Technical Memorandum

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Receiver for the Guam Solid Waste Management Authority

Project Title: Ordot Dump Closure Design

Project No.: 141057.400.413

Technical Memorandum

Subject: Leachate Impact on the Agana Wastewater Treatment Plant

Date: April 4, 2013

To: Chris Lund

From: Woodie Mark Muirhead, Project Scientist

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Section 1: Introduction

This Technical Memorandum (TM) discusses the potential impact of leachate from the Ordot Dump on the Guam Waterworks Authority's (GWA) Agana (also known as Hagatna) Wastewater Treatment Plant (WWTP). The Ordot Dump will close during 2014 (Phase 1) to 2015 (Phase 2). The existing discharge of leachate to wetlands adjacent to the Lonfit River will be greatly reduced in volume as part of the closure, and the planned discharge location for the leachate is to the Agana WWTP via the GWA wastewater collection system connected to the WWTP. Modeled leachate volume, measured leachate quality, and projected condensate volume and quality were used to determine the load of critical parameters that might affect the performance of the Agana WWTP, or pass through the WWTP and possibly cause the discharge to exceed Guam Water Quality Standards (WQS) established by the Guam Environmental Protection Agency (GEPA).

Section 2: Agana (Hagatna) Wastewater Treatment Plant

The Agana WWTP is owned and operated by GWA. The WWTP operates under the authority of National Pollutant Discharge Elimination System (NPDES) permit GU0020087, issued by the United States Environmental Protection Agency (USEPA).

The Agana WWTP currently operates under a Clean Water Act (CWA) Section 301(h) waiver that excludes the facility from secondary treatment requirements (i.e. biological treatment). The WWTP is currently a primary treatment facility. The facility removes settleable and floatable solids in primary clarifiers prior to discharge through an ocean outfall into the Philippine Sea.

The USEPA denied GWA's application for continuation of the waiver on September 30, 2009, and issued a draft NPDES permit for public comment on November 27, 2012. The draft NPDES permit includes secondary treatment standards. A schedule for compliance with the permit has not been set and full implementation is likely at least 10 years away. Copies of the draft NPDES permit and Fact Sheet are provided in Attachments A1 and A2.

In addition to specific numerical effluent limits, the WWTP must also comply with Guam WQS. Compliance with WQS is determined after initial dilution in the mixing zone. Although USEPA water quality modeling predicted an initial dilution of 219:1, the initial dilution of 100:1 requested by GWA in its application was used in the draft NPDES permit. This same dilution was used herein to assess pass-through of pollutants that could potentially exceed Guam WQS.

USEPA's Fact Sheet for the WWTP states that the monthly average discharge flow is 6.5 million gallons per day (mgd) and the maximum discharge flow is 9.9 mgd, based on 2011 discharge monitoring reports. The monthly average discharge flow of 6.5 mgd was used in conjunction with the projected leachate and condensate volumes to determine dilution of leachate pollutants prior to reaching the WWTP. This flow provides the most conservative dilution of leachate and condensate flow into the WWTP.

Section 3: Projected Leachate Volume

The discharge from Ordot Dump after closure will consist of two components: leachate from the decomposition of refuse and condensate from the collection of landfill gas (LFG). The reason for segregating these two components in this assessment is that each source has significantly different liquid volumes and potential constituent concentrations.

The LFG will be managed at sumps /traps at low points in the LFG collection headers, or will be trapped in a knock-out pot in the LFG flare system. The traps will discharge the condensate to the leachate perimeter drain, and will blend with the leachate in the leachate collection system. Condensate is formed at landfills when the moisture in the hot landfill gas condenses in the collection piping upon cooling to ambient

conditions. Based on Guam's annual average temperature, the total daily volume of condensate that will be generated is estimated at 360 to 720 gallons per day (gpd).

Projected leachate volume after closure was determined using USEPA's HELP model. The method was described in a Technical Memorandum titled Estimate of Leachate Production from the Ordot Dump under Post-Closure Conditions, dated December 10, 2012. A summary of the projected leachate volume from the bottom of the municipal solid waste (MSW) is provided in Tables 3-1 and 3-2. A peak daily leachate flow of 48,700 gpd is used for this assessment. Based on this leachate flow, a maximum condensate flow of 720 gpd, and a monthly average Agana WWTP discharge flow of 6.5 mgd, the combined leachate and condensate will be diluted by a minimum of 133:1 before reaching the WWTP. Note that the annual average leachate flow after closure is projected at only 3,600 gpd.

Table 3-1. Total Estimated Peak Daily Leachate Flow (Post-Closure)

Approximate Area of Topographic Region (Acre)		Estimated Peak Daily Flow Through MSW (gal/acre/day)	Estimated Peak Flow (gpd)
Top Deck	5.7	1,653	9,400
Side Slopes	30.5	1,287	39,300
Total Estimated Peak Daily Leachate Flow from Bottom Of MSW:			48,700

Table 3-2. Total Estimated Average Annual Leachate Flow (Post-Closure)

Approximate Area of Topographic Region (Acre)		Estimated Average Annual Flow Through MSW (gal/acre)	Estimated Average Annual (gal)
Top Deck	5.7	54,604	311,200
Side Slopes	30.5	32,762	999,200
Total Estimated Average Annual Leachate Flow from Bottom Of MSW:			1,310,400

Section 4: Leachate Quality

Quarterly leachate (Lea) samples were collected from four separate seeps at Ordot Dump. These seeps are listed below and shown on Figure 4-1.

- Lea Seep – E
- Lea Seep – SE
- Lea Seep – S
- Lea Seep – W

This section summarizes the characteristics of the quarterly samples. Detectable pollutant concentrations for one or more sampling events are provided in Table 4-1.

Since condensate from the Ordot Dump is not currently available to measure its quality, data from four newer operating landfills were used. Table 4-2 lists projected LFG condensate characteristics from 12 LFG condensate samples from the four landfills. Median concentrations are used in this assessment since the refuse in the landfills from which these samples were taken is much less degraded than the refuse in the 70+ year-old Ordot Dump.

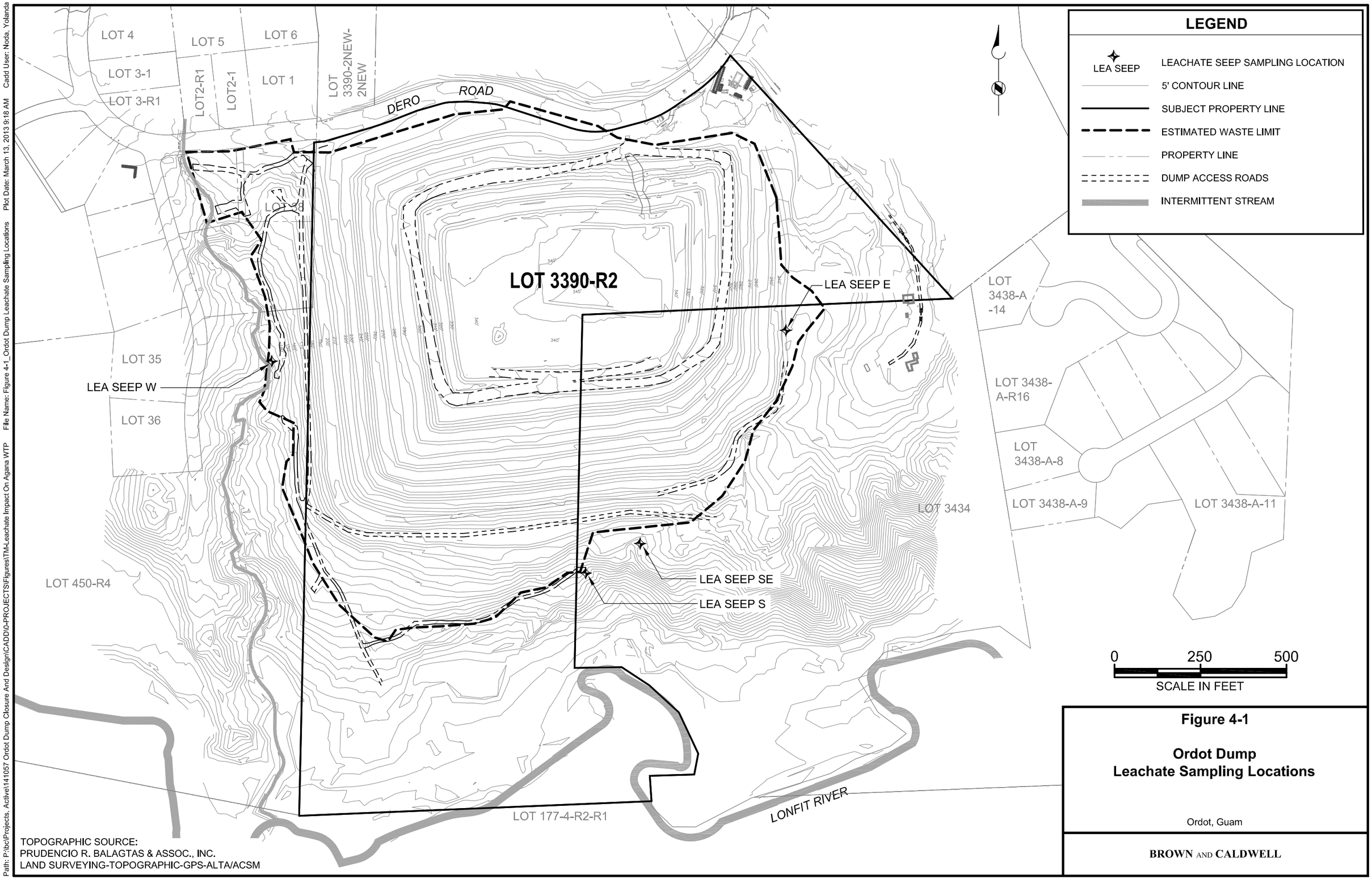
Table 4-1. Detectable Leachate Pollutants at Ordot Dump

Conventional Pollutants	Metals	Organics	Nutrients	Other
• Total Suspended Solids • Chemical Oxygen Demand • Biochemical Oxygen Demand • Total Organic Carbon	• Aluminum • Antimony • Arsenic • Barium • Calcium • Chromium (total) • Cobalt • Copper • Iron • Lead • Magnesium • Manganese • Magnesium • Nickel • Potassium • Selenium • Sodium • Vanadium • Zinc	• Acetone • Benzene • Chlorobenzene • Chloroethane • 3-Methylphenol + 4-Methylphenol • bis (2-Ethylhexyl) phthalate • Butylbenzene phthalate • Di-n-Butylphthlate • Acenapthene • Acenapthylene • Anthracene • Fluorene • Napthalene • Phenanthrene • 2,4,6-Trinitrotoluene	• Ortho-Phosphate • Ammonia-N • Total Kjeldahl Nitrogen • Nitrite • Nitrate	• Chloride • Sulfate • Total cyanide • Total Dissolved Solids • Salinity

Table 4-2. Projected LFG Condensate Pollutant Characteristics[1]

Parameter	Unit[2]	Range of Concentration[3]	Median
Biochemical Oxygen Demand (BOD5)	mg/L	224-3,090	1,400
Chemical Oxygen Demand (COD)	mg/L	1,000-10,000	1,800
Total Suspended Solids (TSS)	mg/L	214-7,910	237
Ammonia-Nitrogen as N (NH3-N)	mg/L	2,040-3,960	2,580
Total Petroleum Hydrocarbons (TPH)	mg/L	20-576	43
Sulfide	mg/L	ND-2.6	0.2
pH	s.u.[4]	1.9-8.8	6.5
Methyl ethyl ketone (MEK)	mg/L	0.10-24.3	6.29
2-Methylphenol	mg/L	ND-5.4	0.1
3,4-Methylphenol	mg/L	0.47-6.00	3.36
Pyridine	mg/L	ND-0.220	0.15
Arsenic (As)	mg/L	0.10-3.1	0.85
Chromium (Cr)	mg/L	ND-3.45	0.03
Lead (Pb)	mg/L	ND-0.145	0.04

1. *Database of 12 LFG condensate samples from 4 confidential Brown and Caldwell client landfill sites.*
2. mg/L = milligrams per liter.
3. ND = non detect
4. s.u. = standard units



TOPOGRAPHIC SOURCE:
PRUDENCIO R. BALAGTAS & ASSOC., INC.
LAND SURVEYING-TOPOGRAPHIC-GPS-ALTA/ACSM

Figure 4-1

Ordot Dump
Leachate Sampling Locations

Ordot, Guam

BROWN AND CALDWELL

Path: P:\tbc\Projects, Active\141057 Ordot Dump Closure And Design\CADD\0-PROJECTS\Figures\TM-Leachate Impact On Agana WTP File Name: Figure 4-1_Ordot Dump Leachate Sampling Locations Plot Date: March 13, 2013 9:18 AM Cadd User: Noda, Yolanda

4.1 Comparison of Leachate Pollutants with Guam Water Quality Standards

The GEPA WQS contain standards for a wide range of pollutants that are intended to prevent toxicity, human health impacts (e.g., bioaccumulation and bacterial infection), nuisance conditions (e.g. algae growth), and general changes in water quality (e.g., temperature and salinity).

Most of these standards include numeric criteria for priority pollutants such as inorganics (e.g., ammonia, metals, and cyanide), volatile organics, semi-volatile organics, and pesticides to prevent acute and chronic toxicity to aquatic organisms, as well as to prevent bioaccumulation in aquatic organisms to protect human health. Definitions for each of these criteria are provided below:

- **Criteria Maximum Concentration (CMC)** is the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (1-hour average) without deleterious effects. The CMC is intended to prevent acute toxicity to aquatic organisms.
- **Criteria Continuous Concentration (CCC)** is the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (4 days) without deleterious effects. The CCC is intended to prevent chronic toxicity to aquatic organisms.
- **Human Health Criteria** are for pollutants in concentrations which, on average during any thirty-day period, exceed the "fish consumption" standards for non-carcinogens. All territorial waters shall also be free from pollutants in concentrations, which on average during any 12-month period, exceed the "fish consumption" standards for pollutants identified as carcinogens.

The pollutant concentrations determined through analysis of the Ordot Dump leachate samples were compared with Guam WQS to determine if any of the pollutants would exceed its respective WQS without dilution. A comparison of leachate pollutant concentrations and Guam WQS is provided in Attachment B.

Section 5: Assessment of Impact

This section discusses the potential impact of the combined leachate and condensate on the existing processes of the Agana WWTP. Though there are plans to add chemically-enhanced primary treatment (CEPT) at the WWTP, this discussion does not consider the improved process performance that will result from CEPT. Since the WWTP provides only primary treatment, leachate should not affect actual performance of the facility, but will result in pass-through of the pollutants in the leachate.

A summary of the leachate pollutants for each of the quarterly samples is provided in Attachment B.

5.1 Leachate Impact on WWTP Performance

An assessment of the impact of leachate on WWTP performance was conducted. This assessment focused primarily on the NPDES permit parameters of BOD and TSS, but also included ammonia due to the high concentrations in the leachate seeps. A 6.5 mgd monthly average Agana WWTP flow and the median condensate concentrations from Table 4-2 and a condensate flow of 720 gpd were used for each of these assessments. Three separate scenarios were assessed for each of the three parameters. The scenarios are described briefly below:

- **Peak Day** – The estimated peak day leachate flow and the average of the four November 2012 quarterly sample concentrations. The probable scenario for the estimated peak day flow to occur is during the wet season when the November 2012 quarterly samples were collected.
- **Annual Average** – The estimated annual average leachate flow of 3,600 gpd and the average of all quarterly samples. The average of all quarterly sample concentrations most closely represents the time-period represented by the annual average leachate flow. This scenario is the most probable and best represents the overall impact on the performance of the WWTP.

- **Worst Case** – The estimated peak day leachate flow and the highest quarterly average leachate sample concentration. This scenario is highly unlikely to occur but was developed to determine the highest concentration using the available data in order to compare it with the most probable scenario of the annual average. It represents both the highest flow and the highest average concentration. There is a negligible chance these might coincide because the peak flow will most probably occur during the wet season and the highest concentrations will occur during the dry season. This analysis is provided in Attachment C. Table 5-1 summarizes the results of the assessments. The results of the assessment show that on an annual average basis, with complete pass-through of the three pollutants (i.e., no removal through treatment), the increase in the Agana WWTP effluent for these three pollutants is well below 1 mg/L. On a peak day, the increase in the effluent concentration is 1 mg/L or less. In a worst case scenario, the increase in the effluent concentration is less than 3 mg/L. To put in perspective the projected increases in the Agana WWTP effluent, the laboratory method reporting limits for BOD, TSS, and ammonia are 2 mg/L, 1 mg/L, and 1.2mg/L, respectively. For the annual average and peak day scenarios, the projected increases are at or below the reporting limit for the constituents.

Table 5-1. Leachate Impacts on Agana WWTP Effluent D, TSS, and Ammonia

Pollutant	Scenario	Leachate Discharge, lb/day	Increase of Agana WWTP Effluent Concentration, mg/L
Annual Average	BOD	13	0.2
	TSS	4	0.1
	NH_3	19	0.4
Peak Day	BOD	17	0.3
	TSS	53	1.0
	NH_3	47	0.9
Worst Case	BOD	140	2.6
	TSS	54	1.0
	NH_3	103	1.9

1. lb/day = pounds per day

The Agana WWTP exceeds its effluent limits for BOD and TSS routinely. The design of chemically enhanced primary treatment (CEPT) for the Agana WWTP is currently underway, and is expected to be implemented by December 2013 according to GWA. This is six months before the Ordot Dump leachate is anticipated to begin discharge to the Agana WWTP.

The impact of leachate on the Agana WWTP performance with CEPT cannot be determined at this time since CEPT has not been implemented and the leachate is not being discharged. Though this memorandum cannot determine the performance of CEPT on the Agana WWTP, a comparison can be made with GWA's Northern District WWTP since it has recently implemented CEPT and accepts leachate from the Andersen Air Force Base landfill.

Figures 5-1 and 5-2 show the peak day BOD and TSS effluent concentrations for the Northern District WWTP since CEPT was first initiated during December 2012. Figure 5-3 shows the monthly average effluent BOD and TSS concentrations for the Northern District WWTP for the same period (Note: The full set of BOD results was not available for March 2013 at the time of the preparation of this TM). The data shows that the WWTP has achieved full compliance with its effluent BOD and TSS limits.

Though the Ordot leachate and condensate have high BOD, TSS, and ammonia concentrations, the dilution of these pollutants by the current wastewater flow will have a negligible impact on Agana WWTP effluent quality. Implementation of CEPT is expected to improve performance by the Agana WWTP even further.

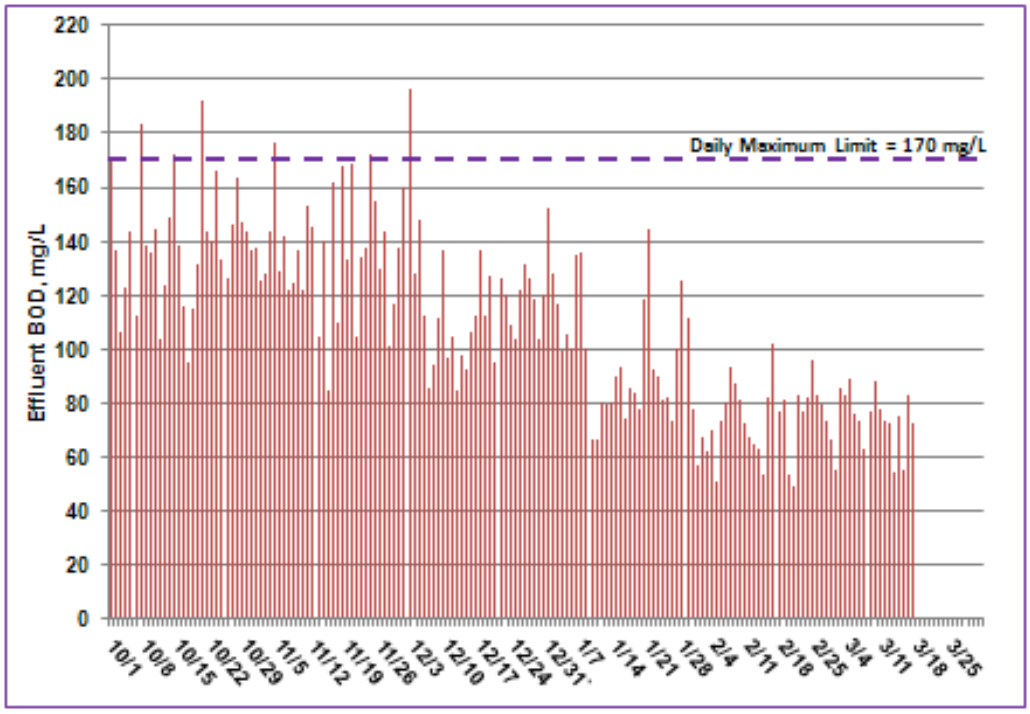


Figure 5-1. Northern District WWTP Effluent BOD Peak Day Performance

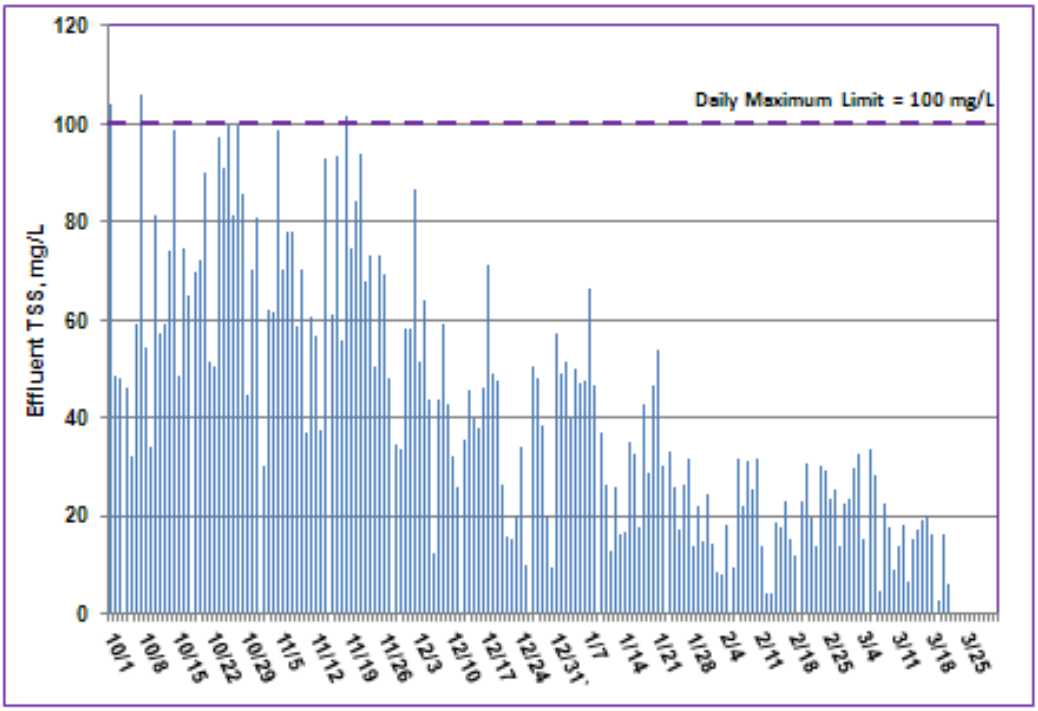


Figure 5-2. Northern District WWTP Effluent TSS Peak Day Performance

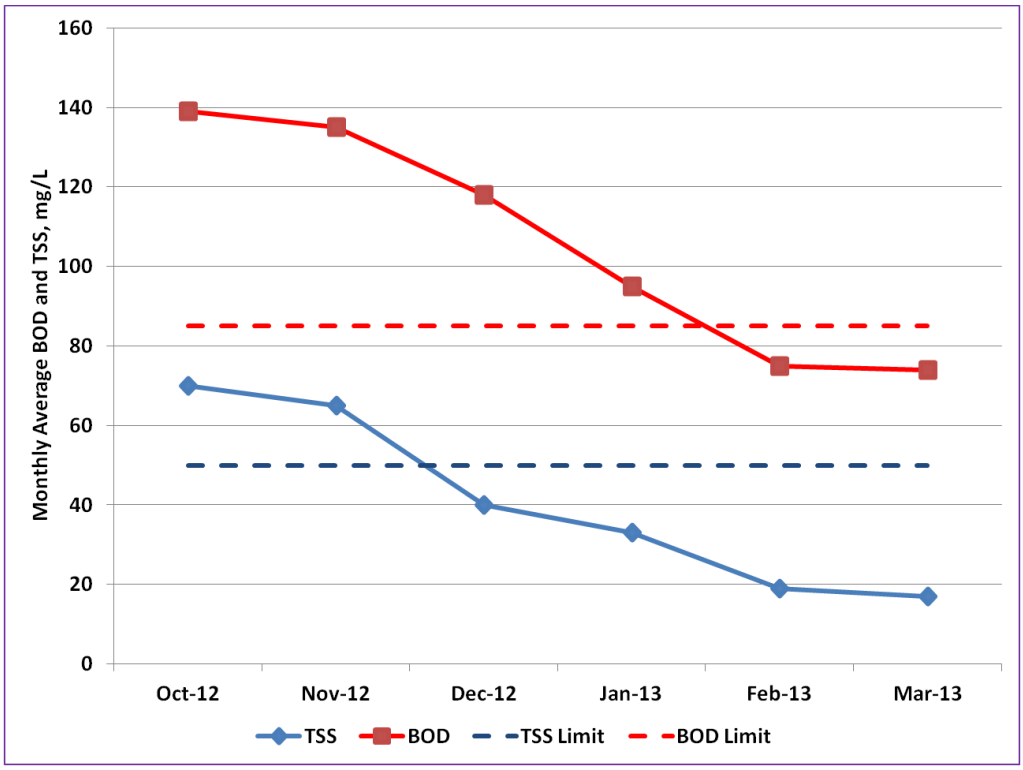


Figure 5-3. Northern District WWTP Monthly Average Effluent BOD and TSS Performance

5.2 Impact of Leachate on Guam WQS

For leachate pollutants that are un-related to specific effluent limits, complete pass-through of the pollutants was assumed for determining compliance with Guam WQS. This is a conservative approach since some of the pollutants, including metals and organics, will adsorb to solid particles in the wastewater conveyance and treatment system, and will be removed during primary treatment at the WWTP.

Section V.B.3 of USEPA's Fact Sheet in Attachment A2 contains a "reasonable potential analysis" of toxic pollutants in the WWTP discharge to exceed Guam WQS. The analysis included arsenic, copper, total chromium, lead, nickel, zinc, acetone, benzoic acid, benzyl alcohol, chloroform (trichloromethane), Di (2-ethylhexyl) phthalate, phenol, toluene, and 4-methylphenol. None of the pollutants were determined to have a reasonable potential to exceed a Guam WQS.

Since leachate pollutant concentrations can potentially increase the WWTP effluent concentrations, a further analysis was conducted to determine the potential for exceeding Guam WQS.

A flow-weighted discharge concentration from the Agana WWTP was calculated using the following information:

- The median condensate concentrations from Table 4-2 and a condensate flow of 720 gpd
- The maximum leachate concentrations from Attachment B and a peak day leachate flow of 48,700 gpd
- The maximum observed effluent concentration from the Agana WWTP listed in the Attachment A2 Fact Sheet and a flow of 6.5 mgd

The weighted concentration was then compared with the associated Guam WQS after a dilution of 100:1. This analysis is provided in Attachment C. The analysis shows that the discharge from Ordot Dump, combined with maximum observed concentrations in the Agana WWTP, would not have a reasonable potential to exceed a Guam WQS.

A separate analysis was conducted for pollutants that were not included in the USEPA's reasonable potential analysis. A similar flow-weighted concentration approach was used for pollutants for which leachate and/or condensate data exist. In addition to the 133:1 dilution of the leachate pollutants in the WWTP wastewater flow, an additional 100:1 dilution was included in the assessment to account for the initial dilution in the WWTP's mixing zone. The cumulative dilution for assessing the impact of leachate on Guam WQS is 13,300:1. Table 5-2 shows the additional pollutants and the dilution that would be required to meet Guam WQS.

Ammonia is the only discharge pollutant that could be considered a risk for exceeding a Guam WQS based on the June 2012, Total Kjeldahl Nitrogen concentration for Lea Seep-E. However, an exceedance is unlikely for the following reasons:

- All the TKN would have to be solely ammonia, or hydrolyzed to ammonia in the collection system or treatment process.
- The entire leachate flow would need to consist of the Lea Seep-E sample location concentration (280 mg/L TKN or 341 mg/L ammonia). There is sufficient dilution for the average (177 mg/L TKN or 216 mg/L ammonia) of the four sampling locations for June 2012. Using the November 2012 quarterly results, the effluent ammonia would increase by approximately 1 mg/L in the Agana WWTP effluent, and would be diluted to 0.01 mg/L in the mixing zone, which is lower than the Guam WQS of 0.02 mg/L.
- The peak day leachate flow of 48,700 gallons would not likely occur during June. Therefore, the high ammonia concentration would have greater dilution.

Table 5-2. Leachate Pollutant Concentrations and Dilution Required to Meet Guam WQS[1]

Conventional Pollutants	Metals	Organics	Nutrients	Other
Not-applicable	• Aluminum (65:1) • Antimony (4:1) • Iron (320:1)	• 2,4,6-Trinitrotoluene (110:1)	• Ortho-Phosphate (24:1) • Ammonia (9500:1) • TKN (17,050:1)[2] • Nitrate (320:1)	• Total cyanide (52:1)

1. *The required dilution is in parentheses*
2. *Assumes all organic nitrogen in TKN is ammonia or is hydrolyzed to ammonia in the wastewater collection system or treatment process*

5.3 Conclusions

Based on the projected leachate flow, the measured leachate concentrations, and compliance information in the Agana WWTP's NPDES draft permit and Fact Sheet (Attachment A), leachate wastewater from Ordot Dump will have a minimal impact on treatment plant performance and will not cause exceedance of a Guam WQS. As the WWTP is upgraded in the future, there should be even less impact or concern.

References

Brown and Caldwell, Estimate of Leachate Production from the Ordot Dump under Post-Closure Conditions, Technical Memorandum, December 10, 2012.

GEPA, Guam Water Quality Standards, 2001 Revision.

USEPA, DRAFT NPDES Permit No.GU0020087 for the Agana Sewage Treatment Plant, November 29, 2012.

USEPA, Proposed National Discharge Elimination System Proposed Permit Fact Sheet for the Agana Sewage Treatment Plant, November 29, 2012.

Attachment A: Agana WWTP NPDES Permit and Fact Sheet

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

NPDES PERMIT NO. GU0020087

In compliance with the provisions of the Clean Water Act, as amended ("CWA") (33 U.S.C. 1251 et seq.), the following discharger is authorized to discharge from the identified facility at the outfall location(s) specified below, in accordance with the effluent limits, monitoring requirements, and other conditions set forth in this permit and in the attached EPA Region 9 "Standard Federal NPDES Permit Conditions," dated June 3, 2002 :

Discharger Name	Guam Waterworks Authority
Discharger Address	P.O. Box 3010
	Hagatna, Guam 96910
Facility Name	Agana/Hagatna Sewage Treatment Plant
Facility Location Address	Marine Drive, Route 1
	Hagatna, GU 96932

Outfall Number	General Type of Waste Discharged	Outfall Latitude	Outfall Longitude	Receiving Water
001	Secondary Treated Domestic Wastewater	N 13° 29' 13.5"	E 144° 44' 51.36"	Philippine Sea

This permit was issued on:	
This permit shall become effective on:	
This permit shall expire at midnight on:	
In accordance with 40 CFR 122.21(d), the discharger shall submit a new application for a permit at least 180 days before the expiration date of this permit	

Signed this_____day of _____, for the Regional Administrator.

_____
Nancy Woo, Acting Director
Water Division

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I. EFFLUENT LIMITS AND MONITORING REQUIREMENTS

A. Effluent Limits and Monitoring Requirements

1. The permittee is authorized to discharge treated wastewater in compliance with the effluent limits and monitoring requirements specified below. The discharge of pollutants at any point other than the outfall specifically authorized in this permit is prohibited.

Table 1. Effluent Limits and Monitoring Requirements – Outfall Number 001

Parameter	Maximum Allowable Discharge Limits Concentration and Loading				Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Units	Frequency	Sample Type
Flow rate	12	(1)	(1)	MGD	Continuous	Metered
Biochemical Oxygen Demand (5-day)	30	45	--	mg/L	Weekly	24 hr Composite
	3000	4000	--	lbs/day		
	The average monthly percent removal shall not be less than 85 percent. (2)			%		
Total Suspended Solids	30	45	–	mg/L	Weekly	24 hr Composite
	3000	4000	–	lbs/day		
	The average monthly percent removal shall not be less than 85 percent. (2)			%		
pH (hydrogen ion)	Within 6.5 and 8.5 at all times.			pH units	Weekly	Discrete
Settleable solids	1	–	2	mL/L	Weekly	Discrete
Oil and grease, total recoverable	10	–	15	mg/L	Weekly	Discrete
Enterococcus(3)	35(3)	–	104(3)	CFU/ 100mL	Weekly	Discrete
Chlorine, total residual (TRC)	0.750	–	1.23	mg/L	Weekly	Discrete
Temperature	(1)	–	(1)	˚C	Weekly	Discrete
Ammonia	(1)	–	(1)	mg/L	Yearly (5)	24 hr Composite
Chronic toxicity (4)	(1)	–	(1)	Pass/Fail	Yearly (5)	24 hr Composite
Priority Pollutant Scan	(1)	–	(1)	–	Yearly (5)	24 hr Composite
Ambient Monitoring	(1)	–	(1)	–	Quarterly	Discrete

(1) No effluent limits are set at this time, but monitoring and reporting is required.

(2) Both the influent and the effluent shall be monitored for Biochemical Oxygen Demand (5-day) and Total Suspended Solids. The arithmetic mean of the concentrations of effluent samples collected in a period of 30 consecutive calendar days shall not exceed 15 percent of the arithmetic mean of the influent samples collected at approximately the same time period. (e.g., must achieve 85% removal rates).

(3) Average monthly *Enterococcus* effluent monitoring shall be reported as a 30-day geometric mean. Maximum daily *Enterococcus* effluent monitoring shall be reported as the highest instantaneous maximum (The maximum of any single sample shall not exceed 104 CFU/ 100mL).

(4) See section II.D for specific requirements on Whole Effluent Toxicity. The permittee shall attempt to ensure a total holding time from collection of the last portion of the composite sample until arrival at the laboratory of not more than 36 hours. EPA has granted an extension to the Permittee for an extension of the holding time. The extended holding time shall not exceed 72 hours.

(5) Yearly monitoring shall be completed by January 31 each year.

2. Pursuant to Guam water quality standards, the discharge shall:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   o. Not cause the concentration of oil or petroleum products in the receiving waters to cause a visible film, or sheen, or result in visible discoloration of the surface with

a corresponding oil or petroleum product odor, damage to fish or invertebrates, or an oil deposit on the shore or bottom;

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

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

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

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

B. Ambient Monitoring

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

Once per month, the permittee shall monitor all stations, only at the surface, for enterocci, ammonia, Total Kjeldahl nitrogen, orthophosphate, and nitrate; and shall document visual monitoring.

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

Table 2 – Agana Receiving Water Monitoring Locations

Station Name	**Description**
Shoreline A (A-sur)	0.5 km West of the treatment plant access road. Surface sample at shoreline.
Shoreline B (B-sur)	East on the treatment plant access road bridge at the second culvert. Surface sample at shoreline.
Shoreline C (C-sur)	0.5 km East of treatment plant at the mouth of the Agana Boat basin on the Paseo De Susanna side halfway to the channel marker. Surface sample at shoreline.
Offshore D (D-sur) (D-mid) (D-bot)	Outfall effluent at boil. Surface, Mid (50 ft) depth and bottom (100 ft) depth
Offshore E (E-sur) (E-mid) (E-bot)	100m South of Station D. Surface, Mid (50 ft) depth and bottom (100 ft) depth
Offshore E (E-sur) (E-mid) (E-bot)	1000m East of Station D. Surface, Mid (50 ft) depth and bottom (100 ft) depth

Table 3 - Receiving Water Monitoring Requirements

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

Part II. MONITORING AND REPORTING

A. Sample locations

Samples taken in compliance with the monitoring requirements specified in Part I, Section A, above, shall be taken at the following location(s):

1. Influent samples shall be taken after the last addition to the collection system prior to treatment.

2. Effluent samples shall be taken downstream from the last treatment process.

B. Twenty-four Hour Reporting of Noncompliance

1. The permittee shall report any noncompliance which may endanger human health or the environment. This information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances to all of the following:

   U.S. Environmental Protection Agency
   Pacific Islands Office : (415) 972-3769
   CWA Compliance Office Chief: (415) 972-3577

   Guam EPA
   (671) 475-1658

2. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

3. The following noncompliance events must also be reported within 24 hours:

   a. Any unanticipated bypass which exceeds any effluent limit in the permit (see 40 CFR 122.44(g)).

   b. Any upset which exceeds any effluent limit in the permit.

C. General Monitoring and Reporting

1. All monitoring shall be conducted in accordance with 40 CFR 136 test methods, unless otherwise specified in this permit. For influent and effluent analyses required in Table 1 of this permit, the permittee shall use 40 CFR 136 test methods with Method Detection Limits (MDLs) and Minimum Levels (MLs) that are lower than the effluent limits in Table 1 of this permit and the water quality criteria concentrations in the National Recommended Water Quality Criteria[1]. If all MDLs or MLs are higher than these effluent limits or criteria concentrations, then the permittee shall use the test method with the lowest MDL or ML available. If all published MDLs are higher than the effluent limitations (or applicable criteria concentrations), the permittee shall utilize the EPA-approved analytical method with the lowest published MDL. The permittee is not required to use "ultra low methods" unless specifically required by the permit.

[1] http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm

2. The permittee shall ensure that the laboratory uses a standard calibration where the lowest standard point is equal to or less than the ML. Influent and effluent analyses for metals shall measure "total recoverable metal," except as provided under 40 CFR 122.45(c).

3. As an attachment to the first Discharge Monitoring Report ("DMR"), the permittee shall submit for all parameters with monitoring requirements specified in Table 1 of this permit:

   a. The test method number or title and published MDL or ML;

   b. The preparation procedure used by the laboratory;

   c. The laboratory's MDL for the test method computed in accordance with Appendix B of 40 CFR 136;

   d. The standard deviation (S) from the laboratory's MDL study;

   e. The number of replicate analyses (n) used to compute the laboratory's MDL; and

   f. The laboratory's lowest calibration standard.

   As part of each DMR submittal, the permittee shall certify that there are no changes to the laboratory's test methods, MDLs, MLs, or calibration standards. If there are any changes to the laboratory's test methods, MDLs, MLs, or calibration standards, these changes shall be summarized in an attachment to the subsequent DMR submittal.

4. The permittee shall develop a Quality Assurance ("QA") Manual for the field collection and laboratory analysis of samples. The purpose of the QA Manual is to assist in planning for the collection and analysis of samples and explaining data anomalies if they occur. At a minimum, the QA Manual shall include the following:

   a. Identification of project management and a description of the roles and responsibilities of the participants; purpose of sample collection; matrix to be sampled; the analytes or compounds being measured; applicable technical, regulatory, or program-specific action criteria; personnel qualification requirements for collecting samples;

   b. Description of sample collection procedures; equipment used; the type and number of samples to be collected including QA/Quality Control ("QC") samples; preservatives and holding times for the samples (see 40 CFR 136.3); and chain of custody procedures;

   c. Identification of the laboratory used to analyze the samples; provisions for any proficiency demonstration that will be required by the laboratory before or after contract award such as passing a performance evaluation sample; analytical method to be used; MDL and ML to be reported; required QC results to be reported (e.g., matrix spike recoveries, duplicate relative percent differences, blank contamination, laboratory control sample recoveries, surrogate spike

recoveries, etc.) and acceptance criteria; and corrective actions to be taken in response to problems identified during QC checks; and

d. Discussion of how the permittee will perform data review and reporting of results to EPA and Guam EPA and how the permittee will resolve data quality issues and identify limits on the use of data.

5. Throughout all field collection and laboratory analyses of samples, the permittee shall use the QA/QC procedures documented in its QA Manual. If samples are tested by a contract laboratory, the permittee shall ensure that the laboratory has the permittee's QA Manual on file. A copy of the permittee's QA Manual shall be retained on the permittee's premises and available for review upon request. The permittee shall review its QA Manual annually and revise it, as appropriate.

6. Samples collected during each month of the reporting period must be reported on DMR forms, as follows:

   a. For a *maximum daily* permit limit or monitoring requirement when one or more samples are collected during the month, report either:

      The *maximum value*, if the maximum value of all analytical results is greater than or equal to the ML; or
      NODI (Q), "No Discharge No Data Information" if the maximum value of all analytical results is greater than or equal to the laboratory's MDL, but less than the ML; or
      NODI (B), if the maximum value of all analytical results is less than the laboratory's MDL.

   b. For an *average weekly* or *average monthly* permit limit or monitoring requirement when only one sample is collected during the week or month, report either:

      The *maximum value*, if the maximum value of all analytical results is greater than or equal to the ML; or
      NODI (Q), if the maximum value of all analytical results is greater than or equal to the laboratory's MDL, but less than the ML; or
      NODI (B), if the maximum value of all analytical results is less than the laboratory's MDL.

   c. For an *average weekly* or *average monthly* permit limit or monitoring requirement when more than one sample is collected during the week or month, report:

      The *average value* of all analytical results where 0 (zero) is substituted for *NODI (B)* and the laboratory's MDL is substituted for *NODI (Q)*.

7. All monitoring results shall be submitted in such a format as to allow direct comparison with the effluent limits, monitoring requirements, and conditions of this permit. Influent and effluent monitoring results are to be reported on EPA Form

3320-1, a pre-printed DMR provided by the EPA Region 9 DMR Coordinator for NPDES. A DMR form must be submitted for the reporting period even if there was not any discharge. DMR forms shall be submitted by the 28th day of the month following the previous quarterly reporting period. For example, the three DMR forms for January, February, and March are due on April 28th. Duplicate signed copies of these, and all other reports required herein, shall be submitted to EPA and Guam EPA at the following addresses, unless otherwise specified in this permit:

U.S. EPA Region IX
NPDES/DMR, WTR-7
75 Hawthorne Street
San Francisco, CA 94105-3901

Administrator
Guam EPA
P.O. Box 22439 GMF
Barrigada, GU 96921

The Discharger has the option to submit all monitoring results in the electronic reporting format approved by EPA. The Discharger may submit DMRs electronically using EPA's NetDMR application. NetDMR is a national tool for regulated Clean Water Act permittees to submit DMRs electronically via a secure Internet application to EPA. By using NetDMR, dischargers can discontinue mailing hard copy forms under 40 CFR 122.41 and 403.12.

D. Whole Effluent Toxicity (WET) Requirements

1. Monitoring Frequency

The permittee shall conduct a yearly static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Fertilization Test Method 1008.0)."

The permittee shall attempt to ensure a total holding time from collection of the last portion of the composite sample until arrival at the laboratory of not more than 36 hours. EPA is granting an extension to the Permittee for an extension of the holding time due to the difficulty in getting samples from Guam to an approved laboratory. The extended holding time shall not exceed 72 hours.

2. Marine and Estuarine Species and Test Methods

Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the first edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA/600/R-95/136, 1995; methods manual) and applicable

water quality standards; also see 40 CFR Parts 122.41(j)(4) and 122.44(d)(1)(iv) and 40 CFR Part 122.21(j)(5)(viii) for POTWs.

3. "Pass" or "Fail" Determination

   The permittee shall use an Instream Waste Concentration (IWC) of 1.0 percent effluent for chronic toxicity testing. This is based on the amount of dilution determined available in the receiving water.

   To calculate either "Pass" or "Fail", the permittee shall follow the instructions in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document*, Appendix A (EPA 833-R-10-003, 2010). For any one toxicity test, the WET permit limit that must be met is rejection of the null hypothesis (H_o):

   IWC (1.0 percent effluent) mean response $\leq 0.75 \times$ Control mean response

   A test result that rejects the null hypothesis is reported as "Pass" on the DMR form.

   A test result that does not reject this null hypothesis is reported as "Fail" on the DMR form. If a test result is reported as "Fail", then the permittee shall follow the Accelerated Toxicity Testing and TRE/TIE Process, below, of this permit.

4. Quality Assurance

   a. Quality assurance measures, instructions, and other recommendations and requirements are found in the *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* referenced above. Additional requirements are specified below.

   c. This discharge is subject to a determination of "Pass" or "Fail" from a single-effluent concentration chronic toxicity test at the IWC (for statistical flowchart and procedures, see *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document*, Appendix A, Figure A-1). Effluent dilution water and control water should be prepared and used as specified in the test methods manual *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA/600/R-95/136, 1995).* If the dilution water is different from test organism culture water, then a second control using culture water shall also be used. If the use of artificial sea salts is considered provisional in the test method, then artificial sea salts shall not be used to increase the salinity of the effluent sample prior to toxicity testing without written approval by the EPA.

   d. If organisms are not cultured in-house, then concurrent testing with a reference toxicant shall be conducted. If organisms are cultured in-house, then monthly reference toxicant testing is sufficient. Reference toxicant tests and effluent toxicity tests shall be conducted using the same test conditions (e.g., same test duration, etc.).

e. All multi-concentration reference toxicant test results must be reviewed and reported according to EPA guidance on the evaluation of concentration-response relationships found in *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR 136)* (EPA 821-B-00-004, 2000).

f. If either the reference toxicant or effluent toxicity tests do not meet all test acceptability criteria in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* , then the permittee shall resample and retest within 14 days.

g. If the discharged effluent is chlorinated, then chlorine shall not be removed from the effluent sample prior to toxicity testing without written approval by the permitting authority

5. Initial Investigation TRE Work Plan

This plan shall include steps the permittee intends to follow if toxicity is measured above the WET permit limit or trigger and should include the following, at minimum:

a. A description of the investigation and evaluation techniques that will be used to identify potential causes and sources of toxicity, effluent variability, and treatment system efficiency.

b. 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.

c. If a Toxicity Identification Evaluation (TIE) is necessary, an indication of who will conduct the TIEs (i.e., an in-house expert or outside contractor).

d. The permittee may initiate a TIE as part of a TRE to identify the causes of toxicity using the same species and test method and the following EPA manuals: *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures* (EPA/600/6-91/003, 1991); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993); *Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/081, 1993); and *Marine Toxicity Identification Evaluation (TIE): Phase I Guidance Document* (EPA/600/R-96-054, 1996).

6. Accelerated Toxicity Testing and TRE/TIE Process

a. If the WET permit limit or trigger 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 toxicity test shall begin within 14 days of receipt of a test result exceeding the chronic WET permit limit

or trigger. If the additional toxicity test does not exceed the chronic WET permit limit or trigger, then the permittee may return to the regular testing frequency.

b. If the WET permit limit or trigger 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 a test result exceeding the chronic WET permit limit or trigger. If none of the additional toxicity tests exceed the chronic WET permit limit or trigger, then the permittee may return to the regular testing frequency.

7. If one of the additional toxicity tests (in paragraphs 6.a or 6.b) exceeds the WET permit limit or trigger, then, within 14 days of receipt of this test result, the permittee shall initiate a TRE using, according to the type of treatment facility, EPA manual Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants (EPA/833/B-99/002, 1999) or EPA manual Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (EPA/600/2-88/070, 1989).

8. In conjunction, the permittee shall develop and implement a Detailed TRE Work Plan which shall include the following: further actions undertaken by the permittee to investigate, identify, and correct the causes of toxicity; actions the permittee will take to mitigate the effects of the discharge and prevent the recurrence of toxicity; and a schedule for these actions.

9. Reporting of Toxicity Monitoring Results

   a. The permittee shall submit a full laboratory report for all toxicity testing as an attachment to the DMR for the month in which the toxicity test was conducted. The laboratory report shall contain: the toxicity test results; the dates 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 provide the actual test endpoint responses for the control (i.e., the control mean) and the IWC (i.e., the IWC mean) for each toxicity test to facilitate the review of test results and determination of reasonable potential for chronic WET by the permitting authority.

   c. The permittee shall notify the permitting authority in writing within 14 days of exceedance of the chronic WET permit limit or trigger. 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.

10. Permit Reopener for Chronic Toxicity

In accordance with 40 CFR Parts 122 and 124, this permit may be modified to include effluent limitations or permit conditions to address chronic toxicity in the effluent or receiving waterbody, as a result of the discharge; or to implement new, revised, or newly interpreted water quality standards applicable to chronic toxicity.

Part III. Special Conditions

A. Reporting of Capacity Attainment and Planning

If the average dry-weather waste flow for any month either equals or exceeds 90 percent of the annual dry weather design capacity of the waste treatment and/or disposal facilities, the permittee shall file a written report with EPA within ninety (90) days. The permittee's senior administrative officer shall sign a letter which transmits that report and certifies that the policy-making body is adequately informed about it. The report shall include:

1. Average daily flow for the month, the date on which the instantaneous peak flow occurred, the rate of that peak flow, and the total flow for the day.

2. The permittee's best estimate of when the average daily dry weather flow rate will equal or exceed the design capacity of the facilities.

3. The permittee's intended schedule for the studies, design, and other steps needed to provide additional capacity for the waste treatment and/or disposal facilities before the waste flow rate equals the capacity of present facilities.

B. Sanitary Sewer Overflows

1. A Sanitary Sewer Overflow (SSO) is an overflow, spill, release, or diversion of wastewater from a sanitary sewer collection system designed to carry only sewage and prior to reaching the treatment plant. Sanitary sewer overflows include: a) overflows or releases of wastewater that reach waters of the U.S.; b) overflows or releases of wastewater that do not reach waters of the U.S.; and c) wastewater backups into buildings that are caused by blockages or flow conditions in a sanitary sewer other than a building lateral. SSOs are generally caused by high volumes of infiltration and inflow (I/I), pipe blockages, pipe breaks, power failure, and insufficient system capacity.

2. SSO identification: The permittee shall identify all wastewater discharges, at locations not authorized as permitted outfalls, that occur prior to the headworks of the wastewater treatment plant covered by this permit. The permittee shall submit, with the scheduled DMR Form, the following information for each discharge event at each source that occurs during the reporting period covered by the DMR Form:

   a) The cause of the discharge;

   b) Duration and volume (estimate, if unknown);

   c) Description of the source (e.g., manhole cover, pump station, etc.);

   d) Type of collection system that overflowed (i.e., combined or separate);

e) Location by street address, or any other appropriate method;

f) Date(s) and time(s) of event;

g) The ultimate destination of the flow, e.g., surface water body, land use location, via municipal separate storm sewer system to a surface water body (show location on a USGS map or copy thereof); and

h) Corrective action taken and steps taken or planned to eliminate reoccurrence of discharge.

C. Pretreatment

1. Revise Ordinance: GWA shall review and revise any existing pretreatment ordinance for consistency with 40 CFR Part 403. GWA shall submit to EPA for review and approval this revised pretreatment ordinance to develop, implement, and enforce Section 403. [2] The objectives of this ordinance are:

- To prevent the introduction of pollutants into the Publicly Owned Treatment Works (POTW) that will interfere with its operation;
- To prevent the introduction of pollutants into the POTW that will pass through the POTW, inadequately treated, into receiving waters, or otherwise be incompatible with the POTW;
- To protect both POTW personnel who may be affected by wastewater and sludge in the course of their employment and the general public;
- To promote reuse and recycling of industrial wastewater and sludge from the POTW;
  To enable GWA to comply with its NPDES permit conditions, sludge use and disposal requirements, and any other Federal or State laws to which the POTW is subject.

2. Notifications required for New Pollutants and Substantial Changes: The permittee must provide notice to U.S. EPA within 30 days when the permittee becomes aware of the following:

1. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 and 306 of the CWA if it were directly discharging those pollutants; and

2. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of this permit.

3. For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated

[2] EPA recommends consultation with EPA's Model Pretreatment Ordinance (EPA 833-B-06-002), available at http://cfpub.epa.gov/npdes/docs.cfm?view=allprog&program_id=3&sort=name

impact of the change on the quantity or quality of effluent to be discharged from the POTW.

D. Fats Oils and Grease (FOG) Program

As part of its pretreatment ordinance, GWA shall submit to EPA for review and approval a comprehensive FOG Program to develop, implement, and enforce grease control measures.[3] At a minimum, GWA shall incorporate the following:

1. Ordinance

   GWA shall review existing ordinances for FOG control and adopt or revise as necessary a municipal ordinance to control FOG. At a minimum the ordinance shall specify:
   - **a.** allowable types of connections,
   - **b.** suitable uses of the equipment,
   - **c.** appropriate sizing criteria,
   - **d.** proper sampling box installation, and
   - **e.** Minimum schedules for cleaning.

2. Baseline Assessment

   GWA shall conduct a baseline assessment of all known SSOs over the past 10 years by evaluating work orders, complaints and local knowledge of sewer blockages to identify geographical areas of repeated problems for FOG discharges. These areas shall be prioritized for outreach, inspections, and enforcement. The Baseline Assessment shall be completed within two years of permit issuance.

   GWA shall supplement the Baseline Assessment by TV/video inspection of sewer mains. The areas where sewer lines are found to contain visible accumulation of fats, oils and grease shall be prioritized for outreach, inspections, and enforcement. At each location where fats, oils and grease are identified in the sewer lines, GWA shall implement a targeted strategy to identify, inspect, and monitor the establishments discharging FOG to the sewer system.

3. Food Service Establishment (FSE) Database within priority areas

   GWA shall identify and maintain a database of Food Service Establishments ("FSE") discharging to the sewer system that are upgradient of the priority areas identified in the Baseline Assessment. FSEs include any facility preparing and/or serving food for commercial use or sale, such as restaurants; cafes; lunch counters; cafeterias; hotels; hospitals; convalescent homes; factory or school kitchens; catering kitchens; bakeries; grocery stores with food preparation, food packaging, meat cutting, and meat

[3] EPA recommends consultation with California's Guide for Developing and Implementing a Fats, Oils, and Grease (FOG) Control Program for Food Service Establishments September 2004. http://www.calfog.org/docs/ProgDevGuide.pdf.

preparation (excluding grocery stores with only food warming operations); and meat packing facilities. The database shall include at a minimum:

a. FSE name, address, phone number, & manager,
b. property owner, address, phone & number,
c. type of food served,
d. health Department license number,
e. monthly average water use,
f. seating capacity or approximate number of employees,
g. type of grease removal equipment & capacity,
h. current FOG disposal method,
i. name of contracted grease hauler,
j. interceptor cleaning frequency,
k. dates of GWA Inspections,
l. results of GWA Inspections,
m. history of compliance,
n. outreach program,
o. other information as necessary.

GWA shall update the database yearly.

5. Outreach Program

a. GWA shall establish an outreach program to Food Service Establishments, restaurant associations, grease haulers, grease recyclers, and any municipal agencies that are responsibilities for controlling FOG. The outreach materials should include at a minimum:

i. acceptable FOG handling and disposal practices,
ii. required operation and maintenance of grease traps,
iii. FOG disposal and/or recycling methods, and
iv. Instructions on how to properly operate and maintain grease traps and grease interceptors.

b. GWA shall establish an outreach program to all residential customers explaining the proper disposal of oil and greases and the negative impacts from dumping grease down the drain. Outreach shall consist of, at a minimum:

i. leaflet materials with water bills and/or sewer bills which describe measures to control and properly dispose of FOG wastes;
ii. doorhangers that GWA will distribute to all residences within 1000 feet of any identified SSO;
iii. materials on GWA's website, and
iv. public service announcement or other methods of outreach to specific communities, especially priority and hotspot areas previously identified.

6. Inspection Program

GWA shall develop an inspection program to evaluate, track and enforce its ordinance to control FOG. The inspection program shall at a minimum include:

a. an inspection protocol to inspect priority areas and areas of known SSOs. Inspections may be coordinated with Health Department Inspections.
b. a standardized inspection checklist form to be used by GWA:
c. a training program for GWA FOG inspectors.
d. a formal enforcement response plan, including Education, Verbal Warning, Follow-up Inspections, Notice of Violation, Administrative Fines, Re-inspection Fees, Violations, Cost Recovery for GWA- provided clean-ups and/or termination of water/wastewater service.

7. Annual report

GWA shall provide an annual report to EPA that shall at a minimum consist of the following:

a. copy of updated FSE database;
b. a description of SSOs or sewage clogging and area prioritization;
c. summary of outreach performed;
d. summary of inspection results;
e. a discussion of the budget and staffing levels for the previous and current years; and
f. analysis of the program's performance over the past year, including, but not limited to, the reduced number of sewer blockages and SSOs, improved POTW performance, and any reduction in the number of collection system hot spots.

E. Permit Reopener

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.

Part IV BIOSOLIDS

"Biosolids" means non-hazardous sewage sludge, as defined in 40 CFR 503.9. Sewage sludge that is hazardous, as defined in 40 CFR 261, must be disposed of in accordance with the Resource Conservation and Recovery Act.

1. General Requirements

a. All biosolids generated by the permittee shall be used or disposed of in compliance with the applicable portions of:

(1) 40 CFR 503 - for biosolids that are land applied, placed in a surface disposal site (dedicated land disposal site, monofill, or sludge-only parcel at a municipal landfill), or incinerated;

(2) 40 CFR 258 - for biosolids disposed of in a municipal solid waste landfill (with other material);

(3) 40 CFR 257 - for all biosolids use and disposal practices not covered under 40 CFR 258 or 503.

b. The permittee is responsible for assuring that all biosolids produced at its facility are used or disposed of in accordance with these rules, whether the permittee itself uses or disposes of the biosolids, or transfers the biosolids to another party for further treatment, use, or disposal. The permittee is responsible for informing subsequent preparers, appliers, and disposers of the requirements that they must meet under these rules.

c. Duty to mitigate: The permittee shall take all reasonable steps to prevent or minimize any biosolids use or disposal which has a likelihood of adversely affecting human health or the environment.

d. No biosolids shall be allowed to enter wetlands or other waters of the United States.

e. Biosolids treatment, storage, use, or disposal shall not contaminate groundwater.

f. Biosolids treatment, storage, use, or disposal shall not create a nuisance such as objectionable odors or flies.

g. The permittee shall assure that haulers transporting biosolids off site for treatment, storage, use, or disposal take all necessary measures to keep the biosolids contained. All haulers must have spill clean-up procedures. Trucks hauling biosolids that are not classified as Class A, as defined at 40 CFR 503.32(a), shall be cleaned as necessary after loading and after unloading so as to have no biosolids on the exterior of the truck body or wheels. Trucks hauling biosolids that are not Class A shall be tarped. Trucks hauling biosolids that are not Class A may not be used for hauling food or feed crops after unloading the biosolids, unless the permittee submits, for EPA approval, a hauling description of how trucks will be thoroughly cleaned prior to adding food or feed.

h. If biosolids are stored over two years from the time they are generated, then the permittee must ensure compliance with all surface disposal requirements under 40 CFR 503, Subpart C, or must submit a written notification to EPA and Guam EPA with the information under 40 CFR 503.20(b) demonstrating the need for longer temporary storage. During temporary storage (of any length of time) for biosolids

that are not Class A, whether on the facility site or off-site, adequate procedures must be taken to restrict public access and access by domestic animals.

i. Any biosolids treatment, disposal, or storage site shall have facilities adequate to: divert surface runoff from adjacent areas, protect the site boundaries from erosion, and prevent any conditions that would cause drainage from the materials at the site to escape from the site. Adequate protection is defined as protection from at least a 100-year storm event and from the highest tidal stage that may occur.

j. There shall be adequate screening at the treatment plant headworks and/or at the biosolids treatment units to ensure that all pieces of metal, plastic, glass, and other inert objects with a diameter greater than 3/8" are removed.

2. Inspection and Entry

The EPA, Guam EPA, or an authorized representative thereof, upon presentation of credentials, shall be allowed by the permittee, directly or through contractual arrangements with their biosolids management contractors, to:

a. Enter upon all premises where biosolids produced by the permittee are treated, stored, used, or disposed of, either by the permittee or another party to whom the permittee transfers the biosolids for treatment, storage, use, or disposal;

b. Have access to and copy any records that must be kept under the conditions of this permit or 40 CFR 503, by the permittee or another party to whom the permittee transfers the biosolids for further treatment, storage, use, or disposal; and

c. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations used in biosolids treatment, storage, use, or disposal by the permittee or another party to whom the permittee transfers the biosolids for treatment, use, or disposal.

3. Monitoring

a. Biosolids shall be monitored for the following constituents, at the frequency specified in paragraph 3.b: arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, organic nitrogen, ammonia-nitrogen, and total solids. This monitoring shall be conducted using the methods in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA publication SW-846), as required in 40 CFR 503.8(b)(4). All results must be reported on a 100% dry weight basis. Records of all analyses must state on each page of the laboratory report whether the results are expressed in “100% dry weight” or “as is.”

b. The constituents in paragraph 3.a shall be monitored at the following frequency, based on the volume of biosolids generated per year:

Volume Generated (dry metric tons per year)	Monitoring Frequency *
>0 - <290	Once per year
290 - <1,500	Four times per year
1,500 - <15,000	Six times per year
>15,000	12 times per year

* If biosolids are removed for use or disposal on a routine basis, then monitoring should be scheduled at regular intervals throughout the year. If biosolids are stored for an extended period of time prior to use or disposal, then monitoring may occur either at regular intervals, or prior to use or disposal corresponding to tonnage accumulated during the period of storage.

c. Class 1 facilities (facilities with pretreatment programs or other facilities designated as Class 1 by the Regional Administrator) and Federal facilities with >5 mgd influent flow shall sample biosolids twice per year for pollutants listed under CWA section 307(a), using best practicable detection limits.

4. Pathogen and Vector Control

Prior to land application, the permittee shall demonstrate that biosolids meet Class A or Class B pathogen reduction levels using one of the alternatives listed under 40 CFR 503.32.

a. Prior to disposal in a surface disposal site, the permittee shall demonstrate that the biosolids meet Class B pathogen reduction levels or shall ensure that the site is covered at the end of each operating day. If pathogen reduction is demonstrated using a Process to Significantly/Further Reduce Pathogens, then the permittee shall maintain daily records of the operating parameters used to achieve this reduction.

If pathogen reduction is demonstrated by testing for fecal coliform and/or other pathogens, then samples must be drawn at the frequency described in paragraph 3.b, above. If Class B pathogen reduction levels are demonstrated using fecal coliform, then at least seven grab samples must be drawn during each sampling event and a geometric mean calculated from these seven samples.

The following sample holding times between sample collection and sample analysis shall not be exceeded: fecal coliform - 24 hours when cooled to 4 ˚C if composted, mesophillically digested, or aerobically digested, 6 hours otherwise; Salmonella sp. - 24 hours when cooled to 4 ˚C; enteric viruses - 2 weeks when frozen; helminth ova - one month when cooled to 4 ˚C.

b. For biosolids that are land applied or placed in a surface disposal site, the permittee shall track and keep records of the operational parameters used to achieve the Vector Attraction Reduction requirements in 40 CFR 503.33(b).

5. Surface Disposal

If biosolids are placed in a surface disposal site (dedicated land disposal site or monofill), then a qualified groundwater scientist shall develop a groundwater monitoring program for the site, or shall certify that the placement of biosolids on the site will not contaminate an aquifer.

6. Landfill Disposal

Biosolids placed in a municipal landfill shall be tested by the Paint Filter Liquids Test (Method Number 9095 in SW-846) at the frequency indicated in paragraph 3.b, above, or more often if necessary, to demonstrate that there are no free liquids.

7. Notification and Reporting

a. The permittee, either directly or through contractual arrangements with its biosolids management contractors, shall comply with the following notification requirements:

(1) Notification of noncompliance: The permittee shall notify EPA and Guam EPA of any noncompliance within 24 hours, if the noncompliance may seriously endanger health or the environment. For other instances of noncompliance, the permittee shall notify EPA and Guam EPA, in writing, within five working days of becoming aware of the circumstances. The permittee shall require its biosolids management contractors to notify EPA and Guam EPA of any noncompliance within these same timeframes.

(2) Interstate notification: If biosolids are shipped to another State, Tribal Lands, or Territory, then the permittee shall send a 60-day prior notice of the shipment to permitting authorities in the receiving State, Tribal Lands, or Territory, and EPA Region 9.

(3) Land Application: Prior to using any biosolids from this facility (other than composted biosolids) at a new or previously unreported site, the permittee shall notify EPA and Guam EPA. The notification shall include: a description and topographic map of the proposed site(s), names and addresses of the applier and site owner, and a list of any state or local permits which must be obtained. The plan shall include a description of the crops or vegetation to be grown, proposed loading rates, and determination of agronomic rates.

If any biosolids within a given monitoring period do not meet the pollutant limits for metals under 40 CFR 503.13, then the permittee (or its contractor) must notify EPA and determine the cumulative metals loading to date at that site, as required in 40 CFR 503.12.

The permittee shall notify the applier of 40 CFR 503 requirements that are applicable to the applier, including applier certification that management practices, site restrictions, and vector attraction reduction requirements have been met. The permittee shall require the applier to certify at the end of 38 months following the application of Class B biosolids, that the harvesting restrictions in effect for up to 38 months have been met.

(4) Surface Disposal: Prior to disposal at a new or previously unreported site, the permittee shall notify EPA and Guam EPA. The notice shall include: a description and topographic map of the proposed site, depth to groundwater, whether the site is lined or unlined, site operator, site owner, and any State, Territory or local permits. The notice shall describe procedures for ensuring restricted public access and grazing restrictions for three years following site closure. The notice shall include a groundwater monitoring plan, or a description of why groundwater monitoring is not required.

b. The permittee shall submit an annual biosolids report to the EPA Region 9 Biosolids Coordinator and Guam EPA by February 19 of each year for the period covering the previous calendar year. This report shall include:

(1) The amount of biosolids generated that year and the amount of biosolids accumulated from previous years, in dry metric tons.

(2) Results of all pollutant monitoring required in the Monitoring section, above, reported on a 100% dry weight basis.

(3) Demonstrations and certifications of pathogen reduction methods and vector attraction reduction methods, as required in 40 CFR 503.17 and 503.27.

(4) Names, mailing addresses, and street addresses of persons who received biosolids for storage, further treatment, or disposal in a municipal waste landfill, or for other use or disposal methods not covered above, and the tonnages delivered to each.

(5) For land application sites, the following information must be submitted by the permittee, unless the permittee requires its biosolids management contractors to report this information directly to the EPA Region 9 Biosolids Coordinator:

The locations of land application sites used that calendar year (with field names and numbers), size of each field applied to, applier, and site owner; the volumes applied to each field (in wet tons and dry metric tons), nitrogen applied, and calculated plant available nitrogen; the crop planted, date of planting, and date of harvesting; for biosolids exceeding 40 CFR 503.13 Table 3 pollutant concentrations, the locations of sites where applied and cumulative metals loading at that site to date; certifications of management practices in 40 CFR 503.14 and certifications of site restrictions in 40 CFR 503.17(b)(6).

(6) For surface disposal sites: The locations of sites, site operator, site owner, and size of parcel on which disposed; the results of any required groundwater monitoring; certifications of management practices in 40 CFR 503.24; and for closed sites, the date of site closure and certifications of management practices for the three years following site closure.

(7) All reports shall be submitted to:

Regional Biosolids Coordinator
U.S. Environmental Protection Agency
Region 9
CWA Compliance Office (WTR-7)
75 Hawthorne Street
San Francisco, CA 94105-3901

Guam EPA
17-3304 Mariner Avenue
Tiyan, Guam 96913

ATTACHMENTS

Attachment A: Definitions

Best Management Practices" or "BMPs" are schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural, and/or managerial practices to prevent or reduce the pollution of waters of the U.S. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may further be characterized as operational, source control, erosion and sediment control, and treatment BMPs.

"Composite" sample means a time-proportioned mixture of not less than eight discrete aliquots obtained at equal time intervals (e.g., 24-hour composite means a minimum of eight samples collected every three hours). The volume of each aliquot shall be directly proportional to the discharge flow rate at the time of sampling, but not less than 100 ml. Sample collection, preservation, and handling shall be performed as described in the most recent edition of 40 CFR 136.3, Table II. Where collection, preservation, and handling procedures are not outlined in 40 CFR 136.3, procedures outlined in the 18th edition of Standard Methods for the Examination of Water and Wastewater shall be used.

"Daily discharge" means the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

"Daily maximum allowable effluent limitation" means the highest allowable "daily discharge.

"DMR" is a "Discharge Monitoring Report" that is an EPA uniform national form, including any subsequent additions, revisions, or modifications for reporting of self-monitoring results by the permittee.

"Grab" sample is a single sample collected at a particular time and place that represents the composition of the discharge only at that time and place. Sample collection, preservation, and handling shall be performed as described in the most recent edition of 40 CFR 136.3, Table II. Where collection, preservation, and handling procedures are not outlined in 40 CFR 136.3, procedures outlined in the 18th edition of Standard Methods for the Examination of Water and Wastewater shall be used.

"Method detection limit" or "MDL" is the minimum concentration of an analyte that can be

detected with 99% confidence that the analyte concentration is greater than zero, as defined by a specific laboratory method in 40 CFR 136. The procedure for determination of a laboratory MDL is in 40 CFR 136, Appendix B.

"Minimum level" or "ML" is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed in a specific analytical procedure, assuming that all the method-specific sample weights, volumes, and processing steps have been followed (as defined in EPA's draft National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-Based Effluent Limitations Set Below Analytical Detection/Quantitative Levels, March 22, 1994). If a published method-specific ML is not available, then an interim ML shall be calculated. The interim ML is equal to 3.18 times the published method-specific MDL rounded to the nearest multiple of 1, 2, 5, 10, 20, 50, etc. (When neither an ML nor MDL are available under 40 CFR 136, an interim ML should be calculated by multiplying the best estimate of detection by a factor of 3.18; when a range of detection is given, the lower end value of the range of detection should be used to calculate the ML.) At this point in the calculation, a different procedure is used for metals, than non-metals:

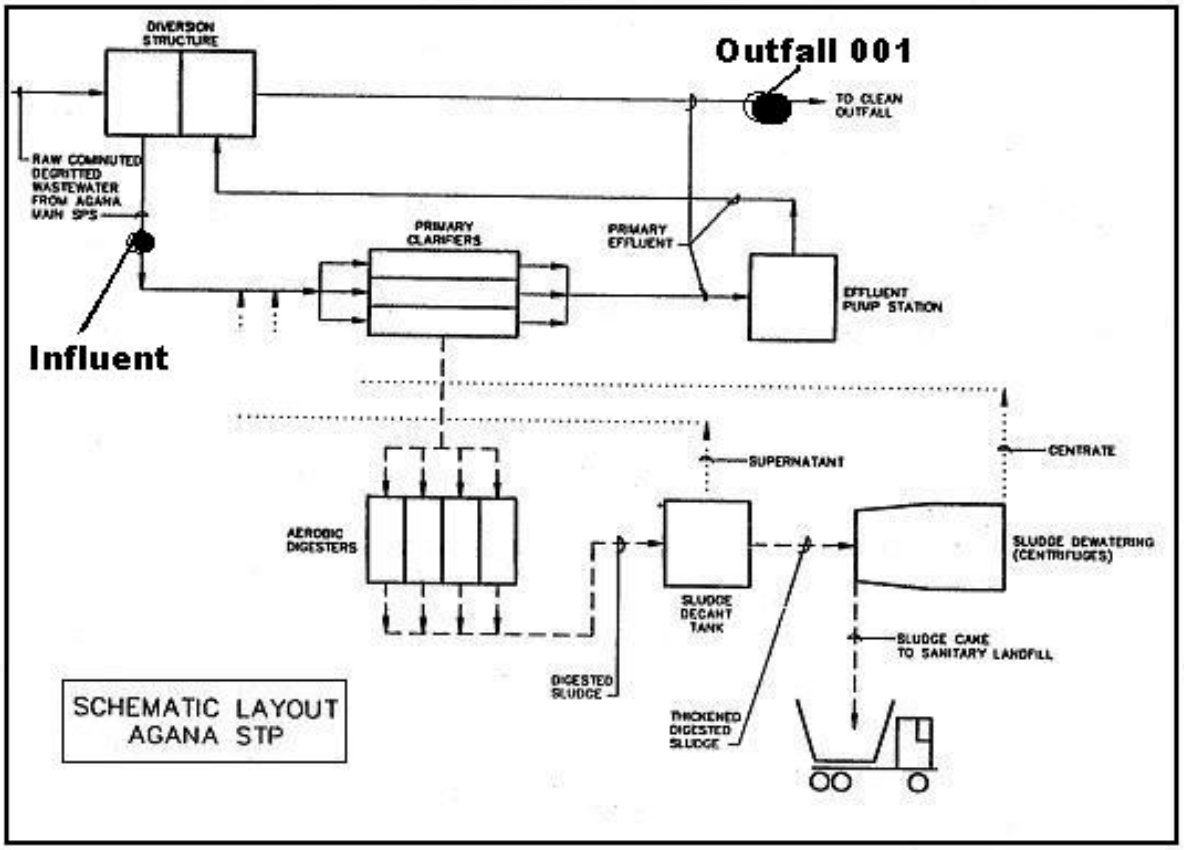
a. For metals, due to laboratory calibration practices, calculated MLs may be rounded to the nearest whole number.

b. For non-metals, because analytical instruments are generally calibrated using the ML as the lowest calibration standard, the calculated ML is then rounded to the nearest multiple of (1, 2, or 5) x 10n, where n is zero or an integer. (For example, if an MDL is 2.5 µg/l, then the calculated ML is: 2.5 µg/l x 3.18 = 7.95 µg/l. The multiple of (1, 2, or 5) x 10n nearest to 7.95 is 1 x 101 = 10 µg/l, so the calculated ML, rounded to the nearest whole number, is 10 µg/l.)

"NODI(B)" No Discharge No Data Information means that the concentration of the pollutant in a sample is not detected. NODI(B) is reported when a sample result is less than the laboratory's MDL.

"NODI(Q)" No Discharge No Data Information means that the concentration of the pollutant in a sample is detected but not quantified. NODI(Q) is reported when a sample result is greater than or equal to the laboratory's MDL, but less than the ML.

Attachment B: Process Flow Diagram



Attachment C: Standard NPDES Conditions

Attached

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

CWA STANDARDS AND PERMITS OFFICE (WTR-5)

STANDARD FEDERAL NPDES PERMIT CONDITIONS

Updated as of June 3, 2002

Reference: CFR 40 Parts 100 to 135, July 1, 2001

Public Notice November 29, 2012

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
PROPOSED PERMIT FACT SHEET

Permittee Name: Guam Waterworks Authority

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

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

NPDES Permit No.: GU00200087

I. STATUS OF PERMIT

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

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

Variance from Secondary Treatment Denial

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

Between 1998 and 2001, GWA submitted additional information to supplement its application for renewal of its section 301(h) variance, all of which was considered by EPA Region IX. On January 5, 2009, EPA Region IX issued a Tentative Decision Document that the application for a renewed variance be denied. Subsequently, EPA Region IX held a public hearing on the tentative decision on June 3, 2009 and accepted public comments on the tentative decision through June 30, 2009. On September 30, 2009, EPA Region IX denied the variance

request and issued its Final Decision Document. (See Final Decision Document, GUAM WATERWORKS AUTHORITY'S AGANA SEWAGE TREATMENT PLANT APPLICATION FOR A MODIFIED NPDES PERMIT UNDER SECTION 301(h) OF THE CLEAN WATER ACT, September 30, 2009)

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

II. GENERAL DESCRIPTION OF FACILITY

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

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

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

Design treatment at the Agana STP includes screening of raw sewage, grit removal, and primary sedimentation. See Appendix B (Flow schematic) The Agana STP underwent a complete renovation between June 2006 and March 2007 with all out-of-service and off-line equipment repaired and/or replaced. The existing facility includes three primary clarifiers operated in parallel. Sludge is pumped to aerobic digesters and decanted prior to hauling off-site. The design treatment removal is estimated to be between 40 and 60% for TSS and between 25 and 40% removal for BOD.

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

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

III. DESCRIPTION OF RECEIVING WATER

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

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

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

IV. DESCRIPTION OF DISCHARGE

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

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

pH		Between 7 and 9.0 standard units		

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

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

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

V. DETERMINATION OF NUMERICAL EFFLUENT LIMITATIONS

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

A. Applicable Technology-Based Effluent Limitations

Publicly Owned Wastewater Treatment Works (POTWs)

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

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

Technology Based Effluent Limits for POTWs (secondary treatment)			
	30-day Average	7-day Average	Removal Efficiency
BOD_5	30 mg/l	45 mg/l	85 % minimum
TSS	30 mg/l	45 mg/l	85 % minimum

pH	Must be in the range of 6.0 to 9.0 standard units

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

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

B. Applicable Water Quality-Based Effluent Limitations

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

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

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

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

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

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

Coastal waters in the vicinity of the outfall are listed as impaired according to the CWA Section 303(d) List of Water Quality Limited Segments for *Enterococcus* bacteria. (*Draft Development of Guam Northern Watershed Bacteria TMDLs*, EPA December 16, 2009.) The TMDLs for the impaired waterbodies of East and West Hagåtña Bay identify Agana STP as a potential source, and establish a Waste Load Allocation for enterococcus. The permit establishes limits for enterococcus based on GWQS without allowance for dilution. The permit limits are consistent with the WLA in the draft TMDL, which establishes the WLA as the GWQS.

2. Dilution in the receiving water

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

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

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

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

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

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

GWA predicted initial dilution rates between 111:1 and 120:1. (GMP Associates, Inc, 2001). EPA re-calculated initial dilution in accordance with the EPA-approved PLUMES model to better understand initial dilution (EPA 1994b). EPA predicted an initial dilution of 219:1 and predicted that the discharge will have a trapping depth of 16.61 ft below the surface. (Agana STP CWA 301(h) Final Decision Document, 2009). For its modeling, EPA used the applicant's outfall design parameters (outfall depth of 275 ft and critical hourly peak flow of 12.0 MGD), a current speed of 0.2 fps, and a current direction perpendicular to the diffuser. EPA used the two ambient density profiles (Nos. 001 and 002) provided by the applicant that EPA determined were the most critical.

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

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

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

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

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

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

3. Existing data on toxic pollutants

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

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

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

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

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

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

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

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

Chromium (total)	2.7ug/l	2	7.4	24 ug/l	5,000 ug/l (Based on chromium VI aquatic life, chronic 50 ug/l)	No
Lead	1.1 ug/l	2	7.4	21 ug/l	810 ug/l (Based on aquatic life, chronic 8.1 ug/l)	No
Nickel	5.5 ug/l	2	7.4	40 ug/l	820 ug/l (Based on aquatic life, chronic 8.2 ug/l)	No
Zinc	59 ug/l	2	7.4	690 ug/l	8600 ug/L (Based on aquatic life, chronic 86 ug/l)	No
Acetone	41 ug/l	2	7.4	NA	None	No
Benzoic Acid	110 ug/l	2	7.4	NA	None	No
Benzyl Alcohol	11 ug/l	2	7.4	NA	None	No
Chloroform (Trichloromethane)	0.88 ug/l	2	7.4	NA	None	No
Di (2-ethylhexyl) phthalate	22 ug/l	2	7.4	163 ug/l	12,000 ug/L (Based on Human health organisms only 120 mg/L)	No
Phenol	8.3 ug/l	2	7.4	61 ug/l	4,600 mg/l (Based on Human health organisms only 4,600 mg/L)	No

Toluene	0.64 ug/l	2	7.4	4.8 ug/l	20,000 ug/L (Based on Human health organisms only 200 mg/L)	No
4-Methylphenol	40 ug/l	2	7.4	NA	None	No

Conclusion

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

C. Rationale for Effluent Limits

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

Flow

The permit establishes continuous flow monitoring for effluent flow.

BOD_5 and TSS

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

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

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

Average Weekly Mass Limits:

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

Settleable Solids

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

Oil and Grease

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

pH

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

Enterococcus

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

Chlorine, Total Residual

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

Toxic Pollutants

As described above, EPA conducted Reasonable Potential Analysis based on all available data and determined no toxic pollutants have the potential to cause or contribute to a violation of

a water quality standard. The permit, however, will require the permittee to monitor the effluent yearly for all priority pollutants in order to continue an assessment of the effluent. EPA may re-evaluate this data and the permit may be re-opened to incorporate effluent limitations if necessary to protect receiving waters.

Whole Effluent Toxicity

The Whole Effluent Toxicity (WET) approach to toxics control for the protection of aquatic life involves the use of acute and chronic toxicity tests to measure the toxicity of wastewaters. WET is a useful parameter for assessing and protecting against impacts on water quality and designated uses caused by the aggregate toxic effects of the different pollutants in a discharge. WET tests employ the use of standardized, surrogate freshwater or marine plants, invertebrates, and vertebrates. EPA has published extensive protocols listing numerous marine and freshwater species for toxicity testing.

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

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

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

VI. NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

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

1. The discharge shall:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

VII. MONITORING AND REPORTING REQUIREMENTS

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

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

Once per month, the permittee shall monitor all stations, only at the surface, for enterocci, ammonia, Total Kjeldahl nitrogen, orthophosphate, and nitrate; and shall document visual monitoring.

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

Table 2 – Agana Receiving Water Monitoring Locations

Station Name	Description
Shoreline A (A-sur)	0.5 km West of the treatment plant access road. Surface sample at shoreline.
Shoreline B	East on the treatment plant access road bridge at the second culvert.

(B-sur)	Surface sample at shoreline.
Shoreline C (C-sur)	0.5 km East of treatment plant at the mouth of the Agana Boat basin on the Paseo De Susanna side halfway to the channel marker. Surface sample at shoreline.
Offshore D (D-sur) (D-mid) (D-bot)	Outfall effluent at boil. Surface, Mid (50 ft) depth and bottom (100 ft) depth
Offshore E (E-sur) (E-mid) (E-bot)	100m South of Station D. Surface, Mid (50 ft) depth and bottom (100 ft) depth
Offshore E (E-sur) (E-mid) (E-bot)	1000m East of Station D. Surface, Mid (50 ft) depth and bottom (100 ft) depth

Table 3 - Receiving Water Monitoring Requirements

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

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

A. Effluent Monitoring and Reporting

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

B. Priority Toxic Pollutants Scan

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

C. Whole Effluent Toxicity Testing

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

VIII. Anti-Backsliding

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

The permit establishes that pH concentrations must be in the range of 6.5 to 8.5 at all times based on applicable GWQS (2001 Revision). The previous permit established pH limits in the range of 7.0 to 9.0 at all times based on previous GWQS adopted July 18, 1987 and revised

January 2, 1992. Therefore, the proposed pH range is slightly different and allows a less stringent limit in the lower pH range while establishing a more stringent limit in the higher pH range.

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

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

IX. Antidegradation Policy

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

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

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

VII. SPECIAL CONDITIONS

A. Biosolids

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

B. Pretreatment

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

C. Development and Implementation of Best Management Practices

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

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

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

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

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

IX. OTHER CONSIDERATIONS UNDER FEDERAL LAW

A. Impact to Threatened and Endangered Species

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

The Endangered Species Act ("ESA") allocates authority to and administers requirements upon Federal agencies regarding threatened or endangered species of fish, wildlife, or plants and

habitat of such species that have been designated as critical. Its implementing regulations (50 CFR Part 402) require EPA to ensure, in consultation with the Secretary of the Interior or Commerce, that any action authorized, funded or carried out by EPA is not likely to jeopardize the continued existence of any threatened or endangered species or adversely affect its critical habitat (40 CFR 122.49(c)).

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

Threatened and Endangered Animal and Plant Species Listing
(Fish and Wildlife Service, 2012, revised)

Status	**Common Name (Inverted)**	**Scientific Name**
E	Bat, little Mariana fruit	*Pteropus tokudae*
T	Bat, Mariana fruit (=Mariana flying fox)	*Pteropus mariannus mariannus*
E	Crow, Mariana (=aga)	*Corvus kubaryi*
E	Kingfisher, Guam Micronesian	*Halcyon cinnamomina cinnamomina*
E	Moorhen, Mariana common	*Gallinula chloropus guami*
E	Rail, Guam	*Rallus owstoni*
T	Sea turtle, green	*Chelonia mydas*
E	Sea turtle, hawksbill	*Eretmochelys imbricata*
E	Sea turtle, leatherback	*Dermochelys coriacea*
T	Sea turtle, loggerhead	*Caretta caretta*
E	Swiftlet, Mariana gray	*Aerodramus vanikorensis bartschi*
Plants		
E	Iagu, Hayun Guam	***Serianthes nelsonii***

Based on a review of the best scientific and commercial data available, EPA Region IX has determined the proposed wastewater discharge will have "no affect" on the endangered Little Mariana Fruit Bat (*Pteropus tokudae),* the Mariana Crow (*Corvus kubaryi),* the Guam Micronesian Kingfisher (*Halcyon cinnamomina cinnamomina),* the Mariana Common Moorhen, (*Gallinula chloropus guami),* the Guam Rail (*Rallus owstoni),* the Leatherback Sea Turtle (*Dermochelys coriacea),* the Hawksbill Sea Turtle (*Eretmochelys imbricata)* or the plant species the Hayun Guam Iagu (*Serianthes nelsonii).* The proposed discharge will have no effect on the threatened Mariana Fruit Bat *(Pteropus mariannus mariannus,* Loggerhead (*Caretta caretta)* or Green *(Chelonia mydas)* Sea Turtle. None of these turtles, bats, birds or plants are found to occur, or are reasonably expected to occur, in the vicinity of the discharge or action area beyond speculative incidental contact.

The discharge will occur 1200 feet beyond the reefline at a depth of 275 feet. Therefore, the discharge will have no potential direct or indirect effect on any endangered or threatened species. For sea turtles, the listing is primarily due to harvesting for shells and eggs, and habitat loss of

nesting and foraging areas. Other factors such as marine debris and net trawling are also cited. (USFWS, 1997, "Recovery Plan for U.S. Pacific Populations East Pacific Green Turtle"). No critical habitat for sea turtles has been designated in the vicinity of the discharge, and none of the species are expected to occur within the vicinity of the discharge, except for speculative incidental contact. The discharge does not have the potential to effect the nesting areas of sea turtles.

EPA has prepared a biological evaluation to support its conclusions. EPA is providing copies of the draft permit, fact sheet, and biological evaluation to the appropriate offices of the NMFS and the USFWS for review and comment during the comment period.

B. Impact to Coastal Zones

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

The permittee is working with the Guam Coastal Management Program regarding its consistency determination.

C. Impact to Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act ("MSA") set forth a number of new mandates for NMFS, regional fishery management councils and other federal agencies to identify and protect important marine and anadromous fish species and habitat. The MSA requires Federal agencies to make a determination on Federal actions that may adversely impact Essential Fish Habitat ("EFH").

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

EPA has sent a copy of the permit to the NMFS Pacific Islands Regional Office for comment.

D. Impact to National Historic Properties

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effect of their undertakings on historic properties that are either listed on, or eligible

for listing on, the National Register of Historic Places. Pursuant to the NHPA and 36 CFR 800.3(a)(1), EPA is making a determination that issuing this proposed NPDES permit does not have the potential to affect any historic properties or cultural properties. As a result, Section 106 does not require EPA to undertake additional consulting on this permit issuance.

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

X. STANDARD CONDITIONS

A. Reopener Provision

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

B. Standard Provisions

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

XI. ADMINISTRATIVE INFORMATION

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

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

Notice of the draft permit 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 is issued.

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

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be

held if EPA determines there is a significant amount of interest expressed during the 30-day public comment period or when it is necessary to clarify the issues involved in the permit decision.

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

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

XII. CONTACT INFORMATION

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

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San Francisco, California 94105

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

XIII. REFERENCES

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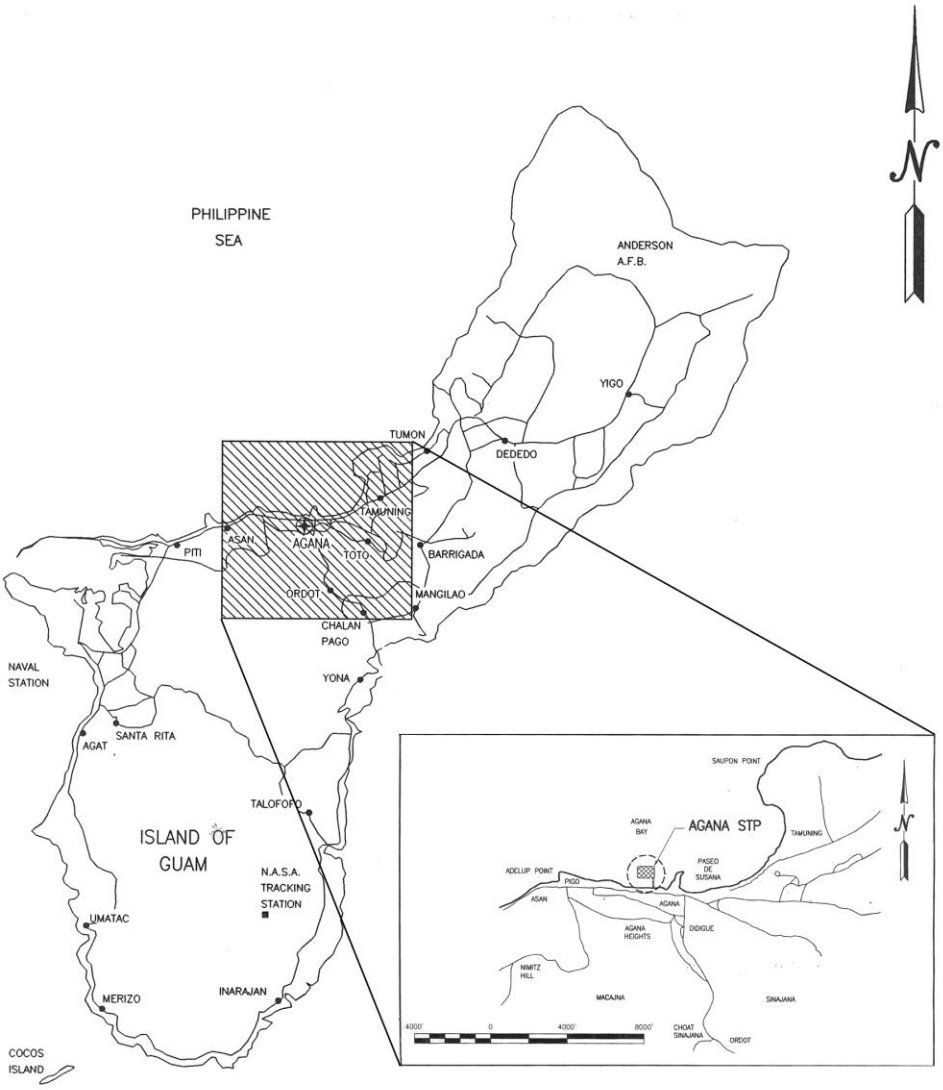
EPA 2009 *Agana STP CWA 301(h) Final Decision Document*.

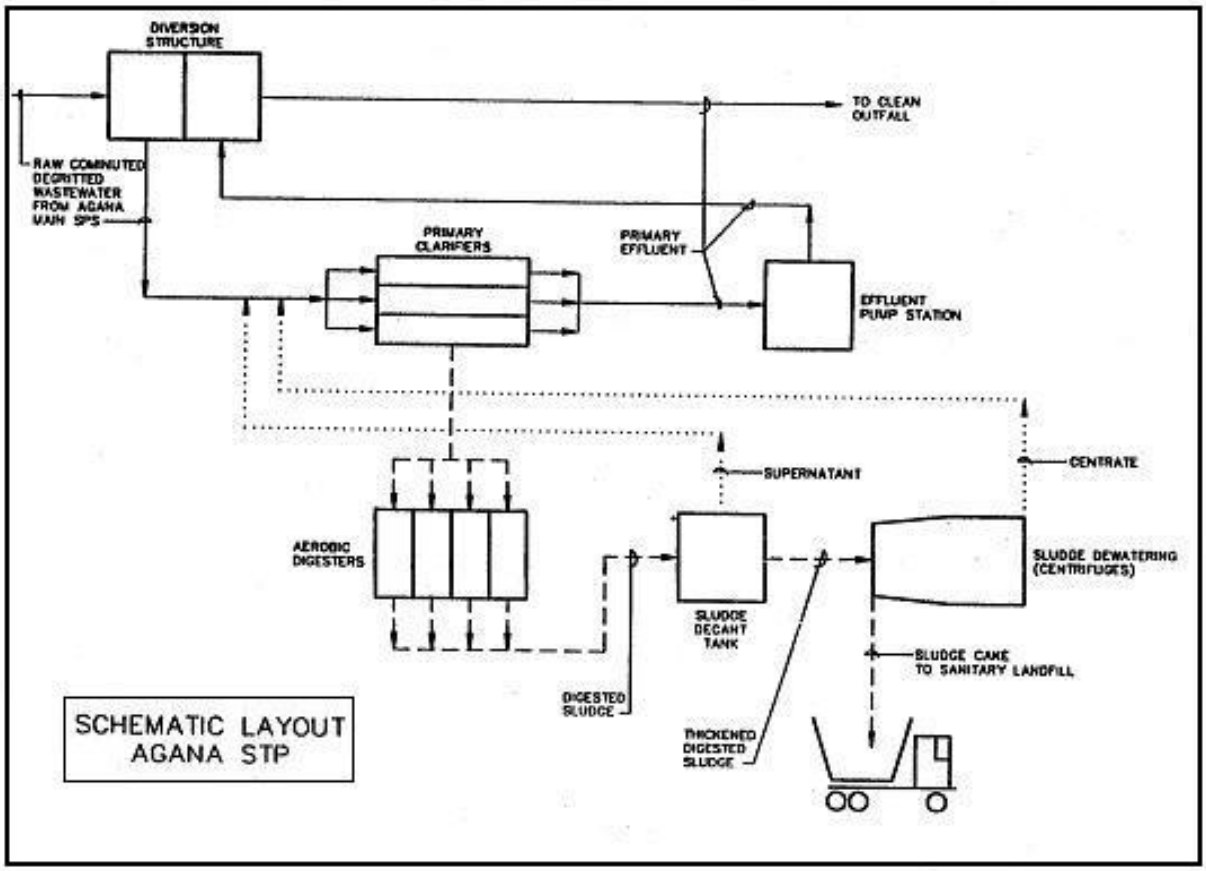
XIV. APPENDICIES

Appendix A- Location Map



Appendix B- Flow Schematic

Figure 2. Process diagram of Agana STP. Reprinted from GWA's section 301(h)-modified NPDES permit renewal application (GWA 1998).



Attachment B: Comparison of Leachate Pollutant Concentrations with Guam WQS

Attachment B. Comparison of Leachate Pollutant Concentrations with Guam WQS

Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
Subpart E Appendix I Metals	Aluminum	mg/L	June 2012 Q1	1.7	0.17	2.1	0.22	NS	0.2	NS	NS
EPA Method 200.7			Aug 2012 Q2	0.7	ND	9.1	5				
			Nov 2012 Q3	1.2	0.35	0.29	13				
			Feb 2013 Q4	NR	0.39	NR	NR				
	Antimony	mg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.014****	4.3****
			Aug 2012 Q2	ND	0.06	0.0087 J	0.0099 J				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Arsenic	mg/l	June 2012 Q1	0.024	0.01	ND	ND	0.069****	0.036****	0.005****	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	0.016	ND	ND	0.018				
			Feb 2013 Q4	NR	ND	NR	NR				
	Barium	mg/l	June 2012 Q1	0.092	0.27	0.46	0.25	NS	0.5***	NS	NS
			Aug 2012 Q2	0.062	0.19	0.36	0.19				
			Nov 2012 Q3	0.082	0.16	0.25	0.31				
			Feb 2013 Q4	NR	0.32	NR	NR				
	Beryllium	mg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Cadmium	mg/L	June 2012 Q1	ND	ND	ND	ND	0.042****	0.0093****	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Calcium	mg/L	June 2012 Q1	73 B	98 B	110 B	91 B	NS	NS	NS	NS
			Aug 2012 Q2	96	100 B	100	150				
			Nov 2012 Q3	78	74 B	78 B	140				
			Feb 2013 Q4	NR	110	NR	NR				
	Chromium (total)	mg/L	June 2012 Q1	0.055	0.034	0.0078	0.0072	NS	NS	NS	NS
			Aug 2012 Q2	0.022	0.014 J	0.026	0.02				
			Nov 2012 Q3	0.032	0.0099	0.0022 J	0.037				
			Feb 2013 Q4	NR	0.014	NR	NR				
	Cobalt	mg/L	June 2012 Q1	0.032	0.031	0.01	0.0097 J	NS	NS	NS	NS
			Aug 2012 Q2	0.011 J	0.018 J	0.019	0.0082 J				
			Nov 2012 Q3	0.018	0.012	0.0092 J	0.014				
			Feb 2013 Q4	NR	0.02	NR	NR				
	Copper	mg/L	June 2012 Q1	0.065	0.054	0.031	0.0046 J	0.0048****	0.0031****	1.3****	NS
			Aug 2012 Q2	0.021	0.049 J	0.13	0.058				
			Nov 2012 Q3	0.019	0.028	0.056	0.089				
			Feb 2013 Q4	NR	0.0083 J	NR	NR				
	Iron	mg/L	June 2012 Q1	2.1	1.4	5.7	1.6	NS	0.05***	NS	NS
			Aug 2012 Q2	0.88	1.1	16	5.3				
			Nov 2012 Q3	2.1	1.4	3.1	29				

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Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Feb 2013 Q4	NR	2.6	NR	NR				
	Lead	mg/L	June 2012 Q1	0.0043 J	ND	ND	ND	0.21****	0.0081****	NS	NS
			Aug 2012 Q2	ND	ND	0.045	0.028				
			Nov 2012 Q3	0.0083	ND	ND	0.06				
			Feb 2013 Q4	NR	ND	NR	NR				
	Magnesium	mg/L	June 2012 Q1	23	66	54	32	NS	NS	NS	NS
			Aug 2012 Q2	18	40	38	38				
			Nov 2012 Q3	20	35	31	35				
			Feb 2013 Q4	NR	86	NR	NR				
	Nickel	mg/L	June 2012 Q1	0.097	0.1	0.047	0.017	0.074****	0.0082****	0.61****	4.6****
			Aug 2012 Q2	0.044	0.06	0.063	0.031				
			Nov 2012 Q3	0.053	0.051	0.033	0.039				
			Feb 2013 Q4	NR	0.076	NR	NR				
	Potassium	mg/L	June 2012 Q1	270	210	120	150	NS	NS	NS	NS
			Aug 2012 Q2	130	140	100	90				
			Nov 2012 Q3	150	110	94	89				
			Feb 2013 Q4	NR	130	NR	NR				
	Selenium	mg/L	June 2012 Q1	ND	0.016	ND	0.0098 J	0.29****	0.071****	NS	NS
			Aug 2012 Q2	ND	ND	0.0084 J	0.016				
			Nov 2012 Q3	0.011	ND	ND	0.013				
			Feb 2013 Q4	NR	0.028	NR	NR				
	Silver	mg/L	June 2012 Q1	ND	ND	ND	ND	0.0023****	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Sodium	mg/L	June 2012 Q1	690	720	480	450	NS	NS	NS	NS
			Aug 2012 Q2	380	480 B	370	260				
			Nov 2012 Q3	490	350	300	280				
			Feb 2013 Q4	NR	570	NR	NR				
	Thallium	mg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0017****	0.0063****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Vanadium	mg/L	June 2012 Q1	0.0059 J	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	0.014	ND				
			Nov 2012 Q3	0.019	0.0066	0.0043 J	0.046				
			Feb 2013 Q4	NR	0.0059 J	NR	NR				
	Zinc	mg/L	June 2012 Q1	0.076	0.056	0.028	0.022	0.095****	0.086****	9.1****	69****
			Aug 2012 Q2	0.057	0.081 J	0.16	0.16				
			Nov 2012 Q3	0.06	0.043	0.031	0.36				
			Feb 2013 Q4	NR	0.024	NR	NR				

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Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
Anions	Chloride	mg/L	June 2012 Q1	660	840	640	400	NS	NS	NS	NS
EPA Method 300.0			Aug 2012 Q2	160	230	380	250				
			Nov 2012 Q3	480	410	310	200				
			Feb 2013 Q4	NR	790	NR	NR				
	Sulfate	mg/L	June 2012 Q1	120	13	24	6.2	NS	NS	NS	NS
			Aug 2012 Q2	48	33	34	3.8				
			Nov 2012 Q3	24	8.5	9.6	1.8				
			Feb 2013 Q4	NR	7	NR	NR				
Subpart E Appendix I VOCs	Acetone	µg/L	June 2012 Q1	29	7.8	4.6 J	ND	NS	NS	NS	NS
EPA Method 8260B			Aug 2012 Q2	25	23	6.6	17				
			Nov 2012 Q3	19 B	11 B	ND	10 B				
			Feb 2013 Q4	NR	ND	NR	NR				
	Acrylonitrile	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.059****	0.66****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Benzene	µg/L	June 2012 Q1	ND	ND	ND	0.33 J	NS	NS	1.2****	71****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	0.45 J	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Bromodichloromethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Bromoform	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	4.3****	360****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Carbon disulfide	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Carbon tetrachloride	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.25****	4.4****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Chlorobenzene	µg/L	June 2012 Q1	ND	ND	0.52	ND	NS	NS	680****	21,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Chlorodibromomethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.41****	34****
			Aug 2012 Q2	ND	ND	ND	ND				

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Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Chloroethane	µg/L	June 2012 Q1	0.64	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	0.47 J	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Chloroform	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	5.7****	470****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,2-Dibromo-3-chloropropane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,2-Dibromoethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,2-Dichlorobenzene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	2,700****	17,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,4-Dichlorobenzene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	400****	2,600****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	0.85	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	trans-1,4-Dichloro-2-butene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,1-Dichloroethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,2-Dichloroethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.38****	99****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,1-Dichloroethene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.057****	3.2****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				

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Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
	cis-1,2-Dichloroethene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,2-Dichloropropane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.52****	39****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	cis-1,3-Dichloropropene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	10****	1,700****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	trans-1,3-Dichloropropene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Ethylbenzene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	3,100****	29,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	0.51	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	2-Hexanone	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Methyl bromide (Bromomethane)	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	48****	4,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Methyl chloride (Chloromethane)	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	0.47 J	ND	ND	ND				
			Nov 2012 Q3	0.48 J	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Methylene chloride	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	4.7****	1,600****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Methyl ethyl ketone	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Methyl iodide	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				

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				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Feb 2013 Q4	NR	ND	NR	NR				
	4-Methyl-2-pentanone	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Styrene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,1,1,2-Tetrachloroethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.17****	11****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,1,2,2-Tetrachloroethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Tetrachloroethene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.8****	8.85****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Toluene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	6,800****	200,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	1	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,2-trans-Dichloroethene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	700****	140,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,1,1-Trichloroethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,1,2-Trichloroethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.6****	42****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Trichloroethene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	2.7****	81****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Trichlorofluoromethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS

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				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Aug 2012 Q2	ND	ND	ND	0.66				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	1,2,3-Trichloropropane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Vinyl acetate	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Vinyl chloride	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	2****	525****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
	Xylenes	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	ND	ND	ND				
			Feb 2013 Q4	NR	ND	NR	NR				
Semi-volatile Organic Compounds (SVOCs)	2-Chlorophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	120****	400****
EPA Method 8270C			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2,4-Dichlorophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	93****	790****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2,4-Dimethylphenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	540****	2,300****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2-Methyl-4,6-dinitrophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	13.4****	765****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2,4-Dinitrophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	70****	14,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2-Nitrophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				

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Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Feb 2013 Q4	NR	ND	NR	NR				
	4-Nitrophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	3-Methyl-4-chlorophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	3-Methylphenol + 4-Methylphenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	0.28 J	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Pentachlorophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	13****	7.9****	0.28****	8.2****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Phenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	21,000****	4,600,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2,4,6-Trichlorophenol	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	2.1****	6.5****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	bis(2-Chloroethoxy)methane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.031****	1.4****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	bis(2-Chloroethyl)ether	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	bis(2-Chloroisopropyl)ether or	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	1,400****	170,000****
	2,2'-Oxybis[1-chloropropane]		Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	bis(2-Ethylhexyl)phthalate	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	1.8****	5.9****
			Aug 2012 Q2	1.8 J	ND	ND	1.9 J				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	4-Bromophenyl phenyl ether	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS

Attachment B. Comparison of Leachate Pollutant Concentrations with Guam WQS

Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Butylbenzyl phthalate	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	3,000****	5,200****
			Aug 2012 Q2	0.77 J	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2-Chloronaphthalene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	1,700****	4,300****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	4-Chlorophenyl phenyl ether	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	3,3'-Dichlorobenzidine	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.04****	0.077****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Diethylphthalate	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	23,000****	120,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Dimethylphthalate	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	313,000****	2,900,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	di-n-Butylphthalate	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	2,700****	12,000****
			Aug 2012 Q2	0.38 J	ND	0.31 J	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2,4-Dinitrotoluene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.11****	9.1****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2,6-Dinitrotoluene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	di-n-Octyl phthalate	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				

Attachment B. Comparison of Leachate Pollutant Concentrations with Guam WQS

Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
	Hexachlorobenzene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.00075****	0.00077****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Hexachlorobutadiene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.44****	50****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Hexachlorocyclopentadiene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	240****	17,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Hexachloroethane	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	1.9****	8.9****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Isophorone	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	36****	2,600****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Nitrobenzene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	17****	1,700****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	N-Nitrosodi-n-propylamine	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.005****	1.4****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Nitroso-N-diphenylamine	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	5.0****	16****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
Polynuclear Aromatic Hydrocarbons (PAHs)	Acenaphthene	µg/L	June 2012 Q1	ND	ND	0.53	1.7	NS	NS	1,200****	2,700****
EPA Method 8270C			Aug 2012 Q2	ND	0.2 J	0.25 J	ND				
			Nov 2012 Q3	ND H	0.16 J H	0.13 J H	0.21 J H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Acenaphthylene	µg/L	June 2012 Q1	0.29 J	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	0.095 J*B	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Anthracene	µg/L	June 2012 Q1	ND	ND	ND	0.31 J	NS	NS	9,600****	110,000****

Attachment B. Comparison of Leachate Pollutant Concentrations with Guam WQS

Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Benzo(a)anthracene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0044****	0.049****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Benzo(a)pyrene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0044****	0.049****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Benzo(b)fluoranthene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0044****	0.049****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	0.22 J H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Benzo(g,h,i)perylene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0044****	0.049****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Benzo(k)fluoranthene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0044****	0.049****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Chrysene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0044****	0.049****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	0.14 J H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Dibenzo(a,h)anthracene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0044****	0.049****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Fluoranthene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	300****	370****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	0.26 J H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Fluorene	µg/L	June 2012 Q1	ND	ND	0.17 J	ND	NS	NS	1,300****	14,000****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Indeno(1,2,3-cd)pyrene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	0.0044***	0.049****
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				

Attachment B. Comparison of Leachate Pollutant Concentrations with Guam WQS

Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
	Naphthalene	µg/L	June 2012 Q1	ND	ND	0.77	ND	NS	NS	NS	NS
			Aug 2012 Q2	0.26 J*B	ND	0.36 J*B	ND				
			Nov 2012 Q3	ND H	0.12 J H	0.1 J H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Phenanthrene	µg/L	June 2012 Q1	ND	0.37 J	0.14 J	0.6	NS	NS	960****	11,000****
			Aug 2012 Q2	0.37 J*	0.22 J	ND	ND				
			Nov 2012 Q3	0.13 J H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	Pyrene	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	0.27 J H				
			Feb 2013 Q4	NR	ND	NR	NR				
Total Cyanide		mg/L	June 2012 Q1	0.052	0.027	0.0082	0.016	0.001****	0.001****	0.7****	200****
EPA Method SM 4500-CN-E			Aug 2012 Q2	0.042	0.033	0.0093	0.013				
			Nov 2012 Q3	0.0054	0.0039 J	ND	ND				
			Feb 2013 Q4	NR	0.0038	NR	NR				
Amenable (Available) Cyanide		mg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
EPA Method SM 4500-CN-G			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND	NR	NR	NR				
			Feb 2013 Q4	NR	0.0038	NR	NR				
Phosphate as P	Ortho-PO4	mg/L	June 2012 Q1	0.472	0.61	0.709	0.243	NS	0.025**	NS	NS
EPA Method SM 4500 P-B 5			Aug 2012 Q2	ND	0.149	ND	ND				
			Nov 2012 Q3	0.469	0.136	0.219	0.298				
			Feb 2013 Q4	NR	0.781	NR	NR				
Alkalinity	Alkalinity	mg/L	June 2012 Q1	1280	1190	723	1280	NS	NS	NS	NS
EPA Method SM 2320B			Aug 2012 Q2	753	1010	675	831				
			Nov 2012 Q3	1.19	688	584	813				
			Feb 2013 Q4	NR	848	NR	NR				
Ammonia as N	Ammonia-N	mg/L	June 2012 Q1	160	95 J	34	150	NS	NS	NS	NS
EPA Method SM 4500-NH3 D			Aug 2012 Q2	48	76	13	51				
			Nov 2012 Q3	160	3.4	14	6.8				
			Feb 2013 Q4	NR	ND	NR	NR				
	Ammonia as NH3	mg/L	June 2012 Q1	NR	NR	NR	NR	NS	0.02	NS	NS
			Aug 2012 Q2	58	92	16	63				
			Nov 2012 Q3	190	4.2	17	NR				
			Feb 2013 Q4	NR	ND	NR	NR				
MEC	HMX	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS
EPA Method 8330/8330A			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	RDX	µg/L	June 2012 Q1	ND	ND	ND	ND	NS	NS	NS	NS

Attachment B. Comparison of Leachate Pollutant Concentrations with Guam WQS

Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
	2,4,6-Trinitrotoluene	µg/L	June 2012 Q1	ND	ND	ND	1.1	0.356***	0.01***	NS	NS
			Aug 2012 Q2	ND	ND	ND	ND				
			Nov 2012 Q3	ND H	ND H	ND H	ND H				
			Feb 2013 Q4	NR	ND	NR	NR				
Total Kjehldahl Nitrogen	TKN	mg/L	June 2012 Q1	280	120	69	240	NS	NS	NS	NS
EPA Method SM 4500B & 4500 NH3			Aug 2012 Q2	53	83	18	48				
EPA Method 531.2			Nov 2012 Q3	170	27	12	47				
			Feb 2013 Q4	NR	3.2	NR	NR				
Total Organic Carbon	TOC	mg/L	June 2012 Q1	150	140	52	82	NS	NS	NS	NS
EPA Method SM 5310B			Aug 2012 Q2	74	110	39	36				
			Nov 2012 Q3	240	230	32	240				
			Feb 2013 Q4	NR	29	NR	NR				
Total Dissolved Solids	TDS	mg/L	June 2012 Q1	2,828	2,992	2,042	1,806	NS	NS	NS	NS
EPA Method SM 2540C			Aug 2012 Q2	2,092	2,357	1,843	1,660				
			Nov 2012 Q3	2,034	1,484	1,283	1,152				
			Feb 2013 Q4	NR	2,364	NR	NR				
Salinity	Salinity	ppT	June 2012 Q1	2.1	3	2.1	2.1	NS	NS	NS	NS
EPA Method SM 2520B			Aug 2012 Q2	<2	<2	<2	<2				
			Nov 2012 Q3	2.6	<2	<2	<2				
			Feb 2013 Q4	NR	2.5	NR	NR				
Total Suspended Solids	TSS	mg/L	June 2012 Q1	45.8	18.4	22.4	14.3	NS	5**	NS	NS
EPA Method SM 2540D			Aug 2012 Q2	70.8	3.9	322	124				
			Nov 2012 Q3	33	76	25	372				
			Feb 2013 Q4	NR	367	NR	NR				
Chemical Oxygen Demand	COD	mg/L	June 2012 Q1	262	190	141	204	NS	NS	NS	NS
EPA Method 410.2			Aug 2012 Q2	181	307	183	111				
			Nov 2012 Q3	995	421	217	137				
			Feb 2013 Q4	NR	521	NR	NR				
Biochemical Oxygen Demand	BOD	mg/L	June 2012 Q1	334	382	373	211	NS	NS	NS	NS
EPA Method SM 5210B			Aug 2012 Q2	83.9	79.3	78.1	108				
			Nov 2012 Q3	28	12	21	20				
			Feb 2013 Q4	NR	81.2	NR	NR				
EPA Method 353.3	Nitrite	mg/L	June 2012 Q1	0.129	0.105	0.18	0.139	NS	NS	NS	NS
			Aug 2012 Q2	0.1	0.1	0.2	0.6				
			Nov 2012 Q3	3.5	4.4	0.69	6				
			Feb 2013 Q4	NR	1.04	NR	NR				
	Nitrate	mg/L	June 2012 Q1	0.091	0.257	0.361	0.051	NS	0.1**	NS	NS
			Aug 2012 Q2	31.8	32	18.9	22.7				
			Nov 2012 Q3	6.4	8.4	6.9	14				

Attachment B. Comparison of Leachate Pollutant Concentrations with Guam WQS

Methods	Constituent	Units	Sample Event	Sample Locations				GWQS - Salt Water		GWQS - Human Health for the consumption of:	
				Lea Seep-E	Lea Seep-SE	Lea Seep-S	Lea Seep-W*	Acute	Chronic	Water and Organisms	Organism Only
			Feb 2013 Q4	NR	1.72	NR	NR				
Notes:											
1. Blue-shaded results exceed GWQS											
2. ND denotes non detection.											
3. Coliform analysis was not conducted.											
B = Compound was found in the blank and sample.											
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approxmate value.											
J* = LCS or LCSD exceeds the control limits.											
H = Sample was prepped or analyzed beyond the specified holding time.											
* = From the TestAmerical laboratory data, the sample location name for Aug 2012 Q2 sampling event is "Lea Seep-W2".											
** = Numeric Water Quality Criteria for Marine Waters.											
*** = Table IV (Appendix A GWQS)											
**** = Table III (Appendix A GWQS)											
NR = Not reported											
NS = No water quality standards											

Attachment C: Reasonable Potential Analysis

Attachment C - Reasonable Potential Analysis

Parameter	Maximum WWTP Effluent Concentration	Maximum Leachate Concentration	Median Condensate Concentration	Calculated Effluent Conc., µg/L	Projected Maximum Effluent Conc., µg/L[1]	Applicable Water Quality Criterion after Initial Dilution, µg/L	Reasonable Potential?
Flow (mgd)	6.5	0.0487	0.00072				
Arsenic	1.6	24	850	1.9	13.8	3,600	No
Copper	33	89		33.4	247.3	620,000	No
Chromium (Total)	2.7	78	30	3.3	24.1	5,000	No
Lead	1.1	60	40	1.5	11.4	810	No
Nickel	5.5	100		6.2	45.9	820	No
Zinc	59	81		59.2	437.8	8,600	No
Acetone	41	29		40.9	302.7	None	No
Chloroform	0.88			0.9	6.5	None	No
Di (2-ethylhexyl) phthalate	22	1.9		21.8	161.7	12,000	No
Phenol	8.3			8.2	61.0	4,600	No
Toluene	0.64	1		0.6	4.8	20,000	No
Methyl ethyl ketone (MEK)			6290	0.7	5.1	None	No
2-Methylphenol			100	0.0	0.1	None	No
3,4-Methylphenol		28	3360	0.6	4.3	None	No
4-Methylphenol	40	0.28		39.7	293.8	None	No
Pyridine			150	0.0	0.1	None	No
TPH			43000	4.7	35.0	None	No

[1] Calculated Effluent Concentration X Multiplier of 7.4 per USEPA Fact Sheet

Worst Case

Parameter	WWTP Effluent (mgd)	Leachate (mg/L)	Condensate (mg/L)	Calculated Effluent Conc., mg/L	WWTP Discharge, lbs.
Flow	6.5	0.0487	0.00072		
Biochemical Oxygen Demand		325	1,400	2.6	140
Total Suspended Solids		130	237	1.0	54
TKN (assumed to be all NH_3)		216	2,580	1.9	103

Peak Day

Parameter	WWTP Effluent (mgd)	Leachate (mg/L)	Condensate (mg/L)	Calculated Effluent Conc., mg/L	WWTP Discharge, lbs.
Flow	6.5	0.0487	0.00072		
Biochemical Oxygen Demand		20.25	1,400	0.3	17
Total Suspended Solids		126.5	237	1.0	53
TKN (assumed to be all NH_3)		78	2,580	0.9	47

Annual Average

Parameter	WWTP Effluent (mgd)	Leachate (mg/L)	Condensate (mg/L)	Calculated Effluent Conc., mg/L	WWTP Discharge, lbs.
Flow	6.5	0.0036	0.00072		
Biochemical Oxygen Demand		139	1,400	0.2	13
Total Suspended Solids		115	237	0.1	5
TKN (assumed to be all NH_3)		90	2,580	0.3	18