

**WATER AND SANITATION PROJECT
MANONO WATER RESOURCE ASSESSMENT**

19 - 26 August 1997

by

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PURPOSE OF THE MISSION

The overall purpose of the mission was to provide technical assistance to the Western Samoan Water Authority (WSWA) by assessing in a joint mission of the WSWA, the Apia Observatory and SOPAC’s Water and Sanitation Programme (WASP) the water resources on Manono Island, Samoa. A specific objective was to produce a comprehensive report through which the actual drinking water problems on Manono Island can be solved with water resources available on the Island. The results of the mission can be found in SOPAC Technical Report No. 255.

MEMBERS OF THE MISSION

Mr. Samuelu Samuelu	Works Engineer, WSWA
Mr. Faafia Brown	Hydrologist, Apia Observatory
Mr Giovanni Ricci	Hydrogeologist, SOPAC/ WASP
Mr. Harald Scholzel	Hydraulic Engineer, SOPAC/ WASP

TRAVEL ITINERARY

19 August 1997:	Suva - Apia by plane
20 August 1997:	Apia - Manono Island by car and boat
23 August 1997:	Manono Island by car and boat
25 August 1997:	Apia - Nadi by plane
27 August 1997:	Nadi - Suva by plane

DESCRIPTION OF ACTIVITIES OF THE TRIP

19 August 1997

8.30AM:	Meeting in the WSWA to coordinate further activities with regard to information procurement and travel arrangements to Manono Island.
10.00 AM:	Meeting with the Land and Environment Department to collect maps and aerial photographs.

11.30 AM: Meeting at the Apia Observatory with Mr. Ausetalia K. Titimaea, Deputy Director to collect borehole data and rainfall data as well as talks with the Executing Scientific Officer for Geophysics, Mr. Malele Faatoia.

14.00 PM: Meeting at the WSWA.

15.00 PM: Meeting at the Lands and Environment Department.

16.00 PM: Meeting at the Apia Observatory.

20 August 1997

Travel by car and boat from Apia to Manono.

The water quality of all 24 existing and used shallow wells on the Island was tested for Conductivity, Turbidity, pH- Value and Total Coliform Bacteria.

The results showed moderate to high Conductivity which implies Salinity values exceeding WHO recommended standards. Turbidity as well as pH- Value samples showed in all but one well satisfying results. Although WHO standards could not be met the Total Coliform test showed astonishing low levels of biological contamination. It is not yet clear if the testing equipment worked properly for earlier taken samples displayed very high contamination levels.

Besides testing the wells water quality, physical properties such as approximate yield of well, depth of well and the construction of the wells were also examined. As anticipated the wells are linked directly with the sea level and the water level rises according to the tidal range.

Investigations carried out during different stages of tidal movement showed no existing stratification between freshwater and seawater. With the present equipment the yield could not be more than an estimate and was determined as less than 30 litres per minute. Depth of the well ranged from 1.80 metres to 2.80 metres and water level changed in accordance with the tidal range.

21 August 1997

The first part of the day was used to identify suitable location to undertake geophysical investigations on Manono Island to assess the present ground water resource. The team could

identify about 15 appropriate sites which fulfilled criteria such as accessibility, elevation, and possible length of geophysics array at location.

During the afternoon and up until dusk, three resistivity tests using the Schlumberger-Array Method was carried out.

22 August 1997

Continued resistivity investigations in the field. Five Schlumberger resistivity soundings were taken.

23 August 1997

A comprehensive inventory of existing roof-rainwater catchments on Manono Island was undertaken. The inventory included data on installed storage capacity, contributing roof area (length of gutters), location and direction of roof-rainwater catchment as well as actual situation of the system. Further investigations were carried out to determine possible additional resources, eg. unutilised roofs and undersized roof catchments.

The inventory showed that about 100 roof-rainwater catchment systems exist on Manono Island of which about 50 per cent seem to perform according to accepted standards. The other 50 per cent consist of either systems with undersized roof-rainwater catchments or systems in very poor operational conditions.

Travel back to Apia at 14.30 PM.

25 August 1997

- 8.30 AM: Meeting at the **WSWA** with Dr Holgar Maier, Engineering Adviser.
- 9.30 AM: Meeting at the Apia Observatory with Mr. Ausetalia K. Titimaea, Deputy Director to collect more borehole data and rainfall data.
- 14:30 PM: Presentation of methodology and preliminary results of the assessment to WSWA staff.

During the meeting Mr. Akira Makino, Senior Volunteer of JICA to the WSWA, showed great interest in the work carried out by the SOPAC technicians and described roughly the problems he faces with a water supply scheme in Savai'i.

Asau, a town of approximately 7,000 inhabitants and located in the northern part of Savai'i is to be provided with about 20 l/s additional drinking water. Due to the geological conditions the abstraction of groundwater seems to be the most viable and economical option. However, the assessment of the groundwater resource is difficult and in most cases expensive.

After having learned that SOPAC could provide the relevant expertise for the required investigations it was agreed that the SOPAC-based Water and Sanitation Programme provides Mr. Makino and the WSWA with relevant Terms of Reference (TOR) and a cost estimate for groundwater investigations in a 10 km² area east of Asau.