NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FACTSHEET

July 8, 2016

Permittee Name:	Guam Waterworks Authority
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NPDES Permit No.:	GU0020371

I. STATUS OF PERMIT

Guam Waterworks Authority (the "permittee" or "GWA") has applied for the renewal of its National Pollutant Discharge Elimination System ("NPDES") permit to authorize the discharge of treated effluent from the Ugum Surface Water Treatment Plant (the "facility" or "SWTF") to the Ugum River. A completed application was submitted on December 16, 2014. The Environmental Protection Agency ("EPA") Region IX is reissuing this facility's permit pursuant to the Clean Water Act ("CWA") section 402. CWA section 402, and EPA's implementing regulations, contain provisions that govern EPA's authorization to require NPDES permit conditions. (40 CFR 122).

The permittee currently is discharging under NPDES permit GU0020371, which was issued April 26, 2010. Pursuant to 40 CFR 122.21, the terms of the existing permit are administratively extended until the issuance of a new permit.

This permittee is classified as a minor discharger. EPA rated the facility with 60 points, and 80 points are needed for the facility to be a major discharger.

II. GENERAL DESCRIPTION OF FACILITY

The Ugum SWTF is the only drinking water treatment plant owned and operated by GWA. The facility is the major source of water supply for the Southern Public Water System, which serves the southern part of the island. Ugum SWTF is designed to process 4 mgd from the river, and discharges, on average 0.02 mgd back to the river over approximately 3 and half hours. (GWA 2014).

GWA upgraded the facility during 2007 to 2011 from a conventional filtration to a microfiltration system, as part of the GWA Stipulated Order for Preliminary Relief. The facility

has operated solely on microfiltration since March 28, 2011. In the facility's previous design, the plant did not discharge wastewater.

The facility includes an intake structure in the river, a pumping station next to the riverbank at the intake structure, transmission lines, and a treatment plant. Raw water is pumped from Ugum River to a wetwell via pre-screens, when operational. The screens are back-flushed periodically to remove solids accumulated on the screen and discharged into the Ugum River. After screening, the raw water flows into flocculation tanks and then fed into contact tanks. Supernatant from the contact tanks is sent to membrane filters (Memcor CS System) for fine solids removal. Permeate is disinfected with chlorine prior to entering the distribution systems[1].

The membrane filters (Memcor System) require regular cleaning (i.e. membrane backwash cycle). The dirty backwash water is transferred to a recycle tank and clarifier to stabilize pH and neutralize the chlorine prior to discharging. The design capacity of the tank is 25,000 gallons, or 0.025 mgd. The facility may discharge multiple times a day if the filters are cleaned more than once per day. Filters are cleaned multiple times only after a high intensity rainfall event occurs after a prolonged dry period.

Solids are collected from the contact tanks and backwash water clarifiers and are sent to the sludge tank. Combined solids from the sludge tank are pumped into the sludge handling system. When the sludge handling system in not in operation, dewatered solids are hauled to a solids handling facility. See Attachment B, process flow diagram for Ugum SWTP.

III. DESCRIPTION OF RECEIVING WATER

The Guam Environmental Protection Agency ("GEPA") adopted water quality standards ("WQS") for different surface waterbodies, depending on the level of protection required. The WQS, revised in 2015, provides water quality criteria by surface waterbody classification. The Ugum River is located within the area classified as Category S-2, medium quality surface water(s). Category S-2 waters are used for recreational purposes, including whole body contact recreation, for use as potable water supply after adequate treatment is provided, and propagation and preservation of aquatic wildlife and aesthetic enjoyment. (GEPA 2001).

The facility discharges to the Ugum River at latitude 13° 19'74" N and 144° 44' 57" E through outfall 001, before the convergence with the Talofofo River, which flows into Talofofo Bay.

The Ugum River is impaired due to turbidity, and in 2007, EPA approved a total maximum daily load ("TMDL") for sediment[2]. See section VI.B.1, Applicable Standards, Designated Uses, and Impairments of Receiving Water.

[1] Chlorine is used in both the membrane system for clean-in-place/maintenance wash and the disinfection system before water enters the distribution system. During the dry season, pre-chlorination at the headworks also can occur.
[2] The Ugum River was delisted from Guam's 303(d) list of impaired waters because EPA approved a sediment TMDL in 2007.

IV. DESCRIPTION OF DISCHARGE

The discharge consists of clean-in-place washwater or maintenance washwater used to clean the filters. A maintenance wash occurs every 3 days and clean-in-place occurs every 2 weeks during normal operations. The frequency of the maintenance wash is designed to be a short version of the CIP cycle. The chemically treated water cleaning the filters contains sodium hypochlorite, citric acid, and sulfuric acid. The neutralization tanks uses sodium hydroxide and sodium bisulfate to balance the pH and sodium meta-bisulphate to neutralize chlorine prior to discharge. The neutralized chlorine and acid wastes generated by the chemical cleaning process is discharged into the Ugum River downstream of the intake structure. See section II. General description of this facility, above, for further information.

Discharge is "batch" analyzed. If the washwater does not meet effluent limits and can't be discharged, the washwater is pumped out by pumper trucks. The permittee then transports the washwater by tanker truck to Inarajan Wastewater Treatment Plant in Inarajan, Guam.

A. Application Discharge Data

As part of the application for permit renewal, the permittee provided data from an analysis of the facility's discharge, as shown in Table 1. The estimated effluent characteristics from the 2010 permit reissuance process are in Table 2.

EPA is requiring new monitoring requirements for BOD and ammonia to verify that the effluent quality is comparable to what was projected prior to the 2010 permit. Data for these pollutants will be used next permit cycle to determine whether effluent limit are needed to protect water quality.

Table 1. Application Discharge Data from Permittee's Renewal Application.

Parameter	Units	Discharge Data	
		Max Daily	Average
Flow	mgd	0.02	0.02
pH	standard units	6.90 – 8.30 (min. – max.)	
Total Suspended Solids (TSS)	mg/L	154.00	25.08
Total Residual Chlorine	mg/L	0.00	0.00
Total Dissolved Solids (TDS)	mg/L	1,104.00	299.54
Aluminum	mg/L	1.36	0.56

Table 2. Estimated Effluent Characteristics from 2010 Permit Reissuance

Pollutant	Units	Washwater Average[(1)]	CIP Average[(1)]
Chemical Oxygen Demand	Parts per million (ppm)	Not expected	83
Biological Oxygen Demand	ppm	Not expected	70
Total Organic Carbon	ppm	22	7
Total Suspended Solids	ppm	29	9

Pollutant	Units	Washwater Average(1)	CIP Average(1)
Ammonia (As N)	N/A	Not expected	Not expected
Temp (Summer)	°C	25-35	25-35°
Temp (Winter)	°C	25-35	25-35°
pH	Standard units	6.5-9.0	6.5-9.0
Total Dissolved Solids	ppm	235	500

(1) Engineer's or MEMCOR estimate.

B. Discharge Monitoring Report Data (2010 to 2015)

EPA utilized available data from its Enforcement and Compliance History Online (ECHO) database, ranging from 2010 to 2015. Effluent quality did not meet limits for aluminum, turbidity, pH, and TSS. The most commonly exceeded parameters was aluminum.

Table 3. Discharge Monitoring Report Data from March 2011 to December 2015.

Parameter	Units	Previous (2010 – 2015) Permit Effluent Limitations			Discharge Monitoring Data (between 2011 – 2015)		
		Average Monthly	Maximum Daily	Instantaneous Max.	Highest Average Monthly	Highest Maximum Daily	Instantaneous Max.
Flow Rate	MGD	--	--	--	0.03	0.09	--
pH	Std. Units	Between 6.5 – 9.0 at all times			4.2 – 9.3 (min – max)		
Turbidity	NTU	--	--	12.50	--	--	109.00
Total Suspend Solids	mg/L	30.00	45.00	--	35.00	43.00	--
	lbs/day	150.00(1)	225.00(1)	--	105.7	170.3	--
Total Dissolved Solids	mg/L	1,000.00	1,000.00	--	1,322.00	1,322.00(3)	--
	lbs/day	384.00	384.00	--	208.00	242.00	--
Total Aluminum	µg/L	1,000.00	--	--	33,000(2)	--	--
	lbs/day	0.384(1)	--	--	821.70(2)	--	--
Total Residual Chlorine(3)	µg/L	0.05	0.05	--	0.00	0.00	--

(1) Mass based limits were calculated using 0.046 MGD design flow.
(2) The next highest reported value for aluminum was 31,000 µg/L and 130 lbs/day.
(3) The next highest reported value for TDS was 649 mg/L.

V. SIGNIFICANT CHANGES FROM PREVIOUS PERMIT TERM (2010 – 2015)

Table 4. Significant changes from previous permit term (2010 – 2015)

Permit Condition	Previous Permit (2010 – 2015)	Re-issued permit (2016 – 2021)	Reason for change
Mass Effluent Limits	EPA calculated mass-based limits using a 0.046 mgd design flow.	Mass-based limits for daily maximums (i.e. TSS and TDS) are included based on flow scenarios: 0.025 mgd and 0.050 mgd.	The design capacity of the tank is 0.025 mgd. However, the facility may discharge multiple times a day after an intense rain or during emergency operations, up to 0.050 mgd.
Effluent Monitoring Requirements	The permittee must monitor and report flow.	The reissued permit includes effluent monitoring for BOD and ammonia in addition to flow.	The permittee provided estimated effluent quality characteristics prior to 2010 permit. No information has been provided about actual concentrations. Data confirming estimated values for BOD and ammonia is needed to assess whether there is reasonable potential to exceed GEPA's water quality narrative standards for dissolved oxygen and numeric standards ammonia.
Frequency of Effluent Monitoring for Turbidity	Four samples must be taken during the course of the discharge. The samples must be taken at intervals of at least 15 minutes.	Monitoring frequency reduced to once per discharge.	The previous permit estimated a discharge rate of 0.046 mgd meaning that the pump would be running for 8 hours. However, the duration of the discharge is 3.5 hours and a single sample will be representative of the effluent. EPA is also retaining receiving water monitoring for turbidity upstream and downstream of the outfall.
Receiving Water Monitoring Requirements	The permittee was required to monitor for pH, temperature, orthophosphate, nitrate-N, ammonia, DO, and TDS.	The reissued permit removes these receiving water monitoring requirements (i.e. pH, temperature, orthophosphate, nitrate-N, ammonia, DO, and TDS).	Parameters were required previously because the facility would be discharging for the first time after plant upgrades and only effluent quality estimates could be provided on the application. EPA is retaining the receiving water monitoring for turbidity and TSS in accordance with the sediment TMDL. Narrative requirements are also retained to protect the receiving water.

The permit also contains electronic reporting requirements for DMR, which are consistent with EPA's final rule, NPDES Electronic Reporting Rule, effective December 2015.

VI. DETERMINATION OF NUMERICAL EFFLUENT LIMITATIONS

EPA 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"). EPA established, in the permit, the most stringent of the applicable technology-based or water quality-based standards, as described below.

A. Applicable Technology-Based Effluent Limitations

There are no applicable national or Guam criteria for drinking water treatment plants. There are, however, NPDES general permits for the water treatment industry in other states that contain technology-based effluent limits (TBELs) based on best professional judgement. The previous permit compared such TBELs for drinking water treatment plants in 4 states (Mississippi, South Carolina, South Dakota, and Washington).

The table below contains updated limits for these 4 states and includes an additional 5 general permits (for Alabama, Arkansas, Massachusetts and New Hampshire, Ohio, and Oklahoma)[3]. The additional general permits were considered during this renewal because the permits included an aluminum effluent limit and were recently issued.

Table 5. Maximum Daily Limits from State General Permit Examples

State[4]	Settleable Solids (mg/L)	TRC (mg/L)	Aluminum (mg/L)	TDS (mg/L)	TSS (mg/L)
Alabama	--	0.019	--	--	45.00
Arkansas	--	<0.100 instant max	2.00	--	30.00
Massachusetts and New Hampshire	--	<0.100	--	--	50.00
Mississippi	--	0.019	--	--	45.00
Ohio	--	0.019	--	--	45.00
Oklahoma	--		2.00	--	30.00

[3] Many general permits included effluent limits for other types of metals, like iron, manganese or arsenic, dependent on the type of source water and type of treatment process. Since this facility uses aluminum, only applicable limits for this metal are included in the table. All general permits included a pH limit, but this facility includes a pH limit based on GEPA's water quality standards.

[4] See the following links for state general permits authorizing discharges from water treatment plants:
AL: http://www.adem.state.al.us/programs/water/permits/ALG640000WaterTreat.pdf;
AR: http://www2.adeq.state.ar.us/water/branch_permits/individual_permits/pdfs_forms/arg640000.pdf;
MA/NH: https://www3.epa.gov/region1/npdes/pwtf/FinalPWTFGP.pdf;
MS:www.deq.state.ms.us/mdeq.nsf/pdf/epd_DrinkingWaterGeneralPermit/$File/Drinking_Water_GP.PDF?OpenElement;
OH: http://www.epa.ohio.gov/portals/35/permits/WaterTreatmentPlants_Final_GP_dec11.pdf;
OK: http://www.deq.state.ok.us/WQDnew/opdes/municipal/general_permits/2012%20OKG38%20Permit.pdf;
SC: http://www.scdhec.gov/environment/docs/g646000.pdf;
SD: http://denr.sd.gov/des/sw/IPermits/WTPPermit.pdf;
WA: http://www.ecy.wa.gov/programs/wq/wtp/permitdocs/wtpfinal071509sig.pdf

South Carolina	--		--	--	60.00
South Dakota	--	<0.050	--	1,000.00	90.00 instant max
Washington	0.200	0.150	--	--	--

Table 6. Average Monthly Limits from State General Permit Examples

State	Settleable Solids (mg/L)	TRC (mg/L)	Aluminum (mg/L)	TDS (mg/L)	TSS (mg/L)
Alabama	--	0.011		--	30.00
Arkansas	--	--	1.00	--	20.00
Massachusetts and New Hampshire	--	--	--	--	30.00
Mississippi	--	0.011	--	--	30.00
Ohio	--	--	--	--	30.00
Oklahoma	--	--	1.00	--	20.00
South Carolina	--	--	--	--	30.00
South Dakota	--	--	--	1,000.00	--
Washington	0.10	0.07	--	--	--

Based on BPJ, EPA is retaining the TBELs developed for total residual chlorine (TRC), total suspended solids (TSS), and total dissolved solids (TDS) contained in the 2010 permit. The TSS effluent limit also is consistent with implementation of the sediment TMDL.

Mass limits were calculated based on flow scenarios. The design capacity of the tank is 0.025 mgd. Under normal operations, the facility discharges on average 0.02 mgd and only needs to empty the tank once. However, the facility may discharge multiple times a day depending on receiving water conditions. After a prolonged dry period, an intense rain can increase the turbidity of the receiving water. The facility usually shuts down under such conditions. However, the filters may need to be cleaned twice prior to resuming operations. Below shows example of calculations for TSS and TDS.

<u>TSS: mass-based limits calculated from concentration-based limits</u>
0.025 mgd flow; normal operation
30-day average – (30 mg/L)(0.025)(8.345) = 6.259 lbs/day
Daily max – (45 mg/L)(0.025)(8.345) = 9.388 lbs/day

0.05 mdg; emergency operation
Daily max – (45 mg/L)(0.050)(8.345) = 18.776 lbs/day

<u>TDS: mass-based limits calculated from concentration-based limits</u>
0.025 mgd flow; normal operation
30-day average – (1,000 mg/L)(0.025)(8.345) = 208.625 lbs/day
Daily max – (1,000 mg/L)(0.025)(8.345) = 208.625 lbs/day

0.05 mdg; emergency operation
Daily max – (1,000 mg/L)(0.050)(8.345) = 417.250 lbs/day

B. Water Quality-Based Effluent Limitations

Water quality-based effluent limitations are required in NPDES permits when the permitting authority determines 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 that 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 *TSD* (EPA 1991) and the *NPDES Permit Writers Manual* (EPA 2010). These factors are listed below and subsequently discussed:

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
5. Reasonable Potential Analysis (using data from previous permit term 2008 to 2013)

1. Applicable Standards, Designated Uses, and Impairments of Receiving Water

To protect the designated uses of waters of the U.S., GEPA adopted water quality standards for waterbodies depending on the level of protection required. Category S-2 waters are used for recreational purposes, including whole body contact recreation, for use as potable water supply after adequate treatment is provided, and propagation and preservation of aquatic wildlife and aesthetic enjoyment. (GEPA 2001). EPA is retaining pH and aluminum effluent limits, which are applicable to GEPA's WQS. The permit includes a daily maximum effluent limit for aluminum as opposed to an average monthly effluent limit because the discharge is intermittent.

The Ugum River has a sediment TMDL. The TMDL was completed prior to the facility's discharge and therefore, does not include a waste load allocation for the facility. EPA is retaining the turbidity and total suspended solids effluent limits, which are consistent with the sediment TMDL, as well as the receiving water monitoring requirements for these pollutants.

2. Dilution in the Receiving Water

Discharges from Outfall 001 are to the Ugum River, and the permittee has not requested a mixing zone. Dilution is not allowed and therefore, not considered by EPA in the development of water quality-based effluent limits applicable to the discharge. All effluent limits apply at the outfall.

3. Type of Industry

Typical pollutants of concern for drinking water treatment plant discharges include chlorine and the byproducts of chlorine, which at elevated levels is toxic to aquatic life. Other pollutants are concern include metals used in the treatment process to clean filters, such as iron and aluminum. The permit retains effluent limits for chlorine and aluminum. The permit includes a daily maximum effluent limit for aluminum as opposed to an average monthly effluent limit because the discharge is intermittent.

4. History of Compliance Problems

In recent years, GWA has faced an increasingly difficult task of keeping the plant operating at full capacity when the river is running with high turbidity rates. This highly turbid water has increased operational costs and, along with poor operation and maintenance practices, has led to premature failure of some components of the treatment plant system.

5. Reasonable Potential Analysis using Existing Data from Previous Permit Term (2008 to 2013)

EPA conducted a reasonable potential analysis based on statistical procedures outlined in the *TSD* (EPA 1991). These statistical procedures calculate the projected maximum effluent concentration based on available monitoring data to account for effluent variability and a limited data set. EPA estimated the projected maximum effluent concentrations assuming a coefficient of variation of 0.6 and a 95 % confidence interval (EPA 1991). 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*. (EPA 1991).

Table 7. Reasonable Potential Statistical Analysis using Data from 2010 to 2015

Parameter[1]	Maximum Observed Concentration	*n*	RP Multiplier[2]	Projected Maximum Effluent Concentration	Most Stringent Water Quality Criterion	Statistical Reasonable Potential?
Total Residual Chlorine	0.0	> 20	1.4	0.0	0.05	No.
Aluminum	33.0 mg/L	> 20	1.4	46.2	1.0 mg/L	Yes.

(1) Only parameters with Maximum Observed Concentration >0 were included in the RP analysis.
(2) RP multiplier is based on 95 % probability using (n) and the coefficient of variation (CV). Because of data variability, EPA used a CV of 0.6 for all parameters.

In addition to using the TSD approach, the exceedances of the previous permit limits for pH indicate the facility may cause or contribute to an excursion above GEPA's water quality

standards.[5] EPA is retaining the TRC effluent limit, consistent with anti-backsliding provisions, in order to ensure water quality is protected as well as the limits for turbidity and TSS to implement the sediment TMDL.

C. Rationale for Numeric Effluent Limits and Monitoring

EPA evaluated the typical pollutants expected to be present in the effluent and selected the most stringent of applicable technology-based or water quality-based effluent limitations. Where effluent concentrations of toxic parameters 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. EPA's rationale for each effluent limit in the permit is below.

- ***Flow:*** No limits are established for flow, but flow rates must be monitored and reported. Weekly monitoring is retained in the permit. The permittee indicated that the design flow rate for the facility is 0.02 and the maximum flow rate is 0.02 mgd on the permit application. However, the permittee also reported a maximum daily flow rate of 0.09 mgd with a monthly average flow of 0.03 mgd. For purposes of this reissuance, EPA is using the design capacity of the tanks, 0.025 mgd. The design flow is used for average monthly massed limits. The permit contains daily maximum mass based limits for different flow scenarios (i.e. normal or emergency): 0.025 mgd and 0.050 mgd.

- ***pH*:** EPA is retaining the pH limits of 6.5 to 9.0 because there is reasonable potential for the water quality standard to be exceeded. Based on effluent monitoring data, pH values ranged from 4.2 to 9.3 S.U. GEPA WQS for S-2 waters for pH is 6.0 to 9.0. Even though the WQS is 6.0 to 9.0, EPA is retaining the pH effluent limit to be consistent with anti-backsliding provisions.

- ***Total Suspended Solids:*** EPA is retaining the TSS effluent limits based on BPJ, consistent with anti-backsliding provisions. Retaining the TSS limit will also ensure the WQS requirement that concentrations of TSS in the receiving water "should not exceed 20 mg/L, except when due to natural conditions" for S-2 waters as well as the sediment TMDL. Receiving water monitoring for TSS is also retained.

- ***Total Residual Chlorine:*** EPA is retaining the effluent limits for TRC based on BPJ, consistent with anti-backsliding provisions.

- ***Total Dissolved Solids:*** EPA is retaining the effluent limits for TDS based on BPJ, consistent with anti-backsliding provisions. Retaining TDS will be used to ensure that the effluent will not cause the ambient water to exceed 500 mg/L or 122% of the ambient conditions for S-2 waters.

[5]EPA Region IX finds that the permittee has a reasonable potential to exceed the receiving water quality standards for the Ugum River because it cannot be demonstrated with a high confidence level that the upper bound of the lognormal distribution of effluent concentration is below the receiving water criteria.

- ***Aluminum:*** Aluminum chlorohydrate is used as a coagulant, as part of the treatment process (i.e. filter backwash from cleaning). EPA is retaining the effluent limits for aluminum because there is reasonable potential for the discharge to exceed the WQS. Per GEPA's WQS, the fresh water maximum numerical limit for Aluminum is 1.0 mg/L. Mass-based effluent limits were calculated using a flow of 0.025 mgd. The permit includes a daily maximum effluent limit for aluminum as opposed to an average monthly effluent limit because the discharge is intermittent.

- ***Turbidity****:* EPA is retaining the turbidity limits in the permit based on BPJ, consistent with anti-backsliding provisions. The limit also implements the numeric target set forth in the Ugum Watershed TMDL. Receiving water monitoring for turbidity is also retained.

D. 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 required in the previous permit, except as provided in the statute. Federal regulations, 40 CFR 122.44(l)(1), allow for backsliding in cases where limits were not previously established appropriately or where new information is available to support a separate limit derivation. The permit retains all effluent limits and requires new monitoring requirements for BOD and ammonia. Mass-based daily maximum effluent limits did changed based on flow scenarios, resulting in a slightly higher limit for total suspended solids and total dissolved solids when the facility discharges up to 0.05 mgd. This flow is only discharged after intense rainstorms or during emergency operations. This slightly larger flow of 0.05 mgd (compared to 0.046 mgd) was used to calculate daily maximum effluent limits when the facility discharges more than once per day, up to 0.05 mgd. However, all other mass-based limits are based on the design capacity of the tanks, 0.025 mgd, and lead to a lower effluent limit for normal plant operations. This change is consistent with anti-backsliding provisions based on updated treatment process and operational information.

E. Antidegradation Policy

The permit contains effluent limits and monitoring requirements to ensure that all applicable water quality standards are met, including EPA's antidegradation policy at 40 CFR 131.12 and at Section 5101.B of GEPA's water quality standards. The permit does not include a mixing zone, and therefore, all effluent limits apply at the end-of-pipe without consideration of dilution in the receiving water.

VII. NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

The GEPA water quality standards, Section 5103, contains narrative water quality standards applicable to the receiving water. EPA is retaining the narrative effluent limits in order to implement GEPA's water quality standards.

VIII. MONITORING AND REPORTING REQUIREMENTS

The permit requires the permittee to conduct monitoring for all pollutants or parameters with effluent limits, at the minimum frequency specified. Where effluent concentrations of toxic parameters are unknown or where data are insufficient to determine reasonable potential, EPA may require monitoring for pollutants or parameters where effluent limits have not been established. This data may be re-evaluated, and the permit re-opened to incorporate effluent limitations, if necessary.

The permittee is required to conduct 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 monitoring data shall be reported on monthly DMR forms and submitted quarterly as specified in the permit.

Grab samples are required for all parameters because of the batch discharges. (40 CFR 136). Discrete samples are appropriate when a sample is needed to monitor a non-continuous discharge and allow collection of a variable sample volume. Continuous metered monitoring of flow rate is retained in the permit.

IX. SPECIAL CONDITIONS - RECEIVING WATER MONITORING

The Ugum River is an impaired water body with a TMDL for sediment. The permittee shall not contribute to the sediment loading in the river. Accordingly, monthly receiving water monitoring is required for turbidity and total suspended solids. The permittee shall take samples both upstream and downstream of the outfall during a discharge. The downstream sample shall be collected at least 200 feet downstream of the outfall to ensure proper effluent mixing with the receiving water.

Additional parameter monitoring is required in order to determine compliance with narrative Guam WQS. The narrative portion of the Guam WQS describes limits while allowing flexibility to account for ambient concentrations. Downstream samples shall be used as a compliance point, while upstream samples shall be used as reference for ambient concentrations. Hence, the downstream compliance sample must be higher than the upstream background sample in order to constitute a violation of a narrative standard, or permit condition. EPA acknowledges statistical variations due to randomness in comparing downstream to upstream receiving water samples and will exercise enforcement discretion accordingly.

X. 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. Since the issuance of NPDES permits by the EPA is a

federal action, consideration of the permitted discharge and its effect on any listed or candidate species or their critical habitat is appropriate.

To determine whether the discharge would affect any endangered or threatened species, EPA reviewed a list of species with habitats or known populations in Guam. (US FWS 2011). A discussion of each of these species is below.

Table 8. Listed species, designated under the U.S. Endangered Species Act for Guam

Type	Common Name	Scientific Name	Status	Critical Habitat Designated
National Marine Fisheries Service				
Fish	Scalloped hammerhead shark, Indo-West Pacific	*Sphyrna lewini*	Threatened (T)	
Mammals	Blue whale	*Balaenoptera musculus*	Endangered (E)	
	Fin whale	*Balaenoptera physalus*	E	
	Sperm whale	*Physeter catodon*	E	
	Humpback whale	*Megaptera novaeangliae*	E	
	Dugong[2]	*Dugong dugon*	E	
	Sei Whale	*Balaenoptera borealis*	E	
Sea Turtles[2]	Olive ridley sea turtle	*Lepidochelys olivacea*	T	
	Leatherback turtle	*Dermochelys coriacea*	E	
	Green Sea turtle	*Chelonia mydas (incl. agassizi)*	T	
	Loggerhead turtle, North Pacific	*Caretta caretta*	T	
	Hawksbill turtle	*Eretmochelys imbricate*	E	
Corals[3]		*Acropora globiceps*	T	
		Acropora jacquelineae	T	
		Acropora lokani	T	
		Acropora retusa	T	
		Acropora speciose	T	
		Acropora tenella	T	
		Anacropora spinose	T	
		Euphyllia paradivisa	T	
		Isopora crateriformis	T	
		Montipora australiensis	T	
		Porites napopora	T	
		Seriatopora aculeate	T	
U.S. Fish and Wildlife Service Species Associated with Ocean Habitats				
Mammals	Little Mariana Fruit Bat	*Pteropus tokudae*	E	Guam
	Mariana Fruit Bat	*Pteropus mariannus mariannus*	T	Guam
Birds	Mariana Swiftlift	*Aerodramus bartschi*	E	
	Mariana Crow	*Corvus kubaryi*	E	Guam

Type	Common Name	Scientific Name	Status	Critical Habitat Designated
Birds (cont.)	Mariana Common Moorhen	*Gallinula chloropus guami*	E	
	Guam Micronesian Kingfisher	*Halcyon cinnamominus cinnammominus*	E	Guam
	Micronesian Megapode	*Megapodius laperouse*	E	
	Guam Rail	*Rallus owstoni*	E	
	Guam Bridled White-eye	*Zosterops conspicillatus conspicillatus*	E	
Plants	Hayun lagu	*Serianthes nelsonii*	E	

Source: NOAA 2015 and US FWS Environmental Conservation Online System.
[1] Critical habitat is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation.
[2] The species is also under the jurisdiction of the U.S. FWS.
3 EPA obtained these corals from http://www.fpir.noaa.gov/Library/PRD/Coral/us_indo-pacific_corals_distribution.pdf and http://www.fpir.noaa.gov/Library/PRD/Coral/Field_ID_guide_Guam.pdf.

Within U.S. Pacific Areas, National Marine Fisheries recently added 15 coral species as threatened under the Endangered Species Act. Specifically within Guam waters, 3 species have been confirmed, 9 are possible and 3 are deemed unlikely. Top threats to corals include ocean warming, ocean acidification, dredging, coastal development, coastal point source pollution, agricultural and land use practices, disease, predation, reef fishing, aquarium trade, physical damage from boats and anchors, marine debris, and aquatic invasive species. In particular, *Seriatopora aculateate* is most susceptible to ocean warming, disease, acidification, sedimentation, nutrients, predation, and collection and trade. The proposed permit includes limitations for sediment in the form of total suspended solids. The discharge is also to inland water, approximately 2 miles upstream of the marine environment. Therefore, the discharge will not effect any listed marine species.

For inland species, EPA also concludes no effect to the listed species in Table 8, as described below.

Bats

The Little Mariana Fruit Bat (*Pteropus tokudae*) and the Mariana Fruit Bat (*Pteropus mariannus mariannus*) are listed as endangered and threatened, respectively, due to habitat lost/degradation, over hunting, predation by the brown treesnake, and natural disturbances. On islands inhabited by humans, bat colonies usually occur in remote sites, especially near or along clifflines. The Mariana Fruit Bat is known to forage on military lands and at the Guam National Wildlife Refuge, which are miles away from this facility's discharge. The facility is not located in an area designated as critical habitat for the Mariana Fruit Bat. (US FWS 2009; US FWS 2012). The facility's discharge will not effect the bats' food, habitat, or the bat itself.

Birds: Seven Endemic Bird Species

The U.S. FWS lists as threatened or endangered seven bird species: 1) Mariana Swiftlet (Aerodramus bartschi); 2) Mariana Crow (Corvus kubaryi); 3) Mariana Common Moorhen (Gallinula chloropus guami); 4) Guam Micronesian Megapode (Megapodius laperouse); 5) Guam Rail (Rallus owstoni); 6) Guam Bridled White-eye (Zosterops conspicillatus conspicillatus); and Guam Micronesian Kingfisher (*Halcyon cinnamominus cinnammominus*).

Many endemic birds, especially flightless birds like the Guam Rail, are listed as threatened or endangered due to predation by the brown treesnake or predation by other animals such as lizards, rats, and feral cats. The Kingfisher was listed as endangered solely from the predation by the brown treesnake and there are no known populations on Guam.

Many of these seven bird species are known to occur in the northern part of the island, miles away from the facilities discharge. Similar to the Mariana fruit bat, the Guam Micronesian kingfisher has critical habitat on the northern part of Guam. The Mariana Crow critical habitat also occurs in the northern tip of Guam (by Ritidian Point). Ugum SWTP is on the southern part of Guam and is not located within the critical habitat area for these species. The discharge will not effect the Mariana fruit bat or the Guam Micronesian kingfisher.

The Micronesian Megapode is listed as endangered. No populations are known to exist on Guam. Current threats to megapodes in the pacific islands include habitat destruction by feral ungulates and commercial/residential development; competition with introduced species; and predation by lizards, cats, rats, pigs, dogs, and the brown treesnake. (US FWS 1998). The discharge will not effect the Micronesian Megapode.

The last two bird species may be present within the area of the discharge. The Mariana Common Moorhen are found primarily at natural and manmade wetlands and feed on a variety of plant and animal matter located in and around the wetlands. The nearest wetland that could potentially support the species is Talofofo floodplain. The Ugum River contribute to the stagnant water in the floodplain and is one of many surface waters contributing to the floodplain. The most serious threat to the Marian Common Moorhen is the disappearance of suitable wetland habitat. (US FWS 1991). The Mariana Swiftlet populations are known to occur in 3 locations on Guam, in natural and manmade caves. The Mariana Crow is known to occur in the northern cliffline forests as well as the Guam bridled white-eye bird. Guano of swiftlifts have been found near Talofofo Bay. The discharge will not effect the Mariana Common Moorhen or the Mariana Swiftlet.

Plants: Hayun Iagu

Only one mature tree on Guam is known to exist and is endangered primarily by the browsing of introduced ungulates and infestations of herbivorous insects. The tree is not in the discharge area. The facility's discharge will not effect the Hayun Iagu (*Serianthes nelsonii*). (US FWS 1993).

In addition to the discussion above, the permittee is considered a minor discharger that discharges approximately 0.02 MGD, 2 miles upstream of Talofofo Bay. This permit

incorporates effluent limits and narrative conditions to ensure that the discharge meets GEPA WQS, without any mixing zones. All effluent limits will apply at end of pipe. Therefore, EPA is making a no effect determination for inland listed species.

Summary: ESA No Effect Determination

Because Ugum SWTF's discharge is a very small proportion (<0.5%) of the Ugum River's flow and the river's flow is further diluted in the floodplain. Ugum SWTF's contribution to the floodplain and the Talofofo Bay may be considered *de minimis*. The permit is a reissuance of a permit for an existing facility. No new construction, new pipelines, land, habitat, or hydrology alterations are associated with the permit reissuance. The effluent limitations in this reissued permit are all as stringent as or equally protective as those in the previous permit. The effluent limits in the permit will not result in acute or chronic exposures to contaminants that would affect federally listed threatened and endangered species, or impair any designated critical habitat.

EPA believes that this permit reissuance will not affect any federally listed threatened and endangered species under the NOAA National Marine Fisheries or US Fish and Wildlife Services jurisdictions that may be present in the area of discharge. If, in the future, EPA obtains information or is provided information that indicates that there could be adverse impacts to federally listed species, EPA will contact the appropriate agency or agencies and initiate consultation, to ensure that such impacts are minimized or mitigated.

EPA drafted this permit to protect the beneficial uses of the river, which include propagation and preservation of aquatic wildlife. Therefore, EPA believes that the permit conditions will not affect the availability or distribution of prey species or produce undesirable aquatic life within the Ugum River that may directly impact threatened or endangered species. In consideration of the factors stated above, EPA believes that a NO EFFECT determination is appropriate for the above listed endangered or threatened species in Guam.

EPA provided the Services with copies of this fact sheet and the draft permit during the public notice period.

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 activity complies with the State (or Territory) Coastal Zone Management program, and the State (or Territory) or its designated agency concurs with the certification.

EPA received a copy of the Bureau of Statistics and Plans review of GWA's federal consistency application on June 23, 2016. EPA reviewed the certification and incorporated any provisions into the permit to ensure compliance with the Guam Coastal Management Plan. See BSP-GCMP Ref. No.: FCR 2016-0014.

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).

The 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 does not directly discharge to areas of essential fish habitat. Therefore, EPA is not required to make a determination on whether this action may adversely impact Essential Fish Habitat, as defined under the MSA.

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 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 reissuance.

XI. 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 EPA Region IX Standard Federal NPDES Permit Conditions, dated July 1, 2001.

XII. ADMINISTRATIVE INFORMATION

A. Public Notice (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 NPDES permit or other significant action with respect to an NPDES permit or application.

B. Public Comment Period (40 CFR 124.10)

Notice of the permit will be placed in a daily or weekly newspaper within the area affected by the facility or activity, with a minimum of 30 days provided for interested parties to respond in writing to EPA. After the closing of the public comment period, EPA is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued. During the public comment period, EPA received no comments.

C. 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 interest for a public hearing was expressed during the public comment period.

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

The GEPA has approved water quality standards. EPA requested certification from the GEPA that the 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 referenced applicable provisions of sections 208(e), 301, 302, 303, 306, and 307 of the CWA and appropriate requirements of Territory law. GEPA provided written certification on July 6, 2016. See 401WQC 16-05.

XIII. CONTACT INFORMATION

Comments, submittals, and additional information relating to this permit may be directed to:

EPA Region IX
Attn: Becky Mitschele
75 Hawthorne Street (WTR 2-3)
San Francisco, California 94105

or

Becky Mitschele
mitschele.becky@epa.gov
(415) 972 – 3492

XIV. REFERENCES

District Court of Guam. 2011. *Civil Case No. 02-00035. Order for Preliminary Relief Regarding Deadlines for Outstanding Projects Under the Amended Stipulated Order*. http://www.epa.gov/region9/water/npdes/pdf/guam/gwa/gwa-order-for-prelim-relief2011.pdf.

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U.S. FWS. 2012. Endangered Species in the Pacific Islands. http://www.fws.gov/pacificislands/fauna/marianabat.html

ATTACHMENT A.
Location of Ugum SWTP Receiving Water Locations, Intake, and Outfall (001)

ATTACHEMENT B.
Diagram of the Treatment Process at Ugum SWTP