REVISED as of 2026-09-04

SCOPE OF WORK

TAFUNA OUTFALL EXTENSION AND DIFFUSER UPGRADE STUDY

1. PROJECT BACKGROUND:

This project is the result of the August 6, 2025, letter USEPA sent to American Samoa Power Authority (ASPA) to address our need to meet the Clean Water Act (CWA) requirement. In light of the 2025 Secondary Treatment Feasibility Study, the letter requires ASPA to take certain actions to attempt to meet the CWA requirements. However, if this project is implemented, it will help ASPA meet these regulatory standards of discharge into the ocean of American Samoa.

2. PROJECT GOAL AND OBJECTIVES

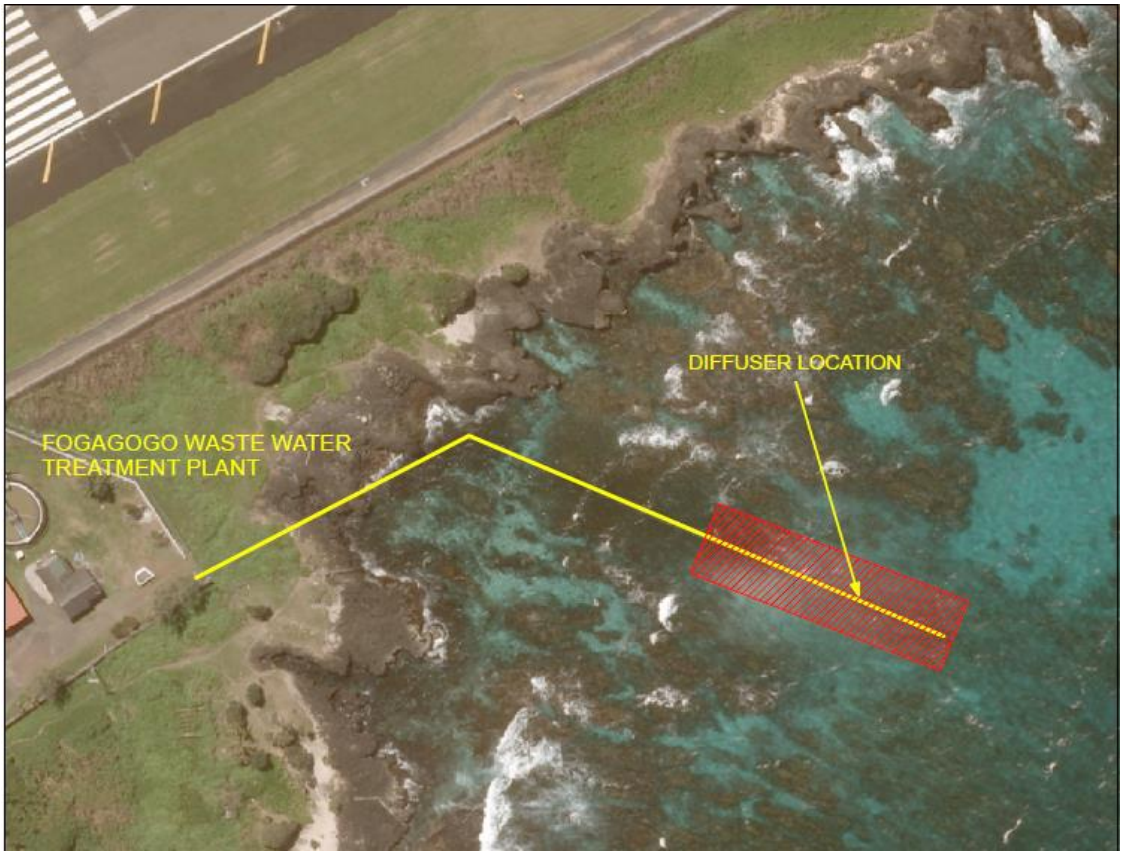
The goal and objective of this project is to engage an Engineering Consultant to carry out a feasibility study of the current outfall and diffuser. The possibility of extending the outfall and upgrading the diffuser for the benefit of increasing the dilution and mixing so that we will continue to meet CWA requirements and the Water Quality Standard of American Samoa. Meeting these regulatory standards, especially the nutrient limits, is the primary objective and goal of this feasibility study.

3. PROJECT DESCRIPTION:

The project will carry out a feasibility study and recommend which option will be available for ASPA to consider so that our outfall and diffuser dilution and mixing will meet the CWA requirements. Once we can determine, through this feasibility study, the direction, we will then proceed to design and implement the project. This feasibility study will also provide ASPA with a conceptual plan that the designer can work with in producing a design drawing. The feasibility study will look at the current outfall and diffusers and carry out an assessment on how it works and the reason we are not meeting the discharge regulatory standard for effluent discharge with the goal of increasing the dilution factor. The feasibility study for Secondary Treatment also recommended re-evaluating the outfall and diffuser configuration in an attempt to meet these regulatory standards before ASPA can consider Secondary Treatment.

4. PROJECT AREA:

This project will focus on Tafuna Wastewater Treatment Plant Outfall.



5. PRIMARY OBJECTIVE & PROJECT GOALS

5.1. Primary Objective

The primary objective of this project is to retain a highly qualified, multi-disciplinary environmental engineering firm to perform a rigorous evaluation of the existing Tafuna Wastewater Treatment Plant (WWTP) Ocean Outfall and Diffuser system.

The consultant will execute a sequence of diagnostic marine inspections, hydrodynamic plume modeling, and engineering feasibility analyses to definitively establish whether the existing asset safely, reliably, and legally serves its intended disposal purpose.

If the baseline study determines that the existing system is deficient, the consultant will identify, evaluate, and provide a 60% conceptual engineering design for optimal physical upgrades—specifically focusing on diffuser re-engineering, initial dilution maximization, and/or an offshore pipeline extension along the Fogagogo reef shelf.

5.2. Core Project Goals

To fulfill the primary objective, the selected consultant must achieve the following milestones:

- **Goal 1: Establish Structural and Operational Reality** – Accurately document the current physical condition (including structural degradation, internal/external corrosion, and port blockage) of the underwater outfall barrel and diffuser assembly using professional dive teams and high-definition ROV (Remotely Operated Vehicle) footage.
- **Goal 2: Deliver Data-Driven Engineering Alternatives** – Provide a clear, legally defensible recommendation on whether the outfall should remain "as-is," undergo land-based and port-level operational reconfigurations, or be physically extended into deeper offshore water to optimize the jet velocity of effluent mixing.
- **Goal 3: De-risk Regulatory and Environmental Liabilities** – Ensure all proposed alternatives protect local marine benthic habitats (specifically vulnerable coral reef ecosystems) and align seamlessly with the U.S. EPA Region 9 National Pollutant Discharge Elimination System (NPDES) criteria and American Samoa Environmental Protection Agency (ASEPA) water quality standards (ASWQS).
- **Goal 4: Safeguard Capital Investment** – Provide ASPA with highly accurate Association for the Advancement of Cost Engineering (AACE) Class 4 capital and O&M life-cycle cost matrices so that leadership can make a financially sound, multi-decade infrastructure investment decision.

6. SCOPE OF WORK (SOW)

6.1 Detailed Tasks & Deliverables

The Detailed Task and Deliverables of this SOW has to be based on the tasks identified here and engineering consultant has to be aware of these expected milestones.

Task 1: Baseline System Evaluation & Inspection

- **Structural Inspection:** Conduct a comprehensive underwater inspection using certified commercial divers or deep-water Remotely Operated Vehicles (ROVs). Document biofouling, sediment buildup, internal/external corrosion, structural shifting, or damage to anchoring mechanisms.
- **Hydraulic Efficiency Review:** Analyze original design capacities versus current and projected peak wet-weather flows to identify bottlenecks or backpressure within the outfall barrel.
- **Effluent & Receiving Water Data Review:** Review historical monitoring data in influent, effluent, and receiving water (, the zone of initial dilution (ZID), and surrounding ocean areas).
- **Deliverable 1:** *Existing Conditions & Structural Integrity Assessment Report.*

Task 2: Hydrodynamic & Plume Modeling

- **Identify Target Dilution Factor:** Determine the target dilution factor needed to achieve compliance with the nutrient limits in the ASWQS under the worst-case scenario.
- **Near-Field and Far-Field Modeling:** Utilize up to date industry-standard software (e.g., Visual Plumes, UM3, CORMIX) to model effluent plume behavior consistent with the American Samoa Water Quality Standard mixing zone policy.
- **Dilution Modeling for each Alternative:** Calculate the critical initial dilution factor for each of the proposed alternatives under the worst-case scenario as discussed below.
- **Density Profile:** Once the preferred alternative is identified, provide a vertical density profile at the diffuser location.
- **Deliverable 2:** *Hydrodynamic Modeling and Mixing Zone Report.*

Task 3: Upgrade Alternatives Analysis & Engineering Design

- **No-Action vs. Action Analysis:** Determine if operational changes can fix mixing issues to meet the American Samoa Water Quality Standard nutrient limits, or if physical infrastructure modifications are required.
- **Alternative 1 (Port Reconfiguration):** Design and evaluate changes to the existing diffuser ports (modifying discharge angles, altering port diameters, or installing high-performance duckbill check valves).
- **Alternative 2 (Offshore Extension):** Assess the engineering requirements for extending the outfall line into deeper offshore water. This must include reef slope bathymetry, geotechnical challenges, and structural anchoring designs capable of surviving major tropical cyclones.
- **Alternative 3:** Third alternative that achieves the target dilution factor.
- **Deliverable 3:** *Alternatives Analysis & Feasibility Study (with 60% conceptual designs for the preferred option).*

Task 4: Environmental Assessment & Permitting Matrix

- **Benthic and Marine Habitat Mapping:** Conduct localized marine surveys along any proposed extension route to identify protected species, critical habitats, essential fish habitats, or sensitive ecosystems.
- **Regulatory Compliance Roadmap:** Outline all steps required to secure or update US EPA Region 9 NPDES permits, American Samoa EPA (ASEPA) water quality certifications, Army Corps of Engineers, NMFS, USFWS and American Samoa Department of Marine and Wildlife Resources. Propose a workflow for the local Project Notification and Review System (PNRS).

- Assess the environmental impact for both alternatives and provide 3-5 pages report on the impact and its mitigation options.
- **Deliverable 4:** *Environmental Information Document (outline here: https://www.epa.gov/system/files/documents/2022-10/EID%20Outline.pdf), Regulatory Permitting Matrix, and biological assessment.*

Task 5: Final Report, Cost Estimation, and Presentation

- **Life-Cycle Cost Estimating:** Develop an Association for the Advancement of Cost Engineering (AACE) Class 4 capital and O&M cost estimate for all viable upgrade paths.
- **Net Present Value (NPV):** Complete a 20-year NPV calculation comparing the financial sustainability of the alternatives mention in Task #3
- **Cost to Customer:** Evaluate how much additional cost our customer will have to pay if we introduce this extension and upgrade.
- **Recommended Alternative:** Identify the preferred alternative taking into account operations and maintenance, environmental impacts, and cost estimates.
- **Final Presentation:** Conduct technical workshops with ASPA leadership, operations staff, and regulatory stakeholders to present findings.
- **Deliverable 5:** *Final Tafuna Outfall Evaluation and Diffuser Upgrade Study following this outline*: https://www.epa.gov/sites/default/files/2017-09/documents/per_508.pdf.

6.2 Safety & Marine Operations Standards

As for this project, focus will be on safety and marine operational standard to avoid any potential damage when doing the study. The following key areas shall guide this study:

- **Commercial Diving Standards:** All dive operations must strictly comply with OSHA 29 CFR Part 1910, Subpart T (Commercial Diving Operations) and the U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1, Section 30).
- **No Recreational Diving:** Recreational, scientific, or SCUBA-only protocols are strictly prohibited. All diving must be performed by a certified commercial dive team using surface-supplied air with hardwire two-way voice communications.
- **Personnel Qualifications:** The contractor must submit valid Association of Diving Contractors International (ADCI) or commercial equivalent certifications for the Diving Supervisor, Divers, and Tenders prior to starting field work.
- **ROV Operations:** ROV systems must be industrial-grade, equipped with high-definition video recording, scaling lasers, a positioning beacon (USBL), and tether lengths adequate for safely tracking the entire length of the existing outfall pipe.

- **Mandatory Documentation:** The selected consultant must submit a *Safe Practices Manual*, site-specific *Dive Plan*, *Job Hazard Analysis (JHA)*, and a localized *Emergency Action Plan (EAP)* to ASPA for approval at least 14 business days before field mobilization.

6.3 Insurance Requirements (Minimum Coverage Limits)

Insurance coverage has to be considered as well when planning to do this study:

The consultant and their marine subcontractors must maintain the following insurance coverage throughout the life of the study:

- **Commercial General Liability (CGL):** $2,000,000 per occurrence / $4,000,000 aggregate (must explicitly cover marine and underwater activities).
- **Professional Liability / Errors & Omissions:** $2,000,000 per claim / aggregate (covering hydrodynamic modeling and engineering designs).
- **Maritime Liability (Jones Act & Marine Hull):** $1,000,000 minimum to cover crew injuries, vessel liability, and equipment loss on the water.
- **Workers' Compensation:** Statutory limits covering all onshore and offshore personnel, including Longshore and Harbor Workers' Compensation Act (USL&H) endorsements where applicable.

6.4 Design Criteria to Support Design RFP

The consultant, as part of this study shall put together a design criteria that will govern the design for the recommended alternative:

- Deign Standard and criteria that shall provide and govern the extension of the outfall and diffuser upgrade as recommended in the study.
- A standard bid document for the design proposal for the RFP
- Put together additional working documents that will govern the design scope of work.
- The design scope of work shall be used for the design of the outfall extension and diffuser upgrade as per recommendation.

7. TIMELINE & MILESTONE FRAMEWORK

This study is structured in phases and milestones which consultants are expected to work within the timeline and milestone expected of them. They shall closely follow what been identified herewith:

- **Phase 1: Mobilization & Desktop Review - 1 months**
    - Kickoff meeting, historical ASPA flow data aggregation, and structural drawing reviews.
    - *Milestone:* Finalized Dive Plan and JHA approved by ASPA.
- **Phase 2: Marine Field Investigation – 2-3 months**
    - Execution of the underwater commercial dive and ROV inspections along the outfall barrel and diffuser zones.
    - Bathymetric data verification along the potential reef-slope extension path.

- *Milestone:* **Existing Conditions & Structural Integrity Report** (including raw HD video footage and port condition matrix).

- **Phase 3: Hydrodynamic Plume Modeling – 1 month**
  - Build and run CORMIX/Visual Plumes models simulating ambient stratification and current trends.
  - *Milestone:* **Hydrodynamic Modeling and Mixing Zone Report**.
- **Phase 4: Alternatives Analysis & Engineering – 2 months**
  - Developing and vetting options (diffuser alterations vs. pipeline extension options).
  - Preparation of 60% conceptual engineering drawings.
  - Milestone: **60% Conceptual Drawing**
- **Phase 5: Environmental & Permitting Matrix - 1 months**
  - Reviewing compliance with EPA Region 9 NPDES rules, ASEPA water standards, and PNRS workflows.
  - *Milestone:* **Environmental Impact Assessment & Permitting Matrix**.
- **Phase 6: Finalization & Costing – 1 months**
  - Development of life-cycle costs and AACE Class 4 construction estimates.
  - *Milestone:* **Final Tafuna Outfall Evaluation and Diffuser Upgrade Study**

8. DELIVERABLE

This project shall be delivered within a timeline of 180 calendar days from the day of NTP issuance.

A. 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 - Completing Phase 1&2

iv. 60% submittal – Completing Phase 3, 4, 5 &6

v. 90% submittals – Completing all Phases of the study with recommendations.

vi. Final draft submittal. Final report is completed 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 15 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.

viii. It shall be mandatory that monthly meeting between ASPA and the consultant shall be scheduled by the consultant to discuss progress, challenges, updates and review submittals.

B. The Consultant shall provide two Post Study presentations/workshops of the final ASPA approved report.

i. One presentation/workshop is for the ASPA Board, the Executive Director and upper management including lunch refreshments for up to 10 staff.

ii. The second presentation/workshop shall be for the ASPA WW Department Operations staff, including lunch refreshments for up to 20 staff.

iii. Each presentation/workshop shall last up to 3 hours, first half to provide a clear explanation of the report and its highlights and the second half to include a question and answer period. Presentation/workshop can be "in person" or by video conference including an agenda and hands on use of the report.

iv. Presentations/workshops shall be conducted by the Firm's main contributors to the study as well as the professional licensed staff who approved the report. The goal is for the audience to thoroughly understand the report, the report's analysis of the ASPA WW System, WWTP's, recommended by-pass system facilities and associated implementation impacts and related topics.

C. Minimum Deliverables:

i. The complete and ASPA approved Study.

ii. A 2 to 3 page "easy on the eyes" type of Study "Summary" with schematics.

iii. Planning, pre-design, engineered and EOR stamped documents related to the study such as value-engineering analysis, calculations, technical specifications and standards.

iv. Milestone schedule and timeline to completion with summary descriptions.

v. Post report presentation/workshop slides, summary and agenda.

vi. Three (3) hard bound copies and electronic copies (i.e. AutoCAD, pdf, Excel spreadsheet, ArcGIS) of report, summary, maps, tables, figures and all deliverables.

vii. Other items as necessary.