



AMERICAN SAMOA POWER AUTHORITY

SCOPE OF WORK

Inflow and Infiltration Study Project

1. Project Background:

ASPA's 2025 Wastewater Utility Plan (WWUP) identified high Inflow and Infiltration (I&I) in the wastewater collection systems (WWCS) as a challenge due to their proximity to the ocean, collection system pipes at elevations below sea level, and aging infrastructure. As a result, the WWUP recommends conducting an I&I study to help determine the cause of I&I into our collection system. Tutuila has two WWCS, Tafuna WWCS and Utulei WWCS; the study will evaluate both. We should be able to update our Wastewater Book once this study is completed.

2. Project Description:

The project will focus on our entire Tutuila Wastewater Collection System. The study will look at all our manholes, 1600# plus manholes, their status, pipeline, (gravity and force main), 57 miles of Sewer pipes, 20 existing Lift Stations and 4# newly built ones their status and then recommend a course of action to address the challenges of inflow and infiltration to our collection system. They will provide ASPA the direction on how ASPA can eliminate or minimize on I&I. To do this they will need to use updated I&I tools available in the market such as CCTV Camera, Flow measurement, using flow meters, smoke test, Dye Water Testing, electrical leak location, acoustic, and/or sewer scanning evaluation technology (SSET). The target is for ASPA to have a clear direction on how we need to address I&I. I&I is one of the key elements identified and major contributing flow into our treatment plants.

3. Project Area:

This project will focus on the entire Tutuila Wastewater Collection System. Within the projected area we have more than 57 miles of sewer pipes, 24# of Lift Stations and about 28,000 people are connected to our system.



4. Project Goal and Objective

The key objective and goal of this I&I Study Project is to:

1. Review structural integrity of all existing manholes and sewer pipe for any potential I&I within the Wastewater Collection System.
2. Establish I&I Benchmark that ASPA can use to manage I&I within the wastewater collection system.
3. Review and evaluate current I&I using flow meters and other means of measuring sewer flow and I&I.
4. Provide a detailed report and analysis on I&I to help ASPA address this challenging subject. This shall include a prioritized list of improvements that can be made to reduce I&I.
5. Provide capital cost improvement and life cycle cost comparison that will help ASPA to decide on the priority of implementation.
6. To review and update our current Wastewater Book.

5. SCOPE OF WORK (SOW)

A. Generals:

The intention of this study project is for any qualified Consultants/Engineering firm to be engaged by ASPA to carry out detail study for I&I within the wastewater collection system as shown on the location map. The I&I study will develop a benchmark and provide the direction into the level of I&I our collection systems have and also highlight critical areas that will need to be addressed. The study shall consider the recommendations in the WWUP on the I&I and use this as a guide towards their approach to this study.

B. Study Criteria and Approach:

The I&I Study criteria shall focus on the following:

As part of this study criteria, reference to what is recommended on the WWUP (Wastewater Utility Plan) will govern the study. Use of temporary meter to measure flow shall be included to determine I&I within individual basins. Refer to WWUP on recommended approach, but we are not limited to that, where other means of flow measurement available can help in establishing I&I with the collection system. The criteria for the study shall also include the following activities:

1. Collection and evaluation of all current wastewater assets such as manholes, sewer mains pipes and laterals pipes within our Collection System such as pipe type, pipe material, pipe sizes, depth, manhole type, depth, size etc.
2. Carry out Flow measurements using temporary flow meters to measure and determine I&I in each collection basin.
3. Identify which of the of the major basins are contributing most to I&I and then divide into to smaller basins to identify where I&I is entering the system.
4. Confirm current flow in and out of the Lift station, pump details and Lift Stations detail, pump discharge etc.
5. Inspect and confirm sources of I&I within the collection system and means to mitigate it.
6. Determine structural integrity of all our existing manholes, sewer mains and lateral pipes within our collection system using up to date CCTV and/or SSET to evaluate structural integrity.
7. Analyze these collected data and provide a priority list for system maintenance and repair to reduce I&I with cost.
8. Provide a detail assessment on the impact of I&I to our collection system, sanitary sewer overflows and treatment capacity, what contributed to it and cost to mitigate it.
9. Provide cost analysis on the impact of I&I to ASPA and determine the savings level if I&I are reduced to standard level.
10. Provide ASPA a benchmark which they can use in future to determine an increase or decrease in I&I within their collection system.
11. Provide detail discussion and evaluation on ways and means to calculate inflow and infiltration so our team will be able to understand and estimate I&I in the future.
12. Provide detail discussion and evaluation on ways to inspect sources of inflow and infiltration within our collection system and basins.

13. Provide detail discussion on other sewer inspection method and what ASPA can use in relation to their location and accessibility.
14. Discuss and evaluate what technique are currently available to reduce infiltration and what ASPA can use to mitigate infiltration.
15. Provide a detail discussion and evaluation on the financial implication of excessive I&I in our collection system and a priority list of improvements and detail costing to help ASPA reduce I&I.
16. Provide detail analysis of discussion and evaluation on impact of I&I to wastewater treatment capacity and meeting regulated standard of discharge.
17. Provide training on the use of Sewer Model to Wastewater staff who will need to use the software.
18. Provide training to ASPA staff for the use of camera, flow meter reading for I&I, to help our field people understand I&I and its impact to our collection system and treatment plant.
19. Updating our Wastewater Book to reflect current findings on pipe sizes, manhole, Lift Station, flow meters Treatment Plant, levels and other relevant information that needs to be part of the Wastewater Book.

C. Study Expectation

The I&I Study outcomes shall include:

Better assessment of our current status of I&I, causes of I&I, action plan to be taken and means to address I&I etc.

1. Comprehensive assessment on status of our current assets, manhole, sewer mains pipe, lateral pipe, lift stations, pumps, etc. and update our Wastewater Book
2. Comprehensive assessment of flow, flow measurement and means of addressing various flow regime.
3. Cost Analysis to reflect current operation and maintenance cost and future cost once I&I is addressed.
4. Develop a prioritized plan of projects to reduce I&I.
5. Put together a cost analysis and capital cost investment for ASPA review and action.
6. To build a model for Wastewater Collection System that ASPA can use for future wastewater development forecast and to train ASPA on how to use the model.
7. The updated of our Wastewater Book

D. Study Report:

The study report shall include but not limited to the following:

1. Status and level of I&I with our collection system
2. Capture flow measurement as a mean of justifying I&I
3. Impact of I&I to our Operation and Maintenance
4. Capital Improvement cost
5. Direction ASPA to take in tackling this challenging subject
6. Causes of I&I with some benchmarks stated.
7. Updated Wastewater Book

E. Assumption and Constraints

1. Our As-built is not that accurate and this study will have to make sure we have an updated Wastewater Book.
2. Some of our sewer main and lateral may be under some newly constructed building.
3. ROW issues will be managed by ASPA with 2-day notice
4. Mobilization refers to fieldwork crews only, not construction mobilization
5. Some of our sewer mains and laterals may be crossing private property and community own land.

F. Quality Control

1. We will require QA/QS Plan from consultant to monitor review process
2. Consultant shall maintain a response log to capture all comments

G. Reporting Format

1. The report shall be submitted in logical increments similar to the following:
 - i. Milestone schedule and timeline
 - ii. Outline of report submittal
 - iii. 30% submittal
 - iv. 60% submittal
 - v. 90% Submittals
 - vi. Final draft submittal. Final report is complete once ASPA and USEPA approves of and signs Final submittal.
 - vii. Each submittal will be succeeded by an ASPA and USEPA review with comments within 20 calendar days. These comments shall be addressed and incorporated into the next submittal if recommended. Also, an ASPA comment and selected firm response list shall be maintained and shared with ASPA.

H. Selection Criteria

The Scope of Work forms part of the evaluation criteria for selecting the consultant. By submitting a proposal, the consultant acknowledges full understanding of the project requirements, existing conditions, and all constraints outlined in this document, and agrees to comply with them without claims of misunderstanding or lack of awareness.

