UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 9
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San Francisco, CA 94105

AMERICAN SAMOA POWER AUTHORITY'S UTULEI SEWAGE TREATMENT PLANT APPLICATION FOR A MODIFIED NPDES PERMIT UNDER SECTION 301(h) OF THE CLEAN WATER ACT	FINAL DECISION OF THE REGIONAL ADMINISTRATOR PURSUANT TO 40 CFR PART 25, SUBPART G

I have reviewed the attached evaluation analyzing the merits of the application submitted by the American Samoa Power Authority requesting renewal of the variance from secondary treatment requirements for the Utulei Sewage Treatment Plant (STP), pursuant to Section 301(h) of the Clean Water Act. It is my decision that the American Samoa Power Authority be granted a variance in accordance with the terms, conditions and limitations of the attached evaluation, based on Section 301(h) of the Act.

My decision is based on available evidence specific to this particular discharge. It is not intended to assess the need for secondary treatment in general, nor does it reflect on the necessity for secondary treatment by other publicly owned treatment works discharging to the marine environment. This decision and the National Pollutant Discharge Elimination System (NPDES) permit implementing this decision are subject to revision on the basis of subsequently acquired information relating to the impact of the less-than-secondary treated discharge on the marine environment.

Under the procedures of permit regulations at 40 CFR Part 124, public notice and comment regarding the draft version of this decision and accompanying NPDES permit were made available to all interested persons.

Dated: 18th November, 2019 /s/

Michael Stoker
Regional Administrator

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INTRODUCTION

The American Samoa Power Authority (Applicant), has requested renewal of its variance[1] under Section 301(h) of the Clean Water Act (the Act or CWA), 33 U.S.C. § 1311(h), from the secondary treatment requirements contained in Section 301(b)(1)(B) of the Act, 33 USC § 1311(b)(1)(B), for the Utulei Sewage Treatment Plant (STP), a publicly owned treatment works (POTW). The Section 301(h) variance would allow the discharge of wastewater receiving less-than-secondary treatment to the Pago Pago Harbor. The Applicant submitted its renewal application to the U.S. Environmental Protection Agency, Pacific Southwest Region (the EPA Region 9 or EPA), on May 1, 2006, and a revised version on March 1, 2008.

The Applicant first obtained a CWA Section 301(h) modified permit to discharge primary treated effluent from the Utulei STP in 1985. The permit was reissued with the variance in 2001. In 2006 the Applicant requested renewal of the variance at the time of permit reapplication. EPA tentatively proposed to deny the variance in 2009 because the Applicant had not shown that it could consistently achieve Water Quality Standards (WQS) beyond the zone of initial dilution (ZID), had not analyzed known or suspected sources of industrials pollutants and pesticides in its effluent, had not implemented a source control program or a sufficient monitoring program, and based on the information available, it appeared that the proposed discharge could have had the potential to interfere with the protection and propagation of a Balanced Indigenous Population (BIP) of shellfish, fish, and wildlife. Since 2009, EPA has been working with the Applicant to collect additional data, conduct modeling, and upgrade treatment and practices at the Utulei STP. As a result, the quality of the discharge has improved and more thorough and representative data are now available.

Secondary treatment is defined at 40 CFR Part 133 in terms of effluent quality for total suspended solids (TSS), biochemical oxygen demand (BOD), and pH. The secondary treatment requirements for effluent TSS, BOD, and pH are listed below:

TSS: (1) The 30-day average shall not exceed 30 mg/l.
(2) The 7-day average shall not exceed 45 mg/l.
(3) The 30-day average percent removal shall not be less than 85 percent.

BOD: (1) The 30-day average shall not exceed 30 mg/l.
(2) The 7-day average shall not exceed 45 mg/l.
(3) The 30-day average percent removal shall not be less than 85 percent.

pH: At all times, shall be maintained within the limits of 6.0 to 9.0 units.

The application is based on a "current" discharge, as defined at 40 CFR 125.58(h). The Applicant is requesting a modification to the TSS and BOD requirements. A modification for pH

[1] The variance is also called a "modification" or, informally, a "waiver."

is not requested. The Applicant's proposed alternative effluent limits for TSS and BOD have not changed from the existing modified permit. The proposed effluent limits are:

TSS: (1) The 30-day average shall not exceed 75 mg/l.
(2) The 7-day average shall not exceed 113 mg/l.
(3) The 30-day average percent removal shall not be less than 30 percent.

BOD: (1) The 30-day average shall not exceed 78.3 mg/l.
(2) The 7-day average shall not exceed 117 mg/l.
(3) The 30-day average percent removal shall not be less than 30 percent.

EPA has concluded that the Applicant's proposed discharge will comply with the criteria set forth in Section 301(h) of the Act, as implemented by regulations contained in 40 CFR Part 125, Subpart G. Therefore, EPA is proposing to grant the Applicant a variance of secondary treatment requirements for TSS and BOD. This document presents EPA's findings and conclusions.

DECISION CRITERIA

Under Section 301(b)(1)(B) of the Act, U.S.C. § 1311(b)(1)(B), POTWs in existence on July 1, 1977, were required to meet effluent limits based on secondary treatment as defined by the Administrator of EPA (the Administrator). Secondary treatment is defined by the Administrator in terms of three parameters: TSS, BOD, and pH. Uniform national effluent limitations for these pollutants were promulgated and included in National Pollutant Discharge Elimination System (NPDES) permits for POTWs issued under section 402 of the Act. POTWs were required to comply with these limitations by July 1, 1977.

Congress subsequently amended the Act, adding Section 301(h) which authorizes the Administrator, with State[2] concurrence, to issue NPDES permits which modify the secondary treatment requirements of the Act with respect to certain discharges. P.L. 95-217, 91 Stat. 1566, as amended by P.L. 97-117, 95 Stat. 1623; and section 303 of the Water Quality Act of 1987. Section 301(h) provides that:

> The Administrator, with the concurrence of the State[2], may issue a permit under section 402 [of the Act] which modifies the requirements of subsection (b)(1)(B) of this section [the secondary treatment requirements] with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the Applicant demonstrates to the satisfaction of the Administrator that:
>
> (1) there is an applicable water quality standard (WQS) specific to the pollutant for which the modification is requested, which has been identified under Section 304(a)(6) of this Act;
>
> (2) the discharge of pollutants in accordance with such modified requirements will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of that water quality which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population (BIP) of shellfish, fish, and wildlife, and allows recreational activities, in and on the water;
>
> (3) the Applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable, and the scope of the monitoring is limited to include only those scientific investigations which are necessary to study the effects of the proposed discharge;
>
> (4) such modified requirements will not result in any additional requirements on any other point or nonpoint source;

[2] In the context of the Clean Water Act, the definition of "State" includes entities like U.S. territories and recognized Tribal nations.

(5) all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;

(6) in the case of any treatment works serving a population of 50,000 or more, with respect to any toxic pollutant introduced into such works by an industrial discharger for which pollutant there is no applicable pretreatment requirement in effect, sources introducing waste into such works are in compliance with all applicable pretreatment requirements, the Applicant will enforce such requirements, and the Applicant has in effect a pretreatment program, which, in combination with the treatment of discharges from such works, removes the same amount of such pollutant as would be removed if such works were to apply secondary treatment to discharges and if such works had no pretreatment program with respect to such pollutant;

(7) to the extent practicable, the Applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from non-industrial sources into such treatment works;

(8) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit; and

(9) the Applicant at the time such modification becomes effective will be discharging effluent which has received at least primary or equivalent treatment and which meets the criteria established under Section 304(a)(1) of the Act after initial mixing in the waters surrounding or adjacent to the point at which such effluent is discharged.

In addition, any modification to secondary treatment requirements must not conflict with applicable provisions of state; local; or other Federal laws, including the Endangered Species Act, Coastal Zone Management Act; or Executive Orders. 40 C.F.R. § 125.59(b)(3).

The plant currently serves a population of approximately 13,000 and discharges an average flow of 2.2 MGD, with a projected increase to 3.0 MGD. Based on the definition in 40 CFR 125.58(c), the Applicant is a small discharger.

EPA may grant the Utulei STP a variance to secondary treatment requirements if the Administrator determines that the Applicant meets the statutory criteria and regulatory requirements. EPA has evaluated the Applicant's proposed discharge in accordance with the statutory criteria and regulatory requirements, as described below, and has concluded that the Applicant is eligible for a modification of the requirements for TSS and BOD.

SUMMARY OF FINDINGS

Based upon review of the data, references, and empirical evidence furnished in the application and other relevant sources, EPA Region 9 makes the following findings with regard to the statutory and regulatory criteria:

1. The Applicant's proposed discharge will comply with primary treatment requirements. [CWA Section 301(h)(9); 40 CFR 125.60]

2. The Applicant's proposed modified discharge will comply with American Samoa water quality standards, including light penetration, dissolved oxygen, and pH. The Applicant has sent a letter to the American Samoa Environmental Protection Agency (ASEPA) requesting determination that the proposed discharge complies with applicable law including water quality standards. [CWA Section 301(h)(1); 40 CFR 125.61]

3. The Applicant has demonstrated it can consistently achieve American Samoa water quality standards at and beyond the zone of initial dilution. [CWA Section 301(h)(9); 40 CFR 125.62(a)]

4. The Applicant's proposed modified discharge, alone or in combination with pollutants from other sources, will not adversely impact public water supplies or interfere with the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife, and will allow for recreational activities. [CWA Section 301(h)(2); 40 CFR 125.62(b), (c), and (d)]

5. The Applicant has proposed to continue, and in some cases will be required to enhance, a successful monitoring program which is sufficient to meet the needs of the facility and the Clean Water Act. [CWA Section 301(h)(3); 40 CFR 125.63]

6. The Applicant's proposed discharge would not result in any additional treatment requirements on any other point or non-point source. [CWA Section 301(h)(4) of the CWA; 40 CFR 125.64]

7. As there are no known or suspected industrial sources of toxic pollutants in the service area, the Applicant is exempt from the requirement to develop and implement a pretreatment program and is therefore exempt from the requirement to enforce such a program. [CWA Section 301(h)(5); 40 CFR 125.66 and 125.68].

8. As the plant serves, and will continue to serve, a population of less than 50,000 in the foreseeable future, the Applicant is exempt from the provisions of the urban area pretreatment program. [CWA Section 301(h)(6) of the Act; 40 CFR 125.65]

9. The Applicant has submitted a chemical analysis of its current discharge for toxic pollutants, which were not found at levels of concern. The facility does not serve any significant non-industrial customers likely to contribute toxicants to facility influent. Therefore, additional action by the Applicant to address non-industrial sources of toxicants is not necessary to meet this criterion. [CWA Section 301(h)(7); 40 CFR 125.66]

10. There will be no new or substantially increased discharges from the point source of the pollutants to which the Section 301(h) variance would apply above those specified in the permit. [CWA Section 301(h)(8); 40 CFR 125.67]

11. This decision along with the accompanying draft permit were shared with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and American Samoa Department of Commerce (Coastal Zone Management Program), as well as AS-EPA, at the time of public notice to seek concurrence that the discharge is consistent with all applicable federal and Territorial laws. Each of these agencies has concurred with EPA's decision and therefore the issuance of this final 301(h)-modified permit does not conflict with applicable provisions of federal and Territorial laws. [40 CFR 125.59].

CONCLUSION

EPA concludes that the Applicant's proposed discharge will satisfy the requirements of CWA Section 301(h) and 40 CFR 125, Subpart G.

RECOMMENDATION

It is recommended that the Applicant be granted a CWA Section 301(h) variance in accordance with the above findings, based upon satisfaction of the following conditions:

1. The determination by the ASEPA that the proposed discharge will comply with applicable provisions of Territorial law, including water quality standards, in accordance with 40 CFR 125.61(b)(2). Certification under §401 of the Clean Water Act, of the permit to be issued by EPA based on this decision, was received from ASEPA on August 9 2019 and serves as determination of compliance.

2. The determination by ASEPA that the proposed discharge will not result in any additional treatment requirements on any other point or nonpoint sources, in accordance with 40 CFR 125.64. Certification under §401 of the Clean Water Act, of the permit to be issued by EPA based on this decision, was received from ASEPA on August 9 2019 and serves as determination of compliance with this condition.

3. The final permit contains the applicable terms and conditions required by 40 CFR 125.68, for establishment of a monitoring program.

4. The determination by the American Samoa Department of Commerce, granted on June 17, 2010, that renewal of a 301(h)-modified permit does not conflict with the Coastal Zone Management Act, as amended.

5. The determination by the U.S. Fish and Wildlife Service, issued July 25 2018, that no critical habitat or federally listed terrestrial species occur within the immediate vicinity and that therefore issuance of a 301(h)-modified permit does not conflict with applicable provisions of the federal Endangered Species Act, as amended.

6. The concurrence by the NOAA National Marine Fisheries Service, dated June 5 2019, with EPA's conclusion that issuance of a 301(h)-modified permit "may affect, but is not likely to adversely affect" endangered marine species in the vicinity of the discharge and therefore does not conflict with applicable provisions of the federal Endangered Species Act, as amended,

7. The determination by the NOAA National Marine Fisheries Service, Pacific Islands Regional Office, on August 20 2019 that the permit would pose "no more than minimal" risk of effects to Essential Fish Habitat and therefore meets the applicable provisions the Magnuson-Stevens Fishery Conservation and Management Act, as amended.

8. Issuance of the 301(h)-modified permit shall assure compliance with all applicable requirements of 40 CFR 122 and 40 CFR 125, Subpart G.

DESCRIPTION OF TREATMENT SYSTEM

Utulei STP is located in the town of Utulei on Tutuila Island, the largest and principal island of American Samoa. Utulei STP is a primary treatment plant that collects and treats wastewater from several nearby residential areas and the downtown area, serving a population of approximately 13,000 people. The service area includes the villages of Faga'alu (including the hospital), Utulei, Fagatogo, Pago Pago (both the upper and lower part of the village), and Atu'u (including the sanitary wastewater from two local tuna canneries). The service area also includes the villages of Leloaloa, Au'a, and Onesosopo which are not yet connected but were included in the original design of the Harbor Sewer System (collection system) and the Utulei STP it feeds into. There are no existing or planned industrial sources of wastewater that discharge to Utulei STP.

The plant provides grit removal, primary sedimentation, anaerobic sludge digestion, and ultraviolet (UV) disinfection prior to discharge into outer Pago Pago Harbor. Influent enters the plant at the influent wet well, which contains four submerged variable speed pumps. As influent exits the wet well, it is screened through a rock basket with two-inch square mesh. Influent is then pumped into an elevated grit channel. Additional grit is removed at the headworks. The plant's primary treatment unit is the clarigester. Clarigesters consist of an upper clarifier that removes settleable solids and skims off floatables and a lower anaerobic digester

that settleable solids are funneled directly into. Gas from the digesters is vented near the top of the clarigesters. Following primary clarification, flow converges and continues to an elevated UV channel. Disinfected effluent is discharged horizontally in alternatively opposite directions through a linear multiport diffuser located approximately 954 feet from Tulutulu Point at a depth of 150 feet in outer Pago Pago Harbor at 14º 16' 59.6" South latitude and 170º 40' 28.1" West longitude. The diffuser consists of six lateral ports, plus a separate "end gate" port, and has a total length of approximately 42.6 feet, with the ports spaced approximately 7.1 feet apart. The lateral ports have a diameter of 5.5 inches while the end gate port is 11 inches in diameter and discharges at a 15-degree angle upwards and parallel to the diffuser barrel. The plant currently discharges 2.2 million gallons per day (MGD) of treated effluent into outer Pago Pago Harbor.

Sludge from the primary treatment process is transported to the Tafuna Sewage Treatment Plant on the southeastern portion of the island, where it is treated by anaerobic digestion and placed in drying beds until landfill disposal.

Since 2011, the Applicant made several improvements to the plant, including: (1) the addition of a UV disinfection component to the treatment process to reduce bacteria in the effluent; (2) modifying the diffuser to enhance the initial dilution and dispersal of the discharge in the receiving water by reducing the size of existing ports from 6 inches to 5.5 inches and adding an 11-inch end port; (3) repairing manholes to reduce inflow and infiltration to the system; and (4) increasing monitoring.

DESCRIPTION OF RECEIVING WATERS

Utulei STP discharges into the outer portion of Pago Pago Harbor. Pago Pago Harbor is located on the southeastern portion of Tutuila Island in American Samoa and empties into the South Pacific Ocean. In the application, the Applicant indicated that outer Pago Pago Harbor has characteristics similar to open coastal ocean waters and is not characteristic of an estuarine system.

Currents

No recent data exist for current speed and direction at the discharge site. In the application, the Applicant indicated that wind direction is generally from the east and southeast during the tradewind season (i.e., April/May through October/November). However, during the non-tradewind season, winds from the northwest to northeast become more prevalent, though southeast winds still dominate. The Applicant also notes that the regional scale ocean currents are
relatively constant causing no apparent oceanographic variability that would affect the transport of the discharge plume. The Applicant described the tides in the vicinity of the discharge as semi-diurnal with a range of 2.5 feet and little diurnal inequality. Since current data for the area around the diffuser was sparse, the Applicant used a worst-case scenario of zero current velocity to model the critical initial dilution.

Stratification

The application indicates that there is little seasonal variation in the water column with respect to temperature and salinity (ASPA 2006). Density profiles at the outfall taken during tradewind and non-tradewind seasons indicate that thermoclines and haloclines do not form, which allows for the constant mixing of the water column throughout the year. In addition, the Applicant indicated that little freshwater drains from Tulutulu Point, the land feature closest to the outfall, which might otherwise affect stratification. The Applicant also indicated that ambient water temperatures near the outfall range from 27.2 to 30.6 degrees Celsius with an average of 28.7 based on receiving water monitoring data collected during the tradewind and non-tradewind seasons (2002-2005), and that salinity ranges from 33.0 to 36.4 parts per thousand, with an average of 34.9 parts per thousand. Salinity in the open ocean of American Samoa has generally been found to be 36 parts per thousand and, therefore, the Applicant concluded that the outer portion of Pago Pago Harbor, where the outfall is located, is characteristic of open coastal waters.

PHYSICAL CHARACTERISTICS OF THE DISCHARGE

Outfall/Diffuser and Initial Dilution

40 CFR 125.62(a)(1) requires that the proposed outfall and diffuser be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater to meet all applicable WQSs and all applicable EPA water quality criteria for which there is no applicable EPA-approved WQS at and beyond the boundary of the ZID. This evaluation is based on conditions occurring during periods of maximum stratification and during other periods when discharge characteristics, water quality, biological seasons, or oceanographic conditions indicate more critical situations may exist.

The Applicant has demonstrated that there is only one critical environmental period in the receiving water near the discharge point based on density profile data collected during both tradewind and non-tradewind seasons. The Applicant is only able to provide an instantaneous maximum effluent flow rather than a peak two to three-hour effluent flow for the new end-of-permit year as specified by EPA's Amended Section 301(h) Technical Support Document (ATSD). However, EPA believes that the Applicant's instantaneous maximum effluent flow is an appropriately conservative measure of its most critical flow condition for the proposed modified discharge during the next permit period. Therefore, for the purpose of the Section 301(h) evaluation, EPA accepted the following information that was used by the Applicant to compute critical initial dilution: the predicted instantaneous maximum effluent flow, the most critical density profile of the receiving water, and a current speed conservatively assumed to be zero in the absence of significant monitoring data.

In the application, the Applicant calculated critical initial dilution using the 1985 EPA-approved mixing zone model, UDKHDEN, based on the predicted instantaneous maximum flow of 6.0 MGD. The UDKHDEN model requires the specification of various parameters describing the diffuser configuration, effluent properties, and ambient conditions. When required by the model,

the Applicant applied the physical outfall characteristics as they were at the time of application. The Applicant also ran the model using characteristics of a proposed altered diffuser, with port restriction plates removed, resulting in 7.75-inch diameter ports. In addition, the Applicant modeled based on the worst-case assumption of zero ambient current in the absence of detailed current data. The various density profiles used to find critical environmental conditions with the model were collected at station U (the diffuser midpoint station), with up-cast and down-cast profiles showing good agreement for each monitoring event. Profiles were collected for five monitoring events, from the 2002 tradewind season through the 2003 and 2004 non-tradewind and tradewind seasons. Based on the results of the UDKHDEN model, the Applicant determined the most critical case is represented by the March 2003 (2003 non-tradewind) season, with a density gradient between the surface and 150-foot depth of 0.72 σ-t (sigma-t units). This profile also matches the description of a typical worst-case profile on page A-3 of EPA's ATSD, as "having sufficiently steep density gradients some distance [on the order of 16 feet] above a diffuser port". The diffuser is at 150 feet and this profile shows a rapid and significant change in density at the 150-foot depth. The Applicant did not account for effluent temperature effects and based the density of the effluent on the density of freshwater at standard conditions, 1.00 g/cm^3. Based on the UDKHDEN model, the Applicant estimated a critical initial dilution of 91:1 at the trapping depth of 17.6 feet. For comparison purposes, the Applicant estimated an initial dilution of 127:1 for the proposed annual average end-of-permit flow of 3.0 MGD (ASPA 2008).

In accordance with EPA's ATSD, EPA reviewed the calculation of initial dilution and trapping depth under both the proposed daily average flow and critical flow scenarios provided by the Applicant. Based on its review, EPA has determined that an average initial dilution and critical initial dilution of 127:1 and 91:1, respectively, are adequately calculated for the purpose of this Section 301(h) evaluation. However, because Section 301(h) regulations require that the Applicant's diffuser be located and designed to provide initial dilution, dispersion, and transport sufficient to ensure compliance with water quality standards at the ZID boundary under *critical conditions* (see 40 CFR 125.62(a)(1)(iv)), EPA evaluated compliance with Section 301(h) regulations based only on the critical initial dilution of 91:1.

EPA also finds this critical initial dilution of 91:1 as appropriately conservative in reviewing the Applicant's upgraded diffuser characteristics, as the reduction in port size and added end port will aid in dispersion of the plume. In addition, the design capacity of the plant has not changed.

Application of Initial Dilution to Water Quality Standards

Based on the information summarized in the previous section, EPA concludes: (1) the outfall and diffuser system are well designed and achieve a high degree of dilution; and (2) the critical initial dilution factor of 91:1 provides a conservative estimate of initial dilution for evaluation of compliance with applicable American Samoa Water Quality Standards (ASWQS). The ASWQS allow for a zone of mixing (ZOM) that does not exceed the zone of initial dilution for toxics and some narrative standards, but allow for a zone of mixing larger than the ZID to be applied to the standards for turbidity, total phosphorus, total nitrogen, chlorophyll-*a*, light penetration, ammonia, dissolved oxygen, pH, and enterococcus, provided that certain conditions are met (ASWQS section 24.0207(b)(6),(7), and (8)).

Zone of Initial Dilution

As defined in 40 CFR 125.58(dd), the ZID is a region of mixing surrounding, or adjacent to, the end of the outfall or diffuser, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards. EPA's ATSD limits the ZID to the area including the bottom area and the water column above that area circumscribed by distance “d” from any point of the diffuser, where “d” is equal to the water depth. Per the application, the ZID is characterized as having a horizontal distance of 150 feet from the diffuser, or 300 feet wide, and 350 feet in length. This is consistent with EPA’s ATSD.

Monitoring stations A and B are considered ZID boundary stations and were sampled for sediment quality. As the ASWQS allow for a ZOM on a pollutant-by-pollutant basis, the permit included a ZOM, situated around the ZID. The ZOM is characterized as having a horizontal distance of 550 feet from the midpoint of the diffuser and an 18 foot depth. In 2002, subsequent to the 2001 permit reissuance, and in accordance with the regional monitoring provision in the permit, monitoring stations were changed to provide a more comprehensive approach to water quality monitoring in Pago Pago Harbor. Some of the monitoring stations were relocated to facilitate the use of common farfield and reference stations in coordination with the tuna canneries. This resulted in all water quality monitoring conducted at the ZOM, not the ZID. Monitoring stations A1 and B1 are considered ZOM boundary stations.

Although the ASWQS allow a ZOM, CWA Section 301(h) requires facilities with variances from secondary treatment to meet water quality standards at the ZID. Where data is available at the ZID, EPA has evaluated whether the proposed discharge would comply with water quality standards at the edge of the ZID; however, where data is not available from the ZID, data from the ZOM is considered, as allowed by the ASWQS.

APPLICATION OF STATUTORY AND REGULATORY CRITERIA

A. Compliance with Federal Primary Treatment Requirements

The Applicant is required under CWA Section 301(h)(9) and 40 CFR 125.60 to demonstrate, at the time the 301(h) variance becomes effective, it will be discharging effluent that has received at least primary or equivalent treatment. According to 40 CFR 125.58(r), primary treatment means treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biological oxygen demanding material and of the suspended solids in the treatment plant influent, and disinfection, where appropriate.

1. Total Suspended Solids

In order to comply with the federal primary treatment requirements, the Applicant proposes renewal of the following effluent limits for total suspended solids as established in the existing permit:

TSS: (1) The 30-day average shall not exceed 75 mg/l.
(2) The 7-day average shall not exceed 113 mg/l.
(3) The 30-day average percent removal shall not be less than 30 percent.

Under the existing permit, the Applicant takes weekly composite samples of the plant influent and effluent to analyze for TSS. EPA reviewed influent and effluent monitoring data reported over the most recent 5 years (2013-2017). Discharge monitoring data for total suspended solids is summarized in the following tables.

Table 1. Monthly average and annual average influent concentrations for total suspended solids (mg/l) at Utulei STP.

Month	**2013**	**2014**	**2015**	**2016**	**2017**
January	94	80	95	48	97
February	104	54	82	82	96
March	104	104	76	95	70
April	72	66	85	109	95
May	80	62	111	104	101
June	48	58	72	84	114
July	116	92	57	76	62
August	103	97	83	96	87
September	89	96	81	103	97
October	116	105	56	99	93
November	108	83	41	105	102
December	118	85	33	88	92
Annual Average	96	82	73	91	92
Maximum Month	118	105	111	109	114
Minimum Month	48	54	33	48	62

Table 2. Monthly average and annual average effluent concentrations for total suspended solids (mg/l) at Utulei STP.

Month	**2013**	**2014**	**2015**	**2016**	**2017**
January	49	30	53	24	43
February	45	32	38	28	40
March	54	26	36	46	36
April	29	30	46	40	38
May	36	23	64	36	41
June	34	22	39	34	46
July	36	34	29	32	25
August	53	34	40	35	35
September	44	38	46	41	40
October	46	35	24	44	40
November	44	36	23	47	43

December	40	48	22	40	39
Annual Average	42.5	32.3	38.3	37.3	38.8
Maximum Month	54.0	48.0	64.0	47.0	46.0
Minimum Month	29.0	22.0	22.0	24.0	25.0

Table 3. Monthly average and annual average percent removals for total suspended solids (%) at Utulei STP.

Month	**2013**	**2014**	**2015**	**2016**	**2017**
January	48.3	58.8	44.4	49.4	55.9
February	56.2	50.7	54.8	64.1	58.
March	48.4	65.5	52.8	51.2	48.
April	71.6	55.3	45.1	63.6	58.1
May	68.	62.2	42.1	65.	58.9
June	55.7	56.4	44.7	57.8	59.7
July	68.8	62.8	48.	5.4[3]	57.6
August	49.5	65.	52.3	63.9	60.2
September	51.2	59.5	41.9	60.5	59.
October	60.1	66.9	57.4	56.4	56.6
November	59.4	56.1	45.9	53.9	57.3
December	63.6	39.	33.	54.4	58.
Annual Average	58.4	58.2	46.9	53.8	57.3
Maximum Month	71.6	66.9	57.4	65.0	60.2
Minimum Month	48.3	39.0	33.0	5.4	48.0

Excluding the apparent data submission error noted in Table 3 (see footnote 3 below), the plant consistently meets the federal primary treatment requirement of at least 30% removal. Table 2 shows the highest monthly average effluent concentration of total suspended solids was 64.0 mg/l, which meets the Applicant's proposed monthly average effluent limit of 75 mg/l.

2. Biochemical Oxygen Demand

In order to comply with the federal primary treatment requirements, the Applicant proposes renewal of the following effluent limits for biochemical oxygen demand as established in the existing permit:

BOD: (1) The 30-day average shall not exceed 78.3 mg/l.
(2) The 7-day average shall not exceed 117 mg/l.
(3) The 30-day average percent removal shall not be less than 30 percent.

[3] The Total Suspended Solids removal value of 5.4% for July 2016 is believed to be a reporting error (entered 5.4 instead of ~57.4). Recalculation of the effluent – influent ratio can be performed with the available data and yields [1- (32 mg/L ÷ 76 mg/L)] = a 57.9% removal rate, well above the required 30% removal.

Under the existing permit, the Applicant takes weekly composite samples of the plant influent and effluent to analyze for BOD. EPA reviewed influent and effluent monitoring data reported over the most recent 5 years (2013-2017). Discharge monitoring data for biochemical oxygen demand is summarized in the following tables.

Table 4. Monthly average and annual average influent concentrations for biochemical oxygen demand (mg/l) at Utulei STP.

Month	**2013**	**2014**	**2015**	**2016**	**2017**
January	98	74	103	91	102
February	114	71	122	121	103
March	129	1114	109	85	101
April	53	80	80	107	77
May	91	63	107	91	100
June	77	54	94	96	106
July	98	122	101	85	58
August	121	99	111	101	104
September	113	124	91	108	108
October	98	125	106	91	90
November	101	99	112	88	110
December	133	118	124	119	111
Annual Average	102	179	105	99	98
Maximum Month	133	1114	124	121	111
Minimum Month	53	54	80	85	58

Table 5. Monthly average and annual average effluent concentrations for biochemical oxygen demand (mg/l) at Utulei STP.

Month	**2013**	**2014**	**2015**	**2016**	**2017**
January	56	46	53	56	52
February	68	34	66	67	51
March	62	61	50	47	48
April	45	46	50	54	41
May	66	38	64	47	53
June	47	39	42	45	65
July	59	60	47	41	38
August	71	55	60	48	55
September	59	62	48	58	63
October	50	63	61	43	46
November	50	47	66	42	63
December	67	67	59	56	57
Annual Average	58.3	51.5	55.5	50.3	52.7
Maximum Month	71.0	67.0	66.0	67.0	65.0

Minimum Month	45.0	34.0	42.0	41.0	38.0

Table 6. Monthly average and annual average percent removals for biochemical oxygen demand (%) at Utulei STP.

Month	**2013**	**2014**	**2015**	**2016**	**2017**
January	41.4	46.	48.3	32.9	48.4
February	40.4	48.7	44.	44.9	48.2
March	51.4	46.3	47.6	45.9	50.6
April	41.3	45.7	38.3	49.7	44.9
May	47.9	44.2	38.7	48.6	46.8
June	52.6	45.2	53.8	51.9	38.3
July	40.7	50.5	49.4	49.	33.9
August	41.1	44.3	45.6	52.	47.2
September	47.9	49.6	46.8	46.6	41.7
October	48.6	48.9	42.6	50.	48.7
November	49.8	52.5	41.	52.2	42.9
December	49.3	43.	50.	52.2	48.3
Annual Average	46.0	47.1	45.5	48.0	45.0
Maximum Month	52.6	52.5	53.8	52.2	50.6
Minimum Month	40.4	43.0	38.3	32.9	33.9

Table 6 shows the plant's monthly average percent removals of biochemical oxygen demand ranged from 32.9% to 53.8% over the permit term, consistently meeting the federal primary treatment requirement of at least 30% removal. Table 5 shows the highest monthly average effluent concentration of biochemical oxygen demand was 71.0 mg/l, which meets the Applicant's proposed monthly average effluent limit of 78.3 mg/l.

B. Attainment of Water Quality Standards for TSS and BOD

Section 301(h)(1) of the CWA, implemented by 40 CFR 125.61(a), requires the existence of water quality standards applicable to the pollutants for which a Section 301(h) modified permit is requested, including: (1) water quality standards for biochemical oxygen demand or dissolved oxygen; (2) water quality standards for suspended solids, turbidity, light transmittance, light scattering, or maintenance of the euphotic zone; and (3) water quality standards for pH. Under 40 CFR 125.61(b)(1), the Applicant must demonstrate the proposed modified discharge will comply with these standards. American Samoa water quality standards applicable to the Utulei STP discharge are specified in the 2013 ASWQS. The Applicant did not request a modification for pH, so it is discussed under section C.1. Attainment of Other Water Quality Standards and Criteria.

1. Dissolved Oxygen

The Applicant requests modified effluent limits for biochemical oxygen demand, which can affect the ambient dissolved oxygen concentration. Section 24.0206(m) of the ASWQS requires the dissolved oxygen of Pago Pago Harbor to be "not less than 70% saturation or less than 5.0 mg/l. If the natural level of dissolved oxygen is less than 5.0 mg/l, the natural level shall become the standard."

Both the Applicant and EPA modeled the potential for: (1) dissolved oxygen depression following initial dilution during the period of maximum stratification (or other critical period); and (2) farfield dissolved oxygen depression associated with biochemical oxygen demand exertion in the wastefield. As the Applicant is a small discharger, they are not required to provide information regarding the dissolved oxygen depression associated with steady-state sediment oxygen demand or resuspension of sediments.

a. Dissolved Oxygen Depression upon Initial Dilution

Using the method described in the ATSD, the Applicant predicted a dissolved oxygen depression following initial dilution of 0.08 mg/l. The Applicant assumed an immediate dissolved oxygen demand (IDOD) of 5 mg/l, initial dilution of 127:1, ambient dissolved oxygen concentration of 5.63 mg/l and effluent dissolved oxygen concentration of 0 mg/l. The 127:1 dilution factor was based on the projected annual average flow of 3.0 MGD at the end of the permit term. The ambient dissolved oxygen concentration was the minimum concentration reported at the diffuser station U during the monitoring period. The immediate dissolved oxygen demand (IDOD) was based on the maximum daily BOD effluent limit of 157 mg/l and travel time through the diffuser of 29 minutes, resulting in an IDOD of 5.0 mg/l. The predicted final dissolved oxygen concentration after initial dilution was 5.55 mg/l, representing a 0.08 mg/l or 1.4% reduction in dissolved oxygen.

EPA recalculated this depression, in compliance with the ATSD, using the critical initial dilution of 91:1 based on a peak flow of 6.0 MGD, and an ambient dissolved oxygen value of 6.16 mg/l based on water quality monitoring data from reference station 5. As previously discussed, the Applicant modeled a critical initial dilution of 91:1 from the March 2003 data. EPA used the critical initial dilution and ambient dissolved oxygen concentration from the March 2003 data as it best represented critical conditions in the receiving water. A summary of the values used is included in Table 7.

Table 7. Summary of values used to estimate final DO concentrations and predicted DO upon critical initial dilution.

Parameter	Applicant Values	EPA Values
Critical flow, MGD	3.0	6.0
Sa	127:1	91:1
IDOD, mg/l	5.0	5.0
DOe, mg/l	0.0	0.0
DOa, mg/l	5.63	6.16

DOf , mg/l	5.55	6.04
ΔDOa-f , mg/l	-0.08	-0.12

Based on a critical initial dilution of 91:1 and a DO_a of 6.16 mg/l, EPA calculated a DO_f of 6.04 mg/l, which results in a depression of 0.12 mg/l or 1.9% from ambient conditions. Thus, even under the worst-case conditions, the maximum predicted reduction in dissolved oxygen is less than 2% and the final DO concentration in the receiving water is still predicted to be above the ASWQS of 5.0 mg/l.

b. Dissolved Oxygen Depression due to BOD in the Farfield

After initial dilution, dissolved oxygen may be consumed by biochemical oxygen demand in the wastefield. The Applicant evaluated whether the dissolved oxygen standard (DO_{STD}) is less than or equal to the dissolved oxygen concentration after initial dilution (DO_f) minus the biochemical oxygen demand after initial dilution (BOD_f) and multiplied by a factor of 1.46. This equation is presented in the ATSD:

$$DO_{STD} \leq DO_f - (BOD_f * 1.46)$$

The ATSD states that if the inequality is true, the discharge will not violate the dissolved oxygen standard due to BOD exertion and no further analysis is necessary. To evaluate this inequality, the Applicant assumed a DO_{STD} of 5.0 mg/l. The DO_f computed in the above section is 5.55 mg/l. Based on the Applicant assuming an effluent BOD concentration of 157 mg/l, an initial dilution of 127:1, and an ambient BOD concentration of 0 mg/l, the BOD_f is 1.23 mg/l. Applying the variables to the inequality yielded a value of 3.8 mg/l, which is less than the DO_{STD}, thus the inequality is false.

EPA re-evaluated the inequality, assuming a DO_f computed above of 6.04 mg/l and calculated BOD_f of 1.73 mg/l assuming a dilution of 91:1, yielding a value of 3.5 mg/l, which is less than the DO_{STD}. Thus, the inequality is false and additional analysis is required.

To assess DO concentrations after initial dilution, the Applicant evaluated receiving water monitoring data for the existing modified discharge and modeled the exertion of BOD in the farfield on DO concentrations under critical conditions. In accordance with EPA's ATSD, DO depression in the farfield due to the consumption of BOD in the receiving water was estimated using a simplified farfield depletion model for open coastal waters.

The DO concentration in the receiving waters following critical initial dilution can be expressed as a function of travel time using Equation B-16 from EPA's ATSD:

$$DO(t) = DO_a + [(DO_f - DO_a) \div D_s] - [(L_{fc} \div D_s)(1-\exp^{-k_c t})] - [(L_{fn} \div D_s)(1-\exp^{k_n t})]$$

where:

$DO(t)$ = DO concentration, in mg/l, in submerged wastefield as a function of travel time, t;

DO_a = Affected ambient DO concentration, in mg/l, immediately up current of the diffuser;

DO_f = DO concentration, in mg/l, at the completion of initial dilution calculated using Equation B-5 described in EPA's ATSD;

k_c = CBOD decay rate coefficient;
k_n = NBOD nitrification rate;
L_{fc} = Ultimate CBOD concentration, in mg/l, above ambient at completion of initial dilution, in mg/l;
L_{fn} = Ultimate NBOD concentration in mg/l above ambient at completion of initial dilution; and
D_s = Dilution attained subsequent to initial dilution as a function of travel time, t.

Table 8 provides a summary of values the Applicant and EPA used to calculate DO(t) concentrations immediately following critical initial dilution as a function of time.

Table 8. Summary of values used by the Applicant and EPA to predict DO concentrations, DO(t), as a function of time.

Parameter	Applicant Values	EPA Values
DOa, mg/l	5.63	6.16
DOf , mg/l	5.55	6.04
kc, day-1	0.325	0.35
kn, day-1	0.141	0.200
Lfc, mg/l	2.63	2.09
Lfn, mg/l	1.04	1.46
Ds	See Table 9	See Table 9

The Applicant used a DO_a value of 5.63 mg/l and a DO_f of 5.55 mg/l. In contrast, EPA used the previously calculated DO_a and DO_f values of 6.16 and 6.04 mg/l, respectively.

For the CBOD decay rate coefficient, k_c, the Applicant calculated a CBOD decay rate of 0.325/day (base e) based on an average ambient water temperature of 27.5 degrees Celsius, since maximum water temperatures have shown to be between 28 and 29 degrees Celsius. In contrast, EPA calculated a k_c of 0.35/day based on an average water temperature of 29 degrees Celsius, which EPA calculated from critical (conservative) conditions from the March 2003 receiving water data at reference station 5.

Similarly, for the nitrogenous BOD (NBOD) decay rate coefficient, k_n, the Applicant calculated a NBOD decay rate of 0.141/day (base e) based the same temperature correction factor and ambient water temperature of 27.5 degrees Celsius. In accordance with EPA's ATSD, studies indicate that a temperature correction factor of 1.08 is valid between 10 and 30 degrees Celsius for nitrogen oxidation. Thus, using this factor and an ambient temperature of 29 degrees Celsius, EPA calculated a k_n of 0.200/day

As described in EPA's ASTD, NBOD may not always contribute to oxygen depletion. However, in embayments such as Pago Pago Harbor where there are other discharges in the vicinity (notably urban/residential runoff and the oxygen demand of waste from the tuna cannery outfall), nitrification may be more important as a source of oxygen depletion. Consequently, EPA has assumed that, in the vicinity of modified discharge, oxygen depletion occurs due to both

carbonaceous BOD (CBOD) and nitrogenous BOD (NBOD) and that both must be considered when modeling farfield dissolved oxygen.

In calculating the ultimate CBOD concentration above ambient at completion of initial dilution, L_{fc}, the Applicant incorrectly applied the default factor of 1.46 twice instead of calculating the L_{fc} based on the equation in the ATSD, resulting in an L_{fc} value of 2.63 mg/l. The Applicant's L_{fc} value would have been 1.54 mg/l, if calculated correctly. EPA calculated an L_{fc} value with the calculated k_c factor of 0.35/day and BOD_f of 1.73 mg/l, resulting in an L_{fc} value of 2.09 mg/l. The L_{fn} values in Table 8 were calculated similarly in accordance with EPA's ATSD.

In the application, the Applicant calculated D_s using an initial width of the sewage field, b, of 100 feet, which corresponds to the length of the diffuser plus half widths of the plume on either end of the diffuser for the critical conditions. Based on the ATSD, the Applicant and EPA predicted dilution, D_s, in the receiving waters as a function of travel time. Table 9 provides a comparison of time intervals and corresponding dilutions calculated by the Applicant and EPA. In the application, the Applicant predicted dilutions based on one day, at 1/6-hour intervals, as well as for 10 days, at 6-hr intervals, to better predict the potential impact of oxygen demand on ambient DO concentrations in the farfield.

In the application, the Applicant estimated that a maximum farfield DO depression of 0.082 mg/l resulted 600 seconds (1/6 hour) after the completion of initial dilution resulting in a DO concentration of 5.548 mg/l in the wastefield. The Applicant concluded that DO is not reduced below 5.0 mg/l in the farfield and that this would comply with American Samoa water quality standards.

EPA reviewed the calculation of the DO concentration in submerged wastefield as a function of travel time for the proposed modified discharge provided by the Applicant. Because the Applicant's lowest modeled DO concentration occurred at the earliest time-step in their modeling, EPA decided to model on a shorter interval. Based on EPA's input values listed in Table 8, the maximum farfield DO depression was found to be 0.0028 mg/l at a time of 330 seconds after completion of initial dilution resulting in a DO concentration of 6.034678 mg/l in the wastefield. This would represent a maximum DO depression of 2.04 percent at the plume trapping depth from the affected ambient condition. Although both EPA and the Applicant predicted a depression of DO after initial dilution, final concentrations were predicted to be above the ASWQS of 5.0 mg/l for DO for Pago Pago Harbor. Therefore, EPA has concluded that the Applicant has demonstrated that the proposed modified discharge after initial dilution would comply with the water quality criterion for DO based on predictive modeling.

Table 9. Comparison of predicted dilution, Ds, and dissolved oxygen concentrations, DO(t), in the farfield calculated by the Applicant and EPA as a function of travel time.
Shaded cells represent the maximum DO depression, i.e., lowest DO concentration, predicted by the Applicant and EPA, occurring at a specific time. EPA calculated on a 30-second timestep (vs. the Applicant's 600-second basis) and the minimum DO occurred before 600 seconds.

Time, t, in seconds	Applicant Calculations		EPA Calculations	
	D_s	DO(t)	D_s	DO(t)
0	-	5.55	-	6.04
30	-	-	1.000000	6.037029
60	-	-	1.000000	6.036695
90	-	-	1.000000	6.036362
120	-	-	1.000004	6.036028
150	-	-	1.000038	6.035699
180	-	-	1.000182	6.035384
210	-	-	1.000570	6.035099
240	-	-	1.001348	6.034863
270	-	-	1.002651	6.034693
300	-	-	1.004579	6.034601
330	-	-	1.007190	6.034596
360	-	-	1.010515	6.034678
390	-	-	1.014554	6.034849
…				
600	1.06048	5.5480727	1.060484	6.038070
1200	1.28713	5.5571618	1.287126	6.054371

c. Dissolved Oxygen Monitoring

As part of Utulei STP's existing permit, the Applicant is required to conduct seasonal (semi-annual) monitoring of DO in the receiving water. EPA reviewed data from monitoring reports submitted between January 2013 and March 2017 to evaluate receiving water concentrations of DO. According to the 2014 American Samoa Water Quality Standards Implementation Guidance Manual, compliance with the DO WQS for NPDES permittees is determined based on a median of all data over a 12-month period at "all depths, all sampling stations, as required in the permit." The previous NPDES permit for the Utulei STP states, "the discharge shall not cause a dissolved oxygen content in the receiving water at and beyond the zone of initial dilution less than 70% saturation, or less than 5.0 mg/l." The permit also requires DO monitoring at stations A and B (ZID stations), C and D (farfield stations), and OH4 (reference station). As noted above, in 2002, the sampling stations for DO changed to A1 and B1 (ZOM stations), C (D farfield station was removed and stations 16 and 18 were added for joint monitoring with the canneries), and 5 (replacing OH4 as the reference station). Thus, EPA calculated median DO concentrations for each 12-month period incorporating all depths and stations A1, B1, C, 16, 18, and 5 collectively (see Table 10).

Table 10. Median DO concentrations for years 2013-2017 at Utulei STP receiving water monitoring stations at or beyond the ZID

Year	Median DO Concentration (mg/l)
2013	6.25
2014	6.16
2015	6.02
2016	5.86
2017	6.10

As shown in Table 10, DO concentrations in the receiving water at and beyond the ZID meet water quality standards. Therefore, EPA has concluded based on current monitoring and the predictive modeling discussed above, the proposed discharge will comply with ASWQS for DO.

2. Total Suspended Solids

The Applicant requests modified effluent limits for TSS. Turbidity, light transmittance, light scattering, and maintenance of the euphotic zone are all measures of the amount of suspended solids in the water column. Section 24.0206(m) of ASWQS provides that turbidity in Pago Pago Harbor shall not exceed 0.75 Nephelometric Turbidity Units (NTU) more than 50% of the time, 1.0 NTU more than 10% of the time, and 1.5 NTU more than 2% of the time and that light penetration depth shall exceed 65.0 feet 50% of the time, 45 feet 10% of the time, and 35 feet 2% of the time. EPA can grant the Applicant a variance from the secondary treatment requirements for TSS if the Applicant demonstrates that the modified discharge would comply with the WQS for turbidity and light penetration (33 USC §1311(h)(2)).

a. Turbidity

EPA reviewed turbidity receiving water monitoring data from 2013 through 2017. According to the 2014 American Samoa Water Quality Standards Implementation Guidance Manual, compliance with the turbidity WQS for NPDES permittees is determined utilizing all data over a 12-month period at "all depths, all sampling stations, as required in the permit." These implementation procedures also provide a screening analysis method to compare the data to the median, 90th percentile, and 98th percentile WQS. The previous NPDES permit states, "the discharge shall not cause the average turbidity in the receiving water at and beyond the ZID to exceed 0.75 NTU." Using the screening method in the implementation procedures and utilizing the data from all depths at and beyond the ZID (stations A1, B1, C, 16, 18, and 5), EPA found the receiving water consistently meets WQS for tubidity, as shown in Table 11.

Table 11. Screening Level Analysis: Compliance for Turbidity

ASWQS percentile	ASWQS criteria (NTU)	Data set percentile value (NTU)				
		2013	2014	2015	2016	2017
50th	0.75	0.23	0.25	0.20	0.19	0.26
90th	1.0	0.42	0.31	0.46	0.25	0.64
98th	1.5	0.52	0.51	0.60	0.29	0.70

b. Light Penetration

EPA also evaluated light penetration based on measurements of Secchi disc depth. By deriving a relationship between visible light and Secchi disc depth, the impact of suspended solids on light penetration in the receiving water can be evaluated using Equation B-54 of EPA's ATSD:

$$\alpha = k_2 \div SD$$

where α = Extinction coefficient of visible light, in meters^{-1};
k_2 = A constant; and
SD = Secchi disc depth in meters for a 30 cm disc.

However, since the water quality criterion for light penetration is expressed as a proportion of light transmitted along a pathway to a specific depth and not as an extinction coefficient, α, the extinction coefficient needs to be estimated. Based on Equation B-51 of EPA's ASTD, the extinction coefficient of visible light can be calculated using the Beer-Lambert law:

$$T_d = e^{-\alpha d}$$

where T_d = Proportion of light transmitted along a path of length d, in meters;
e = the mathematical constant Euler's Number, approximately 2.71828
d = Length of the path, in meters; and
α = Extinction coefficient of visible light, in meters^{-1}.

Based on Equations B-51 and B-54, the Applicant determined that light penetration of one percent at 65.0 feet (19.8 meters) in Pago Pago Harbor, as specified in ASWQS, corresponded to a Secchi disc depth of 24 feet (7.3 meters), which gives the necessary information to determine the value of k_2 in equation B-54. $T_d = e^{-\alpha d}$, so $0.01 = e^{-\alpha * 19.8}$, and $\ln(0.01) = \ln(e^{-\alpha * 19.8})$, or simplifying, $\ln(0.01) = -\alpha * 19.8$, and $\alpha = -(\ln(0.01) / 19.8) \sim= -0.232$. From there, $\alpha = k_2 \div SD$ implies $-0.232 = k_2 \div 7.3$, or $k_2 = -0.232 * 7.3 = -1.6979$.

Based on an extinction coefficient of 0.232 per meter and the calculated k_2 of -1.6979, EPA then used Equation B-54 to estimate a Secchi disc depth which would indicate compliance with the standard. $\alpha = k_2 \div SD$ so $SD = k_2 \div \alpha = -1.6979 \div -0.232 = 7.32$ meters or 24 feet.

Therefore, for the purpose of the Section 301(h) evaluation, EPA believes that a Secchi disc depth of 24 feet is appropriate to evaluate compliance with the water quality criterion for light penetration. Note also that the 2013 revision of the ASWQS also specify light penetration criteria which must be met 90% of the time (45 feet) and 98% of the time (35 feet); using the same series of calculations as above converts these to Secchi depth equivalents of 16.6 feet and 12.9 feet,

respectively. Table 12 provides a summary of Secchi disc depth in the receiving water at stations at and beyond the ZID.

Table 12. Summary of Secchi disc depth recorded at each monitoring station for the Utulei STP.

Site	Station	Secchi Disc Depth (ft) by Year									
		2013		2014		2015		2016		2017	
ZOM	A1	61	40	45	30	70	35	n/a	43	27	30
	B1	62	30	50	35	64	44	n/a	45	43	28
Farfield	C	54	45	45	25	65	29	n/a	33	33	30
	16	56	30	60	35	67	30	n/a	41	35	30
	18	61	25	60	40	80+	42	n/a	43	30	33
REF	5	64	45	85	45	90+	56	n/a	53	27	67

Note: n/a = data not available

Based on receiving water monitoring data, Secchi disc depth was recorded greater than 24 feet at all stations for all of the monitoring events. Therefore, EPA concludes that the Applicant has demonstrated that the discharge meets the WQS for light penetration.

c. Analysis of Suspended Solids Based on Predictive Modeling

i. Suspended Solids Deposition

The Applicant must predict the seabed accumulation due to the discharge of suspended solids into the receiving water. Following the method in EPA's ATSD, the Applicant predicted a steady-state solids accumulation rate of less than 50 g/m^2 based on the effluent flow of 2.2 MGD and the average monthly effluent limitation (emission rate) of 625 kg/day (1,377 lbs/day) for total suspended solids. Since the sediment accumulation rate is less than 50 g/m^2, the Applicant concluded that there would be minimal biological effects associated with the Utulei STP discharge.

EPA calculated a steady-state solids accumulation rate using the requested permit annual average flow of 3.0 MGD and critical instantaneous peak flow of 6.0 MGD, height-of-rise predicted for each flow scenario, and corresponding mass emission rates based on an average monthly effluent limitation of total suspended solids concentration of 75 mg/l. Based on the Applicant's predicted trapping depths for each flow described in the application, EPA calculated a height-of-rise of 131 feet for an effluent flow of 3.0 MGD and a height-of-rise of 120 feet for an effluent flow of 6.0 MGD. Based on a hypothetical high-case discharge flow of 3.0 and 6.0 MGD, EPA calculated the average monthly effluent limitation (emission rate) of 851 kg/day (1,876 lbs/day) and 1,702 kg/day (3,753 lbs/day), respectively, for total suspended solids. Using Figure B-1 of EPA's ATSD and the Applicant's predicted height-of-rise for effluent flows and mass emission rates for each flow scenario, EPA confirmed the predicted steady-state solids accumulation rate would be less than 50 g/m^2.

ii. Suspended Solids Concentration following Initial Dilution

In accordance with EPA's ATSD, the Applicant and EPA estimated the concentration of suspended solids at the completion of initial dilution for the modified discharge. The concentration of suspended solids following critical initial dilution, i.e., at the boundary of the ZID, can be calculated using Equation B-31 of EPA's ATSD:

$$SS_f = SS_a + (SS_e - SS_a) \div S_a$$

where SS_f = Suspended solids concentration at completion of initial dilution, in mg/l;
SS_a = Affected ambient suspended solids concentration immediately up-current of the diffuser averaged from the diffuser port depth to the trapping level, in mg/l;
SS_e = Effluent suspended solids concentration, in mg/l; and
S_a = Initial dilution.

Table 13 provides a summary of predicted suspended solids concentrations at completion of initial dilution predicted by EPA and the values used to estimate these concentrations.

Table 13. Summary of factors used to predict ambient suspended solids concentrations, SS_f, upon critical initial dilution and predicted SS_f values.

Parameter	EPA Value
S_a	91:1
SS_a, mg/l	2.0
SS_e, mg/l	157
SS_f, mg/l	3.7
ΔSS_{a-f}, mg/l	+1.70
ΔSS_{a-f}, %	+85

Table 14. Summary of 2005 quarterly receiving water monitoring data for suspended solids concentrations at the surface, middle and bottom depths at reference station 5.

Reference Station 5 - Depth	Suspended Solids Concentration (mg/l)		Avg. Suspended Solids Concentration (mg/l) at Each Depth
	February 2005	August 2005	
Surface	2	1	1.5
Middle	3	2	2.5
Bottom	2	2	2
Total Average Suspended Solids Concentration			2

In the application, the Applicant predicted a change of 1.0 mg/l; however, EPA predicted a change of 1.7 mg/l. EPA's calculation is based on the very limited ambient monitoring data available from 2005 (see Table 14), a S_a of 91:1, and SS_e of 157 mg/l, resulting in a SS_f of 3.7 mg/l upon initial dilution. This is a discharge-related increase in ambient suspended solids concentration of 1.70 mg/l, which is an 85 percent increase from the affected ambient concentration of 2.0 mg/l.

According to EPA's ATSD, an increase in suspended solids at the completion of initial dilution of less than 10 percent is generally not likely to present a substantial effect in the water column,

although in some cases accumulation of suspended solids in the seabed is possible. Based on the Applicant's and EPA's results, an increase of greater than 10 percent in affected ambient suspended solids concentration was predicted in the receiving water at the ZID; however, as this predictive modeling is based on data more than a decade old, it does not outweigh the more recent direct ambient monitoring data collected for turbidity and light penetration. Therefore, EPA concludes that the Applicant has demonstrated that these applicable water quality standards, indicative of suspended solids in the water column, are being met.

C. Attainment of Other Water Quality Standards and Impact of the Discharge on Public Water Supplies; Shellfish, Fish and Wildlife; and Recreation

Section 301(h)(2) of the CWA, implemented under 40 CFR 125.62, requires the modified discharge not interfere, either alone or in combination with pollutants from other sources, with the attainment or maintenance of water quality that assures protection of public water supplies; protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife; and allows recreational activities in and on the water. In addition, Section 301(h)(9) of the CWA, implemented under 40 CFR 125.62(a), requires the modified discharge meet all applicable EPA-approved Territorial water quality standards and, where no such standards exist, EPA's 304(a)(1) aquatic life criteria for acute and chronic toxicity and human health criteria for carcinogens and noncarcinogens, after initial mixing in the waters surrounding or adjacent to the outfall.

1. Attainment of Other Water Quality Standards and Criteria

40 CFR 125.62(a) requires the Applicant's outfall and diffuser to be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed, at and beyond the zone of initial dilution, all applicable Territorial water quality standards. Where there are no such standards, the discharge must not exceed 304(a)(1) aquatic life and human health criteria.

In addition to DO and TSS, discussed above, Pago Pago Harbor has WQS for nutrients, toxic pollutants, pathogens, toxicity, pH, and ammonia (ASWQS Section 24.0206). EPA's ATSD requires that WQS compliance be reviewed during critical environmental periods, such as periods with maximum stratification and a density profile producing the lowest initial dilution. According to the application, there is little seasonal variation in the water column of Pago Pago Harbor with respect to temperature and salinity. EPA's ATSD also states that compliance with WQS in marine waters can be determined by the Applicant's documenting water quality in the vicinity of the ZID boundary, at control or reference stations, and at areas beyond the ZID where discharge impacts might reasonably be expected. Where receiving water monitoring is available, it is used in the compliance determination below. Where only effluent data is available, calculation of the final receiving water concentration is based on the critical initial dilution of 91:1 discussion above,

a. Nutrients

Nutrients include phosphorus, nitrogen, and chlorophyll-*a*. EPA reviewed monitoring data from 2013 to 2017 to evaluate whether the concentration of nutrients in the receiving water exceeded WQS.

i.Total Phosphorus

Section 24.0206(m) of ASWQS provides that total phosphorus in Pago Pago Harbor shall not exceed 30 ug/l more than 50% of the time, 60 ug/l more than 10% of the time, and 90 ug/l more than 2% of the time. EPA reviewed total phosphorus receiving water monitoring data from 2013 through 2017. According to the 2014 American Samoa Water Quality Standards Implementation Guidance Manual, compliance with the total phosphorus WQS for NPDES permittees is determined utilizing all data over a 12-month period at "all depths, all sampling stations, as required in the permit." These implementation procedures also provide a screening analysis method to compare the data to the median, 90th percentile, and 98th percentile WQS. The previous NPDES permit states, "the discharge shall not cause the average total phosphorus in the receiving water at and beyond the ZID to exceed 30 ug/l." Using the screening method in the implementation procedures and utilizing the data from all depths at and beyond the ZID (stations A1, B1, C, 16, 18, and 5), EPA found the receiving water consistently meets WQS for total phosphorus, as shown in Table 15.

Table 15. Screening Level Analysis: Compliance for Total Phosphorus

ASWQS percentile	**ASWQS criteria (ug/l)**	**Data set percentile value (ug/l)**				
		2013	**2014**	**2015**	**2016**	**2017**
50th	30	12	4	8	13	7
90th	60	24	15	17	15	13
98th	90	27	17	18	26	16

Therefore, EPA concludes that the Applicant has demonstrated that the discharge meets the WQS for total phosphorus.

ii. Total Nitrogen

Section 24.0206(m) of ASWQS provides that total nitrogen in Pago Pago Harbor shall not exceed 200 ug/l more than 50% of the time, 350 ug/l more than 10% of the time, and 500 ug/l more than 2% of the time. EPA reviewed total nitrogen receiving water monitoring data from 2013 through 2017. According to the 2014 American Samoa Water Quality Standards Implementation Guidance Manual, compliance with the total nitrogen WQS for NPDES permittees is determined utilizing all data over a 12-month period at "all depths, all sampling stations, as required in the permit." These implementation procedures also provide a screening analysis method to compare the data to the median, 90th percentile, and 98th percentile WQS. The previous NPDES permit states, "the discharge shall not cause the average total nitrogen in the receiving water at and beyond the ZID to exceed 200 ug/l." Using the screening method in the implementation procedures and utilizing the data from all depths at and beyond the ZID (stations

A1, B1, C, 16, 18, and 5), EPA found that historically, the receiving water exceeded WQS for total nitrogen, as shown in Table 16.

Table 16. Screening Level Analysis: Compliance for Total Nitrogen

ASWQS percentile	ASWQS criteria (ug/l)	Data set percentile value (ug/l)				
		2013	2014	2015	2016	2017
50th	200	383	241	358	333	423
90th	350	530	458	607	548	642
98th	500	580	506	695	722	844

The preliminary screening analysis indicates that TN concentrations exceed water quality standards in the receiving water. Further analysis of reference sites unaffected by the discharge shows that this is because ambient conditions in the receiving water exceed the screening thresholds.

EPA is aware of more recent data which indicate nitrogen levels in the harbor may be improving, Per AS-EPA's recent 303(d) list, the territorial agency has identified a need for additional data collection to determine the status of the harbor with regard to nitrogen. To ensure the discharge complies with applicable water quality standards for TN, the proposed permit includes water quality-based effluent limitations for total nitrogen. Therefore, EPA concludes that the discharge will comply with the applicable WQS for TN.

iii.Chlorophyll-a

Section 24.0206(m) of ASWQS provides that chlorophyll-*a* in Pago Pago Harbor shall not exceed 1.0 ug/l more than 50% of the time, 3.0 ug/l more than 10% of the time, and 5.0 ug/l more than 2% of the time. EPA reviewed chlorophyll-*a* receiving water monitoring data from 2013 through 2017. According to the 2014 American Samoa Water Quality Standards Implementation Guidance Manual, compliance with the chlorophyll-*a* WQS for NPDES permittees is determined utilizing all data over a 12-month period at "all depths, all sampling stations, as required in the permit." These implementation procedures also provide a screening analysis method to compare the data to the median, 90th percentile, and 98th percentile WQS. The previous NPDES permit states, "the discharge shall not cause the average chlorophyll-*a* in the receiving water at and beyond the ZID to exceed 1.0 ug/l." Using the screening method in the implementation procedures and utilizing the data from all depths at and beyond the ZID (stations A1, B1, C, 16, 18, and 5), EPA found the receiving water consistently meets WQS for chlorophyll-*a*, as shown in Table 17.

Table 17. Screening Level Analysis: Compliance for Chlorophyll-a

ASWQS percentile	ASWQS criteria (ug/l)	Data set percentile value (ug/l)				
		2013	2014	2015	2016	2017
50th	1.0	0.8	0.8	0.43	0.64	0.53
90th	3.0	0.8	1.3	0.64	1.71	1.71
98th	5.0	0.8	1.5	0.85	2.67	1.92

Based on statistical screening of monitoring data, EPA finds that the discharge of Total Phosphorus and chlorophyll-a comply with WQSs. Also, as the proposed permit includes water quality based effluent limitations for Total Nitrogen, EPA finds the discharge will also comply with WQS for Total Nitrogen. Therefore, EPA concludes that the proposed discharge will comply with WQSs for nutrients.

a. Toxic Pollutants

Section 24.0206(g) of ASWQS provides that except as may be allowed within a zone of mixing, the concentration of toxic pollutants shall not exceed the more stringent of the aquatic life criteria for marine water or the human health concentration criteria for consumption of organisms found in EPA's National Recommended Water Quality Criteria. The Applicant conducted effluent monitoring for priority toxic pollutants in September 2004 and March 2005. Appendix A shows the effluent concentrations of priority toxic pollutants, the calculated concentration in the receiving water considering critical initial dilution, and the applicable criteria. Toxic pollutants including copper, mercury, zinc, cyanide, dioxins, chlorobenzene, chloroform, methylene chloride, toluene, 4-nitrophenol, phenol, bis(2-ethylhexyl)phthalate, 1,4-dichlorobenzene, diethyl phthalate, fluorene, phenanthrene, alpha-BHC, delta-BHC, and 4,4'-DDT were detected in the effluent. All but 4.4'-DDT were found at concentrations below water quality criteria after consideration of dilution. The concentration of 4.4'-DDT found in 2004 and 2005 exceeded the updated 2015 human health water quality criteria after consideration of dilution; however, this data is more than a decade old. More recent tests have shown no toxic effects in the discharge. Therefore, EPA concludes that the Applicant has demonstrated the discharge will meet applicable water quality standards for individual toxic pollutants at and beyond the ZID. However, in the proposed permit EPA will require the Applicant to collect additional data and will reevaluate if the data indicates that 4.4'-DDT is present in the discharge.

b. Pathogens

To protect whole and limited body-contact recreation in Pago Pago Harbor, ASWQS provide that the number of enterococcus bacteria shall not exceed 35 per 100 ml geometric mean indicator density and 130 per 100 ml statistical threshold value. The 2014 American Samoa Water Quality Standards Implementation Guidance Manual states that "compliance for maximum allowable bacteria levels for public health protection (e.g. beach advisories) shall be based on any single sample exceedance of the statistical threshold value (CFU/100ml) of specified bacteria for fresh and marine waters. For NPDES permittees, permit compliance for marine receiving waters shall be determined utilizing the geometric mean of all discrete measurements (all depths, all stations, as required in the permit) over a 30-day period." Utilizing the data from all depths at and beyond the ZID (stations A1, B1, C, 16, 18, and 5), EPA found the geometric means for each semiannual receiving water sampling event were well below the WQS, as shown in Table 18.

Table 18. Enterococci Semiannual Sampling Event Geometric Mean Concentrations in Pago Pago Harbor

ASWQS criteria (CFU/100ml)	Enterococci Geometric Mean (CFU/100ml)									
	2013		2014		2015		2016		2017	
35	2.2	4.6	2.9	1.6	2.1	2.2	n/a	1.2	1	8.7

In addition, in March 2016, the Utulei STP's UV disinfection system became fully operational. The quarterly reports since the installation of the system indicate the disinfection system has significantly improved levels of enterococci in the effluent. The monitoring data shows that the WQS have not been exceeded at and beyond the ZID. Therefore, EPA concludes that the discharge meets WQS for pathogens.

c. Toxicity

To protect beneficial uses, Section 24.0206(d) of the ASWQS includes a narrative water quality standard that all Territorial waters be "…substantially free from substances and conditions or combinations thereof attributable to sewage, industrial wastes, or other activities of man which may be toxic to humans, other animals, plants, and aquatic life or produce undesirable aquatic life."

In the absence of a numeric criterion for the parameter toxicity, EPA uses a criterion continuous concentration (CCC) of 1.0 Toxic Unit$_{chronic}$ (TU_c) to ensure aquatic life are protected from chronic toxicity in the receiving water. Section 1.3.1 of the TSD defines TUs as 100 divided by the measured effect concentration expressed as a percentage of whole effluent. Thus, TUc = 100/NOEC. The NOEC is the highest concentration of toxicant to which organisms are exposed in a toxicity test that causes no observable adverse effects on the test organisms. With consideration of critical initial dilution, the criterion is 91 TUc.

EPA reviewed data from whole effluent toxicity testing collected between 2013 and 2017 to assess effluent toxicity following critical initial dilution. The Applicant conducted quarterly WET tests on flow-weighted 24-hour composite effluent samples using the Purple Urchin, *Strongylocentrotus purpuratus*, as shown in Table 19.

Table 19. Summary of WET test results for the Utulei STP, 2013-2017.

	2013	2014	2015	2016	2017
Quarter 1	41.7	41.67	41.67	83.3	41.67
Quarter 2	666.7	333.	41.7	41.67	83.3
Quarter 3	167.	166.67	41.7	41.67	41.67
Quarter 4	355.	166.67	41.67	250.	41.67

As shown in Table 19, the Applicant has previously had some test results above 91 TUc; however, all 4 quarters of data in 2017 were below 91 TUc. Also, the previous permit included a trigger for additional monitoring of 333 TUc, and the last three years have been consistently below that level, indicating that treatment performance has reached a level to consistently

achieve compliance with applicable limits. As shown, the discharge has improved over time and there have been no recent toxicity in the discharge. Therefore, EPA concludes the discharge meets the ASWQS for toxicity.

d. Ammonia

Section 24.0206(m) of ASWQS provides that ammonia in Pago Pago Harbor shall not exceed the ammonia toxicity standards in Appendix A of those standards. The ammonia water quality standards are pH and temperature dependent. Using a worse case receiving water pH of 8.3 and temperature of 30 degrees Celsius, the acute water quality standard falls between 1.6 and 2.3 mg/l and the chronic water quality standards falls between 0.23 and 0.34 mg/l. EPA evaluated effluent monitoring data performed as part of the treatment upgrades effectiveness monitoring for 2017 and determined that with dilution of 91:1, the calculated receiving water concentrations of ammonia consistently meet these water quality standards, as shown in Table 20. Therefore, EPA concludes the discharge meets the WQS for ammonia.

Table 20. 2017 Ammonia effluent concentrations for the Utulei STP.

Sampling Event	Effluent concentration of Ammonia (mg/l)	Calculated receiving water concentration using 91:1 dilution (mg/l)
January 2017	20	0.22
February 2017	19	0.21
March 2017	17	0.19
April 2017	16	0.18
May 2017	13	0.14
June 2017	18	0.20
July 2017	16	0.18
August 2017	20	0.22
September 2017	12	0.13
October 2017	3.4	0.04
November 2017	10	0.11
December 2017	6.1	0.07

e. pH

Section 24.0206(m) of the ASWQS provides that pH in Pago Pago Harbor shall be between 6.5 to 8.6 and be within 0.2 pH units of the pH which would occur naturally. The Applicant conducted receiving water monitoring at three depths for each station at and beyond the ZID (stations A1, B1, C, 16, 18, and 5) from 2013 through 2017, showing a minimum pH of 7.97 and a maximum pH of 8.31 in the receiving water. Therefore, EPA concludes that the discharge complies with the WQS for pH.

2. Impact of Discharge on Public Water Supplies

Under 40 CFR 125.62(b), the discharge must allow for the attainment or maintenance of water quality that assures protection of public water supplies. The Utulei STP discharges to marine waters which are not a public water supply. The Applicant states there are no planned or existing public water supply (desalination facility) intakes in the vicinity of the current or modified discharge. EPA's Drinking Water Management Section confirmed this information. Therefore, EPA concludes that the modified discharge will not affect public water supplies.

3. Impact of the Discharge on Shellfish, Fish, and Wildlife

Under 40 CFR 125.62(c), the Applicant's modified discharge must allow for the attainment or maintenance of water quality that assures protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife. A balanced indigenous population must exist immediately beyond the zone of initial dilution and in all other areas beyond the zone of initial dilution where marine life is actually or potentially affected by the Applicant's modified discharge. Conditions within the zone of initial dilution must not contribute to extreme adverse biological impacts, including, but not limited to, the destruction of distinctive habitats of limited distribution, the presence of disease epicenter, or the stimulation of phytoplankton blooms which have adverse effects beyond the zone of initial dilution. The term "balanced indigenous population", as defined in 40 CFR 125.58(f), means an ecological community that exhibits characteristics similar to those of nearby, healthy communities existing under comparable but unpolluted environmental conditions; or may reasonably be expected to become re-established in the polluted water body segment from adjacent waters if sources of pollution were removed.

According to EPA's ATSD, four characteristics generally indicate a low potential for adverse biological impact:

(1) location of the discharge at a depth of greater than 33 ft.,
(2) hydrographic conditions that result in a low predicted solids accumulation rate,
(3) 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
(4) the absence of known or suspected sources of toxic pollutants and pesticides or low concentrations of these substances in the effluent.

EPA evaluated these four characteristics and considered coral reef surveys conducted by the Applicant to confirm that extreme adverse biological impacts are not currently occurring.

Based on evaluation of the four characteristics, EPA has determined that there is low potential for adverse impact from the proposed discharge:

(1) The outfall is located at a depth of 150 ft, which is greater than the 33 ft. threshold;

(2) As described above, the sediment accumulation rate is predicted to be low. Sediment accumulation rates predicted to be less than 50 g/m^2 generally have minimal biological effect in open coastal environments and the predicted sediment accumulation rate for

Utulei STP is less than 50 g/m^2;

(3) There is a subsistence fishery in the shallow waters of Pago Pago Harbor, but no fisheries occur in the vicinity of the outfall, which is in the deep waters of Outer Pago Pago Harbor.

In the vicinity of the outfall there are coral reefs, which are distinctive habitats of limited distribution. To evaluate potential for adverse impacts to coral reefs, EPA considered current conditions, since the proposed discharge will be substantially similar to the existing discharge. Coral reefs are sensitive to sediment deposition, so EPA also reviewed sediment data. The Applicant performed coral reef surveys between 1991 and 2005 as part of its benthic community monitoring program and concluded that no adverse impacts to coral reefs have occurred in the vicinity of the discharge. The Applicant conducted sediment monitoring and found no distinct differences between sediment characteristics at the ZID and at other monitoring locations beyond the ZID, indicating that the sediment is not contributing to extreme adverse biological impacts. The Applicant also reported that there have been no warnings, restrictions, closures, mass mortalities, or increased incidence of disease in marine organisms caused by the existing discharge. Based on analysis of the characteristics associated with low potential for adverse biological impacts and available information about current conditions EPA concludes that conditions within the ZID will not contribute to extreme adverse biological impacts.

(4) All toxics that were found to be present in the 2004 and 2005 sampling events were found at concentrations below water quality standards after consideration of dilution, except for 4.4'-DDT; however, this pollutant is a legacy pollutant, and the proposed permit requires the Applicant to collect new monitoring data for this pollutant. In addition, recent toxicity tests have shown no toxicity in the discharge.

The presence of these characteristics indicates a low potential for the proposed discharge to cause extreme adverse biological impacts.

4. Impact of Discharge on Recreational Activities

Pursuant to 40 CFR 125.62(d), the Applicant's proposed discharge must allow for the attainment or maintenance of water quality which allows for recreational activities beyond the ZID, including, without limitation, swimming, diving, boating, fishing, and picnicking and sports activities along shorelines and beaches. In addition, there must be no Federal, Territorial, or local restrictions on recreational activities within the vicinity of the Applicant's modified outfall unless such restrictions are routinely imposed around sewage outfalls.

According to the Applicant, there is no commercial fishing in the harbor. Recreational and subsistence fishing occurs at shallow depths and on the reef flats, but not in the vicinity of the discharge. There is no primary water contact in the area of the outfall, which is well offshore in deeper water. Also, no restrictions by Federal or Territorial authorities exist in the vicinity of the discharge.

As described in Section 24.0205(e)(1) of the ASWQS, the designated uses for Pago Pago Harbor include commercial, subsistence, and recreational fishing and whole and limited body-contact recreation (e.g., swimming, snorkeling, surfing, and scuba diving). In addition, section 24.0206(g) contains toxic pollutant human health criteria for consumption of organisms. Discharges that comply with the ASWQS allow for the attainment or maintenance of water quality which allows for recreational activities.

As discussed above in C.1, the proposed discharge will comply with the WQS for Pago Pago Harbor. Therefore, EPA has concluded that the proposed discharge will allow for the attainment or maintenance of water quality which allows for recreational activities beyond the ZID.

D. Establishment of a Monitoring Program

EPA may issue a modified permit only if the Applicant has established a system for monitoring the impact of the proposed discharge on a representative sample of aquatic biota (CWA § 301(h)(3)). The monitoring program must be designed to provide data to evaluate the impact of the modified discharge on the marine biota, demonstrate compliance with applicable WQS or water quality criteria, as applicable, and measure toxic substances in the effluent. (40 CFR § 125.63(a)(i)). The Applicant must demonstrate that it has the resources necessary to implement the monitoring program upon issuance of the permit and to carry it out for the life of the permit (40 CFR 125.63(a)(1)(iii)). The Applicant must determine the frequency and extent of the monitoring program by taking into consideration the Applicant's rate of discharge, quantities of toxic pollutants discharged, and the potential significant impacts on the receiving water (40 CFR 125.63(a)(1)(iv)). The program must include biological monitoring, water quality monitoring, and effluent monitoring (40 CFR §§ 125.63(b)-(d)).

EPA has determined that the monitoring requirements included in the proposed permit meet the requirements above. Over the years, the Applicant has conducted a successful monitoring program including effluent, receiving water, and sediment monitoring. On September 27, 2006, the Applicant provided a letter to EPA stating it has the resources necessary to conduct a monitoring program and meet all the requirements of a renewed NPDES permit. Therefore, EPA concludes that the Applicant's monitoring program will meet the requirements of 40 CFR § 125.63.

E. Impact of Modified Discharge on Other Point and Non-point Sources

40 CFR 125.64 implements Section 301(h)(4) of the CWA and requires that the Applicant's proposed modified discharge not result in the imposition of additional treatment requirements on any other point or non-point source. The Applicant is required to obtain a determination from the ASEPA indicating whether the Applicant's discharge will result in any additional treatment requirements on any other point or nonpoint sources, (40 CFR § 125.64(b)).

Other point source discharges to Pago Pago Harbor include the shipyard, a petroleum terminal, and the joint outfall from the two canneries, each of which are regulated by separate individual NPDES permits. ASEPA has indicated that a new certification for the proposed modified

discharge is pending EPA's publication of a draft permit renewal for the facility, in keeping with ASEPA policy. EPA will provide ASEPA this decision document and draft permit at the time of public notice for review and concurrence. EPA is proposing to grant the variance of secondary treatment requirements, with concurrence from ASEPA.

F. Toxics Control Program and Urban Area Pretreatment Program

EPA may not issue a Section 301(h)-modified NPDES permit unless the Applicant demonstrates that all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced (CWA § 301(h)(5)). The Utulei STP does not treat waste from any industrial facilities or other facilities with pretreatment requirements. Therefore, EPA has determined that there are no pretreatment requirements that Utulei STP must enforce.

In addition, POTWs serving a population of 50,000 or more are required to implement a pretreatment program which removes the same amount of toxic pollutants as would be removed if such works were to apply secondary treatment to discharges (CWA § 301(h)(6), 40 CFR 125.65(a)). The Utulei STP serves a population of approximately 13,000 and is therefore not required to implement an urban area pretreatment program.

In accordance with CWA § 301(h)(7), EPA may not issue a Section 301(h)-modified permit unless the Applicant demonstrates that it has established a schedule of activities designed to eliminate the entrance of toxic pollutants from non-industrial sources into the POTW. The Applicant must perform a chemical analysis of its effluent and identify sources of toxic pollutants or pesticides identified (40 CFR §§ 125.66(a)-(b)). For non-industrial sources, the Applicant shall submit a proposed public education program designed to minimize the entrance of non-industrial toxic pollutants and pesticides into its POTW (40 CFR § 125.66(d)).

The Applicant conducted a chemical analysis of its discharge, described above, which showed the presence of some toxic pollutants, but at concentrations below water quality standards. As the Utulei STP does not receive discharges from any industrial facilities, it is reasonable to conclude that these toxic pollutants and pesticides come from non-industrial sources.

To minimize the entrance of toxic pollutants and pesticides to the Utulei STP from non-industrial sources, the Applicant has developed a public education program. The Applicant has proposed to continue its existing Non-Industrial Source Control Education Program, which consists of newspaper articles, radio and television announcements, and informational pamphlets to increase awareness of the need for proper disposal of toxic pollutants. EPA concludes that the applicant's proposed source control program satisfies the requirements of 40 CFR § 125.66(d).

G. Increase in Effluent Volume or Amount of Pollutants Discharged

40 CFR 125.67, which implements Section 301(h)(8) of the CWA, states that no modified discharge may result in any new or substantially increased discharges of the pollutant to which the modification applies above the discharge specified in the 301(h)-modified permit. The Applicant must provide projections of effluent volume and mass loadings for any pollutants to which the modification applies, in five-year increments, for the design life of the facility.

The Utulei STP was constructed with a maximum design flow of 6.0 MGD and permitted for an annual average flow of 2.2 MGD. The Applicant projects an increase in the annual average effluent flow to 3.0 MGD. EPA is proposing to issue a permit authorizing discharge of 3.0 MGD.

The Applicant predicts that pollutant concentrations in the effluent will remain the same, but due to the increased discharge volume, the mass loadings will increase. In accordance with 40 CFR § 125.67, the Applicant projected mass loadings for BOD and TSS in five-year increments, from 2011 to 2021, based on a projected end-of-permit flow of 3.0 MGD. Based on a projected effluent average annual volume of 3.0 MGD for 2011, 2016, and 2021, the Applicant calculated BOD mass loading of 324 metric tons per year and TSS mass loading of 311 metric tons per year. EPA is proposing to issue a permit authorizing the discharge up to 3.0 MGD, with mass limits calculated based on that flow. This increase in mass loading is consistent with antidegradation requirements, as described in the permit fact sheet. The concentration-based limits will be the same as the limits in the previous permit. Based on the Applicant's projections, EPA finds the permit limits to be achievable. The Applicant will be required to comply with the permit limits and will not discharge above the volume specified in the permit.

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H. Compliance with Other Applicable Laws

No § 301(h)-modified permit shall be issued where such issuance would conflict with applicable provisions of Territorial, local, or other Federal laws or Executive Orders (40 CFR § 125.59(b)). This includes compliance with the Coastal Zone Management Act of 1972, as amended, 16 USC 1451 *et seq.*; the Endangered Species Act of 1973, as amended, 16 USC 1531 *et seq.*; Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 USC 1431 *et seq.*; and the Magnuson-Stevens Fisheries Conservation and Management Act of 1976, as amended, 16 U.S.C. 1801 *et seq.*

1. Coastal Zone Management Act of 1972

40 CFR 125.59(b)(3) requires issuance of a 301(h) modified NPDES permit comply with the Coastal Zone Management Act, 16 U.S.C. 1451 *et seq.* A 301(h) modified NPDES permit may not be issued unless the proposed discharge is certified by the Territory to comply with the applicable Territory coastal zone management program(s) approved under the Coastal Zone Management Act, or the Territory waives such certification.

The issuance of a 301(h) modified permit for the Utulei discharge is contingent upon the American Samoa Coastal Management Program's certification.

2. Endangered Species Act of 1973

40 CFR 125.59(b)(3) requires issuance of a 301(h) modified NPDES permit comply with the Endangered Species Act, 16 U.S.C. 1531 *et seq.* A 301(h) modified NPDES permit may not

be issued if the proposed discharge is likely to jeopardize threatened or endangered species or critical habitats listed pursuant to Section 7 of the Endangered Species Act, 16 USC § 1536.

EPA requested a species list from the United States Fish and Wildlife Service (USFWS) and the NOAA National Marine Fisheries Service (NMFS) regarding the proposed renewal of the Utulei STP NPDES permit in a letter dated July 17, 2018. USFWS and NMFS provided lists of endangered and threatened species which may occur in the vicinity of the discharge to EPA. EPA's biological evaluation will be provided to USFWS and NMFS for concurrence. The issuance of a 301(h)-modified permit for the Utulei STP discharge is contingent upon concurrence by the Services.

3. Marine Protection, Research and Sanctuaries Act

To comply with the Marine Protection, Research and Sanctuaries Act, a 301(h)-modified permit may not be issued for a discharge located in a marine sanctuary designated pursuant to Title III, if the regulations applicable to the sanctuary prohibit issuance of such a permit. The proposed modified discharge is not located in a marine sanctuary. The closest marine sanctuary, Fagatele Bay, is located more than five miles from the discharge point of the Utulei STP. Due to the prevailing northeast currents, the distance between the outfall and the marine sanctuary, and dilution of pollutants occurring in the ZID, EPA believes the proposed discharge will not affect the marine sanctuary and complies with the Marine Protection, Research, and Sanctuaries Act.

4. Magnuson-Stevens Fishery Conservation and Management Act

A 301(h)-modified permit shall not be issued where such issuance would conflict with the federal Magnuson-Stevens Fishery Conservation and Management Act, as amended (the MSA), 16 U.S.C. 1801 *et seq*.

The issuance of a 301(h)-modified permit for the Utulei STP discharge is contingent upon the National Marine Fisheries Service's concurrence.

5. State Determination and Concurrence

In accordance with 40 CFR 125.59(i)(2), no Section 301(h)-modified permit shall be issued until the appropriate Territorial certification/concurrence is granted or waived, or if the Territory denies certification/concurrence, pursuant to 40 CFR 124.54. ASEPA, the entity which prepares such certifications, concurred with EPA's permit package and certified consistency with the Territory's requirements in a letter dated August 9, 2019.

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APPENDIX A

Evaluation of Effluent Concentrations of Priority Toxic Pollutants from the Utulei STP

Priority Pollutant	Effluent Conc. (µg/l)		Max. Effluent Conc. (µg/l)	Predicted Receiving Water Conc. (µg/l)[1]	Federal Water Quality Criteria				ASWQS (µg/l)	Exceeds Criteria at ZID?
					Saltwater Aquatic Life Criteria		Human Health Criteria For Consumption of:			
	September 2004	March 2005			CMC (µg/l)	CCC (µg/l)	Water + Organism (µg/l)	Organism Only (µg/l)		
Antimony	ND[2]	ND	-[3]	-	-	-	5.6	640	-	N
Arsenic	ND	ND	-	-	69	36	0.018	0.14	-	N
Beryllium	ND	ND	-	-	-	-	-	-	-	N
Cadmium	ND	ND	-	-	33	7.9	-	-	-	N
Chromium	ND	ND	-	-	1,100	50	-	-	-	N
Copper	6.1	ND	6.1	0.067	4.8	3.1	1,300	-	-	N
Lead	ND	ND	-	-	210	8.1	-	-	-	N
Mercury	0.24	0.0647	0.24	0.0026	1.8	0.94	-	-	0.05	N
Methylmercury	-	-	-	-	-	-	-	0.3 mg/kg	-	-
Nickel	ND	ND	-	-	74	8.2	610	4,600	-	N
Selenium	ND	ND	-	-	290	71	170	4,200	-	N
Silver	ND	ND	-	-	1.9	-	-	-	-	N
Thallium	ND	ND	-	-	-	-	0.24	0.47	-	N
Zinc	27.7	28.5	28.5	0.31	90	81	7,400	26,000	-	N
Cyanide	3	ND	3	0.03	1	1	4	400	-	N
2,3,7,8-TCDD (Dioxin)[4]	1.3E-7	1.0E-7	1.3E-7	1.4E-10	-	-	5.0E-9	5.1E-9	-	N
Acrolein	ND	ND	-	-	-	-	3	400	-	N

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Acrylonitrile	ND	ND	-	-	-	-	0.061	7.0	-	N
Benzene	ND	ND	-	-	-	-	2.1	58	-	N
Bromoform	ND	ND	-	-	-	-	7.0	120	-	N
Carbon Tetrachloride	ND	ND	-	-	-	-	0.4	5	-	N
Chlorobenzene	0.21	ND	0.21	0.002	-	-	100	800	-	N
Chlorodibromomethane	ND	ND	-	-	-	-	0.80	2.1	-	N
Chloroethane	ND	ND	-	-	-	-	-	-	-	N
2-Chloroethylvinyl Ether	ND[3]	ND	-	-	-	-	-	-	-	N
Chloroform	1.5	ND	1.5	0.016	-	-	60	2,000	-	N
Dichlorobromomethane	ND	ND	-	-	-	-	0.95	27	-	N
1,1-Dichloroethane	ND	ND	-	-	-	-	-	-	-	N
1,2-Dichloroethane	ND	ND	-	-	-	-	9.8	650	-	N
1,1-Dichloroethylene	ND	ND	-	-	-	-	300	20,000	-	N
1,2-Dichloropropane	ND	ND	-	-	-	-	0.90	31	-	N
1,3-Dichloropropene	ND	ND	-	-	-	-	0.27	12	-	N
Ethylbenzene	ND	ND	-	-	-	-	68	130	-	N
Methyl Bromide	ND	ND	-	-	-	-	100	10,000	-	N

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Methyl Chloride	ND	ND	-	-	-	-	-	-	-	N
Methylene Chloride	0.42	ND	0.42	0.005	-	-	20	1,000	-	N
1,1,2,2-Tetrachloroethane	ND	ND	-	-	-	-	0.2	3.0	-	N
Tetrachloroethylene	ND	ND	-	-	-	-	10	29	-	N
Toluene	0.51	2.3	2.3	0.025	-	-	57	520	-	N
1,2,-Trans-Dichloroethylene	ND	ND	-	-	-	-	100	4,000	-	N
1,1,1-Trichloroethane	ND	ND	-	-	-	-	10,000	200,000	-	N
1,1,2-Trichloroethane	ND	ND	-	-	-	-	0.55	8.9	-	N
Trichloroethylene	ND	ND	-	-	-	-	0.6	7	-	N
Vinyl Chloride	ND	ND	-	-	-	-	0.022	1.6	-	N
2-Chlorophenol	ND	ND	-	-	-	-	30	800	-	N
2,4-Dichlorophenol	ND	ND	-	-	-	-	10	60	-	N
2,4-Dimethylphenol	ND	ND	-	-	-	-	100	3,000	-	N

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2-Methyl-4,6-Dinitrophenol	ND	ND	-	-	-	-	2	30	-	N
2,4-Dinitrophenol	ND	ND	-	-	-	-	10	300	-	N
2-Nitrophenol	ND	ND	-	-	-	-	-	-	-	N
4-Nitrophenol	13	ND	13	0.143	-	-	-	-	-	N
3-Methyl-4-Chlorophenol	ND	ND	-	-	-	-	-	-	-	N
Pentachlorophenol	ND	ND	-	-	13	7.9	0.03	0.04	-	N
Phenol	12	32	32	0.35	-	-	4,000	300,000	-	N
2,4,6-Trichlorophenol	ND	ND	-	-	-	-	1.5	2.8	-	N
Acenaphthene	ND	ND	-	-	-	-	70	90	-	N
Acenaphthylene	ND	ND	-	-	-	-	-	-	-	N
Anthracene	ND	ND	-	-	-	-	300	00	-	N
Benzidine	ND	ND	-	-	-	-	0.00014	0.011	-	N
Benzo(a)Anthracene	ND	ND	-	-	-	-	0.0012	0.0013	-	N
Benzo(a)Pyrene	ND	ND	-	-	-	-	0.00012	0.00013	-	N
Benzo(b)Fluoranthene	ND	ND	-	-	-	-	0.0012	0.0013	-	N

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Benzo(ghi)Perylene	ND	ND	-	-	-	-	-	-	-	N
Benzo(k)Fluoranthene	ND	ND	-	-	-	-	0.012	0.013	-	N
Bis(2-Chloroethoxy) - Methane	ND	ND	-	-	-	-	-	-	-	N
Bis(2-Chloroethyl)Ether	ND	ND	-	-	-	-	0.030	2.2	-	N
Bis(2-Chloroisopropyl) - Ether	ND	ND	-	-	-	-	-	-	-	N
Bis(2-Ethylhexyl)Phthalate	8.6	12	12	0.13	-	-	0.32	0.37	-	N
4-Bromophenyl Phenyl Ether	ND	ND	-	-	-	-	-	-	-	N
Butylbenzyl Phthalate	ND	ND	-	-	-	-	0.10	0.10	-	N
2-Chloronaphthalene	ND	ND	-	-	-	-	800	1,000	-	N
4-Chlorophenyl Phenyl Ether	ND	ND	-	-	-	-	-	-	-	N
Chrysene	ND	ND	-	-	-	-	0.12	0.13	-	N
Dibenzo(a,h)Anthracene	ND	ND	-	-	-	-	0.00012	0.00013	-	N
1,2-Dichlorobenzene	ND	ND	-	-	-	-	1,000	3,000	-	N
1,3-Dichlorobenzene	ND	ND	-	-	-	-	7	10	-	N
1,4—Dichlorobenzene[5]	4.1/4.3	3.8/1.8	4.3	0.048	-	-	300	900	-	N
3,3-Dichlorobenzidine	ND	ND	-	-	-	-	0.049	0.15	-	N

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Diethyl Phthalate	3.5	4.4	4.4	0.48	-	-	600	600	-	N
Dimethyl Phthalate	ND	ND	-	-	-	-	2,000	2,000	-	N
Di-n-Butyl Phthalate	ND	ND	-	-	-	-	20	30	-	N
2,4-Dinitrotoluene	ND	ND	-	-	-	-	0.049	1.7	-	N
2,6-Dinitrotoluene	ND	ND	-	-	-	-	-	-	-	N
Di-n-Octyl Phthalate	ND	ND	-	-	-	-	-	-	-	N
2,4-Diphenylhydrazine	ND	ND	-	-	-	-	0.03	0.2	-	N
Fluoranthene	ND	ND	-	-	-	-	20	20	-	N
Fluorene	ND	0.38	0.38	0.004	-	-	50	70	-	N
Hexachlorobenzene	ND	ND	-	-	-	-	0.000079	0.000079	-	N
Hexachlorobutadiene	ND	ND	-	-	-	-	0.01	0.01	-	N
Hexachlorocyclo-pentadiene	ND	ND	-	-	-	-	4	4	-	N
Hexachloroethane	ND	ND	-	-	-	-	0.1	0.1	-	N
Indeno(1,2,3-cd)Pyrene	ND	ND	-	-	-	-	0.0012	0.0013	-	N

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Isophorone	ND	ND	-	-	-	-	34	1,800	-	N
Naphthalene	ND	ND	-	-	-	-	-	-	-	N
Nitrobenzene	ND	ND	-	-	-	-	10	600	-	N
N-Nitrosodimethylamine	ND	ND	-	-	-	-	0.00069	3.0	-	N
N-Nitrosodi-n-Propylamine	ND	ND	-	-	-	-	0.0050	0.51	-	N
N-Nitrosodiphenylamine	ND	ND	-	-	-	-	3.3	6.0	-	N
Phenanthrene	ND	0.56	0.56	0.0062	-	-	-	-	-	N
Pyrene	ND	ND	-	-	-	-	20	30	-	N
1,2,4-Trichlorobenzene	ND	ND	-	-	-	-	0.071	0.076	-	N
Aldrin	ND	ND	-	-	1.3	-	0.00000077	0.00000077	-	N
alpha-BHC	0.011	ND	0.011	0.00012	-	-	0.00036	0.00039	-	N
beta-BHC	ND	ND	-	-	-	-	0.0080	0.014	-	N
gamma-BHC (Lindane)	ND	ND	-	-	0.16	-	4.2	4.4	-	N
delta-BHC	0.0052	ND	0.0052	5.7E-5	-	-	-	-	-	N
Chlordane	ND	ND	-	-	0.09	0.004	0.00031	0.00032	-	N
4,4'-DDT	0.018	0.019	0.019	0.00021	0.13	0.001	0.000030	0.000030	-	Y
4,4'-DDE	ND	ND	-	-	-	-	0.000018	0.000018	-	N
4,4'-DDD	ND	ND	-	-	-	-	0.00012	0.00012	-	N

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Dieldrin	ND	ND	-	-	0.71	0.0019	0.0000012	0.0000012	-	N
alpha-Endosulfan	ND	ND	-	-	0.034	0.0087	20	30	-	N
beta-Endosulfan	ND	ND	-	-	0.034	0.0087	20	40	-	N
Endosulfan Sulfate	ND	ND	-	-	-	-	20	40	-	N
Endrin	ND	ND	-	-	0.037	0.0023	0.03	0.03	-	N
Endrin Aldehyde	ND	ND	-	-	-	-	1	1	-	N
Heptachlor	ND	ND	-	-	0.053	0.0036	0.0000059	0.0000059	-	N
Heptachlor Epoxide	ND	ND	-	-	0.053	0.0036	0.000032	0.000032	-	N
Polyclorinated Biphenyls (PCBs)[6]	ND	ND	-	-	-	0.03	6.4E-5	6.4E-5	-	N
Toxaphene	ND	ND	-	-	0.21	0.0002	0.00070	0.00071	-	N

[1]Predicted receiving water concentration calculated by dividing the maximum effluent concentration by the critical initial dilution of 91:1
[2]Concentration estimated to be below laboratory detectable levels
[3]Dashes indicate nondetect concentrations assumed to be zero and thus assumed to not be above the water quality criterion; or no water quality criterion available
[4]Efluent concentration based on 2,3,7,8-TCDD Toxic Equivalency Factors to determine Toxic Equivalents
[5]Two samples were analyzed for 1,4-Dichlorobenzene for each sampling event
[6]Efluent concentration based on "non-detect" concentrations reported for Aroclors 1016, 1232, 1242, 1248, 1254 and 1260