April, 2013

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
Agana Sewage Treatment Plant
PERMIT FACT SHEET

Permittee Name: Guam Waterworks Authority

Mailing Address: P.O. Box 3010. Hagatna, GU 96910

Facility Location: Marine Drive, Route 1, Hagatna, GU 96932
Contact Person(s): Paul Kemp

NPDES Permit No.: GU00200087

I. STATUS OF PERMIT

Guam Waterworks Authority ("GWA" or "the permittee") has applied for the renewal of its National Pollutant Discharge Elimination System ("NPDES") permit to allow the discharge of treated effluent from the Agana Sewage Treatment Plant ("STP"), also referred to as "Hagåtña" or "Hagatna", to Hagatna Bay in the Philippine Sea. EPA Region IX has developed this permit and fact sheet pursuant to Section 402 of the Clean Water Act ("CWA"), which requires point source dischargers to control the amount of pollutants that are discharged to waters of the United States through obtaining a NPDES permit.

In 1986, EPA issued a variance under section 301(h) of the CWA to allow the discharge of primary treated wastewater to Hagatna Bay. EPA issued the Agana STP's first CWA section 301(h)-modified permit (NPDES Permit No. GU0020087) on June 30, 1986. The permit became effective on June 30, 1986, and expired on June 30, 1991. Pursuant to 40 CFR 122.6 , the terms of the existing permit are administratively extended until the issuance of a new permit. EPA has classified this permit as a Major discharger.

Variance from Secondary Treatment Denial

GWA submitted its first section 301(h) application for renewal of its variance on December 28, 1990. Between 1991 and 1997, EPA required GWA to submit additional information to supplement its application renewal. EPA issued a tentative decision on April 4, 1997, that recommended GWA be denied a variance from secondary treatment requirements specified in 40 CFR Part 133 (Marcus 1997). Subsequently, GWA submitted a revised section 301(h) renewal application for the Agana STP to EPA on March 27, 1998 (GWA 1998).

Between 1998 and 2001, GWA submitted additional information to supplement its application for renewal of its section 301(h) variance, all of which was considered by EPA Region IX. On January 5, 2009, EPA Region IX issued a Tentative Decision Document that the application for a renewed variance be denied. Subsequently, EPA Region IX held a public hearing on the tentative decision on June 3, 2009 and accepted public comments on the tentative

decision through June 30, 2009. On September 30, 2009, EPA Region IX denied the variance request and issued its Final Decision Document. (See Final Decision Document, GUAM WATERWORKS AUTHORITY'S AGANA SEWAGE TREATMENT PLANT APPLICATION FOR A MODIFIED NPDES PERMIT UNDER SECTION 301(h) OF THE CLEAN WATER ACT, September 30, 2009)

Subsequently, GWA appealed the Final Decision, thereby staying the decision to deny the 301(h) variance. On November 16, 2011, the Environmental Appeals Board denied GWA's request for review. (See Order Denying Review, Re: Guam Waterworks Authority NPDES Permits Nos. GU0020141 & GU0020087, NPDES Appeal No.(s) 09-15 & 09-16 by the Environmental Appeals Board). This permit renewal therefore establishes full secondary treatment requirements for the permittee.

II. GENERAL DESCRIPTION OF FACILITY

The Agana STP is located on a 152.4 m by 213.4 m (500 ft by 700 ft) man-made island west of Hagatna Bay (see Figure 1). The facility collects and treats wastewater from the central region of Guam which includes the villages of Hagatna, Agana Heights, Asan Piti, Tauning, Mongmong-Toto, Senajana, Chalan Pago-Ordot, Yona, Mangelao, portion of Barrigada, and Tumon. The service area also includes federal government installations (Naval Hospital facilities and personnel residences). The Agana STP currently provides primary treatment for a population of approximately 82,645 people.

Based on information provided by the permittee in its 301(h) waiver application, the average daily and peak hourly design flow capacities of the facility are estimated at 12.0 and 34.1 million gallons per day ("MGD"), respectively. From 2011 Discharge Monitoring Reports ("DMR") data, EPA determined that the monthly average discharge flow is 6.5 MGD and the maximum discharge flow is 9.9 MGD.

The Department of Defense (DoD) is planning an expansion of military operations in Guam with the construction of a new Marine base that will neighbor the Northern District STP facility. Based on information from DoD, EPA understands that DoD is considering the installation of a new sewage connection system from the new base to the Northern District STP.[1] However, the military expansion may also affect the flows at the Agana STP depending on the alignment of facilities and housing. At this time, EPA is not aware of a schedule for completion of the new base or if DoD has made a final decision on wastewater management for the military expansion activities. The DoD expansion may increase future flows at Agana.

Design treatment at the Agana STP includes screening of raw sewage, grit removal, and primary sedimentation. See Appendix B (Flow schematic) The Agana STP underwent a complete renovation between June 2006 and March 2007 with all out-of-service and off-line equipment repaired and/or replaced. The existing facility includes three primary clarifiers operated in parallel. Sludge is pumped to aerobic digesters and decanted prior to hauling off-site.

[1] [1]For more information on the military expansion in Guam, visit the DoD Joint Guam Program Office's website at http://www.guambuildupeis.us

The design treatment removal is estimated to be between 40 and 60% for TSS and between 25 and 40% removal for BOD.

A new outfall was completed and went into operation in December 2008. The new outfall discharges 366 m (1,200 ft) beyond the reef line, which is 100 m (328 ft) further offshore than the previous discharge, and at a depth of 84 m (275 ft). According to GWA's Basis of Design report, the new outfall consists of a 107 cm (42 in) diameter pipe with a new single-port diffuser (GMP Associates, Inc. 2001).

III. DESCRIPTION OF RECEIVING WATER

The Agana STP discharges into coastal waters that are located off Agana Bay on the central and western shoreline of Guam in the Philippine Sea. Agana Bay is located between Oca and Adelup Points and is characterized by a wide fringing reef flat that borders most of the area. The shoreline is characterized as rubble with sand with coral-algal rubble covering the ocean floor.

As specified in section 5102 of Guam Water Quality Standards ("GWQS"), the coastal waters off Agana Bay are considered "Category M-2 Good" marine waters. The beneficial uses for this category of waters are the propagation and survival of marine organisms, particularly shellfish and coral reefs. Other important and intended uses include mariculture activities, aesthetic enjoyment, and compatible recreation inclusive of whole body contact and related activities.

Beach areas in East and West Hagåtña Bay in the vicinity of the outfall are listed as impaired for enterococcus. These include Dungca's Beach, Alupang Beach, Towers Trinchera Beach, Padre Palomo Park Beach, Hagåtña Channel, and Bayside Park. (*Draft Development of Guam Northern Watershed Bacteria TMDLs*, EPA December 16, 2009.)

IV. DESCRIPTION OF DISCHARGE

The following is a summary of previous effluent limitations and monitoring data for pollutants monitored and reported in the Integrated Compliance Monitoring System (ICIS) from DMRs from January 2006 to April 2012. Mass-based effluent limits are based on a design flow of 12 MGD.

Pollutant	**Previous Effluent Limits**			
	Mass-based Limits (kg/day)		**Concentration-based Limits**	
	30-day Average	**Daily Max**	**30-day Average**	**Daily Max**
Flow				12 MGD
BOD	3634	7268	80 mg/L	160 mg/L
TSS	2725	5450	60 mg/L	120 mg/L

pH		Between 7 and 9.0 standard units		

The permittee's discharge has not complied with its previous permit limits for BOD and TSS:

- The monthly average BOD effluent concentration from 2009 to 2012 was 96 mg/L, while the average daily maximum concentration was 120 mg/L.
- The monthly average TSS effluent concentration from 2009 to 2012 was 66 mg/L, while the average daily maximum was 91 mg/L.

The permittee's discharge has complied with the previous pH limitation, which ranged between 7.0 to 7.9 from 2009 to 2012.

V. DETERMINATION OF NUMERICAL EFFLUENT LIMITATIONS

EPA has developed effluent limitations and monitoring requirements in the permit based on an evaluation of the technology used to treat the pollutant (e.g., "technology-based effluent limits") and the water quality standards applicable to the receiving water (e.g., "water quality-based effluent limits"). Based on the comparison, EPA requires the more stringent of the technology-based standard or the water quality-based standard in the permit.

A. Applicable Technology-Based Effluent Limitations

Publicly Owned Wastewater Treatment Works (POTWs)

As noted above, the previous permit established effluent limitations based on the CWA 301(h) waiver requirements, including primary treatment. EPA has denied a request to renew the 301(h) waiver and thus the facility must comply with secondary treatment, as described at 40 CFR Part 133.

EPA developed technology-based treatment standards for municipal wastewater treatment plants in accordance with Section 301(b)(1)(B) of the CWA. The minimum levels of effluent quality attainable by secondary treatment for Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), and pH, as defined in 40 CFR 133.102, are listed below:

Technology Based Effluent Limits for POTWs (secondary treatment)			
	30-day Average	7-day Average	Removal Efficiency
BOD_5	30 mg/l	45 mg/l	85 % minimum
TSS	30 mg/l	45 mg/l	85 % minimum
pH	Must be in the range of 6.0 to 9.0 standard units		

Section 402(a)(1) of the CWA provides for the establishment of Best Professional Judgment (BPJ) as a basis for developing technology-based effluent limitations when effluent limitation guidelines and performance standards are not available for a pollutant of concern. Under 40 CFR Part 125.3(c)(2), to the extent that EPA-promulgated effluent limitations are inapplicable, the permit writer may consider the appropriate technology for the category or class of point sources and any unique factors relating to the applicant.

Accordingly, EPA finds that for a POTW, Oil and Grease should not exceed a 10 mg/l monthly average or a 15 mg/l daily maximum. The minimum levels of effluent quality attainable by secondary treatment for Settleable Solids, as specified in the EPA Region IX Policy memo dated May 14, 1979, are 1 ml/L for a 30-day average and 2 ml/L for a daily maximum. Therefore, EPA has established these BPJ limits in the permit for Oil and Grease and Settleable Solids.

B. Applicable Water Quality-Based Effluent Limitations

Water quality-based effluent limitations ("WQBELS") are required in NPDES permits when the permitting authority determines that a discharge causes, has the reasonable potential to cause, or contributes to an excursion above any water quality standard. (40 CFR 122.44(d)(1))

When determining whether an effluent discharge causes, has the reasonable potential to cause, or contributes to an excursion above narrative or numeric criteria, the permitting authority shall use procedures which account for existing controls on point and non point sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity) and where appropriate, the dilution of the effluent in the receiving water. (40 CFR 122.44 (d)(1)(ii)).

EPA evaluated the reasonable potential to discharge toxic pollutants according to guidance provided in the *Technical Support Document for Water Quality-Based Toxics Control* (TSD) (Office of Water Enforcement and Permits, U.S. EPA, March 1991, Section 3.1.3) and the *U.S. EPA NPDES Permit Writers Manual* (Office of Water, U.S. EPA, 2010). These factors include:

1. Applicable standards, designated uses and impairments of receiving water
2. Dilution in the receiving water
3. Type of industry
4. History of compliance problems and toxic impacts
5. Existing data on toxic pollutants - Reasonable Potential analysis

1. Applicable standards, designated uses and impairments of receiving water

The Agana STP discharges into coastal waters located off Agana Bay in the Philippine Sea. As specified in section 5102 of GWQS, the coastal waters are considered "Category M-2 Good" marine waters.

Coastal waters in the vicinity of the outfall are listed as impaired according to the CWA Section 303(d) List of Water Quality Limited Segments for *Enterococcus* bacteria. (*Draft*

Development of Guam Northern Watershed Bacteria TMDLs, EPA December 16, 2009.) The TMDLs for the impaired waterbodies of East and West Hagåtña Bay identify Agana STP as a potential source, and establish a Waste Load Allocation for enterococcus. The permit establishes limits for enterococcus based on GWQS without allowance for dilution. The permit limits are consistent with the WLA in the draft TMDL, which establishes the WLA as the GWQS.

2. Dilution in the receiving water

The CWA directs States (and Territories) to adopt water quality standards which include the designation of uses and criteria to protect those uses. Pursuant to 40 CFR 131.13, States (and Territories) also are authorized to adopt general policies, such as mixing zones, to implement State water quality standards. Sections 5103(C), (D), and (E) of GWQS allow the use of mixing zones for dischargers that would otherwise exceed water quality criteria for aquatic life, human health, and other water quality criteria at the point of discharge (i.e., end of the pipe).

According to GWQS, mixing zones are allowing under the following conditions:

- Zones of mixing are granted by the Guam Environmental Protection Agency (GEPA) upon review and approval of an Environmental Impact Statement and concurrence of EPA;
- The zone of mixing shall be limited to an area that will minimize impacts on uses, and where allowed, will not adversely affect the receiving water's designated uses;
- Water quality standards must be met at every point outside the zone of mixing;
- Zones of passage must be allowed, and mixing zones must not encroach upon areas used for fish harvesting, particularly of stationary species;
- Biologically important areas and habitat for endangered and threatened species must be protected; and
- Mixing zones shall not cause lethal conditions to aquatic life and wildlife passing through the zone or be injurious to human health from temporary exposure.

GWQS allow for the establishment of a mixing zone for non-thermal discharges to coastal waters (GWQS Section 5104 (C)). The water quality standards at Section 5104(C) specify:

2.a the mixing zone shall be equal in depth to the depth of the water over the diffuser, and in length to twice the depth of the water plus the length of the diffuser, with the diffuser centered within the mixing zone.
b. All discharges to marine waters will comply with the ocean discharge criteria promulgated under Section 403(c) of the Federal Clean Water Act.
c. When practical, discharges and mixing zones should be located within coastal waters entrapped below the thermocline.

The existing outfall was completed and went into operation in December 2008. The outfall discharges 366 m (1,200 ft) beyond the reef line and at a depth of 84 m (275 ft). According to GWA's Basis of Design report, the outfall consists of a 107 cm (42 in) diameter pipe with a single-port diffuser (GMP Associates, Inc. 2001).

GWA predicted initial dilution rates between 111:1 and 120:1. (GMP Associates, Inc, 2001).

EPA re-calculated initial dilution in accordance with the EPA-approved PLUMES model to better understand initial dilution (EPA 1994b). EPA predicted an initial dilution of 219:1 and predicted that the discharge will have a trapping depth of 16.61 ft below the surface. (Agana STP CWA 301(h) Final Decision Document, 2009). For its modeling, EPA used the applicant's outfall design parameters (outfall depth of 275 ft and critical hourly peak flow of 12.0 MGD), a current speed of 0.2 fps, and a current direction perpendicular to the diffuser. EPA used the two ambient density profiles (Nos. 001 and 002) provided by the applicant that EPA determined were the most critical.

In its application for the renewal of its 301(h) variance, GWA proposed an initial dilution of 100:1 for the new outfall. Although EPA modeling has predicted higher dilutions, EPA has concluded that using the applicant's proposed initial dilution of 100:1 is a conservative estimate of critical dilution.

The modeling supports the conclusion that the diffuser will create rapid and complete mixing, thereby minimizing the mixing zone to the zone of initial dilution in accordance with Guam water quality standards. The *Zone of initial dilution* (ZID) means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards. 40 CFR 125.58(dd)

The initial mixing occurs due to discharge jet momentum and buoyancy of the effluent. (*Technical Support Document for Water Quality-Based Toxics Control* (TSD), Office of Water Enforcement and Permits, U.S. EPA, March 1991, Section 4.4.4). Rapid and complete mixing occurs when the distance from the outfall to complete mixing is insignificant (e.g., when the lateral variation of the concentration in the immediate vicinity of the outfall is less than 5%). (TSD, Section 4.4)

As described above, GWQS state that the mixing zone shall be equal in depth to the depth of the water over the diffuser, and in length to twice the depth of the water plus the length of the diffuser, with the diffuser centered within the mixing zone. (GWQS Section 5104 (C) 2.a)) The new outfall diffuser will be 275 feet (84 m) deep, and the single port diffuser will be 4 feet (1m) long. Therefore, Guam WQS allow for a mixing zone 275 feet deep and 554 long [(2 x 275 ft) + 4 feet= 554 feet].

Based on the procedures described in EPA's Amended Section 301(h) Technical Support Document (ATSD; EPA 1994a), EPA calculated the ZID to have a horizontal width and length of 550 ft. (Agana STP CWA 301(h) Final Decision Document, 2009). The ZID therefore meets GWQS mixing zone restrictions. Additionally, EPA predicted the discharge will have a trapping depth of 16.61 ft below the surface. This will maintain the trapping depth to below the thermocline, consistent with GWQS that mixing zones be located within coastal waters entrapped below the thermocline where practicable. (GWQS Section 5104 (C) 2.c)

Based on this information, EPA is proposing that an initial dilution rate of 100:1 be incorporated into the permit.

3. Existing data on toxic pollutants

Existing data on toxic pollutants available to EPA are the results of a March 1998 and a January 2012 effluent analysis.

EPA evaluated all available data. For those pollutants not detected in the effluent, EPA concluded there is no reasonable potential. For any pollutants with a detectable concentration in the effluent, EPA conducted a reasonable potential analysis based on statistical procedures outlined in EPA's *Technical Support Document for Water Quality-based Toxics Control* herein after referred to as EPA's TSD (EPA 1991). These statistical procedures result in the calculation of the projected maximum effluent concentration based on monitoring data to account for effluent variability and a limited data set. The projected maximum effluent concentrations were estimated assuming a coefficient of variation of 0.6 and the 99 percent confidence interval of the 99th percentile based on an assumed lognormal distribution of daily effluent values (see sections 3.3.2 and 5.5.2 of EPA's TSD).

EPA calculated the projected maximum effluent concentration for each pollutant using the following equation:

Projected maximum concentration = C_e × *reasonable potential multiplier factor.*

Where, "C_e" is the reported maximum effluent value and the multiplier factor is obtained from Table 3-1 of the TSD.

As described above, EPA used an initial dilution concentration of 100:1.

Summary of Reasonable Potential Statistical Analysis for all Pollutants Detected in Effluent

Parameter	Maximum Observed Concentration ug/L	*N*	RP Multiplier	Projected Maximum Effluent Concentration ug/L	Applicable Water Quality Criterion After Initial Dilution ug/L	Reasonable Potential?
Arsenic	1.6 ug/l	2	7.4	11.8 ug/l	3,600 ug/l (based on aquatic life, chronic 36 ug/l)	No
Copper	33 ug/l	2	7.4	244 ug/l	620,000 ug/l (Based on aquatic life, chronic 620 ug/l)	No
Chromium (total)	2.7ug/l	2	7.4	24 ug/l	5,000 ug/l (Based on chromium VI aquatic life, chronic 50 ug/l)	No

Lead	1.1 ug/l	2	7.4	21 ug/l	810 ug/l (Based on aquatic life, chronic 8.1 ug/l)	No
Nickel	5.5 ug/l	2	7.4	40 ug/l	820 ug/l (Based on aquatic life, chronic 8.2 ug/l)	No
Zinc	59 ug/l	2	7.4	690 ug/l	8600 ug/L (Based on aquatic life, chronic 86 ug/l)	No
Acetone	41 ug/l	2	7.4	NA	None	No
Benzoic Acid	110 ug/l	2	7.4	NA	None	No
Benzyl Alcohol	11 ug/l	2	7.4	NA	None	No
Chloroform (Trichloromethane)	0.88 ug/l	2	7.4	NA	None	No
Di (2-ethylhexyl) phthalate	22 ug/l	2	7.4	163 ug/l	12,000 ug/L (Based on Human health organisms only 120 mg/L)	No
Phenol	8.3 ug/l	2	7.4	61 ug/l	4,600 mg/l (Based on Human health organisms only 4,600 mg/L)	No
Toluene	0.64 ug/l	2	7.4	4.8 ug/l	20,000 ug/L (Based on Human health organisms only 200 mg/L)	No
4-Methylphenol	40 ug/l	2	7.4	NA	None	No

Conclusion

EPA has concluded there is no reasonable potential for any of the pollutants that were monitored, and thus no WQBELs are necessary based on reasonable potential. As indicated below, EPA is establishing yearly monitoring for toxic pollutants and for whole effluent toxicity to assess the discharge. When additional data becomes available, EPA may re-evaluate effluent concentrations and the potential of any pollutant to cause or contribute to an exceedance of water quality standards.

C. Rationale for Effluent Limits

EPA evaluated the typical pollutants expected to be present in the effluent and selected the more stringent of applicable technology-based standards or water quality-based criteria. Where effluent concentrations of pollutants of concern are unknown or are not reasonably expected to be discharged in concentration that have the reasonable potential to cause or contribute to water quality violations, EPA may establish monitoring requirements in the permit. Where monitoring is required, data will be re-evaluated and the permit may be re-opened to incorporate effluent limitations as necessary.

Flow

The permit establishes continuous flow monitoring for effluent flow.

BOD_5 and TSS

Limits for BOD_5 and TSS for POTWs are established pursuant to 40 CFR 133.102 and described above as the permit technology-based limits. Under 40 CFR Section 122.45(f), mass limits are also required for BOD_5 and TSS. Based on the design flow, the mass based limits are based on the following calculations:

Average Monthly Mass Limits:
Note the conversion factor of 8.345 is used to convert effluent concentration (in mg/l) and design flow (in MGD) to mass (in lbs/day).

Design Flow (daily average)	Average Monthly Concentration Limit	Conversion factor	Weekly Average Mass Limit
12 MGD	30 mg/l	8.345	3000 lbs/day

Average Weekly Mass Limits:

Design Flow (daily maximum)	Average Weekly Concentration Limit	Conversion factor	Weekly Average Mass Limit
12 MGD	45 mg/l	8.345	4500 lbs/day

Settleable Solids
Limits for Settleable Solids are based on BPJ technology based limits as described above, not to exceed 1 ml/L for a 30-day average and 2 ml/L for a daily maximum, and are incorporated into the permit.

Oil and Grease
Limits for Oil and Grease are based on BPJ technology based limits as described above, not to exceed a 10 mg/l monthly average or a 15 mg/l daily maximum are incorporated into the permit.

pH
Secondary Treatment standards for pH are established for POTWs as described above, and must be in the range of 6.0- 9.0. GWQS state that pH standards for M-2 waters must be between 6.5- 8.5. Therefore, in order to address these water quality standards , EPA is establishing an effluent limit for pH that must be maintained between 6.5 to 8.5.

Enterococcus
Beach areas in East and West Hagåtña Bay in the vicinity of the outfall are listed as impaired for enterococcus. These include Dungca's Beach, Alupang Beach, Towers Trinchera Beach, Padre Palomo Park Beach, Hagåtña Channel, and Bayside Park. (*Draft Development of Guam Northern Watershed Bacteria TMDLs*, EPA December 16, 2009.) The TMDLs for the impaired waterbodies of East and West Hagåtña Bay identify Agana STP as a potential source, and establish a Waste Load Allocation for enterococcus. Therefore, limits for Enterococcus based on the Waste Load Allocation are incorporated into the permit. Due to the Bay's listing as an impaired water, no initial dilution may be considered for the effluent. Therefore, the permit establishes limits for enterococcus at 35/100 mL 30 day geometric mean and 104/100 mL as an instantaneous maximum.

Chlorine, Total Residual
Due to the possibility that the facility may use chlorine disinfectant, limits for Total Residual Chlorine (TRC) are established in the permit based on meeting GWQS after allowing for dilution at .750 mg/L as an average monthly maximum and 1.23 mg/L as a daily maximum.

Toxic Pollutants
As described above, EPA conducted Reasonable Potential Analysis based on all available data and determined no toxic pollutants have the potential to cause or contribute to a violation of a water quality standard. The permit, however, will require the permittee to monitor the effluent yearly for all priority pollutants in order to continue an assessment of the effluent. EPA may re-evaluate this data and the permit may be re-opened to incorporate effluent limitations if necessary to protect receiving waters.

Whole Effluent Toxicity
The Whole Effluent Toxicity (WET) approach to toxics control for the protection of aquatic life involves the use of acute and chronic toxicity tests to measure the toxicity of wastewaters. WET is a useful parameter for assessing and protecting against impacts on water quality and designated uses caused by the aggregate toxic effects of the different pollutants in a discharge.

WET tests employ the use of standardized, surrogate freshwater or marine plants, invertebrates, and vertebrates. EPA has published extensive protocols listing numerous marine and freshwater species for toxicity testing.

WET tests are used to measure the acute and/or chronic toxicity of an effluent. Chronic toxicity measures a sublethal effect (e.g., reduced growth, reproduction) in an effluent compared to that of the control organism. When conducting a chronic toxicity test, the highest concentration of an effluent at which no adverse effects are observed on the aquatic test organisms is defined as the No Observed Effect Concentration ("NOEC"). Chronic toxicity units (TU_c) are defined as 100/NOEC.

WET tests were conducted during the January 30, 2012 effluent analysis. The toxicity tests reported a NOEC at 3.1% effluent and TUc at 32.26. However, these results were not reported correctly and may be misleading. For toxicity, the laboratory did a dilution series from 0% effluent to 3.1% effluent, where 3.1 % effluent was the highest level of effluent tested. No negative effects were observed at 3.1% effluent. Therefore, the result is that no toxicity was observed, and the NOEC should really be reported as "Greater Than > 3.1%," and the TUc should be listed as "Less Than <32.26" indicating no observable toxic effects were observed.

As discussed above, EPA is proposing that an initial dilution rate of 100:1 be considered for the permit. Therefore, the applicable water quality standard for WET would be "Pass" at 1.0 % effluent. Existing data demonstrates the effluent "Passes" at greater than 3.1% effluent. Therefore, EPA has concluded there is no Reasonable Potential for the effluent to cause toxicity in the receiving water, and thus no WQBELs are necessary. As indicated below, EPA is establishing yearly monitoring for whole effluent toxicity to monitor the discharge. WET monitoring shall be evaluated as a pass/fail test.

VI. NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

Section 5103 of the GWQS contains narrative water quality standards applicable to the receiving water. Therefore, the permit incorporates the following applicable narrative water quality standards.

1. The discharge shall:

    a. Be free from substances, conditions or combinations that cause visible floating materials, debris, oil, grease, scum, foam, and other floating material which degrade water quality or use;

    b. Be free from substances, conditions or combinations that produce visible turbidity, settle to form deposits or otherwise adversely affect aquatic life;

    c. Be free from substances, conditions or combinations that produce objectionable color, odor, or taste, directly, or by chemical or biological action;

    d. Be free from substances, conditions or combinations that injure or are toxic or harmful to humans, animals, plants or aquatic life;

    e. Be free from substances, conditions or combinations that induce the growth of undesirable aquatic life;

    f. Not cause the pH in the receiving water to be outside the range of 6.5 to 8.5 standard units;

    g. Not cause orthophosphate concentrations in the receiving water to exceed 0.05 mg/L;

    h. Not cause nitrate-nitrogen concentrations to exceed 0.2 mg/L;

    i. Not cause ammonia concentration to exceed 0.02 mg/L;

    j. Not cause the concentration of dissolved oxygen in the receiving water to be less than 75% of saturation;

    k. Not cause alterations of the marine environment that would alter the salinity of marine waters of Guam more than +10% of the ambient conditions, except when due to natural conditions;

    l. Not cause total non-filterable suspended matter at any point to be increased more than 10% from ambient at any time, and the total concentration should not exceed 20 mg/L, except when due to natural conditions;

    m. Not contain any radioactive waste or contaminated radioactive materials from research facilities;

    n. Not cause the temperature in the receiving water to deviate more than 1.0 degree Centigrade (1.8 degree Fahrenheit) from ambient conditions;

    o. Not cause the concentration of oil or petroleum products in the receiving waters to cause a visible film, or sheen, or result in visible discoloration of the surface with a corresponding oil or petroleum product odor, damage to fish or invertebrates, or an oil deposit on the shore or bottom;

p. Not cause concentrations of toxic substances in the receiving water that produce detrimental physiological, acute, or chronic responses in human, plant, animal or aquatic life;

q. Not cause concentrations of toxic substances in the receiving waters that produce contamination in harvestable aquatic life to the extent that it causes detrimental physiological, acute or chronic responses in humans or protected wildlife, when consumed;

r. Not cause concentrations of toxic substances in the receiving waters that result in the survival of aquatic life subject to the discharge to be less than that for the same water body in areas unaffected by the discharge; and

s. Whenever natural concentrations of any toxic substance occurs and exceeds the limits established in Part I of the permit., this greater concentration shall constitute the limit, provided that this natural concentration was not directly affected by human-induced causes.

VII. MONITORING AND REPORTING REQUIREMENTS

The permit requires the permittee to conduct monitoring for all pollutants or parameters where effluent limits have been established, at the minimum frequency specified. The permit requires weekly monitoring for Biochemical Oxygen Demand (5-day), Total Suspended Solids, pH (hydrogen ion), Settleable Solids, Oil and Grease, Enterococci, Total Residual Chlorine, and Temperature. Additionally, the permit establishes yearly monitoring for assessment purposes, including testing for all priority pollutants and whole effluent toxicity.

The permittee shall conduct receiving water monitoring in coastal waters near the outfall at receiving water monitoring stations and frequencies as specified in Tables 2 and 3 below.

Once per quarter, the permittee shall monitor all stations, including mid depth and bottom depth where applicable, for enterocci, ammonia, Total Kjeldahl nitrogen, orthophosphate, nitrate, turbidity, temperature, salinity, pH, and dissolved oxygen in addition to visual monitoring at all stations.

Table 2 – Agana Receiving Water Monitoring Locations

Station Name	Description
Shoreline A (A-sur)	0.5 km West of the treatment plant access road. Surface sample at shoreline.
Shoreline B (B-sur)	East on the treatment plant access road bridge at the second culvert. Surface sample at shoreline.
Shoreline C	0.5 km East of treatment plant at the mouth of the Agana Boat basin on the Paseo De Susanna side halfway to the

(C-sur)	channel marker. Surface sample at shoreline.
Offshore D (D-sur) (D-mid) (D-bot)	Outfall effluent at boil. Surface, Mid (50 ft) depth and bottom (100 ft) depth
Offshore E (E-sur) (E-mid) (E-bot)	100m South of Station D. Surface, Mid (50 ft) depth and bottom (100 ft) depth
Offshore E (E-sur) (E-mid) (E-bot)	1000m East of Station D. Surface, Mid (50 ft) depth and bottom (100 ft) depth

Table 3 - Receiving Water Monitoring Requirements

Parameter	**Units**	**Sample Type**	**Frequency**
Oily sheen; Color; Odor; Presence of floating materials; Clarity/turbidity; Weather; Sampling time; Tide conditions.	Narrative	Visual. Surface only.	Quarterly
Total Kjeldahl Nitrogen	mg/L	Grab Sample.	Quarterly
Ammonia	mg/L	Grab Sample.	Quarterly
Orthophosphate	mg/L	Grab Sample.	Quarterly
Nitrate	mg/L	Grab Sample.	Quarterly
Enterococci	mg/L	Grab Sample.	Quarterly
Turbidity	NTU	Grab Sample.	Quarterly
Temperature	Degrees	Grab Sample.	Quarterly
Salinity	mg/L	Grab Sample.	Quarterly

pH	Std. Units	Grab Sample.	Quarterly
Dissolved Oxygen	mg/L	Grab Sample.	Quarterly

A. Effluent Monitoring and Reporting

The permittee shall conduct effluent monitoring to evaluate compliance with the proposed permit conditions. The permittee shall perform all monitoring, sampling and analyses in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the proposed permit. All monitoring data shall be reported on monthly DMR forms and submitted quarterly as specified in the proposed permit.

B. Priority Toxic Pollutants Scan

A Priority Toxics Pollutants scan shall be conducted yearly to ensure that the discharge does not contain toxic pollutants in concentrations that may cause a violation of water quality standards. The permittee shall perform all effluent sampling and analyses for the priority pollutants scan in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the proposed permit or by EPA. 40 CFR 131.36 provides a complete list of Priority Toxic Pollutants.

C. Whole Effluent Toxicity Testing

The permit establishes tests for toxicity for chronic toxicity. Chronic toxicity testing evaluates reduced growth/reproduction in a sample comprised of 1.0 percent effluent. Chronic toxicity is to be reported based on a comparison of the toxicity of the sample with 1.0 percent effluent to a control sample. The determination of "Pass" or "Fail" will be determined using the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document*, Appendix A (EPA 833-R-10-003, 2010). For marine discharges in Guam, chronic toxicity tests are conducted with the purple sea urchin, *Strongylocentrotus purpuratus*. The presence of chronic toxicity shall be estimated as specified by the methods in the current version of 40 CFR Part 136.

VIII. Anti-Backsliding

Section 402(o) of the CWA prohibits the renewal or reissuance of an NPDES permit that contains effluent limits less stringent than those established in the previous permit, except as provided in the statute.

The permit establishes that pH concentrations must be in the range of 6.5 to 8.5 at all times based on applicable GWQS (2001 Revision). The previous permit established pH limits in the range of 7.0 to 9.0 at all times based on previous GWQS adopted July 18, 1987 and revised January 2, 1992. Therefore, the proposed pH range is slightly different and allows a less

stringent limit in the lower pH range while establishing a more stringent limit in the higher pH range.

As described in Section II, above, a new outfall was completed and went into operation in December 2008. The new outfall discharges 366 m (1,200 ft) beyond the reef line, which is 100 m (328 ft) further offshore than the previous discharge. EPA has determined based on new modeling efforts that initial dilution at the outfall occurs and is allowable under Guam WQS. The new modeling efforts predict an initial dilution of 100:1, which has been considered in the development of effluent limitations for the permit. In accordance with the exception allowed at 40 CFR 122.44(l)(2)(i)(B)(1), the backsliding of the lower pH range is justified based on new information now available that was not available at the time of issuance of the previous permit. Therefore, in order to implement GWQS for "Category M-2 Good" marine waters, EPA is establishing a pH limit that must be in the range of 6.5 to 8.5 at all times.

The permit relaxes an effluent limitation based on new information (40 CFR 122.44(l)(2)(i)(B)(1)), but maintains the limit consistent with an existing state water quality standard. CWA section 303(d)(4)(B) applies to waters where the water quality equals or exceeds levels necessary to protect the designated use, or to otherwise meet applicable water quality standards (i.e., an *attainment water*). Under CWA section 303(d)(4)(B), a limitation based on a TMDL, WLA, other water quality standard, or any other permitting standard may only be relaxed where the action is consistent with state's antidegradation policy. As noted above, the facility has been in compliance with the pH effluent limit of the previous permit, and the receiving waterbody is attaining applicable water quality standards for pH. Therefore, the change in pH is justified. See Section *7.2.1 Anti-backsliding Statutory Provisions of the 2010 NPDES Permit Writers Manual*. As noted below, EPA has also evaluated the permit for compliance with antidegredation policy.

IX. Antidegradation Policy

EPA's antidegradation policy at 40 CFR 131.12 and Section 5101.B. of the GWQS require that existing water uses and the level of water quality necessary to protect the existing uses be maintained.

As described in this document, the permit establishes effluent limits and monitoring requirements to ensure that all applicable water quality standards are met. The permit requires significant facility treatment upgrades from the past permit and now requires the facility to meet EPA's secondary treatment requirements to replace the previously issued waiver. The permit does not allow additional degradation of the receiving water. The permit establishes ambient monitoring requirements in the vicinity of the discharge outfall to ensure compliance with water quality standards.

Therefore, EPA has concluded the discharge will not adversely affect the receiving water body, and the permit will not allow for the degradation of existing water quality.

VII. SPECIAL CONDITIONS

A. Biosolids

Standard requirements for the monitoring, reporting, recordkeeping, and handling of biosolids in accordance with 40 CFR Part 503 are incorporated into the permit.

B. Pretreatment

Standard requirements for pretreatment requirements in accordance with 40 CFR Part 403 are included in this permit.

C. Development and Implementation of Best Management Practices

Pursuant to 40 CFR 122.44(k)(4), EPA may impose Best Management Practices ("BMPs") which are "reasonably necessary . . . to carry out the purposes of the Act." The pollution prevention requirements or BMPs proposed in the permit operate as technology-based limitations on effluent discharges that reflect the application of Best Available Technology and Best Control Technology. Therefore, the draft permit requires that the permittee develop (or update) and implement a Fats Oils and Grease (FOG) Program with appropriate pollution prevention measures or BMPs designed to prevent pollutants from entering Hagatna Bay within the Philippine Sea and other surface waters while performing normal processing operations at the facility.

D. Development of an Initial Investigation TRE Workplan for Whole Effluent Toxicity

In the event effluent toxicity is observed from WET test results, the proposed permit requires accelerated monitoring for WET. The permit also requires the permittee to develop and implement a Toxics Reduction Evaluation ("TRE") Workplan.

An unacceptable effluent toxicity is found when "Fail" is determined, as indicated by a statistically significant difference between a test sample of 100 percent effluent and a control using a t-test. If a test result of "Fail" is determined, the permittee shall conduct an Accelerated Toxicity Testing and TRE/TIE Process, as specified in the permit.

Due to EPA's determination of no reasonable potential for WET, there is no effluent limit for WET contained in the permit. Therefore, the permit does not contain a requirement for the permittee to develop an Initial Investigation TRE Workplan. EPA may revisit this requirement in the future based on future monitoring results.

IX. OTHER CONSIDERATIONS UNDER FEDERAL LAW

A. Impact to Threatened and Endangered Species

Section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1536) requires federal agencies to ensure that any action authorized, funded, or carried out by the federal agency does not jeopardize the continued existence of a listed or candidate species, or result in the destruction or adverse modification of its habitat.

The Endangered Species Act ("ESA") allocates authority to and administers requirements upon Federal agencies regarding threatened or endangered species of fish, wildlife, or plants and habitat of such species that have been designated as critical. Its implementing regulations (50

CFR Part 402) require EPA to ensure, in consultation with the Secretary of the Interior or Commerce, that any action authorized, funded or carried out by EPA is not likely to jeopardize the continued existence of any threatened or endangered species or adversely affect its critical habitat (40 CFR 122.49(c)).

Implementing regulations for the ESA establish a process by which Federal agencies consult with one another to ensure that the concerns of both the U.S. Fish and Wildlife Service ("USFWS") and the National Marine Fisheries Service ("NMFS")(collectively "Services") are addressed. In compliance with Section 7 of the ESA, EPA obtained lists of critical habitat areas and threatened and endangered species.

Based on a review of the best scientific and commercial data available, EPA Region IX has determined the wastewater discharge from the STP will have "no affect" on the endangered Little Mariana Fruit Bat (*Pteropus tokudae)*, the Mariana Crow (*Corvus kubaryi),* the Guam Micronesian Kingfisher (*Halcyon cinnamomina cinnamomina),* the Mariana Common Moorhen (*Gallinula chloropus guami)*, the Guam Rail (*Rallus owstoni),*the Leatherback Sea Turtle (*Dermochelys coriacea)*, the Hawksbill Sea Turtle (*Eretmochelys imbricata),* the plant species the Hayun Guam Iagu (*Serianthes nelsonii),* or the Blue Whale *(Balaenoptera musculus),* Fin Whale *(Balaenoptera physalus),* Humpback Whale *(Magaptera novaeangliea), Sei Whale (Balaenoptera borealis),* Sperm Whale *(Physeter macrocephalus),* or Dugong *(gugong dugon)*. EPA has also determined the discharge will have "no effect" on the threatened Mariana Fruit Bat *(Pteropus mariannus mariannus,* Loggerhead (*Caretta caretta),* Olive Ridley *(Lepidochelys ovivacea)* or Green *(Chelonia mydas)* Sea Turtle. None of these turtles, bats, birds, plants or whales are found to occur, or are reasonably expected to occur, in the vicinity of either discharge or action area beyond speculative incidental contact.

EPA has prepared a biological evaluation to support its conclusions. EPA has provided copies of the draft permit, fact sheet, and biological evaluation to the appropriate offices of the NMFS and the USFWS for review and comment during the comment period. EPA has concluded the action will have "no affect".

B. Impact to Coastal Zones

The Coastal Zone Management Act ("CZMA") requires that Federal activities and licenses, including Federally permitted activities, must be consistent with an approved state Coastal Management Plan (CZMA Sections 307(c)(1) through (3)). Section 307(c) of the CZMA and implementing regulations at 40 CFR 930 prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State (or Territory) Coastal Zone Management program, and the State (or Territory) or its designated agency concurs with the certification.

The Guam Coastal Management Program has issued its consistency determination.

C. Impact to Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act ("MSA") set forth a number of new mandates for NMFS, regional fishery management councils

and other federal agencies to identify and protect important marine and anadromous fish species and habitat. The MSA requires Federal agencies to make a determination on Federal actions that may adversely impact Essential Fish Habitat ("EFH").

The proposed permit contains technology-based effluent limits and numerical and narrative water quality-based effluent limits as necessary for the protection of applicable aquatic life uses. The permit establishes more stringent treatment requirements that the previous permit by requiring secondary treatment standards be met. Additionally, the permit incorporates additional measures to control FOG and other sources of pollutants which will improve the efficiency of the wastewater treatment system. Therefore, EPA has determined that the proposed permit will not adversely affect essential fish habitat.

D. Impact to National Historic Properties

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effect of their undertakings on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. Pursuant to the NHPA and 36 CFR 800.3(a)(1), EPA is making a determination that issuing this proposed NPDES permit does not have the potential to affect any historic properties or cultural properties. As a result, Section 106 does not require EPA to undertake additional consulting on this permit issuance.

If EPA determines that the discharge will cause unreasonable degradation, an NPDES permit will not be issued. If a determination of unreasonable degradation cannot be made because of a lack of sufficient information, EPA must then determine whether a discharge will cause irreparable harm to the marine environment and whether there are reasonable alternatives. For this discharge, EPA has determined that the discharger, operating under appropriate permit conditions and monitoring requirements, will not cause irreparable harm.

X. STANDARD CONDITIONS

A. Reopener Provision

In accordance with 40 CFR 122 and 124, this permit may be modified by EPA to include effluent limits, monitoring, or other conditions to implement new regulations, including EPA-approved water quality standards, or to address new information indicating the presence of effluent toxicity or the reasonable potential for the discharge to cause or contribute to exceedances of water quality standards.

B. Standard Provisions

The permit requires the permittee to comply with the Standard Federal NPDES Permit Conditions.

XI. ADMINISTRATIVE INFORMATION

A. Public Notice and Comment Period (40 CFR 124.10)

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or other significant action with respect to an NPDES permit or application.

Notice of the draft permit was placed in the Pacific Daily News on November 29, 2012.

B. Public Hearing (40 CFR 124.12(c))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if EPA determines there is a significant amount of interest expressed during the 30-day public comment period or when it is necessary to clarify the issues involved in the permit decision. No public hearing was requested.

C. Water Quality Certification Requirements (40 CFR 124.53 and 124.54)

For States, Territories, or Tribes with EPA approved water quality standards, EPA requests certification from the affected State, Territory, or Tribe that the proposed permit will meet all applicable water quality standards. Certification under section 401 of the CWA shall be in writing and shall include the conditions necessary to assure compliance with the CWA and appropriate requirements of State, Territory, or Tribal law. Guam EPA has issued a Section 401 Certification.

XII. CONTACT INFORMATION

Comments and additional information relating to this proposal may be directed to:

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EPA Region IX
75 Hawthorne Street (WTR-5)
San Francisco, California 94105

Email: Tinger.John@epa.gov
Phone: (415) 972-3518

XIII. REFERENCES

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control*. Prepared by EPA, Office of Water Enforcement and Permits, March 1991. EPA/505/2-90-001.

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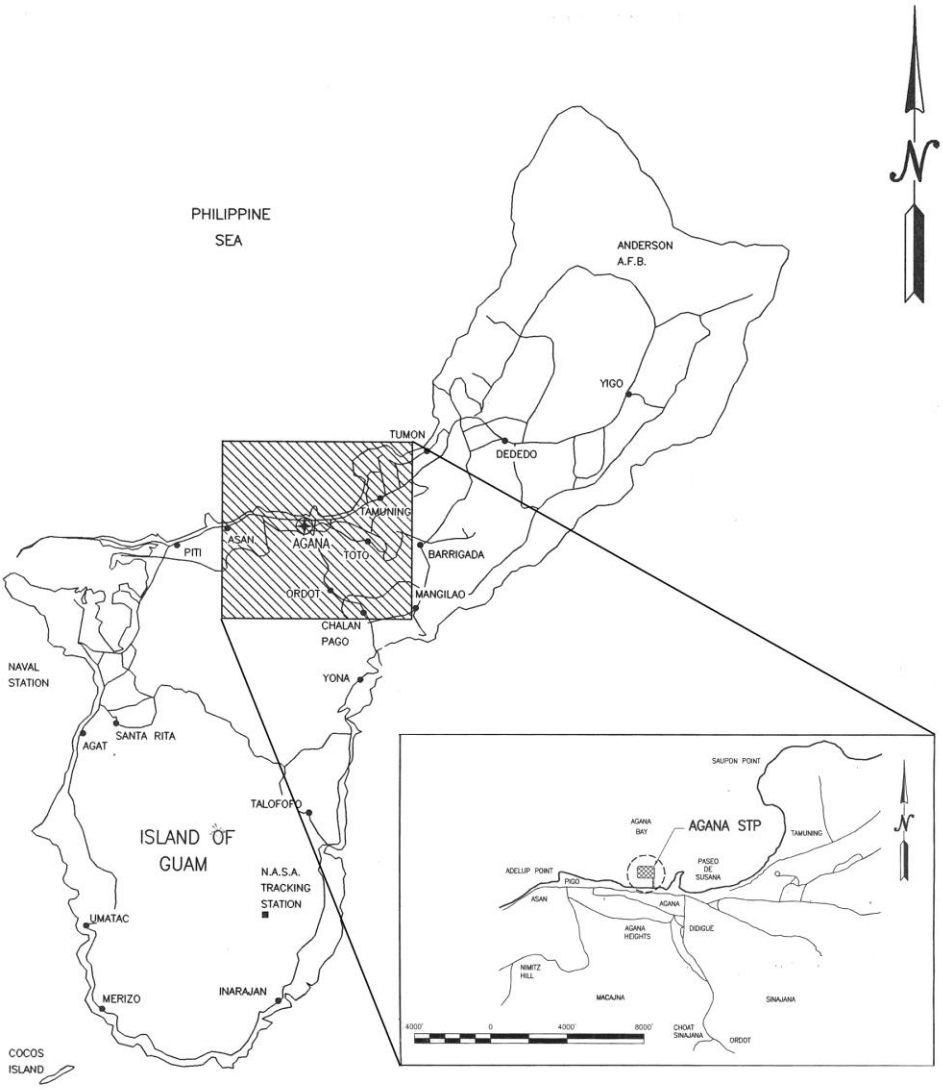
XIV. APPENDICIES

Appendix A- Location Map



Appendix B- Existing Flow Schematic –

Figure 2. Existing rocess diagram of Agana STP. Note this does not represent the secondary treatment system that will be in place to meet secondary treatment requirements. Reprinted from GWA's section 301(h)-modified NPDES permit renewal application (GWA 1998).