



**American Samoa Power Authority**

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July 12, 2019

Mr. Pascal Mues, Environmental Engineer  
NPDES Permits Office  
U.S. EPA Region 9, WTR-2-3  
75 Hawthorne Street  
San Francisco, CA 94105

**RE: Comments on the Draft NPDES Permit for the Utulei STP (AS0020001)**

Dear Mr. Mues,

Thank you for the opportunity to review the draft permit for ASPA's Utulei Sewage Treatment Plant (STP) and your kind consideration of the extension of the review period. Our comments and requests for some revisions to the document are included below with this letter and primarily concern effluent limitations and receiving water quality sampling.

In particular, the use of a critical initial dilution of 91:1 is based on old data that precedes the updated diffuser analysis and the reconfigured diffuser done under the July 2011 Administrative Order as required by USEPA. Using the same basic criteria, critical dilution for an effluent flow of 6 mgd, the revised initial dilution should be 313:1 as described in the attached comments. It is noted that the development and physical retrofitting of the Utulei diffuser was done at the request of USEPA and involved considerable costs on the part of ASPA. The intent of the new diffuser analysis and physical modifications was to increase dilution; it seems odd and unjustifiable for USEPA to ignore this and use outdated information.

We are available to discuss our comments/requests by telephone or in person at your office, if you believe that is necessary. We can also provide any additional information supporting our requests if necessary.

ASPA looks forward to your responses to our comments and the issuance of the NPDES permit for this facility. Please feel free to contact me or our consultant, gdc, directly with any questions.

Sincerely,

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## Comments on Effluent Limits and Monitoring: Part 1.B

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### **Part 1.B. Effluent limits and Monitoring Requirements**

**Comment I.B-1:** Calculation of the Ammonia Impact Ratio (AIR) references Attachments D and E. Attachment D provides a calculation template for the AIR. Attachment D requires the AIR calculation be done using the effluent (freshwater) pH and temperature. Attachment E lists the ammonia objectives based on toxicity in the receiving water (saltwater) with a dilution credit of 91:1.

The Ammonia Objective (Column E, Attachment D) is determined from Attachment E and is to be based on the Ammonia Concentration in Effluent (Column B, Attachment D), Effluent Temperature (Column C, Attachment D), and the Effluent pH (Column D, Attachment D). The AIR (Column F, Attachment D) is then the ratio of the effluent ammonia concentration from Column B, Attachment D to the ammonia objective from Column E, Attachment D. Care must be taken because the effluent monitoring is for total ammonia as N and Attachment E is in terms of total ammonia as NH<sub>3</sub>. The conversion ([Ammonia as N]/[Ammonia as NH<sub>3</sub>]) = 0.822 as stated in the ASWQS) should be included in Attachment E.

The tables in Attachment E have a lower limit of pH of 7.8. However, the effluent pH at the Utulei STP is typically a 7.0 SU to 7.2 SU. The tables in Attachment E are based on an USEPA document\* as specified in the ASWQS\*\*. ASPA requests that, if the descriptions above are as intended, the tables in Attachment E be expanded to cover the lower pH values to accommodate the lower effluent pH in the effluent.

In addition, ASPA requests that the dilution credit be adjusted to 313:1 for the modified diffuser as described in detail in Comment 1.B-2 below.

\* *Ambient Water Quality Criteria for Ammonia (Saltwater)-1989*. EPA 440/5-88-004. April 1989

\*\* *American Samoa Water Quality Standards*, 2013 Revision, Administrative Rule No. 001-2013

**Comment I.B-2:** ASPA requests that Enterococci limitations be based on the reassessed dilution of 313:1 for the new diffuser configuration, as described in Comment I.B-3 below.

The limitations for Enterococci are presented as a daily maximum and a monthly average. The monthly average is set as the ASWQS specified geometric mean and the daily maximum is set as the ASWQS statistical threshold value, both adjusted with a dilution factor. The rationale provided in the associated fact sheet is based on the ASWQS Implementation Guidance Manual criterion that, in the receiving water, compliance be assessed for all samples measured at all stations and depths over a 30-day period. ASPA believes this is a misinterpretation and should not be applied to the effluent limitations.

ASPA requests that the limitations for the effluent be based on a minimum of five sequential samples taken approximately 15 minutes apart (monthly) and the geometric mean and statistical threshold value be applied rather than daily maximum and monthly average. This is a typical procedure for other facilities with EPA NPDES permits and was the procedure used during the AO sampling at Utulei.

**Comment I.B-3:** Total Nitrogen (TN) and Total Phosphorus (TP) limitations

TN and TP were monitored under an Administrative Order\*. Monthly monitoring was performed from December 2011 through March 2018. The results indicate that the proposed effluent limitations for both TN and TP will be routinely exceeded. Based on the monitoring results, supplied to USEPA in quarterly reports, TN exceeded the proposed monthly average limitation of 18,200 µg/l 8-percent of the time and

TP exceeded the proposed monthly average limitation of 2,730 µg/l 36-percent of the time over the 76 months of monthly monitoring. It is noted that the effluent would be in compliance with the proposed daily maximum limitations of 45,000 µg/l for TN (with a single exception, which is an outlier) and 8,190 µg/l for TP. However, the monitoring frequency is monthly, so there is only one sample per month and daily maximum and monthly average are the same value and therefore the monthly averages are the limitations that must be met by the monthly sampling. It is noted that the samples are sent to a commercial laboratory for analysis, which effectively precludes taking additional samples to potentially bring down the monthly average concentrations in any given month.

Examination of the limitations shows that the average monthly value was derived by applying a dilution of 91:1 to the ASWQS criteria. The dilution of 91:1 was a value presented in the initial permit reapplication and request for a 301(h) waiver in 2006. This dilution was based on the diffuser configuration and the receiving water density available at that time. Since that time the diffuser has been redesigned to increase dilution as required by USEPA in the AO referenced above. In addition, the receiving water data base was expanded and a more representative density profile was used as presented to USEPA in a Technical Memorandum in 2013\*\*. In addition, a more realistic modeling configuration was used for diffusers with ports discharging in opposite directions, as is the case for the redesigned diffuser, and as specified in the Amended 301(h) TSD \*\*\*. The results were presented to USEPA in a Technical memorandum in September 2013\*\*\*\*. It is noted that reexamination of the September 2013 Technical Memorandum indicated a calculation error in the presentation of the dilutions (although the modeling results presented were correct) because the flow-averaged dilutions were not correctly calculated. The corrected results are shown in the following table:

Diffuser Performance for Reconfigured Utlei Diffuser								
Flow (mgd)	Densimetric Froude Number		Trapping Level <sup>1</sup> (m)		Maximum Rise Level <sup>2</sup> (m)		Flux Average Dilution at Trapping Level	
	11" port	5.5" ports	11" port	5.5" ports	11" port	5.5" ports		
1	0.92	1.63	RD <sup>3</sup>					
2	1.81	3.23	RD <sup>4</sup>	30.3	RD <sup>4</sup>	22.78	351.43 <sup>4</sup>	
4	3.64	6.47	19.0	22.0	35.4	34.08	335.51	
6	5.45	9.68	14.6	16.7	40.08	40.78	313.19	
8	7.25	12.91	13.3	14.0	41.72	43.29	274.44	
10	9.06	16.15	12.4	12.6	42.84	44.46	246.46	

<sup>1</sup> Trapping level is the distance below the surface of the plume centerline  
<sup>2</sup> Maximum rise is the distance above the discharge point of the plume centerline  
<sup>3</sup> RD indicates the model run was discontinued because the Froude number was below a critical value and calculations may not be reliable.  
<sup>4</sup> The dilution through the end port (11-inch port) was estimated by trendline analysis.

Based on the description in the fact sheet and the TDD, USEPA used the critical initial dilution (91:1 for a flow of 6 mgd) from the 301(h) waiver application. As noted above this is an outdated result. Based on the diffuser redesign, **required by USEPA in the AO**, and the reanalysis of the critical initial dilution, the new dilution of 313:1 should be used to set the TN and TP limitations. Following, the calculations in the draft permit this would result in monthly average limitations of 200\*313=62,600 µg/l and 30\*313=9390 µg/l for TN and TP, respectively. The maximum values recorded during the AO monitoring were 31,000 µg/l and 5,500 µg/l for TN and TP respectively. A reasonable potential effluent concentration for these two parameters based on the AO data and using the method in USEPA's Technical Support Document for Water Quality Based Toxics Control result in values of 41,000 µg/l and 8,000 µg/l for TN and TP

respectively. Based on the above description and the redesigned diffuser required by the USEPA's AO subsequent to the initial permit application, ASPA requests the monthly average limitations for TN and TP be adjusted to the reasonable potential concentrations which can easily be accommodated by the improved dilution.

\* Administrative Order (Docket No. CWA 309(a)-11- 017). Issued July 27, 2011. Modified February 17, 2012. Terminated April 10, 2018.

\*\* *Tafuna WWTP and Utulei WWTP Background Density Gradients for Dilution Model Input*. Technical Memorandum prepared for the American Samoa Power Authority, Submitted to the United States environmental protection Agency and the American Samoa Environmental Protection Agency. Prepared by gdc, August 9, 2013.

\*\*\* *Amended Section 301(h) Technical Support Document* (EPA 842-B-94-007). United States Environmental Protection Agency, Office of Water. September 1994. (See p. 55)

\*\*\*\* *Recommended Modifications to Tafuna WWTP and Utulei WWTP Diffuser Configurations*. Technical Memorandum prepared for the American Samoa Power Authority, Submitted to the United States Environmental protection Agency and the American Samoa Environmental Protection Agency. Prepared by gdc, September 16, 2013.

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## **Comments on Receiving Water Quality Monitoring: Part I.E**

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### **Part I.E.4 Stations to be monitored:**

**Comment I.E.4-1:** ASPA believes that monitoring at Station U (Diffuser Midpoint Station) is unnecessary and requests that it be removed as a monitoring station. This station is not used for compliance because it is within the zone of initial dilution where exceedances of the ASWQS are permissible for select parameters defined in the permit. Furthermore, given the wide range of possible results for this station, from samples taken directly in a plume as discharged from a diffuser port to samples of uncontaminated receiving water (for example if collected between diffuser ports), the results of such samples are generally meaningless.

**Comment I.E.4-2:** ASPA believes that monitoring at Station 5 (Reference Station) is unnecessary and requests that it be removed as a monitoring station. Station 5 is not a suitable reference station because it is not at the mouth of the Harbor (but rather offset to the east offshore of Breakers Point) and the water depth (~120 feet) is considerably shallower than the discharge (~150 feet). ASPA recognized this and, voluntarily, began sampling at Station FF – which is a much more representative reference station. If USEPA believes a second reference station is required, Station 18 is close to the Harbor mouth and represents a more appropriate reference station within the Harbor.

**Comment I.E.4-3:** ASPA believes that monitoring at Stations A1 and B1 (listed as ZOM Stations) is unnecessary and requests that they be removed as a monitoring stations. These stations are not used to assess compliance with the ASWQS and are to be replaced with ZID Stations used for compliance evaluations as described in Part I.E.3.

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### **Part I.E.6: Parameters to be monitored:**

**Comment I.E.6-1:** ASPA requests that monitoring frequency currently stated as “Semi-Annually (March, August)” in the table on page 10 be expanded to “*Semi-Annually (February through April, and August through October)*”. This provides flexibility in scheduling vessels, staff, and laboratories while still maintaining the targeted oceanographic tradewind and non-tradewind seasons.

**Comment I.E.6-2:** ASPA requests that the sampling depths “1m, mid-depth, and 1 m above the bottom” be qualified to say that if the water depth is greater than the discharge depth the samples will be at “1 m below the surface, mid-depth between the surface and the discharge depth, and at the discharge depth”. Sampling below the discharge depth, particularly at the reference station (Station FF), is not useful and may be difficult at the deepest water depths. It is noted that this approach was proposed by USEPA for the StarKist Samoa Sampling in Outer Pago Pago Harbor.

**Comment I.E.6-3:** ASPA requests that the “Sample Type/Method” for Turbidity in the table on page 10 be stated as “Bench Meter or Field Sensor” rather than “Bench Meter”. This is because ASPA’s consultant is in the process of evaluating the use of a field sensor for turbidity. If this evaluation is successful, more comprehensive turbidity data as vertical profiles will be available from the monitoring activities.

**Comment I.E.6-4:** ASPA requests that ammonia be reported as N rather than as NH<sub>3</sub> to be consistent with Appendix D as well as being consistent with past practice and typical laboratory results/reports. Conversion between N and NH<sub>3</sub> is straightforward and listed in the ASWQS for ammonia, so this will not hinder evaluation of compliance with ASWQS.

**Comment I.E.6-5:** ASPA requests that the Sample Type /Method for ammonia be listed as “Lab Sample (EPA 350.1)” rather than “Lab Sample (AS-EPA)” because the ASEPA laboratory does not currently analyze ammonia in seawater.

**Comment I.E.6-6:** ASPA requests that Enterococci be monitored at five stations as is currently done: the two ZID Stations (to be determined) and the farfield Stations (C, 16, and 18). Compliance is not evaluated at Station U (the discharge site) and there is no reason to evaluate bacteria at the Reference Stations (5 and FF). See ASPA’s additional comments on stations to be sampled under Comments on Part I.E.4 above. Monitoring at Stations A1 and B1 is redundant and is not necessary after establishment of the required ZID stations.

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### **Part I.E.7: Sampling Times for Selected Parameters:**

**Comment I.E.7-1:** The permit requires that: “*Sampling for parameters that are influenced by temperature or pH (i.e., Ammonia) shall be conducted once during the time period between noon and sunset to ensure critical (most stringent) high ambient water temperatures are reflected.*” ASPA requests that this requirement be removed because it is not technically required and it could add considerably to the cost of sampling. The following points are noted:

- Total ammonia does not change with temperature and pH, only the toxicity of ammonia changes with these parameters. It is total ammonia that is sampled and analyzed for – toxicity based on the ASWQS, is then calculated based on temperature, pH, and ionic strength (salinity).
- Pago Pago Harbor is a deep tropical marine water body and diurnal changes in temperature and pH are not significant within the resolution of the instruments and/or analyses used to measure them. Any observed diurnal changes are within the upper few centimeters of the water column. At the sampling depths any diurnal changes are within the accuracy of the instruments used and so small as to be insignificant in determining toxicity.
- Having to limit sampling to just the afternoon will potentially extend the required sampling times and expenses such as boat rental costs. Because of the limited flight schedules to Pago Pago (twice per week) extensions of sampling time can substantially extend travel time and costs for staff and on-site travel expenses.

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**Part I.E.8: Description of Sampling Locations:**

**Comment I.E.8-1:** ASPA requests that this condition be removed and/or incorporated in Part I.E.2. The two conditions are essentially the same except for the timing of the required reports.

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**Comments on Chronic Whole Effluent Toxicity (WET) Requirements: Part II.C**

**Comment II.C.1-1:** The permit indicates that testing will be done using three species in year one and five of the permit terms and then continue semiannually using the most sensitive of these three species (the specific species are not identified). However, in Part II.C.2, the permit requires the testing with the purple sea urchin or a sand dollar. ASPA requests USEPA to clarify this – it appears the test species should be as indicated in Part II.C.2.

**Comment II.C.1-2:** The condition requires semi-annual testing as indicated in the comment above. However, Part I.B.1 includes the effluent limitation for toxicity that requires annual testing. ASPA requests that USEPA clarify the testing frequency as well as the species to be tested.

**Comment II.C.3-1:** The permit defines the Instream waste concentration (IWC) as 1.1 percent based on a dilution of 91:1. ASPA requests that the IWC be defined in terms of the reassessed dilution for the new diffuser configuration, as described in Comment I.B-3 above. This would result in an IWC of  $1/313 = 0.0032 = 0.32\%$ . It is noted that at a dilution of 91:1 the effluent toxicity test would fail between 24-percent and 34-percent of the time based on the results of testing over the past five years. At a dilution of 313:1 the test would have failed only once over the past five years.