and efficient management of water resources and infrastructure including wastewater treatment and improvement of sanitation, and be creative and innovative in securing the necessary support and resources to realise the targets of the 2030 Agenda for Sustainable Development in particular SDG 6.. The latest 2015 Update published by the WHO in collaboration with the Secretariat of the Pacific Community and others on the status of Pacific Island countries with regards to water, sanitation and health services shows that water security is a critical sustainable development issue for
Pacific Island countries, with profound implications for livelihoods, economic growth, public health, the environment and human rights. It further shows that while all Pacific Island countries are improving access to safe water and sanitation, these efforts are often not keeping pace with population growth. As a result, the Pacific region has made very poor progress in meeting the MDG drinking water and sanitation target. It is a challenge to you all as water and sanitation Leaders, players, young professionals, suppliers and service providers to realise your role in contributing to improving on that status. It requires you to review, re-think, and reassess what works, what hasn’t worked, and adopting different approaches and solutions appropriate to the specific needs overall of your countries. Any meaningful progress towards the current 2030 Agenda for Sustainable Development targets of universal access to drinking water, sanitation and hygiene will require a fundamental recalibration of efforts by Pacific island countries and development partners, particularly in light of projected population increases.

Achieving such targets will require that the commitments made by Pacific island countries in the past be converted into serious and sufficient investments in the next decade and a half. I am informed that the objectives of this year’s Ministerial will focus on these issues and challenges in our region, share progress on each country’s implementation of SDG 6, and explore areas where collaboration and partnerships might best contribute to the Pacific’s progress towards achieving SDG 6 drinking water and sanitation targets. It is also my pleasure to announce one of the key milestones achieved that will be witnessed by all today and that is the recognition of the Pacific Water and Wastewater Association or PWWA by the Independent State of Samoa as an International organisation and the official signing of the Agreement between the Government of Samoa and PWWA soon to occur, which places Samoa as the Headquarters of the PWWA. This is a historic occasion for not only Samoa but the Pacific; the official recognition of the PWWA as an International Organisation further strengthens its platform as the principal united voice for the Pacific Island nations for water, and wastewater and utilities at the international level. Furthermore, this recognition enhances the development framework of Pacific expertise for the sustainable management of water, wastewater services by shaping a cohesive, proficient and robust sector.

I take this opportunity to acknowledge the hard work of PWWA’s Head of Secretariat, Pitolau Lusia Sefo – Leau, Managing Director of the Samoa Water Authority Seugamaalii Jammie Saena and the Ministry of Natural Resources and Environment in bringing about this momentous achievement that further supports the need for the Pacific region to have a united voice on international issues. You have a full schedule this week, I encourage your full participation and engagement, and I hope we will not disappoint you as hosts. I now declare the 3rd Pacific Water and Wastewater Ministerial Forum and the 10th Pacific Water and Wastewater Conference and Expo officially open.

Soifua
NEW ERA FOR PWWA - HOST AGREEMENT SIGNED

Host Agreement between PWWA and Government of Samoa

A Host Agreement was signed between the Government of Samoa and the PWWA as part of the Opening service of the 10th PWWC. The Agreement signals the declaration of the PWWA as an international organisation under the Samoa Privileges and Immunities Act and establishes the Independent State of Samoa as the host country for the PWWA headquarters. The official signing of the Agreement took place on Tuesday, 8th August 2017 and was witnessed by more than 300 participants, members, dignitaries of the Government of Samoa and members of the diplomatic corps in Samoa. The Honourable Deputy Prime Minister of Samoa, Afioga Fiame Naomi Mata’afa signed on behalf of the Government of Samoa, and the Chairman of the Board of Directors of PWWA, Mr Opetaia Ravai signed on behalf of PWWA.

The establishment of PWWA as an international organisation opens doors for greater opportunities for collaboration with other countries and agencies – opportunities that should benefit individual utility members and the wider communities of our member countries in water and wastewater sector issues.

Left Photo: Honorable Deputy Prime Minister of Samoa, Fiame Naomi Mata’afa and PWWA Chairman Mr Opetaia Ravai signing the agreement with PWWA CEO Pitolau Lusia Sefo Leau and MNRE Legal Officer witnessing.

Right Photo: Honorable Deputy Prime Minister, Fiame Naomi Mata’afa shaking hands with PWWA Chairman, Mr Opetaia Ravai formalizing the signing of the host agreement.
DAY 1

Young Water Professionals Workshop

Facilitator: Nicole Holmes, Hunter Water, Australia

Key Message:

“We, the founding members of the Pacific Young Water Professionals, are dedicated to bringing new energy into the water and wastewater industry and sector.

The Pacific YWPs are a well-connected group, driven by shared values, working to shifting the dialogue towards:

• Realizing sustainability in the water and wastewater sector;
• Building regional knowledge sharing and collaboration through peer-to-peer connection and networking;
• Recognizing cultural and traditional knowledge as a source of expertise;
• Making capacity building, leadership development, and improved communication core management functions;
• Supporting Young Water Professionals and aspiring water professionals to make a difference;
• Advocating for the principles of Gender Equity and Social Inclusion (GESI) throughout the sector;
• Fostering an environment that promotes innovation; and
• Transforming management trends to reflect these values”

Workshop Objective:

The Young Water Professionals program is an initiative that was developed to have the young water professionals in the pacific region engaged early on issues and challenges facing the Pacific water sector. It was also an opportunity created for them to share learnings, knowledge and best practices and to be mentored by current Managers of utilities. This also created a learning experience to build confidence for the young professionals.

3rd Pacific Water Ministerial Forum

Chairman: Hon Unasa Papaliitele Niko Lee Hang

Key Messages:

• Shared understanding of the current status of the Pacific Water and Sanitation sector in relation to the Framework for Pacific Regionalism;
• Re-affirming the strategic direction and focus for the Pacific Water Ministers Forum as part of the regional structure to better deliver on the Sustainable Development Goals (SDGs) Agenda;
• Member countries progress on implementation of SDG Goal 6 and addressing the priority development challenges;
• Identify possible areas of regional collaboration and partnerships with support of PWWA and other partners.

**Samoa 2017 Water Ministers Declaration:**

A declaration was signed by 8 Ministers in Apia on the 8th August 2017 reaffirming commitments by PWWA Country Members in ensuring that common issues and challenges are being addressed and elevated as a regional priority especially within the Water and Wastewater Sector.

Back Row:

Avafoa Irata (Tuvalu Rep), Fonoti Perelini Fonoti (American Samoa Rep), Mr Gerard Fallon (New Caledonia Rep)

Front Row:

N Reagan Belechi (Palau Rep), Hon Ralph Regenvanu (Vanuatu), Hon Teariki Heather (Deputy PM, Cook Islands), Hon Papaliitele Niko Lee Hang (Samoa), Hon Pokotoa Sipeli (Niue), Hon Kelihiano Kalolo (Tokelau), Hon Poasi Tei (Tonga), Hon Anthony Muller (Marshall Islands)
Donors Session: Water in a Changing Environment

Facilitator: Pitolau Lusia Sefo Leau, Chief Executive Officer, PWWA

Key Messages:

- The Donor Session was an opportunity for donors and potential donors to come together and discuss each other’s role in the Pacific Region especially their engagements in the water sector.

- ADB’s support for water management is articulated through its “Water for All” policy which promotes national focus on water sector reform, fostering the integrated management of water resources, improve and expand the delivery of water services, foster the conservation of water and increase system efficiencies, promote regional cooperation, facilitate the exchange of water sector information and improve governance and capacity building.

- Australian Water Partnership (AWP) is an Australian initiative to help the Indo-Pacific Region manage water scarcity with a budget of $30m program fully funded by Department of Foreign Affairs and Trade (DFAT). The Pacific is a priority for AWP with PWWA as one of its major investment to date.

- European Union’s support for the Pacific is mainly aligned with the Sustainable Development Goals with the least developed countries as its target and strengthening partnership with middle income countries.

According to data presented by the Secretary of the Pacific Community (SPC), 52% of Pacific Islands population are using improved drinking water sources, only 31% are using improved sanitation sources; some of the challenges faced by PICTs in respect of water security for the region include climate variability and climate change.

- **7.6 million** Pacific Islanders will require new safe drinking water facilities by 2030 for the Pacific to meet the global SDG for water.

- Japan International Cooperation Agency’s (JICA) grant aid projects support to Samoa was the main focus of JICA’s presentation. The support included Infrastructure such as constructing 2 Water Treatment Plants, Pipelines, Intake Facilities and 1,280 sets of water meters. It also provided training and technical support to areas such as Non-Revenue Water.
Innovations in Operations & Asset Management

Facilitator: Ruth Uesilani, Ministry of Natural Resources and Environment

Key Messages:

• It is pivotal to keep utilities updated on emerging technologies and the need for these technologies to be promoted in the pacific.

• 70% of the earth’s surface is covered with water, 2.6% is freshwater, 2% of the 2.6% (freshwater) is trapped in ice, 0.592% of the 2.6% available as groundwater and 0.014% of the 2.6 available as surface water (Blue Planet Interesting Facts)

• Equally important for the utilities to supply good, clean and healthy water for our people.

Presentation Abstracts:

Presentation 1: Understanding Reverse Osmosis – Safe access to drinking water in challenging environmental conditions in a changing world. Phillip Raichle, XYLEM

This presentation gave the audience a detailed insight about how the technology Reverse Osmosis works, the theory behind it, how generally systems are set up and how it can be applied and operated efficiently.

Climate change and the rise of the ocean water levels poses high risk that existing fresh water resources in remote location of the Pacific Islands will be polluted due to salt water ingress and consequently will become unsuitable for human consumption if not treated properly. The technology Reverse Osmosis gives us access to an unlimited resource of water (the Ocean) and even if climate change cannot be stopped and existing resources will be polluted we have a way to treat the water to suitable level for human consumption. Understanding the basics and the working principle behind this technology will help to gain more confidence in its usage and how it can be used efficiently.

Presentation 2: What is Backflow? Wayne Shields, Hydroflow

The presentation focused on Backflow which is a potential cross contamination of a contaminant into a potable water supply. The case study for this presentation is from certain communities in New Zealand where certain checks were put in place to identify any cross connections in the water supply and have backflow devices installed.

Backflow has installation requirements that needed to be followed to ensure the system is effective and has been installed according to New Zealand standards. A brief overview on different types of backflow prevention devices available and on the required maintenance by IQP registered contractors.

Presentation 3: Niue’s Asset Management, Ross Waugh, Waugh Infrastructure

This presentation was an overview of the Government of Niue’s Asset Management Plan 2016 that was developed as a result of an AMP Analysis conducted together by Waugh Infrastructure and Government
of Niue. The focus on Water and Wastewater was also mentioned in the AMP and how its lessons learned were applied to improve.

A quick overview of ongoing work programme has highlighted the importance of continuing to implement the infrastructure plan over the 5-year period between reviews.

**Presentation 4: Staying Dry with rising tides, James Logan, Hynds**

This presentation focused on some of the Stormwater Solutions that have been employed in Miami Beach, Florida to assist in managing their Stormwater in an increasingly challenging environment. It has been forecast for this area that sea level will rise up to a metre over the next 20-30 years and stormwater management is certainly one of the greatest challenges.

Tourism in greater Miami is a multi-billion USD industry with 56% of visitors in 2016 staying in Miami Beach. Miami Beach is built on natural and man-made barrier islands and home to some of Florida’s most luxurious homes, hotels & resorts. Disruption caused by each flooding event and the resulting cleanup has major negative economic impact.

Much of the system that transports stormwater directly to the sea had been built just a few centimeters to one to two meters above sea level. Outlet structures settled and sea levels have risen often causing seawater to flow into the stormwater system resulting in closed businesses, damaged homes and buildings, blocked roads, inconvenienced residents and tourists and general loss of productivity. Flooding also caused infiltration of salt water into the ground water.

“There is one thing for certain though is that it will take a combined approach on a number of fronts as there is no “one size fits all” solution to this growing problem”.

**Presentation 5: Effluent Discharge Management in South Pacific Small Island Developing States, Rupert Craggs, National Institute of Water and Atmospheric Research, New Zealand**

Despite the recommendations of the SPREP effluent guidelines for Pacific SIDS (1998), very few have adopted them or others. Of those countries with standards or guidelines (U.S. Affiliated Pacific Islands, Cook Islands and Fiji), many lack clear implementation and enforcement.

Most SIDS still lack the necessary legislation, institutional structures, and enforcement for effective wastewater management. This is partly because the management of wastewater among SIDS is often fragmented with many ministries, government departments, boards, authorities and utilities responsible.

There are two main approaches to develop wastewater discharge standards: (1) Technology performance standards – simplest and most easily implemented; (2) Receiving Environmental Quality Objective Standards – assessment of impacts on receiving waters.

Any approach that is adopted must be appropriate in terms of adequate protection of receiving water quality, affordability, and considers available institutional capacity.
Customers and Community (Utilizing Data and Insights)

Facilitator: John Mauli, Samoa Water Authority, Samoa

Key Messages:

- Time for Utilities to become a SMART Water Utility
- Data is vital in making key decisions to improve skills and increases effectiveness of a utility performance.
- Realtime Data, holds the key to providing the platform from which better resource management can be achieved.

Presentation Abstracts:

Presentation 1: Title: Realtime Data, the key to better decision making, David Bowerman, Hunter H20

To meet the challenges in today’s changing environment and enable better informed decision making, real-time data holds the key. Improvements in Operation, Asset Management, Maintenance, Planning, Regulatory Compliance and Customer Support can all be achieved using real-time data.

SCADA and Wide Area Telemetry provides a method to collect real-time data and provide the delivery of this data to the end users. SCADA improves visibility of system operation, highlighting long term trends and capturing fleeting intermittent failures of assets.

The visualization and integration of SCADA data into third party applications such as Modelling, GIS, Asset Management & Customer Support systems extends the availability of the real-time data and further improves the decision-making process to enable proactive actions rather than reactive actions.

Presentation 2: SMART Water Management, Richard Taylor, Thomas Consultant

This presentation gave an overview of SMART water management, some examples of data analysis, and how water utilities can really benefit from introducing these systems and technology.

Water utilities worldwide are looking to become SMART in managing their water supply networks. This involves capturing key flow and pressure data in a timely manner, and then maximising the benefits that can arise from analysing this data. Allowing water systems to operate without close monitoring is becoming a thing of the past. The cost to implement monitoring and communications systems using cell phone technology is now less than it has ever been, and can be considered affordable. The benefits of implementing these systems, from both an operational and asset management perspective, are known to easily outweigh and justify the cost of implementing the systems.

Presentation 3: Water Authority of Fiji GIS Journey: Successes and Updates, Josua Wainiqolo (Water Authority of Fiji), Johan Nel (Open Spatial)
This presentation is a brief report of a partnership between Water Authority Fiji and Open Spatial who are both members of PWWA. Its main aim was to work together in managing the network with tools to ensure data integrity build on the requirements of other water utilities.

Water Authority of Fiji has successfully expanded the use of GIS in the organisation. Their implementation has improved WAF’s operational performance and contributed to improvements in non-revenue water performance and water simulation modelling.

Analytical modelling and ‘shut-off block’ performance have improved WAF’s understanding of the network, with a corresponding improvement in asset performance. The structures that were established have enabled WAF to implement a pro-active disaster preparedness plan; and improved the integration between engineering design and GIS to make better use of existing resources.

WAF is now embarking on asset valuation and customer notification process improvement that is integrally tied to GIS network trace calculations.

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**Sydney Water – Climate Change Guidelines**

*Facilitator: Tafeamaalii Phillip Kerslake, Samoa Water Authority*

*Presentation: Overview of Climate Change and Science Projections for the Pacific Islands, Kathleen McInnes, CSIRO Oceans and Atmosphere*

**Key Messages:**

- Climate Change’s effects on water supply/demand & water infrastructure is seen to have increased and is impacting on utilities water supply and infrastructure.
- Large scale impacts of extreme sea levels in the Pacific can be driven not only by local storms (eg: tropical cyclones) but also remotely driven swell waves
- Weather projections in the Pacific such as wet seas and annual mean rainfall is to increase together with intensity and frequency of days of extreme heat. However, it is also projected that the numbers of tropical cyclones will decline in the SE Pacific Ocean basin.

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**Utility Case Studies on the water supply in a changing environment**

*Facilitator: Sulutumu Sasa, Independent Water Scheme, Samoa*

**Key Messages:**

- Gender continues to be an ongoing challenge in utilities and some utilities have taken initiatives in developing policies to address these within their organisations.
Utilities partnering with Research Institutions in developing new water sources using an integrated approach. In this case the collaboration between ASPA and UH-WRRC to plan for future groundwater development and sustainable management water resources.

Important to document assets to ensure the institutional knowledge is shared and not fall off the radar. Also, more important for asset owners or utilities to know where their assets are located.

**Presentations:**


This presentation was based on Climate change, environmental factors, and aging infrastructure which are present challenges in providing high quality drinking water to customers for American Samoa Power Authority. A Boil Water Notice was issued for areas in the system under the direct influence of surface water. Production wells in Eastern Tutuila yield high chlorides due to over-pumping and seawater intrusion. These chloride levels increase during prolonged periods of low recharge conditions. Resolution of these issues is a top priority, and ASPA is diligently working to explore and develop new water sources using an integrated approach. This approach incorporates scientific research methods, including hydrological monitoring and modeling, with improved engineering techniques to explore for new groundwater sources. Collaboration between ASPA and the UH-Water Resources Research Center has been invaluable for planning future groundwater development and sustainable management of water resources.


Asset data collection and asset management best practice is a critical task faced by all local authorities and utility companies in the pacific region and it is all too often put into the “too hard basket”.

Amalgamation of eight local government authorities into one in 2010 meant that in Auckland, New Zealand, billions of dollars’ worth of roads, land, buildings and water utilities were transferred to newly formed asset teams with the huge task of aligning asset data. Large assets were well documented. Small, off-line assets such as on-site water and wastewater systems were sometimes not well documented or understood due to transition or legacy processes.

Maintenance contractors, Auckland Council, and Morphum worked to build a shared understanding of the assets, their risks, and the opportunities available when managed on a regional basis. The biggest revolution was seeing the assets plotted spatially. This paper discusses the methods used to build asset understanding, the challenges faced, and the benefits of a slow but steady approach to asset data and asset management using a web-based data platform and data confidence ratings.

**Presentation 3: Gender Empowerment at Solomon Water,** Susan Makabo & Evelyn Basi, Solomon Island Water Authority
In the Solomon Islands, 23% of economically active men hold a wage job in the formal sector as compared to 9% women. “Waka Mere” is an initiative funded by International Finance Cooperation (IFC) in partnership with Solomon Islands Chamber of Commerce and Industries (SCCI). It was set up to share best practices and experiences from local, regional and global companies and one of its main objectives is to improve gender equality in the workplace. In the Solomon Island Water Authority, 42% are women holding Team Leaders roles.

A questionnaire was distributed for female to identify employment issues they are facing and the number one issue was Harassment. This exists and is real. 90% of cases are not reported and this impacts women’s work performance.

New York Department of Environment Protection

Facilitator: Petaia Mafulele, Samoa Water Authority, Samoa

Presenter: Arthur Spangel, Director of Plant Operations, Bureau of Wastewater Treatment, New York

Key Messages:

- Climate Change impacts planning is very vital for utilities as it provides a map into enhancing flood and wastewater infrastructure.
- Having these processes and plans in place for infrastructure can save costs in emergency response over the years.

Study Framework
Phase 1
Climate Analysis

What future climate and storm surge conditions should NYC prepare for?

Phase 2
Vulnerability Analysis

What assets are at risk and what are they worth?

Phase 3
Adaptation Analysis

What protective measures should be implemented to reduce risk while balancing cost?

Final Steps
Implement robust design standards and harden infrastructure through capital projects.
Day 3

Supporting Customers (Hardships & Efficiencies)

Facilitator: Namulauulu Irasa Mauala, Samoa Water Authority, Samoa

Key Messages:

- Communities should have access to essential services and infrastructure by strengthening their capacities to develop solutions.
- Whole of Government Approach has been proven to be effective in implementing planning and other major water projects.
- Principles for Sustainable Water Management is closing the water loop making sure that every water drop is captured, collected and recycled.
- Customer research is critical for better understanding & solution design.

Presentations:

Presentation 1: An agile approach for water & wastewater sector strengthening in Asia Pacific Countries, Heidi Michael, Engineers Without Borders, Australia

Engineers Without Borders (EWB) works with communities to improve access to essential services and infrastructure. To achieve this, EWB is working to enable and strengthen local technical sector capacity to develop appropriate solutions and approaches.

This presentation discussed lessons learnt from an agile approach in the quest for context-relevant capacity strengthening in the water and wastewater technical sectors in countries in the Asia Pacific region. EWB focused on 3 key components in the approach used: (1) development and demonstration of technical and professional skills for students and professionals sector-wide; (2) applying strengths-based and human-centred design principles; and (3) engaging in partnerships with locally-led organisations and institutions.

Lessons learnt during EWB’s engagement working with technical sectors highlight core components required: agile and flexible capacity strengthening approaches (eg. technical mentoring, leadership training, design challenges); address the sector’s self-identified needs; and build on existing strengths across the sector (institutionally, individually and organisationally).

Presentation 2: The Singapore Water Story – Sustainable Water Management, Geoffrey Stephens, PUB Singapore

This presentation was a brief look at PUB Singapore 50 years back, the water challenges then and how it has improved by turning “Singapore into a City of Gardens and Water”. It also outlined the whole of government approach taken by the PUB Singapore in implementing its plans. Other areas were also
covered such as catchment management, managing water demand, local and international partnerships and sustainable waste water management.

**Presentation 3: Working with customers to reduce estimated bills, Melanie Werner, Project Manager, Sydney Water**

Sydney Water is the largest water and wastewater service provider in Australia and they have 4.9 million customers.

This presentation discussed how Sydney water developed a strategy to address their unhappy customers on their bills which has contributed to the worsening of performance and increased costs to the organisation. This process has allowed the organisation to trial new processes and make improvements accordingly.

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**Water Resources Management**

*Facilitator: Mele Tanielu, Ministry of Health, Samoa*

**Key Messages:**

- Whole of government approach is important in small countries such as the Pacific island countries in protecting its water resources;
- Sustainable wastewater collection and treatment systems are vital components in the water cycle

**Presentations:**

**Presentation 1: Protecting Vital Water Resources, a Multifaceted Approach, William Hensley & David LePre, Orenco Systems**

With the increasing cost and demand on potable water resources, engineers, planners, and utilities need reliable, innovative methods for protecting this valuable resource. Cost effective and environmentally sustainable wastewater collection and treatment systems are vital components in the water cycle, and require careful analysis. While there is no single solution for every site or community, traditional ‘big-pipe’ systems are rarely appropriate in sensitive environments; however, today there are more options than ever to consider. These alternatives must fit into capital and operational budgets, address topography constraints, account for operator personnel and equipment limitations, and minimize environmental risk. When wastewater collection and treatment systems are properly analyzed, designed, installed, and operated, they can achieve all of these critical objectives.

This presentation described proven low-impact options for consideration when selecting decentralized and onsite wastewater collection and treatment systems.

**Presentation 2: Managing Water Resources in Samoa, Asuao Malaki Iakopo, Ministry of Natural Resources and Environment, Samoa**
This presentation focused on the enabling environment of the water and sanitation sector and the current integrated water resources management in Samoa. The sector is guided by various policies and legal frameworks that start from the Strategy for the Development of Samoa 2017-2020. Its Institutional Mechanisms includes Sectoral Steering Committees and Ministerial Committees.

**Benchmarking – 2016 Initial Findings**

*Facilitator: Pitolau Lusia Sefo Leau, Chief Executive Officer, PWWA*

Twenty utilities provided data for the benchmarking for the fiscal year 2016. For the first time we got information in a systematic way from Tuvalu, and Tokelau, and also from Palau after the two years of passive participation.

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We did NOT receive data from Guam and Saipan (Group 1), four of six FSM utilities and Unelco (group 2), Nauru and Kwajalein (group 3). We hope that these utilities will come back to PWWA with their data and information.

Based on the collected information for 2016, awards were presented to the winners on the Awards Night.
Day 4

Site Visits

Organised by Samoa Water Authority and Ministry of Natural Resources and Environment

The site visits were split between the Samoa Water Authority and Ministry of Natural Resources and Environment.

Site 1: Wastewater Treatment Plant in Apia & Water Treatment Plants at Aleisa and Fuluasou (75 participants visited these sites)

The Sogi WWTP incorporates three stages of wastewater treatment. The primary treatment takes place in the influent well where solids and grits are removed using a mechanical screen. The next phase is the secondary treatment which is the activated sludge process which involves the production of an activated mass of micro-organisms capable of treating wastewater aerobically. This is a time base variable volume process which takes place in the two reactors sequentially.

The last phase of the whole process is the tertiary treatment where the effluent from the secondary treatment gets treated further using cloth filters to remove fine suspended solids and after which it goes through the final treatment which is the ultraviolet disinfection.

The Water Treatment Plants at Aleisa and Fuluasou supplies water to around 20 villages to the west side of Apia area going inland.

Site 2: Independent Water Scheme Laulii & The Vaisigano Watershed Area (50 participants visited these sites)

In 2012-2013 the Independent Water Scheme Investment program, co-funded by the EU and the Government of Samoa upgraded the Laulii water supply scheme. These consisted the

Construction of 2 new river intakes & 1 spring intake
Installation of 2 Tanks - (1 storage 60,000 litres & 1 sedimentation tank 10,000 litres )
Replacement of new main pipelines & 184 new household connections

At least 300 families have benefitted as a result of the new construction works from families who did not have access and limited access to water supply now have improved access and increased amount of water for drinking and washing. The IWS main objective not only ensures that everyone have access to reliable and safer water supply but more importantly the knowledge and capacity the village schemes have to sustain and manage their own water supply for future generations.

The Vaisigano River Catchment area consists of 3 main tributaries that meet at Alaoa and is contained by the Mulivai and Vaivase catchments. The river basis extends downstream to the coastal outlet at the
Apia Harbour. The river rises on the main divide at an elevation of 1,150 metres above mean sea level at Mt. Fito and has a catchment area of 34 km².

The length of the main river is approximately 14.1 km. Approximately 68% of the Vaisigano catchment is forestry, predominantly the upland areas. The lower flanks of the catchment are a mixture of plantations, scrub, grazing lands and settlement. The river basin is bounded to the south by the central chain of volcanic cones that form the Upolu ridge. The Vaisigano River flows through central Apia and is of key importance providing both water supply and power generation for the urban area.

PWWA Annual General Meeting

Hosted by Pacific Water and Wastewater Association Secretariat

One of the important issues that was discussed and approved at the AGM which was held in conjunction with the PWWC17 was the 2018 Annual Membership Fee Increase. At its meeting, PWWA Members have agreed for an increase in fees to support the newly established Secretariat meet its operational costs for the next two years whilst it works on a more comprehensive review of fees to support the development of a 5-year strategic plan which includes a self-sustaining future for the organisation.

As a result, the fees for utility members (PUMs) will increase from US$500, $750, and $1,200 to US$750, $1,200 and $1,600 for small medium and large utilities respectively. Allied Membership fees will now transition to two categories – (1) basic allied member of US$1,000 and (2) premium allied member fee of $1,750 with the benefit for the latter category of guaranteed regular spots on the PWWA website.

There was no increase to the individual membership fee and no change to affiliated and student membership.

The new fees to come into effect 1 January 2018 for the new financial year are as follows:

<table>
<thead>
<tr>
<th>Member</th>
<th>Category</th>
<th>Current Fee 2017 (USD)</th>
<th>New Fee 2018 (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUMs</td>
<td>Small</td>
<td>$500</td>
<td>$750</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>$750</td>
<td>$1,100</td>
</tr>
<tr>
<td></td>
<td>Large</td>
<td>$1,200</td>
<td>$1,600</td>
</tr>
<tr>
<td>Allied</td>
<td>Small</td>
<td>$500</td>
<td>Basic Allied = $1,000</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>$750</td>
<td>Premium Allied = $1,750</td>
</tr>
<tr>
<td></td>
<td>Large</td>
<td>$1,200</td>
<td></td>
</tr>
<tr>
<td>Individuals</td>
<td></td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Affiliated Members</td>
<td>FREE</td>
<td>FREE</td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td></td>
<td>FREE</td>
<td>FREE</td>
</tr>
</tbody>
</table>

Awards Winners
<table>
<thead>
<tr>
<th>Award</th>
<th>Winner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best Coverage with Services Group 1</td>
<td>Polynesienne Des Eaux (French Polynesia)</td>
</tr>
<tr>
<td>Best Coverage with Services Group 2</td>
<td>Eda Ranu (Papua New Guinea)</td>
</tr>
<tr>
<td>Best Coverage with Services Group 3</td>
<td>Niue Department of Utilities</td>
</tr>
<tr>
<td>Sustainable cost recovery for water and wastewater services – Group 1</td>
<td>Caledonienne Des Eaux (New Caledonia)</td>
</tr>
<tr>
<td>Sustainable cost recovery for water and wastewater services – Group 2</td>
<td>Water PNG (Papua New Guinea)</td>
</tr>
<tr>
<td>Established customer database and payment collection system – Group 3</td>
<td>Nauru, Central Pacific Utility</td>
</tr>
<tr>
<td>Best Customer Service - Group 1</td>
<td>American Samoa Power Authority (American Samoa)</td>
</tr>
<tr>
<td>Best customer service - Group 2</td>
<td>Chuuk Public Utilities Corporation (FSM)</td>
</tr>
<tr>
<td>Best Established water intake systems and piped water distribution – Group 3</td>
<td>Majuro Water and Sewer Company (Marshall Islands)</td>
</tr>
<tr>
<td>Best technical performance - Group 1</td>
<td>Caledonienne Des Eaux (New Caledonia)</td>
</tr>
<tr>
<td>Best technical performance - Group 2</td>
<td>Water PNG (Papua New Guinea)</td>
</tr>
<tr>
<td>Water delivery by trucks is organized and fully functioning with minimum losses - Group 3</td>
<td>Nauru Central Pacific Utility (Nauru)</td>
</tr>
<tr>
<td>Best Environmentally friendly utility: Wastewater collection and treatment Group 1</td>
<td>Polynesienne Des Eaux (New Caledonia)</td>
</tr>
<tr>
<td>Best Environmentally friendly utility: Wastewater collection and treatment Group 2</td>
<td>Samoa Water Authority (Samoa)</td>
</tr>
<tr>
<td>Best Environmentally friendly utility, Wastewater regularly collected from latrines Group 3</td>
<td>Infrastructure Cook Islands (Cook Islands)</td>
</tr>
<tr>
<td>Most Improved Utility – Group 1</td>
<td>American Samoa Power Authority (American Samoa)</td>
</tr>
<tr>
<td>Most Improved Utility - Group 2</td>
<td>Samoa Water Authority (Samoa)</td>
</tr>
<tr>
<td>Most Improved Utility – Group 3</td>
<td>Majuro Water and Sewer Company (Marshall Islands)</td>
</tr>
<tr>
<td>Best Utility 2017 – Group 1</td>
<td>Polynesienne Des Eaux (French Polynesia)</td>
</tr>
<tr>
<td>Best Utility 2017 – Group 2</td>
<td>Samoa Water Authority (Samoa)</td>
</tr>
<tr>
<td>Best Utility 2017 – Group 3</td>
<td>Majuro Water and Sewer Company (Marshall Islands)</td>
</tr>
<tr>
<td>Best Utility Overall for 2017</td>
<td>Samoa Water Authority</td>
</tr>
<tr>
<td>PWWA Best utility in gender Balance 2017</td>
<td>Central Yap State Public Service (FSM)</td>
</tr>
<tr>
<td>Percentage of women Employees - engineers</td>
<td>Caledonienne Des Eaux (New Caledonia)</td>
</tr>
<tr>
<td>Female staff salary as a % of male</td>
<td>Water PNG (Papua New Guinea)</td>
</tr>
<tr>
<td>PWWA 2017 Water professional of the year</td>
<td>Fuiava Sulumalo Amataga Penaia (Former CEO of MNRE, Samoa)</td>
</tr>
<tr>
<td>PWWA Young Water Professional Award 2017</td>
<td>Maryse Wamalo (Caledonienne Des Eaux – New Caledonia)</td>
</tr>
</tbody>
</table>