301(h)-Modified NPDES Permit Reissuance Questionnaire for Small Dischargers

TAFUNA WASTEWATER TREATMENT PLANT

NPDES Permit No. AS0020010

Submitted By

AMERICAN SAMOA POWER AUTHORITY

May 4, 2004

I. Introduction

1. This questionnaire is to be submitted by both small and large applicants for modification of secondary treatment requirements under section 301(h) of the Clean Water Act (CWA). A small applicant is defined as a POTW that has a contributing population to its wastewater treatment facility of less than 50,000 and a projected average dry weather flow of less than 5.0 million gallons per day (mgd, 0.22 cubic meters/sec) [40 CFR 125.58(c)]. A large applicant is defined as a POTW that has a population contributing to its wastewater treatment facility of at least 50,000 or a projected average dry weather flow of its discharge of at least 5.0 million gallons per day (mgd, 0.22 cubic meters/sec) [40 CFR 125.58(c)]. The questionnaire is in two sections, a general information and basic requirements section (part II) and a technical evaluation section (part III). Satisfactory completion by small and large dischargers of the appropriate questions of this questionnaire is necessary to enable EPA to determine whether the applicant's modified discharge meets the criteria of section 301(h) and EPA regulations (40 CFR part 125, subpart G).

2. Most small applicants should be able to complete the questionnaire using available information. However, small POTWs with low initial dilution discharging into shallow waters or waters with poor dispersion and transport characteristics, discharging near distinctive and susceptible biological habitats, or discharging substantial quantities of toxics should anticipate the need to collect additional information and/or conduct additional analyses to demonstrate compliance with section 301(h) criteria. If there are questions in this regard, applicants should contact the appropriate EPA Regional Office for guidance.

3. Guidance for responding to this questionnaire is provided by the newly amended section 301(h) technical support document. Where available information is incomplete and the applicant needs to collect additional data during the period it is preparing the application or a letter of intent, EPA encourages the applicant to consult with EPA prior to data collection and submission. Such consultation, particularly if the applicant provides a project plan, will help ensure that the proper data are gathered in the most efficient matter.

4. The notation (L) means large applicants must respond to the question, and (S) means small applicants must respond.

II. General Information and Basic Data Requirements

II.A. Treatment System Description

II.A.1. (L,S) On which of the following are you basing your application: a current discharge, improved discharge, or altered discharge, as defined in 40 CFR 125.58? [40 CFR 125.59(a)]

The application is based on a current (existing) discharge from the American Samoa Power Authority (ASPA) Tafuna wastewater treatment plant (WWTP) with an existing 301(h)-modified NPDES Permit No. AS 0020010. ASPA proposes an increase in annual average flow from 2 mgd to 3 mgd. No increase in maximum flow of 6 mgd or concentration of Total Suspended Solids (TSS) or Biochemical Oxygen demand (BOD) is requested. Data and analysis are included to support this increase in Attachment 2, titled "Supporting Technical Analysis for 301(h) Waiver Renewal for the Tafuna Wastewater Treatment Plant" (Supporting Technical Analysis).

Also, the applicant may request minor modifications in the diffuser configuration in the future. Data and analysis to support such a request is included in the Supporting Technical Analysis (Attachment 2)

II.A.2. (L,S) Description of the Treatment/Outfall System [40 CFR 125.62(a) and 125.62(e)]

a. Provide detailed descriptions and diagrams of the treatment system and outfall configuration which you propose to satisfy the requirements of section 301(h) and 40 CFR part 125, subpart G. What is the total discharge design flow upon which this application is based?

The Tafuna Wastewater Treatment Plant (Tafuna WWTP) is located on Tutuila Island, the largest and principal island of American Samoa (see Figures in Attachment 1). The Tafuna WWTP is a primary treatment plant. This plant presently serves the airport, a non-industrial business park, government housing in Tafuna, the Community College and 400 homes surrounding the Pala Lagoon special wetlands area. In addition, under the ongoing construction, funded in part with Clean Water Construction Grants funds, an additional 900 structures were connected under Phase I, and 350 were connected under Phase II, of the Tafuna Sewer Project.

The average flow to the existing plant in CY-2003 was 1.83 mgd. Future system expansions on the collection system are estimated to provide service to an estimated 20,000 people.

This facility discharges through a 0.6 m (24-inch) HDPE line directly into the South Pacific Ocean at a depth of 29 m (94.5 ft) approximately 476 m (1562 ft) from shore. Treatment at the Tafuna WWTP consists of primary sedimentation. Sludge is treated by digestion and placed in drying beds.

b. Provide a map showing the geographic location of proposed outfall(s) (i.e., discharge). What is the latitude and longitude of the proposed outfall(s)?

Please see location maps in Attachment 1.
The latitude of the existing Tafuna WWTP outfall is: S 14° 20′ 28.58″
The longitude of the existing Tafuna WWTP outfall is W 170° 43′ 04.28″

c. For a modification based on an improved or altered discharge, provide a description and diagram of your current treatment system and outfall configuration. Include the current outfall's latitude and longitude, if different from the proposed outfall.

Not applicable (N/A): the Tafuna WWTP is an existing facility and discharge.

II.A.3. (L,S) Primary or equivalent treatment requirements [40 CFR 125.60]

a. Provide data to demonstrate that your effluent meets at least primary or equivalent treatment requirements as defined in 40 CFR 125.58(r) [40 CFR 125.60]

Currently primary effluent standards require the average monthly BOD not to exceed 100 mg/l, and the TSS not to exceed 75 mg/l. The tentative decision of the EPA Regional Administrator pursuant to 40 CFR 125, subpart G, also required the demonstration of 30% removal of biochemical oxygen demanding material (BOD) from the influent on an annual averaging basis as a condition of the requirement for primary treatment. The table below demonstrates that the effluent meets and surpasses primary or equivalent treatment. The effluent pH is also in compliance with existing NPDES effluent limitations.

Tafuna WWTP Monthly Average Influent and Effluent BOD and Total Suspended Solids (TSS) and Percent Removal - CY 2003

Month	Flow mgd	Influent BOD (mg/l)	Effluent BOD (mg/l)	BOD % Removed	Influent TSS (mg/l)	Effluent TSS (mg/l)	TSS % Removed
Jan	1.84	82	36	56	148	38	74
Feb	1.88	82	41	50	101	32	68
Mar	1.84	88	44	50	112	33	71
Apr	1.91	91	49	46	161	38	76
May	2.00	67	42	37	139	29	79
Jun	1.76	69	45	35	88	29	67
Jul	1.78	128	70	45	83	31	63
Aug	1.76	126	64	49	205	50	76
Sep	1.82	161	75	53	163	69	58
Oct	1.61	115	64	44	171	36	79
Nov	1.88	105	67	36	113	39	65
Dec	1.88	326	57	83	90	40	56
Average	1.83	120	55	49	131	39	69
		BOD Removed		**49%**	**TSS Removed**		**69%**

b. If your effluent does not meet the primary or equivalent treatment requirements, when do you plan to meet them? Provide a detailed schedule, including design, construction, start-up and full operation, with your application. This requirement must be met by the effective date of the new section 301(h) modified permit.

N/A

II.A.4. (L,S) Effluent Limitations and Characteristics [40 CFR 125.61(b) and 125.62(e)(2)]

a. Identify the final effluent limitations for five-day biochemical oxygen demand (BOD5), suspended solids, and pH upon which your application for a modification is based:

The requested effluent limitations for Tafuna WWTP presented in the table below are calculated based on using a projected end-of-permit annual average flow of 0.131 m^3/sec (3.0 mgd). This projected flow is based on the population growth, which has occurred in the Tafuna Plains area serviced by the Tafuna WWTP. Under the ongoing construction program, the plant flows are anticipated to be 3.0 mgd at the end of the permit period. The plant capacity is designed to handle this anticipated flow projection. The concentration limitations shown in table below, for BOD and TSS, are based on the previous 301 (h)-modified NPDES permit first issued June 30, 1985, and re-issued Sept 30, 1999.

Requested Effluent Limitations for Tafuna WWTP

	Mass Emissions (lbs/day)			Concentration (mg/l)		
	Monthly	Weekly	Daily	Monthly	Weekly	Daily
BOD (5 day)	2502	3753	5004	100	150	200
Suspended Solids	1877	2827	3753	75	113	150
Settleable Solids	N/A			1 ml/L	N/A	2 ml/L
pH	Not less than 6.5 nor greater than 8.6					

b. Provide data on the following effluent characteristics for your current discharge as well as for the modified discharge if different from the current discharge:

For the data categories below there is no average dry weather and average wet weather values provided because in American Samoa the climate is classified as the humid tropics[1] with wet months occurring on a year-round basis. Tables with the minimum, maximum and monthly averages are included in the Supporting Technical Analysis (Attachment 2, Appendix 1). Two annual averages are given below: the 2003 annual average and the 5-yr annual average from 1999 to 2003.

[1] Humid tropical classification as mapped in Appendix F, Proceedings and Report *Tropical Water Quality Indicator Workshop*. Special Report SR-2004-01. Fujioka, Roger S., and Muruleehara N. Byappanahalli (Eds.) University of Hawaii at Manoa, Water Resources Research Center, Honolulu, Hawaii 96822.

Flow (m^3/sec):

—***minimum*** 0.02 mgd - reported Aug 2002
—***average dry/wet weather*** N/A
—***maximum*** 5.80 mgd - reported Nov 2000
—***2003 annual average*** 1.83 mgd (average daily flow)
—***5-yr annual average*** 1.68 mgd (5-year average daily flow)

BOD5 (mg/l) for the following plant flows

—***minimum*** 12 mg/l - reported Aug 2001
—***average dry/wet weather*** N/A
—***maximum*** 96 mg/l - Jul 2003
—***2003 annual average*** 55 mg/l (average of 2003 monthly averages)
—***5-yr annual average*** 41mg/l (5-yr avg., of annual monthly avg.)

Suspended solids (mg/l) for the following plant flows:

—***minimum*** 2 mg/l - reported Mar 1999, Jun 2000, Jun 2002
—***average dry/wet weather*** N/A
—***maximum*** 250 mg/l - reported Aug 1999
—***2003 annual average*** 39 mg/l (average of 2003 monthly averages)
—***5-yr annual average*** 34 mg/l (5-yr avg., of annual monthly avg.)

pH:

—***minimum*** 6.7 SU - reported Jan 2001, Jun 2002, Oct, Dec 2000
—***maximum*** 7.6 SU - Reported Oct 2003

Dissolved oxygen (mg/l, prior to chlorination) for the following plant flows:

—***minimum***
—***average dry/wet weather***
—***maximum***
—***annual average***

N/A: No dissolved oxygen (DO) measurements are available for the Tafuna WWTP effluent. DO data collection is not required under the existing 301(h)-modified NPDES permit. Effluent DO is assumed to be 0.0 mg/l for analysis of effluent effects on receiving water DO.

Immediate dissolved oxygen demand (mg/l):

N/A: IDOD has not been measured. IDID of 5 mg/l is assumed for analysis of effluent effects on receiving water following the method provided in the EPA 301(h) Technical Support Document (TSD)[2]. Based on travel time and BOD_5 concentration.

[2] Amended Section 301(h) Technical Support Document, US EPA, Office of Water, EPA 842-B-94-007, September 1994.

Toxic pollutants and pesticides (µg/L):

—list each toxic pollutant and pesticide (See Table below)

—list each 304(a)(1) criteria and toxic pollutant and pesticide (See Table below)

Tafuna WWTP Results of 1990 Priority Pollutant Analysis

(Data shown for constituents for which 304(a) criteria exist and for constituents with concentrations above the method detection limit)

Category	Constituent	Concentration (µg/l)	Criteria		
			Saltwater: Aquatic Life		HCC[1]
			CMC	CCC	
Metals	Arsenic	15.9	69	36	0.14
	Copper	22.1 (J)[2]	4.8	3.1	
	Lead	12.4	210	8.1	
	Zinc	73.4	90	81	
	Manganese (NPP)[3]	47.3 (J)			100
	Silver	25.8 (J)	1.9		
Pesticides/PCBs	gamma BHC	0.06	0.16		
Semi-volatiles	Benzene	5			51
	1,4-diclorobenzene	3 (J)			2600

[1] HCC = Human Health Criteria for consumption of organisms only
[2] J = Value is estimated
[3] NPP = Constituent is not a priority pollutant

Note: 1990 priority pollutant analysis was conducted by USEPA for the Tafuna WWTP and results were included in the 301(h)-modified NPDES permit application submitted to USEPA in March 1996. Most of the constituents were non-detect and reported at the non-detect (U) levels.

II.A.5. (L,S) Effluent Volume and Mass Emissions [40 CFR 125.62(e)(2) and 125.67]

a. Provide detailed analyses showing projections of effluent volume (annual average, m^3/sec) and mass loadings (mt/y) of BOD_5 and suspended solids for the design life of your treatment facility in five-year increments. If the application is based upon an improved or altered discharge, the projections must be provided with and without the proposed improvements or alterations.

The Table below provides the results of the analyses of projected effluent volume and mass loadings in five-year increments for Tafuna WWTP without any improvements or alterations but based on anticipated increased flows, are as follows:

Tafuna WWTP Effluent Volume and Loading Projections			
Year	Effluent Average Annual Volume (m^3/s)	Mass Loading (metric tons/yr)	
		BOD	Suspended Solids
2005	0.088	276	207
2010	0.131	414	311
2015	0.131	414	311
2020	0.131	414	311

b. Provide projections for the end of your five-year permit term for 1) the treatment facility contributing population and 2) the average daily total discharge flow for the maximum month of the dry weather season.

The projections for 2010 are based on the completion of much of the ongoing construction project serving up to 20,000 people, and the anticipated average daily total effluent discharge flow of 150 gpcd (3 mgd).

II.A.6. (L,S) Average Daily Industrial Flow (m^3/sec). Provide or estimate the average daily industrial inflow to your treatment facility for the same time increments as in question II.A.5 above. [40 CFR 125.66]

Only domestic sewage is allowed by regulation and enforcement into the Tafuna collection system, and the Tafuna WWTP. Domestic sewage, by definition, is also contributed by restaurants, laundromats, and the domestic sewage from businesses in the Tafuna Industrial Park. The industrial flow for the Tafuna WWTP has not changed since the Section 301(h)-modified NPDES permit for this facility was issued in 1985. Any industrial flow, by regulation, will require extensive pre-treatment at the source prior to entering into the Tafuna collection system. There are currently no industrial wastewater flows in operation, and there do not appear to be any in the planning process, based on verbal communication with staff of the Department of Commerce, PNRS review (American Samoa land-use planning process).

II.A.7. (L,S) Combined Sewer Overflows [40 CFR 125.67(b)]

a. Does (will) your treatment and collection system include combined sewer overflows?

No, combined sewer overflows do not exist in the Tafuna WWTP collection system. Such overflows are prohibited by regulation, and inspections on all structures are made prior to providing permanent power and water. Only ASPA wastewater employees are allowed to tap into the collection system.

b. If yes, provide a description of your plan for minimizing combined sewer overflows to the receiving water.

N/A

II.A.8. (L,S) Outfall/Diffuser Design. Provide the following data for your current discharge as well as for the modified discharge, if different from the current discharge: [40 CFR 125.62(a)(1)]

—Diameter and length of the outfall(s) (meters)
Outfall is 0.61-meter (24-inch) HDPE pipe with a 0.53-meter (21-inch) inside diameter. The total outfall length with the diffuser is 476.1 meters (1562 feet)

—Diameter and length of the diffuser(s) (meters)
Diffuser is 0.61-meter (24-inch) HDPE pipe with a 0.53-meter (21-inch) inside diameter. The total diffuser length is approximately 15.2 meters (50 feet).

—Angle(s) of port orientation(s) from horizontal (degrees)
The port angle is 0 degrees horizontal set on 0.91-meter (3-ft) high risers.

—Port diameter(s) (meters)
The six (6) ports have diameters of 0.1956-meters (7.7-inch) with variable orifice plates, resulting in one port each of following sizes in the offshore direction:

0.19-meter (7.5-inch)
0.17-meter (6.5-inch)
0.14-meter (5.5-inch)
0.13-meter (5.0-inch)
0.11-meter (4.5-inch)
0.10-meter (4.0-inch)

The proposed condition is as shown in the table below.

—Orifice contraction coefficient(s), if known
The orifices are consistent with a sharp edged orifice.

—Vertical distance from mean lower low water (or mean low water) surface
Each of the 6 ports has a slightly variable vertical distance that ranges between 26.7 and 27.9 meters (MLLW) (87.6 to 91.5 feet MMLW). The exact depths for each port are given in table below.

—Outfall port(s) centerline (meters)
The diffuser port centerline is 1.07 meters (3.5 feet) from the seabed.

—Number of ports
The diffuser has 6 ports.

—Port spacing (meters)

The port spacing is 3.05 meters (10 feet)

—Design flow rate for each port, if multiple ports are used (m^3/sec)

The design flow rates, as-built flow rates, and proposed flow rates are given in the table below. A description of the modeling used to obtain these flows is given in the Supporting Technical Analysis, Attachment 2. Note the as-built and design condition are inconsistent. ASPA intends to remove and replace orifice plates to achieve original design conditions. ASPA may also request permission to implement the modified alternative configuration. An analysis has been prepared for all these conditions.

Tafuna WWTP Outfall and Diffuser Port Flow Characteristics for Design, As-Built, and Alternate Conditions

Configuration	Port	Port Description				Flow = 6 mgd (0.2629 m^3/s)	
		Port Diameter		Port Depth		Port Flow	
		inches	meters	feet	m	mgd	m3/s
Largest Port Offshore (Design Condition)	1	7.5	0.1905	91.5	27.89	1.55	0.0679
	2	6.5	0.1651	90.7	27.65	1.30	0.0570
	3	5.5	0.1397	89.9	27.41	1.00	0.0438
	4	5.0	0.1270	89.1	27.17	0.85	0.0372
	5	4.5	0.1143	88.3	26.93	0.71	0.0311
	6	4.0	0.1016	87.6	26.69	0.59	0.0259
					Total Flow	**6.00**	0.2629
Largest Port Onshore (As-built Condition)	1	4.0	0.1016	91.5	27.89	0.57	0.0250
	2	4.5	0.1143	90.7	27.65	0.71	0.0311
	3	5.0	0.1270	89.9	27.41	0.86	0.0377
	4	5.5	0.1397	89.1	27.17	1.01	0.0443
	5	6.5	0.1651	88.3	26.93	1.30	0.0570
	6	7.5	0.1905	87.6	26.69	1.55	0.0679
					Total Flow	**6.00**	0.2629
Alterbate (Orifice Plates Removed)	1	7.7	0.1956	91.5	27.89	1.00	0.0438
	2	7.7	0.1956	90.7	27.65	1.00	0.0438
	3	7.7	0.1956	89.9	27.41	1.00	0.0438
	4	7.7	0.1956	89.1	27.17	1.00	0.0438
	5	7.7	0.1956	88.3	26.93	1.00	0.0438
	6	7.7	0.1956	87.6	26.69	1.00	0.0438
					Total Flow	**6.00**	0.2629

II.B. Receiving Water Description

II.B.1. (L,S) Are you applying for a modification based on a discharge to the ocean [40 CFR 125.58(n)] or to a saline estuary [40 CFR 125.58(v)]? [40 CFR 125.59(a)].

The existing discharge is to the open coastal ocean. No changes in the existing location of the outfall are being proposed.

II.B.2. (L,S) Is your current discharge or modified discharge to stressed waters as defined in 40 CFR 125.58(z)? If yes, what are the pollution sources contributing to the stress? [40 CFR 125.59(b)(4) and 125.62(f)].

No, the open coastal waters of American Samoa are not considered as stressed waters. The Tafuna WWTP is the only domestic WWTP discharging into the Pacific Ocean. The other discharge from a WWTP occurs inside Pago Pago Harbor, from the Utulei WWTP. The Joint Cannery Outfall also discharges into Pago Pago Harbor. Neither of these discharges affects the receiving water for the Tafuna WWTP discharge.

II.B.3. (L,S) Provide a description and data on the seasonal circulation patterns in the vicinity of your current and modified discharge(s). [40 CFR 125.62(a)].

The tides in vicinity of the discharge are semi-diurnal with a range of 2.5 feet and little diurnal inequality. There is negligible freshwater surface water entering Vai Cove, the land feature closest to the outfall. There are two climatic seasons in American Samoa affecting the wind, the tradewind season and non-tradewind season. Winds are generally from the east and southeast and from this direction most of the time during the tradewind season, which is typically April/May through October/November. During November/December through March/April east to southeast winds still dominate but northwest to northeast wind directions become more prevalent.

Current speed and direction have been measured at the Tafuna outfall location on three occasions, October 1975[3] and February 1979 and July 1979[4]. The currents near the outfall site are predominantly parallel to the shoreline, as are the southeast predominant winds. During both occasions the net current flow was southwesterly, which is the along shore direction. Tidal current reversals occur to the northeast direction. Current speeds ranged between 0 cm/sec to 20 cm/sec with current speeds 5 cm/sec and above occurring about 90-percent of the time. Under the predominate SE wind conditions the near surface water layer is expected to have a net offshore transport.

---

[3] Current meter study for October 1975 conducted by CH2M HILL is documented in 1979 Baseline Water Quality Survey, listed in footnote 4, below.

[4] Current meter studies for 1979 conducted by M& E Pacific and documented in *Baseline Water Quality Survey American Samoa*, October 1979 for U.S. Army Corps of Engineers, Fort Shafter, Hawaii. Report Number Samoa-7830R.

~~II.B.4. (L) Oceanographic conditions in the vicinity of the current and proposed modified discharge(s). Provide data on the following: [40 CFR 125.62(a)].~~

~~—Lowest ten percentile current speed (m/sec)~~
~~—Predominant current speed (m/sec) and direction (true) during the four seasons~~
~~—Period(s) of maximum stratification (months)~~
~~—Period(s) of natural upwelling events (duration and frequency, months)~~
~~—Density profiles during period(s) of maximum stratification~~

N/A: not required for small dischargers[5]

II.B.5. (L,S) Do the receiving waters for your discharge contain significant amounts of effluent previously discharged from the treatment works for which you are applying for a section 301(h) modified permit? [40 CFR 125.57(a)(9)]

No, circulation and flushing is excellent and effluent is mixed with receiving water very quickly because of the high initial dilution achieved. Receiving water monitoring indicates no reflux or build-up of effluent.

II.B.6. Ambient water quality conditions during the period(s) of maximum stratification: at the zone of initial dilution (ZID) boundary, at other areas of potential impact, and at control stations. [40 CFR 125.62(a)]

~~a. (L) Provide profiles (with depth) on the following for the current discharge location and for the modified discharge location, if different from the current discharge:~~

~~—BOD5 (mg/l)~~
~~—Dissolved oxygen (mg/l)~~
~~—Suspended solids (mg/l)~~
~~—pH Temperature (°C)~~
~~—Salinity (ppt)~~
~~—Transparency (turbidity, percent light transmittance)~~
~~—Other significant variables (e.g., nutrients, 304(a)(1) criteria and toxic pollutants and pesticides, fecal coliform bacteria)~~

N/A: not required for small dischargers[6]

b. (S) Provide available data on the following in the vicinity of the current discharge location and for the modified discharge location, if different from the current discharge: [40 CFR 125.61(b)(1)]

Tables providing the complete receiving water quality monitoring data from 1999 to 2003 are included in the Supporting Technical Analysis (Attachment 2, Appendix 2). Provided below are general comments for each of the constituents listed as follows:

[5] However, some of these data are provided in the Supporting technical Analysis (Attachment 2).
[6] However, some of these data are provided in the Supporting technical Analysis (Attachment 2).

—***Dissolved Oxygen (DO) (mg/l)*** ranged between 4.4 to 8.8 mg/l, the ASWQS is not less than 80% saturation or less than 5.5 mg/l. Average DO is 6.5 mg/l.

—***Total Suspended Solids (TSS) (mg/l)*** values at nearby locations are <5 mg/l

—***pH*** ranged between 7.5 to 8.4 with a mean of 8.1 SU, which is typical for marine waters, the ASWQS is range of 6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally.

—***Temperature (°C)*** nearby locations values range from 26 to 30 °C seasonally, monitoring data.

—***Salinity (ppt)*** typically ± 36ppt in open ocean, monitoring data in the vicinity of the outfall are not reliable.

—***Transparency (turbidity, percent light transmittance)*** typically measured turbidity at <1 NTU, monitoring data appears to be erratic, the ASWQS is 0.25 NTU

—***Other significant variables (e.g., nutrients, 304(a)(1) criteria and toxic pollutants and pesticides, fecal coliform bacteria)***
Other data collected for the receiving water include the following constituents:

—***Total Nitrogen (TN) (mg/l)*** ranged 0.100 to 0.272 mg/l with a two outliers, 1.430 and 1.980. TN average is 0.169 for all of the data (1999-2003) and 0.079 mg/l if only samples outside the ZID are considered. The ASWQS for TN as N is 0.130 mg/l.

—***Total Phosphorus (TP) (mg/l)*** ranged between 0.006 and 0.063 mg/l. The average TP is 0.017 mg/l for all of the data (1999-2003) and 0.014 mg/l for samples outside of the ZID. The ASWQS for TP is 0.015 mg/l.

—***Chlorophyll-a (µg/l)*** ranged between 0.01 to 0.60 µg/l, with a mean of 0.15 µg/l, and the ASWQS is 0.25 µg/l.

—***Enterococci (No/100 m/)*** ranged between 0.0 and 20.0(No/100ml) with one outlier (41.0), ASWQS is 124/100ml (single sample maximum) and 35/100ml (steady state geometric mean)

c. (L,S)Are there other periods when receiving water quality conditions may be more critical than the period(s) of maximum stratification? If so, describe these and other critical periods and data requested in 6.a. for the other critical period(s). [40 CFR 125.62(a)(1)].

No, there is little seasonal variation in the water column, in terms of salinity or temperature. Consequently haloclines and thermoclines do not form and the water column stays well mixed. The most critical profile available was selected from a nearby location to use in the modeling conducted on the Tafuna WWTP for determining plume and dilution characteristics. The density profile has very small density gradients and very often there is no density gradient down to 100 feet. There are no nearby significant freshwater inflows. The regional scale ocean currents are relatively constant causing no apparent oceanographic variability that would affect the transport of the discharge plume

~~II.B.7. (L) Provide data on steady state sediment dissolved oxygen demand and dissolved oxygen demand due to resuspension of sediments in the vicinity of your current and modified discharge(s) (mg/l/day).~~

N/A: not required for small dischargers

II.C. Biological Conditions

~~***II.C.1. (L) Provide a detailed description of representative biological communities (e.g., plankton, macrobenthos, demersal fish, etc.) in the vicinity of your current and modified discharge(s): within the ZID, at the ZID boundary, at other areas of potential discharge-related impact, and at reference (control) sites. Community characteristics to be described shall include (but not be limited to) species composition; abundance; dominance and diversity; spatial/temporal distribution; growth and reproduction; disease frequency; trophic structure and productivity patterns; presence of opportunistic species; bioaccumulation of toxic materials; and the occurrence of mass mortalities.***~~

N/A: not required for small dischargers

II.C.2. (L,S) a. Are distinctive habitats of limited distribution (such as kelp beds or coral reefs) located in areas potentially affected by the modified discharge? [40 CFR 125.62(c)]

Yes, coral reefs are located in proximity to the existing discharge but are not limited in distribution in American Samoa on Tutuila Island.

b. If yes, provide information on type, extent, and location of habitats.

The east and south shores of Tutuila Island have a nearly continuous fringing coral reef. The Taema and Nafanua Banks, 1.5 miles offshore, run parallel to shoreline, and represent a former barrier reef now submerged to 18.3 m (60 ft) or more. The coral reef along the southeast coast of Tutuila Island ends at Matautuotafuna Point, approximately 1.1 miles east of the Tafuna WWTP discharge point offshore of Vai Cove. The discharged effluent plume does not affect any areas of coral reef habitat.

II.C.3. (L,S) a. Are commercial or recreational fisheries located in areas potentially affected by the discharge? [40 CFR 125.62 (c) and (d)]

Yes, a recreational subsistence fishery is located in shallow waters (0-10 meters) and coral reef tops surrounding Tutulia Island, for a diverse array of fish and shellfish. However, the ocean in the vicinity of the discharge is considered much too rough, due to the high energy, and is dangerous to recreational fishers.

b. If yes, provide information on types, location, and value of fisheries.

Dr. Peter Craig, now with the National Park Service in American Samoa, reviewed the Tafuna WWTP discharge and it's potential to impact local subsistence fisheries in the last (1992) 301(h)-modified NPDES renewal application. Dr Craig was then with the American Samoa Department of Marine and Wildlife Resources, and his comments were in Appendix 5 of the 1992 document.

Dr. Craig indicated that a considerable water depth separates the shoreline subsistence fishery activity from the Tafuna WWTP outfall, the outfall is at 30 meters (95 ft) and the fishery is at 1 m (10 ft) or less. Given the high levels of dilution of the effluent even under critical conditions (190:1 to 380:1) and the plume trapping level at 5 to 10 meters (15 to 30 ft) below the surface there is no significant possibility of causing harm to the subsistence fishery. Dr. Craig documented that there had never been any fish or invertebrate kills observed in the vicinity of the outfall over the then 20 years (now 30 years) of operation. Also, he documented that sublethal effects and human health risks have never been attributed to the Tafuna WWTP discharge.

II.D. State and Federal Laws [40 CFR 125.61 and 125.62(a)(1)]

II.D.1. (L,S) Are there water quality standards applicable to the following pollutants for which a modification is requested:

—***Biochemical oxygen demand?*** No
—***Dissolved oxygen?*** Yes
—***Suspended solids?*** No
—***Turbidity?*** Yes
—***Light transmission, light scattering, or maintenance of the euphotic zone?*** Yes
—***pH of the receiving water ?*** Yes

II.D.2. (L,S) If yes, what is the water use classification for your discharge area? What are the applicable standards for your discharge area for each of the parameters for which a modification is requested? Provide a copy of all applicable water quality standards or a citation to where they can be found.

The water use classification for the Tafuna discharge is: Open Coastal Waters.

The American Samoa Water Quality Standards (1999 Revision) can be obtained from the American Samoa EPA.

Applicable standards for parameters requesting a modification are summarized below.

Tafuna WWTP – Applicable Standards for which Modification is Requested

Parameter	Average Not to Exceed Given Value	Modification Requested
Dissolved Oxygen (mg/l)	Not less than 80% saturation or less than 5.5 mg/l.	Mixing Zone within the ZID (see Section III.B.6 and Section III.B.7)
Turbidity (NTU)	0.25	
Light Penetration (feet)	130.00	
pH	6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally	

II.D.3. (L,S) Will the modified discharge: [40 CFR 125.59(b)(3)].

—***Be consistent with applicable State coastal zone management program(s) approved under the Coastal Zone Management Act as amended, 16 U.S.C. 1451 et seq.? [See 16 U.S.C. 1456(c)(3)(A)]***

Previous correspondence from the American Samoa Coastal Management Project (ASCMP) Manager certified that the proposed action to continue the Section

301(h)-modified NPDES permit for the Tafuna WWTP does in fact comply with the goals and policies of the American Samoa Coastal Management Program, and if carried out in the manner described will be consistent with that program. This correspondence was dated February 28, 1991 and was contained in the previous application as Appendix 4. Since that time the outfall and improvements to the Tafuna WWTP have been fully implemented and the resultant water quality is better. If additional confirmation is required, another letter of support from the ASCMP Manager will be solicited.

—Be located in a marine sanctuary designated under Title III of the Marine Protection, Research, and Sanctuaries Act (MPRSA) as amended, 16 U.S.C. 1431 et seq., or in an estuarine sanctuary designated under the Coastal Zone Management Act as amended, 16 U.S.C. 1461? If located in a marine sanctuary designated under Title III of the MPRSA, attach a copy of any certification or permit required under regulations governing such marine sanctuary. [See 16 U.S.C. 1432(f)(2)]

No, the closest marine sanctuary, Fagatele Bay, is located approximately 4 miles from the Tafuna WWTP outfall.

—Be consistent with the Endangered Species Act as amended, 16 U.S.C. 1531 et seq.? Provide the names of any threatened or endangered species that inhabit or obtain nutrients from waters that may be affected by the modified discharge. Identify any critical habitat that may be affected by the modified discharge and evaluate whether the modified discharge will affect threatened or endangered species or modify a critical habitat. [See 16 U.S.C. 1536(a)(2)].

Yes, the Tafuna WWTP discharge is consistent with the Endangered Species Act. This was demonstrated in the original 301(h) waiver application.

There is not any critical habitat located near the discharge that will be affected by the discharge.

II.D.4. (L,S) Are you aware of any State or Federal laws or regulations (other than the Clean Water Act or the three statutes identified in item III.D.3 above) or an Executive Order which is applicable to your discharge?

Yes, the local Environment Quality Commission (EQC) is responsible for issuing the Water Quality Certification. Application was made in conjunction with the previous application process.

Also a Mixing Zone Determination will be required from EQC. Application was made in conjunction with the previous application process.

If yes, provide sufficient information to demonstrate that your modified discharge will comply with such law(s), regulation(s), or order(s). [40 CFR 125.59 (b)(3)].

Under Appendix 6 of the previous application (on file at USEPA) a request for Water Quality Certification for a Section 301(h) NPDES permit for the Tafuna

WWTP was submitted to the Office of the Governor, Environmental Protection Agency.

On May 15, 1991, a letter from Pati Faiai, Director of the American Samoa Environmental Protection Agency was signed stating that the discharge from the Tafuna WWTP is consistent with the American Samoa Water Quality Standards. The Tafuna WWTP is also in compliance with Sections 301, 302, 303, 306, 307 of the Clean Water Act, and certification was thereby granted.

III. Technical Evaluation

III.A. Physical Characteristics of Discharge [40 CFR 125.62(a)]

III.A.1. (L,S) What is the critical initial dilution for your current and modified discharge(s) during (1) the period(s) of maximum stratification? and (2) any other critical period(s) of discharge volume/composition, water quality, biological seasons, or oceanographic conditions?

(1) During critical conditions the critical initial dilution (CID) for the existing (as-built) outfall and diffuser configuration is 192:1. This is a flux-averaged dilution. Dilutions for individual ports ranged from 148:1 to 280:1. The CID was calculated using EPA's initial dilution model UDKHDEN for critical ambient and discharge conditions. For the design diffuser configuration the CID is 190:1 and for the alternate configuration being considered the CID is 187:1. A detailed description of the hydraulic and dilution performance of the diffuser is provided in the Supporting Technical Analysis (Attachment 2). Critical conditions were defined as follows:

- Effluent discharge rate was assumed to be 6 mgd, which is the hydraulic capacity of the treatment system.
- The effluent density was based on freshwater at a representative temperature of 30°C. Dilution is not sensitive to small changes in effluent density.
- Discharge port diameters and orientation were based on the as-built configuration, the design configuration and the alternate configuration. Port flows were distributed based on hydraulic calculations.
- The depth of the ports (top of riser) were based on a depth of 91.5 feet for the most seaward port and adjusted for a seabed slope of 4.5°. Tidal ranges are small and water depths do not vary by more than 1 to 3 feet over tidal extremes. The plume traps below the surface under critical conditions.
- The model predictions using UDKHDEN were done accounting for plume merging. This is a conservative assumption (predicts dilutions lower than expected) since the alternating direction of port discharge is not accounted for.
- Ambient current speed was taken as the 10-percentile current based on available data. The current direction is perpendicular to the diffuser orientation and the 10-percentile speed is 5 cm/sec.

- The critical ambient density profile was determined by running the model for available density profiles and the case producing the lowest initial dilution was selected as the critical case. This was a profile taken in March 2002 with a density gradient of 0.42 sigma-t units between the surface and the 100-foot depth. The profiles was base on data collected offshore of Pago Pago Harbor, and is considered to represent the general area along the south central coastal area of Tutuila Island.

(2) There are no other conditions considered more critical than those described above. Seasonal variations in ambient conditions are small. For the proposed annual average effluent discharge flows of 3 mgd, the flux-averaged dilution was calculated to be 289:1 under critical ambient conditions for the as-built diffuser configuration. If the existing port configurations were modified by removing all orifice plates from the ports, resulting in a constant port diameter of 7.7 inches, the CID would become 187 and 289 for 6 mgd and 3 mgd effluent flows, respectively.

III.A.2. (L,S) What are the dimensions of the zone of initial dilution for your modified discharge(s)?

The zone of initial dilution (ZID) for the existing diffuser configuration, and for critical conditions described above, extends a horizontal distance of 19.6 meters from the diffuser. This definition is based on the point where the plume reaches the calculated equilibrium height in the water column, just as in the case for the CID presented above. This is a flux average value, and the range of the ZID from individual ports is 19.0 to 20.9 meters. The calculations were conducted accounting for merging of adjacent plumes. The vertical dimension extends from the elevation of the ports above the seabed (approximately1.2 metes) to the trapping level. The flux averaged trapping level is 5.2 meters, ranging from 1.6 meters to 8.9 meters below the sea surface for individual ports. The dimensions of the ZID for other diffuser configurations are similar and do not vary by more than a fraction of a meter.

~~*III.A.3. (L) What are the effects of ambient currents and stratification on dispersion and transport of the discharge plume/wastefield?*~~

N/A: not required for small dischargers. The circulation patterns in the discharge area result in good flushing.

III.A.4. (S) Will there be significant sedimentation of suspended solids in the vicinity of the modified discharge?

Using the method described in the 301(h) TSD for small dischargers, there will not be significant sedimentation of suspended solids in the vicinity of the discharge. The accumulation rate of sediment attributable to the discharge is less than 50 g/m^2 based on the average discharge of 2 mgd and the suspended solids

average monthly loading of 1252 lbs/day. The same order of magnitude results would be obtained for the proposed 3 mgd flow and increased TSS loading. Details of the calculations are included in the Supporting Technical Analysis, (Attachment 2).

~~III.A.5. (L) Sedimentation of suspended solids~~

~~a. What fraction of the modified discharge's suspended solids will accumulate within the vicinity of the modified discharge?~~

~~b. What are the calculated area(s) and rate(s) of sediment accumulation within the vicinity of the modified discharge(s) (g/m2/yr)?~~

~~c. What is the fate of settleable solids transported beyond the calculated sediment accumulation area?~~

N/A: not required for small dischargers

III.B. Compliance with Applicable Water Quality Standards and CWA §304(a)(1) water quality criteria [40 CFR 125.61(b) and 125.62(a)]

III.B.1. (L,S) What is the concentration of dissolved oxygen immediately following initial dilution for the period(s) of maximum stratification and any other critical period(s) of discharge volume/composition, water quality, biological seasons, or oceanographic conditions?

The concentration of DO immediately after initial dilution was examined for two ambient conditions: the minimum DO observed over the height of plume rise, and the average DO over the height of plume rise. These ambient values were 5.55 mg/l and 6.5 mg/l, respectively. For these two conditions the change in DO was determined for three diffuser configurations and for existing permit flow limitation (2 mgd annual average), the proposed permit flow limitation (3 mgd annual average), and the maximum flow (6 mgd). The three diffuser configurations are the design configuration, the as-built configuration, and an alternate configuration as described in the Supporting Technical Analysis, (Attachment 2). All of the situations examined were based on the most critical period of water column stratification.

The range of DO decrease for all cases considered was 0.028 to 0.056 mg/l for the most critical case (ambient of 5.55 mg/l) and 0.03 to 0.061 for average ambient condition (6.5 mg/l). The minimum DO resulting from all of these calculations is 5.494 mg/l which is essential identical to the water quality standard for open coastal waters of 5.5 mg/l. For the average condition, on which the water quality standards are actually based, the minimum value resulting form the calculations is 6.439 mg/l, well above the water quality standard. It is noted that the effluent DO was taken to be 0.0 mg/l and the IDOD was taken to be 5 mg/l, both of which are conservative and will tend to yield over-predictions of the DO demand (predict lower values of DO after initial dilution than expected). More detailed information is provided in the Supporting Technical Analysis (Attachment 2).

III.B.2. (L,S) What is the farfield dissolved oxygen depression and resulting concentration due to BOD exertion of the wastefield during the period(s) of maximum stratification and any other critical period(s)?

The maximum calculated farfield DO depression is 0.0016 mg/l, which occurs six minutes following the completion of initial dilution. Therefore, including the DO depression during initial dilution the total DO depression is .0626 mg/l (0.061 mg/l +0.0016 mg/l). This calculation was done for the lowest initial dilution for the range of diffuser configurations and effluent flows considered. Small variations in the dilution and plume geometry have negligible effects on the results of the calculation, which indicates a negligible effect regardless. The ambient DO will be depressed from 6.5 mg/l to 6.437 mg/l. The Supporting

Technical Analysis (Attachment 2) provides additional detail on the assumptions and methods used to determine farfield DO sag.

~~***III.B.3. (L) What are the dissolved oxygen depressions and resulting concentrations near the bottom due to steady sediment demand and resuspension of sediments?***~~

Not required for small discharger: using the methods described in the 301(h) TSD, the steady state sediment DO demand is less than (probably substantially less than) 0.2 mg/l.

III.B.4. (L,S) What is the increase in receiving water suspended solids concentration immediately following initial dilution of the modified discharge(s)?

The concentration of TSS immediately after initial dilution was examined for a range of ambient conditions. There is no recent available data for the receiving water in the immediate vicinity of the discharge. However, nearby data suggests the ambient concentrations are low and can be below 5 mg/l. A range of 1 to 50 mg/l was considered to include the potential range expected in the receiving water.

For these conditions the change in TSS was determined for three diffuser configurations and for existing permit flow limitation (2 mgd annual average), the proposed permit flow limitation (3 mgd annual average), and the maximum flow (6 mgd). The three diffuser configurations are the design configuration, the as-built configuration, and an alternate configuration as described in the Supporting Technical Analysis (Attachment 2).

All of the situations examined were based on the most critical period of water column stratification. Using the permitted maximum of 150 mg/l for the effluent concentration, the range of TSS increase for all cases considered was 0.26 to 0.80 mg/l. Larger increases are associated with the higher effluent flows and lower ambient concentrations. More detailed information is provided in the Supporting Technical Analysis (Attachment 2).

~~***III.B.5. (L) What is the change in receiving water pH immediately following initial dilution of the modified discharge(s)?***~~

N/A: not required for small dischargers:

However, it is noted that the pH of the effluent is typically lower than the pH of the receiving water and if discharged at the minimum permitted pH value (6.5) the ambient pH will change by less than 0.1 unit for the entire range of sea water pH values (7.8 to 8.2) found in open coastal waters. The calculation is based on critical conditions and maximum effluent flow (dilution of 190:1) and is carried

out with calculations using the hydrogen ion concentration rather than pH directly. (Note: pH is a logarithmic description of [H^+] and thus does not mix on a volume-to-volume basis as is applied to concentrations of other parameters.)

III.B.6. (L,S) Does (will) the modified discharge comply with applicable water quality standards for:

—Dissolved oxygen?

The discharge is assumed to have low DO values with concomitant high IDOD and BOD concentrations. However, the water quality standards will be achieved at the edge of the ZID and no mixing zone extending beyond the ZID is required. See responses to III.B.1, III.B.2, and III.B.3 for more information on the magnitude of DO depressions resulting from the discharge.

—Suspended solids or surrogate standards?

There is no American Samoa Water Quality Standard (ASWQS) for suspended solids. There are standards for turbidity and light penetration. Because of the high dilution achieved by the diffuser, the discharge is not expected to result in non-compliance with the standards for either turbidity or light penetration. Receiving water quality data for turbidity indicates that the standard (0.25) is achieved, and occasional excursions above the ASWQS cannot be attributed to the discharge. See the Supporting Technical Analyses (Attachment 2) and the response to III.B.4 above, for more detailed information. Light penetration measurements have not been recently conducted in the vicinity of the outfall, but based on experience in nearby locations, sampled during monitoring of Pago Pago Harbor, it is believed that the light penetration ASWQS is generally met. Although the effluent is not expected to meet the ASWQS for turbidity, the high dilution results in no need for a mixing zone beyond the ZID.

—pH?

All receiving water pH values are within the natural range of ocean coastal oceanic waters, and thus the ASWQS is met. The effects of the discharge, beyond the ZID are negligible as describe in the response to III.B.5, above. Since the ASWQS and the effluent limitation are identical, no mixing zone, beyond the ZID, is required.

III.B.7. (L,S) Provide data to demonstrate that all applicable State water quality standards, and all applicable water quality criteria established under Section 304(a)(1) of the Clean Water Act for which there are no directly corresponding numerical applicable water quality standards approved by EPA, are met at and beyond the boundary of the ZID under critical environmental and treatment plant conditions in the waters surrounding or adjacent to the point at which your effluent is discharged. [40 CFR 125.62(a)(1)]

There are "state" (American Samoa) water quality standards for parameters listed in the following table. The receiving water monitoring data addresses

most of these parameters and compliance with ASWQS is noted in the table below for each parameter. The receiving water data are provided in Appendix 2 of the Supporting Technical Analyses (Attachment 2)

American Samoa Water Quality Standards for Open Coastal Waters		
Parameter	**Water Quality Standard Average not to Exceed the Given Value**	**Compliance at and beyond ZID**
Turbidity	0.25	Yes: the monitoring data are not reliable at the low levels encountered, but the ASWQS appears to be met.
Total Phosphorus	15.0 µg/l as P	Yes: Average is 15 µg/l at the edge of the established ZOM and 14 µg/l at the reference station.
Total Nitrogen	130 µg/l as N	No: However, the monitoring data clearly indicates that the discharge is not responsible for non-compliance.
Chlorophyll-a	0.25 µg/l	Yes: Average is 0.17 at the edge of the established ZOM and 0.13 at the reference station.
Light Penetration	130 feet – to be exceeded 50% of the time (defined as depth of 99% extinction)	Unknown but believed in compliance based on data from open coastal measurements to the east of the outfall location at the mouth of Pago Pago Harbor.
Dissolved Oxygen	Not less than 80% saturation or 5.5 mg/l or the natural level if less than 5.5 mg/l.	Yes: Average value is 6.3 mg/l at the edge of the established ZOM and 6.6 mg/l at the reference station. The 80% saturation value is between 5.4 and 5.5 mg/l. Occasional readings below 5.5 mg/l have been recorded, but these appear to be natural (or analytical artifacts) and not associated with the discharge.
pH	Between 6.5 and 8.6 and within 0.2 units of that which would occur naturally.	Yes: the average value at the edge of the established ZOM and the reference monitoring station is 8.1, which is within the natural range for ocean water.
Enterococci	35 per 100 ml (geometric mean) 124 per 100 ml (single sample)	All measurements in the receiving water are below 124 per 100 ml.

The total nitrogen values often exceed the ASWQS, and the average values exceed the numerical criterion. This appears to be a natural phenomenon and the variations in the monitoring data between the ZID, ZOM, and reference stations do not show any trends that indicate that the discharge is having a measurable effect on the values measured. It is noted that the water quality standard is at or below the typical method-reporting limit for most analytical laboratories. The analytical methods used to achieve levels reported for the samples collected in the receiving water are modified and not standard EPA methods. Therefore, the compliance with the total nitrogen ASWQS is difficult to

assess. The concentration of chlorophyll-a, however, clearly indicates that the nutrients in the water column are not having a detrimental affect.

The receiving waters have not been tested for the 304(a) list of parameters. However, there is no reason to expect exceedences of any of the listed criteria in the well-flushed open coastal receiving water.

III.B.8. (L,S) Provide the determination required by 40 CFR 125.61(b)(2) for compliance with all applicable provisions of State law, including water quality standards or, if the determination has not yet been received, a copy of a letter to the appropriate agency(s) requesting the required determination.

Under Appendix 6 of the previous application (on file at USEPA) a request for Water Quality Certification for a Section 301(h)-modified NPDES permit for the Tafuna WWTP was submitted to the Office of the Governor, Environmental Protection Agency.

On May 15, 1991, a letter from Pati Faiai, Director of the American Samoa Environmental Protection Agency was signed stating that the discharge from the Tafuna WWTP is consistent with the American Samoa Water Quality Standards. The facility is also in compliance with Sections 301, 302, 303, 306, 307 of the Clean Water Act, and certification was thereby granted.

If another letter stating the same thing is required, a request to the local ASEPA will be submitted.

III.C. Impact on Public Water Supplies [40 CFR 125.62(b)]

III.C.1. (L,S) Is there a planned or existing public water supply (desalinization facility) intake in the vicinity of the current or modified discharge?

No, there is no such facility planned or needed.

III.C.2. (L,S) If yes:

a. What is the location of the intake(s) (latitude and longitude)?

b. Will the modified discharge(s) prevent the use of intake(s) for public water supply?

c. Will the modified discharge(s) cause increased treatment requirements for public water supply(s) to meet local, State, and EPA drinking water standards?

N/A

III.D. Biological Impact of Discharge [40 CFR 125.62(c)]

III.D.1. (L,S) Does (will) a balanced indigenous population of shellfish, fish, and wildlife exist:

—Immediately beyond the ZID of the current and modified discharge(s)?

Yes, biological studies were considered in the original Section 301(h) decision document in 1985. That decision found that no adverse biological effects of the discharge were expected as the Tafuna WWTP met the four criteria established in the 301(h) TSD. The Tafuna WWTP still meets the criteria now listed in the 1994 301(h) TSD (page 82). The Tafuna WWTP has high initial dilution and good flushing on an open coastline and has a low potential for impact given the applicability of the four criteria, as follows:

- Location of the discharge in water depths greater than 10 m (33 ft)
- Hydrologic conditions that result in low predicted solids accumulation rates
- The absence of distinctive habitats of limited distribution and the absence of fisheries in the vicinity of the outfall, when such absences are not due to anthropogenic stresses; and
- The absence of known or suspected sources of toxic pollutants and pesticides or low concentrations of these substances in the effluent

The first two criteria are met. The Tafuna Outfall depth is 29 m (94.5 ft). The predicted suspended solids accumulation rate is less than 50 g/m^2 for both the 2 mgd and 3 mgd discharge rates, as discussed in Section III.A.4 above and documented in the Supporting Technical Analysis (Attachment 2).

There is an absence of distinctive habitats of limited distribution near the Tafuna WWTP outfall, as discussed in Section II.C.2 above, and the absence of recreational fisheries in the vicinity of the outfall as discussed in Section II.C.3 above.

The Tafuna WWTP outfall, ZID and ZOM are believed to be absent of toxic pollutants and pesticides based on the results of the effluent priority pollutant analysis conducted by US EPA in 1990. These results are considered to be applicable to the current effluent as there has been minimal change in the type and character of the wastewater supplied to the Tafuna facility. As documented in Section III.H below, there is no change in the amount of industrial wastewater coming into the Tafuna WWTP.

—In all other areas beyond the ZID where marine life is actually or potentially affected by the current and modified discharge(s)?

As the Tafuna WWTP discharge meets the above criteria within the ZID, it is highly probable that the discharge will meet the criteria beyond the ZID. There has been no impact to marine life in any area in proximity to or distant from the Tafuna WWTP in all the 30+ years of operation.

III.D.2. (L,S) Have distinctive habitats of limited distribution been impacted adversely by the current discharge and will such habitats be impacted adversely by the modified discharge?

No, distinctive habitats of limited distribution are located in the ZID, ZOM, or nearby proximity. The closest marine sanctuary, Fagatele Bay, is located approximately 4 miles from the Tafuna WWTP outfall. The modified discharge option with all ports at 7.7" has a similar dilution to the present condition, so no degradation in effluent quality is expected.

III.D.3. (L,S) Have commercial or recreational fisheries been impacted adversely by the current discharge (e.g., warnings, restrictions, closures, or mass mortalities) or will they be impacted adversely by the modified discharge?

There have been no warnings, restrictions, closures, or mass mortalities caused by the Tafuna WWTP to any commercial or recreational fishery. As discussed in Section II.C.3 above, there was a lack of potential for these fisheries to be impacted by the Tafuna WWTP effluent discharge outfall and diffuser. The American Samoa Department of Marine and Wildlife Resources provided documentation, and those comments were supplied in Appendix 5 of the 1992 301(h) application document.

III.D.4. (L,S) Does the current or modified discharge cause the following within or beyond the ZID: [40 CFR 125.62(c)(3)]*

—Mass mortality of fishes or invertebrates due to oxygen depletion, high concentrations of toxics, or other conditions? No
—An increased incidence of disease in marine organisms? No
—An abnormal body burden of any toxic material in marine organisms? No
—Any other extreme, adverse biological impacts? No

No toxicity has been demonstrated in the ZID. Toxicity testing has been conducted for the Tafuna WWTP effluent by the US EPA, Region 9, Laboratory, using the sea urchin fertilization toxicity test, from 2000 to 2004.

The target TU_C set in the existing permit has been met. The highest TU_C after critical dilutions is <1. Results of these tests are presented in tabular form in the Supporting Technical Analysis document (Attachment 2, Appendix 1).

III.D.5. (L,S) For discharges into saline estuarine waters: [40 CFR 125.62 (c)(4)]

—Does or will the current or modified discharge cause substantial differences in the benthic population within the ZID and beyond the ZID?
—Does or will the current or modified discharge interfere with migratory pathways within the ZID?
—Does or will the current or modified discharge result in bioaccumulation of toxic pollutants or pesticides at levels which exert adverse effects on the biota within the ZID?

N/A: Discharge is into open coastal waters.

No section (h) modified permit shall be issued where the discharge enters into stressed saline estuarine waters as stated in 40 CFR 125.59(b)(4).

III.D.6. (L,S) For improved discharges, will the proposed improved discharge(s) comply with the requirements of 40 CFR 125.62(a) through 125.62(d)? [40 CFR 125.62(e)]

N/A

III.D.7. (L,S) For altered discharge(s), will the altered discharge(s) comply with the requirements of 40 CFR 125.62(a) through 125.62(d)? [40 CFR 125.62(e)]

N/A: If the diffuser configuration and or flow and loadings are altered the critical condition at the maximum flow will not change from the existing condition.

III.D.8. (L,S) If your current discharge is to stressed ocean waters, does or will your current or modified discharge: [40 CFR 125.62(f)]

—Contribute to, increase, or perpetuate such stressed condition?
—Contribute to further degradation of the biota or water quality if the level of human perturbation from other sources increases?
—Retard the recovery of the biota or water quality if human perturbation from other sources decreases?

N/A: Discharge is not into stressed ocean waters

III.E. Impacts of Discharge on Recreational Activities [40 CFR 125.62(d)]

III.E.1. (L,S) Describe the existing or potential recreational activities likely to be affected by the modified discharge(s) beyond the zone of initial dilution.

No existing or potential recreational activities will likely be affected by the discharge because the ocean in the vicinity of the ZID is too dangerous for recreational activities. The area is also tightly secured because it is adjacent to the Pago Pago International Airport and is under surveillance from Airport Security as required by the FAA. Therefore, recreational activities are not expected in the vicinity of the discharge or adjacent shoreline.

III.E.2. (L,S) What are the existing and potential impacts of the modified discharge(s) on recreational activities? Your answer should include, but not be limited to, a discussion of fecal coliform bacteria.

Little or no water related recreational activity occurs near the Tafuna outfall since the area experiences unusually hazardous sea and surf conditions. Lava cliffs 10 to 15 feet high border Vai Cove to the north. A storm beach composed of coarse calcareous sand and coral rubble approximately 153 m (500 ft) long by 23 m (75 ft) wide is located along Vai Cove. Access to the water here is difficult even during calm conditions. Although no recreational activity is expected, it would not be affected by the discharge, which is 476 m (1562 ft) offshore at a depth of 28.9 m (95 ft). The existing data for fecal coliform reported in the previous 301(h) renewal application, and the more recent data for *Enterococci* presented in the attached Supporting Technical Analysis (Appendix 1) indicate low levels of bacteria even close to the discharge. The water quality standard for *Enterococci* is met well offshore from the shoreline and within the water column in the vicinity of the discharge.

III.E.3. (L,S) Are there any Federal, State, or local restrictions on recreational activities in the vicinity of the modified discharge(s)? If yes, describe the restrictions and provide citations to available references.

No restrictions by federal or territorial authorities exist in the vicinity of the discharge, except that the treatment plant is adjacent to the Airport that has stringent security regulations in place to protect both the physical aspects of the airport, and the traveling public. The site is located in the open ocean, which is extremely rough, and is much too dangerous for potential recreational activities.

III.E.4. (L,S) If recreational restrictions exist, would such restrictions be lifted or modified if you were discharging a secondary treatment effluent?

N/A; no recreational restrictions exist in discharge area

III.F. Establishment of a Monitoring Program [40 CFR 125.63]

III.F.1. (L,S) Describe the biological, water quality, and effluent monitoring programs which you propose to meet the criteria of 40 CFR 125.63. Only those scientific investigations that are necessary to study the effects of the proposed discharge should be included in the scope of the 301(h) monitoring program [40 CFR 125.63(a)(1)(i)(B)].

Because of the high dilution achieved by the diffuser and the good flushing characteristics of the receiving water, it is highly improbable that any effect of the effluent discharge can be measured in a receiving water monitoring effort targeted at the ZID boundary and beyond. Examination of the available data (see the Supporting Technical Analysis, Attachment 2, Appendix 1) indicates that the variability in concentrations of currently targeted receiving water monitoring parameters is not attributable to the discharge. Therefore, the existing monitoring requirements do not provide much useful data concerning the effects of the discharge on the receiving water and associated biological communities.

The best approach to examine the potential effects of the discharge on the receiving water and biological communities in the vicinity of the discharge is to examine the sediments, which tend to integrate effects over long periods of time. Since sediment quality and the response of the benthic community structure change slowly, this monitoring need not be done frequently to determine if the discharge is having any effect.

Transport of bacteria to the shoreline after discharge could also be a perceived, although unlikely, issue. There are no nearby recreational use areas, and other sources of bacteria (runoff from permanent and intermittent streams and exchange of water between Pala Lagoon and the open coastal waters, could easily dominate the bacterial concentrations, if any, along the shoreline. A survey of shoreline bacteria, adequately designed to account for other sources, would be useful to characterize the shoreline distribution and develop a baseline survey for future reference. However, an ongoing monitoring plan is not likely to be useful for characterizing the effects of the Tafuna WWTP discharge.

Based on the above discussions and a careful examination of the existing data, the following proposal is made for future monitoring:

- Receiving water quality monitoring as currently conducted should be discontinued.

- A sediment monitoring study, including selected chemical parameters and benthic community enumeration should be conducted once per permit cycle (once every 5 years). The study should include stations near the edge of the ZID, in the farfield along the expected trajectory of the plume, and at reference sites. A study plan would be developed and approved as a special condition of the renewal permit.

- A one-time shoreline bacteria study is recommended. The study should be designed to enable identification, to the extent possible, of sources other than the effluent discharge. A study plan could be developed and approved as a special condition of the renewal permit.

- If the sediment study or the shoreline bacteria survey shows potential impact then a dye study to define the plume dilution and transport (nearfield and farfield) could be done. But such a study is not recommended unless and until other monitoring indicates it is necessary. The requirement for such a study could be in a special condition allowing EPA to require such a study during the permit period if other monitoring results indicated it would be useful.

III.F.2. (L,S) Describe the sampling techniques, schedules, and locations, analytical techniques, quality control and verification procedures to be used.

It is proposed that the monitoring studies described in III.F.1 above be included in the NPDES permit as a special condition, and as a part of that condition the development of a study plan within a given time (e.g. six months) of the effective date of the permit be required. The study plan would address the sampling techniques, schedules, and locations, analytical techniques, quality control and verification procedures to be used. The study plan would be submitted to and approved by USEPA-Region 9 and ASEPA prior to implementation of the study. In this way a meaningful study, useful to all parties, could be cooperatively developed. It is proposed that only the broad outlines of the studies be specified in the permit special condition and those for the sediment study would include:

- Draft study plan required within 6 months of effective data of permit

- USEPA and ASEPA to review and comment within 60 days of receipt of the study plan.

- ASPA to respond with revised draft within 60 days of comments.

- Final approval and conditions of the study plan to be developed and approved within 1 year of the effective data of the permit.

- Sediment study to include up to 8 stations including reference stations. Analysis to include physical and chemical parameters to be developed in the study plan. Such parameters should be reasonable in terms of expected contaminants.

- Benthic community to be sorted, counted, and identified to the general taxonomic groupings. Identification to species is not required or necessary.

- The sampling will be done no more than two times, representing the major tradewind and non-tradewind oceanographic seasons.

For the bacteriological study a one-time survey with the following general characteristics is proposed:

- No more than 10 shoreline stations, with five sequential samples from each station would be conducted.
- Only *Enterococci* would be analyzed
- The need for any additional studies would be trigged by results from the initial study.

III.F.3. (L,S) Describe the personnel and financial resources available to implement the monitoring programs upon issuance of a modified permit and to carry it out for the life of the modified permit.

Resources necessary to carry out the monitoring program will be supported by increasing the operations budget provided by ASPA. Personnel from ASPA and selected consultants, if necessary, will be provided for sample collection, transportation, analysis, reporting and interpretation. It is expected that ASEPA laboratory will analyze samples for *Enterococci* . Other analyses will be done by selected and approved laboratories specified in the study plans.

III.G. Effect of Discharge on Other Point and Nonpoint Sources [40 CFR 125.64]

III.G.1. (L,S) Does (will) your modified discharge(s) cause additional treatment or control requirements for any other point or nonpoint pollution source(s)?

No, the Tafuna WWTP outfall is located at a depth of 95 feet and there are no other point sources in proximity to the discharge. There are no nonpoint pollution sources in the vicinity of the outfall and the outfall diffuser is located 1500 feet offshore.

There are no other legal point sources or illegal non-point sources along this portion of the open coastal waters. The adjacent land is broken basaltic lava rock, which is very porous. There are no streams or surface water discharges that are within several miles in either direction, of the discharge. Therefore there will not be a need to analyze other discharges or require the non-existent discharges to modify or increase their treatment levels.

III.G.2. (L,S) Provide the determination required by 40 CFR 125.64(b) or, if the determination has not yet been received, a copy of a letter to the appropriate agency(s) requesting the required determination.

The local Environment Quality Commission is responsible for issuing water quality certification. Application was made in conjunction with the previous application process.

Under Appendix 6 of the previous application (on file at USEPA) a request for Water Quality Certification for a Section 301(h)-modified NPDES permit for the Tafuna WWTP was submitted to the Office of the Governor, Environmental Protection Agency.

On May 15, 1991, a letter from Pati Faiai, Director of the American Samoa Environmental Protection Agency was signed stating that the proposed discharge from the Tafuna WWTP is consistent with the American Samoa Water Quality Standards. The facility is also in compliance with Sections 301, 302, 303, 306, 307 of the Clean Water Act, and certification was thereby granted.

If additional documentation is required, then the new determination will be made part of the application for another Water Quality Certification from the ASEPA

III.H. Toxics Control Program and Urban Area Pretreatment Program [40 CFR 125.65 and 125.66]

III.H.1. Industrial Source Information

a. (L,S) Do you have any known or suspected industrial sources of toxic pollutants or pesticides?

No

b. (L,S) If no, provide the certification required by 40 CFR 125.66(a)(2) for small dischargers, and required by 40 CFR 125.66(c)(2) for large dischargers.

In the previous Tafuna 301(h) renewal application, we certified that there were no known or suspected sources of toxic pollutants in the service area of the Tafuna WWTP. In a letter dated 6 August 1994, we documented this certification with an industrial users survey as described by 40 CFR 403.8(f)(2)(ii). This survey indicated that the sewage flowing into the Tafuna WWTP from all industrial park renters is domestic in nature only. There are no other industrial inputs planned in the service area.

c. (L,S*) Provide the results of wet and dry weather effluent analyses for toxic pollutants and pesticides as required by 40 CFR 125.66(a)(1). (* to the extent practicable)

In June 1990, EPA Region 9 conducted a priority pollutant scan [equivalent to 40 CFR 125.58(m) & (u)] of each of the sewage treatment plant effluents in the Insular Islands of the Pacific that applied for a section 301(h) waiver. Since seasonal differences in effluent quality are minimal in the South Pacific, EPA determined that a single effluent survey at each treatment plant would fulfill the requirements of 40 CFR 125.66(a)

At that time, the Tafuna WWTP effluent was found to contain no significant toxic pollutants or pesticides (See results in Section II.A.4, above). Furthermore, using the estimated critical initial dilution of 45:1 USEPA determined that all toxic pollutants and pesticides levels complied with American Samoa numerical toxic standards and U.S. EPA water quality criteria. In fact the critical initial dilution is actually more than 4 times that previously used, therefore the same toxic standards and criteria will be readily met.

Under the current permit, toxicity samples for bioassay testing of the effluent have been collected and sent to the USEPA on a regular basis in excess of the permit requirements, and to date permit required toxicity targets have been consistently met.

d. (L,S*) Provide an analysis of known or suspected industrial sources of toxic pollutants and pesticides identified in (1)(c) above as required by 40 CFR 125.66(b). (* to the extent practicable)

Since we certified that the Tafuna WWTP effluent has no known or suspected sources of toxic pollutants or pesticides, and we have verified that certification with an industrial user's survey, we believe we should be exempt from the requirements of this section.

In addition, there are no known or suspected sources of toxic pollutants per our findings addressed under Section III.H.3 below.

III.H.2. (S) Problems Related to Toxics

a. (S)Are there any known or suspected water quality, sediment accumulation, or biological problems related to toxic pollutants or pesticides from your modified discharge(s)?

No, there is no known or suspected water quality, sediment accumulation, or biological problems related to toxic pollutants or pesticides. The sediment accumulation from the Tafuna WWTP outfall is very small, on the order of < 50g/m^2, as documented in the Supporting Technical Analysis (Attachment 2).

As stated in Section III.D.4 above no toxicity has been demonstrated in the toxicity testing conducted for the Tafuna WWTP effluent by the USEPA, Region 9, Laboratory, using the sea urchin fertilization toxicity test, from 2000 to 2004. The target TU_C set in the existing permit has been met. The highest TU_C after critical dilution is <1. Results of these tests are presented in tabular form in the Supporting Technical Analysis document (Attachment 2, Appendix 1).

b. (S) If no, provide the certification required by 40 CFR 125.66(d)(2) together with available supporting data.

N/A

c. (S) If yes, provide a schedule for development and implementation of nonindustrial toxics control programs to meet the requirements of 40 CFR 126.66(d)(3).

N/A

~~***d. (L) Provide a schedule for development and implementation of a nonindustrial toxics control program to meet the requirements of 40 CFR 125.66(d)(3).***~~

N/A: for large dischargers only

III.H.3. (L,S) Describe the public education program you propose to minimize the entrance of nonindustrial toxic pollutants and pesticides into your treatment system. [40 CFR 125.66(d)(1)]

The Non-industrial Source Control Education Program was originally implemented in 1989 and consisted of a series of radio spots, newspaper notices, a panel TV show, and three-fold handouts. This program included personnel from ASPA, ASEPA, Public Health and the Office of Samoan Affairs. It is the intent and our proposal to continue the public education program on a continuous rotating basis to assure wide coverage of the education information.

III.H.4. (L,S) Do you have an approved industrial pretreatment program?

No approved pretreatment program exists, as there are no major industrial inputs into the Tafuna WWTP at this time. None are expected into the future given the economy and lack of technical expertise on the island.

a. If yes, provide the date of EPA approval.

N/A

b. If no, and if required by 40 CFR part 403 to have an industrial pretreatment program, provide a proposed schedule for development and implementation of your industrial pretreatment program to meet the requirements of 40 CFR part 403.

N/A

III.H.5. Urban area pretreatment requirement [40 CFR 125.65] Dischargers serving a population of 50,000 or more must respond.

N/A. Tafuna WWTP is a small discharger currently serving a population of 12,000 with a build out population that may approach 20,000. Therefore, we are exempt from requirements of this section.

~~*a. Provide data on all toxic pollutants introduced into the treatment works from industrial sources (categorical and noncategorical).*~~

~~*b. Note whether applicable pretreatment requirements are in effect for each toxic pollutant. Are the industrial sources introducing such toxic pollutants in compliance with all of their pretreatment requirements? Are these pretreatment requirements being enforced? [40 CFR 125.65(b)(2)]*~~

~~*c. If applicable pretreatment requirements do not exist for each toxic pollutant in the POTW effluent introduced by industrial sources,*~~

~~*—provide a description and a schedule for your development and implementation of applicable pretreatment requirements [40 CFR 125.65(c)], or*~~
~~*—describe how you propose to demonstrate secondary removal equivalency for each of those toxic pollutants, including a schedule for compliance, by using a secondary treatment pilot plant. [40 CFR 125.65(d)]*~~