

US EPA ARCHIVE DOCUMENT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
FACT SHEET

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NPDES Permit No.: GU0110019

PART I - STATUS OF PERMIT

The U.S. Navy (hereinafter, USN or the permittee) has applied for renewal of its National Pollutant Discharge Elimination System (NPDES) permit pursuant to U.S. Environmental Protection Agency (EPA) regulations set forth in Title 40, Code of Federal Regulations (CFR), Part 122.21, for the discharge of treated effluent from its Apra Harbor Wastewater Treatment Plant (Apra Harbor WWTP or the facility) to the Tupalao Bay of the Philippine Sea. These regulations require any person who discharges or proposes to discharge pollutants from a point source into waters of the U.S. to submit a complete application for a NPDES permit, including renewal of a permit. Because the Territory of Guam (Guam) has not been delegated primary regulatory responsibility for administering the NPDES program, EPA is issuing a NPDES permit which incorporates both federal and Guam water quality requirements. In accordance with 40 CFR 122.21(e), USN submitted an initial application for renewal of its NPDES permit on October 19, 2005, with supplemental information to complete the application on November 1, 2005. Under NPDES Permit No. GU0110019, which became effective on April 16, 2001 and expired on April 15, 2006, the Apra Harbor WWTP currently discharges through the Tupalao Bay Outfall (Discharge Point No. 001) to the Tupalao Bay of the Philippine Sea. Pursuant to 40 CFR 122.21, the terms of the existing permit are administratively extended until the issuance of a new permit.

PART II - DESCRIPTION OF FACILITY

The permittee owns and operates the Apra Harbor WWTP, which serves the USN's Apra Harbor Complex on the Island of Guam (Attachment A). The facility discharges treated *domestic, industrial and commercial* wastewater from the Apra Harbor WWTP to the Tupalao Bay of the Philippine Sea. The Apra Harbor WWTP serves a population of approximately 20,000 through

separate sanitary sewer connections. The facility was upgraded in 1993 to provide secondary treatment and consists of a trickling filter secondary treatment system with a design capacity of 4.3 million gallons per day (MGD). The facility also operates a chlorination and dechlorination system. Appendix A provides a process flow diagram for the facility. Based on review of Discharge Monitoring Reports (DMRs) for January 2003 through September 2005, the permittee reported a maximum daily maximum flow rate of 7.69 MGD (August 2005) and a maximum monthly average flow of 3.41 MGD (September 2005). Effluent is pumped through the Tupalao Bay ocean outfall, a predominantly subsurface offshore steel pipeline that terminates approximately 1,800 feet offshore at a depth of 120 feet.

PART III - DESCRIPTION OF DISCHARGE AND RECEIVING WATER

During facility operations, the permittee discharges at the following discharge points:

Discharge Point No.	Discharge Point Description	Effluent Description	Discharge Point Latitude	Discharge Point Longitude
001	Tupalao Bay Outfall	Secondary Treated Effluent (Disinfected)	13° 24' 48" N	144° 38' 30" E

Effluent from Discharge Point No. 001 is discharged to Category M-2 (Good) receiving waters of Tupalao Bay (Appendix B). This outfall also discharges effluent from the Agat-Santa Rita Wastewater Treatment Plant, which is operated by the Guam Waterworks Authority and is regulated by a separate NPDES discharge permit (NPDES Permit No. GU0020222). A summary of existing effluent limitations and monitoring requirements pursuant to the existing NPDES permit and the maximum effluent concentrations reported by the facility for Discharge Point No. 001 is provided in Table 1.

To protect the designated uses of waters of the U.S., Guam has adopted water quality standards for surface waters depending on the level of protection required. The Tupalao Bay of the Philippine Sea is a territorial water of Guam and is classified as marine waters. Guam water quality standards (GWQS) identify protected uses for Category M-2 waters that include the following:

- propagation and survival of marine life, particularly of shellfish and other similarly harvested aquatic organisms, coral, and reef-related resources;
- whole body contact recreation;
- mariculture activities; and
- aesthetic enjoyment and related activities.

PART IV - DETERMINATION OF NUMERICAL EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires point source dischargers to control the amount of pollutants that are discharged to waters of the U.S. The control of pollutants is established through effluent limitations and other requirements in NPDES permits. When determining

effluent limitations, EPA must consider limitations based on the technology used to treat the pollutant(s) (i.e., technology-based effluent limits) and limitations that are protective of water quality standards (i.e., water quality-based effluent limits).

Table 1 – Summary of Existing Effluent Limitations and Monitoring Requirements for Discharge Point No. 001, and Facility Performance Data based on Discharge Monitoring Reports (January 2003 – September 2005) for the Apra Harbor WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Sample Type
Flow Rate	MGD	Monitoring Only	Monitoring Only	Monitoring Only	3.41	-- ²	7.69	Continuous	Metered
Biochemical Oxygen Demand (5-day)	mg/L	30	45	--	7.5	10.0	--	Weekly	24-hr Composite
	lbs/day	1,076	1,614	--	182	218	--		
	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 30 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period.				81% to 97%				
Total Suspended Solids	mg/L	30	45	Monitoring Only	47.1	95.0	--	Weekly	24-hr Composite
	lbs/day	1,076	1,614	--	837	1,629	--		
	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 30 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period.				66% to 99%				
Fecal Coliform	CFU/100 mL	200	400	--	122	458	--	Weekly	Discrete

Table 1 Continued – Summary of Existing Effluent Limitations and Monitoring Requirements for Discharge Point No. 001, and Facility Performance Data based on Discharge Monitoring Reports (January 2003 – September 2005) for the Apra Harbor WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Sample Type
Total Chlorine Residual ³	µg/L	7.5	--	12.3	6.13	--	18.75	Weekly	Discrete
	lbs/day	0.269	--	0.442	0.11	--	0.32		
pH	Standard Units	Not < 6.0 nor > 9.0 SU at any time.			6.95 (minimum monthly average) 8.12 (maximum daily maximum)			Weekly	Discrete
Enterococci ⁴	CFU/100 mL	35	--	57	36	--	332	Weekly	Discrete
Copper	ug/L	2.9	--	4.8	11.0	--	11.0	Weekly	24-hr Composite
	lbs/day	0.105	--	0.172	0.22	--	0.22		
Nickel	ug/L	8.2	--	13	20.2	--	27.5	Weekly	24-hr Composite
	lbs/day	0.294	--	0.483	0.32	--	0.40		
Zinc	ug/L	58	--	95	40.1	--	40.1	Weekly	24-hr Composite
	lbs/day	2.07	--	3.41	0.64	--	0.64		
Aluminum	ug/L	120	--	200	6,500	--	6,500	Weekly	24-hr Composite
	lbs/day	4.37	--	7.17	114	--	114		
Other Heavy Metals ⁵	µg/L or mg/L	--	--	Monitoring Only	--	--	--	Annually	24-hr Composite
Pesticides ⁶	µg/L or mg/L	--	--	Monitoring Only	--	--	--	Annually	24-hr Composite

Table 1 Continued – Summary of Existing Effluent Limitations and Monitoring Requirements for Discharge Point No. 001, and Facility Performance Data based on Discharge Monitoring Reports (January 2003 – September 2005) for the Apra Harbor WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Sample Type
Ammonia	mg/L	Monitoring Only	--	Monitoring Only	0.70	--	1.9	Weekly	24-hr Composite
	lbs/day	Monitoring Only	--	Monitoring Only	17.3	--	28.0		
Oil and Grease	mg/L	Monitoring Only	--	Monitoring Only	10.8	--	10.8	Monthly	Discrete
	lbs/day	Monitoring Only	--	Monitoring Only	88.2	--	88.2		
Whole Effluent Toxicity	TU _C	--	--	Monitoring Only	--	--	20.8	Quarterly	24-hr Composite

¹ Mass limitations based on an annual average daily design flow of 4.3 MGD

² Not applicable or data not available for review

³ Contact time following chlorination and prior to effluent discharge shall not be less than 15 minutes

⁴ To determine compliance, a minimum of four (4) samples must be collected at approximately equal intervals; reported as colony forming units (CFU) per 100 mL

⁵ Heavy metals include: As, Cd, Cr³⁺, Cr⁶⁺, Pb, Hg, and Ag, and shall be monitored for both total recoverable and dissolved metal

⁶ For the listing of all pesticides (organochlorines, organophosphates, carbamates, herbicides, fungicides, defoliants, and botanicals) see EPA's Water Quality Criteria *Blue Book*

A. Applicable Technology-Based Effluent Limitations

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), Total Suspended Solids (TSS), and pH, as defined in 40 CFR 133.102, are:

- BOD: 30 mg/L as a 30-day (monthly) average, 45 mg/L as a 7-day (weekly) average, and 85% removal efficiency;
- TSS: 30 mg/L as a 30-day (monthly) average, 45 mg/L as a 7-day (weekly) average, and 85% removal efficiency; and
- pH: must range from 6.0 to 9.0 standard units as an instantaneous maximum.

In accordance with 40 CFR 133, technology-based effluent limitations are proposed for BOD, TSS, and pH based on secondary treatment requirements for municipal wastewater treatment facilities. These requirements are performance-based and represent the degree of effluent reduction achievable using available wastewater treatment technology. In conjunction with federal requirements, section 5104 of GWQS provides secondary treatment requirements that describe the minimum level of effluent quality to be attained when secondary treatment is required. Table 2 provides a summary of proposed technology-based effluent limitations for Discharge Point No. 001.

1. **Biochemical Oxygen Demand.** Pursuant to 40 CFR 133.102 and section 5104(A)(7)(a) of GWQS, effluent limitations are proposed for BOD. Secondary treatment requirements provide that effluent concentrations of BOD shall not exceed 30 mg/L on a 30-day average and not exceed 45 mg/L based on a 7-day average. In addition, the 30-day average percent removal shall not be less than 85%. Therefore, EPA proposes an average monthly limitation of 30 mg/L and average weekly limitation of 45 mg/l; and that the 30-day average percent BOD removal shall not be less than 85%. Based on the facility's design flow of 4.3 MGD, EPA also proposes a mass-based weekly average effluent limitation of 1,614 lbs/day and a monthly average effluent limitation of 1,076 lbs/day for BOD.

Table 2 - Summary of Proposed Technology-Based Effluent Limitations for Discharge Point No. 001 for the Apra Harbor WWTP.

Parameter	Units ¹	Proposed Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Biochemical Oxygen Demand (5-day)	mg/L	30	45	-- ²	--	--
	lbs/day	1,076	1,614	--	--	--
	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 15% of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85%.					
Total Suspended Solids	mg/L	30	45	--	--	--
	lbs/day	1,076	1,614	--	--	--
	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15% of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85%.					
Oil and Grease	mg/L	10	--	15	--	--
	lbs/day	360	--	540	--	--
Fecal Coliform	CFU/100 mL	200	400	--	--	--
pH ³	Standard Units	--	--	--	6.5	8.5

¹Mass-based limits based on design flow of 4.3 MGD

² Not applicable

³ Based on more stringent water quality standards for pH

2. **Total Suspended Solids.** Pursuant to 40 CFR 133.102 and section 5104 (A)(7)(b) of GWQS, effluent limitations are proposed for TSS. Secondary treatment requirements provide that effluent concentrations of TSS shall not exceed 30 mg/L on a 30-day average and 45 mg/L on 7-day average. In addition, the 30-day average percent removal shall not be less than 85%. Therefore, EPA proposes an average monthly limitation of 30 mg/L and average weekly limitation of 45 mg/l; and that the 30-day average percent BOD removal shall not be less than 85%. Based on the facility's design flow of 4.3 MGD, EPA also proposes a mass-based weekly average effluent limit of 1,614 lbs/day, and a monthly average effluent limitation of 1,076 lbs/day for TSS.
3. **Fecal Coliform.** Section 5104 (A)(7)(c) of GWQS provides secondary treatment requirements for bacteria. GWQS provide that the arithmetic mean of the fecal coliform values for effluent samples collected over a period of 30 consecutive days shall not exceed 200 colony forming units (CFU) per 100 mL, and the arithmetic mean values for the effluent samples collected over a period of seven consecutive days shall not exceed 400 CFU per 100 mL. In addition to these technology-based standards, GWQS also provide receiving water quality standards for bacteria based on

enterococci for M-2 marine waters. Fecal coliform and enterococci are used as indicators to estimate the presence of pathogens. The existing permit established technology-based effluent limits for fecal coliforms based on secondary treatment requirements for bacteria, and water quality-based limits for enterococci. (See section IV.B.(3)(h) for the discussion of water-quality-based enterococcus permit limits). Pursuant to GWQS, EPA proposes effluent limitations for fecal coliform as an indicator to determine the effectiveness of the facility's disinfection system.

4. **pH.** Under 40 CFR 133.102(c) and section 5104 (A)(7)(d) of GWQS, secondary treatment requirements for pH provide that effluent values for pH shall be maintained within the limits of 6.0 and 9.0 standard units. GWQS, however, establish pH effluent limits between 6.5 to 8.5 standard units, which are more stringent than the required treatment performance standard. Therefore, EPA proposes effluent limitations for pH of 6.5 to 8.5 standard units.
5. **Oil and Grease.** Oil and grease are common components of domestic wastewater. Section 5103 of GWQS provides narrative water quality standards that state that all waters shall be free from substances, conditions or combinations attributable to domestic discharges that cause visible floating materials, debris, oils, grease, scum, foam or other floating matter which degrade water quality or use. However, GWQS do not provide a numeric water quality standard for oil and grease. Therefore, EPA proposes effluent limitations for oil and grease based on EPA's Best Professional Judgment (BPJ) related to the development of technology-based effluent limits since (1) there are no applicable effluent limitation guidelines and performance standards for oil and grease, and (2) similar domestic wastewater treatment facilities have shown that a maximum daily limit of 15 mg/l and an average monthly limit of 10 mg/l can be easily achieved. Section 402(a)(1) of the CWA provides for the establishment of BPJ-based effluent limits when effluent limitation guidelines and performance standards are not available for a pollutant of concern. Therefore, EPA proposes a maximum daily limitation (MDEL) of 15 mg/l and an average monthly limitation (AML) of 10 mg/L for oil and grease. These limits are consistent with similar facilities that treat domestic wastewater in EPA Region IX. Also, based on the facility's design flow of 4.3 MGD, EPA proposes a mass-based maximum daily effluent limitation of 540 lbs/day, and a monthly average effluent limitation of 360 lbs/day. In addition to the technology-based effluent limits, EPA proposes narrative water quality-based limits for oil and grease (section 5103.C.10 of GWQS), such as prohibiting visible sheening.
6. **Compliance with Federal Anti-Backsliding Regulations and Guam's Antidegradation Policy for Proposed Technology-based Effluent Limitations.** Section 402(o) of the CWA prohibits the renewal or reissuance of an existing NPDES permit that contains technology-based effluent limits that are less stringent than those established in the previous permit, except as provided in 40 CFR 122.44(l). This is referred to as "anti-backsliding." The permit establishes technology-based effluent limitations for BOD, TSS, fecal coliform, and pH that are as stringent as or more stringent than those in the existing permit; therefore, the permit complies with anti-backsliding. The facility also has not requested an increased flow or any mass-based limits in its application; therefore the permit complies with anti-degradation.

B. Water Quality-Based Effluent Limitations (WQBELs)

Pursuant to 40 CFR 122.44(d)(1), water quality-based effluent limitations, or 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. Applicable water quality standards are established in GWQS, which incorporate section 304(a) of the CWA water quality criteria. Revisions to these standards were adopted by the Guam Environmental Protection Agency (GEPA) on May 17, 2002 (GEPA 2002). These standards were subsequently approved by EPA.

1. **Determining the Need for WQBELs.** When determining whether an effluent discharge causes, has the reasonable potential to cause, or contributes to an excursion above narrative or numeric criteria within State (or Territory) water quality standards, the permitting authority uses procedures which account for existing controls on point and nonpoint sources of pollution, and the variability of the pollutant or parameter in the effluent, the sensitivity of species to toxicity testing, and, where appropriate, dilution of the effluent in the receiving water. EPA conducted a Reasonable Potential Analysis (RPA) for each monitored pollutant or parameter in the effluent, except pH. RPA was based on procedures outlined in EPA's *Technical Support Document for Water Quality-based Toxics Control* herein after referred to as the TSD (EPA 1991). These procedures result in the determination of the maximum daily effluent concentration (MEC) that is determined from monitoring data provided by the permittee.

EPA reviewed DMRs submitted by the permittee from January 2003 through September 2005 and determined the MEC for each pollutant or parameter of concern. The MEC is then compared directly to the applicable water quality standard or criterion. If the MEC is greater than the applicable standard or criterion, the pollutant has a reasonable potential for violating its water quality standard or criterion. Table 3 provides the detailed RPA for each pollutant or parameter that causes, has the reasonable potential to cause, or contributes to an excursion above GWQS.

- a. **Copper.** Section 5103(C)(11)(B)(i) of the GWQS provide that in Category M-2 waters, copper shall not exceed 4.8 ug/L as a Criterion Maximum Concentration (CMC) or 3.1 ug/L as a Criterion Chronic Concentration (CCC). Based on DMR data, the MEC is 11 ug/L (February 2003). Since the MEC is greater than both the CMC and CCC water quality criteria, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for copper.
- b. **Nickel.** Section 5103(C)(11)(B)(i) of the GWQS provide that in Category M-2 waters, nickel shall not exceed 74 ug/L as a CMC, 8.2 ug/L as a CCC, or 4,600 ug/L for human consumption of food only. Based on DMR data, the MEC is 27.5 ug/L (May 2004). Since the MEC is greater than the CCC water quality criterion, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for nickel.

- c. **Zinc.** Section 5103(C)(11)(B)(i) of the GWQS provide that in Category M-2 waters, zinc shall not exceed 95 ug/L as a CMC, 86 ug/L as a CCC, or 69,000 ug/L for human consumption of food only. Based on DMR data, the MEC is 40.1 ug/L (May 2004) for zinc. Based on the MEC, EPA has determined the discharge does not have a reasonable potential to cause, or contributes to an exceedance of GWQS for zinc. Although zinc was limited in the previous permit, it is not being limited in the proposed permit based on the results of this RPA. Therefore, EPA has not proposed to establish a limit for zinc.
- d. **Aluminum.** Section 5103(C)(11) of GWQS provides that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. Section 5103(C)(11)(B)(i) of GWQS, at Table IV of Appendix A, provides additional (non-priority) toxic pollutants with maximum numerical limits that apply to all waters of Guam. For marine waters, Table IV establishes a maximum limit for aluminum as 200 ug/L. Based on DMR data, the MEC for aluminum is 6,500 ug/L (February 2003). Since the MEC is greater than the maximum allowable water quality criterion, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for aluminum.
- e. **Total Ammonia.** Section 5103(C)(11) of GWQS provides that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. Untreated domestic wastewater contains ammonia. Ammonia is known to cause toxicity to aquatic organisms in surface waters. Section 5103(C)(11)(B)(i) of GWQS provides that Appendix A contains Table IV of additional (non-priority) toxic pollutants that have maximum numerical limits that apply to all waters of Guam. For marine waters, Table IV establishes a maximum water quality criterion for ammonia in marine waters as 20 ug/L, which is believed to represent unionized ammonia. Based on DMR data, ammonia has been reported as total ammonia (unionized and ionized). As a result, EPA is unable to evaluate reasonable potential based on Table IV of GWQS.

Therefore, EPA evaluated a reasonable potential for ammonia based on EPA's National Recommended Water Quality Criteria for Non-priority Pollutants for total ammonia in marine water, based on 1989 Ambient Water Quality Criteria for Ammonia (Saltwater) (EPA 1989). The MEC for total ammonia is 1,890 ug/L (April 2003). Based on receiving water monitoring data for Tupalao Bay collected by the U.S. Navy for its Apra Harbor WWTP monitoring program, EPA determined a salinity of 30 g/kg, average temperature of 28 degree Celsius, and a pH of 8.6. This resulted in a calculated CMC of 1,220 ug/L and a CCC of 184 ug/L. Since the MEC is greater than both the CMC and CCC water quality criteria, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for ammonia. In addition, because the permittee has not established nitrification to remove ammonia from the waste stream, EPA has found reasonable potential for the discharge to cause, or contributes to an exceedance of GWQS for toxicity and monitoring is required

f. Total Chlorine Residual. Section 5103(C)(11) of GWQS provides that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. Chlorine is known to be toxic to aquatic life. The existing permit established effluent limitations for total chlorine residual. The permittee currently operates a disinfection system that uses chlorine coupled with de-chlorination. The MEC for total residual chlorine is 18.75 ug/L (June 2003). Section 5103(C)(11)(B)(i) of GWQS, at Table IV of Appendix A, provides additional (non-priority) toxic pollutants with maximum numerical limits that apply to all waters of Guam. For marine waters, Table IV establishes a maximum limit for total residual chlorine as 7.5 ug/L. Since the MEC is greater than the maximum allowable water quality criterion, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for total residual chlorine.

Table 3 – Summary of Reasonable Potential Analysis for Discharge Point No. 001 for the Apra Harbor WWTP.

Parameter	Units	Max. Effluent Concentration, ug/L	N	Water Quality Criterion, ug/L	Exceeds Standard?
Copper	ug/L	11	27	3.1	Y
Nickel	ug/L	27.5	27	8.2	Y
Aluminum	ug/L	6,500	27	200	Y
Total Ammonia, Acute	ug/L	1,890	27	1,220	Y
Total Ammonia, Chronic	ug/L	1,890	27	184	Y
Total Residual Chlorine, Chronic	ug/L	18.75	27	7.5	Y

g. Whole Effluent Toxicity. Pursuant to 40 CFR 122.2, whole effluent toxicity (WET) is defined as the aggregate toxic effect of an effluent measured directly by a toxicity test. Two types of WET tests are acute and chronic. An acute test is conducted over a shorter time period and measures mortality. A chronic test measures sublethal effects (e.g., reproduction and/or growth). The existing permit requires quarterly chronic toxicity testing using the sea urchin, *Strongylocentrotus purpuratus*. In the existing permit, a median monthly whole effluent toxicity trigger of 83 TU_c was established, as well as a maximum daily whole effluent toxicity trigger of 136 TU_c, based on the CCC and an approved mixing zone dilution of 82:1. Based on review of DMR data, a WET value of less than 20.8 TU_c was reported for all seven individual monitoring events: February, May, and August 2002; February and June 2003; February 2004; and August 2005.

The approved mixing zone has been continued in this permit. However, GWQS also provide narrative water quality criteria, which must be met in all waters

(including within a mixing zone), that prohibit discharges that "...injure or are toxic or harmful to humans, animals, plants, or aquatic life" (Section 5103(A)(1)(d) of GWQS). Sections 5103(C)(11)(A)(i) through (C)(11)(A)(iv) of GWQS address general requirements for toxic substances. These requirements are often referred to as "no toxics in toxic amounts." Achieving "no toxics in toxic amounts" at the end of the pipe (i.e., within a mixing zone) requires a TUC not greater than 1.0; because monitoring data indicate toxicity as only "less than" a value greater than 1 TUC, the toxicity of this effluent is indeterminate. Therefore, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for WET.

2. Application of Mixing Zones and Dilution Credits. 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. Section 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 allowed under the following conditions:

- Zones of mixing are granted by the 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.

The mixing zone was approved by GEPA February 14, 2001 and is continued in this permit. In its Section 401 Water Quality Certification dated November 27, 2009, GEPA required that the discharger submit a Mixing Zone Application within six months of the issuance of the Certification. EPA is not aware of any application submittal at this time.

3. Establishing WQBELs. In accordance with 40 CFR 122.44(d), EPA proposes water quality-based effluent limits (WQBELs) for several pollutants or parameters since EPA has determined, based on effluent data provided by the permittee and the nature of the discharge, that the effluent discharged from the facility causes, has the

reasonable potential to cause, or contributes to an exceedance of GWQS. EPA has determined that effluent from the Apra Harbor WWTP, when discharged through Discharge Point No. 001, demonstrates reasonable potential to exceed water quality standards for copper, nickel, aluminum, total chlorine residual, and whole effluent toxicity (WET).

WQBELs for water quality-limited pollutants can include consideration of background (ambient) pollutant concentrations, determined at a reference site. Waste load allocations (WLAs) typically reduce the assimilative capacity of the receiving water by subtracting the contribution of background levels of pollution from the total allowed as determined from applicable water quality standards or criteria. However, the WLAs derived below did not include any consideration of background levels of pollutants in their derivation.

EPA recommends the use of a permit limit derivation procedure for WQBELs where the acute, chronic, and human health WLAs are statistically translated into an MDEL and AML based on the more stringent acute, chronic, or human health WLA (section 5.4.1 of EPA's TSD). As described in section 5.2.2 of EPA's TSD, WQBELs for NPDES dischargers are established based on the need to maintain effluent quality for a pollutant at a level that will comply with water quality standards even during critical conditions in the receiving water. This level is determined by the WLA for the particular pollutant. The WLA, in turn, dictates the necessary treatment performance level for the pollutant through the calculation of a long-term average (LTA) to ensure that the WLA is met under critical conditions over a long-term period. Mass-based MDELs and AMLs were calculated based on the design flow of 4.3 MGD. Appendix C provides an example of the permit limit derivation procedure for this discharge.

For all reissued permits, section 402(o) of the CWA and 40 CFR 122.44(l) require permit conditions to be as stringent as the existing permit unless specific exceptions apply. The permit contains no specific exceptions for WQBELs. The derivation of each WQBEL is described in sections 3.a. through 3.i. Table 4 provides a summary of all proposed WQBELs, monitoring frequency, and sample types for each pollutant or parameter in the permit for Discharge Point No. 001 that demonstrated reasonable potential to cause, or contribute to an exceedance of GWQS.

- a. pH.** As provided in 40 CFR 133, secondary treatment requirements for domestic wastewater treatment facilities provide that the pH be within the range 6.0 to 9.0 standard units. Section 5103(C)(2) of the GWQS provide that the pH for Category M-2 waters shall be between 6.5 to 8.5 and should not vary more than 0.2 units from the naturally occurring variation due to the discharge. In accordance with 40 CFR 122.44(d), the more stringent criterion applies. Therefore, EPA has proposed effluent limitations for pH of between 6.5 to 8.5 standard units.
- b. Copper.** The more stringent of the criteria for copper is the aquatic life criteria. Of this, the acute Long-Term Average (LTA) was the more stringent and resulted in an MDEL and AML for copper of 4.8 ug/L and 2.9 ug/L, respectively EPA

also proposes a mass-based MDEL and AML of 0.17 lbs/day and 0.105 lbs/day, respectively.

- c. **Nickel.** The more stringent of the criteria for nickel is the aquatic life criteria. Of this, the chronic LTA was the more stringent and resulted in an MDEL and AML for nickel of 13 ug/L and 8.2 ug/L, respectively. EPA also proposes a mass-based MDEL and AML of 0.48 lbs/day and 0.29 lbs/day, respectively.
- d. **Aluminum** The more stringent of the criteria for Aluminum is the aquatic life criteria. Of this, the chronic LTA was the more stringent and resulted in an MDEL and AML for aluminum of 200 ug/L and 120 ug/L, respectively. EPA also proposes a mass-based MDEL and AML of 7.17 lbs/day and 4.30 lbs/day, respectively
- e. **Total Chlorine Residual.** EPA proposes a MDEL of 12.3 ug/L and AML of 7.5 ug/L and mass-based WQBELS of 0.442 lbs/day as the MDEL and 0.269 lbs/day as the AML.
- f. **Total Ammonia.** EPA proposes monitoring only for ammonia.
- g. **Whole Effluent Toxicity.** Section 5103 of GWQS provides narrative toxicity requirements that limit the adverse effects of toxic substances in effluents. The existing permit requires quarterly chronic toxicity testing using the sea urchin, *Strongylcentrotus purpuratus*. EPA proposes quarterly chronic toxicity monitoring with triggers set for any one test result greater than 136 TU_c (during the monthly reporting period), or any one or more test rests with a calculated median value greater than 83 TU_c (during the monthly reporting period).
- h. **Enterococci.** Section 5103(C)(1)(b) of the GWQS provides microbiological requirements for surface waters. For water bodies classified as Category M-2 waters, GWQS provide that enterococci shall be no greater than 35 CFU/100 mL based on the geometric mean of five sequential samples taken over a 30-day period, nor shall any instantaneous reading exceed 104 CFU/100 mL. To protect the beneficial uses of Category M-2 waters, EPA proposes a MDEL and AML of 104 CFU/100 mL and 35 CFU/100 mL, respectively.
- i. **Compliance with Federal Anti-Backsliding Provisions and Guam's Antidegradation Policy for Proposed WQBELS.** Section 402(o) of the CWA prohibits the renewal or reissuance of an NPDES permit that contains WQBELS less stringent than those established in the previous permit, except as provided in the statute. This is referred to as "anti-backsliding." Two pollutants are being proposed with limits that are less stringent than established in the existing permit: zinc and enterococci. Based on new data, the RPA for zinc indicated zinc had no reasonable potential to exceed GWQS. Therefore, EPA has removed limits for zinc in the proposed permit. For enterococci, the MDEL in the existing permit is 57 cfu/100mL; the proposed permit limit is 104 cfu/100 mL. The proposed MDEL is based on current Guam water quality standards and on statistical procedures outlined in Sections 5.4.1 and 5.4.4 of EPA's *Technical Support Document for Water Quality-*

based Toxics implementation of current, duly promulgated water quality standards and are authorized under the CWA and not considered “anti-backsliding.

Also, the existing permit has monitoring requirements for heavy metals and pesticides. Monitoring for several of these parameters has been removed from the proposed permit because EPA has determined there is sufficient new information to conclude these requirements address no concerns related to pollutants shown to have a reasonable potential to exceed GWQS nor any related to those that may potentially be discharged under the proposed permit. The proposed permit establishes monitoring requirements for annual priority pollutant screening for quarterly WET testing to ensure that the effluent complies with all GWQS.

Table 4 – Comparison of Existing and Proposed Effluent Limitations, Monitoring Frequency, and Sample Type for Each Pollutant or Parameter for Discharge Point No. 001 for the Apra Harbor WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Proposed Effluent Limitations			Proposed Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Monitoring Frequency	Sample Type
Flow Rate	MGD	-- ²	--	--	-- ²	--	--	Continuous	Metered
Biological Oxygen Demand	mg/L	30	45	--	30	45	--	Weekly	24-hr Composite
	lbs/day	1,076	1,614	--	1,076	1,614	--		
	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period.								
Total Suspended Solids	mg/L	30	45	--	30	45	--	Weekly	24-hr Composite
	lbs/day	1,076	1,614	--	1,076	1,614	--		
	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period.								
Fecal Coliform	CFU/100mL	200	400	--	200	400	--	Weekly	Discrete
Total Chlorine Residual	ug/L	7.5	--	12.3	7.5	--	12.3	Weekly	Discrete
	lbs/day	0.269	--	0.442	0.269	--	0.442		
pH	std. units	Not < 6.0 or > 9.0 SU at any time.			Not < 6.5 or > 8.5 SU at any time			Weekly	Discrete
Enterococci	CFU/100mL	35	--	57	35	--	104	Weekly	Discrete
Copper	ug/L	2.9	--	4.8	2.9	--	4.8	Monthly	24-hr Composite
	lbs/day	0.105	--	0.172	0.105	--	0.17		
Nickel	ug/L	8.2	--	13	8.2	--	13	Monthly	24-hr Composite
	lbs/day	0.294	--	0.483	0.294	--	0.48		
Zinc	ug/L	58	--	95	None	--	None	Monthly	24-hr Composite
	lbs/day	2.07	--	3.41	None	--	None		

Table 4 Continued - Comparison of Existing and Proposed Effluent Limitations, Monitoring Frequency, and Sample Type for Each Pollutant or Parameter for Discharge Point No. 001 for the Apra Harbor WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Proposed Effluent Limitations			Proposed Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Monitoring Frequency	Sample Type
Aluminum	ug/L	120	--	200	120	--	200	Monthly	24-hr Composite
	lbs/day	4.37	--	7.17	4.37	--	7.17		
Other Heavy Metals ³	ug/L or mg/L	--	--	Monitoring Only	--	--	--	--	--
Pesticides ⁴	ug/L or mg/L	--	--	Monitoring Only	--	--	--	--	--
Priority Pollutant Analysis ⁵	ug/L or mg/L	--	--	--	--	--	Monitoring Only	Annually	24-hr Composite
Total Ammonia (as N)	ug/L	Monitoring Only	--	Monitoring Only	Monitoring Only	--	Monitoring Only	Weekly	24-hr Composite
	lbs/day	Monitoring Only	--	Monitoring Only	Monitoring Only	--	Monitoring Only		
Oil and Grease	mg/L	Monitoring Only	--	Monitoring Only	10	--	15	Monthly	Grab
	lbs/day	Monitoring Only	--	Monitoring Only	359	--	538		
Chronic Whole Effluent Toxicity	TU _c	--	--	Monitoring Only	Monitoring Only	--	Monitoring Only	Annually	24-hr Composite

¹ Mass effluent limitations based on a design flow of 4.3 MGD

² Not applicable

³ Heavy metals mean: As, Cd, Cr³⁺, Cr⁶⁺, Cu, Hg, Pb, Ni, Ag, and Zn; both total recoverable and dissolved metal concentrations shall be reported

⁴ For all pesticides (organochlorines, organophosphates, carbamates, herbicides, fungicides, defoliants, and botanicals) see EPA Water Quality Criteria *Blue Book*

⁵ Monitoring for toxic pollutants in accordance with 40 CFR 136 unless otherwise specified by EPA; a complete list of toxic pollutants can be found at 40 CFR 131.36

PART V - DETERMINATION OF NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

Section 5103 of GWQS contains narrative water quality standards that apply to all waters of Guam. The permit establishes the following narrative water quality-based effluent limits:

- A. The discharge shall be free from substances, conditions or combinations that cause visible floating materials, debris, oil, grease, scum, foam, and other floating material which degrades water quality or use.
- B. The discharge shall be free from substances, conditions or combinations that produce visible turbidity, settle to form deposits or otherwise adversely affect aquatic life.
- C. The discharge shall be free from substances, conditions or combinations that produce objectionable color, odor or taste, directly or by chemical or biological action.
- D. The discharge shall be free from substances, conditions or combinations that injure or are toxic or harmful to humans, animals, plants or aquatic life.
- E. The discharge shall not cause the pH to change more than 0.2 units from the naturally occurring variation, or in any case outside the range of 6.5 to 8.5 standard units.
- F. The discharge shall not cause orthophosphate concentration in the receiving waters to exceed 0.05 mg/L.
- G. The discharge shall not cause nitrate-nitrogen concentrations to exceed 0.2 mg/L.
- H. The discharge shall not cause ammonia to exceed 0.020 mg/L.
- I. The discharge shall not cause the concentration of DO in the receiving water to be less than 75% of saturation.
- J. The discharge shall not cause alterations of the marine environment that would alter the salinity of marine or estuarine waters and wetlands of Guam more than +10% of the ambient conditions, except when due to natural conditions.
- K. The discharge shall 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.
- L. The discharge shall not cause the turbidity in the receiving water to exceed 1.0 NTU over ambient conditions, except when due to natural causes.
- M. The discharge of any radioactive wastes and contaminated radioactive materials from research facilities is strictly prohibited.
- N. The discharge shall not cause the temperature in the receiving water to deviate more than 1.0 degree Centigrade (1.8 of the degree Fahrenheit) from ambient conditions.
- O. The discharge shall not cause the concentration of oil or petroleum products in the receiving waters to cause: 1) a visible film, or sheen, or results in visible discoloration of the surface with a corresponding oil or petroleum product odor, or 2) damage to fish or invertebrates, or 3) an oil deposit on the shore or bottom.

- P. The discharge shall not cause concentrations of toxic substances in the receiving waters that produce detrimental physiological, acute, or chronic responses in human, plant, animal, or aquatic life.
- Q. The discharge shall not cause concentrations of toxic substances in the receiving waters that produce contamination of harvestable aquatic life to the extent that it causes detrimental physiological, acute, or chronic responses in humans or protected wildlife, when consumed.
- R. The discharge shall 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 discharges.
- S. Whenever natural concentrations of any toxic substance shall occur and exceed the limits established in these standards, this greater concentration shall constitute the limit, provided that this natural concentration was not directly affected by human-induced causes.

PART VI - MONITORING AND REPORTING REQUIREMENTS

The permit requires the permittee to continue to monitor for pollutants or parameters in the effluent with technology-based effluent limits and water quality-based effluent limits for the duration of the permit term.

A. Influent and Effluent Monitoring and Reporting

The permittee shall conduct influent and effluent monitoring to evaluate compliance with the 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 permit. All influent monitoring data shall be reported on monthly DMR forms and submitted quarterly to EPA and GEPA, as specified in the permit.

B. NetDMR reporting

As an alternative to reporting DMRs as described in VI.A., above, the permittee has the option to submit all monitoring results in the electronic reporting format approved by U.S. EPA. The permittee may submit DMRs electronically using EPA's NetDMR application. NetDMR is a national tool for regulated Clean Water Act permittees to submit discharge monitoring reports (DMRs) electronically via a secure Internet application to U.S. EPA. By using NetDMR, dischargers can discontinue mailing hard copy forms under 40 CFR 122.41 and 403.12.

C. Whole Effluent Toxicity Monitoring and Reporting

For compliance with narrative GWQS for toxicity, the permit requires the permittee to conduct whole effluent toxicity monitoring to determine whether the effluent is contributing chronic toxicity to the receiving water. The permit also requires that if effluent toxicity is observed, the permittee must investigate the causes of, and identify corrective actions to reduce or eliminate any observed effluent toxicity.

1. **Monitoring Frequency.** The permit requires the permittee to conduct quarterly chronic toxicity tests on 24-hour composite effluent samples. The chronic toxicity test sample shall be collected at the designated NPDES sampling station for the effluent, i.e., downstream from the last treatment process and any in-plant return flows where a representative effluent sample can be obtained. During each year of the permit term, a split of one toxicity test sample shall be analyzed for all other monitored parameters at the minimum frequency of analysis specified by the effluent monitoring program.
2. **Marine Species and Test Methods.** The permit requires the permittee to conduct chronic toxicity tests with the sea urchin, *Strongylocentrotus purpuratus* (Fertilization Test Method 1008.0) or or *Tripneustes gratilla* (protocol refined by Amy Wagner and the City and County of Honolulu). Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the EPA documents, *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA 1995) and *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms* (EPA 2002). Since the discharge is chlorinated, chlorine shall not be removed from the effluent sample prior to toxicity testing without written approval by EPA.
3. **Toxicity Limits.** For this discharge, EPA proposes numeric effluent limitations that, if exceeded, require additional, accelerated toxicity testing (see Part VIII.E). For this discharge, a mixing zone or dilution allowance is authorized for chronic toxicity. WET test results shall be reported in TU_c , where $TU_c = 100 \div NOEC$ (No Observed Effect Concentration, which is the highest concentration of toxicant to which organisms are exposed that causes no observable adverse effects on the test organisms). For this discharge, the chronic WET permit limit are any one test result greater than $136 TU_c$ (during the monthly reporting period), or any one or more test results with a calculated median value greater than $83 TU_c$ (during the monthly reporting period).
4. **Toxicity Reporting.** All toxicity monitoring data shall be reported on monthly DMR forms and submitted to EPA and GEPA.
 - a. A full laboratory report for all toxicity testing shall be submitted as an attachment to the DMR for the month in which the toxicity test was conducted and shall also include: the toxicity test results reported in NOEC and TU_c , and EC_{25} in accordance to the test methods manual chapter on report preparation and test review; the dates and times of sample collection and initiation of each toxicity test; all results for effluent parameters monitored concurrently with the toxicity test(s); and progress reports on TRE/TIE investigations.
 - b. The permittee shall notify the permitting authority in writing within 14 days of exceedance of a chronic toxicity permit limit. This notification shall describe actions the permittee has taken or will take to investigate, identify, and correct the causes of toxicity; the status of actions required by this permit; and schedule for actions not yet completed; or reason(s) that no action has been taken.

5. Initial Investigation TRE Workplan and **Accelerated Toxicity Testing and TRE Process for Chronic Toxicity**

The permit requires the permittee to develop and implement a Toxics Reduction Evaluation (TRE) workplan in the event of unacceptable effluent toxicity. For chronic toxicity, unacceptable effluent toxicity is found for any monthly chronic toxicity test results with a calculated median value greater than 83 TU_c or any maximum daily chronic toxicity test result of 136 TU_c. The permit requires additional toxicity testing if a chronic toxicity effluent limitation is exceeded.

b. Initial Investigation TRE Workplan

Within 90 days of the permit effective date, the permittee shall prepare and submit a copy of its Initial Investigation Toxicity Reduction Evaluation (TRE) Workplan (1-2 pages) to EPA and GEPA for review. This plan shall include steps the permittee intends to follow if toxicity is measured above chronic WET permit limit and should include, at minimum the following:

- i. A description of the investigation and evaluation techniques that would be used to identify potential causes and sources of chronic toxicity, effluent variability, and treatment system efficiency;
- ii. A description of methods for maximizing in-house treatment system efficiency, good housekeeping practices, and a list of all chemicals used in operations at the facility; and
- iii. If a Toxicity Identification Evaluation (TIE) is necessary, an indication of who would conduct the TIE (i.e., an in-house expert or outside contractor).

c. Accelerated Toxicity Testing and TRE/TIE Process for Chronic Toxicity

- i. If a chronic WET permit limit is exceeded and the source of toxicity is known (e.g., a temporary plant upset), then the permittee shall conduct one additional toxicity test using the same species and test method. This test shall begin within 14 days of receipt of test results exceeding a chronic WET permit limit. If the additional toxicity test does not exceed a chronic WET permit limit, then the permittee may return to the its regular testing frequency.
- ii. If a chronic WET permit limit is exceeded and the source of toxicity is not known, then the permittee shall conduct six additional toxicity tests using the same species and test method, approximately every two weeks, over a 12 week period. This testing shall begin within 14 days of receipt of test results exceeding a chronic WET permit limit. If none of the additional toxicity tests exceed a chronic WET permit limit, then the permittee may return to its regular testing frequency.
- iii. If one of the additional toxicity tests (as stated paragraphs 6.a and b above) exceeds a chronic WET permit limit, then, within 14 days of receipt of this test result, the permittee shall initiate a TRE, based on EPA guidance manual *Toxicity Reduction Evaluation Guidance for*

Municipal Wastewater Treatment Plants (EPA 1999). In conjunction, the permittee shall develop and implement a Detailed TRE Workplan which shall include: further actions undertaken by the permittee to investigate, identify, and correct the causes of toxicity; actions the permittee will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and a schedule for these actions.

- iv. The permittee may initiate a TIE as part of a TRE to identify the causes of chronic toxicity using the same species and test method and EPA test method guidance manuals: *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I* (EPA 1992); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA1993a); and *Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA 1993b).

D. Priority Toxic Pollutants Analyses

The permit requires the permittee to conduct annual Priority Toxics Pollutants analyses to ensure that the discharge does not contain toxic pollutants in concentrations that may cause a violation of water quality standards. 40 CFR 131.36 provides a complete list of Priority Toxic Pollutants. This requirement replaces the heavy metals and pesticides monitoring requirement in the existing permit.

PART VII - STANDARD CONDITIONS

A. Reopener Provisions

1. In accordance with 40 CFR 122 and 124, the 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 reasonable potential for the discharge to cause or contribute to exceedances of water quality standards.
2. In accordance with 40 CFR and Parts 122 and 124, the permit may be modified to include effluent limitations or permit conditions to address chronic toxicity in the effluent or receiving water body, as a result of the discharge; or implement new, revised, or newly interpreted water quality standards applicable to chronic toxicity.

B. Standard Provisions

The permit requires the permittee to comply with EPA Region IX Standard Federal NPDES Permit Conditions, dated July 1, 2001.

PART VIII - SPECIAL CONDITIONS

A. Biosolids Requirements

Pursuant to 40 CFR 503, the permit requires the monitoring, reporting, recordkeeping, and handling of biosolids. Biosolids permit provisions address: General Requirements, Inspection and Entry, Monitoring, Pathogen and Vector Control, Surface Disposal, Landfill Disposal, and Notification and Reporting.

B. Development and Implementation of Best Management Practices

The permit requires the permittee to develop and implement appropriate pollution prevention measures or Best Management Practices (BMPs) designed to control site runoff, spillage or leaks, sludge or waste disposal, and drainage from collection system, storage/supply, and treatment/operational/process areas that may contribute pollutants to surface waters **within 90 days from the effective date of this permit** (section 304(e) of the CWA and 40 CFR 122.44(k)). BMPs shall include but are not limited to those necessary to control TSS and oil and grease. Through the implementation of BMPs described in a BMP Plan, the permittee shall prevent or minimize the generation and discharge of wastes and pollutants from the facility to waters of the U.S. The BMP plan shall be located at the facility and be made available upon request by EPA and/or GEPA.

C. Development and Implementation of Receiving Water Monitoring Program

Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impact of the discharge on the receiving water. The existing permit established a receiving water monitoring program that consisted of quarterly monitoring of ambient water quality and sediment. EPA proposes to re-establish the monitoring requirements from the existing permit.

1. **Monitoring Locations.** The permit requires the permittee to conduct monitoring at the stations described in Table 5. Appendix D provides the locations of the receiving water monitoring stations.
2. **Monitoring Requirements.** The permit requires the permittee to conduct water quality monitoring as described in Table 6. The permit requires that the permittee to submit quarterly monitoring reports to EPA and GEPA by 28th of April, July, October, and January for each period covering the previous three calendar months. At a minimum, these reports shall include:
 - a. A description of all station locations with verified latitude and longitude coordinates submitted with the first quarterly receiving water report;
 - b. A description of climatic and receiving water characteristics at the time of sampling (*e.g.*, weather observations, floating debris, discoloration, time of sampling, tide, *etc.*);
 - c. A description of the sample collection and preservation procedures used in the receiving water monitoring program;

- d. Description of the specific method used for laboratory analysis; and
- e. An in-depth discussion of the results of the receiving water monitoring program.

Table 5 - Description of monitoring stations in Tupalao Bay for the Receiving Water Monitoring Program for the Apra Harbor WWTP.

Station Name	Description
Tipalao Shore A (TS1)	On either side of the cove, near the shoreline
Tipalao Shore B (TS2)	Directly shoreward of the outfall diffuser
Tipalao Shore C (TS3)	1,000 meters southeast of the diffuser, near the shoreline; control station
Tipalao Bay A (TB1)	120 - 130 feet south of Discharge Point No. 001
Tipalao Bay B (TB2)	120 -130 feet north of Discharge Point No. 001
Tipalao Bay C (TB3)	At least 1,000 meters southeast of Discharge Point No. 001, or outside of Tipalao Bay; control station

Table 6 - Receiving Water Monitoring Requirements

Parameter	Units	Monitoring Frequency	Sample Type	Stations
Oil and Grease, color, foam	Visual	Monthly	Surface Grab	TS1, TS2, TS3, TB1, TB2, TB3
Turbidity	NTU	Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3
Suspended Solids	mg/L	Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3
Temperature		Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3
Salinity	mg/L	Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3
pH	Std. Units	Quarterly	CDP ¹	TB1, TB2, TB3
Dissolved Oxygen	mg/L	Quarterly	CDP	TB1, TB2, TB3
Copper ²	µg/L	Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3
Nickel ²	µg/L	Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3
Aluminum ²	µg/L	Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3
Ammonia, Total ²	µg/L	Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3
Chlorine, Total Residual ²	µg/L	Quarterly	Surface, mid-depth, bottom grab	TB1, TB2, TB3

¹ Continuous depth profile (CDP) is a plot of depth versus water quality parameter. The maximum interval between points on the curve shall be 2 meters.

² Monitoring for copper, nickel, aluminum, total ammonia, and total residual chlorine incorporated into receiving water monitoring requirements as required by Guam EPA conditional Section 401 certification.

PART 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. On May 22, 2008, EPA requested informal consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service (collectively referred to as the Services) to identify any federally listed, proposed and candidate endangered or threatened species and designated and proposed critical habitats that occur in Tupalao Bay or in the vicinity of the effluent discharge. To date, EPA has not received any information on from the Services on ESA-listed species or habitat that occur near the discharge site. At the time this information is received, EPA will review the information and make a determination prior to issuance of the final permit whether any listed species are affected by the discharge.

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 (sections 307(c)(1) through (3) of the CZMA). Section 307(c) of the CZMA and its 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.

In a letter dated March 3, 2010, the Guam Bureau of Statistics and Plans concurred with the Navy's Federal Consistency Certification, provided the section 401 WQC imposed conditions are met and/or adhered to.

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 the National Marine Fisheries Service, 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) in marine environments. Since Tupalao Bay is considered a marine ecosystem, federal requirements of the MSA apply to EPA's proposed action to issue an NPDES permit to discharge in the Tupalao Bay. Therefore, EPA is required to make a determination on whether this action may adversely impact EFH, as defined under the MSA. EPA has determined that reissuance of the NPDES permit for the Apra Harbor WWTP will not adversely impact EFH.

D. Section 403 of the CWA Marine Discharge Criteria

Section 403 of the CWA require that an NPDES permit for a discharge to marine waters located seaward of the inner boundary of the territorial seas be issued in accordance with guidelines for determining the potential degradation of the marine environment. These guidelines, referred to as the Ocean Discharge Criteria (40 CFR 125 Subpart M) and section 403 of the CWA, are intended to "prevent unreasonable degradation of the marine environment and to authorize imposition of effluent limitations, including a prohibition of discharge, if necessary, to ensure this goal" (49 FR 65942, October 3, 1980).

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.

E. 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 either listed on, or eligible for listing on, the National Register of Historic Places. Pursuant to federal requirements of NHPA and 36 CFR 800.3(a)(1), EPA has determined that the permit does not have the potential to affect any historic or cultural properties.

PART X - ADMINISTRATIVE INFORMATION

A. Public Notice

In accordance with 40 CFR 124.10, the EPA Director shall give public notice that a proposed permit has been prepared under 40 CFR 124.6(d) by mailing a copy of the notice to the permit applicant and other federal and state agencies, and through publication of a notice in a daily or weekly newspaper within the area affected by the facility. The public notice shall allow at least 30 days for public comment on the proposed permit.

B. Public Comment Period

In accordance with 40 CFR 124.11 and 12, during the public comment period, any interested person may submit written comments on the proposed permit and may request a public hearing, if no hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. In accordance with 40 CFR 124.13, all persons must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period.

C. Public Hearing

In accordance with 40 CFR 124.12, the EPA Director shall hold a public hearing whenever she finds, on the basis of requests, a significant degree of public interest in the draft permit. The Director may also hold a public hearing when, for instance, such a hearing might clarify one or more issues involved in the permit decision. Public notice of such hearing shall be given as specified in 40 CFR 124.10.

D. Territorial Certification

In accordance with 40 CFR 124.53, under section 401 of the CWA, EPA may not issue a permit until certification is granted or waived in accordance with that section by the State (or Territory) in which the discharge originates. Territorial certification under section 401 of the CWA shall be in writing and shall include the conditions necessary to assure compliance with referenced applicable provisions of sections 208(e), 301, 302, 303, 306, and 307 of the CWA and appropriate requirements of Territory law. In a letter dated November 4, 2009, EPA received a conditional section 401 certification from GEPA certifying that the permittee's discharge is consistent with the protected uses of the Tipalao Bay as stated in the GWQS and the CWA. The conditions of the certification have been inserted into the permit. The certification has been added as an appendix to this fact sheet (see Appendix E).

PART XI - REFERENCES

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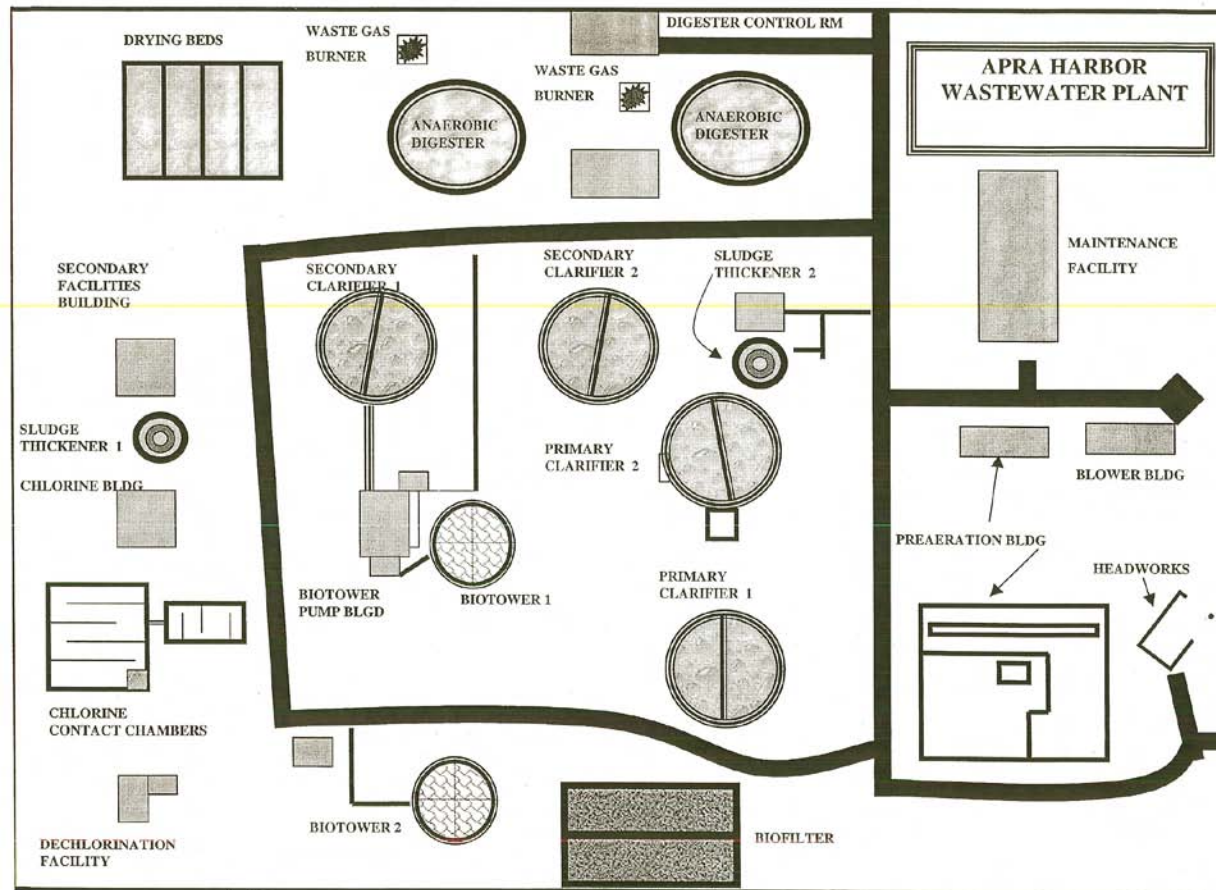
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PART XII - APPENDICES

APPENDIX A

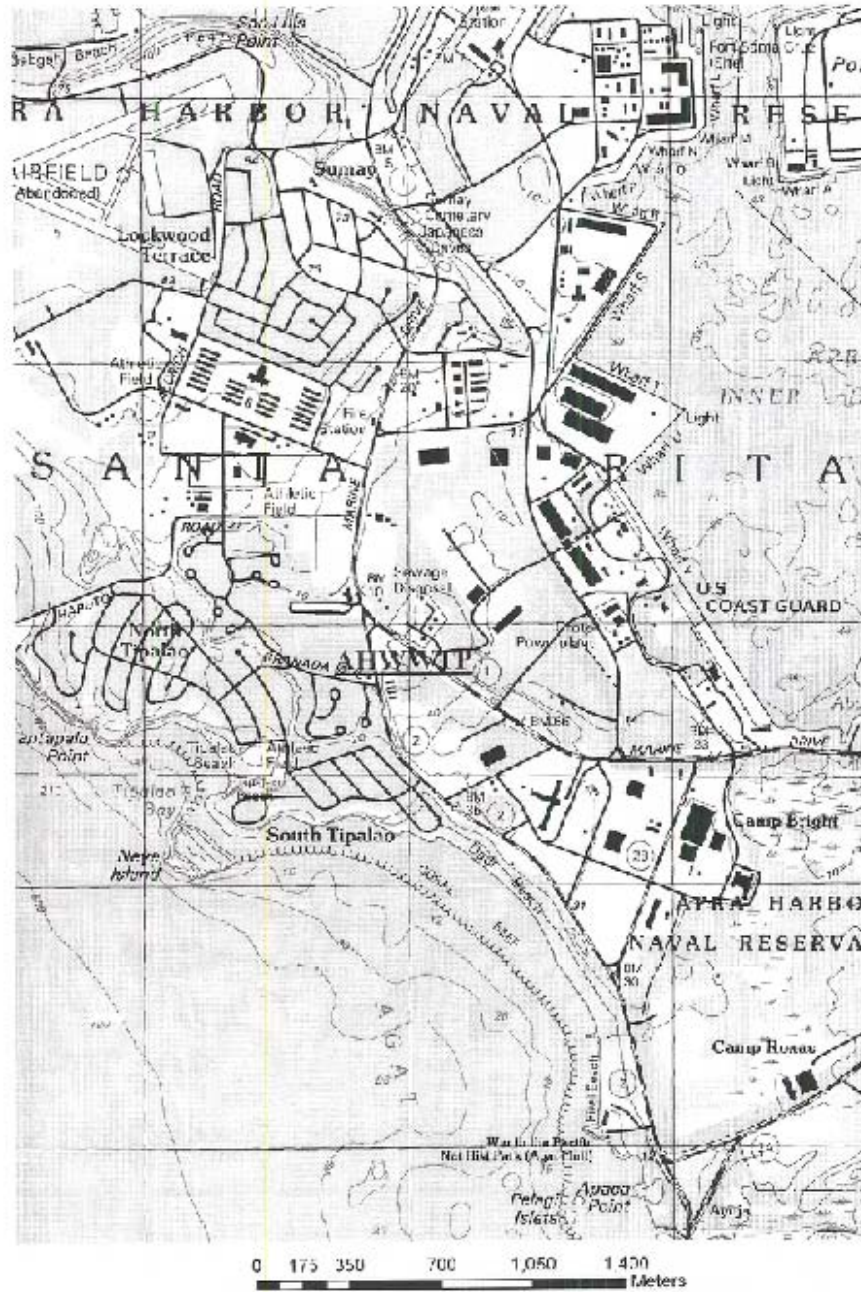
Apra Harbor WWTP Process Diagram



US EPA ARCHIVE DOCUMENT

APPENDIX B

Location of the Apra Harbor WWTP on Guam



APPENDIX C

Calculations for Water Quality-Based Effluent Limitations

In accordance with EPA's Technical Support Document for Water Quality-Based Toxics Control (TSD), EPA calculated water quality-based effluent limitations for the permit using the following statistical procedures. Using copper as an example, the following demonstrates the procedure for developing water quality-based effluent limitations for NPDES permits.

Step 1: Determine the Waste Load Allocation. For each constituent requiring an effluent limit, identify the applicable water quality criteria. For each criterion, determine the effluent concentration or waste load allocation (WLA) using the following steady state equation:

$$\text{WLA} = \frac{(\text{Cr})(\text{Qr}) + (\text{C}_a)(\text{Qa})}{\text{Qd}}$$

Where:

- Cr = Applicable water quality criterion
- Qr = Total Flow in receiving water
- C_a = Ambient Background Concentration
- Q_a = Ambient Background Flow
- Q_d = Flow of Discharge

For copper, the applicable water quality criteria for the protection of aquatic life in saltwater and other parameters include the following,

$$\begin{aligned} C_{\text{acute}} &= 4.8 \text{ ug/l} \\ C_{\text{chronic}} &= 3.1 \text{ ug/l} \\ D &= (Q_a/Q_d) = 1:1 \text{ (no mixing zone)} \\ C_a &= 0.0 \text{ ug/l.} \end{aligned}$$

Based on the equation above, the WLA for both acute and chronic are:

$$\begin{aligned} \text{WLA}_{\text{acute}} &= (4.8 + 0.0)/1 = 4.8 \text{ ug/L} \\ \text{WLA}_{\text{chronic}} &= (3.1 + 0.0)/1 = 3.1 \text{ ug/L} \end{aligned}$$

Step 2: Determine the Long-Term Average. For each WLA based on aquatic life criterion, determine the long-term average discharge condition (LTA) by multiplying the WLA by a WLA multiplier. The multiplier is a statistically-based factor that adjusts the WLA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set and whether it is an acute or chronic criterion. Table 5-1 of EPA's TSD provides pre-calculated WLA multipliers based on the value of the CV and the probability basis (i.e., the 95th or 99th percentile level). As specified in the TSD, a CV of 0.6 is typical of the range of variability of effluents measured by EPA and represents a reasonable degree of relative variability. Therefore, EPA recommends a CV of 0.6 and the 99th percentile when data sets are limited.

$$\begin{aligned} \text{LTA}_{\text{acute}} &= \text{WLA}_{\text{acute}} \times \text{WLA multiplier}_{\text{acute}} \\ \text{LTA}_{\text{chronic}} &= \text{WLA}_{\text{chronic}} \times \text{WLA multiplier}_{\text{chronic}} \end{aligned}$$

For copper, the following information was used to develop the LTA_{acute} and $LTA_{chronic}$ using Table 5-1 of the TSD.

$$WLA_{acute} = 4.8 \text{ ug/l}$$

$$WLA_{chronic} = 3.1 \text{ ug/l}$$

$$WLA \text{ multiplier}_{acute} = 0.321$$

$$WLA \text{ multiplier}_{chronic} = 0.527$$

Thus,

$$LTA_{acute} = 4.8 \times 0.321 = 1.54 \text{ ug/l}$$

$$LTA_{chronic} = 3.1 \times 0.527 = 1.64 \text{ ug/l.}$$

Step 3: Select the More Limiting Long-Term Average. Selecting the most limiting (lowest) LTA for copper, the most limiting LTA was the LTA_{acute} .

Step 4. Determine the Concentration-Based Average Monthly and Maximum Daily Permit Limits. Water quality based effluent limits are expressed as an Average Monthly Limit (AML) and Maximum Daily Effluent Limit (MDEL). Calculate the water quality based effluent limits by multiplying the LTA by an AML and MDEL multiplier:

$$AML = LTA_{AML} \times AML \text{ multiplier}$$

$$MDEL = LTA_{MDEL} \times MDEL \text{ multiplier.}$$

The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedances frequencies of the criteria and the effluent limitation. The value of the multiplier varies depending on the probability, the CV, and for the AML only, the number of samples. Table 5-2 of the TSD provides pre-calculated AML and MDEL multipliers. For limited data, the TSD recommends the 95th percentile and $n = 4$ samples/month for the AML multiplier and the 99th occurrence probability for the MDEL multiplier. *For this permit, EPA maintained the method of calculation used in the previous permit, which was to establish the AML using the 99th percentile and $n = 4$ samples per month.* For copper, the following equations were developed to determine the concentration-based AML and MDEL for aquatic life using Table 5-2 of the TSD:

$$AML_{concentration} = 1.54 \times 1.90 = 2.9 \text{ ug/l}$$

$$MDEL_{concentration} = 1.54 \times 3.11 = 4.79 \text{ ug/l.}$$

Step 5. Determine the Mass-Based Average Monthly and Maximum Daily Permit Limits.

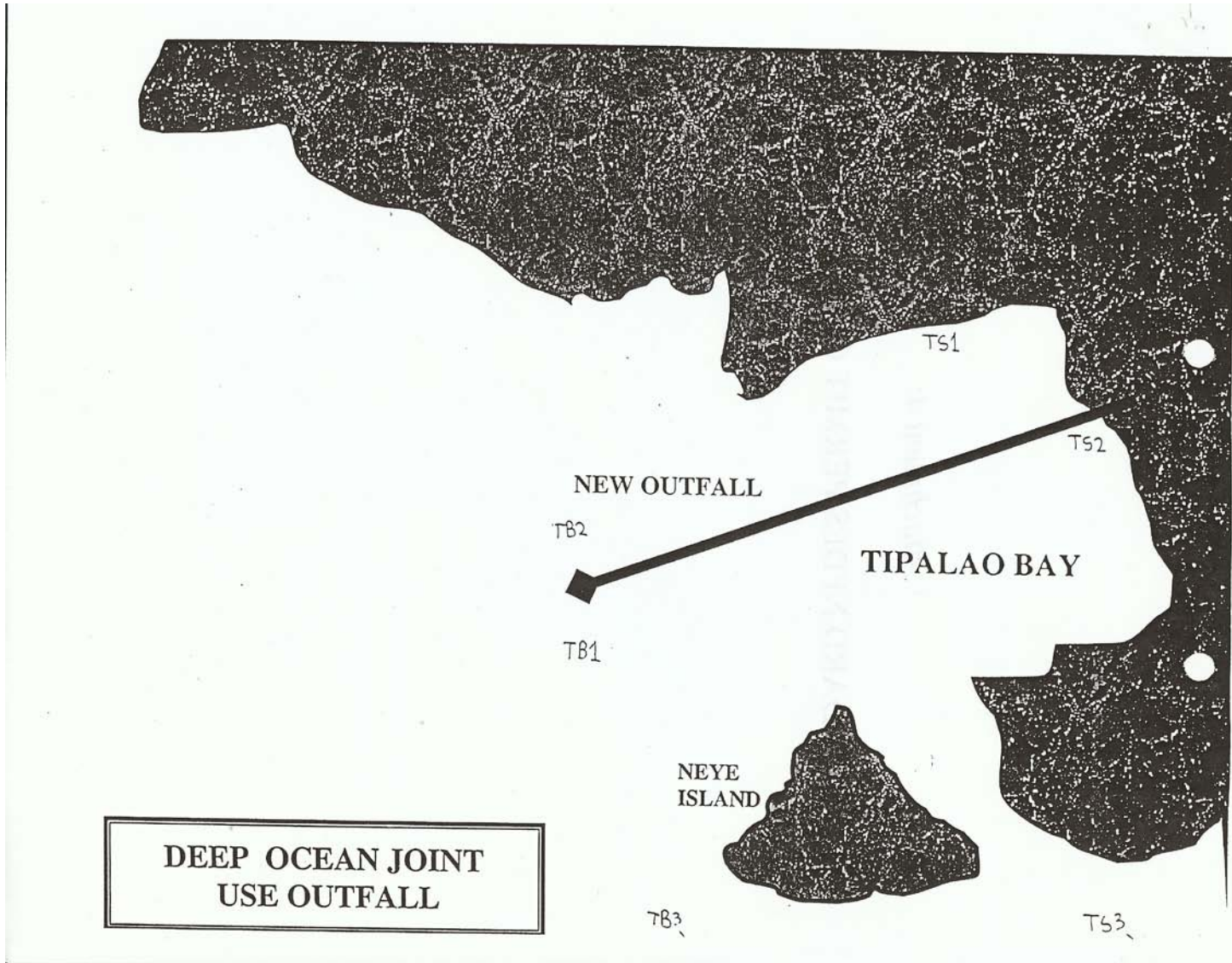
To determine the mass-based limitations for copper, calculate the mass limit based on the AML and MDEL using the maximum design flow rate of 4.3 MGD and a standard unit conversion factor:

$$AML_{mass} = 2.9 \text{ ug/l} \times 4.3 \text{ MGD} \times 0.00834 \text{ lbs/MGD/ug/L} = 0.104 \text{ lbs/day}$$

$$MDEL_{mass} = 4.79 \text{ ug/l} \times 4.3 \text{ MGD} \times 0.00834 \text{ lbs/MGD/ug/L} = 0.171 \text{ lbs/day}$$

APPENDIX D

Location of Receiving Water Monitoring Stations for Apra Harbor WWTP.



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APPENDIX E

**Guam Environmental Protection Agency Section 401 Water Quality
Certification**

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APPENDIX F

**Guam Coastal Zone Management Program Federal Consistency Certification
Concurrence**

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