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APÉNDICE-11
CALIDAD DEL AGUA

A11.1 CALIDAD ACTUAL DEL AGUA EN LOS RÍOS

A11.1.1 RÍO YAQUE DEL NORTE

Desde julio del 1999, CORAASAN ha recolectado la calidad del agua mensual en el Río Yaque del Norte y sus ríos tributarios. Los parámetros típicos de calidad del agua son analizados a continuación: DBO, COD, sólidos suspendidos, pH, conductividad eléctrica, sulfato, nitrógeno de amoníaco, nitrito, nitrato, etc. La tabla debajo resume los datos de la calidad del agua en los cinco puntos de monitoreo existentes a lo largo del Río Yaque del Norte en el Area de Estudio. Los datos detallados y las informaciones son presentadas en la Tabla A.11.1 y la Figura A11.11 hasta la 11.4.

Calidad del Agua en el Río Yaque del Norte

Punto de Monitoreo		Indicador de	Mes, 2000			
			Julio	Agosto	Octubre	Noviembre
St.1	Antes Toma de Pastor	BOD_5 (mg/l)	1.3	0.4	-	11
		COD_{Cr} (mg/l)	4	6	23	29
		NH_4-N (mg/l)	0.08	0.03	0.15	0.13
		DO (mg/l)	7.4	6.3	4.72	5.5
		Conductividad eléctrica (μ S/cm)	172	160	120	125
St.2	Antes Obra Toma de Canal	BOD_5 (mg/l)	4.8	1.3	-	18
		COD_{Cr} (mg/l)	8	21	19	40
		NH_4-N (mg/l)	0.18	0.23	0.28	0.28
		DO (mg/l)	7	6	4.47	5.4
		Conductividad eléctrica (μ S/cm)	184	208	160	163
St.3	Después Descarga Tenería Bermúdez	BOD_5 (mg/l)	17	29	-	23
		COD_{Cr} (mg/l)	143	160	25	12
		NH_4-N (mg/l)	1.41	1.81	2.18	0.61
		DO (mg/l)	N.D.	N.D.	2	4.6
		Conductividad eléctrica (μ S/cm)	557	613	480	157
St.4	Frente Planta Rafey	BOD_5 (mg/l)	19	30	-	17
		COD_{Cr} (mg/l)	159	154	112	68
		NH_4-N (mg/l)	0.2	1.08	0.8	0.4
		DO (mg/l)	N.D.	N.D.	0.87	4.8
		Conductividad eléctrica (μ S/cm)	607	650	492	188
St.5	Después Descarga A. N. Rafey	DBO_5 (mg/l)	18	40	-	19
		COD_{Cr} (mg/l)	113	148	175	53
		NH_4-N (mg/l)	0.74	2.78	2.48	0.5
		DO (mg/l)	N.D.	N.D.	2.2	5.1
		Conductividad eléctrica (μ S/cm)	661	796	528	226

(Fuente: CORAASAN)

El punto de muestro del agua de St.1 (Toma de Pastor) en el Río, donde el agua no está muy afectada por las descargas de aguas residuales urbanas desde la Ciudad de Santiago: Concentración de DBO es tan baja como 2 mg/L variando de 0.4 a 11 mg/L según se muestra en la tabla debajo. El agua del Río en el punto St.5 (A.N. Rafey: el caudal de aguas abajo de Rafey WWTP) es, sin embargo, más contaminado por la descarga de aguas residuales urbanas; las concentraciones de DBO son tan altas como 18-40 mg/L. Más aún, la tendencia similar fue observada en concentraciones de COD, NH_4-N, etc.

A11.1.2 RÍOS TRIBUTARIOS

La tabla debajo presenta los datos de la calidad del agua de cuatro ríos tributarios: : 1) Arroyo Hondo, 2) Arroyo Nibaje, 3) Arroyo Gurabo, y 4) Río Jacagua. Los datos e informaciones detalladas son presentadas en la Tabla A11.2.

Calidad del agua de los Ríos Tributarios

Punto de Monitoreo		Indicador de	Mes, 2000			
			Agosto	Septiembre	Octubre	Noviembre
St.6	Arroyo Hondo	COD_{Cr} (mg/l)	35	20	129	63
		NH_4-N (mg/l)	1.7	1.0	1.0	2.4
		DO (mg/l)	3.2	4.9	5.8	5.6
		Conductividad eléctrica (μ S/cm)	421	245	200	313
St.7	Arroyo Nibaje	COD_{Cr} (mg/l)	92	56	69	43
		NH_4-N (mg/l)	4.4	5.2	5.2	7.4
		DO (mg/l)	2.7	5.0	0.7	5.5
		Conductividad eléctrica (μ S/cm)	871	920	894	816
St.8	Arroyo Gurabo	COD_{Cr} (mg/l)	128	54	139	64
		NH_4-N (mg/l)	3.0	2.6	1.3	3.3
		DO (mg/l)	1.8	2.6	3.8	3.2
		Conductividad eléctrica (μ S/cm)	1,203	751	740	1,118
St.9	Río Jacagua	COD_{Cr} (mg/l)	164	124	105	186
		NH_4-N (mg/l)	8.3	5.7	1.3	9.0
		DO (mg/l)	0.8	2.3	2.5	1.7
		Conductividad eléctrica (μ S/cm)	1,499	1,273	1,044	1,272

Fuente: CORAASAN

A11.1.3 Calidad Promedio del Agua en el Area de Estudio

Los datos de la calidad del agua de la encuesta y de CORAASAN durante el año 2001 al 2001 están combinados para calcular el valor promedio de los parámetros mayores de calidad. La tabla siguiente resume los valores promedio calculados en cada punto de monitoreo desde el RC1 al RC10, el cual está especificado en el Capítulo 3 en el Reporte Principal, Volumen II Parte 1 de este reporte.

Valores Promedio de los Parámetros Mayores de Calidad del Agua

Punto de Monitoreo		RC1	RC2	RC3	RC4	RC5	RC6	RC7	RC8	RC9	RC10
DBO_5	[mg/L]	2.8	5.7	31	32	26	43	22	39	79	6
COD_{Cr}	[mg/L]	21	22	90	105	108	73	65	72	202	23
SS	[mg/L]	113	159	125	386	385	165	142	218	210	214
Conductividad eléctrica	[μS/cm]	141	186	486	532	564	457	844	1,018	1,362	225
NH_4-N	[mg/L]	0.08	0.25	1.90	1.50	1.97	2.0	5.5	3.7	8.5	0.3
NO_3-N	[mg/L]	1.1	1.3	0.9	1.0	1.9	1.9	2.3	1.3	2.0	2.5
NO_2-N	[mg/L]	0.006	0.013	0.025	0.035	0.072	0.058	0.057	0.038	0.019	0.020
T-N	[mg/L]	0.56	4.4	7.6	24	7.6	5.3	51.9	10.5	14.9	13.0
T-P	[mg/L]	0.82	0.57	1.32	1.90	0.18	2.66	0.60	1.82	1.55	0.89
DO	[mg/L]	6.6	6.7	2.3	2.0	2.1	5.2	3.6	1.6	1.2	7.9

(Fuente: CORAASAN, JICA Equipo de Estudio)

La calidad del agua en el punto RC1, el cual está localizado en el caudal más alto del Río Yaque del Norte en el Area de Estudio, muestra relativamente buenas condiciones: DBO_5: 2.8 mg/L y DO: 6.6 mg/L. Esta agua es adecuada para el suministro de agua potable con un proceso de tratamiento convencional, propósitos de irrigación y otros muchos propósitos del uso del agua.

El agua es gradualmente degradada desde el caudal más alto hasta el caudal más bajo(desde RC1 a RC5), por ejemplo, las concentraciones de DBO_5 y la conductividad eléctrica se incrementaron pero DO decremento hacia el caudal bajo. También reveló que las calidades de agua de RC3 a RC5 empeoran, donde los ríos tributarios contaminados, RC6 a RC9, se unen al Río Yaque del Norte.

Las concentraciones promedio de DBO, T-N y T-P en RC1 son utilizada para predecir el futuro de la calidad del agua a lo largo del Río Yaque del Norte. La concentración promedio de SS de 65mg/L es utilizada para la proyección, la cual es calculada como muestra la Tabla A11.1-2, excluyendo dos datos.

A11.2 ESTÁNDARES DE CALIDAD DE LA SUPERFICIE DEL AGUA

La nueva Norma (AG-CC-01) establece los estándares de las calidades de la superficie del agua. Los estándares son clasificados en cuatro categorías considerando el uso del agua. La Tabla A11.3 muestra las concentraciones para cada parámetro de la calidad del agua establecido en los estándares.

A11.3 CARGAS CONTAMINANTES

A11.3.1 GENERALIDADES

Para entender los efectos del programa de mejoramiento del alcantarillado sanitario propuesto para el 2015 en la calidad del agua del Río Yaque del Norte se ha realizado, según se describe en la sección 11.4, el Reporte Principal, Volumen II Parte I de este reporte. Esta sección presenta los datos y la información de las cargas contaminantes para ser utilizadas para las proyecciones de calidad futura del agua.

Según los mayores contaminantes del río se han seleccionado DBO, SS, T-N y T-P, y sus cargas originadas de aguas residuales domésticas y aguas residuales industriales han sido estimadas como se explica en el Apéndice –7 y Apéndice –10, respectivamente.

Las cargas contaminantes generalmente de varias fuentes son tratadas por plantas de tratamiento comunes / individuales del sitio, de modo directo o indirecto, o sin ningún tratamiento, y finalmente descargados al medio ambiente como se muestra en la Figura A11.5.

A11.3.2 CARGAS CONTAMINANTES

Como se ilustra en la Figura A11.5, las cargas contaminantes generadas fueron calculadas y unidas para estimar las cargas contaminantes necesarias al Río Yaque del Norte para el año 2000, 2005, 2010, y 2015. La calidad futura del agua ha sido predecida bajo los tres diferentes casos, “Sin el Caso” , “ Con el Caso de la Implementación del Programa” y “ Con el Caso del Mejoramiento Final”

Las cargas contaminantes descargadas finalmente al Río Yaque del Norte son:

- Cargas de aguas residuales domésticas desde áreas sin alcantarillas, descargadas directamente al río (**USDD**, No.**1** in Figure A11.5)
- Cargas de aguas residuales domésticas e industriales, sin pasar por las WWTP públicas

y sin tratamiento alguno y descargadas al río. (**BPDD**, No.**3** en Figura A11.5)

- Cargas de aguas residuales domésticas e industriales, tratadas en las WWTP públicas para alcanzar los estándares de efluentes y descargadas al río. (**TWTP**, No.**4** en Figura A11.5).

- Cargas de aguas residuales industriales, tratadas por sus propias / comunes plantas de tratamiento y descargadas al río. (**TWTP**, No.**3** in Figure A11.5)

- Cargas contaminantes de ambientes naturales, u otras actividades económicas como desperdicios sólidos. (**NOD**, No.**8** en Figura A11.5)

Las cargas contaminantes anteriores, distribuidas por los Distritos de Alcantarillado y sub-distritos; Estados Industriales de Zona Franca; y los ríos son esquemáticamente presentes en la Figura A.11.6 y estas son presentadas en la Tabla A11.5 hasta la A11.11 bajo ” Sin Caso”, en la Tabla A11.13 hasta la A11.19 bajo “ Sin Caso del Programa de Implementación” y en la Tabla A11.21 bajo “ Con el Caso del Mejoramiento Final”.

Las cargas contaminantes descargadas en el Río Yaque del Norte son resumidas en la Tabla A11.4, A11.12, y A11.20, para cada caso. Figura A11.7 y A11.8 muestra la descarga de DBO al Río Yaque del Norte.

A11.4 PROYECCIONES DE LA CALIDAD DEL AGUA

Las calidades futuras de agua en las cinco localizaciones son estimadas basadas en las cargas contaminantes descargadas al Río y el caudal promedio del río y las concentraciones de contaminantes promedio. Las concentraciones de contaminantes promedio en el RC1 son utilizadas para la proyección, excepto las concentraciones de sólidos suspendidos. La concentración promedio de SS es utilizada en vez de la 113mg/L.

La concentración de contaminantes promedio es estudiada más adelante basado en las condiciones del caudal, los registros disponibles de los caudales mayores y menores en el río Yaque del Norte, como se muestra en la tabla de la sección 2.1.3 en el Reporte Principal, Volumen II Parte I de este reporte.

Las Tablas A11.23, A11.27 y A11.31 muestran la calidad actual del agua calculada basada en las suposiciones y condiciones establecidas par el cálculo.

Las Tabla A11.24 hasta la A11.34 representa la proyección de la calidad futura del agua por año bajo los tres casos.

Las Figuras A11.9 hasta la A11.11 muestran las concentraciones de DBO esperadas para el 2015 bajo los tres diferentes Casos. Las Figuras A.11.12 hasta la A11.14 muestran las concentraciones esperadas de DBO en el RC5 que está localizada después de la WWTP de Rafey bajo los diferentes Casos.

TABLA A11.1 DATOS DE LA CALIDAD DEL AGUA EN EL RÍO YAQUE DEL NORTE (2000,2001) (1/3)

			RC1	Junction of Arroyo Hondo	Junction of Arroyo Nibaje	RC2	RC3	Junction of Arroyo Gurabo	RC4	RC5
			Antes Toma de Pastor			Antes Obra Toma de Canal	Despues Descarga Tenería Bermudez		Frente Planta Rafey	Despues Descarga A. N. Rafey
Distance [km]			0.0	2.1	4.1	6.1	7.4	7.6	9.1	10.4
BOD_5 [mg/L]	2000	March	-	-	-	12	87	-	-	-
		April	-	-	-	-	-	-	-	-
		May	1	-	-	2	12	4	70	52
		June	1	-	-	2	25	-	31	21
		July	1	-	-	5	17	-	19	18
		August	0	-	-	1	29	-	30	40
		October	-	-	-	-	-	-	-	-
		November	11	-	-	18	23	-	17	19
	2001	1.Mar	2	-	-	4	(267)	-	43	17
		6.Mar	2	-	-	2	25	-	15	14
	Average		2.8			5.7	31		32	26
COD_{Cr} [mg/L]	2000	March	(171)	-	-	(3,240)	(3,060)	-	(350)	(225)
		April	10	-	-	15	87	-	97	-
		May	76	-	-	45	53	-	55	157
		June	25	-	-	34	96	-	98	62
		July	4	-	-	8	143	-	159	113
		August	6	-	-	21	160	-	154	148
		October	23	-	-	19	25	-	112	175
		November	29	-	-	40	12	-	68	53
	2001	1.Mar	10	-	-	8	(1,895)	-	121	112
		6.Mar	8	-	-	4	140	-	82	40
	Average		21			22	90		105	108
SS [mg/L] (Note 1)	2000	March	133	-	-	234	54	-	278	350
		April	62	-	-	131	199	-	181	-
		May		-	-			-		
		June		-	-			-		
		July		-	-			-		
		August		-	-			-		
		October		-	-			-		
		November		-	-			-		
	2001	1.Mar	93	-	-	37	106	-	103	172
		6.Mar	162	-	-	235	140	-	981	634
	Average		113			159	125		386	385
Electric Conductivity [μ S/cm]	2000	March	133	-	-	169	334	-	367	332
		April	136	-	-	193	364	-	341	-
		May	140	-	-	203	338	-	539	384
		June	144	-	-	186	622	-	638	700
		July	172	-	-	184	557	-	607	661
		August	160	-	-	208	613	-	650	796
		October	120	-	-	160	480	-	492	528
		November	125	-	-	163	157	-	188	226
	2001	1.Mar	149	-	-	193	722	-	748	732
		6.Mar	135	-	-	200	675	-	748	714
	Average		141			186	486		532	564

(Source: CORASAAN, JICA Study Team)

(Note1): Additional data at the point RC1 is shown in TableA2.3-1.

TABLA A11.1 DATOS DE LA CALIDAD DEL AGUA EN EL RÍO YAQUE DEL NORTE (2000,2001) (2/3)

			RC1	Junction of Arroyo Hondo	Junction of Arroyo Nibaje	RC2	RC3	Junction of Arroyo Gurabo	RC4	RC5
			Antes Toma de Pastor			Antes Obra Toma de Canal	Despues Descarga Tenería Bermudez		Frente Planta Rafey	Despues Descarga A. N. Rafey
Distance [km]			0.0	2.1	4.1	6.1	7.4	7.6	9.1	10.4
NH_4-N [mg/L]	2000	March	-	-	-	-	-	-	-	-
		April	-	-	-	-	-	-	-	-
		May	0.00	-	-	0.20	0.70	-	0.70	1.00
		June	0.01	-	-	0.00	0.05	-	0.00	1.17
		July	0.08	-	-	0.18	1.41	-	0.20	0.74
		August	0.03	-	-	0.23	1.81	-	1.08	2.78
		October	0.15	-	-	0.28	2.18	-	0.80	2.48
		November	0.13	-	-	0.28	0.61	-	0.40	0.50
	2001	1.Mar	0.00	-	-	0.40	4.00	-	3.80	3.70
		6.Mar	0.20	-	-	0.40	4.40	-	5.00	3.40
	Average		**0.08**			**0.25**	**1.90**		**1.50**	**1.97**
NO_3-N [mg/L]	2000	March	-	-	-	-	-	-	-	-
		April	-	-	-	-	-	-	-	-
		May	1.0	-	-	0.5	0.5	-	1.0	1.0
		June	0.3	-	-	0.0	0.6	-	0.0	1.7
		July	0.7	-	-	0.7	0.9	-	2.9	1.8
		August	0.5	-	-	1.2	0.7	-	0.6	0.8
		October	1.0	-	-	1.8	1.0	-	1.4	3.5
		November	0.8	-	-	0.9	1.4	-	0.6	1.1
	2001	1.Mar	4.4	-	-	4.6	1.5	-	0.8	4.7
		6.Mar	0.1	-	-	0.3	0.2	-	0.6	0.8
	Average		**1.1**			**1.3**	**0.9**		**1.0**	**1.9**
NO_2-N [mg/L]	2000	March	-	-	-	-	-	-	-	-
		April	-	-	-	-	-	-	-	-
		May	0.020	-	-	0.050	0.050	-	0.070	0.070
		June	0.000	-	-	0.000	0.010	-	0.000	0.040
		July	0.003	-	-	0.004	0.015	-	0.017	0.031
		August	0.005	-	-	0.017	0.022	-	0.020	0.018
		October	0.002	-	-	0.002	0.043	-	0.122	0.099
		November	0.005	-	-	0.006	0.010	-	0.013	0.160
	2001	1.Mar	0.006	-	-	0.009	0.037	-	0.016	0.064
		6.Mar	0.010	-	-	0.012	0.015	-	0.019	0.090
	Average		**0.006**			**0.013**	**0.025**		**0.035**	**0.072**
T-N [mg/L]	2000	March	-	-	-	-	-	-	-	-
		April	-	-	-	-	-	-	-	-
		May	-	-	-	-	-	-	-	-
		June	-	-	-	-	-	-	-	-
		July	-	-	-	-	-	-	-	-
		August	-	-	-	-	-	-	-	-
		October	-	-	-	-	-	-	-	-
		November	-	-	-	-	-	-	-	-
	2001	1.Mar	0.96	-	-	7.9	1.7	-	40	4.3
		6.Mar	0.15	-	-	0.88	13.4	-	8.7	10.9
	Average		**0.56**			**4.4**	**7.6**		**24**	**7.6**

(Source: CORASAAN, JICA Study Team)

TABLA A11.1 DATOS DE LA CALIDAD DEL AGUA EN EL RÍO YAQUE DEL NORTE (2000,2001) (3/3)

			RC1	Junction of Arroyo Hondo	Junction of Arroyo Nibaje	RC2	RC3	Junction of Arroyo Gurabo	RC4	RC5
			Antes Toma de Pastor			Antes Obra Toma de Canal	Despues Descarga Tenería Bermudez		Frente Planta Rafey	Despues Descarga A. N. Rafey
Distance [km]			0	2.1	4.1	6.1	7.4	7.6	9.1	10.4
T-P [mg/L]	2000	March	-	-	-	-	-	-	-	-
		April	-	-	-	-	-	-	-	-
		May	-	-	-	-	-	-	-	-
		June	-	-	-	-	-	-	-	-
		July	-	-	-	-	-	-	-	-
		August	-	-	-	-	-	-	-	-
		October	-	-	-	-	-	-	-	-
		November	-	-	-	-	-	-	-	-
	2001	1.Mar	1.31	-	-	0.75	2.06		1.88	0.22
		6.Mar	0.32	-	-	0.38	0.57	-	1.92	0.13
	Average		**0.82**			**0.57**	**1.32**		**1.90**	**0.18**
DO [mg/L]	2000	March	5.2	-	-	7.4	6.8	-	5.9	6.8
		April	6.7	-	-	6.5	5.3	-	5.2	-
		May	7.3	-	-	6.8	3.8	-	0.0	1.0
		June	7.16	-	-	7.0	0.0	-	0.0	0.0
		July	7.4	-	-	7.0	0.0	-	0.0	0.0
		August	6.3	-	-	6.0	0.0	-	0.0	0.0
		October	4.72	-	-	4.5	2.0	-	0.87	2.2
		November	5.5	-	-	5.4	4.6	-	4.8	5.1
	2001	1.Mar	8	-	-	8.0	0.0	-	0.0	0.0
		6.Mar	8.2	-	-	8.4	0.0	-	3.0	3.4
	Average		**6.6**			**6.7**	**2.3**		**2.0**	**2.1**

(Source: CORASAAN, JICA Study Team)

TABLA A11.2 DATOS DE LA CALIDAD DEL AGUA EN LOS RÍOS TRIBUTARIOS (2000,2001) (1/3)

			RC6	RC7	RC8	RC9	RC10
			Arroyo Hondo	Nibaje	Gurabo	Jacagua	Diversion channel for irrigation
BOD_5 [mg/L]	2000	March	100	102	101	100	-
		April	-	-	-	-	-
		May	50	17	43	120	-
		June	5	19	14	87	-
		July	18	8	23	60	-
		August	-	-	-	-	-
		September	-	-	-	-	-
		October	-	-	-	-	-
		November	-	-	-	-	-
	2001	1.Mar	63	39	43	88	4
		6.Mar	20	13	8	18	7
	Average		43	33	39	79	6
COD_{Cr} [mg/L]	2000	March	(4,450)	(2,410)	(2,170)	768	-
		April	64	101	48	165	-
		May	39	93	45	128	-
		June	22	24	31	160	-
		July	110	26	56	124	-
		August	35	92	128	164	-
		September	20	56	54	124	-
		October	129	69	139	105	-
		November	63	43	64	186	-
	2001	1.Mar	158	114	128	140	11
		6.Mar	90	31	22	163	35
	Average		73	65	72	202	23
SS [mg/L]	2000	March	248	293	366	275	
		April	98	26	112	170	
		May					
		June					
		July					
		August					
		September					
		October					
		November					
	2001	1.Mar	101	77	142	165	225
		6.Mar	213	170	251	228	202
	Average		165	142	218	210	214
Electric Conductivity [μ S/cm]	2000	March					
		April	668	891	1,133	1,498	
		May	295	597	786	1,104	
		June	147	907	1,172	1,719	
		July	415	901	1,043	1,626	
		August	421	871	1,203	1,499	
		September	245	920	751	1,273	
		October	200	894	740	1,044	
		November	313	816	1,118	1,272	
	2001	1.Mar	1,363	827	1,121	1,567	194
		6.Mar	500	820	1,111	1,017	256
	Average		457	844	1,018	1,362	225

TABLA A11.2 DATOS DE LA CALIDAD DEL AGUA EN LOS RÍOS TRIBUTARIOS (2000,2001) (2/3)

			RC6	RC7	RC8	RC9	RC10
			Arroyo Hondo	Nibaje	Gurabo	Jacagua	Diversion channel for irrigation
DO [mg/L]	2000	March	5.1	3.4	2.7	2.4	
		April	4.1	2.6	0.7	ND	
		May	5.9	2.0	0.0	0.0	
		June	6.9	2.6	0.0	0.0	
		July	4.3	3.9	0.0	0.0	
		August	3.2	2.7	1.8	0.8	
		September	4.9	5.0	2.6	2.3	
		October	5.8	0.7	3.8	2.5	
		November	5.6	5.5	3.2	1.7	
	2001	1.Mar	6.0	5.0	ND	ND	8.0
		6.Mar	5.5	5.7	ND	ND	7.7
	Average		5.2	3.6	1.6	1.2	7.9
T-N [mg/L]	2000	March					
		April					
		May					
		June					
		July					
		August					
		September					
		October					
		November					
	2001	1.Mar	4.9	14.8	7.0	14.4	25.2
		6.Mar	5.7	89.0	14.0	15.4	0.8
	Average		5.3	51.9	10.5	14.9	13.0
T-P [mg/L]	2000	March					
		April					
		May					
		June					
		July					
		August					
		September					
		October					
		November					
	2001	1.Mar	4.55	0.41	1.60	2.04	1.33
		6.Mar	0.76	0.78	2.04	1.05	0.44
	Average		2.66	0.60	1.82	1.55	0.89

TABLA A11.2 DATOS DE LA CALIDAD DEL AGUA EN LOS RÍOS TRIBUTARIOS (2000,2001) (3/3)

			RC6	RC7	RC8	RC9	RC10
			Arroyo Hondo	Nibaje	Gurabo	Jacagua	Diversion channel for irrigation
NH_4-N [mg/L]	2000	March					
		April					
		May	1.6	6.0	2.4	8.0	
		June	0.2	5.8	3.6	13.5	
		July	2.6	5.6	2.6	12.1	
		August	1.7	4.4	3.0	8.3	
		September	1.0	5.2	2.6	5.7	
		October	1.0	5.2	1.3	1.3	
		November	2.4	7.4	3.3	9.0	
	2001	1.Mar	1.7	4.6	4.3	8.9	0.3
		6.Mar	6.0	5.3	10.4	10.0	0.4
	Average		**2.0**	**5.5**	**3.7**	**8.5**	**0.3**
NO_3-N [mg/L]	2000	March					
		April					
		May	1.2	0.2	0.0	0.0	
		June	1.2	3.2	2.7	6.8	
		July	2.1	1.0	1.0	2.1	
		August	2.1	10.2	0.8	1.7	
		September	3.0	0.8	1.5	1.0	
		October	0.7	0.5	0.7	0.6	
		November	1.0	0.6	0.7	0.7	
	2001	1.Mar	4.7	4.4	4.4	4.5	4.6
		6.Mar	0.9	0.2	0.2	0.5	0.3
	Average		**1.9**	**2.3**	**1.3**	**2.0**	**2.5**
NO_2-N [mg/L]	2000	March					
		April					
		May	0.008	0.030	0.006	0.000	
		June	0.003	0.038	0.008	0.010	
		July	0.084	0.020	0.009	0.011	
		August	0.120	0.037	0.005	0.035	
		September	0.043	0.058	0.021	0.021	
		October	0.018	0.016	0.118	0.052	
		November	0.080	0.037	0.041	0.010	
	2001	1.Mar	0.082	0.043	0.023	0.023	0.030
		6.Mar	0.085	0.230	0.110	0.013	0.010
	Average		**0.058**	**0.057**	**0.038**	**0.019**	**0.020**

TABLA A11.3 MÁXIMA CONCENTRACIÓN DE PARÁMETROS FÍSICOS, QUÍMICOS Y BIOLÓGICOS EN LA SUPERFICIE DEL AGUA (1/2)

Parameters	Unit	Surface Water		
		Class A	Class B	Class C
General				
Surfactant	mg/L	0.15	0.5	2
Chlorides	mg/L	250	250	1,000
Fecal Coliforms	MPN/100ml	400	1,000	4,000
Total Coliforms	MPN/100ml	1,000	1,000	10,000
Color	U.Pt-Co	15	50	200
BOD_5	mg/L	2	5	100
Fluoruros	mg/L	0.7	1	3
PO_4-P	mg/L	-	-	-
Total-P	mg/L	0.025	0.025	0.1
Oil & Grease	mg/L	Absence	1	20
NH_3-N	mg/L	0.5	0.5	-
NO_3-N + NO_2-N	mg/L	10	10	-
DO (Dissolved Oxygen)	% sat.	> 80	> 70	> 50
PH	-	6.5 – 8.5	6.5 – 9.0	5.0 – 10.0
Dissolved Solids	mg/L	1,000	1,000	5,000
Floating Solids	-	Absence	Absence	Absence
SO_4	mg/L	400	400	5,000
Sulfur	mg/L	0.002	0.002	-
Temp. Increment	℃	±3	±3	±3
Metals				
As(Arsenic)	mg/L	0.05	0.05	1
Ba(Barium)	mg/L	1	2	10
B(Boron)	mg/L	0.5	0.5	5
Cd(Cadmium)	mg/L	0.005	0.005	0.05
CN(Cyanide)	mg/L	0.1	0.1	0.5
Ni(Nickel)	mg/L	0.1	0.1	-
Cu(Copper)	mg/L	0.2	0.2	2
T-Cr(Total Chromium)	mg/L	0.05	0.05	1
Cr(VI)(Hexavelent Chromium)	mg/L	0.01	0.01	0.1
Fe(Iron)	mg/L	0.3	0.3	3
Mn(Manganese)	mg/L	0.5	1	5
Hg(Mercury)	mg/L	0.001	0.001	0.005
Pb(Lead)	mg/L	0.05	0.05	0.5
Co(Cobalt)	mg/L	0.2	0.2	0.5
Ag(Silver)	mg/L	0.01	0.01	0.1
Se(Selenium)	mg/L	0.01	0.01	0.5
Zn(Zinc)	mg/L	0.05	0.05	0.1
Radioactivity				
Activated α	Bq/L	0.1	0.1	0.1
Activated β	Bq/L	1	1	1

TABLA A11.3 MÁXIMA CONCENTRACIÓN DE PARÁMETROS FÍSICOS, QUÍMICOS Y BIOLÓGICOS EN LA SUPERFICIE DEL AGUA (2/2)

Parameters	Unit	Surface Water		
		Class A	Class B	Class C
Organo-chlorine compounds & Pesticides				
Aldrin-Dieldrin	μg/L	0.0008	0.0008	-
Chlordane	μg/L	0.005	0.004	-
DDT & Metabolites	μg/L	0.0003	0.0003	-
Endosulfano	μg/L	0.009	0.009	-
Endrin	μg/L	0.002	0.002	-
Heptachlorine	μg/L	0.001	0.001	-
Lindano	μg/L	0.075	0.075	-
Metoxichlorine	μg/L	0.02	0.02	-
Mirex	μg/L	0.001	0.001	-
Pentachlorphenol	μg/L	7.9	7.9	-
Pertano	μg/L	0.07	0.07	-
Toxafeno	μg/L	0.0002	0.0002	-
Organo-Phosphorous,				
Azinfos-Metil	μg/L	0.01	0.01	-
Clorpyrifos	μg/L	0.04	0.04	-
Coumafos	μg/L	0.01	0.01	-
Diazinon	μg/L	0.00002	0.00002	-
2,4 D	μg/L	4	4	-
Paraquat	μg/L	0.00001	0.00001	-
Diquat	μg/L	0.00007	0.00007	-
Derneton	μg/L	0.1	0.1	-
Fertion	μg/L	0.4	0.4	-
Malation	μg/L	0.1	0.1	-
Naled	μg/L	0.4	0.4	-
Paration	μg/L	0.01	0.01	-
2,4,5-TP	μg/L	10	10	-
Persistent Organics				
Benzene	μg/L	5	5	-
Vinyl Chlorides	μg/L	2	2	-
Dichlorobenzene	μg/L	75	75	-
1,2 Dichloroethane	μg/L	5	5	-
1,1 Dichloroethylen	μg/L	7	7	-
Persistent Phenols	μg/L	1	1	-
Tetrachloroethylen	μg/L	5	5	-
Tetrachlorocarbon	μg/L	5	5	-
1,1,1 Trichloroethane	μg/L	200	200	-
Trichloroethylene	μg/L	5	5	-

(Note: The class-D is not included in above table because all of their parameters must meet natural conditions.)

TABLA A11.4 RESUMEN DE LAS CARGAS CONTAMINADAS AL RÍO YAQUE DEL NORTE [SIN CASO] (1/2)

Year	2000																									
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	2,640	360	420	84	5	5,740	850	964	184	14	0	0	0	0	0	85	85	68	5	1	8,465	1,295	1,452	273	20
Embrujo Sewerage District	1,800	246	287	57	3	1,240	184	208	40	3	3,300	116	116	99	7	0	0	0	0	0	6,340	546	611	196	13
Los Salados Sewerage District	1,500	204	238	48	3	3,910	579	657	125	10	0	0	0	0	0	0	0	0	0	0	5,410	783	895	173	13
Rafey Sewerage District	45,610	6,219	7,257	1,451	82	18,490	2,737	3,106	592	46	25,000	875	875	750	50	5,850	1,477	1,497	75	10	94,950	11,308	12,735	2,868	188
Zona Sur Sewerage District	1,870	255	298	60	3	5,310	786	892	170	13	0	0	0	0	0	0	0	0	0	0	7,180	1,041	1,190	230	16
Herradura Sewerage District	7,830	1,068	1,246	249	14	1,110	164	186	36	3	0	0	0	0	0	0	0	0	0	0	8,940	1,232	1,432	285	17
CIP FZIE																720	29	17	29	5	720	29	17	29	5
Gurabo FZIE																342	19	12	10	2	342	19	12	10	2
Pisano FZIE																182	9	5	6	1	182	9	5	6	1
Santiago-I FZIE																182	7	4	7	1	182	7	4	7	1
Santiago-II FZIE																1,133	106	77	22	4	1,133	106	77	22	4
Santiago-III FZIE																154	15	12	3	0	154	15	12	3	0
Outside Sewerage District																215	133	57	5	1	215	133	57	5	1
Total	**61,250**	**8,352**	**9,746**	**1,949**	**110**	**35,800**	**5,300**	**6,013**	**1,147**	**89**	**28,300**	**991**	**991**	**849**	**57**	**8,864**	**1,880**	**1,750**	**161**	**25**	**134,214**	**16,523**	**18,500**	**4,106**	**281**

Year	2005																									
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	2,550	366	444	89	6	7,820	1,212	1,423	266	23	0	0	0	0	0	125	125	100	7	2	10,495	1,703	1,967	362	31
Embrujo Sewerage District	1,700	244	296	59	4	2,620	406	477	89	8	3,300	116	116	99	7	0	0	0	0	0	7,620	766	889	247	19
Los Salados Sewerage District	1,400	201	244	49	3	5,290	820	963	180	15	0	0	0	0	0	0	0	0	0	0	6,690	1,021	1,207	229	18
Rafey Sewerage District	51,760	7,427	9,004	1,800	114	33,350	5,169	6,070	1,134	97	25,000	875	875	750	50	8,596	2,285	3,822	117	15	118,706	15,756	19,771	3,801	276
Zona Sur Sewerage District	1,500	215	260	52	3	7,220	1,119	1,314	245	21	0	0	0	0	0	0	0	0	0	0	8,720	1,334	1,574	297	24
Herradura Sewerage District	7,150	1,026	1,244	249	16	3,430	532	624	117	10	0	0	0	0	0	0	0	0	0	0	10,580	1,558	1,868	366	26
CIP FZIE																1,058	96	72	44	8	1,058	96	72	44	8
Gurabo FZIE																502	78	68	15	2	502	78	68	15	2
Pisano FZIE																267	35	30	9	2	267	35	30	9	2
Santiago-I FZIE																267	24	18	11	2	267	24	18	11	2
Santiago-II FZIE																1,664	356	319	34	7	1,664	356	319	34	7
Santiago-III FZIE																226	51	48	4	1	226	51	48	4	1
Outside Sewerage District																316	318	138	7	2	316	318	138	7	2
Total	**66,060**	**9,479**	**11,492**	**2,298**	**146**	**59,730**	**9,258**	**10,871**	**2,031**	**174**	**28,300**	**991**	**991**	**849**	**57**	**13,022**	**3,369**	**4,615**	**248**	**42**	**167,112**	**23,097**	**27,969**	**5,426**	**419**

TABLA A11.4 RESUMEN DE LAS CARGAS CONTAMINADAS AL RÍO YAQUE DEL NORTE [SIN CASO] (2/2)

Year	2010																								
Pollution Source	[1] Domestic Wastewater fromUnsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	2,350	363	441	78	5	10,110	1,567	1,840	344	29	0	0	0	0	0	159	159	127	10	2	12,619	2,089	2,408	432	36
Embrujo Sewerage District	1,460	226	275	49	3	4,190	649	763	142	12	3,300	116	116	99	7	0	0	0	0	0	8,950	991	1,154	290	22
Los Salados Sewerage District	1,250	192	234	42	3	6,770	1,049	1,232	230	20	0	0	0	0	0	0	0	0	0	0	8,020	1,241	1,466	272	23
Rafey Sewerage District	54,860	8,460	10,289	1,828	115	51,070	7,916	9,295	1,736	148	25,000	875	875	750	50	10,971	2,984	5,833	154	20	141.901	20,235	26,292	4,468	333
Zona Sur Sewerage District	980	152	185	33	2	9,340	1,448	1,700	318	27	0	0	0	0	0	0	0	0	0	0	10,320	1,600	1,885	351	29
Herradura Sewerage District	5,710	881	1,071	190	12	6,340	983	1,154	216	18	0	0	0	0	0	0	0	0	0	0	12,050	1,864	2,225	406	30
CIP FZIE																1,351	155	119	58	10	1,351	155	119	58	10
Gurabo FZIE																641	129	117	19	3	641	129	117	19	3
Pisano FZIE																341	58	51	12	2	341	58	51	12	2
Santiago-I FZIE																341	39	30	15	3	341	39	30	15	3
Santiago-II FZIE																2,124	572	528	44	8	2,124	572	528	44	8
Santiago-III FZIE																288	83	79	5	1	288	83	79	5	1
Outside Sewerage District																404	479	208	9	3	404	479	208	9	3
Total	66,610	10,274	12,495	2,220	140	87,820	13,612	15,984	2,986	254	28,300	991	991	849	57	16,619	4,657	7,092	326	52	199,349	29,534	36,562	6,381	503

Year	2015																								
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	1,800	288	360	65	4	12,750	1,976	2,321	434	37	0	0	0	0	0	185	185	148	11	3	14,735	2,449	2,829	510	44
Embrujo Sewerage District	1,180	188	235	42	3	5,900	915	1,074	201	17	3,300	116	116	99	7	0	0	0	0	0	10,380	1,219	1,425	342	27
Los Salados Sewerage District	850	136	170	31	2	8,490	1,316	1,545	289	25	0	0	0	0	0	0	0	0	0	0	9,340	1,452	1,715	320	27
Rafey Sewerage District	55,780	8,920	11,150	2,008	135	71,210	11,038	12,960	2,421	207	25,000	875	875	750	50	12,718	3,498	7,313	182	23	164,708	24,331	32,298	5,361	415
Zona Sur Sewerage District	150	24	30	5	0	11,840	1,835	2,155	403	34	0	0	0	0	0	0	0	0	0	0	11,990	1,859	2,185	408	34
Herradura Sewerage District	3,830	612	765	138	9	9,930	1,539	1,807	338	29	0	0	0	0	0	0	0	0	0	0	13,760	2,151	2,572	476	38
CIP FZIE																1,566	198	153	67	12	1,566	198	153	67	12
Gurabo FZIE																743	167	153	22	4	743	167	153	22	4
Pisano FZIE																395	75	67	14	2	395	75	67	14	2
Santiago-I FZIE																395	50	38	17	3	395	50	38	17	3
Santiago-II FZIE																2,462	731	682	52	10	2,462	731	682	52	10
Santiago-III FZIE																334	105	102	6	1	334	105	102	6	1
Outside Sewerage District																468	597	260	10	3	468	597	260	10	3
Total	63,590	10,168	12,710	2,289	153	120,120	18,619	21,862	4,086	349	28,300	991	991	849	57	19,266	5,605	8,915	381	61	231,276	35,383	44,478	7,605	620

TABLA A11.5 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS [SIN CASO] (1/4)

Year	2000														
	5+6+7(Total Industrial Wastewater Discharged)					5 (Industrial Wastewater Discharged to Sewer)					6 ((Industrial Wastewater Discharged to River)				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	482	190	221	19	4	391	104	152	14	3	85	85	68	5	1
Emerjo Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Salados Sewerage District	384	173	136	20	4	384	173	136	20	4	0	0	0	0	0
Rafey Sewerage District	12,568	4,590	4,020	364	53	6,619	3,056	2,490	285	42	5,850	1,477	1,497	75	10
Zona Sur Sewerage District	27	5	5	1	0	27	5	5	1	0	0	0	0	0	0
Herradura Sewerage District	310	100	61	11	2	0	0	0	0	0	0	0	0	0	0
CIP FZIE	758	36	23	31	6	0	0	0	0	0	720	29	17	29	5
Gurabo FZIE	342	19	12	10	2	0	0	0	0	0	342	19	12	10	2
Pisano FZIE	314	13	8	11	2	132	4	3	5	1	182	9	5	6	1
Santiago-I FZIE	1,718	316	286	73	13	1,536	309	282	66	12	182	7	4	7	1
Santiago-II FZIE	1,572	207	166	41	8	439	101	89	19	4	1,133	106	77	22	4
Santiago-III FZIE	877	160	128	36	6	723	145	116	33	6	154	15	12	3	0
Outside Sewerage District	857	239	511	14	3	84	88	42	6	2	215	133	57	5	1
Santiago City Total	**20,209**	**6,048**	**5,577**	**630**	**101**	**10,336**	**3,985**	**3,314**	**449**	**72**	**8,864**	**1,880**	**1,750**	**161**	**25**
Licey Sewerage District	93	40	43	4	0	49	10	8	2	0	0	0	0	0	0
Tamboril Sewerage District	83	184	77	3	1	71	172	67	2	1	0	0	0	0	0
Licey FZIE	39	8	7	2	0	0	0	0	0	0	0	0	0	0	0
Tamboril FZIE	3	1	1	0	0	3	1	1	0	0	0	0	0	0	0
Licey, Tamboril Total	**218**	**233**	**127**	**9**	**2**	**123**	**183**	**76**	**4**	**1**	**0**	**0**	**0**	**0**	**0**

Year	2000				
	7 (Industrial Wastewater Discharged to Ground)				
	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	6	1	1	0	0
Emerjo Sewerage District	0	0	0	0	0
Los Salados Sewerage District	0	0	0	0	0
Rafey Sewerage District	99	57	33	4	1
Zona Sur Sewerage District	0	0	0	0	0
Herradura Sewerage District	310	100	61	11	2
CIP FZIE	38	8	6	2	0
Gurabo FZIE	0	0	0	0	0
Pisano FZIE	0	0	0	0	0
Santiago-I FZIE	0	0	0	0	0
Santiago-II FZIE	0	0	0	0	0
Santiago-III FZIE	0	0	0	0	0
Outside Sewerage District	557	18	412	3	0
Santiago City Total	**1,010**	**183**	**513**	**20**	**4**
Licey Sewerage District	44	30	35	2	0
Tamboril Sewerage District	12	12	10	1	0
Licey FZIE	39	8	7	2	0
Tamboril FZIE	0	0	0	0	0
Licey, Tamboril Total	**95**	**50**	**52**	**5**	**0**

TABLA A11.5 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS [SIN CASO] (2/4)

Year	2005														
	5+6+7(Total Industrial Wastewater Discharged)					5 (Industrial Wastewater Discharged to Sewer)					6 ((Industrial Wastewater Discharged to River)				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	709	280	325	28	6	575	153	223	20	4	125	125	100	7	2
Emerjo Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Salados Sewerage District	565	254	200	29	6	565	254	200	29	6	0	0	0	0	0
Rafey Sewerage District	18,466	7,247	7,889	543	79	9,725	4,860	3,998	419	62	8,596	2,285	3,822	117	15
Zona Sur Sewerage District	39	8	7	2	0	39	8	7	2	0	0	0	0	0	0
Herradura Sewerage District	456	178	127	18	3	0	0	0	0	0	0	0	0	0	0
CIP FZIE	1,114	108	81	47	8	0	0	0	0	0	1,058	96	72	44	8
Gurabo FZIE	502	78	68	15	2	0	0	0	0	0	502	78	68	15	2
Pisano FZIE	461	52	45	17	3	194	16	15	8	1	267	35	30	9	2
Santiago-I FZIE	2,524	484	438	109	19	2,257	459	420	98	17	267	24	18	11	2
Santiago-II FZIE	2,310	505	450	62	12	645	149	131	28	5	1,664	356	319	34	7
Santiago-III FZIE	1,288	264	218	52	9	1,063	213	170	48	9	226	51	48	4	1
Outside Sewerage District	1,258	491	825	21	5	123	147	81	10	2	316	318	138	7	2
Santiago City Total	**29,693**	**9,948**	**10,672**	**943**	**153**	**15,187**	**6,259**	**5,245**	**662**	**107**	**13,021**	**3,370**	**4,615**	**249**	**40**
Licey Sewerage District	137	58	63	6	1	73	15	12	3	1	0	0	0	0	0
Tamboril Sewerage District	122	271	112	4	2	104	253	98	3	1	0	0	0	0	0
Licey FZIE	58	12	10	3	1	0	0	0	0	0	0	0	0	0	0
Tamboril FZIE	4	1	1	0	0	4	1	1	0	0	0	0	0	0	0
Licey, Tamboril Total	**321**	**342**	**186**	**13**	**3**	**181**	**268**	**111**	**7**	**2**	**0**	**0**	**0**	**0**	**0**

Year	2005				
	7 (Industrial Wastewater Discharged to Ground)				
	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	9	2	2	0	0
Emerjo Sewerage District	0	0	0	0	0
Los Salados Sewerage District	0	0	0	0	0
Rafey Sewerage District	145	102	69	7	2
Zona Sur Sewerage District	0	0	0	0	0
Herradura Sewerage District	456	178	127	18	3
CIP FZIE	56	11	9	3	0
Gurabo FZIE	0	0	0	0	0
Pisano FZIE	0	0	0	0	0
Santiago-I FZIE	0	0	0	0	0
Santiago-II FZIE	0	0	0	0	0
Santiago-III FZIE	0	0	0	0	0
Outside Sewerage District	819	26	605	5	1
Santiago City Total	**1,485**	**319**	**812**	**33**	**6**
Licey Sewerage District	65	44	52	3	1
Tamboril Sewerage District	18	18	14	1	0
Licey FZIE	58	12	10	3	1
Tamboril FZIE	0	0	0	0	0
Licey, Tamboril Total	**140**	**73**	**76**	**6**	**2**

TABLA A11.5 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS [SIN CASO] (3/4)

Year	2010														
	5+6+7(Total Industrial Wastewater Discharged)					5 (Industrial Wastewater Discharged to Sewer)					6 ((Industrial Wastewater Discharged to River)				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Cienfuegos Sewerage District	904	356	414	36	7	733	195	285	26	5	159	159	127	10	2
Emerjo Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Salados Sewerage District	721	325	255	37	7	721	325	255	37	7	0	0	0	0	0
Rafey Sewerage District	23,568	9,545	11,236	699	101	12,412	6,420	5,303	535	79	10,971	2,984	5,833	154	20
Zona Sur Sewerage District	50	10	9	2	0	50	10	9	2	0	0	0	0	0	0
Herradura Sewerage District	582	246	184	24	5	0	0	0	0	0	0	0	0	0	0
CIP FZIE	1,422	169	130	61	11	0	0	0	0	0	1,351	155	119	58	10
Gurabo FZIE	641	129	117	19	3	0	0	0	0	0	641	129	117	19	3
Pisano FZIE	589	85	77	22	4	248	27	26	11	2	341	58	51	12	2
Santiago-I FZIE	3,221	629	570	139	25	2,881	590	540	125	22	341	39	30	15	3
Santiago-II FZIE	2,948	762	695	80	15	824	190	167	36	7	2,124	572	528	44	8
Santiago-III FZIE	1,644	354	296	66	12	1,356	271	217	61	11	288	83	79	5	1
Outside Sewerage District	1,606	710	1,096	28	6	158	199	116	12	3	404	479	208	9	3
Santiago City Taoal	**37,897**	**13,319**	**15,079**	**1,214**	**197**	**19,383**	**8,226**	**6,917**	**845**	**137**	**16,619**	**4,657**	**7,092**	**325**	**52**
Licey Sewerage District	175	74	81	8	2	93	19	15	4	1	0	0	0	0	0
Tamboril Sewerage District	156	343	143	6	2	132	320	125	4	2	0	0	0	0	0
Licey FZIE	73	15	12	3	1	0	0	0	0	0	0	0	0	0	0
Tamboril FZIE	5	1	1	0	0	5	1	1	0	0	0	0	0	0	0
Licey, Tamboril Taoal	**409**	**434**	**237**	**17**	**4**	**230**	**340**	**141**	**9**	**2**	**0**	**0**	**0**	**0**	**0**

Year	2010				
	7 (Industrial Wastewater Discharged to Ground)				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Cienfuegos Sewerage District	12	2	2	1	0
Emerjo Sewerage District	0	0	0	0	0
Los Salados Sewerage District	0	0	0	0	0
Rafey Sewerage District	185	141	100	10	2
Zona Sur Sewerage District	0	0	0	0	0
Herradura Sewerage District	582	246	184	24	5
CIP FZIE	72	14	11	3	1
Gurabo FZIE	0	0	0	0	0
Pisano FZIE	0	0	0	0	0
Santiago-I FZIE	0	0	0	0	0
Santiago-II FZIE	0	0	0	0	0
Santiago-III FZIE	0	0	0	0	0
Outside Sewerage District	1,045	33	773	6	1
Santiago City Total	**1,895**	**436**	**1,070**	**44**	**8**
Licey Sewerage District	83	56	66	3	1
Tamboril Sewerage District	23	23	18	1	0
Licey FZIE	73	15	12	3	1
Tamboril FZIE	0	0	0	0	0
Licey, Tamboril Total	**179**	**94**	**97**	**8**	**2**

TABLA A11.5 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS [SIN CASO] (4/4)

Year	2015														
	5+6+7(Total Industrial Wastewater Discharged)					5 (Industrial Wastewater Discharged to Sewer)					6 ((Industrial Wastewater Discharged to River)				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Cienfuegos Sewerage District	1,049	414	481	41	9	850	226	330	30	6	185	185	148	11	3
Emerjo Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Salados Sewerage District	835	376	296	43	9	835	376	296	43	9	0	0	0	0	0
Rafey Sewerage District	27,321	11,236	13,699	813	118	14,389	7,568	6,263	620	92	12,718	3,498	7,313	182	23
Zona Sur Sewerage District	58	12	10	3	1	58	12	10	3	1	0	0	0	0	0
Herradura Sewerage District	675	296	226	29	6	0	0	0	0	0	0	0	0	0	0
CIP FZIE	1,649	215	166	71	13	0	0	0	0	0	1,566	198	153	67	12
Gurabo FZIE	743	167	153	22	4	0	0	0	0	0	743	167	153	22	4
Pisano FZIE	683	110	101	26	5	287	35	34	12	2	395	75	67	14	2
Santiago-I FZIE	3,735	735	666	162	29	3,340	685	628	145	26	395	50	39	17	3
Santiago-II FZIE	3,417	951	876	93	17	955	220	194	42	8	2,462	731	682	52	10
Santiago-III FZIE	1,906	420	353	77	14	1,572	315	252	71	13	334	105	102	6	1
Outside Sewerage District	1,862	871	1,296	32	7	183	236	141	14	4	468	597	260	10	3
Santiago City Total	**43,933**	**15,801**	**18,323**	**1,412**	**230**	**22,470**	**9,672**	**8,147**	**980**	**159**	**19,266**	**5,605**	**8,915**	**381**	**61**
Licey Sewerage District	203	86	94	9	2	107	21	17	5	1	0	0	0	0	0
Tamboril Sewerage District	180	399	166	7	2	154	373	145	5	2	0	0	0	0	0
Licey FZIE	85	18	14	4	1	0	0	0	0	0	0	0	0	0	0
Tamboril FZIE	6	1	1	0	0	6	1	1	0	0	0	0	0	0	0
Licey, Tamboril Total	**474**	**504**	**275**	**19**	**5**	**267**	**395**	**163**	**10**	**3**	**0**	**0**	**0**	**0**	**0**

Year	2015				
	7 (Industrial Wastewater Discharged to Ground)				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Cienfuegos Sewerage District	14	3	3	1	0
Emerjo Sewerage District	0	0	0	0	0
Los Salados Sewerage District	0	0	0	0	0
Rafey Sewerage District	214	170	123	11	3
Zona Sur Sewerage District	0	0	0	0	0
Herradura Sewerage District	675	296	226	29	6
CIP FZIE	83	17	13	4	1
Gurabo FZIE	0	0	0	0	0
Pisano FZIE	0	0	0	0	0
Santiago-I FZIE	0	0	0	0	0
Santiago-II FZIE	0	0	0	0	0
Santiago-III FZIE	0	0	0	0	0
Outside Sewerage District	1,211	38	896	7	1
Santiago City Total	**2,197**	**523**	**1,261**	**52**	**10**
Licey Sewerage District	96	65	77	4	1
Tamboril Sewerage District	26	26	21	2	0
Licey FZIE	85	18	14	4	1
Tamboril FZIE	0	0	0	0	0
Licey, Tamboril Total	**207**	**108**	**112**	**9**	**2**

TABLA A11.6 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [SIN CASO] (1/4)

Year	2000																								
Pollutants Source	Hondo					Nibaje					Gurabo					Jacagua					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	5,310	786	892	170	13	6,340	546	611	196	13	14,910	2,034	2,373	474	27	13,790	1,993	2,279	441	32	40,350	5,359	6,155	1,281	85
Unsewered	(Discharged to Yaque del Norte)					1,800	246	287	57	3	14,910	2,034	2,373	474	27	4,140	564	658	132	8	20,850	2,844	3,318	663	38
Bypassed	5,310	786	892	170	13	1,240	184	208	40	3	0	0	0	0	0	9,650	1,429	1,621	309	24	16,200	2,399	2,721	519	40
Treated	0	0	0	0	0	3,300	116	116	99	7	0	0	0	0	0	0	0	0	0	0	3,300	116	116	99	7
Industial	720	29	17	29	5	0	0	0	0	0	342	19	12	10	2	624	451	359	32	7	1,686	499	388	71	14
Natural/Others																									
Total	6,030	815	909	199	18	6,340	546	611	196	13	15,252	2,053	2,385	484	29	14,414	2,444	2,638	473	39	42,036	5,858	6,543	1,352	99
Mesured Value	25,920	1,115	4,277	137	69	58,752	1,939	8,343	3,049	35	38,880	1,516	8,476	408	71	77,760	6,143	16,330	1,159	121		8,756	9,652	1,941	152

TABLA A11.6 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [SIN CASO] (2/4)

Year	2005																								
Pollutants Source	Hondo					Nibaje					Gurabo					Jacagua					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	7,220	1,119	1,314	245	21	7,620	766	889	247	19	16,370	2,349	2,848	569	36	17,060	2,599	3,074	584	47	48,270	6,833	8,125	1,645	123
Unsewered	(Discharged to Yaque del Norte)					1,700	244	296	59	4	16,370	2,349	2,848	569	36	3,950	567	688	138	9	22,020	3,160	3,832	766	49
Bypassed	7,220	1,119	1,314	245	21	2,620	406	477	89	8	0	0	0	0	0	13,110	2,032	2,386	446	38	22,950	3,557	4,177	780	67
Treated	0	0	0	0	0	3,300	116	116	99	7	0	0	0	0	0	0	0	0	0	0	3,300	116	116	99	7
Industial	1,058	96	72	44	8	0	0	0	0	0	502	78	68	15	2	916	684	550	47	12	2,476	859	690	106	22
Natural/Others																									
Total	8,278	1,215	1,386	289	29	7,620	766	889	247	19	16,872	2,427	2,916	584	38	17,976	3,283	3,624	631	59	50,746	7,692	8,815	1,751	145

TABLA A11.6 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [SIN CASO] (3/4)

Year	2010																								
Pollutants Source	Hondo					Nibaje					Gurabo					Jacagua					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	9,340	1,448	1,700	318	27	8,950	991	1,154	290	22	16,270	2,509	3,052	542	34	20,480	3,171	3,747	694	57	55,040	8,119	9,653	1,844	140
Unsewered	(Discharged to Yaque del Norte)					1,460	226	275	49	3	16,270	2,509	3,052	542	34	3,600	555	675	120	8	21,330	3,290	4,002	711	45
Bypassed	9,340	1,448	1,700	318	27	4,190	649	763	142	12	0	0	0	0	0	16,880	2,616	3,072	574	49	30,410	4,713	5,535	1,034	88
Treated	0	0	0	0	0	3,300	116	116	99	7	0	0	0	0	0	0	0	0	0	0	3,300	116	116	99	7
Industial	1,351	155	119	58	10	0	0	0	0	0	641	129	117	19	3	1,169	886	714	62	14	3,160	1,170	950	138	27
Natural/Others																									
Total	10,691	1,603	1,819	376	37	8,950	991	1,154	290	22	16,911	2,638	3,169	561	37	21,649	4,057	4,461	756	71	58,200	9,289	10,603	1,982	167

TABLA A11.6 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [SIN CASO] (4/4)

Year	2015																								
Pollutants Source	Hondo					Nibaje					Gurabo					Jacagua					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	11,840	1,835	2,155	403	34	10,380	1,219	1,425	342	27	14,910	2,384	2,980	537	36	23,890	3,716	4,396	819	68	61,020	9,154	10,956	2,101	165
Unsewered	(Discharged to Yaque del Norte)					1,180	188	235	42	3	14,910	2,384	2,980	537	36	2,650	424	530	96	6	18,740	2,996	3,745	675	45
Bypassed	11,840	1,835	2,155	403	34	5,900	915	1,074	201	17	0	0	0	0	0	21,240	3,292	3,866	723	62	38,980	6,042	7,095	1,327	113
Treated	0	0	0	0	0	3,300	116	116	99	7	0	0	0	0	0	0	0	0	0	0	3,300	116	116	99	7
Industial	1,566	198	153	67	12	0	0	0	0	0	743	167	153	22	4	1,356	1,036	836	72	17	3,665	1,401	1,142	161	33
Natural/Others																									
Total	13,406	2,033	2,308	470	46	10,380	1,219	1,425	342	27	15,653	2,551	3,133	559	40	25,246	4,752	5,232	891	85	64,685	10,555	12,098	2,262	198

Note:
1. Industrial wastewater generated at CIP FZIE is to be discharged into Hondo river.
2. Domestic Wastewater :
   Hondo: Treated and Untreated WWs generated at Zona Sur S.D. are discharged to Hondo River. WW generated N.-Served area of Zona Sur S.D. is Discharged to Yaque del Norte River.
   Nibaje: WWs of Treated, Untreated and N.-Served area generated from Embrujo S.D. are discharged into Nibaje River.
   Gurabo: WWs of N.-Served area of Rafey S.D. generated in the area of Gurabo (Area IV of Rafey) are discharged into Gurabo River.
   Jacagua: WWs of Treated, Untreated and N.-Served area generated from Los SaradosS.D. and Cienfuegos S.D. are discharged into Jacagua River.
3. Domestic wastewaters generated from the Rafey areas of I, II, III and V of N.-Served area are discharged into Yaque del Norte River.
4. Industrial wastewater generated at Gurabo FZIE is to be discharged into Gurabo river.
5. Industrial wastewaters generated at Pisano FZIE and Cienfuegos S.D. are to be discharged into Jacagua river.
6. Part of Industrial wastewater generated at Rafey S.D. is to be discharged into Jacagua river.
7. Domestic wastewaters generated from Herradura S.D. are discharged into Yaque del Norte River.
   WWs of Treated and Untreated are discharged after the pointbt of KC1. WW from N.-Served area is discharged into Yaque del Norte River between Nibaje and Gurabo.

TABLA A11.7 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS A LOS RÍOS YAQUE DEL NORTE Y JACAGUA DESDE EL DISTRITO DE ALCANTARILLADO SANITARIO DE RAFEY [SIN CASO]

River	2000					2005					2010					2015				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Jacagua	357	357	286	21	5	524	524	420	31	8	669	669	536	40	10	776	776	621	47	12
Yaque del Norte	5,493	1,120	1,211	54	5	8,072	1,761	3,402	86	7	10,302	2,315	5,297	114	10	11,942	2,722	6,692	135	11
Total	**5,850**	**1,477**	**1,497**	**75**	**10**	**8,596**	**2,285**	**3,822**	**117**	**15**	**10,971**	**2,984**	**5,833**	**154**	**20**	**12,718**	**3,498**	**7,313**	**182**	**23**

TABLA A11.8 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS AL RÍO JACAGUA [SIN CASO]

River	2000					2005					2010					2015				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
From Cienfuegos S.D.	85	85	68	5	1	125	125	100	7	2	159	159	127	10	2	185	185	148	11	3
From Rafey S.D.	357	357	286	21	5	524	524	420	31	8	669	669	536	40	10	776	776	621	47	12
From Piaso FZIE	182	9	5	6	1	267	35	30	9	2	341	58	51	12	2	395	75	67	14	2
From Unsewered Area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**624**	**451**	**359**	**32**	**7**	**916**	**684**	**550**	**47**	**12**	**1,169**	**886**	**714**	**62**	**14**	**1,356**	**1,036**	**836**	**72**	**17**

TABLA A11.9 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS AL RÍO YAQUE DEL NORTE DESDE FUERA DEL DISTRITO DE ALCANTARILLADO SANITARIO [SIN CASO]

River	2000					2005					2010					2015				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Especias y Aditivos Alim	36	25	14	2	1	53	42	28	3	1	67	56	39	4	1	78	67	48	5	1
Isidoro Bordas	180	108	43	3	1	264	276	111	4	1	337	422	169	5	2	390	529	212	6	2
Total(Between Junction of Hondo and Nibaje)	**216**	**133**	**57**	**5**	**2**	**317**	**318**	**139**	**7**	**2**	**404**	**478**	**208**	**9**	**3**	**468**	**596**	**260**	**11**	**3**

TABLA A11.10 CAUDAL DE LAS AGUAS RESIDUALES INDUSTRIALES DESCARGADAS A LOS RÍOS[SIN CASO](1/2)

	2000							2005						
	Industrial Wastewater discharged to River	Rivers						Industrial Wastewater discharged to River	Rivers					
		Yaque del Norte	Hondo	Nibaje	Gurabo	Jacagua	Others		Yaque del Norte	Hondo	Nibaje	Gurabo	Jacagua	Others
	[m³/day]	[m³/day]						[m³/day]	[m3/day]					
Cienfuegos Sewerage Distr	85					85		125					125	
Emerjo Sewerage District	0							0						
Los Salados Sewewrage District	0							0						
Rafey Sewerage District	5,850	5,493				357		8,596	8,072				524	
Zona Sur Sewerage Distric	0							0						
Herradura Sewerage District	0							0						
CIP FZIE	720		720					1,058		1,058				
Gurabo FZIE	342				342			502				502		
Pisano FZIE	182					182		267					267	
Santiago-I FZIE	182	181						267	267					
Santiago-II FZIE	1,133	1,133						1,664	1,664					
Santiago-III FZIE	154	154						226	226					
Outside Sewerage District	215	215						316	316					
Santiago City Total	**8,863**	**7,177**	**720**	**0**	**342**	**624**	**0**	**13,021**	**10,545**	**1,058**	**0**	**502**	**916**	**0**
Licey Sewerage District	0							0						
Tamboril Sewerage Distric	0							0						
Licey FZIE	0							0						
Tamboril FZIE	0							0						
Livey, Tamboril Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**8,863**	**7,177**	**720**	**0**	**342**	**624**	**0**	**13,021**	**10,545**	**1,058**	**0**	**502**	**916**	**0**

TABLA A11.10 CAUDAL DE LAS AGUAS RESIDUALES INDUSTRIALES DESCARGADAS A LOS RÍOS[SIN CASO](2/2)

Year	2010							2015						
	Industrial Wastewater discharged to River	Rivers						Industrial Wastewater discharged to River	Rivers					
		Yaque del Norte	Hondo	Nibaje	Gurabo	Jacagua	Others		Yaque del Norte	Hondo	Nibaje	Gurabo	Jacagua	Others
	[m³/day]	[m3/day]						[m³/day]	[m³/day]					
Cienfuegos Sewerage Distr	159					159		185					185	
Emerjo Sewerage District	0							0						
Los Salados Sewewrage District	0							0						
Rafey Sewerage District	10,971	10,302				669		12,718	11,942				776	
Zona Sur Sewerage Distric	0							0						
Herradura Sewerage District	0							0						
CIP FZIE	1,351		1,351					1,566		1,566				
Gurabo FZIE	641				641			743				743		
Pisano FZIE	341					341		395					395	
Santiago-I FZIE	341	341						395	395					
Santiago-II FZIE	2,124	2,124						2,462	2,462					
Santiago-III FZIE	288	288						334	334					
Outside Sewerage District	404	404						468	468					
Santiago City Total	**16,619**	**13,458**	**1,351**	**0**	**641**	**1,169**	**0**	**19,266**	**15,601**	**1,566**	**0**	**743**	**1,356**	**0**
Licey Sewerage District	0							0						
Tamboril Sewerage Distric	0							0						
Licey FZIE	0							0						
Tamboril FZIE	0							0						
Livey, Tamboril Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**16,619**	**13,458**	**1,351**	**0**	**641**	**1,169**	**0**	**19,266**	**15,601**	**1,566**	**0**	**743**	**1,356**	**0**

TABLA A11.11 CARGAS CONTAMINADAS DESCARGADAS DIRECTAMENTE AL RÍO YAQUE DEL NORTE (EXCLUYENDO CARGAS DESDE LOS RÍOS TRIBUTARIOS [SIN CASO (1/2)

Year	2000					2005					2010					2015				
Pollutants Source	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
DWW from Unsewered Area																				
Zona Sur S.D.	*1,870*	*255*	*298*	*60*	*3*	*1,500*	*215*	*260*	*52*	*3*	*980*	*152*	*185*	*33*	*2*	*150*	*24*	*30*	*5*	*0*
Rafey S.D. (Area I)	*1,170*	*159*	*186*	*37*	*2*	*1,150*	*165*	*200*	*40*	*3*	*840*	*130*	*158*	*28*	*2*	*330*	*52*	*65*	*12*	*1*
From RC1 until Junction of Hondo Total	**3,040**	**414**	**484**	**97**	**5**	**2,650**	**380**	**460**	**92**	**6**	**1,820**	**282**	**343**	**61**	**4**	**480**	**76**	**95**	**17**	**1**
From Hondo until Junction of Nibaje Total	**27,170**	**3,705**	**4,323**	**865**	**49**	**31,940**	**4,583**	**5,556**	**1,111**	**69**	**36,050**	**5,558**	**6,759**	**1,201**	**75**	**39,880**	**6,380**	**7,975**	**1,435**	**96**
Rafey S.D. (Area III)	*1,170*	*159*	*186*	*37*	*2*	*1,150*	*165*	*200*	*40*	*3*	*840*	*130*	*158*	*28*	*2*	*330*	*52*	*65*	*12*	*1*
HerraduraS.D.	*7,830*	*1,068*	*1,246*	*249*	*14*	*7,150*	*1,026*	*1,244*	*249*	*16*	*5,710*	*881*	*1,071*	*190*	*12*	*3,830*	*612*	*765*	*138*	*9*
From Nibaje until Junction of Gurabo Total	**9,000**	**1,227**	**1,432**	**286**	**16**	**8,300**	**1,191**	**1,444**	**289**	**19**	**6,550**	**1,011**	**1,229**	**218**	**14**	**4,160**	**664**	**830**	**150**	**10**
From Gurabo until RC5 Total (Rafey Area V)	**1,190**	**162**	**189**	**38**	**2**	**1,150**	**165**	**200**	**40**	**3**	**860**	**133**	**162**	**29**	**2**	**330**	**52**	**65**	**12**	**1**
Bypassed Wastewater																				
After Junction of Gurabo (Rafey S.D.)	**18,490**	**2,737**	**3,106**	**592**	**46**	**33,350**	**5,169**	**6,070**	**1,134**	**97**	**51,070**	**7,916**	**9,295**	**1,736**	**148**	**71,210**	**11,038**	**12,960**	**2,421**	**207**
After RC5 (Herradura S.D.)	**1,110**	**164**	**186**	**36**	**3**	**3,430**	**532**	**624**	**117**	**10**	**6,340**	**983**	**1,154**	**216**	**18**	**9,930**	**1,539**	**1,807**	**338**	**29**
Treated DWW																				
After Junction of Gurabo (Rafey S.D.)	**25,000**	**875**	**875**	**750**	**50**	**25,000**	**875**	**875**	**750**	**50**	**25,000**	**875**	**875**	**750**	**50**	**25,000**	**875**	**875**	**750**	**50**
After RC5 (Herradura S.D.)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
DWW Total	**85,000**	**9,284**	**10,595**	**2,664**	**171**	**105,820**	**12,895**	**15,229**	**3,533**	**254**	**127,690**	**16,758**	**19,817**	**4,211**	**311**	**150,990**	**20,624**	**24,607**	**5,123**	**394**

TABLA A11.11 CARGAS CONTAMINADAS DESCARGADAS DIRECTAMENTE AL RÍO YAQUE DEL NORTE (EXCLUYENDO CARGAS DESDE LOS RÍOS TRIBUTARIOS [SIN CASO (2/2)

Year	2000					2005					2010					2015				
Pollution Source	Flowrate [m^3/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m^3/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m^3/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m^3/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Industrial Wastewater																				
After Junction of Gurabo (Rafey Total)	**6,962**	**1,248**	**1,304**	**86**	**10**	**10,229**	**2,192**	**3,787**	**135**	**17**	**13,055**	**3,009**	**5,934**	**179**	**22**	**15,133**	**3,608**	**7,514**	**210**	**25**
Rafey S.D.	*5,493*	*1,120*	*1,211*	*54*	*5*	*8,072*	*1,761*	*3,402*	*86*	*7*	*10,302*	*2,315*	*5,297*	*114*	*10*	*11,942*	*2,722*	*6,692*	*135*	*11*
Santiago-I FZIE	*182*	*7*	*4*	*7*	*1*	*267*	*24*	*18*	*11*	*2*	*341*	*39*	*30*	*15*	*3*	*395*	*50*	*38*	*17*	*3*
Santiago-II FZIE	*1,133*	*106*	*77*	*22*	*4*	*1,664*	*356*	*319*	*34*	*7*	*2,124*	*572*	*528*	*44*	*8*	*2,462*	*731*	*682*	*52*	*10*
Santiago-III FZIE	*154*	*15*	*12*	*3*	*0*	*226*	*51*	*48*	*4*	*1*	*288*	*83*	*79*	*6*	*1*	*334*	*105*	*102*	*6*	*1*
Outside Sewerage District Total	**216**	**133**	**57**	**5**	**2**	**317**	**318**	**139**	**7**	**2**	**404**	**478**	**208**	**9**	**3**	**468**	**596**	**260**	**11**	**3**
Between Junction of Hondo and Nibaje	*216*	*133*	*57*	*5*	*2*	*317*	*318*	*139*	*7*	*2*	*404*	*478*	*208*	*9*	*3*	*468*	*596*	*260*	*11*	*3*
Before Junction of Hondo	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
After Junction of Gurabo	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Industrial WW Total	**7,178**	**1,381**	**1,361**	**91**	**12**	**10,546**	**2,510**	**3,926**	**142**	**19**	**13,459**	**3,487**	**6,142**	**188**	**25**	**15,601**	**4,204**	**7,774**	**221**	**28**
Total (DWW+IWW)	**92,178**	**10,665**	**11,956**	**2,755**	**183**	**116,366**	**15,405**	**19,155**	**3,675**	**273**	**141,149**	**20,245**	**25,959**	**4,399**	**336**	**166,591**	**24,828**	**32,381**	**5,344**	**422**

TABLA A11.12 RESUMEN DE LAS CARGAS CONTAMINADAS AL RÍO YAQUE DEL NORTE [IMPLEMENTACIÓN PROGRAMA CON CASO] (1/2)

Year	2000																									
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	2,640	360	420	84	5	5,740	850	964	184	14	0	0	0	0	0	85	85	68	5	1	8,465	1,295	1,452	273	20
Embrujo Sewerage District	1,800	246	287	57	3	1,240	184	208	40	3	3,300	116	116	99	7	0	0	0	0	0	6,340	546	611	196	13
Los Salados Sewerage District	1,500	204	238	48	3	3,910	579	657	125	10	0	0	0	0	0	0	0	0	0	0	5,410	783	895	173	13
Rafey Sewerage District	45,610	6,219	7,257	1,451	82	18,490	2,737	3,106	592	46	25,000	875	875	750	50	5,850	1,477	1,497	75	10	94,950	11,308	12,735	2,868	188
Zona Sur Sewerage District	1,870	255	298	60	3	5,310	786	892	170	13	0	0	0	0	0	0	0	0	0	0	7,180	1,041	1,190	230	16
Herradura Sewerage District	7,830	1,068	1,246	249	14	1,110	164	186	36	3	0	0	0	0	0	0	0	0	0	0	8,940	1,232	1,432	285	17
CIP FZIE																720	29	17	29	5	720	29	17	29	5
Gurabo FZIE																342	19	12	10	2	342	19	12	10	2
Pisano FZIE																182	9	5	6	1	182	9	5	6	1
Santiago-I FZIE																182	7	4	7	1	182	7	4	7	1
Santiago-II FZIE																1,133	106	77	22	4	1,133	106	77	22	4
Santiago-III FZIE																154	15	12	3	0	154	15	12	3	0
Outside Sewerage District																215	133	57	5	1	215	133	57	5	1
Total	61,250	8,352	9,746	1,949	110	35,800	5,300	6,013	1,147	89	28,300	991	991	849	57	8,864	1,880	1,750	161	25	134,214	16,523	18,500	4,106	281

Year	2005																									
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	2,550	366	444	89	6	0	0	0	0	0	7,820	274	274	235	16	0	0	0	0	0	10,370	640	718	324	22
Embrujo Sewerage District	1,700	244	296	59	4	0	0	0	0	0	5,920	207	207	178	12	0	0	0	0	0	7,620	451	503	237	16
Los Salados Sewerage District	1,400	201	244	49	3	0	0	0	0	0	5,290	185	185	159	11	0	0	0	0	0	6,690	386	429	208	14
Rafey Sewerage District	30,120	4,322	5,240	1,047	67	44,190	6,849	8,043	1,502	128	35,800	1,253	1,253	1,074	72	0	0	0	0	0	110,110	12,424	14,536	3,623	267
Zona Sur Sewerage District	1,500	215	260	52	3	7,220	1,119	1,314	245	21	0	0	0	0	0	0	0	0	0	0	8,720	1,334	1,574	297	24
Herradura Sewerage District	7,150	1,026	1,244	249	16	3,430	532	624	117	10	0	0	0	0	0	0	0	0	0	0	10,580	1,558	1,868	366	26
CIP FZIE																1,114	56	56	47	8	1,114	56	56	47	8
Gurabo FZIE																502	25	25	12	2	502	25	25	12	2
Pisano FZIE																461	23	23	10	2	461	23	23	10	2
Santiago-I FZIE																2,157	108	108	36	8	2,157	108	108	36	8
Santiago-II FZIE																					0	0	0	0	0
Santiago-III FZIE																					0	0	0	0	0
On-Site Treatment System																8,519	93	426	22	2	8,519	93	426	22	2
Total	44,420	6,374	7,728	1,545	99	54,840	8,500	9,981	1,864	159	54,830	1,919	1,919	1,646	111	12,753	305	638	126	22	166,843	17,098	20,266	5,181	391

TABLA A11.12 RESUMEN DE LAS CARGAS CONTAMINADAS AL RÍO YAQUE DEL NORTE [IMPLEMENTACIÓN PROGRAMA CON CASO] (2/2)

Year	2010																									
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	2,350	363	441	78	5	0	0	0	0	0	10,110	354	354	303	20	0	0	0	0	0	12,460	717	795	381	25
Embrujo Sewerage District	1,460	226	275	49	3	0	0	0	0	0	7,490	262	262	225	15	0	0	0	0	0	8,950	488	537	274	18
Los Salados Sewerage District	1,250	192	234	42	3	0	0	0	0	0	6,770	237	237	203	14	0	0	0	0	0	8,020	429	471	245	17
Rafey Sewerage District	16,960	2,617	3,183	565	36	42,370	6,949	8,220	1,398	119	71,600	2,506	2,506	2,148	143	0	0	0	0	0	130,930	12,072	13,909	4,111	298
Zona Sur Sewerage District	980	152	185	33	2	0	0	0	0	0	9,340	327	327	280	19	0	0	0	0	0	10,320	479	512	313	21
Herradura Sewerage District	5,710	881	1,071	190	12	0	0	0	0	0	6,340	222	222	190	13	0	0	0	0	0	12,050	1,103	1,293	380	25
CIP FZIE																1,422	71	71	60	11	1,422	71	71	60	11
Gurabo FZIE																640	32	32	16	3	640	32	32	16	3
Pisano FZIE																589	29	29	12	2	589	29	29	12	2
Santiago-I FZIE																2,752	138	138	46	10	2,752	138	138	46	10
Santiago-II FZIE																					0	0	0	0	0
Santiago-III FZIE																					0	0	0	0	0
On-Site Treatment System																10,873	124	544	28	2	10,873	124	544	28	2
Total	**28,710**	**4,431**	**5,389**	**957**	**61**	**42,370**	**6,949**	**8,220**	**1,398**	**119**	**111,650**	**3,908**	**3,908**	**3,349**	**224**	**16,276**	**394**	**814**	**162**	**28**	**199,006**	**15,682**	**18,331**	**5,866**	**432**

Year	2015																									
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	1,800	288	360	65	4	2,640	446	541	92	8	10,110	354	354	303	20	0	0	0	0	0	14,550	1,088	1,255	460	32
Embrujo Sewerage District	1,180	188	235	42	3	0	0	0	0	0	9,200	322	322	276	18	0	0	0	0	0	10,380	510	557	318	21
Los Salados Sewerage District	850	136	170	31	2	0	0	0	0	0	8,490	297	297	255	17	0	0	0	0	0	9,340	433	467	286	19
Rafey Sewerage District	6,470	1,032	1,290	233	16	73,920	12,492	15,154	2,587	222	71,600	2,506	2,506	2,148	143	0	0	0	0	0	151,990	16,030	18,950	4,968	381
Zona Sur Sewerage District	150	24	30	5	0	1,840	311	377	64	6	10,000	350	350	300	20	0	0	0	0	0	11,990	685	757	369	26
Herradura Sewerage District	3,830	612	765	138	9	0	0	0	0	0	9,930	348	348	298	20	0	0	0	0	0	13,760	960	1,113	436	29
CIP FZIE																1,649	82	82	70	13	1,649	82	82	70	13
Gurabo FZIE																743	37	37	18	3	743	37	37	18	3
Pisano FZIE																683	34	34	14	3	683	34	34	14	3
Santiago-I FZIE																3,191	160	160	54	12	3,191	160	160	54	12
Santiago-II FZIE																					0	0	0	0	0
Santiago-III FZIE																					0	0	0	0	0
On-Site Treatment System																12,604	147	630	33	3	12,604	147	630	33	3
Total	**14,280**	**2,280**	**2,850**	**514**	**34**	**78,400**	**13,249**	**16,072**	**2,743**	**236**	**119,330**	**4,177**	**4,177**	**3,580**	**238**	**18,870**	**460**	**943**	**190**	**33**	**230,880**	**20,166**	**24,042**	**7,027**	**541**

TABLA A11.13 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS [IMPLEMENTACIÓN PROGRAMA CON CASO](1/4)

Year	2000														
	5+6+7(Total Industrial Wastewater Discharged)					5 (Industrial Wastewater Discharged to Sewer)					6 ((Industrial Wastewater Discharged to River)				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	482	190	221	19	4	391	104	152	14	3	85	85	68	5	1
Embrujo Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Salados Sewerage District	384	173	136	20	4	384	173	136	20	4	0	0	0	0	0
Rafey Sewerage District	12,568	4,590	4,020	364	53	6,619	3,056	2,490	285	42	5,850	1,477	1,497	75	10
Zona Sur Sewerage District	27	5	5	1	0	27	5	5	1	0	0	0	0	0	0
Herradura Sewerage District	310	100	61	11	2	0	0	0	0	0	0	0	0	0	0
CIP FZIE	758	36	23	31	6	0	0	0	0	0	720	29	17	29	5
Gurabo FZIE	342	19	12	10	2	0	0	0	0	0	342	19	12	10	2
Pisano FZIE	314	13	8	11	2	132	4	3	5	1	182	9	5	6	1
Santiago-I FZIE	1,718	316	286	73	13	1,536	309	282	66	12	182	7	4	7	1
Santiago-II FZIE	1,572	207	166	41	8	439	101	89	19	4	1,133	106	77	22	4
Santiago-III FZIE	877	160	128	36	6	723	145	116	33	6	154	15	12	3	0
Outside Sewerage District	857	239	511	14	3	84	88	42	6	2	215	133	57	5	1
Santiago City Total	**20,209**	**6,048**	**5,577**	**630**	**101**	**10,336**	**3,985**	**3,314**	**449**	**72**	**8,864**	**1,880**	**1,750**	**161**	**25**
Licey Sewerage District	93	40	43	4	0	49	10	8	2	0	0	0	0	0	0
Tamboril Sewerage District	83	184	77	3	1	71	172	67	2	1	0	0	0	0	0
Licey FZIE	39	8	7	2	0	0	0	0	0	0	0	0	0	0	0
Tamboril FZIE	3	1	1	0	0	3	1	1	0	0	0	0	0	0	0
Licey, Tamboril Total	**218**	**233**	**127**	**9**	**2**	**123**	**183**	**76**	**4**	**1**	**0**	**0**	**0**	**0**	**0**

Year	2000				
	7 (Industrial Wastewater Discharged into Ground)				
	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	6	1	1	0	0
Embrujo Sewerage District	0	0	0	0	0
Los Salados Sewerage District	0	0	0	0	0
Rafey Sewerage District	99	57	33	4	1
Zona Sur Sewerage District	0	0	0	0	0
Herradura Sewerage District	310	100	61	11	2
CIP FZIE	38	8	6	2	0
Gurabo FZIE	0	0	0	0	0
Pisano FZIE	0	0	0	0	0
Santiago-I FZIE	0	0	0	0	0
Santiago-II FZIE	0	0	0	0	0
Santiago-III FZIE	0	0	0	0	0
Outside Sewerage District	557	18	412	3	0
Santiago City Total	**1,010**	**183**	**513**	**20**	**4**
Licey Sewerage District	44	30	35	2	0
Tamboril Sewerage District	12	12	10	1	0
Licey FZIE	39	8	7	2	0
Tamboril FZIE	0	0	0	0	0
Licey, Tamboril Total	**95**	**50**	**52**	**5**	**0**

TABLA A11.13 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS [IMPLEMENTACIÓN PROGRAMA CON CASO] (2/4)

Year	2005														
	5+6 (Discharged Wastewater Total)					5 (Industrial Wastewater Discharged to Sewer)					6 ((Industrial Wastewater Discharged to River)				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	709	145	220	23	5	709	145	220	23	5	0	0	0	0	0
Embrujo Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Salados Sewerage District	565	129	135	23	5	565	129	135	23	5	0	0	0	0	0
Rafey Sewerage District	15,048	3,439	3,468	460	102	15,048	3,439	3,468	460	102	0	0	0	0	0
Zona Sur Sewerage District	39	8	7	2	0	39	8	7	2	0	0	0	0	0	0
Herradura Sewerage District	456	102	102	17	3	456	102	102	17	3	0	0	0	0	0
CIP FZIE	1.114	56	56	47	8	0	0	0	0	0	1,114	56	56	46.5	8.3
Gurabo FZIE	502	25	25	12	2	0	0	0	0	0	502	25	25	12	2.2
Pisano FZIE	461	23	23	10	2	0	0	0	0	0	461	23	23	9.5	1.8
Santiago-I FZIE	2,157	108	108	36	8	-	-	-	-	-	2,157	108	108	36	7.9
Santiago-II FZIE	-	-	-	-	-	(Included in each Sewerage Area)					-	-	-	-	-
Santiago-III FZIE	(Included in Santiago- I FZIE)										(Included in Santiago- I FZIE)				
Outside Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
On-Site Treatment System	8,519	93	426	22	2	0	0	0	0	0	8,519	93	426	22	2
Santiago City Total	**29,570**	**4,128**	**4,570**	**650**	**137**	**16,817**	**3,823**	**3,932**	**524**	**115**	**12,753**	**305**	**638**	**126**	**22**
Licey Sewerage District	195	42	47	7	2	195	42	47	7	2	0	0	0	0	0
Tamboril Sewerage District	250	88	100	9	3	250	88	100	9	3	0	0	0	0	0
Licey FZIE	(Included in Licey Sewerage Area)				-	-	(Included in each Sewerage Area)				0	0	0	0	0
Tamboril FZIE	(Included in Tamboril Sewerage Area)				-	-					0	0	0	0	0
Licey, Tamboril Total	**445**	**130**	**147**	**16**	**4**	**445**	**130**	**147**	**16**	**4**	**0**	**0**	**0**	**0**	**0**

TABLA A11.13 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS [IMPLEMENTACIÓN PROGRAMA CON CASO] (3/4)

Year	2010														
	5+6 (Discharged Wastewater Total)					5 (Industrial Wastewater Discharged to Sewer)					6 ((Industrial Wastewater Discharged to River)				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	905	185	281	29	6	905	185	281	28.9	6	0	0	0	0	0
Embrujo Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Salados Sewerage District	721	165	172	29	6	721	165	172	28.8	6	0	0	0	0	0
Rafey Sewerage District	19,205	4,393	4,461	588	131	19,205	4,393	4,461	587.8	131	0	0	0	0	0
Zona Sur Sewerage District	50	10	9	2	0	50	10	9	2	0	0	0	0	0	0
Herradura Sewerage District	582	135	137	22	4	582	135	137	22	4	0	0	0	0	0
CIP FZIE	1,422	71	71	60	11	0	0	0	0	0	1,422	71	71	60.2	10.7
Gurabo FZIE	640	32	32	16	3	0	0	0	0	0	640	32	32	15.5	2.8
Pisano FZIE	589	29	29	12	2	0	0	0	0	0	589	29	29	12.2	2.3
Santiago-I FZIE	2,752	138	138	46	10	-	-	-	-	-	2,752	138	138	46.3	10.1
Santiago-II FZIE	-	-	-	-	-	(Included in each Sewerage Area)					-	-	-	-	-
Santiago-III FZIE	(Included in Santiago- I FZIE)										(Included in Santiago- I FZIE)				
Outside Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
On-Site Treatment System	10,873	124	544	28	2	0	0	0	0	0	10,873	124	544	28	2
Santiago City Total	**37,739**	**5,282**	**5,874**	**832**	**176**	**21,463**	**4,888**	**5,060**	**670**	**148**	**16,276**	**394**	**814**	**162**	**28**
Licey Sewerage District	249	53	60	9	2	249	53	60	8.9	2	0	0	0	0	0
Tamboril Sewerage District	319	112	128	11	3	319	112	128	10.9	3	0	0	0	0	0
Licey FZIE	(Included in Licey Sewerage Area)				-	-	(Included in each Sewerage Area)				0	0	0	0	0
Tamboril FZIE	(Included in Tamboril Sewerage Area)				-	-					0	0	0	0	0
Licey, Tamboril Total	**568**	**165**	**188**	**20**	**5**	**568**	**165**	**188**	**20**	**5**	**0**	**0**	**0**	**0**	**0**

TABLA A11.13 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS [IMPLEMENTACIÓN PROGRAMA CON CASO] (4/4)

Year	2015														
	5+6 (Discharged Wastewater Total)					5 (Industrial Wastewater Discharged to Sewer)					6 ((Industrial Wastewater Discharged to River)				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m^3/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	1,049	214	326	34	7	1,049	214	326	33.5	7	0	0	0	0	0
Embrujo Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Salados Sewerage District	835	191	199	33	7	835	191	199	33.4	7	0	0	0	0	0
Rafey Sewerage District	22,264	5,094	5,173	682	152	22,264	5,094	5,173	681.5	152	0	0	0	0	0
Zona Sur Sewerage District	58	12	10	2	1	58	12	10	2.3	1	0	0	0	0	0
Herradura Sewerage District	675	159	163	26	5	675	159	163	26	5	0	0	0	0	0
CIP FZIE	1,649	82	82	70	13	0	0	0	0	0	1,649	82	82	70.3	12.5
Gurabo FZIE	743	37	37	18	3	0	0	0	0	0	743	37	37	18.1	3.3
Pisano FZIE	683	34	34	14	3	0	0	0	0	0	683	34	34	14.2	2.6
Santiago-I FZIE	3,191	160	160	54	12	-	-	-	-	-	3,191	160	160	53.9	11.8
Santiago-II FZIE	-	-	-	-	-	(Included in each Sewerage Area)					-	-	-	-	-
Santiago-III FZIE	-	(Included in Santiago- I FZIE)			-	-	-	-	-	-	-	(Included in Santiago- I FZIE)			-
Outside Sewerage District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
On-Site Treatment System	12,604	147	630	33	3	0	0	0	0	0	12,604	147	630	33	3
Santiago City Total	**43,751**	**6,130**	**6,814**	**966**	**204**	**24,881**	**5,670**	**5,871**	**777**	**171**	**18,870**	**460**	**943**	**190**	**33**
Licey Sewerage District	288	62	70	10	2	288	62	70	10.3	2	0	0	0	0	0
Tamboril Sewerage District	369	130	148	13	4	369	130	148	12.7	4	0	0	0	0	0
Licey FZIE	(Included in Licey Sewerage Area)				-	(Included in each Sewerage Area)				-	0	0	0	0	0
Tamboril FZIE	(Included in Tamboril Sewerage Area)				-	-	-	-	-	-	0	0	0	0	0
Licey, Tamboril Total	**657**	**192**	**218**	**23**	**6**	**657**	**192**	**218**	**23**	**6**	**0**	**0**	**0**	**0**	**0**

TABLA A11.14 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [IMPLEMENTACIÓN PROGRAMA CON CASO] (1/4)

Year	2000																								
	Hondo					Nibaje					Gurabo					Jacagua					Total				
Pollutants Source	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	5,310	786	892	170	13	6,340	546	611	196	13	14,910	2,034	2,373	474	27	13,790	1,993	2,279	441	32	40,350	5,359	6,155	1,281	85
Unsewered	(Discharged to Yaque del Norte)					*1,800*	*246*	*287*	*57*	*3*	*14,910*	*2,034*	*2,373*	*474*	*27*	*4,140*	*564*	*658*	*132*	*8*	*20,850*	*2,844*	*3,318*	*663*	*38*
Bypassed	*5,310*	*786*	*892*	*170*	*13*	*1,240*	*184*	*208*	*40*	*3*	*0*	*0*	*0*	*0*	*0*	*9,650*	*1,429*	*1,621*	*309*	*24*	*16,200*	*2,399*	*2,721*	*519*	*40*
Treated	*0*	*0*	*0*	*0*	*0*	*3,300*	*116*	*116*	*99*	*7*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3,300*	*116*	*116*	*99*	*7*
Industial	720	29	17	29	5	0	0	0	0	0	342	19	12	10	2	624	451	359	32	7	1,686	499	388	71	14
Natural/Others																									
Total	**6,030**	**815**	**909**	**199**	**18**	**6,340**	**546**	**611**	**196**	**13**	**15,252**	**2,053**	**2,385**	**484**	**29**	**14,414**	**2,444**	**2,638**	**473**	**39**	**42,036**	**5,858**	**6,543**	**1,352**	**99**
Mesured Value	**25,920**	**1,115**	**4,277**	**137**	**69**	**58,752**	**1,939**	**8,343**	**3,049**	**35**	**38,880**	**1,516**	**8,476**	**408**	**71**	**77,760**	**6,143**	**16,330**	**1,159**	**121**		**8,756**	**9,652**	**1,942**	**153**

TABLA A11.14 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [IMPLEMENTACIÓN PROGRAMA CON CASO] (2/4)

Year	2005																								
	Hondo					Nibaje					Gurabo					Jacagua					Total				
Pollutants Source	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	7,220	1,119	1,314	245	21	7,620	451	503	237	16	16,370	2,349	2,848	569	36	17,060	1,026	1,147	532	36	48,270	4,945	5,812	1,583	109
Unsewered	(Discharged to Yaque del Norte)					*1,700*	*244*	*296*	*59*	*4*	*16,370*	*2,349*	*2,848*	*569*	*36*	*3,950*	*567*	*688*	*138*	*9*	*22,020*	*3,160*	*3,832*	*766*	*49*
Bypassed	*7,220*	*1,119*	*1,314*	*245*	*21*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*7,220*	*1,119*	*1,314*	*245*	*21*
Treated	*0*	*0*	*0*	*0*	*0*	*5,920*	*207*	*207*	*178*	*12*	*0*	*0*	*0*	*0*	*0*	*13,110*	*459*	*459*	*394*	*27*	*19,030*	*666*	*666*	*572*	*39*
Industial	1,114	56	56	47	8	0	0	0	0	0	502	25	25	12	2	463	23	23	10	2	2,079	104	104	68	12
Natural/Others																									
Total	**8,334**	**1,175**	**1,370**	**292**	**29**	**7,620**	**451**	**503**	**237**	**16**	**16,872**	**2,374**	**2,873**	**581**	**38**	**17,523**	**1,049**	**1,170**	**542**	**38**	**50,349**	**5,049**	**5,916**	**1,651**	**121**

TABLA A11.14 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [IMPLEMENTACIÓN PROGRAMA CON CASO] (3/4)

Year	2010																									
Pollutants Source	Hondo					Nibaje					Gurabo					Jacagua					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	9,340	327	327	280	19	8,950	488	537	274	18	6,790	1,047	1,274	226	14	20,480	1,146	1,266	626	42	45,560	3,008	3,404	1,406	93
Unsewered	(Discharged to Yaque del Norte)					*1,460*	*226*	*275*	*49*	*3*	*6,790*	*1,047*	*1,274*	*226*	*14*	*3,600*	*555*	*675*	*120*	*8*	*25,130*	*1,864*	*2,140*	*781*	*51*
Bypassed	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Treated	*9,340*	*327*	*327*	*280*	*19*	*7,490*	*262*	*262*	*225*	*15*	*0*	*0*	*0*	*0*	*0*	*16,880*	*591*	*591*	*506*	*34*	*33,710*	*1,180*	*1,180*	*1,011*	*68*
Industial	1,422	71	71	60	11	0	0	0	0	0	640	32	32	16	3	592	29	29	12	2	2,654	132	132	88	16
Natural/Others																									
Total	**10,762**	**398**	**398**	**340**	**30**	**8,950**	**488**	**537**	**274**	**18**	**7,430**	**1,079**	**1,306**	**242**	**17**	**21,072**	**1,175**	**1,295**	**638**	**44**	**48,214**	**3,140**	**3,536**	**1,494**	**109**

TABLA A11.14 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [IMPLEMENTACIÓN PROGRAMA CON CASO] (4/4)

Year	2015																									
Pollutants Source	Hondo					Nibaje					Gurabo					Jacagua					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	11,840	661	727	364	26	10,380	510	557	318	21	2,580	412	515	93	6	23,890	1,521	1,722	746	51	48,690	3,104	3,521	1,521	104
Unsewered	(Discharged to Yaque del Norte)					*1,180*	*188*	*235*	*42*	*3*	*2,580*	*412*	*515*	*93*	*6*	*2,650*	*424*	*530*	*96*	*6*	*6,410*	*1,024*	*1,280*	*231*	*15*
Bypassed	*1,840*	*311*	*377*	*64*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2,640*	*446*	*541*	*92*	*8*	*4,480*	*757*	*918*	*156*	*14*
Treated	*10,000*	*350*	*350*	*300*	*20*	*9,200*	*322*	*322*	*276*	*18*	*0*	*0*	*0*	*0*	*0*	*18,600*	*651*	*651*	*558*	*37*	*37,800*	*1,323*	*1,323*	*1,134*	*75*
Industial	1,649	82	82	70	13	0	0	0	0	0	743	37	37	18	3	686	34	34	14	3	3,078	153	153	103	18
Natural/Others																									
Total	**13,489**	**743**	**809**	**434**	**39**	**10,380**	**510**	**557**	**318**	**21**	**3,323**	**449**	**552**	**111**	**9**	**24,576**	**1,555**	**1,756**	**760**	**54**	**51,768**	**3,257**	**3,674**	**1,624**	**122**

Note:
1. Industrial wastewater generated at CIP FZIE is to be discharged into Hondo river.
2. Domestic Wastewater :
   Hondo: Treated and Untreated WWs generated at Zona Sur S.D. are discharged to Hondo River. WW generated N.-Served area of Zona Sur S.D. is Discharged to Yaque del Norte River.
   Nibaje: WWs of Treated, Untreated and N.-Served area generated from Embrujo S.D. are discharged into Nibaje River.
   Gurabo: WWs of N.-Served area of Rafey S.D. generated in the area of Gurabo (Area IV of Rafey) are discharged into Gurabo River.
   Jacagua: WWs of Treated, Untreated and N.-Served area generated from Los SaradosS.D. and Cienfuegos S.D. are discharged into Jacagua River.
3. Domestic wastewaters generated from the Rafey areas of I, II, III and V of N.-Served area are discharged into Yaque del Norte River.
4. Industrial wastewater generated at Gurabo FZIE is to be discharged into Gurabo river.
5. Industrial wastewaters generated at Pisano FZIE and Cienfuegos S.D. are to be discharged into Jacagua river.
6. Part of Industrial wastewater generated at Rafey S.D. is to be discharged into Jacagua river.
7. Domestic wastewaters generated from Herradura S.D. are discharged into Yaque del Norte River.
   WWs of Treated and Untreated are discharged after the poinbt of RC1. WW from N.-Served area is discharged into Yaque del Norte River between Nibaje and Gurabo.

TABLA A11.15 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS A LOS RÍOS YAQUE DEL NORTE Y JACAGUA DESDE EL DISTRITO DE ALCANTARILLADO SANITARIO DE RAFEY [IMPLEMENTACIÓN DEL PROGRAMA/ MEJORAMIENTO FINAL CON CASO]

River	2000					2005					2010					2015				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Jacagua	357	357	286	21	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yaque del Norte	5,493	1,120	1,211	54	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,850	1,477	1,497	75	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLA A11.16 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS AL RÍO JACAGUA [IMPLEMENTACIÓN DEL PROGRAMA/ MEJORAMIENTO FINAL CON CASO

River	2000					2005					2010					2015				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
From Cienfuegos S.D.	85	85	68	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
From Rafey S.D.	357	357	286	21	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
From Piaso FZIE	182	9	5	6	1	461	23	23	10	2	589	29	29	12	2	683	34	34	14	3
From Non-S. D.	0	0	0	0	0	2	0	0	0	0	3	0	0	0	0	3	0	0	0	0
Total	624	451	359	32	7	463	23	23	10	2	592	29	29	12	2	686	34	34	14	3

TABLA A11.17 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS AL RÍO YAQUE DEL NORTE (DESDE FUERA DEL DISTRITO DEL ALCANTARILLADO SANITARIO Y DEL SISTEMA DE TRATAMIENTO EN EL SITIO) [IMPLEMENTACIÓN DEL PROGRAMA/ MEJORAMIENTO FINAL CON CASO]

	2000					2005					2010					2015				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Acero EstrellaS.D.						48	10	2	2	0	62	12	3	3	0	71	14	4	3	0
Cemento Ciba						712	7	36	1	0	909	9	45	2	0	1,054	11	53	2	0
De Acero Industrial S & M						8	2	0	0	0	10	2	0	0	0	11	2	1	1	0
Especias y Aditivos Alim	36	25	14	2	1	53	3	3	1	1	67	3	3	1	1	78	4	4	1	1
Hormigpones del Cibao						22	0	1	0	0	27	0	1	0	0	32	0	2	0	0
Isidoro Bordas	180	108	43	3	1	264	13	13	3	1	337	17	17	3	1	390	20	20	4	1
Troquelados Dominicano						15	3	1	1	0	20	4	1	1	0	23	5	1	1	0
UST Industries						11	1	1	0	0	14	1	1	0	0	17	1	1	0	0
Between Junction of Hondo and Nibaje	**216**	**133**	**57**	**5**	**2**	**1,133**	**39**	**57**	**7**	**2**	**1,446**	**48**	**71**	**10**	**2**	**1,676**	**57**	**86**	**11**	**3**
Ochos Hermanos						1,591	13	80	3	0	2,030	17	102	4	0	2,354	20	118	5	0
EmpresasNunez						308	2	15	1	0	393	3	20	1	0	455	4	23	1	0
Before Junction of Hondo Total	**0**	**0**	**0**	**0**	**0**	**1,899**	**15**	**95**	**4**	**0**	**2,423**	**20**	**122**	**5**	**0**	**2,809**	**24**	**141**	**6**	**0**
Hoyo de Lima						5,485	40	274	11	0	7,001	55	350	14	0	8,116	66	406	16	0
After Junction of Gurabo Total	**0**	**0**	**0**	**0**	**0**	**5,485**	**40**	**274**	**11**	**0**	**7,001**	**55**	**350**	**14**	**0**	**8,116**	**66**	**406**	**16**	**0**
Yaque Total	**216**	**133**	**57**	**5**	**2**	**8,517**	**94**	**426**	**22**	**2**	**10,870**	**123**	**543**	**28**	**2**	**12,601**	**147**	**633**	**33**	**3**

TABLA A11.18 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS A LOS [IMPLEMENTACIÓN DEL PROGRAMA/ MEJORAMIENTO FINAL CON CASO] (1/2)

	2000							2005						
	Industrial Wastewater discharged to River	Discharged river						Industrial Wastewater discharged to River	Discharged river					
		Yaque del Norte	Hondo	Nibaje	Gurabo	Jacagua	Others		Yaque del Norte	Hondo	Nibaje	Gurabo	Jacagua	Others
	[m³/day]	[m³/day]						[m³/day]	[m3/day]					
Cienfuegos Sewerage Distric	85					85		0						
Embrujo Sewerage District	0							0						
Los Sarados Sewewrage District	0							0						
Rafey Sewerage District	5,850	5,493				357		0						
Zona Sur Sewerage District	0							0						
Herradura Sewerage District	0							0						
CIP FZIE	720		720					1,114		1,114				
Gurabo FZIE	342				342			502				502		
Pisano FZIE	182					182		461					461	
Santiago-I FZIE	182	182						2,157	2,157					
Santiago-II FZIE	1,133	1,133						0						
Santiago-III FZIE	154	154						0						
Outside Sewerage District	215	215						0						
On-Site Treatment System	0							8,519	8,517				2	
Santiago City Total	**8,863**	**7,177**	**720**	**0**	**342**	**624**	**0**	**12,753**	**10,674**	**1,114**	**0**	**502**	**463**	**0**
Licey Sewerage District	0							0						
Tamboril Sewerage District	0							0						
Licey FZIE	0							0						
Tamboril FZIE	0							0						
Licey, Tamboril Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0	0	0	0	0	0	0
Total	**8,863**	**7,177**	**720**	**0**	**342**	**624**	**0**	**12,753**	**10,674**	**1,114**	**0**	**502**	**463**	**0**

TABLA A11.18 AGUAS RESIDUALES INDUSTRIALES DESCARGADAS A LOS [IMPLEMENTACIÓN DEL PROGRAMA/ MEJORAMIENTO FINAL CON CASO] (2/2)

Year	2010							2015						
	Industrial Wastewater discharged to River	Discharged river						Industrial Wastewater discharged to River	Discharged river					
		Yaque del Norte	Hondo	Nibaje	Gurabo	Jacagua	Others		Yaque del Norte	Hondo	Nibaje	Gurabo	Jacagua	Others
	[m³/day]	[m3/day]						[m³/day]	[m³/day]					
Cienfuegos Sewerage Distric	0							0						
Embrujo Sewerage District	0							0						
Los Sarados Sewewrage District	0							0						
Rafey Sewerage District	0							0						
Zona Sur Sewerage District	0							0						
Herradura Sewerage District	0							0						
CIP FZIE	1,422		1,422					1,649		1,649				
Gurabo FZIE	640				640			743				743		
Pisano FZIE	589					589		683					683	
Santiago-I FZIE	2,752	2,752						3,191	3,191					
Santiago-II FZIE	0							0						
Santiago-III FZIE	0							0						
Outside Sewerage District	0							0						
On-Site Treatment System	10,873	10,870				3		12,604	12,601				3	
Santiago City Total	**16,276**	**13,622**	**1,422**	**0**	**640**	**592**	**0**	**18,870**	**15,792**	**1,649**	**0**	**743**	**686**	**0**
Licey Sewerage District	0							0						
Tamboril Sewerage District	0							0						
Licey FZIE	0							0						
Tamboril FZIE	0							0						
Licey, Tamboril Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**16,276**	**13,622**	**1,422**	**0**	**640**	**592**	**0**	**18,870**	**15,792**	**1,649**	**0**	**743**	**686**	**0**

TABLA A11.19 CARGAS CONTAMINADAS DIRECTAS DESCARGADAS AL RÍO YAQUE DEL NORTE (EXCLUYENDO CARGAS DESDE LOS RÍOS TRIBUTARIOS) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/2)

Year	2000					2005					2010					2015				
Pollutants Source	Flowrate [m^3/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m^3/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m^3/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m^3/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
DWW from Non-Served District																				
Zona Sur S.D.	*1,870*	*255*	*298*	*60*	*3*	*1,500*	*215*	*260*	*52*	*3*	*980*	*152*	*185*	*33*	*2*	*150*	*24*	*30*	*5*	*0*
Rafey S.D. (Area I)	*1,170*	*159*	*186*	*37*	*2*	*1,150*	*165*	*200*	*40*	*3*	*840*	*130*	*158*	*28*	*2*	*330*	*52*	*65*	*12*	*1*
From RC1 until Junction of Hondo Total	**3,040**	**414**	**484**	**97**	**5**	**2,650**	**380**	**460**	**92**	**6**	**1,820**	**282**	**343**	**61**	**4**	**480**	**76**	**95**	**17**	**1**
From Hondo until Junction of Nibaje Total (Rafey II)	**27,170**	**3,705**	**4,323**	**865**	**49**	**10,300**	**1,478**	**1,792**	**358**	**22**	**7,630**	**1,177**	**1,431**	**254**	**16**	**2,900**	**464**	**480**	**104**	**7**
Rafey S.D. (Area III)	*1,170*	*159*	*186*	*37*	*2*	*1,150*	*165*	*200*	*40*	*3*	*840*	*130*	*158*	*28*	*2*	*330*	*52*	*65*	*12*	*1*
HerraduraS.D.	*7,830*	*1,068*	*1,246*	*249*	*14*	*7,150*	*1,026*	*1,244*	*249*	*16*	*5,710*	*881*	*1,071*	*190*	*12*	*3,830*	*612*	*765*	*138*	*9*
From Nibaje until Junction of Gurabo Total	**9,000**	**1,227**	**1,432**	**286**	**16**	**8,300**	**1,191**	**1,444**	**289**	**19**	**6,550**	**1,011**	**1,229**	**218**	**14**	**4,160**	**664**	**830**	**150**	**10**
From Gurabo until RC5 Total (Rafey Area V)	**1,190**	**162**	**189**	**38**	**2**	**1,150**	**165**	**200**	**40**	**3**	**860**	**133**	**162**	**29**	**2**	**330**	**52**	**65**	**12**	**1**
Bypassed Wastewater																				
After Junction of Gurabo (Rafey S.D.)	**18,490**	**2,737**	**3,106**	**592**	**46**	**44,190**	**6,849**	**8,043**	**1,502**	**128**	**42,370**	**6,949**	**8,220**	**1,398**	**119**	**73,920**	**12,492**	**15,154**	**2,587**	**222**
After RC5 (Herradura S.D.)	**1,110**	**164**	**186**	**36**	**3**	**3,430**	**532**	**624**	**117**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Treated DWW																				
After Junction of Gurabo (Rafey S.D.)	**25,000**	**875**	**875**	**750**	**50**	**35,800**	**1,253**	**1,253**	**1,074**	**72**	**71,600**	**2,506**	**2,506**	**2,148**	**143**	**71,600**	**2,506**	**2,506**	**2,148**	**143**
After RC5 (Herradura S.D.)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6,340**	**222**	**222**	**190**	**13**	**9,930**	**348**	**348**	**298**	**20**
DWW Total	**85,000**	**9,284**	**10,595**	**2,664**	**171**	**105,820**	**11,848**	**13,816**	**3,472**	**260**	**137,170**	**12,280**	**14,113**	**4,298**	**311**	**163,320**	**16,602**	**19,478**	**5,316**	**404**

TABLA A11.19 CARGAS CONTAMINADAS DIRECTAS DESCARGADAS AL RÍO YAQUE DEL NORTE (EXCLUYENDO CARGAS DESDE LOS RÍOS TRIBUTARIOS) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/2)

Year	2000					2005					2010					2015				
Pollutants Source	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Industrial Wastewater *After Junction of Gurabo (Rafey Total)*	**6,962**	**1,248**	**1,304**	**86**	**10**	**2,157**	**108**	**108**	**36**	**8**	**2,752**	**138**	**138**	**46**	**10**	**3,191**	**160**	**160**	**54**	**12**
Rafey S.D.	*5,493*	*1,120*	*1,211*	*54*	*5*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Santiago-I FZIE	*182*	*7*	*4*	*7*	*1*	*2,157*	*108*	*108*	*36*	*8*	*2,752*	*138*	*138*	*46*	*10*	*3,191*	*160*	*160*	*54*	*12*
Santiago-II FZIE	*1,133*	*106*	*77*	*22*	*4*	~~(Included in Santiago- I FZIE)~~					~~(Included in Santiago- I FZIE)~~					~~(Included in Santiago- I FZIE)~~				
Santiago-III FZIE	*154*	*15*	*12*	*3*	*0*															
Non-S.D./O.S. T.S. Total	**216**	**133**	**57**	**5**	**2**	**8,517**	**94**	**426**	**22**	**2**	**10,870**	**123**	**543**	**29**	**2**	**12,601**	**147**	**633**	**33**	**3**
Between Junction of Hondo and Nibaje	*216*	*133*	*57*	*5*	*2*	*1,133*	*39*	*57*	*7*	*2*	*1,446*	*48*	*71*	*10*	*2*	*1,676*	*57*	*86*	*11*	*3*
Before Junction of Hondo	*0*	*0*	*0*	*0*	*0*	*1,899*	*15*	*95*	*4*	*0*	*2,423*	*20*	*122*	*5*	*0*	*2,809*	*24*	*141*	*6*	*0*
After Junction of Gurabo	*0*	*0*	*0*	*0*	*0*	*5,485*	*40*	*274*	*11*	*0*	*7,001*	*55*	*350*	*14*	*0*	*8,116*	*66*	*406*	*16*	*0*
Industrial WW Total	**7,178**	**1,381**	**1,361**	**91**	**12**	**10,674**	**202**	**534**	**58**	**10**	**13,622**	**261**	**681**	**75**	**12**	**15,792**	**307**	**793**	**87**	**15**
Total (DWW+IWW)	**92,178**	**10,665**	**11,956**	**2,755**	**183**	**116,494**	**12,050**	**14,350**	**3,530**	**270**	**150,792**	**12,541**	**14,794**	**4,373**	**323**	**179,112**	**16,909**	**20,271**	**5,403**	**419**

TABLA A11.20 RESUMEN DE LAS CARGAS CONTAMINADAS AL RÍO YAQUE DEL NORTE [CON EL CASO DEL MEJORAMIENTO FINAL] (1/2)

Year	2000																								
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	2,640	360	420	84	5	5,740	850	964	184	14	0	0	0	0	0	85	85	68	5	1	8,465	1,295	1,452	273	20
Embrujo Sewerage District	1,800	246	287	57	3	1,240	184	208	40	3	3,300	116	116	99	7	0	0	0	0	0	6,340	546	611	196	13
Los Salados Sewerage District	1,500	204	238	48	3	3,910	579	657	125	10	0	0	0	0	0	0	0	0	0	0	5,410	783	895	173	13
Rafey Sewerage District	45,610	6,219	7,257	1,451	82	18,490	2,737	3,106	592	46	25,000	875	875	750	50	5,850	1,477	1,497	75	10	94,950	11,308	12,735	2,868	188
Zona Sur Sewerage District	1,870	255	298	60	3	5,310	786	892	170	13	0	0	0	0	0	0	0	0	0	0	7,180	1,041	1,190	230	16
Herradura Sewerage District	7,830	1,068	1,246	249	14	1,110	164	186	36	3	0	0	0	0	0	0	0	0	0	0	8,940	1,232	1,432	285	17
CIP FZIE																720	29	17	29	5	720	29	17	29	5
Gurabo FZIE																342	19	12	10	2	342	19	12	10	2
Pisano FZIE																182	9	5	6	1	182	9	5	6	1
Santiago-I FZIE																182	7	4	7	1	182	7	4	7	1
Santiago-II FZIE																1,133	106	77	22	4	1,133	106	77	22	4
Santiago-III FZIE																154	15	12	3	0	154	15	12	3	0
Outside Sewerage District																215	133	57	5	1	215	133	57	5	1
Total	**61,250**	**8,352**	**9,746**	**1,949**	**110**	**35,800**	**5,300**	**6,013**	**1,147**	**89**	**28,300**	**991**	**991**	**849**	**57**	**8,864**	**1,880**	**1,750**	**161**	**25**	**134,214**	**16,523**	**18,500**	**4,106**	**281**

Year	2005																								
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P	Flowrate	BOD_5	SS	N	P
	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]	[m³/day]	[kg/day]	[kg/day]	[kg/day]	[kg/day]
Cienfuegos Sewerage District	2,550	366	444	89	6	0	0	0	0	0	7,820	274	274	235	16	0	0	0	0	0	10,370	640	718	324	22
Embrujo Sewerage District	1,700	244	296	59	4	0	0	0	0	0	5,920	207	207	178	12	0	0	0	0	0	7,620	451	503	237	16
Los Salados Sewerage District	1,400	201	244	49	3	0	0	0	0	0	5,290	185	185	159	11	0	0	0	0	0	6,690	386	429	208	14
Rafey Sewerage District	30,120	4,322	5,240	1,047	67	44,190	6,849	8,043	1,502	128	35,800	1,253	1,253	1,074	72	0	0	0	0	0	110,110	12,424	14,536	3,623	267
Zona Sur Sewerage District	1,500	215	260	52	3	7,220	1,119	1,314	245	21	0	0	0	0	0	0	0	0	0	0	8,720	1,334	1,574	297	24
Herradura Sewerage District	7,150	1,026	1,244	249	16	3,430	532	624	117	10	0	0	0	0	0	0	0	0	0	0	10,580	1,558	1,868	366	26
CIP FZIE																1,114	56	56	47	8	1,114	56	56	47	8
Gurabo FZIE																502	25	25	12	2	502	25	25	12	2
Pisano FZIE																461	23	23	10	2	461	23	23	10	2
Santiago-I FZIE																2,157	108	108	36	8	2,157	108	108	36	8
Santiago-II FZIE																					0	0	0	0	0
Santiago-III FZIE																					0	0	0	0	0
On-Site Treatment System																8,519	93	426	22	2	8,519	93	426	22	2
Total	**44,420**	**6,374**	**7,728**	**1,545**	**99**	**54,840**	**8,500**	**9,981**	**1,864**	**159**	**54,830**	**1,919**	**1,919**	**1,646**	**111**	**12,753**	**305**	**638**	**126**	**22**	**166,843**	**17,098**	**20,266**	**5,181**	**391**

TABLA A11.20 RESUMEN DE LAS CARGAS CONTAMINADAS AL RÍO YAQUE DEL NORTE [CON EL CASO DEL MEJORAMIENTO FINAL] (2/2)

Year	2010																									
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Cienfuegos Sewerage District	2,350	363	441	78	5	0	0	0	0	0	10,110	354	354	303	20	0	0	0	0	0	12,460	717	795	381	25
Embrujo Sewerage District	1,460	226	275	49	3	0	0	0	0	0	7,490	262	262	225	15	0	0	0	0	0	8,950	488	537	274	18
Los Salados Sewerage District	1,250	192	234	42	3	0	0	0	0	0	6,770	237	237	203	14	0	0	0	0	0	8,020	429	471	245	17
Rafey Sewerage District	16,960	2,617	3,183	565	36	0	0	0	0	0	113,970	3,989	3,989	3,419	228	0	0	0	0	0	130,930	6,606	7,172	3,984	264
Zona Sur Sewerage District	980	152	185	33	2	0	0	0	0	0	9,340	327	327	280	19	0	0	0	0	0	10,320	479	512	313	21
Herradura Sewerage District	5,710	881	1,071	190	12	0	0	0	0	0	6,340	222	222	190	13	0	0	0	0	0	12,050	1,103	1,293	380	25
CIP FZIE																1,422	71	71	60	11	1,422	71	71	60	11
Gurabo FZIE																640	32	32	16	3	640	32	32	16	3
Pisano FZIE																589	29	29	12	2	589	29	29	12	2
Santiago-I FZIE																2,752	138	138	46	10	2,752	138	138	46	10
Santiago-II FZIE																					0	0	0	0	0
Santiago-III FZIE																					0	0	0	0	0
On-Site Treatment System																10,873	124	544	28	2	10,873	124	544	28	2
Total	**28,710**	**4,431**	**5,389**	**957**	**61**	**0**	**0**	**0**	**0**	**0**	**154,020**	**5,391**	**5,391**	**4,620**	**309**	**16,276**	**394**	**814**	**162**	**28**	**199,006**	**10,216**	**11,594**	**5,739**	**398**

Year	2015																									
Pollution Source	[1] Domestic Wastewater from Unsewered Area					[3] Bypassed Wastewater					[4] Treated Wastewater					[6] Industrial Wastwewater					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Cienfuegos Sewerage District	1,800	288	360	65	4	0	0	0	0	0	12,750	446	446	383	26	0	0	0	0	0	14,550	734	806	448	30
Embrujo Sewerage District	1,180	188	235	42	3	0	0	0	0	0	9,200	322	322	276	18	0	0	0	0	0	10,380	510	557	318	21
Los Salados Sewerage District	850	136	170	31	2	0	0	0	0	0	8,490	297	297	255	17	0	0	0	0	0	9,340	433	467	286	19
Rafey Sewerage District	6,470	1,032	1,290	233	16	0	0	0	0	0	145,520	5,093	5,093	4,366	291	0	0	0	0	0	151,990	6,125	6,383	4,599	307
Zona Sur Sewerage District	150	24	30	5	0	0	0	0	0	0	11,840	414	414	355	24	0	0	0	0	0	11,990	438	444	360	24
Herradura Sewerage District	3,830	612	765	138	9	0	0	0	0	0	9,930	348	348	298	20	0	0	0	0	0	13,760	960	1,113	436	29
CIP FZIE																1,649	82	82	70	13	1,649	82	82	70	13
Gurabo FZIE																743	37	37	18	3	743	37	37	18	3
Pisano FZIE																683	34	34	14	3	683	34	34	14	3
Santiago-I FZIE																3,191	160	160	54	12	3,191	160	160	54	12
Santiago-II FZIE																					0	0	0	0	0
Santiago-III FZIE																					0	0	0	0	0
On-Site Treatment System																12,604	147	630	33	3	12,604	147	630	33	3
Total	**14,280**	**2,280**	**2,850**	**514**	**34**	**0**	**0**	**0**	**0**	**0**	**197,730**	**6,920**	**6,920**	**5,933**	**396**	**18,870**	**460**	**943**	**190**	**33**	**230,880**	**9,660**	**10,713**	**6,637**	**463**

TABLA A11.21 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [CON EL CASO DEL MEJORAMIENTO FINAL] (1/4)

Year	2000																									
	Hondo					Nibaje					Gurabo					Jacagua					Total				
Pollutants Source	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	5,310	786	892	170	13	6,340	546	611	196	13	14,910	2,034	2,373	474	27	13,790	1,993	2,279	441	32	40,350	5,359	6,155	1,281	85
Unsewered	(Discharged to Yaque del Norte)					*1,800*	*246*	*287*	*57*	*3*	*14,910*	*2,034*	*2,373*	*474*	*27*	*4,140*	*564*	*658*	*132*	*8*	*20,850*	*2,844*	*3,318*	*663*	*38*
Bypassed	*5,310*	*786*	*892*	*170*	*13*	*1,240*	*184*	*208*	*40*	*3*	*0*	*0*	*0*	*0*	*0*	*9,650*	*1,429*	*1,621*	*309*	*24*	*16,200*	*2,399*	*2,721*	*519*	*40*
Treated	*0*	*0*	*0*	*0*	*0*	*3,300*	*116*	*116*	*99*	*7*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3,300*	*116*	*116*	*99*	*7*
Industial	720	29	17	29	5	0	0	0	0	0	342	19	12	10	2	624	451	359	32	7	1,686	499	388	71	14
Natural/Others																									
Total	6,030	815	909	199	18	6,340	546	611	196	13	15,252	2,053	2,385	484	29	14,414	2,444	2,638	473	39	42,036	5,858	6,543	1,352	99
Mesured Value	25,920	1,115	4,277	137	69	58,752	1,939	8,343	3,049	35	38,880	1,516	8,476	408	71	77,760	6,143	16,330	1,159	121		8,756	9,652	1,942	153

TABLA A11.21 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [CON EL CASO DEL MEJORAMIENTO FINAL] (2/4)

Year	2005																									
	Hondo					Nibaje					Gurabo					Jacagua					Total				
Pollutants Source	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	7,220	1,119	1,314	245	21	7,620	451	503	237	16	16,370	2,349	2,848	569	36	17,060	1,026	1,147	532	36	48,270	4,945	5,812	1,583	109
Unsewered	(Discharged to Yaque del Norte)					*1,700*	*244*	*296*	*59*	*4*	*16,370*	*2,349*	*2,848*	*569*	*36*	*3,950*	*567*	*688*	*138*	*9*	*22,020*	*3,160*	*3,832*	*766*	*49*
Bypassed	*7,220*	*1,119*	*1,314*	*245*	*21*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*7,220*	*1,119*	*1,314*	*245*	*21*
Treated	*0*	*0*	*0*	*0*	*0*	*5,920*	*207*	*207*	*178*	*12*	*0*	*0*	*0*	*0*	*0*	*13,110*	*459*	*459*	*394*	*27*	*19,030*	*666*	*666*	*572*	*39*
Industial	1,114	56	56	47	8	0	0	0	0	0	502	25	25	12	2	463	23	23	10	2	2,079	104	104	68	12
Natural/Others																									
Total	8,334	1,175	1,370	292	29	7,620	451	503	237	16	16,872	2,374	2,873	581	38	17,523	1,049	1,170	542	38	50,349	5,049	5,916	1,651	121

TABLA A11.21 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [CON EL CASO DEL MEJORAMIENTO FINAL] (3/4)

Year	2010																								
Pollutants Source	Hondo					Nibaje					Gurabo					Jacagua					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	9,340	327	327	280	19	8,950	488	537	274	18	6,790	1,047	1,274	226	14	20,480	1,146	1,266	626	42	45,560	3,008	3,404	1,406	93
Unsewered	(Discharged to Yaque del Norte)					*1,460*	*226*	*275*	*49*	*3*	*6,790*	*1,047*	*1,274*	*226*	*14*	*3,600*	*555*	*675*	*120*	*8*	*25,130*	*1,864*	*2,140*	*781*	*51*
Bypassed	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Treated	*9,340*	*327*	*327*	*280*	*19*	*7,490*	*262*	*262*	*225*	*15*	*0*	*0*	*0*	*0*	*0*	*16,880*	*591*	*591*	*506*	*34*	*33,710*	*1,180*	*1,180*	*1,011*	*68*
Industial	1,422	71	71	60	11	0	0	0	0	0	640	32	32	16	3	592	29	29	12	2	2,654	132	132	88	16
Natural/Others																									
Total	**10,762**	**398**	**398**	**340**	**30**	**8,950**	**488**	**537**	**274**	**18**	**7,430**	**1,079**	**1,306**	**242**	**17**	**21,072**	**1,175**	**1,295**	**638**	**44**	**48,214**	**3,140**	**3,536**	**1,494**	**109**

TABLA A11.21 CARGAS CONTAMINADAS DESCARGADAS A LOS RÍOS TRIBUTARIOS [CON EL CASO DEL MEJORAMIENTO FINAL] (4/4)

Year	2015																								
Pollutants Source	Hondo					Nibaje					Gurabo					Jacagua					Total				
	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Wastewaters	11,840	414	414	355	24	10,380	510	557	318	21	2,580	412	515	93	6	23,890	1,167	1,273	734	49	48,690	2,503	2,759	1,500	100
Unsewered	(Discharged to Yaque del Norte)					*1,180*	*188*	*235*	*42*	*3*	*2,580*	*412*	*515*	*93*	*6*	*2,650*	*424*	*530*	*96*	*6*	*6,410*	*1,024*	*1,280*	*231*	*15*
Bypassed	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Treated	*11,840*	*414*	*414*	*355*	*24*	*9,200*	*322*	*322*	*276*	*18*	*0*	*0*	*0*	*0*	*0*	*21,240*	*743*	*743*	*638*	*43*	*42,280*	*1,479*	*1,479*	*1,269*	*85*
Industial	1,649	82	82	70	13	0	0	0	0	0	743	37	37	18	3	686	34	34	14	3	3,078	153	153	103	18
Natural/Others																									
Total	**13,489**	**496**	**496**	**425**	**37**	**10,380**	**510**	**557**	**318**	**21**	**3,323**	**449**	**552**	**111**	**9**	**24,576**	**1,201**	**1,307**	**748**	**52**	**51,768**	**2,656**	**2,912**	**1,603**	**118**

Note:
1. Industrial wastewater generated at CIP FZIE is to be discharged into Hondo river.
2. Domestic Wastewater :
   Hondo: Treated and Untreated WWs generated at Zona Sur S.D. are discharged to Hondo River. WW generated N.-Served area of Zona Sur S.D. is Discharged to Yaque del Norte River.
   Nibaje: WWs of Treated, Untreated and N.-Served area generated from Embrujo S.D. are discharged into Nibaje River.
   Gurabo: WWs of N.-Served area of Rafey S.D. generated in the area of Gurabo (Area IV of Rafey) are discharged into Gurabo River.
   Jacagua: WWs of Treated, Untreated and N.-Served area generated from Los SaradosS.D. and Cienfuegos S.D. are discharged into Jacagua River.
3. Domestic wastewaters generated from the Rafey areas of Ⅰ, Ⅱ, Ⅲ and Ⅴ of N.-Served area are discharged into Yaque del Norte River.
4. Industrial wastewater generated at Gurabo FZIE is to be discharged into Gurabo river.
5. Industrial wastewaters generated at Pisano FZIE and Cienfuegos S.D. are to be discharged into Jacagua river.
6. Part of Industrial wastewater generated at Rafey S.D. is to be discharged into Jacagua river.
7. Domestic wastewaters generated from Herradura S.D. are discharged into Yaque del Norte River.
   WWs of Treated and Untreated are discharged after the poinbt of KC1. WW from N.-Served area is discharged into Yaque del Norte River between Nibaje and Gurabo.

TABLA A11.22 CARGAS CONTAMINADAS DIRECTAS DESCARGADAS AL RÍO YAQUE DEL NORTE (EXCLUYENDO CARGAS DESDE LOS RÍOS TRIBUTARIOS) [CON EL CASO DEL MEJORAMIENTO FINAL](1/2)

Year	2000					2005					2010					2015				
Pollutants Source	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
DWW from Non-Served District																				
Zona Sur S.D.	*1,870*	*255*	*298*	*60*	*3*	*1,500*	*215*	*260*	*52*	*3*	*980*	*152*	*185*	*33*	*2*	*150*	*24*	*30*	*5*	*0*
Rafey S.D. (Area I)	*1,170*	*159*	*186*	*37*	*2*	*1,150*	*165*	*200*	*40*	*3*	*840*	*130*	*158*	*28*	*2*	*330*	*52*	*65*	*12*	*1*
From RC1 until Junction of Hondo Total	**3,040**	**414**	**484**	**97**	**5**	**2,650**	**380**	**460**	**92**	**6**	**1,820**	**282**	**343**	**61**	**4**	**480**	**76**	**95**	**17**	**1**
From Hondo until Junction of Nibaje Total	**27,170**	**3,705**	**4,323**	**865**	**49**	**10,300**	**1,478**	**1,792**	**358**	**22**	**7,630**	**1,177**	**1,431**	**254**	**16**	**2,900**	**464**	**480**	**104**	**7**
Rafey S.D. (Area III)	*1,170*	*159*	*186*	*37*	*2*	*1,150*	*165*	*200*	*40*	*3*	*840*	*130*	*158*	*28*	*2*	*330*	*52*	*65*	*12*	*1*
HerraduraS.D.	*7,830*	*1,068*	*1,246*	*249*	*14*	*7,150*	*1,026*	*1,244*	*249*	*16*	*5,710*	*881*	*1,071*	*190*	*12*	*3,830*	*612*	*765*	*138*	*9*
From Nibaje until Junction of Gurabo Total	**9,000**	**1,227**	**1,432**	**286**	**16**	**8,300**	**1,191**	**1,444**	**289**	**19**	**6,550**	**1,011**	**1,229**	**218**	**14**	**4,160**	**664**	**830**	**150**	**10**
From Gurabo until RC5 Total (Rafey Area V)	**1,190**	**162**	**189**	**38**	**2**	**1,150**	**165**	**200**	**40**	**3**	**860**	**133**	**162**	**29**	**2**	**330**	**52**	**65**	**12**	**1**
Bypassed Wastewater																				
After Junction of Gurabo (Rafey S.D.)	**18,490**	**2,737**	**3,106**	**592**	**46**	**44,190**	**6,849**	**8,043**	**1,502**	**128**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
After RC5 (Herradura S.D.)	**1,110**	**164**	**186**	**36**	**3**	**3,430**	**532**	**624**	**117**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Treated DWW																				
After Junction of Gurabo (Rafey S.D.)	**25,000**	**875**	**875**	**750**	**50**	**35,800**	**1,253**	**1,253**	**1,074**	**72**	**113,970**	**3,989**	**3,989**	**3,419**	**228**	**145,520**	**5,093**	**5,093**	**4,366**	**291**
After RC5 (Herradura S.D.)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6,340**	**222**	**222**	**190**	**13**	**9,930**	**348**	**348**	**298**	**20**
DWW Total	**85,000**	**9,284**	**10,595**	**2,664**	**171**	**105,820**	**11,848**	**13,816**	**3,472**	**260**	**137,170**	**6,814**	**7,376**	**4,171**	**277**	**163,320**	**6,697**	**6,911**	**4,947**	**330**

TABLA A11.22 CARGAS CONTAMINADAS DIRECTAS DESCARGADAS AL RÍO YAQUE DEL NORTE (EXCLUYENDO CARGAS DESDE LOS RÍOS TRIBUTARIOS) [CON EL CASO DEL MEJORAMIENTO FINAL](2/2)

Year	2000					2005					2010					2015				
Pollutants Source	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]	Flowrate [m³/day]	BOD_5 [kg/day]	SS [kg/day]	N [kg/day]	P [kg/day]
Industrial Wastewater *After Junction of Gurabo (Rafey Total)*	**6,962**	**1,248**	**1,304**	**86**	**10**	**2,157**	**108**	**108**	**36**	**8**	**2,752**	**138**	**138**	**46**	**10**	**3,191**	**160**	**160**	**54**	**12**
Rafey S.D.	*5,493*	*1,120*	*1,211*	*54*	*5*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Santiago-I FZIE	*182*	*7*	*4*	*7*	*1*	*2,157*	*108*	*108*	*36*	*8*	*2,752*	*138*	*138*	*46*	*10*	*3,191*	*160*	*160*	*54*	*12*
Santiago-II FZIE	*1,133*	*106*	*77*	*22*	*4*	~~(Included in Santiago- I FZIE)~~					~~(Included in Santiago- I FZIE)~~					~~(Included in Santiago- I FZIE)~~				
Santiago-III FZIE	*154*	*15*	*12*	*3*	*0*															
Non-S.D./O.S. T.S. Total	**216**	**133**	**57**	**5**	**2**	**8,517**	**94**	**426**	**22**	**2**	**10,870**	**123**	**543**	**29**	**2**	**12,601**	**147**	**633**	**33**	**3**
Between Junction of Hondo and Nibaje	*216*	*133*	*57*	*5*	*2*	*1,133*	*39*	*57*	*7*	*2*	*1,446*	*48*	*71*	*10*	*2*	*1,676*	*57*	*86*	*11*	*3*
Before Junction of Hondo	*0*	*0*	*0*	*0*	*0*	*1,899*	*15*	*95*	*4*	*0*	*2,423*	*20*	*122*	*5*	*0*	*2,809*	*24*	*141*	*6*	*0*
After Junction of Gurabo	*0*	*0*	*0*	*0*	*0*	*5,485*	*40*	*274*	*11*	*0*	*7,001*	*55*	*350*	*14*	*0*	*8,116*	*66*	*406*	*16*	*0*
Industrial WW Total	**7,178**	**1,381**	**1,361**	**91**	**12**	**10,674**	**202**	**534**	**58**	**10**	**13,622**	**261**	**681**	**75**	**12**	**15,792**	**307**	**793**	**87**	**15**
Total (DWW+IWW)	**92,178**	**10,665**	**11,956**	**2,755**	**183**	**116,494**	**12,050**	**14,350**	**3,530**	**270**	**150,792**	**7,075**	**8,057**	**4,246**	**289**	**179,112**	**7,004**	**7,704**	**5,034**	**345**

TABLA A11.23 CALIDAD ACTUAL DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [SIN CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,494,720	9,000	54,132	-		1,190	18,490	25,000	6,962			1,110	0	92,174	
Flowrate	[m³/day]	2,583,360	2,586,400	2,618,350	2,618,350	2,618,350	2,618,350	2,645,520	2,710,612	2,710,828	2,710,828	2,710,828	1,216,108	1,225,108	1,279,240	1,279,240	1,279,240	1,280,430	1,298,920	1,323,920	1,330,882	1,330,882	1,330,882	1,331,992	1,331,992	1,423,056	1,423,856
BOD_5	[kg/day]	7,233	7,647	8,462	8,462	8,708	8,708	12,413	12,959	13,092	13,969	13,969	6,267	7,494	9,547	10,203	10,203	10,365	13,102	13,977	15,225	16,229	16,229	16,393	16,393	18,837	18,837
SS	[kg/day]	167,918	168,402	169,311	169,311	169,590	169,590	173,913	174,524	174,581	175,579	175,579	78,767	80,199	82,584	83,347	83,347	83,536	86,642	87,517	88,821	89,916	89,916	90,102	90,102	92,740	92,740
T-N	[kg/day]	1,447	1,544	1,743	1,743	1,802	1,802	2,667	2,863	2,868	3,081	3,081	1,382	1,668	2,152	2,306	2,306	2,344	2,936	3,686	3,772	4,065	4,065	4,101	4,101	4,574	4,574
T-P	[kg/day]	2,118	2,123	2,141	2,141	2,146	2,146	2,195	2,208	2,210	2,223	2,223	997	1,013	1,042	1,051	1,051	1,053	1,099	1,149	1,159	1,180	1,180	1,183	1,183	1,222	1,222
BOD_5	[mg/L]	2.8	3.0	3.2	3.2	3.3	3.3	4.7	4.8	4.8	5.2	5.2	5.2	6.1	7.5	8.0	8.0	8.1	10.1	10.6	11.4	12.2	12.2	12.3	12.3	13.2	13.2
SS	[mg/L]	65	65	65	65	65	65	66	64	64	65	65	65	65.5	65	65	65	65	67	66	67	68	68	68	68	65	65
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	1.0	1.1	1.1	1.1	1.1	1.1	1.4	1.7	1.8	1.8	1.8	2.3	2.8	2.8	3.1	3.1	3.1	3.1	3.2	3.2
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

Measured Value (Year: 2000, 2001)

		RC1 Antes Toma de Pastor					After Junction of Arroyo					After Junction of Arroyo					After Junction of Arroyo						RC5 Despues Descarga A. N. Rafey				After Junction of Arroyo
BOD_5	[mg/L]	2.8										5.7					31						26				
SS	[mg/L]	113										159					125						385				
T-N	[mg/L]	0.6										4.4					7.6						7.6				
T-P	[mg/L]	0.8										0.57					1.32						0.18				

TABLA A11.23 CALIDAD ACTUAL DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [SIN CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,572,480	9,000	54,132	-		1,190	18,490	25,000	6,962	-		1,110	0	92,174	
Flowrate		4,475,520	4,478,560	4,510,510	4,510,510	4,510,510	4,510,510	4,537,680	4,602,772	4,602,988	4,602,988	4,602,988	3,030,508	3,039,508	3,093,640	3,093,640	3,093,640	3,094,830	3,113,320	3,138,320	3,145,282	3,145,282	3,145,282	3,146,392	3,146,392	3,237,456	3,237,456
BOD_5	[kg/day]	12,531	12,945	13,760	13,760	14,006	14,006	17,711	18,257	18,390	19,267	19,267	12,685	13,912	15,965	16,621	16,621	16,783	19,520	20,395	21,643	22,647	22,647	22,811	22,811	25,255	25,255
SS		290,909	291,393	292,302	292,302	292,580	292,580	296,903	297,514	297,571	298,570	298,570	196,572	198,004	200,389	201,152	201,152	201,341	204,447	205,322	206,626	207,721	207,721	207,907	207,907	210,545	210,545
T-N		2,506	2,603	2,802	2,802	2,861	2,861	3,726	3,922	3,927	4,141	4,141	2,726	3,012	3,496	3,650	3,650	3,688	4,280	5,030	5,116	5,409	5,409	5,445	5,445	5,918	5,918
T-P		3,670	3,675	3,693	3,693	3,698	3,698	3,747	3,760	3,762	3,774	3,774	2,485	2,501	2,530	2,538	2,538	2,540	2,586	2,636	2,646	2,668	2,668	2,671	2,671	2,710	2,710
BOD_5	[mg/L]	2.8	2.9	3.1	3.1	3.1	3.1	3.9	4.0	4.0	4.2	4.2	4.2	4.6	5.2	5.4	5.4	5.4	6.3	6.5	6.9	7.2	7.2	7.2	7.2	7.8	7.8
SS		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	66	65	66	66	66	66	66	65	65
T-N		0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.2	1.2	1.2	1.4	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

TABLA A11.23 CALIDAD ACTUAL DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [SIN CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,183,680	9,000	54,132	-		1,190	18,490	25,000	6,962	-		1,110	0	92,174	
Flowrate		1,321,920	1,324,960	1,356,910	1,356,910	1,356,910	1,356,910	1,384,080	1,449,172	1,449,388	1,449,388	1,449,388	265,708	274,708	328,840	328,840	328,840	330,030	348,520	373,520	380,482	380,482	380,482	381,592	381,592	472,656	472,656
BOD5	[kg/day]	3,701	4,115	4,930	4,930	5,176	5,176	8,881	9,427	9,560	10,437	10,437	1,913	3,140	5,193	5,849	5,849	6,011	8,748	9,623	10,871	11,876	11,876	12,040	12,040	14,484	14,484
SS		85,925	86,409	87,318	87,318	87,596	87,596	91,919	92,530	92,587	93,586	93,586	17,157	18,589	20,974	21,737	21,737	21,926	25,032	25,907	27,211	28,306	28,306	28,492	28,492	31,130	31,130
T-N		740	837	1,036	1,036	1,095	1,095	1,960	2,156	2,161	2,375	2,375	435	721	1,205	1,359	1,359	1,397	1,989	2,739	2,825	3,118	3,118	3,154	3,154	3,627	3,627
T-P		1,084	1,089	1,107	1,107	1,112	1,112	1,161	1,174	1,176	1,188	1,188	218	234	262	271	271	273	319	369	379	401	401	404	404	443	443
BOD5	[mg/L]	2.8	3.1	3.6	3.6	3.8	3.8	6.4	6.5	6.6	7.2	7.2	7.2	11.4	15.8	17.8	17.8	18.2	25.1	25.8	28.6	31.2	31.2	31.6	31.6	30.6	30.6
SS		65	65	64	64	65	65	66	64	64	65	65	65	68	64	66	66	66	72	69	72	74	74	75	75	66	66
T-N		0.6	0.6	0.8	0.8	0.8	0.8	1.4	1.5	1.5	1.6	1.6	1.6	2.6	3.7	4.1	4.1	4.2	5.7	7.3	7.4	8.2	8.2	8.3	8.3	7.7	7.7
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.1	1.1	0.9	0.9

TABLA A11.24 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [SIN CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	2,650	34,198	0	-		31,940	66,372	317	-		-1,503,360	8,300	55,752	-		1,150	33,350	25,000	10,229	-		3,430	0	95,736	
Flowrate	[m³/day]	2,583,360	2,586,010	2,620,208	2,620,208	2,620,208	2,620,208	2,652,148	2,718,520	2,718,837	2,718,837	2,718,837	1,215,477	1,223,777	1,279,529	1,279,529	1,279,529	1,280,679	1,314,029	1,339,029	1,349,258	1,349,258	1,349,258	1,352,688	1,352,688	1,448,424	1,448,424
BOD_5	[kg/day]	7,233	7,613	8,829	8,829	9,148	9,148	13,731	14,497	14,815	15,948	15,948	7,130	8,321	10,748	11,471	11,471	11,636	16,805	17,680	19,872	21,553	21,553	22,085	22,085	25,368	25,368
SS	[kg/day]	167,918	168,378	169,764	169,764	170,133	170,133	175,689	176,578	176,717	178,034	178,034	79,591	81,035	83,952	84,824	84,824	85,024	91,094	91,969	95,756	97,942	97,942	98,566	98,566	102,190	102,190
T-N	[kg/day]	1,447	1,539	1,828	1,828	1,904	1,904	3,015	3,262	3,269	3,542	3,542	1,584	1,873	2,456	2,631	2,631	2,671	3,805	4,555	4,690	5,101	5,101	5,218	5,218	5,849	5,849
T-P	[kg/day]	2,118	2,124	2,153	2,153	2,160	2,160	2,229	2,248	2,250	2,268	2,268	1,014	1,033	1,071	1,083	1,083	1,086	1,183	1,233	1,250	1,283	1,283	1,293	1,293	1,352	1,352
BOD_5	[mg/L]	2.8	2.9	3.4	3.4	3.5	3.5	5.2	5.3	5.4	5.9	5.9	5.9	6.8	8.4	9.0	9.0	9.1	12.8	13.2	14.7	16.0	16.0	16.3	16.3	17.5	17.5
SS	[mg/L]	65	65	65	65	65	65	66	65	65	65	65	65	66.2	66	66	66	66	69	69	71	73	73	73	73	71	71
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	1.1	1.2	1.2	1.3	1.3	1.3	1.5	1.9	2.1	2.1	2.1	2.9	3.4	3.5	3.8	3.8	3.9	3.9	4.0	4.0
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9

TABLA A11.24 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [SIN CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	2,650	34,198	0	-		31,940	66,372	317	-		-1,581,120	8,300	55,752	-		1,150	33,350	25,000	10,229	-		3,430	0	95,736	
Flowrate	[m³/day]	4,475,520	4,478,170	4,512,368	4,512,368	4,512,368	4,512,368	4,544,308	4,610,680	4,610,997	4,610,997	4,610,997	3,029,877	3,038,177	3,093,929	3,093,929	3,093,929	3,095,079	3,128,429	3,153,429	3,163,658	3,163,658	3,163,658	3,167,088	3,167,088	3,262,824	3,262,824
BOD_5	[kg/day]	12,531	12,911	14,127	14,127	14,446	14,446	19,029	19,795	20,113	21,246	21,246	13,961	15,152	17,579	18,303	18,303	18,468	23,637	24,512	26,704	28,384	28,384	28,916	28,916	32,199	32,199
SS	[kg/day]	290,909	291,369	292,754	292,754	293,124	293,124	298,680	299,569	299,708	301,024	301,024	197,802	199,246	202,163	203,035	203,035	203,235	209,305	210,180	213,967	216,153	216,153	216,777	216,777	220,401	220,401
T-N	[kg/day]	2,506	2,598	2,888	2,888	2,964	2,964	4,075	4,322	4,329	4,602	4,602	3,024	3,313	3,896	4,071	4,071	4,111	5,245	5,995	6,130	6,542	6,542	6,659	6,659	7,290	7,290
T-P	[kg/day]	3,670	3,676	3,705	3,705	3,712	3,712	3,781	3,800	3,802	3,820	3,820	2,510	2,529	2,567	2,579	2,579	2,582	2,679	2,729	2,746	2,779	2,779	2,789	2,789	2,848	2,848
BOD_5	[mg/L]	2.8	2.9	3.1	3.1	3.2	3.2	4.2	4.3	4.4	4.6	4.6	4.6	5.0	5.7	5.9	5.9	6.0	7.6	7.8	8.4	9.0	9.0	9.1	9.1	9.9	9.9
SS	[mg/L]	65	65	65	65	65	65	66	65	65	65	65	65	66	65	66	66	66	67	67	68	68	68	68	68	68	68
T-N	[mg/L]	0.6	0.6	0.6	0.6	0.7	0.7	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.3	1.3	1.7	1.9	1.9	2.1	2.1	2.1	2.1	2.2	2.2
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

TABLA A11.24 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [SIN CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	2,650	34,198	0	-		31,940	66,372	317	-		-1,192,320	8,300	55,752	-		1,150	33,350	25,000	10,229	-		3,430	0	95,736	
Flowrate	[m³/day]	1,321,920	1,324,570	1,358,768	1,358,768	1,358,768	1,358,768	1,390,708	1,457,080	1,457,397	1,457,397	1,457,397	265,077	273,377	329,129	329,129	329,129	330,279	363,629	388,629	398,858	398,858	398,858	402,288	402,288	498,024	498,024
BOD5	[kg/day]	3,701	4,081	5,297	5,297	5,616	5,616	10,199	10,965	11,283	12,416	12,416	2,258	3,449	5,876	6,600	6,600	6,765	11,934	12,809	15,001	16,681	16,681	17,213	17,213	20,496	20,496
SS	[kg/day]	85,925	86,385	87,770	87,770	88,140	88,140	93,696	94,585	94,724	96,040	96,040	17,468	18,912	21,829	22,701	22,701	22,901	28,971	29,846	33,633	35,819	35,819	36,443	36,443	40,067	40,067
T-N	[kg/day]	740	832	1,122	1,122	1,198	1,198	2,309	2,556	2,563	2,836	2,836	516	805	1,388	1,563	1,563	1,603	2,737	3,487	3,622	4,034	4,034	4,151	4,151	4,782	4,782
T-P	[kg/day]	1,084	1,090	1,119	1,119	1,126	1,126	1,195	1,214	1,216	1,234	1,234	224	243	282	293	293	296	393	443	460	494	494	504	504	562	562
BOD5	[mg/L]	2.8	3.1	3.9	3.9	4.1	4.1	7.3	7.5	7.7	8.5	8.5	8.5	12.6	17.9	20.1	20.1	20.5	32.8	33.0	37.6	41.8	41.8	42.8	42.8	41.2	41.2
SS	[mg/L]	65	65	65	65	65	65	67	65	65	66	66	66	69	66	69	69	69	80	77	84	90	90	91	91	80	80
T-N	[mg/L]	0.6	0.6	0.8	0.8	0.9	0.9	1.7	1.8	1.8	1.9	1.9	1.9	2.9	4.2	4.7	4.7	4.9	7.5	9.0	9.1	10.1	10.1	10.3	10.3	9.6	9.6
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.1	1.1

TABLA A11.25 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [SIN CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,611	0	-		36,050	67,702	404	-		-1,512,000	6,550	55,791	-		860	51,070	25,000	13,055	-		6,340	0	99,409	
Flowrate	[m³/day]	2,583,360	2,585,180	2,621,791	2,621,791	2,621,791	2,621,791	2,657,841	2,725,543	2,725,947	2,725,947	2,725,947	1,213,947	1,220,497	1,276,287	1,276,287	1,276,287	1,277,147	1,328,217	1,353,217	1,366,272	1,366,272	1,366,272	1,372,612	1,372,612	1,472,021	1,472,021
BOD_5	[kg/day]	7,233	7,515	9,118	9,118	9,307	9,307	14,865	15,856	16,334	17,036	17,036	7,587	8,598	11,236	11,601	11,601	11,734	19,650	20,525	23,534	24,727	24,727	25,710	25,710	29,767	29,767
SS	[kg/day]	167,918	168,261	170,080	170,080	170,296	170,296	177,055	178,209	178,417	179,229	179,229	79,816	81,045	84,214	84,654	84,654	84,816	94,111	94,986	100,920	102,547	102,547	103,701	103,701	108,162	108,162
T-N	[kg/day]	1,447	1,508	1,883	1,883	1,927	1,927	3,128	3,418	3,427	3,577	3,577	1,593	1,811	2,372	2,450	2,450	2,479	4,215	4,965	5,144	5,413	5,413	5,629	5,629	6,385	6,385
T-P	[kg/day]	2,118	2,122	2,160	2,160	2,164	2,164	2,239	2,261	2,264	2,274	2,274	1,013	1,027	1,064	1,069	1,069	1,071	1,219	1,269	1,291	1,313	1,313	1,331	1,331	1,402	1,402
BOD_5	[mg/L]	2.8	2.9	3.5	3.5	3.5	3.5	5.6	5.8	6.0	6.2	6.2	6.2	7.0	8.8	9.1	9.1	9.2	14.8	15.2	17.2	18.1	18.1	18.7	18.7	20.2	20.2
SS	[mg/L]	65	65	65	65	65	65	67	65	65	66	66	66	66.4	66	66	66	66	71	70	74	75	75	76	76	73	73
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	1.2	1.3	1.3	1.3	1.3	1.3	1.5	1.9	1.9	1.9	1.9	3.2	3.7	3.8	4.0	4.0	4.1	4.1	4.3	4.3
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0

TABLA A11.25 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [SIN CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,611	0	-		36,050	67,702	404	-		-1,589,760	6,550	55,791	-		860	51,070	25,000	13,055	-		6,340	0	99,409	
Flowrate	[m³/day]	4,475,528	4,477,340	4,513,951	4,513,951	4,513,951	4,513,951	4,550,001	4,617,703	4,618,107	4,618,107	4,618,107	3,028,347	3,034,897	3,090,687	3,090,687	3,090,687	3,091,547	3,142,617	3,167,617	3,180,672	3,180,672	3,180,672	3,187,012	3,187,012	3,286,421	3,286,421
BOD_5	[kg/day]	12,531	12,813	14,416	14,416	14,605	14,605	20,163	21,154	21,632	22,335	22,335	14,646	15,657	18,295	18,660	18,660	18,793	26,709	27,584	30,593	31,786	31,786	32,769	32,769	36,827	36,827
SS	[kg/day]	290,909	291,252	293,070	293,070	293,286	293,286	300,045	301,199	301,407	302,220	302,220	198,182	199,411	202,580	203,020	203,020	203,182	212,477	213,352	219,286	220,912	220,912	222,066	222,066	226,528	226,528
T-N	[kg/day]	2,506	2,567	2,943	2,943	2,986	2,986	4,187	4,477	4,486	4,636	4,636	3,040	3,258	3,819	3,897	3,897	3,926	5,662	6,412	6,591	6,860	6,860	7,076	7,076	7,832	7,832
T-P	[kg/day]	3,670	3,674	3,711	3,711	3,715	3,715	3,790	3,812	3,815	3,825	3,825	2,508	2,522	2,560	2,565	2,565	2,567	2,715	2,765	2,787	2,809	2,809	2,827	2,827	2,898	2,898
BOD_5	[mg/L]	2.8	2.9	3.2	3.2	3.2	3.2	4.4	4.6	4.7	4.8	4.8	4.8	5.2	5.9	6.0	6.0	6.1	8.5	8.7	9.6	10.0	10.0	10.3	10.3	11.2	11.2
SS	[mg/L]	65	65	65	65	65	65	66	65	65	65	65	65	66	66	66	66	66	68	67	69	69	69	70	70	69	69
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.8	2.0	2.1	2.2	2.2	2.2	2.2	2.4	2.4
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

TABLA A11.25 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [SIN CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Trreted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Trreted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,611	0	-		36,050	67,702	404	-		-1,200,960	6,550	55,791	-		860	51,070	25,000	13,055	-		6,340	0	99,409	
Flowrate		1,321,920	1,323,740	1,360,351	1,360,351	1,360,351	1,360,351	1,396,401	1,464,103	1,464,507	1,464,507	1,464,507	263,547	270,097	325,887	325,887	325,887	326,747	377,817	402,817	415,872	415,872	415,872	422,212	422,212	521,621	521,621
BOD5	[kg/day]	3,701	3,983	5,586	5,586	5,775	5,775	11,333	12,324	12,802	13,504	13,504	2,430	3,441	6,079	6,444	6,444	6,577	14,493	15,368	18,377	19,571	19,571	20,554	20,554	24,611	24,611
SS		85,925	86,268	88,086	88,086	88,302	88,302	95,061	96,215	96,423	97,236	97,236	17,498	18,727	21,896	22,336	22,336	22,498	31,793	32,668	38,602	40,229	40,229	41,383	41,383	45,844	45,844
T-N		740	801	1,177	1,177	1,220	1,220	2,421	2,711	2,720	2,870	2,870	517	735	1,295	1,373	1,373	1,402	3,138	3,888	4,067	4,337	4,337	4,553	4,553	5,308	5,308
T-P		1,084	1,088	1,125	1,125	1,129	1,129	1,204	1,226	1,229	1,239	1,239	223	237	274	279	279	281	429	479	501	523	523	541	541	612	612
BOD5	[mg/L]	2.8	3.0	4.1	4.1	4.2	4.2	8.1	8.4	8.7	9.2	9.2	9.2	12.7	18.7	19.8	19.8	20.1	38.4	38.2	44.2	47.1	47.1	48.7	48.7	47.2	47.2
SS		65	65	65	65	65	65	68	66	66	66	66	66	69	67	69	69	69	84	81	93	97	97	98	98	88	88
T-N		0.6	0.6	0.9	0.9	0.9	0.9	1.7	1.9	1.9	2.0	2.0	2.0	2.7	4.0	4.2	4.2	4.3	8.3	9.7	9.8	10.4	10.4	10.8	10.8	10.2	10.2
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.9	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.2

TABLA A11.26 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [SIN CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Trreted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Trreted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	480	39,326	0	-		39,880	69,132	468	-		-1,512,000	4,160	54,533	-		330	71,210	25,000	15,133	-		9,930	0	103,006	
Flowrate		2,583,360	2,583,840	2,623,166	2,623,166	2,623,166	2,623,166	2,663,046	2,732,178	2,732,646	2,732,646	2,732,646	1,220,646	1,224,806	1,279,338	1,279,338	1,279,338	1,279,668	1,350,878	1,375,878	1,391,011	1,391,011	1,391,011	1,400,941	1,400,941	1,503,948	1,503,948
BOD_5	[kg/day]	7,233	7,309	9,342	9,342	9,553	9,553	15,933	17,152	17,748	18,568	18,568	8,294	8,958	11,509	11,830	11,830	11,882	22,920	23,795	27,403	28,960	28,960	30,499	30,499	35,252	35,252
SS		167,918	168,013	170,321	170,321	170,562	170,562	178,537	179,962	180,222	181,188	181,188	80,935	81,765	84,898	85,294	85,294	85,359	98,319	99,194	106,708	108,849	108,849	110,656	110,656	115,888	115,888
T-N		1,447	1,464	1,934	1,934	1,983	1,983	3,418	3,760	3,771	3,949	3,949	1,764	1,914	2,473	2,544	2,544	2,556	4,977	5,727	5,937	6,276	6,276	6,614	6,614	7,505	7,505
T-P		2,118	2,119	2,165	2,165	2,170	2,170	2,266	2,293	2,296	2,309	2,309	1,031	1,041	1,081	1,086	1,086	1,087	1,294	1,344	1,369	1,397	1,397	1,426	1,426	1,511	1,511
BOD_5	[mg/L]	2.8	2.8	3.6	3.6	3.6	3.6	6.0	6.3	6.5	6.8	6.8	6.8	7.3	9.0	9.2	9.2	9.3	17.0	17.3	19.7	20.8	20.8	21.8	21.8	23.4	23.4
SS		65	65	65	65	65	65	67	66	66	66	66	66	66.8	66	67	67	67	73	72	77	78	78	79	79	77	77
T-N		0.6	0.6	0.7	0.7	0.8	0.8	1.3	1.4	1.4	1.4	1.4	1.4	1.6	1.9	2.0	2.0	2.0	3.7	4.2	4.3	4.5	4.5	4.7	4.7	5.0	5.0
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

TABLA A11.26 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [SIN CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Trreted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Trreted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	480	39,326	0	-		39,880	69,132	468	-		-1,589,760	4,160	54,533	-		330	71,210	25,000	15,133	-		9,930	0	103,006	
Flowrate		4,475,520	4,476,000	4,515,326	4,515,326	4,515,326	4,515,326	4,555,206	4,624,338	4,624,806	4,624,806	4,624,806	3,035,046	3,039,206	3,093,738	3,093,738	3,093,738	3,094,068	3,165,278	3,190,278	3,205,411	3,205,411	3,205,411	3,215,341	3,215,341	3,318,348	3,318,348
BOD_5	[kg/day]	12,531	12,607	14,640	14,640	14,851	14,851	21,231	22,450	23,046	23,866	23,866	15,662	16,326	18,877	19,198	19,198	19,250	30,288	31,163	34,771	36,328	36,328	37,867	37,867	42,620	42,620
SS		290,909	291,004	293,312	293,312	293,552	293,552	301,527	302,952	303,212	304,178	304,178	199,618	200,448	203,581	203,977	203,977	204,042	217,002	217,877	225,391	227,532	227,532	229,339	229,339	234,571	234,571
T-N		2,506	2,523	2,993	2,993	3,042	3,042	4,477	4,819	4,830	5,009	5,009	3,287	3,437	3,996	4,067	4,067	4,079	6,500	7,250	7,460	7,799	7,799	8,137	8,137	9,028	9,028
T-P		3,670	3,671	3,717	3,717	3,722	3,722	3,818	3,845	3,848	3,860	3,860	2,533	2,543	2,583	2,588	2,588	2,589	2,796	2,846	2,871	2,899	2,899	2,928	2,928	3,013	3,013
BOD_5	[mg/L]	2.8	2.8	3.2	3.2	3.3	3.3	4.7	4.9	5.0	5.2	5.2	5.2	5.4	6.1	6.2	6.2	6.2	9.6	9.8	10.8	11.3	11.3	11.8	11.8	12.8	12.8
SS		65	65	65	65	65	65	66	66	66	66	66	66	66	66	66	66	66	69	68	70	71	71	71	71	71	71
T-N		0.6	0.6	0.7	0.7	0.7	0.7	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.3	1.3	1.3	1.3	2.1	2.3	2.3	2.4	2.4	2.5	2.5	2.7	2.7
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

TABLA A11.26 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [SIN CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Raley	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6		-				10.4				
Flowin/Flowout	[m³/day]	0	480	39,326	0	-		39,880	69,132	468	-		-1,200,960	4,160	54,533	-		330	71,210	25,000	15,133	-		9,930	0	103,006	
Flowrate		1,321,920	1,322,400	1,361,726	1,361,726	1,361,726	1,361,726	1,401,606	1,470,738	1,471,206	1,471,206	1,471,206	270,246	274,406	328,938	328,938	328,938	329,268	400,478	425,478	440,611	440,611	440,611	450,541	450,541	553,548	553,548
BOD5	[kg/day]	3,701	3,777	5,810	5,810	6,021	6,021	12,401	13,620	14,216	15,036	15,036	2,762	3,426	5,977	6,298	6,298	6,350	17,388	18,263	21,871	23,428	23,428	24,967	24,967	29,719	29,719
SS		85,925	86,020	88,328	88,328	88,568	88,568	96,543	97,968	98,228	99,194	99,194	18,221	19,051	22,184	22,580	22,580	22,645	35,605	36,480	43,994	46,135	46,135	47,942	47,942	53,174	53,174
T-N		740	757	1,227	1,227	1,276	1,276	2,711	3,053	3,064	3,243	3,243	596	746	1,305	1,375	1,375	1,387	3,808	4,558	4,768	5,108	5,108	5,446	5,446	6,336	6,336
T-P		1,084	1,085	1,131	1,131	1,136	1,136	1,232	1,259	1,262	1,274	1,274	234	244	284	289	289	290	497	547	572	600	600	629	629	714	714
BOD5	[mg/L]	2.8	2.9	4.3	4.3	4.4	4.4	8.8	9.3	9.7	10.2	10.2	10.2	12.5	18.2	19.1	19.1	19.3	43.4	42.9	49.6	53.2	53.2	55.4	55.4	53.7	53.7
SS		65	65	65	65	65	65	69	67	67	67	67	67	69	67	69	69	69	89	86	100	105	105	106	106	96	96
T-N		0.6	0.6	0.9	0.9	0.9	0.9	1.9	2.1	2.1	2.2	2.2	2.2	2.7	4.0	4.2	4.2	4.2	9.5	10.7	10.8	11.6	11.6	12.1	12.1	11.4	11.4
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.3	1.3

TABLA A11.27 CALIDAD ACTUAL DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,494,720	9,000	54,132	-		1,190	18,490	25,000	6,962			1,110	0	92,174	
Flowrate	[m³/day]	2,583,360	2,586,400	2,618,350	2,618,350	2,618,350	2,618,350	2,645,520	2,710,612	2,710,828	2,710,828	2,710,828	1,216,108	1,225,108	1,279,240	1,279,240	1,279,240	1,280,430	1,298,920	1,323,920	1,330,882	1,330,882	1,330,882	1,331,992	1,331,992	1,423,056	1,423,056
BOD_5	[kg/day]	7,233	7,647	8,462	8,462	8,708	8,708	12,413	12,959	13,092	13,969	13,969	6,267	7,494	9,547	10,203	10,203	10,365	13,102	13,977	15,225	16,229	16,229	16,393	16,393	18,837	18,837
SS	[kg/day]	167,918	168,402	169,311	169,311	169,590	169,590	173,913	174,524	174,581	175,579	175,579	78,767	80,199	82,584	83,347	83,347	83,536	86,642	87,517	88,821	89,916	89,916	90,102	90,102	92,740	92,740
T-N	[kg/day]	1,447	1,544	1,743	1,743	1,802	1,802	2,667	2,863	2,868	3,081	3,081	1,382	1,668	2,152	2,306	2,306	2,344	2,936	3,686	3,772	4,065	4,065	4,101	4,101	4,574	4,574
T-P	[kg/day]	2,118	2,123	2,141	2,141	2,146	2,146	2,195	2,208	2,210	2,223	2,223	997	1,013	1,042	1,051	1,051	1,053	1,099	1,149	1,159	1,181	1,181	1,184	1,184	1,223	1,223
BOD_5	[mg/L]	2.8	3.0	3.2	3.2	3.3	3.3	4.7	4.8	4.8	5.2	5.2	5.2	6.1	7.5	8.0	8.0	8.1	10.1	10.6	11.4	12.2*	12.2	12.3	12.3	13.2	13.2
SS	[mg/L]	65	65	65	65	65	65	66	64	64	65	65	65	65.5	65	65	65	65	67	66	67	68	68	68	68	65	65
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	1.0	1.1	1.1	1.1	1.1	1.1	1.4	1.7	1.8	1.8	1.8	2.3	2.8	2.8	3.1	3.1	3.1	3.1	3.2	3.2
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

Measured Value (Year: 2000, 200

		RC1 Antes Toma de Pastor					After Junction of Arroyo					After Junction of Arroyo					After Junction of Arroyo						RC5 Despues Descarga A. N. Rafey				After Junction of Arroyo
BOD_5	[mg/L]	2.8										5.7					31						26				
SS	[mg/L]	113										159					125						385				
T-N	[mg/L]	0.6										4.4					7.6						7.6				
T-P	[mg/L]	0.8										0.57					1.32						0.18				

TABLA A11.27 CALIDAD ACTUAL DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Trreted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Trreted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,572,480	9,000	54,132	-		1,190	18,490	25,000	6,962	-		1,110	0	92,174	
Flowrate	[m³/day]	4,475,520	4,478,560	4,510,510	4,510,510	4,510,510	4,510,510	4,537,680	4,602,772	4,602,988	4,602,988	4,602,988	3,030,508	3,039,508	3,093,640	3,093,640	3,093,640	3,094,830	3,113,320	3,138,320	3,145,282	3,145,282	3,145,282	3,146,392	3,146,392	3,237,456	3,237,456
BOD_5	[kg/day]	12,531	12,945	13,760	13,760	14,006	14,006	17,711	18,257	18,390	19,267	19,267	12,685	13,912	15,965	16,621	16,621	16,783	19,520	20,395	21,643	22,647	22,647	22,811	22,811	25,255	25,255
SS	[kg/day]	290,909	291,393	292,302	292,302	292,580	292,580	296,903	297,514	297,571	298,570	298,570	196,572	198,004	200,389	201,152	201,152	201,341	204,447	205,322	206,626	207,721	207,721	207,907	207,907	210,545	210,545
T-N	[kg/day]	2,506	2,603	2,802	2,802	2,861	2,861	3,726	3,922	3,927	4,141	4,141	2,726	3,012	3,496	3,650	3,650	3,688	4,280	5,030	5,116	5,409	5,409	5,445	5,445	5,918	5,918
T-P	[kg/day]	3,670	3,675	3,693	3,693	3,698	3,698	3,747	3,760	3,762	3,774	3,774	2,485	2,501	2,530	2,539	2,539	2,541	2,587	2,637	2,647	2,669	2,669	2,672	2,672	2,711	2,711
BOD_5	[mg/L]	2.8	2.9	3.1	3.1	3.1	3.1	3.9	4.0	4.0	4.2	4.2	4.2	4.6	5.2	5.4	5.4	5.4	6.3	6.5	6.9	7.2	7.2	7.3	7.3	7.8	7.8
SS	[mg/L]	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	66	65	66	66	66	66	66	65	65
T-N	[mg/L]	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.2	1.2	1.2	1.4	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

TABLA A11.27 CALIDAD ACTUAL DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Trreted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Trreted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,183,680	9,000	54,132	-		1,190	18,490	25,000	6,962	-		1,110	0	92,174	
Flowrate	[m³/day]	1,321,920	1,324,960	1,356,910	1,356,910	1,356,910	1,356,910	1,384,080	1,449,172	1,449,388	1,449,388	1,449,388	265,708	274,708	328,840	328,840	328,840	330,030	348,520	373,520	380,482	380,482	380,482	381,592	381,592	472,656	472,656
BOD5	[kg/day]	3,701	4,115	4,930	4,930	5,176	5,176	8,881	9,427	9,560	10,437	10,437	1,913	3,140	5,193	5,849	5,849	6,011	8,748	9,623	10,871	11,876	11,876	12,040	12,040	14,484	14,484
SS	[kg/day]	85,925	86,409	87,318	87,318	87,596	87,596	91,919	92,530	92,587	93,586	93,586	17,157	18,589	20,974	21,737	21,737	21,926	25,032	25,907	27,211	28,306	28,306	28,492	28,492	31,130	31,130
T-N	[kg/day]	740	837	1,036	1,036	1,095	1,095	1,960	2,156	2,161	2,375	2,375	435	721	1,205	1,359	1,359	1,397	1,989	2,739	2,825	3,119	3,119	3,155	3,155	3,628	3,628
T-P	[kg/day]	1,084	1,089	1,107	1,107	1,112	1,112	1,161	1,174	1,176	1,188	1,188	218	234	263	272	272	274	320	370	380	401	401	404	404	443	443
BOD5	[mg/L]	2.8	3.1	3.6	3.6	3.8	3.8	6.4	6.5	6.6	7.2	7.2	7.2	11.4	15.8	17.8	17.8	18.2	25.1	25.8	28.6	31.2	31.2	31.6	31.6	30.6	30.6
SS	[mg/L]	65	65	64	64	65	65	66	64	64	65	65	65	68	64	66	66	66	72	69	72	74	74	75	75	66	66
T-N	[mg/L]	0.6	0.6	0.8	0.8	0.8	0.8	1.4	1.5	1.5	1.6	1.6	1.6	2.6	3.7	4.1	4.1	4.2	5.7	7.3	7.4	8.2	8.2	8.3	8.3	7.7	7.7
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.1	1.1	0.9	0.9

TABLA A11.28 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	2,650	34,254	1,899	-		10,300	66,372	1,133	-		-1,477,440	8,300	55,752	-		1,150	44,190	35,800	7,642			3,430	0	95,283	
Flowrate	[m³/day]	2,583,360	2,586,010	2,620,264	2,622,163	2,622,163	2,622,163	2,632,463	2,698,835	2,699,968	2,699,968	2,699,968	1,222,528	1,230,828	1,286,580	1,286,580	1,286,580	1,287,730	1,331,920	1,367,720	1,375,362	1,375,362	1,375,362	1,378,792	1,378,792	1,474,075	1,474,075
BOD_5	[kg/day]	7,233	7,613	8,788	8,803	9,117	9,117	10,595	11,046	11,085	11,479	11,479	5,198	6,389	8,763	9,476	9,476	9,641	16,490	17,743	17,891	19,574	19,574	20,106	20,106	21,155	21,155
SS	[kg/day]	167,918	168,378	169,748	169,843	170,228	170,228	172,020	172,523	172,580	173,051	173,051	78,356	79,800	82,673	83,537	83,537	83,737	91,780	93,033	93,415	95,390	95,390	96,014	96,014	97,184	97,184
T-N	[kg/day]	1,447	1,539	1,830	1,834	1,912	1,912	2,270	2,507	2,514	2,634	2,634	1,193	1,482	2,063	2,237	2,237	2,277	3,779	4,853	4,900	5,432	5,432	5,549	5,549	6,091	6,091
T-P	[kg/day]	2,118	2,124	2,154	2,154	2,161	2,161	2,183	2,199	2,201	2,209	2,209	1,000	1,019	1,057	1,069	1,069	1,072	1,200	1,272	1,280	1,322	1,322	1,332	1,332	1,370	1,370
BOD_5	[mg/L]	2.8	2.9	3.4	3.4	3.5	3.5	4.0	4.1	4.1	4.3	4.3	4.3	5.2	6.8	7.4	7.4	7.5	12.4	13.0	13.0	14.2	14.2	14.6	14.6	14.4	14.4
SS	[mg/L]	65	65	65	65	65	65	65	64	64	64	64	64	64.8	64	65	65	65	69	68	68	69	69	70	70	66	66
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	0.9	0.9	0.9	1.0	1.0	1.0	1.2	1.6	1.7	1.7	1.8	2.8	3.5	3.6	3.9	3.9	4.0	4.0	4.1	4.1
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9

TABLA A11.28 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	2,650	34,254	1,899	-		10,300	66,372	1,133	-		-1,555,200	8,300	55,752	-		1,150	44,190	35,800	7,642	-		3,430	0	95,283	
Flowrate	[m³/day]	4,475,520	4,478,170	4,512,424	4,514,323	4,512,424	4,512,424	4,522,724	4,589,096	4,590,229	4,590,229	4,590,229	3,035,029	3,043,329	3,099,081	3,099,081	3,099,081	3,100,231	3,144,421	3,180,221	3,187,863	3,187,863	3,187,863	3,191,293	3,191,293	3,286,576	3,286,576
BOD_5	[kg/day]	12,531	12,911	14,086	14,101	14,415	14,415	15,893	16,344	16,383	16,777	16,777	11,093	12,284	14,658	15,371	15,371	15,536	22,385	23,638	23,786	25,469	25,469	26,001	26,001	27,050	27,050
SS	[kg/day]	290,909	291,369	292,739	292,834	293,219	293,219	295,011	295,514	295,571	296,041	296,041	195,740	197,184	200,057	200,921	200,921	201,121	209,164	210,417	210,799	212,774	212,774	213,398	213,398	214,568	214,568
T-N	[kg/day]	2,506	2,598	2,890	2,894	2,971	2,971	3,329	3,566	3,573	3,694	3,694	2,442	2,731	3,312	3,486	3,486	3,526	5,028	6,102	6,149	6,682	6,682	6,799	6,799	7,340	7,340
T-P	[kg/day]	3,670	3,676	3,705	3,705	3,712	3,712	3,734	3,750	3,752	3,760	3,760	2,486	2,505	2,543	2,555	2,555	2,558	2,686	2,758	2,766	2,808	2,808	2,818	2,818	2,856	2,856
BOD_5	[mg/L]	2.8	2.9	3.1	3.1	3.2	3.2	3.5	3.6	3.6	3.7	3.7	3.7	4.0	4.7	5.0	5.0	5.0	7.1	7.4	7.5	8.0	8.0	8.1	8.1	8.2	8.2
SS	[mg/L]	65	65	65	65	65	65	65	64	64	64	64	64	65	65	65	65	65	67	66	66	67	67	67	67	65	65
T-N	[mg/L]	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.6	1.9	1.9	2.1	2.1	2.1	2.1	2.2	2.2
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

TABLA A11.28 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Raby	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	2,650	34,254	1,899	-		10,300	66,372	1,133	-		-1,166,400	8,300	55,752	-		1,150	44,190	35,800	7,642	-		3,430	0	95,283	
Flowrate	[m³/day]	1,321,920	1,324,570	1,358,824	1,360,723	1,360,723	1,360,723	1,371,023	1,437,395	1,438,528	1,438,528	1,438,528	272,128	280,428	336,180	336,180	336,180	337,330	381,520	417,320	424,962	424,962	424,962	428,392	428,392	523,675	523,675
BOD5	[kg/day]	3,701	4,081	5,256	5,271	5,585	5,585	7,063	7,514	7,553	7,947	7,947	1,503	2,694	5,068	5,781	5,781	5,946	12,795	14,048	14,196	15,879	15,879	16,411	16,411	17,460	17,460
SS	[kg/day]	85,925	86,385	87,755	87,850	88,235	88,235	90,027	90,530	90,587	91,057	91,057	17,225	18,669	21,542	22,406	22,406	22,606	30,649	31,902	32,284	34,259	34,259	34,883	34,883	36,053	36,053
T-N	[kg/day]	740	832	1,124	1,128	1,205	1,205	1,563	1,800	1,807	1,928	1,928	365	654	1,235	1,409	1,409	1,449	2,951	4,025	4,072	4,604	4,604	4,721	4,721	5,263	5,263
T-P	[kg/day]	1,084	1,090	1,119	1,119	1,126	1,126	1,148	1,164	1,166	1,174	1,174	222	241	279	291	291	294	422	494	502	544	544	554	554	592	592
BOD5	[mg/L]	2.8	3.1	3.9	3.9	4.1	4.1	5.2	5.2	5.3	5.5	5.5	5.5	9.6	15.1	17.2	17.2	17.6	33.5	33.7	33.4	37.4	37.4	38.3	38.3	33.3	33.3
SS	[mg/L]	65	65	65	65	65	65	66	63	63	63	63	63	67	64	67	67	67	80	76	76	81	81	81	81	69	69
T-N	[mg/L]	0.6	0.6	0.8	0.8	0.9	0.9	1.1	1.3	1.3	1.3	1.3	1.3	2.3	3.7	4.2	4.2	4.3	7.7	9.6	9.6	10.8	10.8	11.0	11.0	10.0	10.0
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.9	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.1	1.1

TABLA A11.29 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Raley	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,682	2,423	-		7,630	67,702	1,446	-		-1,486,080	6,550	46,310	-		860	42,370	71,600	9,753	-		0	6,340	98,832	
Flowrate	[m³/day]	2,583,360	2,585,180	2,621,862	2,624,285	2,624,285	2,624,285	2,631,915	2,699,617	2,701,063	2,701,063	2,701,063	1,214,983	1,221,533	1,267,843	1,267,843	1,267,843	1,268,703	1,311,073	1,382,673	1,392,426	1,392,426	1,392,426	1,392,426	1,398,766	1,497,598	1,497,598
BOD_5	[kg/day]	7,233	7,515	7,913	7,933	8,003	8,003	9,180	9,668	9,716	9,888	9,888	4,448	5,459	6,538	6,747	6,747	6,880	13,829	16,335	16,528	17,506	17,506	17,506	17,728	18,903	18,903
SS	[kg/day]	167,918	168,261	168,659	168,781	168,868	168,868	170,299	170,836	170,907	171,111	171,111	76,968	78,197	79,503	79,757	79,757	79,919	79,919	82,425	82,913	83,228	83,228	83,228	83,450	84,745	84,745
T-N	[kg/day]	1,447	1,508	1,848	1,853	1,894	1,894	2,148	2,422	2,432	2,485	2,485	1,118	1,336	1,577	1,623	1,623	1,652	1,652	3,800	3,861	4,084	4,084	4,084	4,274	4,913	4,913
T-P	[kg/day]	2,118	2,122	2,152	2,152	2,155	2,155	2,171	2,189	2,191	2,195	2,195	987	1,001	1,018	1,021	1,021	1,023	1,023	1,166	1,176	1,192	1,192	1,192	1,205	1,249	1,249
BOD_5	[mg/L]	2.8	2.9	3.0	3.0	3.0	3.0	3.5	3.6	3.6	3.7	3.7	3.7	4.5	5.2	5.3	5.3	5.4	10.5	11.8	11.9	12.6	12.6	12.6	12.7	12.6	12.6
SS	[mg/L]	65	65	64	64	64	64	65	63	63	63	63	63	64.0	63	63	63	63	61	60	60	60	60	60	60	57	57
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	1.1	1.2	1.3	1.3	1.3	1.3	2.7	2.8	2.9	2.9	2.9	3.1	3.3	3.3
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8

TABLA A11.29 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Nibaje	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo Gurabo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Raley	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo Jacagua
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,682	2,423	-		7,630	67,702	1,446	-		-1,563,840	6,550	46,310	-		860	42,370	71,600	9,753	-		0	6,340	98,832	
Flowrate	[m³/day]	4,475,520	4,477,340	4,514,022	4,516,445	4,516,445	4,516,445	4,524,075	4,591,777	4,593,223	4,593,223	4,593,223	3,029,383	3,035,933	3,082,243	3,082,243	3,082,243	3,083,103	3,125,473	3,197,073	3,206,826	3,206,826	3,206,826	3,206,826	3,213,166	3,311,998	3,311,998
BOD_5	[kg/day]	12,531	12,813	13,211	13,231	13,301	13,301	14,478	14,966	15,014	15,186	15,186	10,016	11,027	12,106	12,315	12,315	12,448	19,397	21,903	22,096	23,074	23,074	23,074	23,296	24,471	24,471
SS	[kg/day]	290,909	291,252	291,650	291,772	291,858	291,858	293,289	293,826	293,897	294,101	294,101	193,969	195,198	196,504	196,758	196,758	196,920	196,920	199,426	199,914	200,229	200,229	200,229	200,451	201,746	201,746
T-N	[kg/day]	2,506	2,567	2,907	2,912	2,953	2,953	3,207	3,481	3,491	3,545	3,545	2,338	2,556	2,797	2,843	2,843	2,872	2,872	5,020	5,081	5,304	5,304	5,304	5,494	6,133	6,133
T-P	[kg/day]	3,670	3,674	3,704	3,704	3,707	3,707	3,723	3,741	3,743	3,747	3,747	2,471	2,485	2,502	2,505	2,505	2,507	2,507	2,650	2,660	2,675	2,675	2,675	2,688	2,733	2,733
BOD_5	[mg/L]	2.8	2.9	2.9	2.9	2.9	2.9	3.2	3.3	3.3	3.3	3.3	3.3	3.6	3.9	4.0	4.0	4.0	6.2	6.9	6.9	7.2	7.2	7.2	7.3	7.4	7.4
SS	[mg/L]	65	65	65	65	65	65	65	64	64	64	64	64	64	64	64	64	64	63	62	62	62	62	62	62	61	61
T-N	[mg/L]	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.6	1.6	1.7	1.7	1.7	1.7	1.9	1.9
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

TABLA A11.29 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Trreted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Raley	Untreated DWW	Trreted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,682	2,423	-		7,630	67,702	1,446	-		-1,175,040	6,550	46,310	-		860	42,370	71,600	9,753	-		0	6,340	98,832	
Flowrate	[m³/day]	1,321,920	1,323,740	1,360,422	1,362,845	1,362,845	1,362,845	1,370,475	1,438,177	1,439,623	1,439,623	1,439,623	264,583	271,133	317,443	317,443	317,443	318,303	360,673	432,273	442,026	442,026	442,026	442,026	448,366	547,198	547,198
BOD5	[kg/day]	3,701	3,983	4,381	4,401	4,471	4,471	5,648	6,136	6,184	6,356	6,356	1,168	2,179	3,258	3,467	3,467	3,600	10,549	13,055	13,248	14,226	14,226	14,226	14,448	15,623	15,623
SS	[kg/day]	85,925	86,268	86,666	86,788	86,874	86,874	88,305	88,842	88,913	89,117	89,117	16,378	17,607	18,913	19,167	19,167	19,329	19,329	21,835	22,323	22,639	22,639	22,639	22,861	24,156	24,156
T-N	[kg/day]	740	801	1,141	1,146	1,187	1,187	1,441	1,715	1,725	1,779	1,779	327	545	786	832	832	861	861	3,009	3,070	3,293	3,293	3,293	3,483	4,122	4,122
T-P	[kg/day]	1,084	1,088	1,118	1,118	1,121	1,121	1,137	1,155	1,157	1,161	1,161	213	227	244	247	247	249	249	392	402	418	418	418	431	475	475
BOD5	[mg/L]	2.8	3.0	3.2	3.2	3.3	3.3	4.1	4.3	4.3	4.4	4.4	4.4	8.0	10.3	10.9	10.9	11.3	29.2	30.2	30.0	32.2	32.2	32.2	32.2	28.6	28.6
SS	[mg/L]	65	65	64	64	64	64	64	62	62	62	62	62	65	60	60	60	61	54	51	51	51	51	51	51	44	44
T-N	[mg/L]	0.6	0.6	0.8	0.8	0.9	0.9	1.1	1.2	1.2	1.2	1.2	1.2	2.0	2.5	2.6	2.6	2.7	2.4	7.0	6.9	7.5	7.5	7.5	7.8	7.5	7.5
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9

TABLA A11.30 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	480	39,409	2,809	-		2,900	69,132	1,676	-		-1,477,440	4,160	42,203	-		330	73,920	71,600	11,307	-		0	9,930	102,336	
Flowrate	[m³/day]	2,583,360	2,583,840	2,623,249	2,626,058	2,626,058	2,626,058	2,628,958	2,698,090	2,699,766	2,699,766	2,699,766	1,222,326	1,226,486	1,268,689	1,268,689	1,268,689	1,269,019	1,342,939	1,414,539	1,425,846	1,425,846	1,425,846	1,425,846	1,435,776	1,538,112	1,538,112
BOD_5	[kg/day]	7,233	7,309	8,052	8,076	8,161	8,161	8,625	9,135	9,192	9,295	9,295	4,208	4,872	5,321	5,433	5,433	5,485	17,977	20,483	20,709	22,236	22,236	22,236	22,584	24,139	24,139
SS	[kg/day]	167,918	168,013	168,822	168,963	169,068	169,068	169,548	170,105	170,191	170,303	170,303	77,105	77,935	78,487	78,625	78,625	78,690	93,844	96,350	96,916	98,746	98,746	98,746	99,094	100,850	100,850
T-N	[kg/day]	1,447	1,464	1,898	1,904	1,950	1,950	2,054	2,372	2,383	2,426	2,426	1,098	1,248	1,359	1,386	1,386	1,398	3,985	6,133	6,202	6,684	6,684	6,684	6,982	7,742	7,742
T-P	[kg/day]	2,118	2,119	2,158	2,158	2,162	2,162	2,169	2,190	2,193	2,196	2,196	994	1,004	1,014	1,015	1,015	1,016	1,238	1,381	1,393	1,431	1,431	1,431	1,451	1,505	1,505
BOD_5	[mg/L]	2.8	2.8	3.1	3.1	3.1	3.1	3.3	3.4	3.4	3.4	3.4	3.4	4.0	4.2	4.3	4.3	4.3	13.4	14.5	14.5	15.6	15.6	15.6	15.7	15.7	15.7
SS	[mg/L]	65	65	64	64	64	64	64	63	63	63	63	63	63.5	62	62	62	62	70	68	68	69	69	69	69	66	66
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.1	3.0	4.3	4.4	4.7	4.7	4.7	4.9	5.0	5.0
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

TABLA A11.30 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	480	39,409	2,809	-		2,900	69,132	1,676	-		-1,555,200	4,160	42,203	-		330	73,920	71,600	11,307	-		0	9,930	102,336	
Flowrate	[m³/day]	4,475,520	4,476,000	4,515,409	4,518,218	4,518,218	4,518,218	4,521,118	4,590,250	4,591,926	4,591,926	4,591,926	3,036,726	3,040,886	3,083,089	3,083,089	3,083,089	3,083,419	3,157,339	3,228,939	3,240,246	3,240,246	3,240,246	3,240,246	3,250,176	3,352,512	3,352,512
BOD_5	[kg/day]	12,531	12,607	13,350	13,374	13,459	13,459	13,923	14,433	14,490	14,593	14,593	9,651	10,315	10,764	10,875	10,875	10,927	23,419	25,925	26,151	27,678	27,678	27,678	28,026	29,581	29,581
SS	[kg/day]	290,909	291,004	291,813	291,954	292,058	292,058	292,538	293,095	293,181	293,294	293,294	193,961	194,791	195,343	195,481	195,481	195,546	210,700	213,206	213,772	215,601	215,601	215,601	215,949	217,705	217,705
T-N	[kg/day]	2,506	2,523	2,958	2,964	3,009	3,009	3,113	3,431	3,442	3,486	3,486	2,305	2,455	2,566	2,592	2,592	2,604	5,191	7,339	7,409	7,891	7,891	7,891	8,189	8,949	8,949
T-P	[kg/day]	3,670	3,671	3,709	3,709	3,713	3,713	3,720	3,741	3,744	3,747	3,747	2,478	2,488	2,498	2,500	2,500	2,501	2,723	2,866	2,877	2,915	2,915	2,915	2,935	2,989	2,989
BOD_5	[mg/L]	2.8	2.8	3.0	3.0	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.2	3.4	3.5	3.5	3.5	3.5	7.4	8.0	8.1	8.5	8.5	8.5	8.6	8.8	8.8
SS	[mg/L]	65	65	65	65	65	65	65	64	64	64	64	64	64	63	63	63	63	67	66	66	67	67	67	66	65	65
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.6	2.3	2.3	2.4	2.4	2.4	2.5	2.7	2.7
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

TABLA A11.30 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	480	39,409	2,809	-		2,900	69,132	1,676	-		-1,166,400	4,160	42,203	-		330	73,920	71,600	11,307	-		0	9,930	102,336	
Flowrate		1,321,920	1,322,400	1,361,809	1,364,618	1,364,618	1,364,618	1,367,518	1,436,650	1,438,326	1,438,326	1,438,326	271,926	276,086	318,289	318,289	318,289	318,619	392,539	464,139	475,446	475,446	475,446	475,446	485,376	587,712	587,712
BOD5	[kg/day]	3,701	3,777	4,520	4,544	4,629	4,629	5,093	5,603	5,660	5,763	5,763	1,089	1,753	2,202	2,314	2,314	2,366	14,858	17,364	17,590	19,117	19,117	19,117	19,465	21,020	21,020
SS		85,925	86,020	86,829	86,970	87,074	87,074	87,554	88,111	88,197	88,310	88,310	16,696	17,526	18,078	18,216	18,216	18,281	33,435	35,941	36,507	38,336	38,336	38,336	38,684	40,440	40,440
T-N		740	757	1,192	1,198	1,243	1,243	1,347	1,665	1,676	1,720	1,720	325	475	586	612	612	624	3,211	5,359	5,429	5,911	5,911	5,911	6,209	6,969	6,969
T-P		1,084	1,085	1,123	1,123	1,127	1,127	1,134	1,155	1,158	1,162	1,162	220	230	239	241	241	242	464	607	619	656	656	656	676	730	730
BOD5	[mg/L]	2.8	2.9	3.3	3.3	3.4	3.4	3.7	3.9	3.9	4.0	4.0	4.0	6.4	6.9	7.3	7.3	7.4	37.9	37.4	37.0	40.2	40.2	40.2	40.1	35.8	35.8
SS		65	65	64	64	64	64	64	61	61	61	61	61	63	57	57	57	57	85	77	77	81	81	81	80	69	69
T-N		0.6	0.6	0.9	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.2	1.2	1.7	1.8	1.9	1.9	2.0	8.2	11.5	11.4	12.4	12.4	12.4	12.8	11.9	11.9
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.2	1.2

TABLA A11.31 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,494,720	9,000	54,132	-		1,190	18,490	25,000	6,962			1,110	0	92,174	
Flowrate	[m³/day]	2,583,360	2,586,400	2,618,350	2,618,350	2,618,350	2,618,350	2,645,520	2,710,612	2,710,828	2,710,828	2,710,828	1,216,108	1,225,108	1,279,240	1,279,240	1,279,240	1,280,430	1,298,920	1,323,920	1,330,882	1,330,882	1,330,882	1,331,992	1,331,992	1,423,056	1,423,056
BOD_5	[kg/day]	7,233	7,647	8,462	8,462	8,708	8,708	12,413	12,959	13,092	13,969	13,969	6,267	7,494	9,547	10,203	10,203	10,365	13,102	13,977	15,225	16,229	16,229	16,393	16,393	18,837	18,837
SS	[kg/day]	167,918	168,402	169,311	169,311	169,590	169,590	173,913	174,524	174,581	175,579	175,579	78,767	80,199	82,584	83,347	83,347	83,536	86,642	87,517	88,821	89,916	89,916	90,102	90,102	92,740	92,740
T-N	[kg/day]	1,447	1,544	1,743	1,743	1,802	1,802	2,667	2,863	2,868	3,081	3,081	1,382	1,668	2,152	2,306	2,306	2,344	2,936	3,686	3,772	4,065	4,065	4,101	4,101	4,574	4,574
T-P	[kg/day]	2,118	2,123	2,141	2,141	2,146	2,146	2,195	2,208	2,210	2,223	2,223	997	1,013	1,042	1,051	1,051	1,053	1,099	1,149	1,159	1,181	1,181	1,184	1,184	1,223	1,223
BOD_5	[mg/L]	2.8	3.0	3.2	3.2	3.3	3.3	4.7	4.8	4.8	5.2	5.2	5.2	6.1	7.5	8.0	8.0	8.1	10.1	10.6	11.4	12.2	12.2	12.3	12.3	13.2	13.2
SS	[mg/L]	65	65	65	65	65	65	66	64	64	65	65	65	65.5	65	65	65	65	67	66	67	68	68	68	68	65	65
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	1.0	1.1	1.1	1.1	1.1	1.1	1.4	1.7	1.8	1.8	1.8	2.3	2.8	2.8	3.1	3.1	3.1	3.1	3.2	3.2
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

Measured Value (Year: 2000, 200

		RC1 Antes Toma de Pastor					After Junction of Arroyo					After Junction of Arroyo					After Junction of Arroyo						RC5 Despues Descarga A. N. Rafey				After Junction of Arroyo
BOD_5	[mg/L]	2.8										5.7					31						26				
SS	[mg/L]	113										159					125						385				
T-N	[mg/L]	0.6										4.4					7.6						7.6				
T-P	[mg/L]	0.8										0.57					1.32						0.18				

TABLA A11.31 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,572,480	9,000	54,132	-		1,190	18,490	25,000	6,962	-		1,110	0	92,174	
Flowrate		4,475,520	4,478,560	4,510,510	4,510,510	4,510,510	4,510,510	4,537,680	4,602,772	4,602,988	4,602,988	4,602,988	3,030,508	3,039,508	3,093,640	3,093,640	3,093,640	3,094,830	3,113,320	3,138,320	3,145,282	3,145,282	3,145,282	3,146,392	3,146,392	3,237,456	3,237,456
BOD_5	[kg/day]	12,531	12,945	13,760	13,760	14,006	14,006	17,711	18,257	18,390	19,267	19,267	12,685	13,912	15,965	16,621	16,621	16,783	19,520	20,395	21,643	22,647	22,647	22,811	22,811	25,255	25,255
SS		290,909	291,393	292,302	292,302	292,580	292,580	296,903	297,514	297,571	298,570	298,570	196,572	198,004	200,389	201,152	201,152	201,341	204,447	205,322	206,626	207,721	207,721	207,907	207,907	210,545	210,545
T-N		2,506	2,603	2,802	2,802	2,861	2,861	3,726	3,922	3,927	4,141	4,141	2,726	3,012	3,496	3,650	3,650	3,688	4,280	5,030	5,116	5,409	5,409	5,445	5,445	5,918	5,918
T-P		3,670	3,675	3,693	3,693	3,698	3,698	3,747	3,760	3,762	3,774	3,774	2,485	2,501	2,530	2,539	2,539	2,541	2,587	2,637	2,647	2,669	2,669	2,672	2,672	2,711	2,711
BOD_5	[mg/L]	2.8	2.9	3.1	3.1	3.1	3.1	3.9	4.0	4.0	4.2	4.2	4.2	4.6	5.2	5.4	5.4	5.4	6.3	6.5	6.9	7.2	7.2	7.3	7.3	7.8	7.8
SS		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	66	65	66	66	66	66	66	65	65
T-N		0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.2	1.2	1.2	1.4	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

TABLA A11.31 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2000) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	3,040	31,950	0	-		27,170	65,092	216	-		-1,183,680	9,000	54,132	-		1,190	18,490	25,000	6,962	-		1,110	0	92,174	
Flowrate		1,321,920	1,324,960	1,356,910	1,356,910	1,356,910	1,356,910	1,384,080	1,449,172	1,449,388	1,449,388	1,449,388	265,708	274,708	328,840	328,840	328,840	330,030	348,520	373,520	380,482	380,482	380,482	381,592	381,592	472,656	472,656
BOD5	[kg/day]	3,701	4,115	4,930	4,930	5,176	5,176	8,881	9,427	9,560	10,437	10,437	1,913	3,140	5,193	5,849	5,849	6,011	8,748	9,623	10,871	11,876	11,876	12,040	12,040	14,484	14,484
SS		85,925	86,409	87,318	87,318	87,596	87,596	91,919	92,530	92,587	93,586	93,586	17,157	18,589	20,974	21,737	21,737	21,926	25,032	25,907	27,211	28,306	28,306	28,492	28,492	31,130	31,130
T-N		740	837	1,036	1,036	1,095	1,095	1,960	2,156	2,161	2,375	2,375	435	721	1,205	1,359	1,359	1,397	1,989	2,739	2,825	3,119	3,119	3,155	3,155	3,628	3,628
T-P		1,084	1,089	1,107	1,107	1,112	1,112	1,161	1,174	1,176	1,188	1,188	218	234	263	272	272	274	320	370	380	401	401	404	404	443	443
BOD5	[mg/L]	2.8	3.1	3.6	3.6	3.8	3.8	6.4	6.5	6.6	7.2	7.2	7.2	11.4	15.8	17.8	17.8	18.2	25.1	25.8	28.6	31.2	31.2	31.6	31.6	30.6	30.6
SS		65	65	64	64	65	65	66	64	64	65	65	65	68	64	66	66	66	72	69	72	74	74	75	75	66	66
T-N		0.6	0.6	0.8	0.8	0.8	0.8	1.4	1.5	1.5	1.6	1.6	1.6	2.6	3.7	4.1	4.1	4.2	5.7	7.3	7.4	8.2	8.2	8.3	8.3	7.7	7.7
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.1	1.1	0.9	0.9

TABLA A11.32 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	2,650	34,254	1,899	-		10,300	66,372	1,133	-		-1,477,440	8,300	55,752	-		1,150	44,190	35,800	7,642			3,430	0	95,283	
Flowrate	[m³/day]	2,583,360	2,586,010	2,620,264	2,622,163	2,622,163	2,622,163	2,632,463	2,698,835	2,699,968	2,699,968	2,699,968	1,222,528	1,230,828	1,286,580	1,286,580	1,286,580	1,287,730	1,331,920	1,367,720	1,375,362	1,375,362	1,375,362	1,378,792	1,378,792	1,474,075	1,474,075
BOD_5	[kg/day]	7,233	7,613	8,788	8,803	9,117	9,117	10,595	11,046	11,085	11,479	11,479	5,198	6,389	8,763	9,476	9,476	9,641	16,490	17,743	17,891	19,574	19,574	20,106	20,106	21,155	21,155
SS	[kg/day]	167,918	168,378	169,748	169,843	170,228	170,228	172,020	172,523	172,580	173,051	173,051	78,356	79,800	82,673	83,537	83,537	83,737	91,780	93,033	93,415	95,390	95,390	96,014	96,014	97,184	97,184
T-N	[kg/day]	1,447	1,539	1,830	1,834	1,912	1,912	2,270	2,507	2,514	2,634	2,634	1,193	1,482	2,063	2,237	2,237	2,277	3,779	4,853	4,900	5,432	5,432	5,549	5,549	6,091	6,091
T-P	[kg/day]	2,118	2,124	2,154	2,154	2,161	2,161	2,183	2,199	2,201	2,209	2,209	1,000	1,019	1,057	1,069	1,069	1,072	1,200	1,272	1,280	1,322	1,322	1,332	1,332	1,370	1,370
BOD_5	[mg/L]	2.8	2.9	3.4	3.4	3.5	3.5	4.0	4.1	4.1	4.3	4.3	4.3	5.2	6.8	7.4	7.4	7.5	12.4	13.0	13.0	14.2	14.2	14.6	14.6	14.4	14.4
SS	[mg/L]	65	65	65	65	65	65	65	64	64	64	64	64	64.8	64	65	65	65	69	68	68	69	69	70	70	66	66
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	0.9	0.9	0.9	1.0	1.0	1.0	1.2	1.6	1.7	1.7	1.8	2.8	3.5	3.6	3.9	3.9	4.0	4.0	4.1	4.1
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9

TABLA A11.32 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Nibaje	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo Gurabo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo Jacagua
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	2,650	34,254	1,899	-		10,300	66,372	1,133	-		-1,355,200	8,300	55,752	-		1,150	44,190	35,800	7,642	-		3,430	0	95,283	
Flowrate	[m³/day]	4,475,520	4,478,170	4,512,424	4,514,323	4,512,424	4,512,424	4,522,724	4,589,096	4,590,229	4,590,229	4,590,229	3,035,029	3,043,329	3,099,081	3,099,081	3,099,081	3,100,231	3,144,421	3,180,221	3,187,863	3,187,863	3,187,863	3,191,293	3,191,293	3,286,576	3,286,576
BOD_5	[kg/day]	12,531	12,911	14,086	14,101	14,415	14,415	15,893	16,344	16,383	16,777	16,777	11,093	12,284	14,658	15,371	15,371	15,536	22,385	23,638	23,786	25,469	25,469	26,001	26,001	27,050	27,050
SS	[kg/day]	290,909	291,369	292,739	292,834	293,219	293,219	295,011	295,514	295,571	296,041	296,041	195,740	197,184	200,057	200,921	200,921	201,121	209,164	210,417	210,799	212,774	212,774	213,398	213,398	214,568	214,568
T-N	[kg/day]	2,506	2,598	2,890	2,894	2,971	2,971	3,329	3,566	3,573	3,694	3,694	2,442	2,731	3,312	3,486	3,486	3,526	5,028	6,102	6,149	6,682	6,682	6,799	6,799	7,340	7,340
T-P	[kg/day]	3,670	3,676	3,705	3,705	3,712	3,712	3,734	3,750	3,752	3,760	3,760	2,486	2,505	2,543	2,555	2,555	2,558	2,686	2,758	2,766	2,808	2,808	2,818	2,818	2,856	2,856
BOD_5	[mg/L]	2.8	2.9	3.1	3.1	3.2	3.2	3.5	3.6	3.6	3.7	3.7	3.7	4.0	4.7	5.0	5.0	5.0	7.1	7.4	7.5	8.0	8.0	8.1	8.1	8.2	8.2
SS	[mg/L]	65	65	65	65	65	65	65	64	64	64	64	64	65	65	65	65	65	67	66	66	67	67	67	67	65	65
T-N	[mg/L]	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.6	1.9	1.9	2.1	2.1	2.1	2.1	2.2	2.2
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

TABLA A11.32 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2005) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Trreted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Trreted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flownut	[m³/day]	0	2,650	34,254	1,899	-		10,300	66,372	1,133	-		-1,166,400	8,300	55,752	-		1,150	44,190	35,800	7,642	-		3,430	0	95,283	
Flowrate	[m³/day]	1,321,920	1,324,570	1,358,824	1,360,723	1,360,723	1,360,723	1,371,023	1,437,395	1,438,528	1,438,528	1,438,528	272,128	280,428	336,180	336,180	336,180	337,330	381,520	417,320	424,962	424,962	424,962	428,392	428,392	523,675	523,675
BOD5	[kg/day]	3,701	4,081	5,256	5,271	5,585	5,585	7,063	7,514	7,553	7,947	7,947	1,503	2,694	5,068	5,781	5,781	5,946	12,795	14,048	14,196	15,879	15,879	16,411	16,411	17,460	17,460
SS	[kg/day]	85,925	86,385	87,755	87,850	88,235	88,235	90,027	90,530	90,587	91,057	91,057	17,225	18,669	21,542	22,406	22,406	22,606	30,649	31,902	32,284	34,259	34,259	34,883	34,883	36,053	36,053
T-N	[kg/day]	740	832	1,124	1,128	1,205	1,205	1,563	1,800	1,807	1,928	1,928	365	654	1,235	1,409	1,409	1,449	2,951	4,025	4,072	4,604	4,604	4,721	4,721	5,263	5,263
T-P	[kg/day]	1,084	1,090	1,119	1,119	1,126	1,126	1,148	1,164	1,166	1,174	1,174	222	241	279	291	291	294	422	494	502	544	544	554	554	592	592
BOD5	[mg/L]	2.8	3.1	3.9	3.9	4.1	4.1	5.2	5.2	5.3	5.5	5.5	5.5	9.6	15.1	17.2	17.2	17.6	33.5	33.7	33.4	37.4	37.4	38.3	38.3	33.3	33.3
SS	[mg/L]	65	65	65	65	65	65	66	63	63	63	63	63	67	64	67	67	67	80	76	76	81	81	81	81	69	69
T-N	[mg/L]	0.6	0.6	0.8	0.8	0.9	0.9	1.1	1.3	1.3	1.3	1.3	1.3	2.3	3.7	4.2	4.2	4.3	7.7	9.6	9.6	10.8	10.8	11.0	11.0	10.0	10.0
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.9	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.1	1.1

TABLA A11.33 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,682	2,423	-		7,630	67,702	1,446	-		-1,486,080	6,550	46,310	-		860	0	113,970	9,753	-		0	6,340	98,832	
Flowrate	[m³/day]	2,583,360	2,585,180	2,621,862	2,624,285	2,624,285	2,624,285	2,631,915	2,699,617	2,701,063	2,701,063	2,701,063	1,214,983	1,221,533	1,267,843	1,267,843	1,267,843	1,268,703	1,268,703	1,382,673	1,392,426	1,392,426	1,392,426	1,392,426	1,398,766	1,497,598	1,497,598
BOD_5	[kg/day]	7,233	7,515	7,913	7,933	8,003	8,003	9,180	9,668	9,716	9,888	9,888	4,448	5,459	6,538	6,747	6,747	6,880	6,880	10,869	11,062	11,493	11,493	11,493	11,715	12,890	12,890
SS	[kg/day]	167,918	168,261	168,659	168,781	168,868	168,868	170,299	170,836	170,907	171,111	171,111	76,968	78,197	79,503	79,757	79,757	79,919	79,919	83,908	84,396	84,860	84,860	84,860	85,082	86,377	86,377
T-N	[kg/day]	1,447	1,508	1,848	1,853	1,894	1,894	2,148	2,422	2,432	2,485	2,485	1,118	1,336	1,577	1,623	1,623	1,652	1,652	5,071	5,132	5,483	5,483	5,483	5,673	6,311	6,311
T-P	[kg/day]	2,118	2,122	2,152	2,152	2,155	2,155	2,171	2,189	2,191	2,195	2,195	987	1,001	1,018	1,021	1,021	1,023	1,023	1,251	1,261	1,285	1,285	1,285	1,298	1,343	1,343
BOD_5	[mg/L]	2.8	2.9	3.0	3.0	3.0	3.0	3.5	3.6	3.6	3.7	3.7	3.7	4.5	5.2	5.3	5.3	5.4	5.4	7.9	7.9	8.3	8.3	8.3	8.4	8.6	8.6
SS	[mg/L]	65	65	64	64	64	64	65	63	63	63	63	63	64.0	63	63	63	63	63	61	61	61	61	61	61	58	58
T-N	[mg/L]	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	1.1	1.2	1.3	1.3	1.3	1.3	3.7	3.7	3.9	3.9	3.9	4.1	4.2	4.2
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

TABLA A11.33 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Nibaje	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo Gurabo	DWW from Non Served Area	Untreated DWW	Treted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treted DWW	Arroyo Jacagua	After Junction of Arroyo Jacagua
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,682	2,423	-		7,630	67,702	1,446	-		-1,563,840	6,550	46,310	-		860	0	113,970	9,753	-		0	6,340	98,832	
Flowrate	[m³/day]	4,475,520	4,477,340	4,514,022	4,516,445	4,516,445	4,516,445	4,524,075	4,591,777	4,593,223	4,593,223	4,593,223	3,029,383	3,035,933	3,082,243	3,082,243	3,082,243	3,083,103	3,083,103	3,197,073	3,206,826	3,206,826	3,206,826	3,206,826	3,213,166	3,311,998	3,311,998
BOD_5	[kg/day]	12,531	12,813	13,211	13,231	13,301	13,301	14,478	14,966	15,014	15,186	15,186	10,016	11,027	12,106	12,315	12,315	12,448	12,448	16,437	16,630	17,061	17,061	17,061	17,283	18,458	18,458
SS	[kg/day]	290,909	291,252	291,650	291,772	291,858	291,858	293,289	293,826	293,897	294,101	294,101	193,969	195,198	196,504	196,758	196,758	196,920	196,920	200,909	201,397	201,861	201,861	201,861	202,083	203,378	203,378
T-N	[kg/day]	2,506	2,567	2,907	2,912	2,953	2,953	3,207	3,481	3,491	3,545	3,545	2,338	2,556	2,797	2,843	2,843	2,872	2,872	6,291	6,352	6,703	6,703	6,703	6,893	7,531	7,531
T-P	[kg/day]	3,670	3,674	3,704	3,704	3,707	3,707	3,723	3,741	3,743	3,747	3,747	2,471	2,485	2,502	2,505	2,505	2,507	2,507	2,735	2,745	2,769	2,769	2,769	2,782	2,826	2,826
BOD_5	[mg/L]	2.8	2.9	2.9	2.9	2.9	2.9	3.2	3.3	3.3	3.3	3.3	3.3	3.6	3.9	4.0	4.0	4.0	4.0	5.1	5.2	5.3	5.3	5.3	5.4	5.6	5.6
SS	[mg/L]	65	65	65	65	65	65	65	64	64	64	64	64	64	64	64	64	64	64	63	63	63	63	63	63	61	61
T-N	[mg/L]	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.3
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

TABLA A11.33 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2010) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Trreted DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Trreted DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	1,820	36,682	2,423	-		7,630	67,702	1,446	-		-1,175,040	6,550	46,310	-		860	0	113,970	9,753	-		0	6,340	98,832	
Flowrate	[m³/day]	1,321,920	1,323,740	1,360,422	1,362,845	1,362,845	1,362,845	1,370,475	1,438,177	1,439,623	1,439,623	1,439,623	264,583	271,133	317,443	317,443	317,443	318,303	318,303	432,273	442,026	442,026	442,026	442,026	448,366	547,198	547,198
BOD5	[kg/day]	3,701	3,983	4,381	4,401	4,471	4,471	5,648	6,136	6,184	6,356	6,356	1,168	2,179	3,258	3,467	3,467	3,600	3,600	7,589	7,782	8,214	8,214	8,214	8,436	9,611	9,611
SS	[kg/day]	85,925	86,268	86,666	86,788	86,874	86,874	88,305	88,842	88,913	89,117	89,117	16,378	17,607	18,913	19,167	19,167	19,329	19,329	23,318	23,806	24,270	24,270	24,270	24,492	25,787	25,787
T-N	[kg/day]	740	801	1,141	1,146	1,187	1,187	1,441	1,715	1,725	1,779	1,779	327	545	786	832	832	861	861	4,280	4,341	4,692	4,692	4,692	4,882	5,520	5,520
T-P	[kg/day]	1,084	1,088	1,118	1,118	1,121	1,121	1,137	1,155	1,157	1,161	1,161	213	227	244	247	247	249	249	477	487	511	511	511	524	569	569
BOD5	[mg/L]	2.8	3.0	3.2	3.2	3.3	3.3	4.1	4.3	4.3	4.4	4.4	4.4	8.0	10.3	10.9	10.9	11.3	11.3	17.6	17.6	18.6	18.6	18.6	18.8	17.6	17.6
SS	[mg/L]	65	65	64	64	64	64	64	62	62	62	62	62	65	60	60	60	61	61	54	54	55	55	55	55	47	47
T-N	[mg/L]	0.6	0.6	0.8	0.8	0.9	0.9	1.1	1.2	1.2	1.2	1.2	1.2	2.0	2.5	2.6	2.6	2.7	2.7	9.9	9.8	10.6	10.6	10.6	10.9	10.1	10.1
T-P	[mg/L]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.1	1.1	1.2	1.2	1.2	1.2	1.0	1.0

TABLA A11.34 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (1/3)

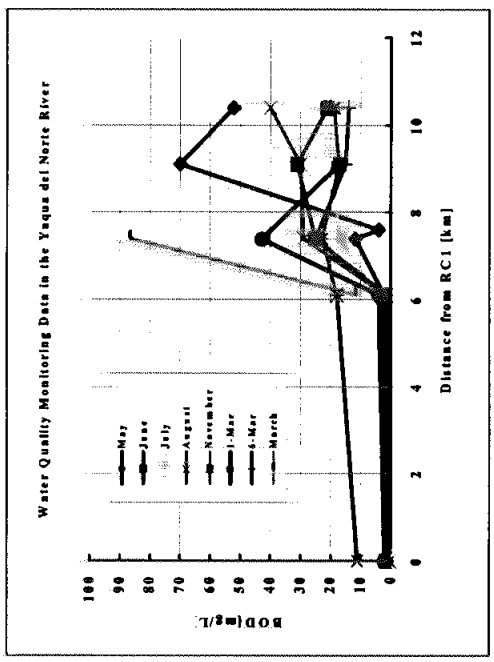
		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	480	39,409	2,809	-		2,900	69,132	1,676	-		-1,477,440	4,160	42,203	-		330	0	145,520	11,307	-		0	9,930	102,336	
Flowrate		2,583,360	2,583,840	2,623,249	2,626,058	2,626,058	2,626,858	2,628,958	2,698,090	2,699,766	2,699,766	2,699,766	1,222,326	1,226,486	1,268,689	1,268,689	1,268,689	1,269,019	1,269,019	1,414,539	1,425,846	1,425,846	1,425,846	1,425,846	1,435,776	1,538,112	1,538,112
BOD_5	[kg/day]	7,233	7,309	7,805	7,829	7,889	7,889	8,353	8,863	8,920	9,023	9,023	4,085	4,749	5,198	5,310	5,310	5,362	5,362	10,455	10,681	11,218	11,218	11,218	11,566	12,767	12,767
SS		167,918	168,013	168,509	168,650	168,724	168,724	169,204	169,761	169,847	169,959	169,959	76,949	77,779	78,331	78,470	78,470	78,535	78,535	83,628	84,194	84,766	84,766	84,766	85,114	86,421	86,421
T-N		1,447	1,464	1,889	1,895	1,940	1,940	2,044	2,362	2,373	2,416	2,416	1,094	1,244	1,355	1,381	1,381	1,393	1,393	5,759	5,829	6,274	6,274	6,274	6,572	7,320	7,320
T-P		2,118	2,119	2,156	2,156	2,160	2,160	2,167	2,188	2,191	2,194	2,194	993	1,003	1,013	1,014	1,014	1,015	1,015	1,306	1,318	1,349	1,349	1,349	1,369	1,420	1,420
BOD_5	[mg/L]	2.8	2.8	3.0	3.0	3.0	3.0	3.2	3.3	3.3	3.3	3.3	3.3	3.9	4.1	4.2	4.2	4.2	4.2	7.4	7.5	7.9	7.9	7.9	8.1	8.3	8.3
SS		65	65	64	64	64	64	64	63	63	63	63	63	63.4	62	62	62	62	62	59	59	59	59	59	59	56	56
T-N		0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.1	1.1	4.1	4.1	4.4	4.4	4.4	4.6	4.8	4.8
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9

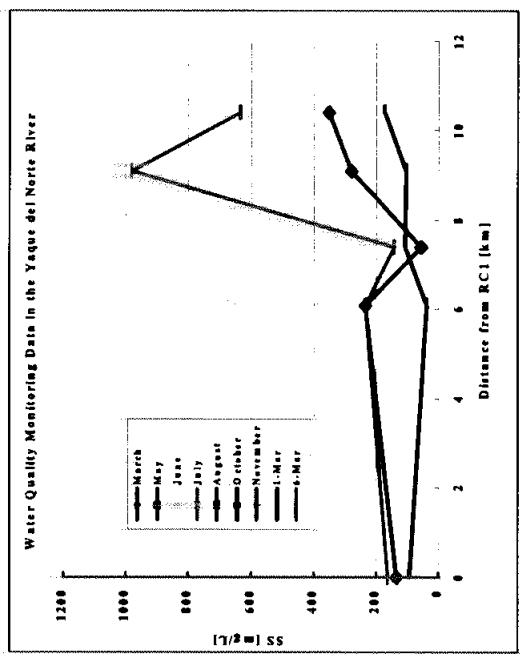
TABLA A11.34 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (2/3)

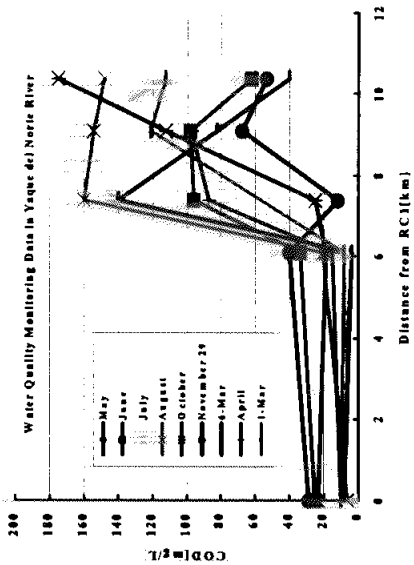
		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Nibaje	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo Gurabo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo Jacagua
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	480	39,409	2,809	-		2,900	69,132	1,676	-		-1,555,200	4,160	42,203	-		330	0	145,520	11,307	-		0	9,930	102,336	
Flowrate		4,475,520	4,476,000	4,515,409	4,518,218	4,518,218	4,518,218	4,521,118	4,590,250	4,591,926	4,591,926	4,591,926	3,036,726	3,040,886	3,083,089	3,083,089	3,083,089	3,083,419	3,083,419	3,228,939	3,240,246	3,240,246	3,240,246	3,240,246	3,250,176	3,352,512	3,352,512
BOD_5	[kg/day]	12,531	12,607	13,103	13,127	13,187	13,187	13,651	14,161	14,218	14,321	14,321	9,471	10,135	10,584	10,695	10,695	10,747	10,747	15,840	16,066	16,603	16,603	16,603	16,951	18,152	18,152
SS		290,909	291,004	291,500	291,641	291,714	291,714	292,194	292,751	292,837	292,949	292,949	193,733	194,563	195,115	195,253	195,253	195,318	195,318	200,411	200,977	201,549	201,549	201,549	201,897	203,204	203,204
T-N		2,506	2,523	2,949	2,955	2,999	2,999	3,103	3,421	3,432	3,476	3,476	2,299	2,449	2,560	2,586	2,586	2,598	2,598	6,964	7,034	7,478	7,478	7,478	7,776	8,525	8,525
T-P		3,670	3,671	3,707	3,707	3,711	3,711	3,718	3,739	3,742	3,745	3,745	2,477	2,487	2,496	2,498	2,498	2,499	2,499	2,790	2,802	2,832	2,832	2,832	2,852	2,904	2,904
BOD_5	[mg/L]	2.8	2.8	2.9	2.9	2.9	2.9	3.0	3.1	3.1	3.1	3.1	3.1	3.3	3.4	3.5	3.5	3.5	3.5	4.9	5.0	5.1	5.1	5.1	5.2	5.4	5.4
SS		65	65	65	65	65	65	65	64	64	64	64	64	64	63	63	63	63	63	62	62	62	62	62	62	61	61
T-N		0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	2.2	2.2	2.3	2.3	2.3	2.4	2.5	2.5
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

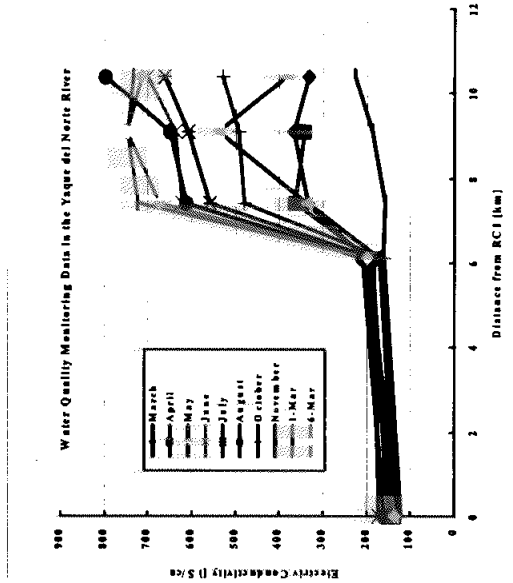
TABLA A11.34 CALIDAD FUTURA DEL AGUA EN EL RÍO YAQUE DEL NORTE (AÑO: 2015) [IMPLEMENTACIÓN DEL PROGRAMA CON CASO] (3/3)

		RC1 Antes Toma de Pastor	DWW from Non Served Area	Arroyo Hondo	Industrial Wastewater	Natural/ Others	After Junction of Arroyo Hondo	DWW from Non Served Area	Arroyo Nibaje	Industrial Wastewater	Natural/ Others	After Junction of Arroyo	Diversion Point of Irrigation Channel	DWW from Non Served Area	Arroyo Gurabo	Natural/ Others	After Junction of Arroyo	DWW from Non Served Area	Untreated DWW	Treated DWW	Industrial Wastewater	Natural/ Others	RC5 Despues Descarga A. N. Rafey	Untreated DWW	Treated DWW	Arroyo Jacagua	After Junction of Arroyo
Distance[km]		0.0					2.1					4.1	6.3				7.6						10.4				
Flowin/Flowout	[m³/day]	0	480	39,409	2,809	-		2,900	69,132	1,676	-		-1,166,400	4,160	42,203	-		330	0	145,520	11,307	-		0	9,930	102,336	
Flowrate		1,321,920	1,322,400	1,361,809	1,364,618	1,364,618	1,364,618	1,367,518	1,436,650	1,438,326	1,438,326	1,438,326	271,926	276,086	318,289	318,289	318,289	318,619	318,619	464,139	475,446	475,446	475,446	475,446	485,376	587,712	587,712
BOD5	[kg/day]	3,701	3,777	4,273	4,297	4,357	4,357	4,821	5,331	5,388	5,491	5,491	1,038	1,702	2,151	2,262	2,262	2,314	2,314	7,407	7,633	8,171	8,171	8,171	8,519	9,720	9,720
SS		85,925	86,020	86,516	86,657	86,730	86,730	87,210	87,767	87,853	87,965	87,965	16,630	17,460	18,012	18,151	18,151	18,216	18,216	23,309	23,875	24,447	24,447	24,447	24,795	26,102	26,102
T-N		740	757	1,183	1,189	1,233	1,233	1,337	1,655	1,666	1,710	1,710	323	473	584	610	610	622	622	4,988	5,058	5,503	5,503	5,503	5,801	6,549	6,549
T-P		1,084	1,085	1,121	1,121	1,125	1,125	1,132	1,153	1,156	1,159	1,159	219	229	238	240	240	241	241	532	544	575	575	575	595	646	646
BOD5	[mg/L]	2.8	2.9	3.1	3.1	3.2	3.2	3.5	3.7	3.7	3.8	3.8	3.8	6.2	6.8	7.1	7.1	7.3	7.3	16.0	16.1	17.2	17.2	17.2	17.6	16.5	16.5
SS		65	65	64	64	64	64	64	61	61	61	61	61	63	57	57	57	57	57	50	50	51	51	51	51	44	44
T-N		0.6	0.6	0.9	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.2	1.2	1.7	1.8	1.9	1.9	2.0	2.0	10.7	10.6	11.6	11.6	11.6	12.0	11.1	11.1
T-P		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.1





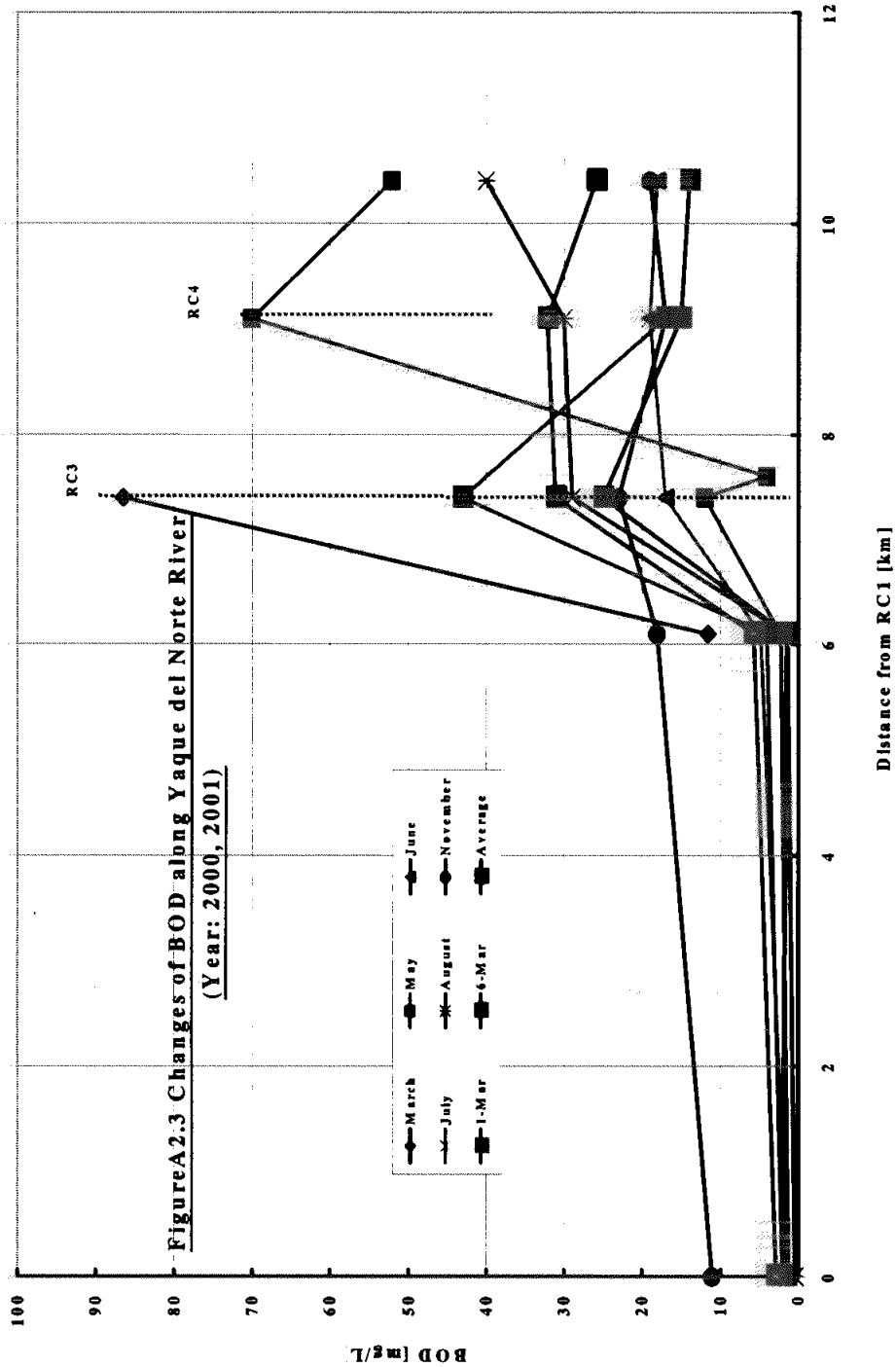




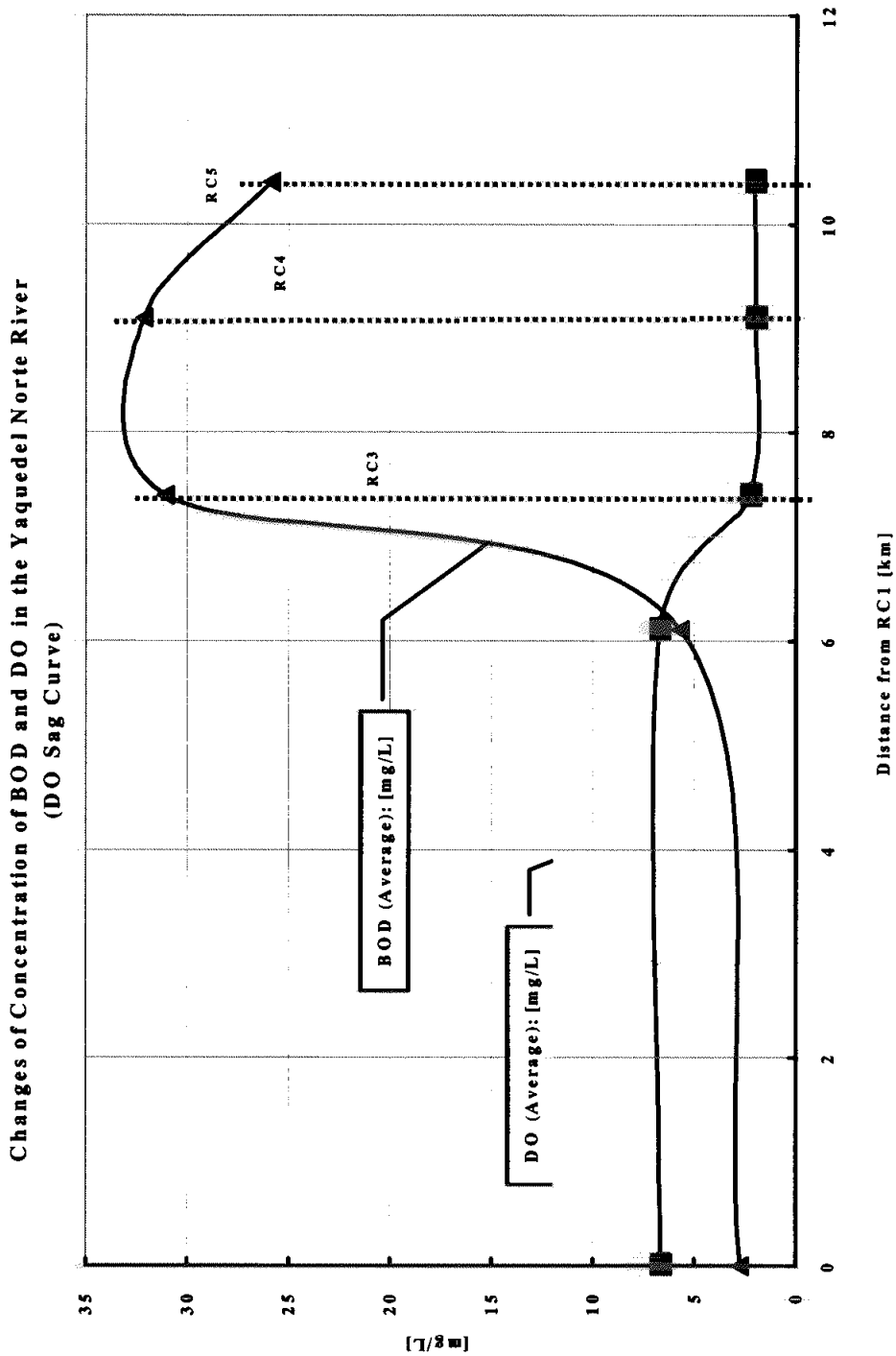
THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO

JAPAN INTERNATIONAL COOPERATION AGENCY

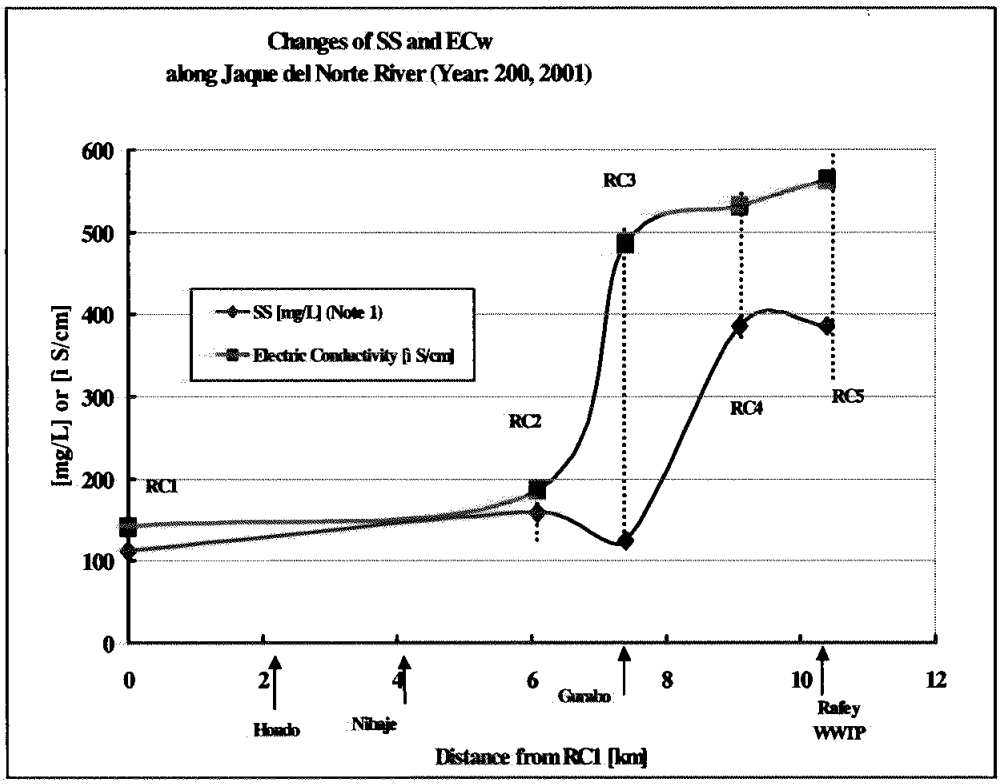
Figura A11.1
Datos del Monitoreo de la Calidad del Agua en el Río Yaque del Norte

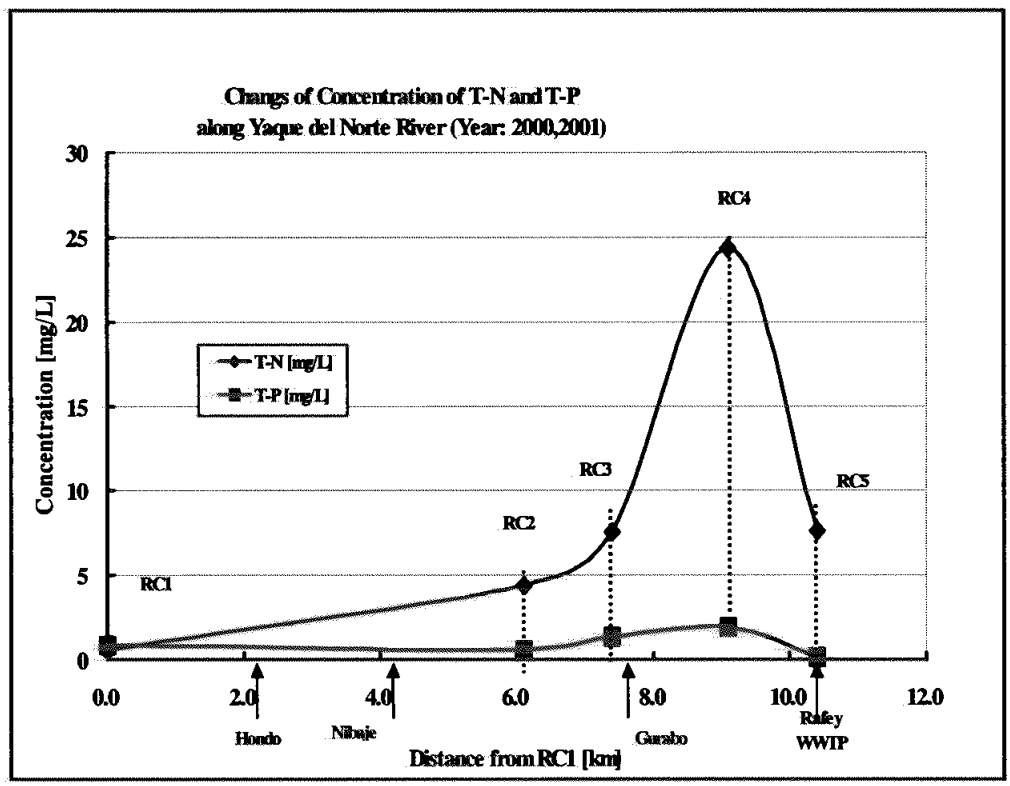


THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO	Figura A11.2 Cambios de DBR a lo largo del Río Yaque del Norte
JAPAN INTERNATIONAL COOPERATION AGENCY	

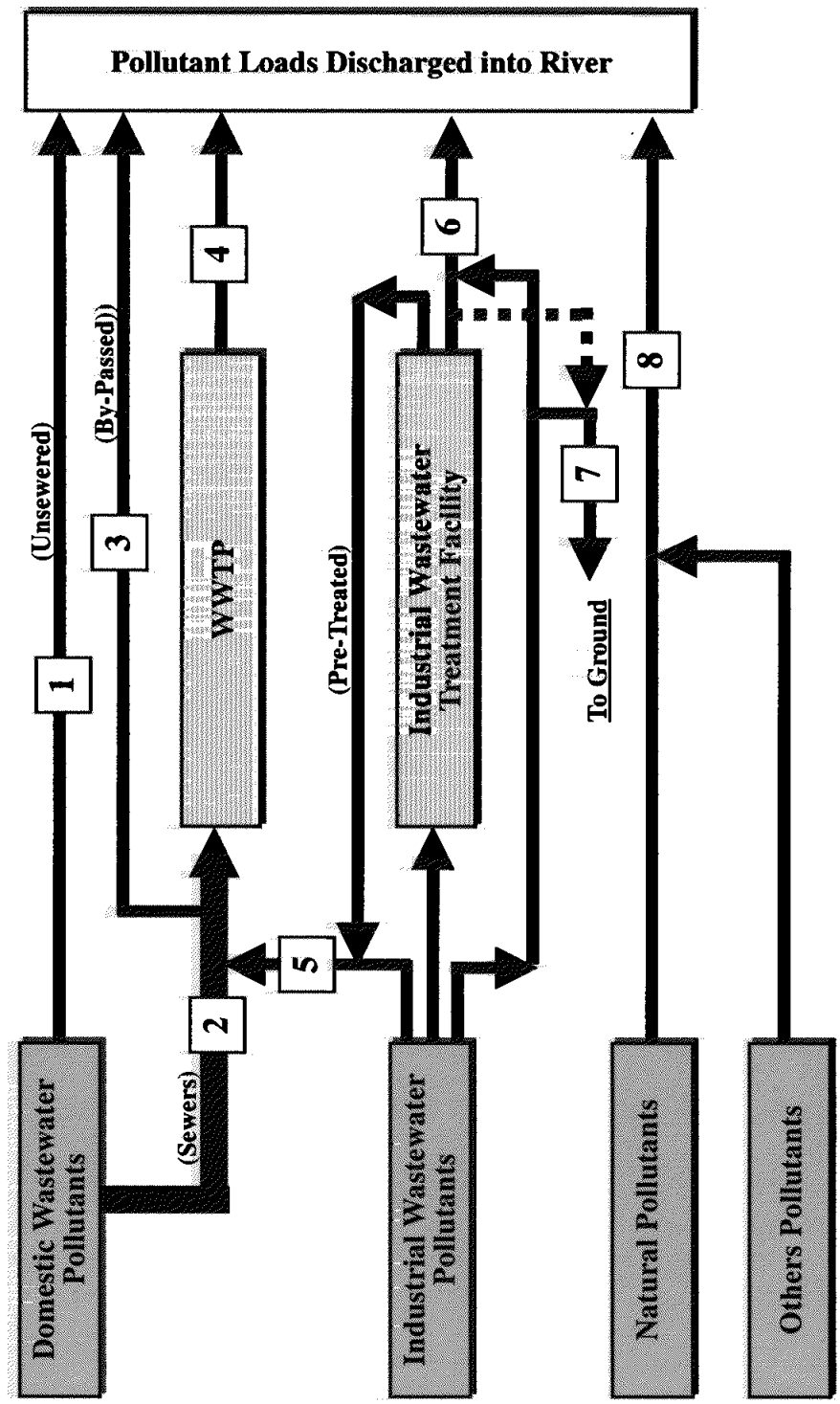


THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO	Figura A11.3 Cambios de Concentración de NOV y DO en el Río Yaque del Norte (Año: 2000)
JAPAN INTERNATIONAL COOPERATION AGENCY	





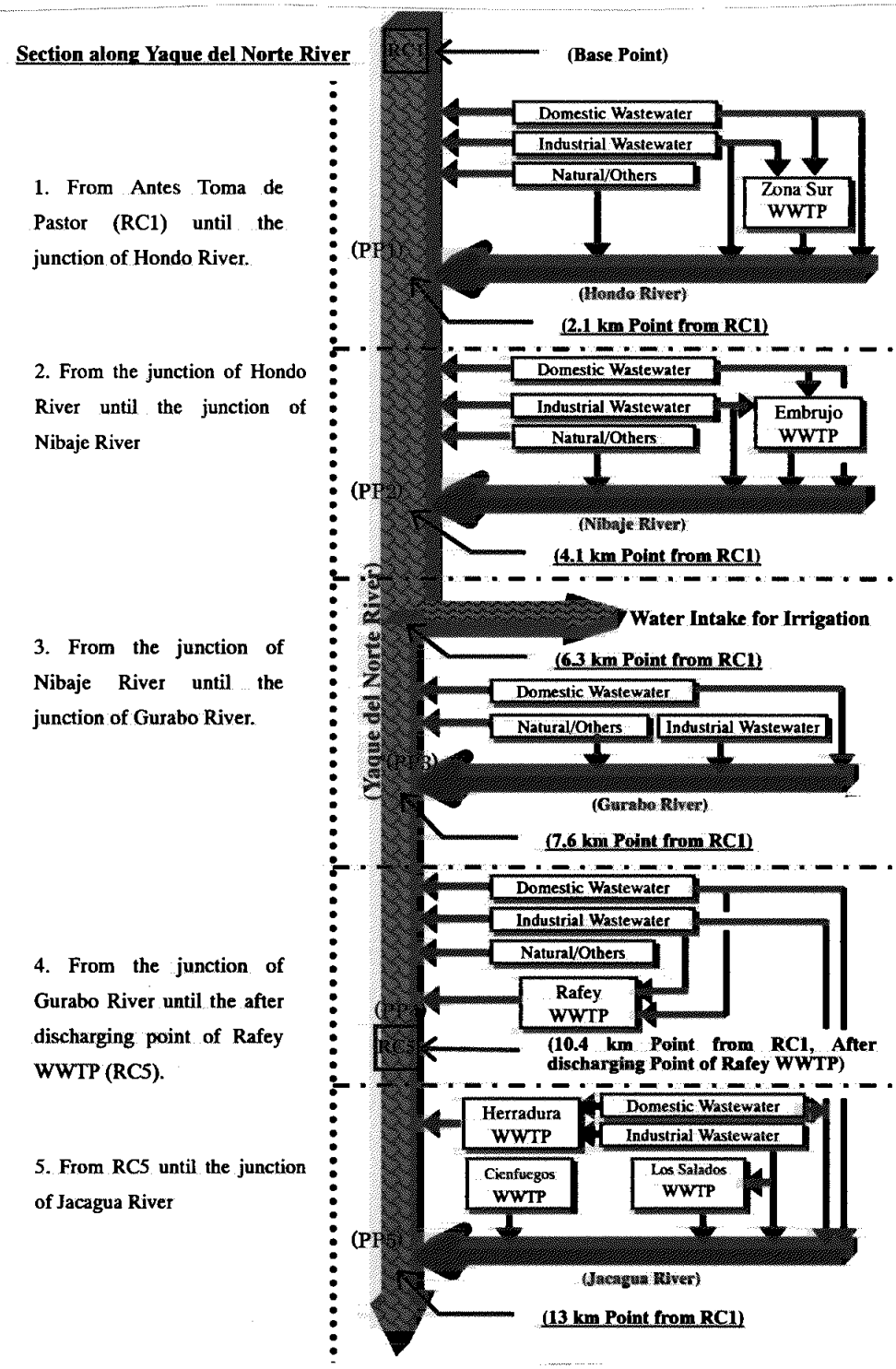
THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO	Figura A11.4 Cambios de SS, EC_w, T-N y T-P a lo largo del Río Yaque del Norte
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO

JAPAN INTERNATIONAL COOPERATION AGENCY

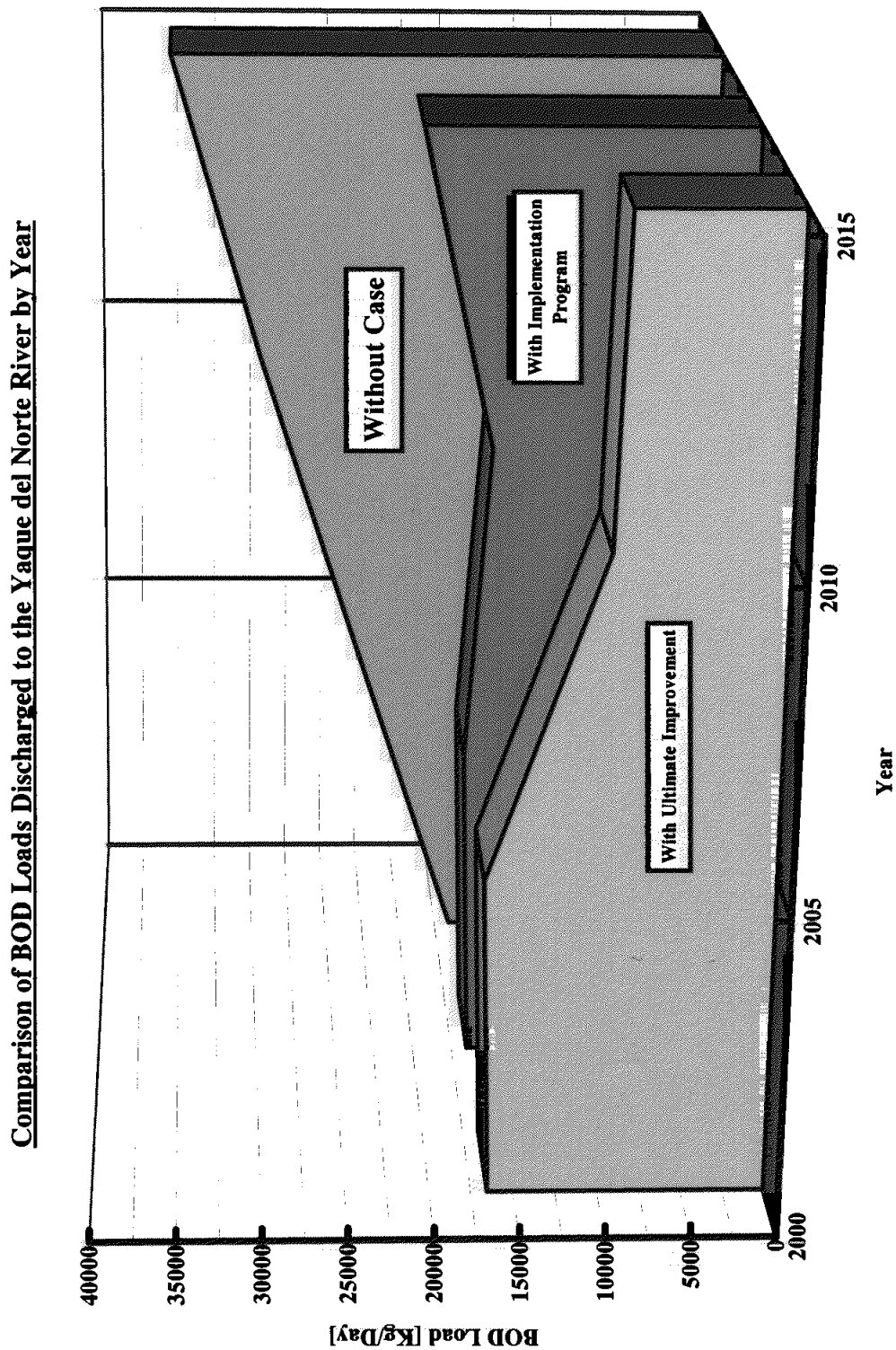
Figura A11.5
Destino de las Cargas
Contaminadas Descargadas



THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO

JAPAN INTERNATIONAL COOPERATION AGENCY

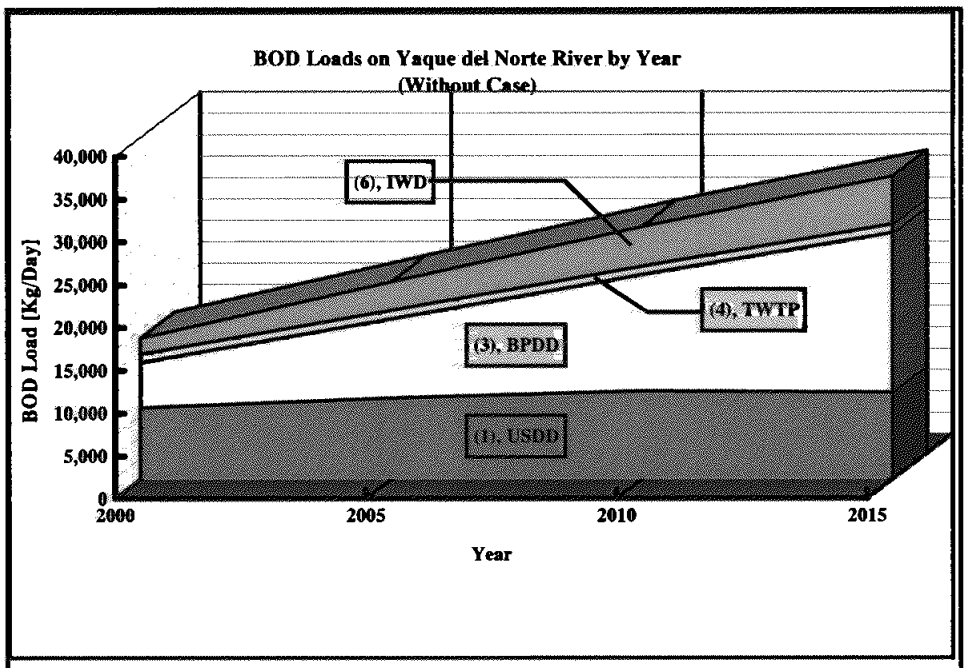
Figura A11.6
Tratamiento de Aguas Residuales y Desechos en el Río Yaque del Norte

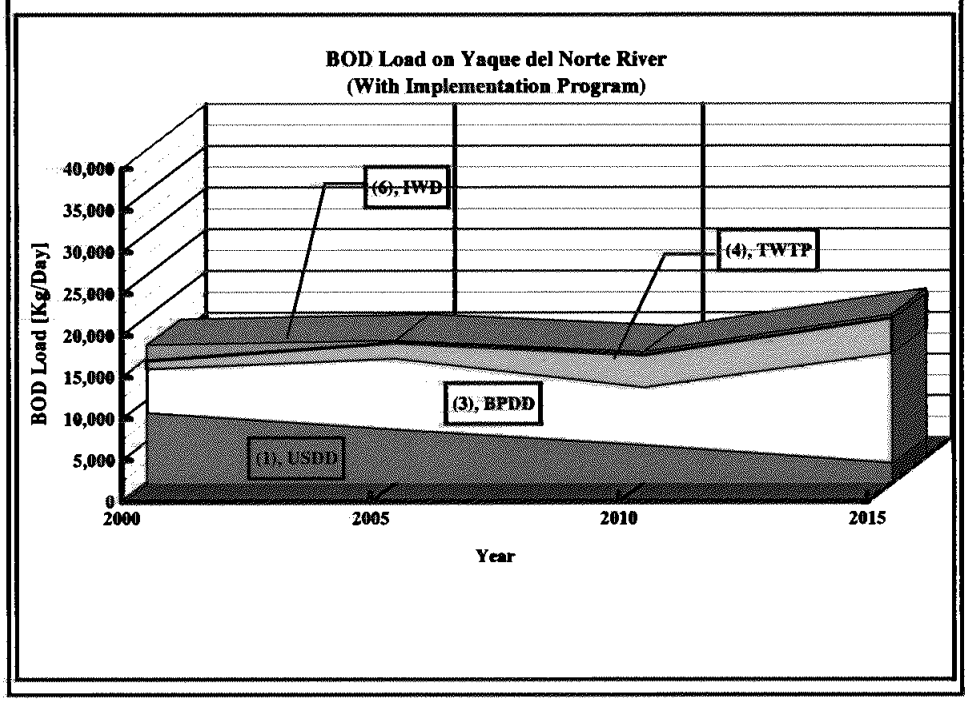


THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO

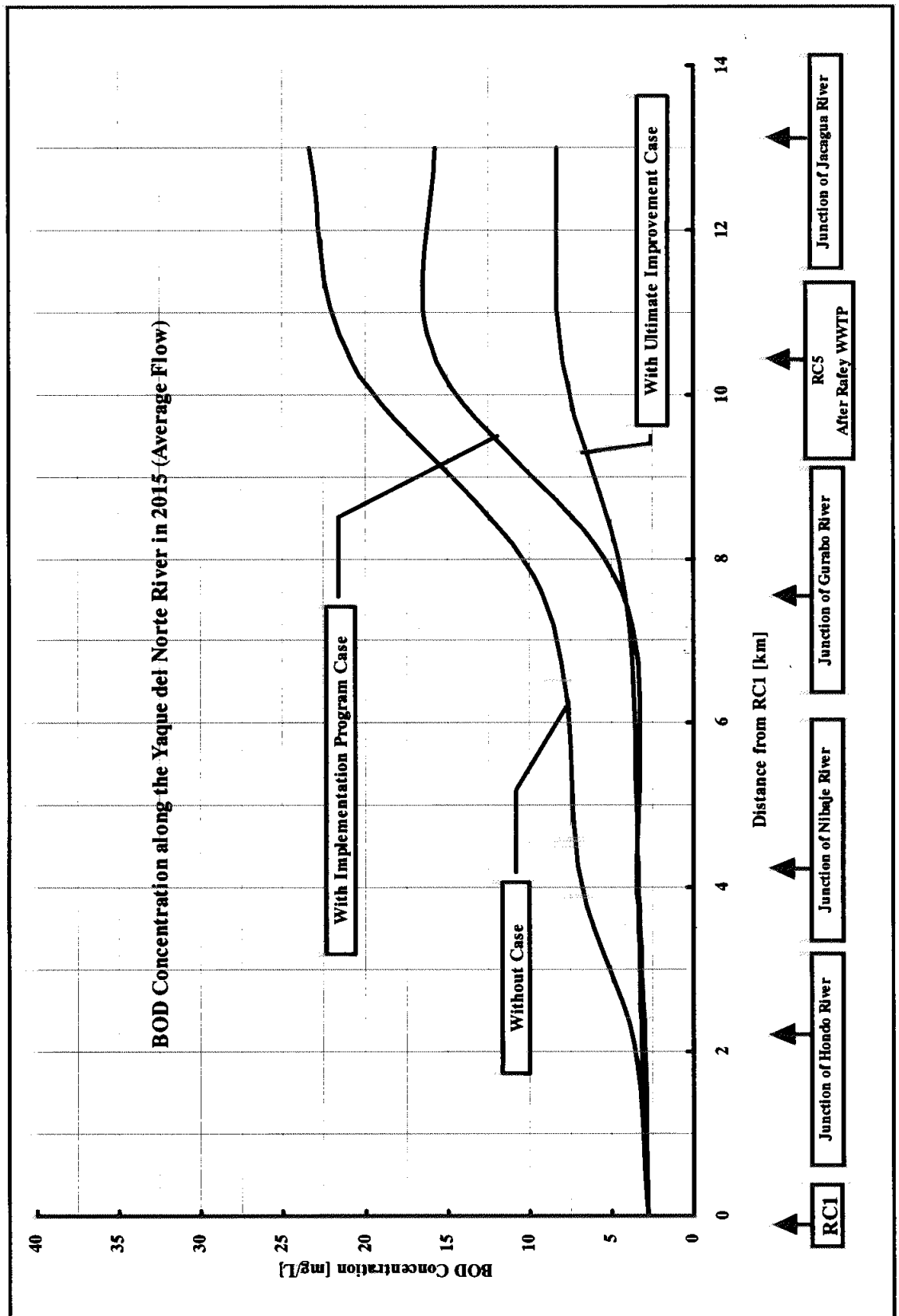
JAPAN INTERNATIONAL COOPERATION AGENCY

Figura A11.7
Comparación de las Cargas de DOB Descargadas al Río Yaque del Norte

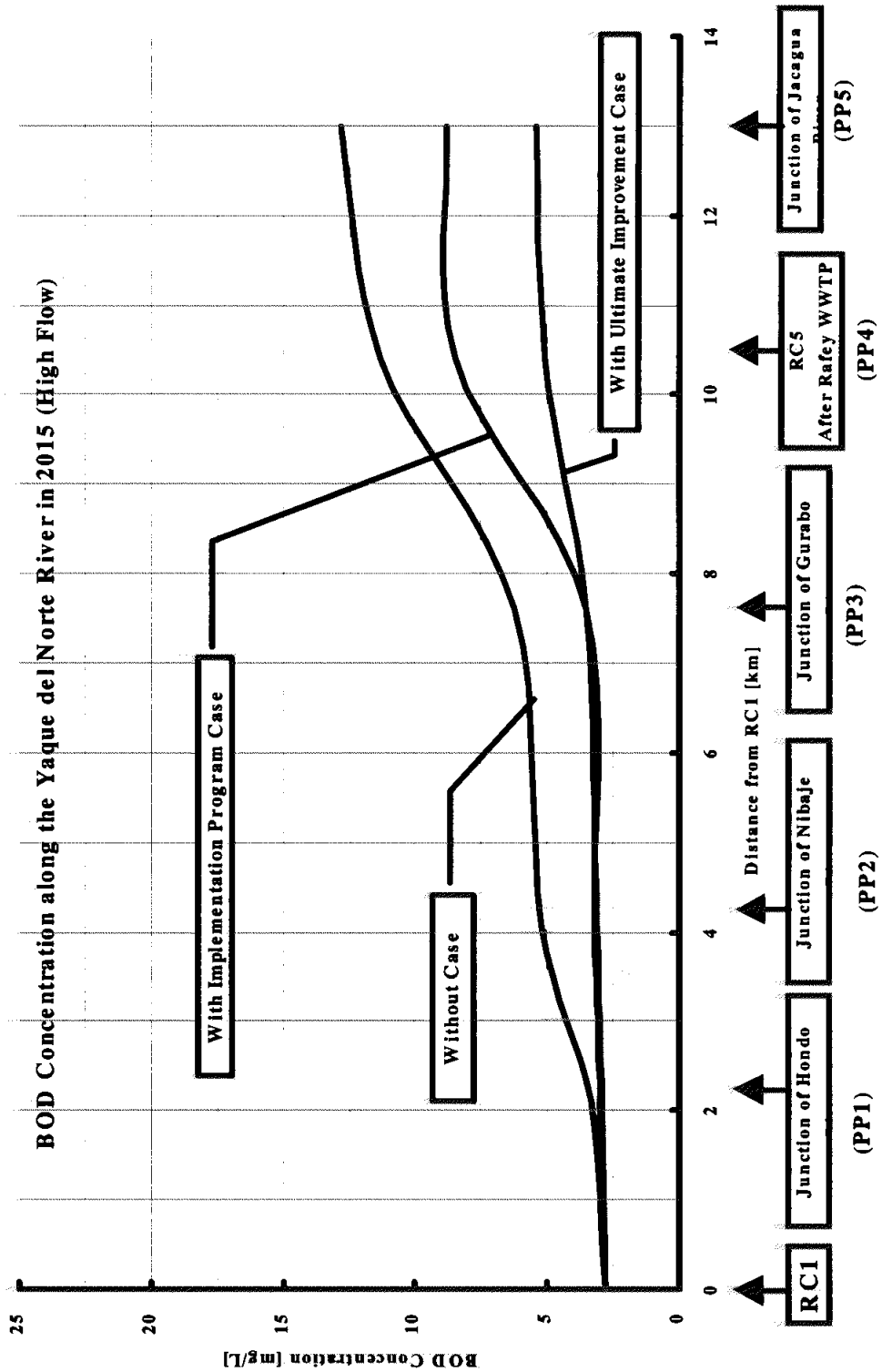




THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO	Figura A11.8 Carga de DBO Descargada al Río Yaque del Norte
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	



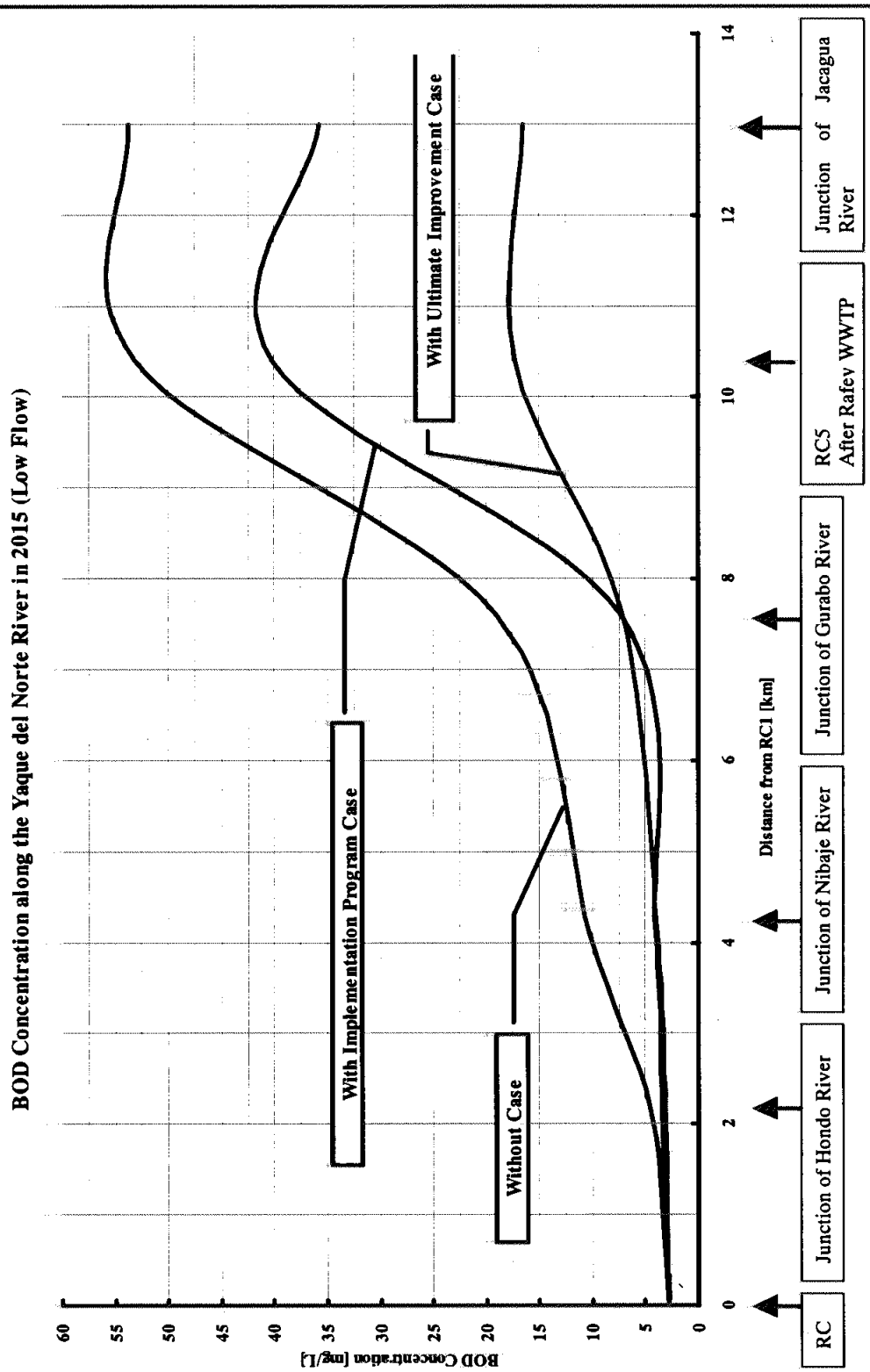
THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO	FigureA11-9.
JAPAN INTERNATIONAL COOPERATION AGENCY	BOD Concentration along the Yaque del Norte River in 2015(Average Flow)



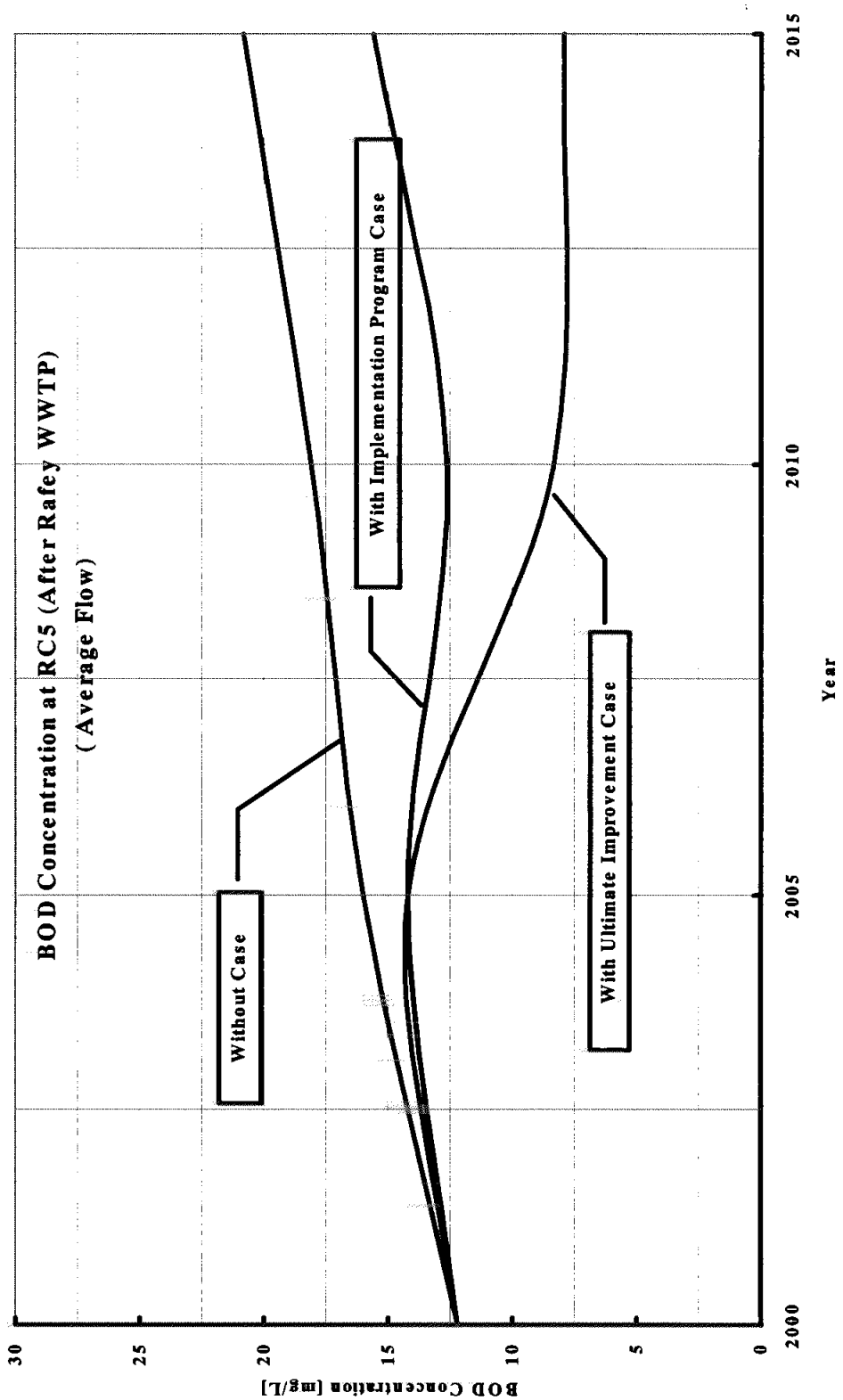
THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO

JAPAN INTERNATIONAL COOPERATION AGENCY

Figura A11.10
Concentración de DBO
a lo largo del Río Yaque
del Norte en 2015
(Caudal Alto)



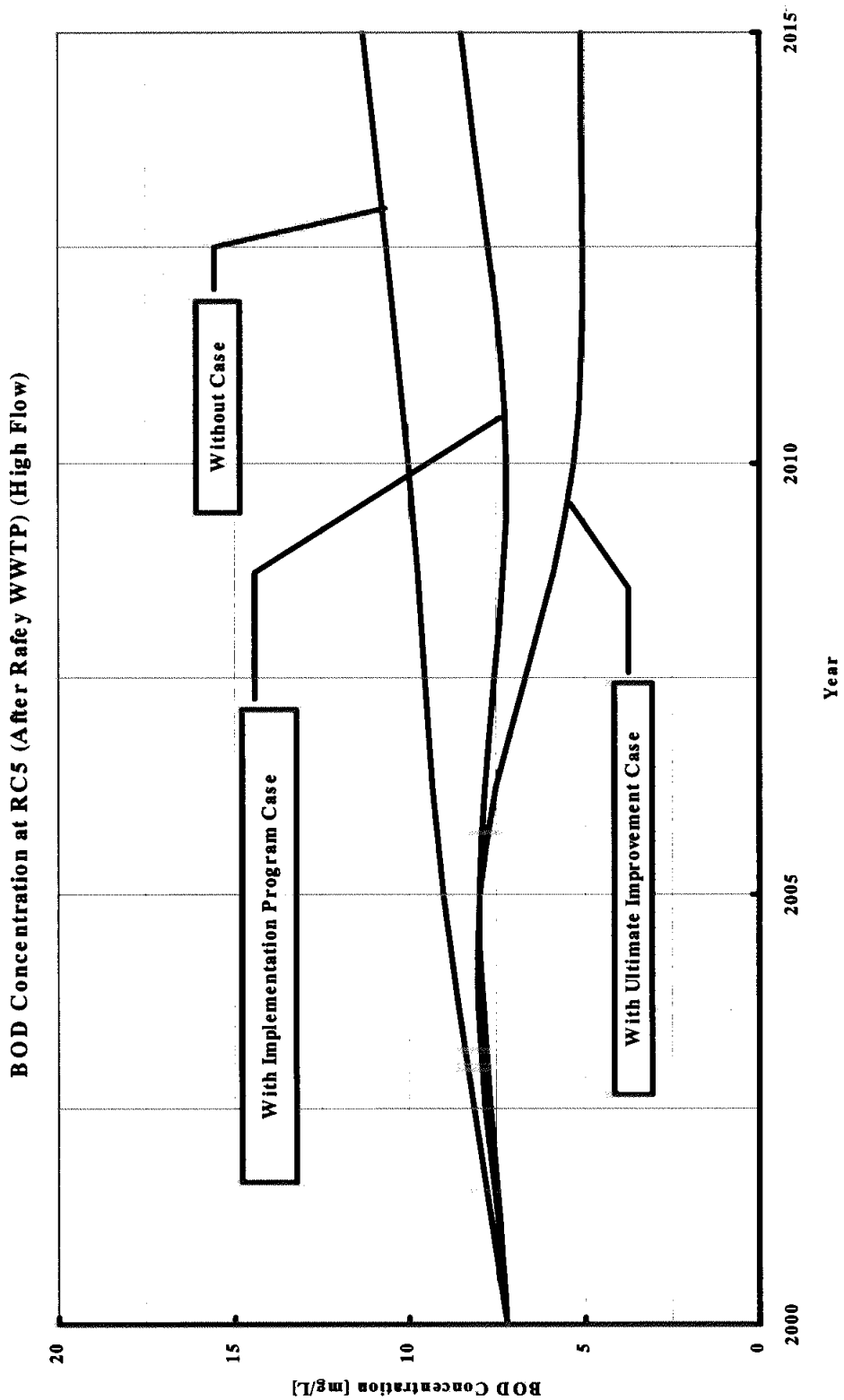
THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO	Figura A11.11 Concentración de DBO a lo largo del Río Yaque del Norte en 2015 (Caudal Bajo)
JAPAN INTERNATIONAL COOPERATION AGENCY	



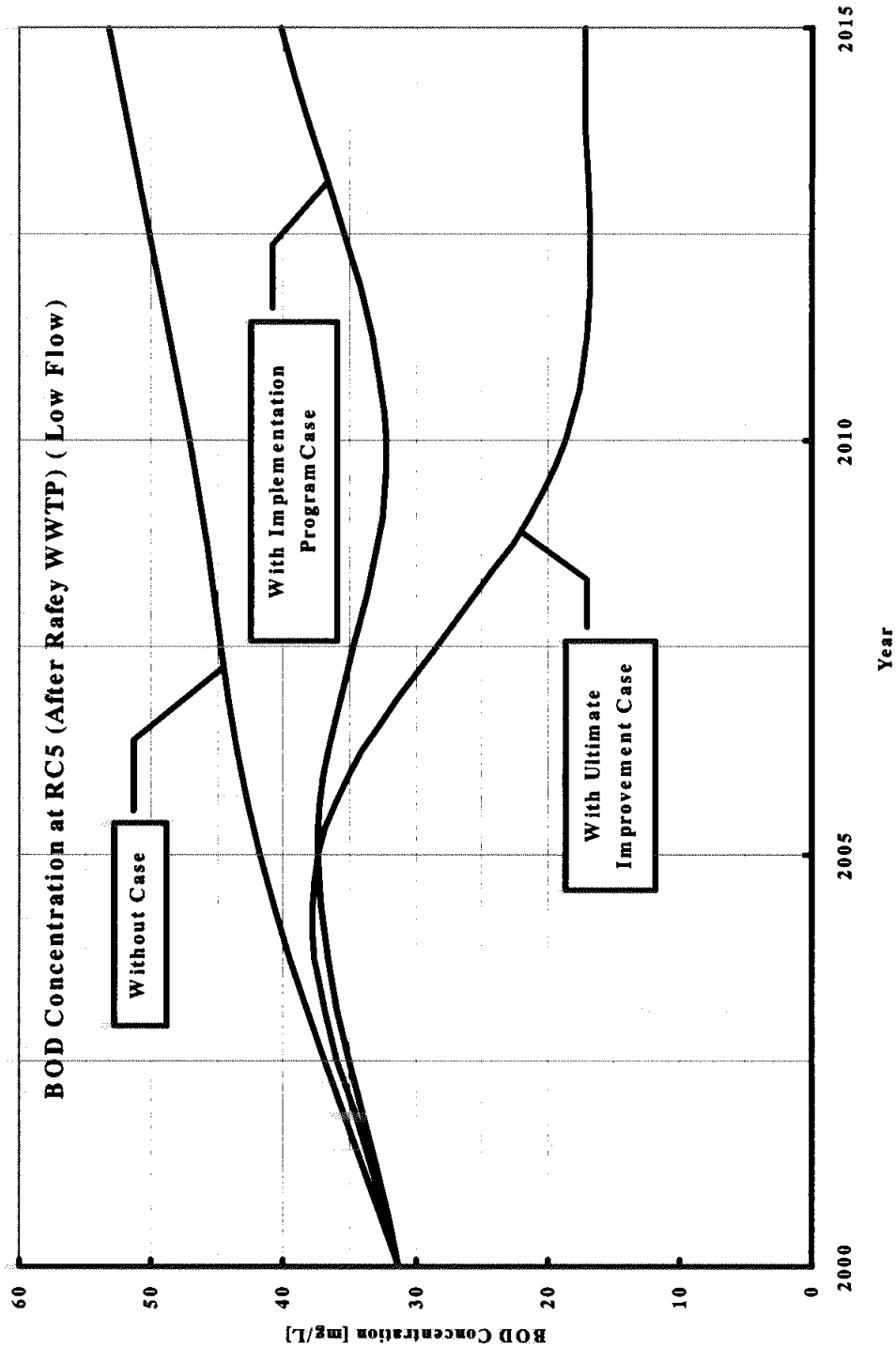
THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO

JAPAN INTERNATIONAL COOPERATION AGENCY

Figura A11.12
Concentración de DBO en RC5 (Después de WWTP Rafey) (Caudal Promedio)



THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO	Figura A11.13 Concentración de DBO en RC5 (Después de WWTP Rafey) (Caudal Alto)
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE STUDY ON THE IMPROVEMENT OF SEWERAGE SYSTEM AND ENVIRONMENT IN THE CITY OF SANTIAGO

JAPAN INTERNATIONAL COOPERATION AGENCY

Figura A11.14
Concentración de DBO
en RC5 (Después de WWTP
Rafey) (Caudal Bajo)