

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 2

## DECISION DOCUMENT

ANALYSIS OF THE CLEAN WATER ACT SECTION 301(h) MODIFICATION OF  
SECONDARY TREATMENT APPLICATIONS FOR THE BAYAMÓN AND  
PUERTO NUEVO REGIONAL WASTEWATER TREATMENT PLANTS  
NPDES PERMIT NOs. PR0023728 AND PR0021555



WATER DIVISION

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## INTRODUCTION

The Puerto Rico Aqueduct and Sewer Authority (hereinafter, the applicant or PRASA) has requested a renewal of its waivers under Section 301(h) of the Clean Water Act (the Act), 33 U.S.C. 1311(h), from the secondary treatment requirements contained in Section 301(b)(1)(B) of the Act, 33 U.S.C. 1311(b)(1)(B) for the Bayamón and Puerto Nuevo Regional Wastewater Treatment Plants (RWWTPs), two publicly owned treatment works (POTW) located on the island of Puerto Rico that share a common discharge outfall. [National Pollutant Discharge Elimination System (NPDES) Permit Nos. PR0023728 and PR0021555, respectively.] The facilities are owned and operated by PRASA.

The applicant is seeking Section 301(h) modifications to discharge wastewater receiving less-than-secondary treatment from the Bayamón and Puerto Nuevo RWWTPs joint outfall to the Atlantic Ocean. The joint outfall also is shared by the Bacardí Corporation distillery, which contributes industrial wastewater from its Wastewater Treatment Plant (Bacardí WWTP) (NPDES Permit No. PR0000591).

The original applications for Section 301(h) modification of secondary treatment requirements at the Bayamón and Puerto Nuevo RWWTPs were submitted to the U.S. Environmental Protection Agency Region 2 in 1979 and were tentatively approved in 1990. In 2001, the EPA issued a Final Decision Document approving PRASA's applications for Section 301(h) modified permits for the Bayamón and Puerto Nuevo RWWTPs based, in part, on a re-evaluation of the 1990 Tentative Approval as well as additional information in the EPA's relevant files. In 2007, the EPA issued a second Final Decision Document approving PRASA's application for renewal of its waiver from the secondary treatment requirements, and subsequently issued two individual modified permits that became effective on July 1, 2008. In September 2011, the EPA issued new NPDES permits for Bayamón and Puerto Nuevo RWWTPs, with an effective date of permit for each on December 1, 2011.

In 2016, PRASA submitted renewal 301(h) applications which was updated in December 2020, requesting modifications to the permitted flow limitations for the Bayamón and Puerto Nuevo RWWTPs. Since wastewater discharged from the joint outfall consists of effluent from the Bayamón RWWTP, Puerto Nuevo RWWTP and the Bacardí WWTP, it is necessary to characterize and evaluate the discharge individually from the Bayamón RWWTP and Puerto Nuevo RWWTP, and combined with discharge from the Bacardí WWTP to determine whether to grant or deny a Section 301(h) waiver for the PRASA facilities pursuant to Section 301(h) of the Act.

This Decision Document presents the EPA's findings, conclusions, and recommendations as to whether both modified discharges will comply with the criteria set forth in section 301(h) of the Act, as implemented by regulations contained in 40 CFR Part 125, Subpart G, and Puerto Rico Water Quality Standards (PRWQS) Regulations, as amended (Regulation Number 7837).

## DECISION CRITERIA

Under Section 301(b)(1)(B) of the Act, 33 U.S.C. 1311(b)(1)(B), POTWs in existence on July 1, 1977, were required to meet effluent limitations based upon secondary treatment as defined by the Administrator of the EPA (the Administrator). As previously described, secondary treatment is defined by the Administrator in terms of three parameters: TSS, BOD<sub>5</sub>, and pH. Uniform national effluent limitations for these pollutants were promulgated (see 40 CFR Part 133) and included in NPDES permits for POTWs issued under Section 402 of the Act. POTWs were required to be in compliance with these limitations, in most circumstances, by July 1, 1977.

Congress subsequently amended the Act, adding Section 301(h), which authorized the Administrator, with State<sup>1</sup> concurrence, to issue NPDES permits which modify the secondary treatment requirements of the Act. P.L. 95-217, 91 Stat. 1566, as amended by P.L. 97-117, 95 Stat. 1623; and Section 303 of the Water Quality Act (WQA) of 1987. Section 301(h) provides that:

The Administrator, with the concurrence of the State, may issue a permit under [Section 402 of the Act] which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the applicant demonstrates to the satisfaction of the Administrator that:

- (1) there is an applicable water quality standard specific to the pollutant for which the modification is requested, which has been identified under [Section 304(a)(6) of the Act];
- (2) the discharge of pollutants in accordance with such modified requirements will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of that water quality which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife, and allows recreational activities, in and on the water;
- (3) the applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable, and the scope of such monitoring is limited to include only those scientific investigations which are necessary to study the effects of the proposed discharge;
- (4) such modified requirements will not result in any additional requirements on any other point or nonpoint source;
- (5) all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;
- (6) in the case of any treatment works serving a population of 50,000 or more, with respect to any toxic pollutant introduced into such works by an industrial discharger for which pollutant there is no applicable pretreatment requirement in effect, sources introducing waste into such works are in compliance with all applicable pretreatment requirements, the applicant will enforce such requirements, and the applicant has in effect a pretreatment program which, in combination with the treatment of discharges from such works, removes the same amount of such pollutant as would be removed if such works were to apply secondary treatment to discharges and if such works had no pretreatment program with respect to such pollutant;
- (7) to the extent practicable, the applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from nonindustrial sources into such treatment works;
- (8) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit;

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<sup>1</sup> Section 502(3) of the Act defines "State" to include the Commonwealth of Puerto Rico. 33 U.S.C. 1362(3).

(9) the applicant at the time such modification becomes effective will be discharging effluent which has received at least primary or equivalent treatment and which meets the criteria established under [Section 304(a)(1) of this Act] after initial mixing in the waters surrounding or adjacent to the point at which such effluent is discharged . . .”

For the purpose of this subsection the phrase “the discharge of any pollutant into marine waters” refers to a discharge into deep waters of the territorial sea or the waters of the contiguous zone, or into saline estuarine waters where there is strong tidal movement and other hydrological and geological characteristics which the Administrator determines necessary to comply with the requirements of Sections 301(h)(2) and 101(a)(2) of the Act. For the purposes of Section 301(h)(9), “primary or equivalent treatment” means treatment by screening, sedimentation and skimming adequate to remove at least 30 percent of the biochemical oxygen demanding material and 30 percent of the suspended solids in the treatment works influent, and disinfection, where appropriate. A municipality which applies for a waiver of secondary treatment shall be eligible to receive a permit pursuant to this subsection which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from any treatment works owned by such municipality into marine waters. No permit issued shall authorize the discharge of sewage sludge into marine waters. In order for a permit to be issued for the discharge of a pollutant into marine waters, such marine waters must exhibit characteristics assuring that water providing dilution does not contain significant amounts of previously discharged effluent from such treatment works. No permit issued shall authorize the discharge of any pollutant into marine or estuarine waters which at the time of application does not support a balanced, indigenous population of shellfish, fish and wildlife, or allow recreation in and on the waters or which exhibit ambient water quality below applicable water quality standards adopted for the protection of public water supplies, shellfish and wildlife, or recreational activities or such other standards necessary to assure support and protection of such uses. The prohibition contained in the preceding sentence shall apply without regard to the presence or absence of a causal relationship between such characteristics and the applicant’s current or proposed discharge.

On August 9, 1994, the EPA promulgated final regulations implementing these statutory criteria in 40 CFR Part 125, Subpart G. These regulations provide that a Section 301(h) modified NPDES permit may not be issued in violation of 40 CFR 125.59(b), which requires, among other things, compliance with provisions of the Coastal Zone Management Act (16 U.S.C. 1451 et seq.), the Endangered Species Act (16 U.S.C. 1531 et seq.), Title III of the Marine Protection, Research and Sanctuaries Act (16 U.S.C. 1431 et seq.), and other applicable provisions of State or Federal laws or Executive Orders such as requirements of Essential Fish Habitat of the Magnuson-Stevens Fishery Conservation and Management Act and the President’s Executive Order on Coral Reef Protection dated June 11, 1998. Furthermore, in accordance with 40 CFR 125.59(i), the decision to grant or deny a Section 301(h) waiver shall be made by the Administrator and shall be based on the applicant's demonstration that it has met all the requirements of 40 CFR 125.59 through 125.68, as described in this Decision Document. The EPA has reviewed all data submitted by the applicant in the context of applicable statutory and regulatory criteria and has presented its findings and conclusions in this Decision Document.

## SUMMARY OF FINDINGS

Based upon review of information provided by the applicant and other supporting documents, the EPA makes the following findings regarding each modified discharge and the combined discharge's compliance with statutory and regulatory criteria:

1. The modified discharges will not cause violations of PRWQS standards for dissolved oxygen, color, turbidity, or pH. [Section 301(h)(1), 40 CFR 125.61]
2. The applicant has demonstrated that it can consistently achieve PRWQS at and beyond the zone of initial dilution. The applicant's modified discharges from each facility, alone or in combination with pollutants from other sources, will not impact public water supplies. Each modified discharge as well as the combined discharge will not interfere with the protection and propagation of a balanced indigenous population of fish, shellfish, and wildlife, and will not affect recreational activities. [Section 301(h)(2), 40 CFR 125.62]
3. The applicant has proposed an adequate monitoring program to assess the impact of the modified discharges from each facility. The terms of this program will become enforceable conditions of the modified permits to be issued to the applicant. [Section 301(h)(3), 40 CFR 125.63]
4. The applicant's modified discharges will not result in additional treatment requirements on any other point or nonpoint sources. [Section 301(h)(4), 40 CFR 125.64]
5. The applicant has an industrial pretreatment program for both facilities and the program continues to be implemented on an island-wide basis. [Section 301(h)(5), 40 CFR 125.66 and 125.68]
6. The applicant has demonstrated that it has met the urban area pretreatment requirements. [Section 301(h)(6), 40 CFR 125.65]
7. The applicant has proposed a toxics control program to limit the entrance of toxic pollutants from nonindustrial sources into the treatment works. [Section 301(h)(7), 40 CFR 125.66]
8. There will be no new or substantially increased discharges from point sources of pollutants to which the waiver applies above those specified in the modified permits. [Section 301(h)(8), 40 CFR 125.67]
9. The applicant has demonstrated the modified discharges from the Bayamón and Puerto Nuevo RWWTPs will receive at least primary or equivalent treatment and meet the requirements established under Section 304(a)(1) of the Act after initial mixing. [Section 301(h)(9), 40 CFR 125.60]

## CONCLUSION

The EPA has concluded that each modified discharge from the Bayamón and Puerto Nuevo RWWTPs, and the modified discharges combined with wastewater from the Bacardí Corporation WWTP, will not adversely impact the marine environment and beneficial uses of the receiving water, and will comply with the requirements of Section 301(h) of the Act and 40 CFR Part 125, Subpart G.

## RECOMMENDATION

It is recommended that the applicant be granted two Section 301(h) modified permits in accordance with the above findings, and that a public notice of intent to issue the modified permits be prepared in accordance with all applicable provisions of 40 CFR Parts 122 and 124. In accordance with 40 CFR 125.68, each Section 301(h) modified permit for the Bayamón RWWTP (NPDES Permit No. PR0023728) and Puerto Nuevo RWWTP (NPDES Permit No. PR0021555) shall contain, in addition to all applicable terms and conditions required by 40 CFR Part 122, the following special conditions:

1. All requirements determined necessary by the Puerto Rico Department of Natural and Environmental Resources (DNER) as part of its final water Quality Certificates for the Bayamón and Puerto Nuevo RWWTPs to ensure that the modified discharges will comply with all applicable provisions of Commonwealth law, including water quality standards. [Section 401, 40 CFR 124.54]
2. Effluent limitations and mass loadings presented in Table 1, in accordance with 40 CFR Parts 122 and 125;

**Table 1 - Proposed Section 301(h) Modified Effluent Limitations**

Parameter		Units	Bayamón RWWTP	Puerto Nuevo RWWTP
Flow	Daily Maximum	MGD	88	144
	Monthly Average	MGD	52	80
BOD <sub>5</sub>	Weekly Average	kg/d	33,346	70,930
	Monthly Average	mg/l	100	117
	Monthly Average	kg/d	19,688	35,465
	Minimum Removal	%	30	30
TSS	Weekly Average	kg/d	19,783	40,920
	Monthly Average	mg/l	58	68
	Monthly Average	kg/d	11,673	24,460
	Minimum Removal	%	60	60

3. Requirements for the use of chemical addition (e.g., polymer) to increase solids removal to achieve a 60 percent removal rate, on a monthly average basis, for TSS;
4. Monitoring requirements for establishing and implementing the Bayamón and Puerto Nuevo RWWTPs' Section 301(h) Waiver Demonstration Studies that include, but are not limited

to, biological, effluent, and water quality monitoring that are consistent with 40 CFR 125.60, 125.62, 125.63, and 125.68(c);

5. Reporting requirements for the Bayamón and Puerto Nuevo RWWTPs Section 301(h) Waiver Demonstration Studies, in accordance with 40 CFR 125.68(d);
6. Requirements to modify, as necessary, and implement a toxics control program upon the effective date of each modified permit to limit the entrance of toxic pollutants from nonindustrial sources into the treatment works; and
7. Requirements for implementing a pretreatment program and nonindustrial control program in accordance with 40 CFR 125.65, 125.66, and 125.68(b).

## DESCRIPTION OF THE TREATMENT FACILITIES

The Bayamón RWWTP is located on the north coast of the island of Puerto Rico, within the town of Cataño. The facility provides wastewater treatment services to the towns of Bayamón, Cataño, Rio Piedras, Toa Alta, and part of Guaynabo. The Bayamón RWWTP first began operations in May 1983 and is designed to provide advanced primary treatment of wastewater through screening, grit removal, polymer-enhanced sedimentation, disinfection (chlorination), and sludge thickening. The facility is currently permitted for a maximum daily flow of 88 MGD and monthly average flow of 52 MGD.

The Puerto Nuevo RWWTP is located in the town of San Juan and provides wastewater treatment services to the towns of San Juan, Rio Piedras, Trujillo Alto and parts of Bayamón, Carolina and Guaynabo. The Puerto Nuevo RWWTP first began operations in 1957 and discharged to San Juan Bay until it was connected to the Bayamón RWWTP's ocean outfall in August 1985. The Puerto Nuevo RWWTP is designed to provide advanced primary treatment of wastewater through screening, grit removal, polymer-enhanced sedimentation, disinfection (chlorination), and sludge dewatering. In addition, the facility's collection system includes the Santurce Combined Sewer System (Santurce CSS). The facility is currently permitted for a maximum daily flow of 144 MGD and average monthly flow of 80 MGD.

Effluent from the Bayamón RWWTP and Puerto Nuevo RWWTP is combined with wastewater from the Bacardí WWTP and discharged through a joint outfall system directly into the Atlantic Ocean. The Bacardí WWTP is located within the town of Cataño on the coast of San Juan Bay and treats domestic and industrial wastewater from the Bacardí Corporation distillery. The facility has an average daily design flow of 2 MGD and a maximum daily design flow of 4 MGD and generally contributes less than one percent of the total combined flow through the joint outfall system. The joint outfall system consists of a "Y-shaped" high-rate diffuser with the terminus located approximately 7,365 ft (2,245.7 m) from the shoreline into the Atlantic Ocean, at a location approximately 3,600 ft (1,097 m) north of Isla de Cabras, at a depth of 141 feet (43 meters).

Initial Dilution. For the purpose of Section 301(h) evaluations, dilution is defined as the ratio of the total volume of the sample (ambient water plus effluent) to the volume of effluent in the sample.

Pursuant to 40 CFR 124.53, the Commonwealth of Puerto Rico must either grant a certification pursuant to CWA Section 401 or waive this certification before the EPA may issue a final permit. In 2019, PRASA submitted an application for a mixing zone to the DNER. On March 5, 2021, DNER issued a Final Water



Quality Certificate for each of the three facilities that included an authorization of a Mixing Zone. The critical initial dilution on which the current water quality certificate and NPDES permit based is 150:1.

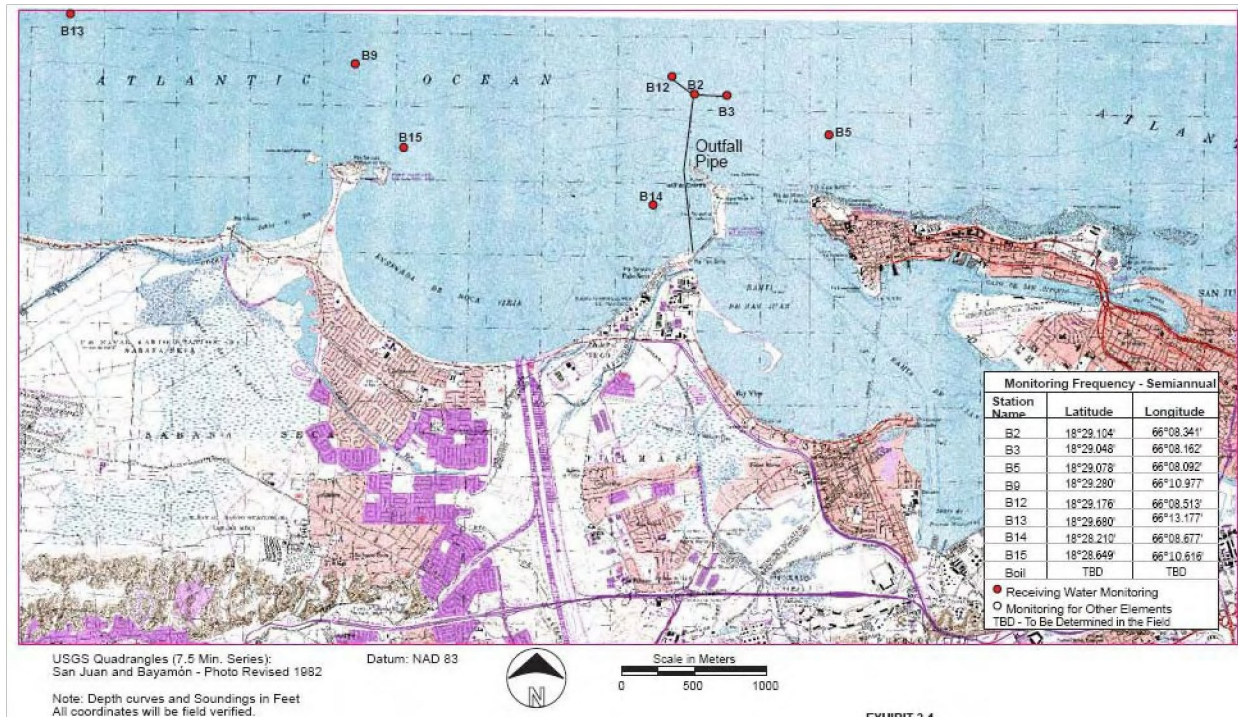


Figure 1. Location of ambient monitoring stations for the Bacardí WWTP/Bayamón RWWTP/Puerto Nuevo RWWTP joint outfall.

Since 1999, PRASA has been conducting receiving water monitoring in the vicinity of the zone of initial dilution (ZID). The current modified permits require the applicant to conduct annual Section 301(h) Waiver Demonstration Studies at eight receiving water monitoring stations (Figure 1), which include locations within the ZID (B2), at the boundary of the ZID (B3 and B12), beyond the ZID (i.e., farfield stations B5 and B9), onshore (B14 and B15), and at a reference site (B13). PRASA is also required to conduct coral community monitoring surveys at two stations (BC14 and BC15) located south of the joint outfall. Receiving water monitoring under the Section 301(h) Waiver Demonstration Studies consists of sampling at three depths: surface (10 feet), middle (50 feet), and bottom (90 feet). From 1999 to 2020 PRASA has conducted 33 receiving water monitoring events since the beginning of the Section 301(h) monitoring program.

## DESCRIPTION OF RECEIVING WATERS

The Bayamón and Puerto Nuevo RWWTPs are located on the north coast of the island of Puerto Rico. The north coast consists of a narrow shelf that forms continuously strong currents and wave action, which can be exacerbated by tropical storm events. Depths at the shelf break are typically around 700 feet (213 m) with the deepest depths ranging between 1,200 feet (366 m) and 2,400 feet (732 m). Because of strong wave action, the north coast has few coral reefs than the south coast region of the island, which has a wide shelf that protects the coast and allows for the support of fringing coral reefs. Coral reefs on the north coast are much lower in species diversity than those on the south coast or compared to other Caribbean reefs (Glynn 1973). The nearest coral assemblage to the joint outfall is

located approximately 0.5 miles southwest of the outfall and consists of a rock reef with very sparse hard coral growth.

Currents in the vicinity of the joint outfall are generally influenced by the Atlantic Ocean current system known as the North Equatorial Current. Local winds do not significantly affect the general hydrological flow patterns near the outfall, although they may influence surface currents.

In the renewal applications, PRASA indicated that there is little seasonal variation in the water column with respect to temperature and salinity. Density profiles at the joint outfall taken during wet and dry seasons indicate that thermoclines and haloclines do not form, which allows for constant mixing of the water column throughout the year. Also, annual ambient water temperatures are shown to range between 25 and 29 degrees Celsius (°C), with only minor seasonal and spatial differences. Annual temperature and salinity data indicate that surface-to-bottom differences of these parameters are small, and spatial differences are insignificant.

## APPLICATION OF STATUTORY AND REGULATORY CRITERIA

The Bayamón/Puerto Nuevo RWWTP compliance with Puerto Rico's Water Quality Standards Regulations (WQSR), as related to the receiving waters, was evaluated by the EPA based on the WQSR adopted on April 26, 2019 and the following documentation:

- Application for Renewal of the 301(h) Waiver for the Bayamón/Puerto Nuevo RWWTP, December 22, 2020,
- Puerto Rico Environmental Quality Board *Interim Mixing Zone and Bioassay Guidelines* (April 1988),
- Mixing Zone Application for the Bayamón/Puerto Nuevo RWWTP, 2016 and 2019,
- Quality Assurance Project Plan (QAPP) and Sampling and Analysis Protocols for the Bayamón/Puerto Nuevo RWWTP 301(h) Waiver Demonstration Studies (April 2008),
- Additional information related to the QA/QC, not included in the QAPP (email dated January 5, 2021),
- October 2015 Wet Season Report for the Bayamón/Puerto Nuevo RWWTP 301(h) Waiver Demonstration Studies, (submitted on January 27, 2016),
- April 2016 Dry Season Report for the Bayamón/Puerto Nuevo RWWTP 301(h) Waiver Demonstration Studies, (submitted on June 29, 2016),
- March 2018 Dry Season Report for the Bayamón/Puerto Nuevo RWWTP 301(h) Waiver Demonstration Studies, (submitted on September 13, 2018),
- October 2019 Wet Season Report for the Bayamón/Puerto Nuevo RWWTP 301(h) Waiver Demonstration Studies, (submitted January 31, 2020), and,
- February/March 2020 Dry Season Report for the Bayamón/Puerto Nuevo RWWTP 301(h) Waiver Demonstration Studies, (submitted June 23, 2020).

As described in the 2020 Renewal Application, a total of eight stations (Figure 1) were sampled annually from 2015 to 2020, in alternating wet and dry seasons for the 301(h) waiver demonstration studies.

The EPA analyzed the compliance with the applicable water quality standards (WQS) set in PR's 2019 WQSR based on monitoring completed for the 5-year reporting period (2015-2020), with no 301(h) monitoring conducted at the Bayamón/Puerto Nuevo RWWTP in 2017 as a result of Hurricane Maria.

Per the WQSR adopted by Puerto Rico in 2019, the Bayamón/Puerto Nuevo RWWTP discharges into Class SB waters. The criteria applicable to Class SB waters are Puerto Rico Water Quality Criteria set forth for Class SB waters (Table 2) in the Puerto Rico's WQSR in 2019.

**Table 2 - Uses and selected Water Quality Standards applicable for Class SB Coastal Waters of Puerto Rico**

<b>Class SB Uses and/or Description:</b> Coastal waters and estuarine waters intended for use in primary and secondary contact recreation, and for propagation and maintenance of desirable species, including threatened or endangered species.	
<b>Class SB Water Quality Standards:</b>	
Dissolved Oxygen	Shall not contain less than 5 mg/L, except when this value is depressed due to natural phenomena as defined under 2019 WQSR.
Coliform	In shellfish growing or harvesting areas, designated by the pertinent agency and adopted by the Department, through Resolution; the median fecal coliform concentration of a series of representative samples of the waters taken sequentially, shall not exceed 14 MPN/100 ml, and not more than 10 percent of the samples shall exceed 43 MPN/100 ml.
Enterococci	The enterococci density, in terms of geometric mean shall not exceed 35 colonies/100 ml in any 90-day interval; neither the 90th Percentile of the samples taken shall exceed 130 colonies/100 ml in the same 90-day interval.
pH	In no case the pH will lie outside the range of 7.3 to 8.5, standard pH units, except when it is altered by natural phenomena, as defined under 2019 WQSR.
Color	Shall not be altered except by natural phenomena, as defined under 2019 WQSR.  The waters of Puerto Rico shall be free from color attributable to discharges in such a degree as to create a nuisance to the enjoyment of the existing or designated uses of the water body.

Turbidity	<p>Shall not exceed 10 nephelometric turbidity units (NTU), except by natural phenomena, as defined under 2019 WQSR.</p> <p>The waters of Puerto Rico shall be free from turbidity attributable to discharges in such a degree as to create a nuisance to the enjoyment of the existing or designated uses of the water body.</p>
Taste and Odor Producing Substances	<p>Shall not be present in amounts that will interfere with primary contact recreation or will render any undesirable taste or odor to edible aquatic life.</p> <p>The waters of Puerto Rico shall be free from odor and taste attributable to discharges in such a degree as to create a nuisance to the enjoyment of the existing or designated uses of the water body.</p>
Sulfates	For SB estuarine waters, sulfates shall not exceed 2,800 mg/L.
Surfactants as MBAS:	Shall not exceed 500 mg/L.
Total Phosphorus	For SB estuarine waters, total phosphorus shall not exceed 1,000 µg/L.
Total Nitrogen	Shall not exceed 5,000 µg/L.
Temperature	<p>Except by natural phenomena, as defined under this regulation no heat which would cause the temperature of any site to exceed 86°F or 30°C, may be added to the waters of Puerto Rico.</p> <p>No thermal discharge or combination of thermal discharges into or onto the surface, estuarine and coastal waters shall be injurious to aquatic life or the culture or propagation of a balanced indigenous population there of nor in anyway affect the designated uses.</p>
BOD	The allowable level of biochemical oxygen demand of wastewater sources will be determined on a case by case basis, depending on the assimilative capacity of the receiving water body. Such determination will be performed to assure compliance with the dissolved oxygen standard applicable to the receiving water body.

## 1. Attainment of Water Quality Standards related to BOD<sub>5</sub> and TSS [Section 301(h)(1), 40 CFR 125.61]

Under 40 CFR 125.61, which implements Section 301(h)(1), there must be water quality standards applicable to the pollutants for which the modification is requested, and the applicant must demonstrate that the modified discharge will comply with these standards. The applicant has requested modified secondary treatment requirements for BOD<sub>5</sub>, which affects dissolved oxygen (DO), and TSS, which affects the color or turbidity in the receiving water. PRASA has not requested a permit modification from secondary treatment requirements for pH. PRWQS have established water quality criteria for DO, color, turbidity, and pH.

### a. Dissolved Oxygen

The 2019 PRWQSR requires that DO for Class SB waters, such as those in the vicinity of Bayamón/Puerto Nuevo RWWTP outfall, shall not be less than 5.0 mg/L except when natural conditions cause this value to be depressed.

Compliance with the applicable PRWQS for DO is assessed two ways: 1) by comparing ambient DO concentrations observed at all 301(h) monitoring stations with the applicable WQS; and 2) through the nearfield and farfield DO analyses for the Bayamón/Puerto Nuevo RWWTP.

#### (1) Ambient Water Evaluation:

DO concentrations in the receiving water were evaluated based on hydrographic profile data reported at one meter depth increments in the water column from monitoring stations with a depth approximately equal to or deeper than the discharge depth, including initial mixing zone stations. Selected by PRASA stations for assessment included stations B2, B3, B5, B9 and B12. Stations B13, B14 and B15 were not included in PRASA's assessment because they are in water depths too shallow to represent DO concentration at the discharge depth.

The minimum DO values measured from 2015 through 2020 in the receiving waters at the five (out of eight) stations selected by PRASA in the vicinity of the Bayamón/Puerto Nuevo RWWTP discharge ranged from a minimum value of 5.08 mg/L (at the bottom of Station B3 edge of mixing zone) in 2015 to a maximum value of 6.89 mg/L. All ambient DO values reported for the five selected monitoring stations were above the Class SB DO criteria of 5.0 mg/L.

Based on observed monitoring data in the vicinity of the Bayamón/Puerto Nuevo RWWTP outfall, the applicant has demonstrated that the applicable DO criterion for Class SB waters (5.0 mg/L) is being met in the ambient receiving waters. The EPA will continue to evaluate future DO data for compliance with applicable water quality standards.

#### (2) Nearfield and farfield DO analyses:

The calculation of effluent discharge effects on receiving water DO concentration is based on the procedure presented in Section II, Chapter 6, Part C, of the Puerto Rico

Environmental Quality Board *Interim Mixing Zone and Bioassay Guidelines* (EQB, 1988). The most recent (2019) PRWQSR criterion for DO in Class SB waters requires that the discharge not cause the receiving water DO to be less than 5 mg/L. The Guidelines provide for a sequential process to evaluate DO in the nearfield (following initial dilution) and in the farfield (following subsequent plume diffusion).

Accordingly, the results of the farfield DO demand calculations indicate an insignificant DO demand in the farfield (0.018 mg/L) after initial dilution, based on an effluent DO of 0.0 and an Initial DO Demand (IDOD) of 9.0 mg/L. The minimum DO is calculated to be greater than 5.0 mg/L. Therefore, the DO criterion of the PRWQSR (5.0 mg/L) will be achieved in both the nearfield and the farfield under worst-case conditions.

Based on the above, the EPA ambient water analysis and the Applicant's nearfield and farfield DO analyses, the EPA 301(h) Review Team concludes that the Bayamón/Puerto Nuevo RWWTP discharge will not cause violations of the 2019 PRWQS for DO in SB waters.

b. Color

Article 3.1.2 of PRWQS provides that “the waters of Puerto Rico shall be free from color attributable to discharges in such a degree as to create a nuisance to the enjoyment of the existing or designated uses of the waterbody.” Specifically, for Class SB waters, Article 3.2.2 provides that color shall not be altered except by natural causes. Color in water can reduce light penetration and affect aquatic life by limiting photosynthesis by phytoplankton and aquatic plants (EPA 1986b).

To assess the impact of the modified discharge on color in the receiving water, the EPA reviewed effluent and ambient monitoring data. Based on effluent monitoring data collected from February 2016 through January 2019, color was observed between 5 and 60 Pt-Co Units. Furthermore, based on Section 301(h) Waiver Demonstration Studies, the color at and beyond the ZID was reported between the levels of non-detect and 5 Pt-Co Units. In accordance with DNER's water quality certificate, the EPA proposes an effluent limitation of 60 Pt-Co for color in the draft permit. Based on review of effluent data, the EPA believes that the modified discharge will be able to meet this limitation.

c. Turbidity

Suspended solids in the effluent can result in a significant loading of particles to the water column and their subsequent deposition onto the seafloor in the vicinity of the modified discharge. Suspended solids can cause turbidity, decrease light penetration, and harm sensitive marine ecosystems by interfering with the light available for photosynthesis. Pursuant to 40 CFR 125.61 and 125.62, PRASA must demonstrate that the modified discharge from the Bayamón/Puerto Nuevo RWWTP will comply with water quality standards for suspended solids, which may include criteria for turbidity, light transmission, light scattering, or maintenance of the euphotic zone. In addition, PRASA must demonstrate that the outfall and diffuser are located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed, at and beyond the ZID, these water quality standards. Rule 1303.1 of PRWQS provides that “the waters of Puerto Rico shall be free ... from turbidity

attributable to discharges in such a degree as to create a nuisance to the enjoyment of the existing or designated uses of the waterbody.” Specifically, Rule 1303.2 B (f) provides that turbidity in Class SB waters shall not exceed 10 nephelometric turbidity units (NTUs), except by natural causes.

#### Ambient Waters Evaluation:

PRASA monitored ambient turbidity in Class SB waters, at 8 stations (B2, B3, B5, B9, B12, B13, B14, and B15) at three depths per station (10, 50 and 90 percent depth of the water column). During monitoring events from 2015 -2020, PRASA collected a total of 120 ambient turbidity samples, with values ranging from a minimum of 0.05 to a maximum of 1.37 NTUs. All of these samples were significantly below and in compliance with the Class SB turbidity criteria of 10 NTUs. In summary, Turbidity was consistently below the PRWQSR criterion of 10 NTU at the mixing zone boundary and in the adjacent receiving water.

Based on above data, all ambient turbidity samples collected were below and, therefore, in compliance with the PRWQS for turbidity of 10 NTUs.

#### d. pH

Pursuant to 40 CFR Part 133, secondary treatment requirements provide that effluent values for pH shall be maintained within the range of 6.0 to 9.0 standard units. In the renewal application, PRASA did not request a waiver from pH requirements.

In addition to the secondary treatment requirements for pH, Article 3.2 of PRWQS has established water quality criteria for pH for Class SB waters which states that “in no case the pH will lie outside the range of 7.3 to 8.5 standard pH units, except when caused by natural phenomena.” The EPA also evaluated receiving water monitoring data for pH at and beyond the edge of the mixing zone to ensure that the modified discharge will not cause or contribute to changes to pH levels in the receiving water.

All observed pH values are within the 7.3 to 8.5 SU range criterion. Based on review of all the pH data, the EPA has concluded that the applicant has demonstrated that the modified discharge will consistently meet water quality criteria for pH at and beyond the boundary of the ZID.

### **Puerto Rico Water Quality Standards Compliance - Receiving Waters**

#### **Field Parameters:**

**Temperature** – During monitoring events in 2015, 2016 and 2018, the maximum water temperature ranged from 26.73 deg C (in 2020) to 29.71 deg C (B13 background station in 2015). All observations for these events were below the PRWQSR maximum value of 30 deg C.

During the October 2019 sampling event, temperature exceeded the PRWQSR maximum value of 30 deg C at Station B2 (ZID), B5 (farfield location) and B14 and 15 (nearshore locations) with a range of 30.02 deg C to 30.18 deg C)

**pH** – The observed pH ranged from 8.10 SU in 2016 to 8.30 SU in 2018. All observed pH values are within the 7.3 to 8.5 SU range criterion.

**DO** – In October 2015 sampling event, the minimum DO value of 5.08 mg/L was observed at the bottom of Station B3 (edge of mixing zone). In April 2016, the minimum DO value of 5.65 mg/L was observed at the nearshore station B14 at mid-depth (8 meters below the surface). In March of 2018, the minimum DO value of 6.14 mg/L was observed at Station B3 (edge of mixing zone) at 32 meters below the surface. In October of 2019, the minimum DO value of 6.0 mg/L was observed at the farfield station B5 at 29 and 30 meters below the surface. In March 2020, the minimum DO value of 6.22 mg/L was observed at the farfield station B5 at 37 meters below the surface. All ambient minimum DO values were reported to be above the Class SB DO criterion of 5.0 mg/L.

In summary, 2019 PRWQSR criteria for temperature, pH and DO were met in the receiving waters based on the results of the 2015 – 2020 sampling events.

## **2. Attainment of Other Water Quality Standards and Impact of Discharge on Public Water Supplies; Shellfish, Fish and Wildlife; and Recreation [Section 301(h)(2), 40 CFR 125.62]**

Section 301(h)(2) of the Act provides that the Administrator may issue a permit which modifies the requirements of secondary treatment if the applicant demonstrates that the discharge of pollutants will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of water quality which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population (BIP) of shellfish, fish and wildlife, and allows recreational activities. Pursuant to 40 CFR 125.62(a), which implements Section 301(h)(2), the applicant's outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed, at and beyond the ZID, all applicable water quality standards, nor exceed section 304(a) criteria for toxic pollutants for which there are no applicable EPA-approved standards. Attainment of water quality criteria for DO, turbidity and pH was previously discussed. In accordance with 40 CFR 125.62(a), the EPA has assessed the impact of the combined discharge on the attainment of other water quality standards, including those for toxic pollutants, bacteria, and toxicity; and the impact on the protection and propagation of a BIP of shellfish, fish and wildlife; public water supplies and recreation.

- a. Pollutant-specific Analysis [40 CFR 125.62(a)] Toxic pollutants, bacteria and whole effluent toxicity.

Pursuant to the existing modified permits, PRASA monitors the concentration of approximately 150 pollutants including metals and pesticides in effluent from the Bayamón and Puerto Nuevo RWWTPs and in the receiving water. In accordance with 40 CFR 125.62(a), the EPA has assessed the potential for each pollutant to cause or contribute to an exceedance of PRWQS or the EPA water quality criteria at the edge of the mixing zone.

The EPA has applied a critical initial dilution of 150:1 to assess attainment of water quality criteria (i.e., toxic pollutants, bacteria, and whole effluent toxicity) at the ZID. For several pollutants, the EPA was unable to adequately assess their impact on water quality since effluent and receiving water concentration values were reported as generally not detected at the detection limit, which was often above the respective water quality criterion. Based on review of data collected for the Section 301(h) Waiver Demonstration Studies, the EPA determined that the detection limits for several pollutants, in particular pesticides, were generally not sensitive enough to adequately evaluate effluent and receiving water quality based on the criteria values specified in PRWQS.



## Conventional Constituents:

Out of all the conventional constituents analyzed against the 2019 PRWQSR (turbidity, MBAS, undissociated sulfide (H<sub>2</sub>S), total nitrogen, color, free cyanide and *Enterococcus* bacteria), all were observed at concentrations below the applicable water quality standards at the edge of the mixing zone (Stations B3 and B12) except for *Enterococcus* bacteria in 2015, 2018 and 2019, and total nitrogen in 2016 and 2020. Although exceedances on the WQS for free cyanide were observed, values were reported by PRASA as “estimated” thus were not considered in this analysis because such value may not be accurate or precise.

**Enterococcus** – 2019 PR WQSR include the criterion of geometric mean not to exceed 35 colonies/100 mL in any 90-day interval and the 90<sup>th</sup> percent tile of the same sample not to exceed 130 colonies/100 mL in the same 90-day interval, applicable to class SB waters. PRASA used the geometric mean of five samples per station for *Enterococcus* bacteria data analysis.

### Ambient Water Evaluation:

**2015** - *Enterococcus* bacteria concentrations at Stations B3 (edge of ZID; 90<sup>th</sup> percentile depth) and B12 (edge of ZID at 50<sup>th</sup> and 90<sup>th</sup> percentile depths) were reported at greater than the WQS. The maximum geometric mean for *Enterococcus* bacteria concentrations was 190 colonies/100 mL at the 50<sup>th</sup> percentile depth at Station B12. At Station B3 the geometric mean was 36 colonies/100 mL.

**2018** – Geometric means of *Enterococcus* bacteria concentrations exceeded the WQS at the 10<sup>th</sup> and 50<sup>th</sup> percentile depths at Station B3 (edge of ZID; 88 colonies/100mL and 236 colonies/100 mL, respectively). One out of five single-sample *Enterococcus* bacteria concentrations collected at B3 (10<sup>th</sup> percentile depth) was greater than 130 colonies/100 mL (160 colonies/100 mL) and five out of five single-sample concentrations collected at Station B3 at 50<sup>th</sup> percentile depth were greater than 130 colonies/100 mL.

**2019** - Geometric means of *Enterococcus* bacteria concentrations exceeded the WQS at the 90<sup>th</sup> percentile depth at Station B12 (edge of ZID; 48 colonies/100mL and at all depths at Station B3 (edge of ZID; with maximum value of 501 colonies/100 mL at 90<sup>th</sup> percentile depth). Three out of five single-sample *Enterococcus* bacteria concentrations collected at B3 (10<sup>th</sup> percentile depth) were greater than 130 colonies/100 mL and five out of five single-sample concentrations collected at Station B3 at 90<sup>th</sup> percentile depth were greater than 130 colonies/100 mL.

**Total Nitrogen** – 2019 PR WQSR include the criterion of 5,000 ug/L (5 mg/L).

### Ambient Water Evaluation:

**2016** – Total Nitrogen concentration (sum of NO<sub>3</sub>+NO<sub>2</sub>+TKN) of 10.2 mg/L, above the WQS was observed at 50<sup>th</sup> percentile depth at Station B9 (farfield). Total nitrogen concentrations were below WQS at all other stations.

**2020** - Total Nitrogen concentration (sum of NO<sub>3</sub>+NO<sub>2</sub>+TKN) of 14.4 mg/L, above the WQS was observed at 90<sup>th</sup> percentile depth at Station B12 (edge of ZID). Total nitrogen concentrations were below WQS at all other stations.

In summary, as a result of annual sampling completed from 2015 to 2020, out of all conventional constituents analyzed against numeric water quality standards, all were observed at concentrations below 2019 PRWQSR at all monitoring stations, except for *Enterococcus* bacteria and Total Nitrogen. All of the *Enterococcus* bacteria exceedances were reported at either Station B3 or B12, which represent edge of the mixing zone. Enterococci bacteria concentrations exceedances were not detected at any of the stations beyond the mixing zone boundary.

### **301(h) Program Constituents:**

The Bayamón/Puerto Nuevo QAPP/SAP requires effluent and receiving water monitoring for the full list of EPA Priority Pollutants, as well as for certain parameters included in the EPA Marine Water Quality Criteria, on either an annual basis or once per 5-year permit period. PRASA, as part of its annual monitoring events completed from 2015-2020, analyzed the full list of EPA priority pollutants in the Bayamón/Puerto Nuevo RWWTP effluent and in the ambient receiving waters, at eight ambient monitoring stations and at three depths per station (10, 50 and 90 percentile).

Eleven of the compounds detected in the receiving waters from 2015 to 2020 were present at concentrations below the 2019 PRWQSR at the edge of the ZID (Stations B3 and B12), except for Sulfate.

**Sulfates** - PR WQSR include the criterion of not to exceed 2,800 mg/l for sulfates, applicable to estuarine class SB waters.

In 2015, sulfate concentrations were reported at greater than the WQS at all receiving water stations and depths, with a maximum concentration of 3,246 mg/L. In 2016, sulfate concentrations were reported at greater than the WQS at all receiving water stations and depths, with a maximum concentration of 3,107 mg/L except. In 2018, sulfate concentrations were reported at greater than the WQS at all receiving water stations and depths, with a maximum concentration of 3,196 mg/L. None of the receiving water samples exceeded the WQS for sulfate in 2019 or 2020. Because elevated sulfate concentrations were reported throughout the study area (including reference and farfield sites), these exceedances are not believed to be attributable to the Bayamón/Puerto Nuevo RWWTP outfall.

All of the compounds detected in the receiving waters in 2015-2020 were present at concentrations below the 2019 PRWQSR. The exceedances of sulfates in 2015, 2016 and 2018 are not considered to be a representative of receiving water condition around the Bayamón/Puerto Nuevo RWWTP outfall. As a result, it is the EPA's conclusion that these data indicate that the receiving waters in the vicinity of the Bayamón/Puerto Nuevo RWWTP outfall are not being adversely influenced by the discharge of effluent treated at the advanced primary level.

### **Parameters for which compliance with the 2019 WQSR could not be evaluated**

The evaluation of Program Detection Limits and Laboratory Reporting Limits as related to the applicable 2019 WQSR was performed. The exhibit below provides list of compounds for which the Reporting Limits exceed the corresponding water quality criteria. As the result, for the parameters listed below, compliance with the applicable WQSR cannot be determined.

Exhibit 1. Compounds for which Reporting Limits as listed in the QAPP exceed corresponding PR Water Quality Criteria

	2019 WQSR ug/L	Program Detection Limit Ug/L	Reporting Limits Ug/L
Aldrin	0.0000077	0.00025	0.0004
Dieldrin	0.000012	0.0002	0.0004
Heptachlor	0.000059	0.00025	0.0004
Heptachlor Epoxide	0.00032	0.00025	0.0004
Toxaphene	0.0002	0.05	0.1
Guthion	0.01	0.05	0.1
Chlorpyrifos	0.0056	0.025	0.05
Demeton	0.1	0.075	0.15
Benzo(a) anthracene	0.013	0.1	0.2
Benzo(a) pyrene	0.0013	0.1	0.2
Benzo(b)fluoranthene	0.013	0.1	0.2
Benzidine	0.11	10	20
Benzo(k)fluoranthene	0.13	0.1	0.2
Dibenzo(a,h)anthracene	0.0013	0.1	0.2
3,3-Dichlorobenzidene	1.5	5	10
1,2 Diphenylhydrazine	2	5	10
Indeno(123-cd) pyrene	0.013	0.1	0.2
N-nitrosodi-n-propylamine	5.1	5	10
4,4 – DDE	0.00018	0.00025	0.0004
4,4 DDT	0.0003	0.00025	0.0004
Pentachlorophenol	0.4	5	10

	2019 WQSR ug/L	Program Detection Limit Ug/L	Reporting Limits Ug/L
2,3,7,8 -TCDD (Dioxin)	5.1 x 10 <sup>-8</sup>	5	10
1,2,4 -Trichlorobenzene	0.76	5	10
1,2 – Diphenylhydrazine	2	5	10
3,3 – Dichlorobenzidine	1.5	5	10
Bis (2 Ethylhexyl) Phthalate	3.7	5	10
Butylbenzyl Phthalate	1	3	6
Hexachlorobutadiene	0.1	5	10
Hexachlorocyclopentadiene	4	5	10
Hexachloroethane	1	5	10

Because the Reporting Limits for these parameters are higher than the applicable WQS criteria, the EPA 301(h) Review Team is not able to determine whether or not the Bayamón/Puerto Nuevo RWWTP discharge is anticipated to adversely affect these levels in the receiving water during the next permit term. PRASA must use appropriate the EPA approved testing methods that the detection limits are adequate and lower enough to address the Detection Limits and Reporting Limits for these parameters during the next permit term.

### Whole Effluent Toxicity Requirements

Rule 1303.1(I) of PRWQS provides that all waters of Puerto Rico shall not contain any substance at such concentration which, either alone or as result of synergistic effects with other substances is toxic or produces undesirable physiological responses in human, fish or other fauna or flora. This is generally referred to as a narrative water quality criterion “no toxics in toxic amounts”. PRWQS do not provide a numeric criterion for toxicity. Since controls on individual pollutants may not always adequately protect water quality, toxicity testing is used to assess and control whole effluent toxicity (WET) which is necessary to reduce or eliminate the toxic impact of the effluent and meet narrative water quality criteria (54 FR 23868, June 2, 1989). NPDES regulations define WET as the whole or aggregate toxic effect of an effluent measured directly by a toxicity test.

Pursuant to the current modified permits, PRASA and the Bacardí Corporation are required to conduct acute and chronic WET testing on the combined effluent, and chronic WET testing on individual effluent samples from the Bayamón RWWTP, Puerto Nuevo RWWTP, and the Bacardí WWTP. PRASA has conducts acute WET monitoring for the combined effluent using the mysid shrimp (*Mysidopsis bahia*) and sheepshead minnow (*Cyprinidon variegates*), and chronic WET monitoring events using these WET test species as well as purple sea urchin (*Arbacia punctulata*).

Since effluent toxicity is inversely related to the effect concentration (the lower the effect concentration, the higher the toxicity in the effluent), WET test data are sometimes expressed as toxic units (TUs) to better illustrate the magnitude of potential toxicity. Rule 1301.1 of PRWQS defines acute TU (TU<sub>a</sub>) and chronic TU (TU<sub>c</sub>) values as the Lethal Concentration (LC<sub>50</sub>) of the tested effluent at which 50 percent of the test organisms die, where  $TU_a = 100 \div LC_{50}$ ; and the No Observed Effect Concentration (NOEC), where  $TU_c = 100 \div NOEC$ , respectively.<sup>2</sup> To assess WET test data, PRWQS definitions at Rule 1301.1 include a criterion maximum concentration (CMC) of 0.3 TU<sub>a</sub> and criterion continuous concentration (CCC) of 1.0 TU<sub>c</sub> be used to ensure aquatic life protection against toxicity in the receiving water, which is based on the EPA recommended national water quality criteria (EPA 1991).

For the purpose of the Section 301(h) evaluation, the EPA determined the maximum allowable level of effluent toxicity or wasteload allocation (WLA) at the edge of the mixing zone that would still ensure attainment of water quality criteria for toxicity. With consideration of dilution and CMC and CCC values, the EPA calculated acute and chronic WLAs of 30.6 TU<sub>a</sub> and 102 TU<sub>c</sub>, respectively, and then compared the WLAs to effluent WET test data.

For the combined effluent, acute results were below the WLA of 30.6 TU<sub>a</sub>. Most chronic WET tests reported TU<sub>c</sub> values based on the NOEC that were below the chronic WLA of 102 TU<sub>c</sub>. In March 2019, chronic test results for growth of *Mysidopsis bahia* were observed at levels above the chronic WLA of 102 TU<sub>c</sub>, calculated using the inverse of the NOEC concentration. This level of chronic effects triggered accelerated monitoring, as required by the current permit. Subsequent chronic results were within permit limits and below the chronic WLA.

Based on review of WET data, in accordance with 40 CFR 122.44(d)(v), the EPA has determined that the combined discharge will cause, has the reasonable potential to cause, or contributes to an excursion above the narrative criterion for chronic toxicity and has proposed effluent limitation for the combined discharge. With consideration of dilution, the EPA has proposed a maximum daily effluent limitation of 83.32 TU<sub>c</sub>, expressed as any combined discharge chronic test result greater than or equal to 1.2% effluent in the draft modified permits for the Bayamón RWWTP, Puerto Nuevo RWWTP, and Bacardí WWTP. The EPA believes that the combined discharge will meet this effluent limitation upon permit issuance.

In addition to the limitation, the EPA has included other toxicity testing requirements on the individual effluents from these three facilities, as these effluents combine prior to discharge. Such monitoring is also required by the draft Water Quality Certificate issued by the Puerto Rico Department of Natural and Environmental Resources. The toxicity observed in the effluent may be the result of toxicity in one or more of the discharges, or it may be the result of synergistic effects that occur when the effluents combine prior to discharge. The contemporaneous testing on each of the effluents from these facilities will provide an indication as to the source of any toxicity observed in the combined discharge.

The EPA has required in the past that all three dischargers develop plans for a toxicity reduction evaluation (TRE). The three dischargers may coordinate and develop one plan to meet the permit requirement in each NPDES permit. Violation of the limitation for chronic toxicity using the combined discharge would trigger accelerated monitoring of both the combined discharge and the individual

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The NOEC is the highest tested effluent concentration (in percent effluent) that does not cause an adverse effect on the test organism (i.e., the highest effluent concentration at which the values for the observed responses are not statistically different from the control).

contributions from Bacardí, and PRASA Bayamón and Puerto Nuevo facilities for twelve weeks. During the accelerated testing period an additional violation of the limitation on the combined discharge would require these three permittees to activate their TRE workplans, and implement their strategy to identify and abate the source of toxicity.

Based on review of WET data, the EPA has concluded that the applicant has consistently demonstrated that the combined discharge will meet water quality standards for toxicity in the receiving water as required by 40 CFR 125.62(a). However, in accordance with 40 CFR 122.44(d)(v), the EPA has determined that the combined discharge will cause, has the reasonable potential to cause, or contributes to an excursion above the narrative criterion for chronic toxicity and has proposed effluent limitations for the combined discharge. With consideration of dilution, the EPA has proposed a maximum daily effluent limitation of 83.32 TUC (or 1.2 percent effluent) for chronic toxicity in the draft modified permits for the Bayamón RWWTP, Puerto Nuevo RWWTP, and Bacardí WWTP. The EPA believes that the combined discharge will meet this effluent limitation upon permit issuance.

b. Impact of Discharge on Public Water Supplies [40 CFR 125.62(b)]

Pursuant to 40 CFR 125.62(b), which implements Section 301(h)(2) of the Act, the applicant's modified discharge must allow for the attainment or maintenance of water quality that assures the protection of public water supplies. The applicant's modified discharge also must not interfere with the use of planned or existing public water supplies. Drinking water supplies in Puerto Rico are derived from inland surface and groundwater sources and thus drinking water (for human consumption) has not been established as a designated use for Class SB waters (Rule 1303.2 of PRWQS). Consequently, the modified discharges from the Bayamón and Puerto Nuevo RWWTPs are not likely to affect public water supplies since ocean waters within the vicinity of the joint outfall are not considered a source of public water supply at the present time nor are expected to become one in the near future.

c. Biological Impact of Discharge [40 CFR 125.62(c)]

Pursuant to 40 CFR 125.62(c), the applicant must demonstrate that its modified discharge will allow for the attainment or maintenance of water quality which assures protection and propagation of a balanced indigenous population (BIP) of shellfish, fish and wildlife, and that a BIP of shellfish, fish and wildlife will exist in all areas beyond the ZID that might be affected by the modified discharge. PRASA has completed 33 waiver monitoring events in total since the beginning of the section 301(h) waiver monitoring program in 1999. For the purpose of this Section 301(h) evaluation, monitoring data were reviewed to assess the biological conditions of phytoplankton, benthic invertebrate, fish, and coral reef communities in the vicinity of the Bayamón RWWTP/Puerto Nuevo RWWTP/Bacardí WWTP joint outfall. As part of the renewal applications, PRASA reviewed monitoring data collected between 2015 to 2020 to provide for a more robust statistical analysis.

## Phytoplankton

Eutrophication of coastal waters and the occurrence of phytoplankton blooms can result in significant economic and ecological consequences. Increased levels of nutrients such as nitrogen and phosphorus are generally associated with conditions of eutrophication and phytoplankton blooms, with nutrient inputs largely resulting from anthropogenic sources such as agricultural runoff, and sewage and

industrial discharges. Chlorophyll *a* (Chl-*a*) is often used as an indicator of eutrophication where high nutrient inputs are suspected or documented. In the renewal applications, PRASA indicated that phytoplankton blooms have not been documented in the vicinity of the joint outfall.

Results of chlorophyll *a* concentrations from 2015 to 2020 for each sampling station and each depth during the 5-year study period of sampling were analyzed. The results of the analyses of chlorophyll *a* indicate that chlorophyll *a* concentrations at the stations nearest to the outfall are comparable to, if not lower in average concentration than, those found elsewhere within the study area. It was observed that although chlorophyll *a* concentrations vary among sampling periods and among sampling stations, there are no patterns that indicate that the Bayamón/Puerto Nuevo/Bacardí outfall effluent discharge is affecting chlorophyll *a* or phytoplankton.

Based on chlorophyll-*a* monitoring in the receiving water, the discharge of nutrients from the combined discharge does not appear to be at levels that would result in excessive phytoplankton growth in the vicinity of the joint outfall.

### **Benthic Invertebrates**

In aquatic systems, monitoring of benthic invertebrates adjacent to wastewater outfalls can provide useful information on the spatial extent and magnitude of impacts of the discharge to the surrounding area. Benthic communities are an important component in the analysis of a BIP since they are sedentary or relatively immobile and therefore may be chronically exposed to discharged pollutants or adversely affected by the organic enrichment of sediments from the discharge. To assess the effect of the modified discharges on the benthic infaunal community, sediment quality and accumulation were evaluated as an initial step toward understanding the impact of the modified discharges. The number of taxa and several biological indices (including the Shannon-Wiener diversity index, species evenness and species richness) were then used to describe the overall condition of the benthic community.

- **Number of Taxa.** This index measures the overall variety of the macroinvertebrate assemblage in a community. The station with the highest number of taxa (91) was also at the boundary of the ZID (Station B12). The ZID and reference station (Stations B2 and B13, respectively) had the same average of 44 taxa during the 5-year period. In addition, the ZID boundary east and east farfield stations (B3 and B5, respectively) had the same number of taxa (51). Overall, the data show the number of taxa to be relatively stable through time, with no trends related to the location of the outfall.
- **Shannon-Wiener Species Diversity Index (H).** This index is used to characterize species diversity in a community. This index accounts for both abundance and evenness of the species present. The highest average species diversity value (3.77) was associated with the ZID boundary station (B12), and the lowest average was associated with the farfield station (B9). The ZID and ZID boundary stations (B2, B3, and B12) had the highest average species diversity values during the 2015–2020 period. Similar to the results of the analysis of the number of taxa, the data do not appear to show any trend in the Shannon-Wiener species diversity index relative to the position of the outfall during the 2015–2020 reporting period.
- **Species Evenness (Pielou's Evenness J).** This index provides a measure of the similarity of the abundances of different species in a group or community. Average species evenness values were greatest at all of the ZID stations (B2, B3, and B12) and the reference station (B13). The lowest

average J index value was associated with the farfield station (B5), which has declined since the 2018 event and may be related to the hurricane. There is no overall trend in average species evenness related to outfall proximity during the 2015– 2020 reporting period.

- **Species Richness (Margalef’s Diversity ‘d1’).** The species richness metric (D) is a measure of number of species and takes no account of the number of individuals of each species in the community. On average, the greatest species richness D value was found at the ZID edge station (B12). The lowest species richness value was found at the west farfield station (B9). The ZID and ZID edge stations (B2 and B3, respectively) had very similar richness values to the reference station (B13). There appears to be little difference between stations sampled during the 5-year monitoring period and no indication of adverse effects on species richness relative to the location of the Bayamón/Puerto Nuevo/Bacardí outfall.
- **Number of Individuals.** This metric is a measure of the abundance of individual organisms sampled at each station. The eastern farfield station (B5), east ZID edge station (B12), and west farfield station (B9) had the highest average number of individuals (2,149, 1,495, and 1,102, respectively). The lowest average number of individuals were found at the reference station (B13) with 688 individuals. No effects related to the outfall operation were apparent based on the number of individuals. With respect to the number of individuals of benthic infaunal species, there is no apparent trend relative to the position of the outfall and its ZID.
- **Estimated Density.** This metric is a measure of abundance of individuals per square meter. Similar to the number on individuals, eastern farfield station (B5), east ZID edge station (B12), and west farfield station (B9) had the highest average organism density. Station B13 (reference) had the lowest average density and falls within the same range as the ZID and ZID edge east (stations B2 and B3, respectively). There is no apparent trend in species density related to outfall proximity during the 5-year monitoring period.

Based on the infaunal benthic invertebrate monitoring surveys at the Bayamón/Puerto Nuevo/Bacardí outfall and vicinity indicate that the benthic communities at the sampling stations, including the stations associated with the ZID, contained moderately to highly diverse populations of infaunal benthic invertebrates. The data do not show any adverse trend in the number of taxa or the diversity of benthic infaunal species among the stations sampled.

#### Sediment Quality and Accumulation.

Many of the potential impacts of wastewater discharges are associated with the discharge of suspended solids and toxic pollutants that accumulate in the sediment. Suspended solids in the effluent can result in a significant loading of solids, in some cases with adsorbed pollutants, to the water column that subsequently deposit onto the seafloor and influence DO levels in near-bottom waters and pollutant concentrations in the sediments that can adversely impact benthic communities. Analysis of sediment was based on annual surveys conducted by PRASA between 2015 to 2020.

Sediment samples were evaluated for the presence of constituents regulated by the EPA under the 301(h) program, including priority pollutant organic compounds, pesticides, metals, and other miscellaneous inorganic constituents. Only two organic constituents were found during the 5-year period: chloroform and methylene chloride. Both were detected in sediment at the ZID station (B2) from 2015 to 2020, where all reported concentrations were less than applicable NOAA



benchmark concentrations. The same was true for concentrations reported in sediments from the edge-of-ZID (B3 and B12), farfield (B5 and B9), and reference (B13) stations.

A total of 17 metals and inorganic constituents detected or estimated in sediments collected at the sampling stations during the reporting period (2015 to 2020). NOAA ER-L, ER-M, and AET benchmark concentrations for each constituent are compared. Concentrations of inorganic constituents in the sediments were generally approximately equal to or lower at the ZID (Station B2) than at the reference and farfield stations.

With respect to sediment benchmark screening values, concentrations of the inorganic constituents found in the sediments are generally less than levels associated with possible adverse effects (benchmark values). In all cases for which NOAA ER-M screening benchmarks are available (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), concentrations in sediments at the edge of the ZID did not exceed ER-M values. Additionally, none of the 17 inorganic constituents in sediments collected at the ZID (Station B2) in February 2020, as well as during the previous four monitoring events, had concentrations greater than the NOAA ER-L, AET, or other screening benchmark values for marine sediments. It indicated that the accumulation of sediments or toxic pollutants do not present a significant risk to the benthic community in the vicinity of the joint outfall.

#### Benthic Community Indexes and Sediment Analyses.

Review of the extensive benthic data set for stations in the vicinity of the Bayamón/Puerto Nuevo/Bacardí outfall, a statistical analysis was performed by PRASA to compare stations and evaluate trends over the entire period of record (November 2015 to March 2020). The benthic statistical mean and trend results for the reporting period indicated that:

- **Sediment Nutrient Concentrations:** When compared to the ZID (B2), stations exhibited similar sediment chemistry for TP, TKN, and TOC, except for two farfield stations (B5 and B9), which reported comparatively higher TP concentrations and the reference station (B13), which reported lower TOC concentrations than the ZID. During the study period, a decreasing trend was observed for TKN at Stations B12 (edge of ZID) and B13 (reference), for TOC at Station B9 (farfield), and for TP at Station B3 (edge of ZID). No other trends were observed.
- **Sediment Particle Size:** Variation in particle size distribution was evident at the edge of ZID (B12) and reference (B13) stations from the ZID station (B2). With respect to trends, clay and silt decreased and sand increased at Station B9 (farfield), and gravel increased at Station B12 (ZID edge) during the study period. No other trends related to particle size were evident.

Based on the above, the benthic macroinvertebrate and sediment monitoring at the Bayamón/Puerto Nuevo/ Bacardí ocean outfall indicate that the outfall has no measurable effect on the infaunal populations in its vicinity.

#### **Fish Bioaccumulation Assessment**

Fish specimens are collected for bioaccumulation analyses and assessment every 5 years, as specified in the QAPP/SAP; therefore, the most recent data are from 2015. The potential effects on the biological community resulting from chemical concentrations in fish tissue were evaluated by comparing concentrations to benchmark values that indicate potential risk. In the EPA National Sedimentation

Conference Proceedings, a set of tissue screening concentration benchmarks was developed. The tissue screening concentration benchmarks were used to determine whether fish tissue concentrations of inorganic constituents were at levels potentially harmful to marine environments. Samples were analyzed for 16 priority pollutant metal constituents and results were compared to tissue screening concentration benchmarks.

In general, concentrations of constituents that were quantifiable in fish tissues collected from the ZID (Station B2) were comparable to those demonstrated at the reference location (Station B13) and/or farfield locations (Stations B5 and B9). Furthermore, most constituents were detected at concentrations far below the established EPA benchmarks for bioaccumulation and do not indicate harm to fish. For the most part, where a benchmark concentration was exceeded at the ZID station, it was also exceeded at the reference or farfield stations, which indicates that the accumulation was not related to the effluent discharge.

Because elevated metal concentrations for arsenic, barium, chromium, mercury, nickel, and selenium were detected above benchmarks either throughout the study area or only in single fish specimens, the estimated/detected ZID concentrations for these six constituents are not likely attributable to the discharge. In summary, the results of the analysis of fish tissue samples collected at stations at the outfall, as well as from sites located outside the immediate influence of the effluent, indicate that no significant deleterious bioaccumulation of metals in fishes has occurred.

### **Coral Reef Communities as Distinctive Habitats of Limited Distribution**

Distinctive habitats of limited distribution are defined as habitats whose protection is of special concern because of their ecological significance, such as coral reefs, or value to humans, such as for subsistence fishing (EPA 1994a). Because of their nature, distinctive habitats of limited distribution may be highly susceptible to the potential effects of discharged suspended solids, nutrients, and other pollutants on the unique faunal components of marine communities. Coral reefs on the North Coast of Puerto Rico are poorly developed due to the strong wind and wave action. The nearest coral community is located approximately 0.5 miles south of the joint outfall. Since 2006, PRASA has conducted three coral reef monitoring events at two onshore stations, B14 and B15. PRASA indicates that coral reefs in these areas are naturally poorly developed compared to coral reefs in the southern part of the island due to rough wave conditions.

Based on the coral community assessments conducted from 1999 through 2008, it indicated that there is no well-developed coral reef community near the outfall's mixing zone or at any of the stations sampled. These conditions are believed to be attributable to the natural physical stresses on the community caused by the high-energy nearshore environment, coupled with discharge of San Juan Harbor sediment, which is susceptible to frequent episodes of resuspension. There is no evidence that coral community conditions in the study area are influenced by discharges from the Bayamón/Puerto Nuevo/Bacardí outfall.

### **Biological Impact of Discharge Conclusion**

Biological monitoring data indicate that the modified discharges will allow for the attainment or maintenance of water quality which assures protection and propagation of a BIP of shellfish, fish and wildlife, and that a BIP of shellfish, fish and wildlife will exist in all areas beyond the ZID that might be

affected by the modified discharges. Therefore, the EPA has concluded that PRASA has met the requirements of 40 CFR 125.62(c).

#### Absence of Extreme Adverse Impacts Within the ZID [40 CFR 125.62(c)(3)]

Pursuant to 40 CFR 125.62(c)(3), conditions within the ZID must not contribute to extreme adverse biological impacts, including but not limited to, the destruction of distinctive habitats of limited distribution, the presence of disease epicenters, or the stimulation of phytoplankton blooms which have severe adverse effects beyond the ZID. Since issuance of the EPA's 2007 Final Decision and modified permits, effluent and receiving water monitoring data continue to indicate that the modified discharges from the Bayamón and Puerto Nuevo RWWTPs will provide for the attainment of water quality criteria for DO, turbidity, toxic pollutants, and toxicity, and maintenance of a BIP during the next permit term. The EPA is not aware of any phytoplankton blooms, fish kills, or other adverse impacts in the vicinity of the joint outfall, and does not anticipate any adverse impacts during the next permit term to rise to the level of being extremely adverse as a result of the modified discharges. The modified discharges are to open coastal waters that provide a dynamic mixing zone unstratified in nature and influenced by largescale, wind-driven ocean currents, and thus are not likely to cause conditions within the ZID that would contribute to extreme adverse biological impacts as a result of the discharges.

#### d. Impact of Discharge on Recreational Activities [40 CFR 125.62(a) and (d)]

Under 40 CFR 125.62(a) and (d), the applicant's outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed, at and beyond the ZID, all applicable water quality standards, and that the discharge must allow for the attainment or maintenance of water quality which allows for recreational activities beyond the ZID, including, without limitation, swimming, diving, boating, fishing, picnicking, and sports activities along shorelines and beaches. There must also be no federal, territorial, or local restrictions on recreational activities within the vicinity of the applicant's outfall unless such restrictions are routinely imposed around sewage outfalls or would be lifted or modified if the applicant's Bayamón or Puerto Nuevo RWWTPs were upgraded to secondary treatment (EPA 1994a).

PRASA has indicated that the joint outfall is located more than 0.6 miles from any existing or potential recreational beaches and that the prevailing long-shore ocean currents creates rapid flushing and dispersion that result in little, if any, impacts to recreational activities.

The outfall is located 3,600 feet offshore in marine waters approximately 131 feet deep. The discharge is to an open ocean environment and, therefore, poses no risk to any current or proposed public water supply systems. The generally rough waters of the north coast of Puerto Rico discourage significant recreational activities in the discharge area. As a result, and because it is adjacent to a navigation channel for commercial shipping, there is little recreational fishing or boating near the outfall.

As summarized in the 2016 Mixing Zone Application and confirmed by five receiving water sampling events during the 2015–2020 reporting period, the data demonstrate that the outfall does not cause water quality criteria established to protect public health and the environment to be exceeded at the edge of the small mixing zone. Therefore, the effluent from the Bayamón/Puerto Nuevo/Bacardí outfall does not negatively affect recreational activities.

Effluent concentrations of bacteria from the Bayamón and Puerto Nuevo RWWTPs indicate that the modified discharges, alone and in combination with effluent from each other and the Bacardí WWTP, will consistently meet water quality criteria for bacteria at the ZID and allow for recreational activities such as water contact recreation (40 CFR 125.62(a) and (d)). To ensure continuing protection of Class SB waters for recreational use, the EPA has proposed effluent limitations for both enterococci and fecal coliform in the draft permits for the Bayamón and Puerto Nuevo RWWTPs.

Since bacterial contributions from the Bacardí WWTP are significant to the combined discharge, the EPA also reviewed bacteria concentrations in the receiving water at and beyond the ZID to further assess the potential impact of bacteria on water quality. Effluent concentrations of bacteria from the Bayamón and Puerto Nuevo RWWTPs indicate that the modified discharges, alone and in combination with effluent from each other and the Bacardí WWTP, will consistently meet water quality criteria for bacteria at the ZID and allow for recreational activities such as water contact recreation (40 CFR 125.62(a) and (d)). To ensure continuing protection of Class SB waters for recreational use, the EPA has proposed effluent limitations for both enterococci and fecal coliform in the draft permits for the Bayamón and Puerto Nuevo RWWTPs.

#### Stressed Waters [40 CFR 125.62(f)]

Under 40 CFR 125.62(f) the applicant must demonstrate that the modified discharge will not contribute to, increase, or perpetuate stressed conditions, contribute to further degradation if pollution from other sources increases, and will not retard recovery if pollution from other sources decreases. As defined in 40 CFR 125.58(z), stressed waters are those ocean waters for which an applicant can demonstrate that the absence of a BIP is caused solely by human perturbations other than the applicant's modified discharge. PRASA has indicated that the Bayamón and Puerto Nuevo RWWTPs do not discharge into stressed waters, as defined in 40 CFR 125.58(z). Since PRASA has demonstrated that a BIP exists in the vicinity of the joint outfall and that the modified discharges will provide for the attainment of water quality standards and criteria at and beyond the ZID, PRASA has met the requirements of 40 CFR 125.62(f).

### **3. Establishment of a Monitoring Program [Section 301(h)(3), 40 CFR 125.63]**

Under 40 CFR 125.63, which implements section 301(h)(3) of the Act, the applicant must have a monitoring program designed to evaluate the impact of the modified discharge on the marine biota, demonstrate compliance with applicable water quality standards, and measure toxic substances in the discharge. In addition, the applicant must also demonstrate that it has the resources necessary to implement the monitoring program upon issuance of a section 301(h) modified permit and to carry it out for the life of the permit (40 CFR 125.63(a)(1)(iii)). The frequency and extent of the monitoring program are to be determined by taking into consideration the Bayamón and Puerto Nuevo RWWTPs' rate of discharge, quantities of toxic pollutants discharged, and the potential for significant impacts in the receiving water (40 CFR 125.63(a)(1)(iv)).

Since 1999, PRASA has implemented a Section 301(h) monitoring program for the Bayamón and Puerto Nuevo RWWTPs that consists of effluent and water quality monitoring and biological and community assessments. The monitoring program (Table 3) is well-established and has been developed jointly between the EPA, DNER and PRASA. PRASA has conducted 33 Section 301 monitoring events at monitoring stations established at and beyond the ZID. In the renewal applications, PRASA has

proposed continuation of the existing Section 301(h) Waiver Demonstration Studies for the next five-year permit term. A description of the Section 301(h) monitoring program is in Table 3 below. PRASA has not proposed any changes to the monitoring program requirements described in the current modified permits and PRASA's 2008 Quality Assurance Project Plan and Sampling and Analysis Protocols (QAPP/SAP) for the Bayamón and Puerto Nuevo RWWTPs 301(h) Waiver Demonstration Studies (PRASA 2008c). The draft permits require that PRASA continue to implement a Section 301(h) monitoring program for the Bayamón and Puerto Nuevo RWWTPs 301(h) Waiver Demonstration Studies. Any revisions to the Section 301(h) monitoring program will be subject to the EPA's approval and modification of the 2008 QAPP/SAP. The EPA has concluded that the applicant has met the requirements of 40 CFR 125.63 based on design of the monitoring program to evaluate the impact of the modified discharges on the receiving water and PRASA's demonstration that it has the resources to implement such a monitoring program.

**Table 3 - Section 301(h) monitoring program for the Bayamón and Puerto Nuevo RWWTPs**

Monitoring Type	Substrate and/or Parameter	Monitoring Frequency
Effluent Monitoring	Conventional and non-conventional pollutants (DO, TSS, oil and grease, nitrogen species, bacteria, etc.)	Annual
	Metals, Pesticides, and PCBs	Annual
	Dioxins, volatile and semi-volatile organic pollutants	Once per permit term
Water Quality Monitoring	Conventional and non-conventional pollutants (DO, TSS, oil and grease, nitrogen species, bacteria, etc.)	Annual
	Metals and Pesticides	Annual
	Dioxins, volatile and semi-volatile organic pollutants	Once per permit term
Biological Monitoring	Benthic Invertebrate Monitoring	Annual
	Sediment Quality Monitoring	Annual
	Fish Tissue Bioaccumulation	Once per permit term

#### 4. Effect of Discharge on Other Point and Nonpoint Sources [Section 301(h)(4), 40 CFR 125.64]

In accordance with Section 301(h)(4) of the Act, the EPA may not issue a Section 301(h) modified permit unless the applicant demonstrates that such modified requirements will not result in any additional requirements on any other point or nonpoint source. In the renewal applications, PRASA indicated that the modified discharges will not cause additional treatment or control requirements for other point or nonpoint sources (PRASA 2020). In 2019, PRASA requested a determination from DNER that the modified discharges from the Bayamón and Puerto Nuevo RWWTPs will comply with all applicable provisions of Commonwealth law, as required by 40 CFR 125.64(b). On March 5, 2021 DNER issued final water quality certificates for each facility that the modified discharges will not cause violations to the applicable water quality standards in the receiving water or result in additional treatment controls or other requirements on any other point or nonpoint sources. PRASA has requested a waiver from secondary treatment requirements for BOD<sub>5</sub> and TSS for the Bayamón and Puerto Nuevo RWWTPs. Although these facilities share a common outfall with the Bacardí Corporation, the modified discharges have not caused additional treatment or control requirements for any pollutant or parameter, including BOD<sub>5</sub> and TSS, for the Bacardí WWTP or any other point or nonpoint sources, and the EPA does not anticipate any additional treatment or control requirements resulting from an increase in discharge flows from the Bayamón and Puerto Nuevo RWWTPs during the next permit term.

## 5. Urban area pretreatment program [section 301(h)(5) and (6), 40 CFR 125.65]

In accordance with Section 301(h)(5) and (6) of the Act, EPA may not issue a Section 301(h) modified permit unless the applicant demonstrates that all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced. As explained in the preamble to the 1994 revision of the Section 301(h) regulations (59 FR 40656, August 9, 1994), for urban area pretreatment programs with significant numbers of industrial users, at any given time, it is reasonable to expect that at least one or more of those users might be out of compliance. EPA determines a POTW's continuing eligibility for a Section 301(h) modified permit under Section 301(h)(6) by measuring industrial user compliance and POTW enforcement activities against existing criteria in the EPA's National Pretreatment Program.

PRASA has an Industrial Pretreatment Program that was approved by the EPA on September 28, 1985, and an Enforcement Response Plan approved by the EPA on May 30, 1995, as part of this program. As part of an Industrial Pretreatment Program, POTWs that seek a Section 301(h) waiver must assess the need for local limits and set local limits in accordance with 40 CFR Part 403 based on an analysis of toxic pollutants known or suspected of being introduced by industrial sources. Local limits are developed for pollutants that may cause interference, pass through, sludge contamination, and/or worker health and safety problems, if discharged in excess of the receiving POTW's capabilities and/or receiving water quality standards.

In evaluating the need for local limit development, a POTW must identify industries that might be subject to the pretreatment program and determine the character and volume of pollutants contributed to the POTW by these industries. The POTW then determines which pollutants have a reasonable potential for pass through, interference, or sludge contamination. To calculate the maximum allowable POTW influent loading for a pollutant of concern, treatment plant data and estimates of pollutant removal rates are used to calculate the total allowable pollutant load that would meet sludge requirements, permit limits, and water quality standards. After accounting for domestic sources, the remaining load is then evenly distributed among industries that contribute to the POTW. The EPA's approval of PRASA's pretreatment program in 1985 only contained general island-wide local limits for all of its wastewater treatment facilities. Since then, PRASA has assessed the need for facility-specific local limits for all facilities. For the Bayamón and Puerto Nuevo RWWTPs, PRASA has established facility-specific local limits, which are summarized in Table 4. PRASA has incorporated these limits into all applicable industrial pretreatment permits for industries that discharge to the Bayamón and Puerto Nuevo RWWTPs in accordance with 40 CFR Part 403.

For several pollutants that were detected in industrial user wastewater and the Bayamón and Puerto Nuevo RWWTP influent, effluent, or sludge, PRASA determined that local limits were not necessary. According to PRASA's 2019 Industrial Pretreatment Program Annual Report, which covers activities from September 1, 2018 through August 31, 2019, PRASA determined that local limits for Bromodichloromethane, Chloroform, and Toluene did not need to be established for the Bayamón RWWTP. For the Puerto Nuevo RWWTP, PRASA determined that local limits for Chloroform, Dichloromethane, and Toluene, also were not necessary at this time.

**Table 4- List of parameters and local limits for the Bayamón and Puerto Nuevo RWWTPs**

Parameter	Bayamón RWWTP Local Limit (mg/l)	Puerto Nuevo RWWTP Local Limit (mg/l)
Arsenic	3.450	0.750
Beryllium	3.220	4.960
Biochemical Oxygen Demand	250	250
Cadmium	0.100	0.10
Chromium	1.000	1.00
Color	250	-
Copper	0.500	1.00
Cyanide, Total	0.100	0.10
Flammability	No two consecutive readings at $\geq 5\%$ LEL, and no reading of $\geq 10\%$ LEL allowed	No two consecutive readings at $\geq 5\%$ LEL, and no reading of $\geq 10\%$ LEL allowed
Flow	NL	NL
Fluoride	NL*	-
Lead	0.200	0.20
Manganese	NL*	-
Mercury	0.030	0.02
Molybdenum	NL*	NL*
Nickel	0.500	0.81
Nitrogen (NO <sub>3</sub> , NO <sub>2</sub> , NH <sub>3</sub> )	NL	NL
Oil & Grease	50	50
Phenols	1.0	1.0
pH	6.5-9.0 SU	6.5-9.0 SU
Selenium	0.200	0.20
Silver	0.280	0.30
Surfactants	NL*	-
Thallium	0.260	0.74
Temperature	40°C (104°F) at POTW 60°C (140°F) from SIU	40°C (104°F) at POTW 60°C (140°F) from SIU
Total Suspended Solids	250	250
Total Toxic Organics (TTO)	NL	NL
Zinc	0.500	9.95

**NL** For parameters where **no limit** has been adopted, PRASA reserves the right to establish limits on a case-by- case basis when an industry discharges in amounts that could cause interference or pass-through.

**NL\*** Parameters that were included in the PRASA's 2019 Industrial Pretreatment Program Annual Report.

For urban area pretreatment programs with significant numbers of industrial users, at any given time, it is reasonable to expect that at least one or more of those users might be out of compliance (59 FR 40656, August 9, 1994). The EPA determines a POTW's continuing eligibility for a section 301(h) modified permit under Section 301(h)(6) by measuring industrial user compliance and POTW enforcement activities against existing criteria in EPA's National Pretreatment Program. A POTW's

enforcement program is considered adequate if not more than fifteen percent of its industrial users meet the significant noncompliance (SNC) criteria in a single year. In situations where the POTW followed its procedures but the level of significant noncompliance among significant industrial users (SIUs) is fifteen percent or greater, the adequacy of the enforcement procedures should be reviewed. A total of seven SIUs are monitored under the Pretreatment Program for the Bayamón RWWTP and eleven for the Puerto Nuevo RWWTP, and all currently have discharge permits. According to PRASA's 2019 Industrial Pretreatment Program Annual Report covering the period from September 1, 2018 through August 31, 2019, the Bayamón RWWTP and Puerto Nuevo RWWTP service areas reported a SNC rate of seventy-one percent (five of seven SIUs) and eighty-one percent (nine of eleven SIUs), respectively, for its SIUs. The SNC rates for both RWWTPs service area are greater than the SNC criteria of fifteen percent for determining the adequacy of the pretreatment program.

PRASA has been adequately enforcing its Industrial User Pretreatment Program. All SIUs are monitored once a year, and unannounced compliance inspections are performed at least twice a year. Non-compliance issues were addressed with escalated enforcement actions. PRASA issued Notices of Noncompliance to the facilities and the facilities returned to compliance. These enforcement actions against the industrial users indicate that PRASA's enforcement program has met the criteria for adequate enforcement of its pretreatment program for the Bayamón and Puerto Nuevo RWWTPs

Since PRASA has established local limits as a means to control toxic pollutants that may be introduced by an industrial discharger, and has demonstrated that it is able to enforce these limits, the EPA has concluded that the applicant has demonstrated that it has met requirements of 40 CFR 125.65 for an urban area pretreatment program. The EPA has concluded that PRASA has demonstrated that it enforces its applicable pretreatment requirements in accordance with the Section 301(h) requirement at 40 CFR 125.65.

## **6. Toxics Control Program [Section 301(h)(5), 40 CFR 125.66(a) through (c)]**

### **a. Chemical Analysis**

Pursuant to 40 CFR 125.66(a), at the time of application, the applicant must submit a chemical analysis of its current discharge for all toxic pollutants and pesticides defined in 40 CFR 125.58(p) and (aa). As specified in the EPA's ATSD, the applicant must submit results of wet and dry weather analyses of the effluent if known or suspected industrial sources of toxic pollutants or pesticides exist. The analysis shall be performed on a minimum of two 24-hour composite samples (dry weather/wet weather). Applicants may supplement or substitute chemical analyses if the composition of the supplemental or substitute samples typifies that which occurs during wet and dry weather conditions.

### **b. Toxic Pollutant Source Identification**

Under 40 CFR 125.66(b), the applicant must submit at the time of application an analysis of the known or suspected sources of toxic pollutants or pesticides identified in response to 40 CFR 125.66(a). To the extent practicable, the applicant shall also categorize the sources according to industrial and non-industrial types. PRASA has indicated that there are seven industries permitted as SIUs that discharge to the Bayamón RWWTP and eleven industries that discharge



to the Puerto Nuevo RWWTP. In the renewal application, PRASA indicated that the Bayamón RWWTP generally provides service to the industries including metal finishing point source, transportation equipment cleaning point source, and food manufacturing process. PRASA indicated that the Puerto Nuevo RWWTP generally provides service to the industries including dairy products processing point source, meats and poultry products point source, and photographic point source.

Based on PRASA's 2019 Industrial Pretreatment Program Annual Report, EPA has concluded that the applicant has met the requirements of 40 CFR §125.66(b).

#### c. Industrial Pretreatment Program

Under 40 CFR 125.66(c), an application for a Section 301(h) modification from secondary treatment requirements that has known or suspected industrial sources of toxic pollutants must have an approved pretreatment program as described in 40 CFR Part 403. PRASA's Industrial Pretreatment Program was originally approved by the EPA on September 28, 1985, and its Enforcement Response Plan approved by the EPA on May 30, 1995 as part of this program. The program is implemented on an island-wide basis and includes the service areas of the Bayamón and Puerto Nuevo RWWTPs. The Puerto Rico Rules and Regulations for the Supply of Water and Sewer Service were approved as part of the original program in 1985 and met the existing pretreatment requirements for legal authority at 40 CFR 403.8. On June 19, 2003, PRASA revised the Rules and Regulations in accordance with the changes made to the federal pretreatment regulations (e.g., additional federal prohibitions, revised definitions, and notification requirements). Since PRASA has an EPA-approved industrial pretreatment program for the Bayamón and Puerto Nuevo RWWTPs, the EPA has concluded that the applicant has demonstrated that it has met the requirements of 40 CFR 125.66(c).

### **7. Nonindustrial Source Control Program [Section 301(h)(7), 40 CFR 125.66(d)]**

Pursuant to 40 CFR 125.66(d), which implements Section 301(h)(7) of the Act, all applicants must propose a public education program designed to minimize the entrance of nonindustrial toxic pollutants into the wastewater treatment system, which shall be implemented no later than 18 months after issuance of a Section 301(h) modified permit.

PRASA proposed the continuation of the "Aquamóvil" Education Program and the Fats, Oil and Grease Program. Originally implemented in 1993, the "Aquamóvil" Education Program is an island-wide program designed to control toxic substances from nonindustrial sources through a mobile learning center that travels throughout the island providing literature, illustrations, and models of the wastewater treatment processes.

During 2018 and 2019, PRASA's Communications Office performed 129 education and public awareness activities in the municipalities served by the Bayamón and Puerto Nuevo RWWTPs. PRASA's website (<http://acueductospr.com/>) provides information to the public about the availability of PRASA's Educational Program. The POGS Program covers the food service establishments across the island, including fast foods, restaurants, bakeries, and maintenance and repair service establishments (MRSEs) including gas stations, commercial garages and car washes, and so forth, that discharge to the Bayamón and Puerto Nuevo RWWTPs. An educational phase

started in 2016 that consisted of providing a Best Manufacturing Program Manual to food service establishments and courtesy inspections to evaluate fats oil and grease management and disposal; these inspections continue.

On June 2019, PRASA launched a public educational campaign called “*Tuberías Limpias.*” The main goal of this campaign is to educate the citizens, establishments, and industries about the proper management and disposal of fats, oils, petroleum, and grease. The campaign was fully covered by the public media. This program covers the commercial facilities across the island, including food establishments that discharge to the Bayamón and Puerto Nuevo RWWTPs. Since 2017, around 1,696 food service establishments were inspected in the areas of San Juan, Trujillo Alto, and portions of Bayamón and Guaynabo areas that are served by the Puerto Nuevo RWWTP, and 786 food service establishments were inspected in areas of Bayamón, Cataño, portions of Guaynabo, Toa Alta and Toa Baja that are served by the Bayamón RWWTP.

Based on review of PRASA’s Nonindustrial Source Control Program, the EPA has concluded that PRASA has met the requirements of 40 CFR 125.66(d). The EPA has proposed in the draft modified permit for each facility that PRASA be required to implement its Nonindustrial Source Control Program and modify the program, as necessary, within 18 months of the effective date of the permits.

#### **8. Increase in effluent volume or amount of pollutants discharged [Section 301(h)(8), 40 CFR 125.67]**

Under 40 CFR 125.67, which implements Section 301(h)(8) of the Act, the EPA may not issue a section 301(h) modified permit unless the applicant demonstrates there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above the volume of discharge specified in the permit.

For the Bayamón RWWTP, the permitted monthly average discharge load allocations for BOD and TSS are 19,688 kilograms per day (kg/day) and 11,673 kg/day, respectively. As noted from the data in the reapplication, the Bayamón RWWTP has remained significantly below these limits for the 2015–2020 reporting period. For the Puerto Nuevo RWWTP, the permitted monthly average discharge load allocations for BOD and TSS are 35,465 kg/day and 24,460 kg/day, respectively. The Puerto Nuevo RWWTP has remained significantly below these limits for the 2015–2020 reporting period.

There is no indication that there will be an increase of effluent in volume along with the permitted BOD<sub>5</sub> and TSS that would result in mass loadings similar to those currently permitted. The EPA believes that PRASA has demonstrated that there will be no substantially increased discharges of BOD<sub>5</sub> and TSS from Bayamón and Puerto Nuevo RWWTPs above the volume of discharge specified in the draft modified permits in accordance with 40 CFR 125.67.

#### **9. Minimum level of treatment [Section 301(h)(9), 40 CFR 125.60]**

Section 301(h)(9) of the Act was amended by Section 303(d)(1) and (2) of the WQA. Under Section 303(d)(1), the applicant's effluent must be receiving at least primary or equivalent treatment at the time its Section 301(h) modified permit becomes effective. Section 303(d)(2) defines primary or equivalent treatment as a means of treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the BOD<sub>5</sub> and TSS in the POTW’s influent, and disinfection, where appropriate. To

ensure that the effluent discharge has received primary or equivalent treatment, 40 CFR 125.60 requires that the applicant perform monitoring of influent and effluent and assess BOD<sub>5</sub> and TSS removal rates based on a monthly average.

Based on monitoring data collected between 2015 to 2020, monthly average removal rates for BOD<sub>5</sub> and TSS at each facility were generally above the primary treatment requirement of 30 percent removal. For the Bayamón RWWTP, monthly average removal rates for BOD<sub>5</sub> ranged between 21 and 72 percent with only three incidents (March 2016, June 2019 and June 2020) during the 5 years period fell below the 30 percent removal requirement. TSS removal rates were significantly greater than the 30 percent removal requirement with six incidents fell below 60 percent. For the Puerto Nuevo RWWTP, monthly average removal rates for BOD<sub>5</sub> ranged between 25 and 65 percent with four months (December 2007 and May 2008) observed to have monthly average removal rates less than the 30 percent removal requirement. For TSS, removal rates ranged between 30 and 90 percent with 8 incidents fell below 60 percent, possible due to hurricane damage.

The EPA also reviewed facility compliance with concentration and mass-based effluent limitations in the existing modified permits and evaluated whether each facility would be able to meet limitations for BOD<sub>5</sub> and TSS during the next permit term based on the same flow conditions.

Based on available data, the EPA has concluded that the Bayamón and Puerto Nuevo RWWTPs can consistently achieve at least primary or equivalent treatment with 30 percent removal of BOD<sub>5</sub> and TSS in the influent. Moreover, each facility has demonstrated that it is able to achieve greater percent removal for TSS, as required by the existing modified permits. In accordance with 40 CFR 125.60, the EPA proposes in the draft modified permits effluent limitations of 30 percent removal of BOD<sub>5</sub> and 60 percent removal of TSS from the influent of the Bayamón and Puerto Nuevo RWWTPs. The proposed percent removal limitations are consistent with the requirements of Section 301(h) for primary treatment of influent based on a minimum of 30 percent removal of BOD<sub>5</sub> and TSS.

## **COMPLIANCE WITH APPLICABLE PROVISIONS OF COMMONWEALTH, LOCAL, OR OTHER FEDERAL LAW OR EXECUTIVE ORDERS**

Under 40 CFR 125.59(b)(3), a modified permit may not be issued if such issuance would conflict with applicable provisions of Commonwealth, local, or other federal laws or executive orders. As part of the application renewal, the applicant must demonstrate compliance with all applicable Commonwealth and federal laws and regulations, and executive orders which include the Coastal Zone Management Act, Marine Protection Research and Sanctuaries Act, and the Endangered Species Act.

### **Coastal Zone Management Act**

Under 40 CFR 125.59(b)(3), a modified permit must comply with the Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 *et seq.* In accordance with 16 U.S.C. 1456(c)(3)(A), and its implementing regulations, a Section 301(h) modified permit may not be issued unless the proposed discharge is certified by the Commonwealth of Puerto Rico to be consistent with the Commonwealth's Coastal Zone Management Program. PRASA has indicated that the joint outfall is located in a coastal area managed by the Commonwealth's Coastal Zone Management Program. On February 11, 2015, the Puerto Rico Planning Board issued a consistency certification for each of the modified discharges certification.

## **Marine Protection, Research and Sanctuaries Act**

40 CFR 125.59(b)(3) provides that issuance of a Section 301(h) modified permit must comply with Title III of the Marine Protection, Research and Sanctuaries Act (MPRSA), 16 U.S.C. 1431 *et seq.* In accordance with 16 U.S.C. 1434(d), a Section 301(h) modified permit may not be issued for a discharge located in a marine sanctuary designated pursuant to Title III of the MPRSA if the regulations applicable to the sanctuary prohibit issuance of such a permit. PRASA has indicated that the joint outfall is not located in a marine or estuarine sanctuary designated under Title III of the MPRSA. On March 17, 1989, the National Oceanic and Atmospheric Administration (NOAA) determined that the joint outfall is not located in a marine or estuarine sanctuary designated under Title III of the MPRSA. Since then, the location of the outfall has not changed nor has there been a marine or estuarine sanctuary designated under Title III of the MPRSA in the area of the joint outfall. As a result, the EPA has determined that the 1989 letter from NOAA is sufficient for the applicant to meet the requirements of 40 CFR 125.59(b)(3).

## **Endangered Species Act**

Under 40 CFR 125.59(b)(3), a Section 301(h) modified permit may not be issued if the proposed discharge will adversely impact threatened or endangered species or critical habitat listed pursuant to the Endangered Species Act (ESA), 16 U.S.C. 1531 *et seq.* In the renewal applications, PRASA indicated that there are threatened or endangered species that may occur in the vicinity of the Bacardí WWTP/Bayamón RWWTP/Puerto Nuevo RWWTP joint outfall.

On January 15, 2021 and November 3, 2014, the National Marine Fishery Service (NMFS) and United States Fishery and Wildlife Service (USFWS), respectively provided concurrence that the modified discharge from each facility will comply with the ESA.

## **Magnuson-Stevens Fishery Conservation and Management Act**

Under 40 CFR 125.59(b)(3), a modified permit must comply with applicable provisions of Federal laws including the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) of 1976, 16 U.S.C. 1801 *et seq.*, which protects against adverse impacts to Essential Fish Habitat (EFH). As required by MSFCMA, the EPA must demonstrate that an approval of a Section 301(h) waiver for the Bayamón and Puerto Nuevo RWWTPs will not result in adverse impact to any EFH or species included in Caribbean or Federal Fisheries Management Plans. On August 17, 2010, NMFS issued a letter to the EPA indicating that EFH consultation under the General Concurrence procedures of 50 CFR 600.920(g) is not required for issuance of a modified permit.

## **Executive Order on Coral Reef Protection**

On June 11, 1998, the President issued an Executive Order on Coral Reef Protection, directing federal agencies to expand research, preservation, and restoration activities for the protection of coral reef ecosystems. As described previously, there is no coral growth in the vicinity of the joint outfall. The EPA has determined that modified discharges from the Bayamón RWWTP and Puerto Nuevo RWWTP are consistent with the Executive Order on Coral Reef Protection. At this time, the EPA is not aware of any additional Commonwealth or local laws that need to be addressed prior to issuance of the final modified permits for the Bayamón RWWTP and Puerto Nuevo RWWTP.

## Climate Change

The EPA has considered climate change when developing the conditions of the permit. This is in accordance with the draft *National Water Program 2012 Strategy: Response to Climate Change* that identifies ways to address climate change impacts by NPDES permitting authorities (77 *Federal Register* 63, April 2, 2012, 19661-19662). Climate change is expected to affect surface waters in several ways, affecting both human health and ecological endpoints. As outlined in the draft National Water Program 2012 Strategy, the EPA is committed to protecting surface water, drinking water, and ground water quality, and diminishing the risks of climate change to human health and the environment, through a variety of adaptation and mitigation strategies

## Environmental Justice

The EPA has performed an Environmental justice analysis for the discharge in accordance with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations*, and the EPA's Plan EJ 2014. Environmental justice is the right to a safe, healthy, productive, and sustainable environment for all, where "environment" is considered in its totality to include the ecological, physical, social, political, aesthetic and economic environments. In the NPDES permitting program, the public participation process provides opportunities to address environmental justice concerns by providing appropriate avenues for public participation, seeking out and facilitating involvement of those potentially affected.

## COMMONWEALTH CONCURRENCE OF WAIVER

Under 40 CFR 125.61(b)(2) and 125.64(b), the applicant must provide a determination signed by the state or interstate agency authorized to provide certification under 40 CFR 124.53 and 124.54 that the modified discharge will comply with applicable provisions of Commonwealth law including water quality standards. The state determination shall include a discussion of the basis for its conclusion. Furthermore, pursuant to 40 CFR 124.53 and 124.54, the Commonwealth of Puerto Rico must either grant a certification pursuant to section 401 of the Act or waive this certification before the EPA may issue a modified permit.

PRASA requested a determination from DNER that the modified discharges from the Bayamón RWWTP and Puerto Nuevo RWWTP, combined with the discharge from the Bacardí WWTP, will comply with all applicable provisions of Commonwealth law. On March 5, 2021, DNER issued Final water quality certificates for the Bayamón and Puerto Nuevo RWWTPs that certify that the modified discharges will comply with all applicable provisions of Commonwealth law including applicable water quality standards and will not result in any additional treatment requirements on any point or nonpoint sources.

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