This document contains the appendices from the 2004 Holland America Veendam Sampling Episode Report for sampling episode 6503. The report and all the appendices can be downloaded from
http://www.epa.gov/owow/oceans/cruise_ships/veendam.html

Holland America Veendam

Sampling Episode Report

Appendices A, B, C, D and E

March 2006

Appendix A

ANALYTICAL RESULTS

Appendix A-1

Pathogen Indicator Sample Numbers and Sample Collection Times
Holland America Veendam

Sampling Point (SP)	Approximate Sample Collection Time	Sample Numbers				
		6/20/04 - 6/21/04	6/21/04 - 6/22/04	6/22/04 - 6/23/04	6/23/04 - 6/24/04	6/24/04 - 6/25/04
		Day 1	Day 2	Day 3	Day 4	Day 5
Laundry Wastewater (SP-1)	2300				65205	
Accommodations Wastewater (SP-3)	1330				65207	
Food Pulper Wastewater (SP-4)	0745 1447			65211 65212		
Galley Wastewater (SP-5)	1200		65215			
Influent to Wastewater Treatment System (SP-6)	0650 1515 2200 0315	65219 65220 65221 65222	65223 65224 65225	65227 65228	65231 65232 65234	65235 65236 65237
Influent to Wastewater Treatment System Duplicate (SP-7)	1515		65310			
Influent to UV Disinfection (SP-8)	0700 1500 2200 0315	65241 65242 65243 65244	65245 65246 65247	65249 62450	65253 65254 65256	65257 65258 65259

Appendix A-1
(continued)
Pathogen Indicator Sample Numbers and Sample Collection Times
Holland America Veendam

Sampling Point (SP)	Approximate Sample Collection Time	Sample Numbers				
		6/20/04 - 6/21/04	6/21/04 - 6/22/04	6/22/04 - 6/23/04	6/23/04 - 6/24/04	6/24/04 - 6/25/04
		Day 1	Day 2	Day 3	Day 4	Day 5
Influent to UV Disinfection Duplicate (SP-8)	2200					65304
Effluent from Wastewater Treatment System (SP-9)	0630 1500 2200 0330	65261 65262 65263 65264	65265 65266 65267	65269 65270	65273 65274 65276	65277 65278 65279
Effluent from Wastewater Treatment System Duplicate (SP-10)	0630 1500 2200 0330	65281 65302	65283 65303		65287 65288 65311	65289 65305
Screening Solids (SP-11)	1500	65291				
Source Water (SP-15)	0600	65295	65296	65297	65298	65299

Appendix A-1
(continued)
Pathogen Indicators Analytical Results
Holland America Veendam

SP-1, Laundry Wastewater Characterization	**Grab 1**				**Unit**
Day 4	**65205**				
Pathogen Indicators					
E. coli	ND(10.0)				MPN/100 mL
Enterococci	ND(10.0)				MPN/100 mL
Fecal Coliform	ND(1,000)				CFU/100 mL

SP-3, Accommodations Wastewater Characterization	**Grab 1**				**Unit**
Day 4	**65207**				
Pathogen Indicators					
E. coli	520				MPN/100 mL
Enterococci	510				MPN/100 mL
Fecal Coliform	7,730,000				CFU/100 mL

SP-4, Food Pulper Wastewater Characterization	**Grab 1**	**Grab 2**			**Unit**
Day 3	**65211**	**65212**			
Pathogen Indicators					
E. coli	2,420,000	17,300			MPN/100 mL
Enterococci	28,800	10,400			MPN/100 mL
Fecal Coliform	130,000	29,000			CFU/100 mL

SP-5, Galley Wastewater Characterization	**Grab 1**				**Unit**
Day 2	**65215**				
Pathogen Indicators					
E. coli	77,600				MPN/100 mL
Enterococci	750				MPN/100 mL
Fecal Coliform	1,300,000				CFU/100 mL

SP-6, Influent to Wastewater Treatment System	**Grab 1**	**Grab 2**	**Grab 3**	**Grab 4**	**Unit**
Day 1	**65219**	**65220**	**65221**	**65222**	
Pathogen Indicators					
E. coli	> 242,000	> 2,420,000	> 2,420,000	411,000	MPN/100 mL
Enterococci	> 242,000	276,000	> 2,420,000	63,100	MPN/100 mL
Fecal Coliform	20,700,000	3,200,000	8,700,000	940,000	CFU/100 mL

SP-6, Influent to Wastewater Treatment System	**Grab 1**	**Grab 2**	**Grab 3**		**Unit**
Day 2	**65223**	**65224**	**65225**		
Pathogen Indicators					
E. coli	488,000	> 2,420,000	> 24,200,000		MPN/100 mL
Enterococci	2,690	> 2,420,000	2,010,000		MPN/100 mL
Fecal Coliform	3,700,000	14,500,000	20,000,000		CFU/100 mL

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Appendix A-1
(continued)
Pathogen Indicators Analytical Results
Holland America Veendam

SP-6, Influent to Wastewater Treatment System Day 3	Grab 1 65227	Grab 2 65228			Unit
Pathogen Indicators					
E. coli	2,010,000	14,000,000			MPN/100 mL
Enterococci	2,010,000	7,890,000			MPN/100 mL
Fecal Coliform	23,000,000	119,000,000			CFU/100 mL

SP-6, Influent to Wastewater Treatment System Day 4	Grab 1 65231	Grab 2 65232	Grab 3 65234		Unit
Pathogen Indicators					
E. coli	10,100,000	613,000	8,160,000		MPN/100 mL
Enterococci	2,280,000	83,000	1,660,000		MPN/100 mL
Fecal Coliform	194,000,000	490,000	10,400,000		CFU/100 mL

SP-6, Influent to Wastewater Treatment System Day 5	Grab 1 65235	Grab 2 65236	Grab 3 65237		Unit
Pathogen Indicators					
E. coli	5,790,000	2,010,000	9,800,000		MPN/100 mL
Enterococci	866,000	983,000	6,870,000		MPN/100 mL
Fecal Coliform	2,600,000	3,400,000	14,900,000		CFU/100 mL

SP-7, Duplicate of Influent to Wastewater Treatment System Day 2		Grab 2 65310			Unit
Pathogen Indicators					
E. coli		75,900			MPN/100 mL
Enterococci		201,000			MPN/100 mL
Fecal Coliform		3,600,000			CFU/100 mL

SP-8, Influent to UV Disinfection Day 1	Grab 1 65241	Grab 2 65242	Grab 3 65243	Grab 4 65244	Unit
Pathogen Indicators					
E. coli	67.0	10.7	291	22.8	MPN/100 mL
Enterococci	80.1	18.1	41.7	8.10	MPN/100 mL
Fecal Coliform	49.0	9.00	330	12.0	CFU/100 mL

SP-8, Influent to UV Disinfection Day 2	Grab 1 65245	Grab 2 65246	Grab 3 65247		Unit
Pathogen Indicators					
E. coli	15.8	3.10	3.10		MPN/100 mL
Enterococci	6.30	NC	12.2		MPN/100 mL
Fecal Coliform	13.0	4.00	19.0		CFU/100 mL

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Appendix A-1
(continued)
Pathogen Indicators Analytical Results
Holland America Veendam

SP-8, Influent to UV Disinfection **Day 3**	**Grab 1** **65249**	**Grab 2** **65250**			**Unit**
Pathogen Indicators					
E. coli	ND(1.00)	2.00			MPN/100 mL
Enterococci	2.00	3.00			MPN/100 mL
Fecal Coliform	5.00	7.00			CFU/100 mL

SP-8, Influent to UV Disinfection **Day 4**	**Grab 1** **65253**	**Grab 2** **65254**	**Grab 3** **65256**		**Unit**
Pathogen Indicators					
E. coli	ND(1.05)	ND(1.00)	1.00		MPN/100 mL
Enterococci	70.0	13.1	79.4		MPN/100 mL
Fecal Coliform	6.40	ND(1.00)	4.00		CFU/100 mL

SP-8, Influent to UV Disinfection **Day 5**	**Grab 1** **65257**	**Grab 2** **65258**	**Grab 3** **65259**		**Unit**
Pathogen Indicators					
E. coli	3.00	50.4	75.4		MPN/100 mL
Enterococci	47.5	66.9	60.8		MPN/100 mL
Fecal Coliform	ND(1.00)	25.0	18.2		CFU/100 mL

SP-8, Duplicate of Influent to UV Disinfection **Day 5**			**Grab 3** **65304**		**Unit**
Pathogen Indicators					
E. coli			77.1		MPN/100 mL
Enterococci			35.4		MPN/100 mL
Fecal Coliform			8.18		CFU/100 mL

SP-9, Effluent from Wastewater Treatment **Day 1**	**Grab 1** **65261**	**Grab 2** **65262**	**Grab 3** **65263**	**Grab 4** **65264**	**Unit**
Pathogen Indicators					
E. coli	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	MPN/100 mL
Enterococci	ND(1.00)	Excluded	ND(1.00)	ND(1.00)	MPN/100 mL
Fecal Coliform	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	CFU/100 mL

SP-9, Effluent from Wastewater Treatment **Day 2**	**Grab 1** **65265**	**Grab 2** **65266**	**Grab 3** **65267**		**Unit**
Pathogen Indicators					
E. coli	ND(1.00)	ND(1.00)	ND(1.00)		MPN/100 mL
Enterococci	ND(1.00)	ND(1.00)	ND(1.00)		MPN/100 mL
Fecal Coliform	ND(1.00)	ND(1.00)	ND(1.00)		CFU/100 mL

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Appendix A-1
(continued)
Pathogen Indicators Analytical Results
Holland America Veendam

SP-9, Effluent from Wastewater Treatment	**Grab 1**	**Grab 2**			**Unit**
Day 3	**65269**	**65270**			
Pathogen Indicators					
E. coli	ND(1.00)	ND(1.00)			MPN/100 mL
Enterococci	ND(1.00)	ND(1.00)			MPN/100 mL
Fecal Coliform	ND(1.00)	ND(1.00)			CFU/100 mL

SP-9, Effluent from Wastewater Treatment	**Grab 1**	**Grab 2**	**Grab 3**		**Unit**
Day 4	**65273**	**65274**	**65276**		
Pathogen Indicators					
E. coli	ND(1.00)	ND(1.00)	ND(1.00)		MPN/100 mL
Enterococci	ND(1.00)	5.10	1.00		MPN/100 mL
Fecal Coliform	ND(1.00)	ND(1.00)	ND(1.00)		CFU/100 mL

SP-9, Effluent from Wastewater Treatment	**Grab 1**	**Grab 2**	**Grab 3**		**Unit**
Day 5	**65277**	**65278**	**65279**		
Pathogen Indicators					
E. coli	ND(1.00)	ND(1.00)	ND(1.00)		MPN/100 mL
Enterococci	ND(1.00)	ND(1.00)	ND(1.00)		MPN/100 mL
Fecal Coliform	ND(1.00)	ND(1.00)	ND(1.00)		CFU/100 mL

SP-10, Duplicate of Effluent from Wastewater Treatment System	**Grab 1**				**Unit**
Day 1	**65281**				
Pathogen Indicators					
E. coli	ND(1.00)				MPN/100 mL
Enterococci	ND(1.00)				MPN/100 mL
Fecal Coliform	ND(1.00)				CFU/100 mL

SP-10, Duplicate of Effluent from Wastewater Treatment System				**Grab 4**	**Unit**
Day 1				**65302**	
Pathogen Indicators					
E. coli				ND(1.00)	MPN/100 mL
Enterococci				ND(1.00)	MPN/100 mL
Fecal Coliform				ND(1.00)	CFU/100 mL

SP-10, Duplicate of Effluent from Wastewater Treatment System	**Grab 1**				**Unit**
Day 2	**65283**				
Pathogen Indicators					
E. coli	ND(1.00)				MPN/100 mL
Enterococci	ND(1.00)				MPN/100 mL
Fecal Coliform	ND(1.00)				CFU/100 mL

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Appendix A-1
(continued)
Pathogen Indicators Analytical Results
Holland America Veendam

SP-10, Duplicate of Effluent from Wastewater Treatment System			**Grab 3**	**Unit**
Day 2			**65303**	
Pathogen Indicators				
E. coli			ND(1.00)	MPN/100 mL
Enterococci			ND(1.00)	MPN/100 mL
Fecal Coliform			ND(1.00)	CFU/100 mL

SP-10, Duplicate of Effluent from Wastewater Treatment System	**Grab 1**	**Grab 2**		**Unit**
Day 4	**65287**	**65288**		
Pathogen Indicators				
E. coli	ND(1.00)	ND(1.00)		MPN/100 mL
Enterococci	ND(1.00)	ND(1.00)		MPN/100 mL
Fecal Coliform	ND(1.00)	ND(1.00)		CFU/100 mL

SP-10, Duplicate of Effluent from Wastewater Treatment System			**Grab 3**	**Unit**
Day 4			**65311**	
Pathogen Indicators				
E. coli			ND(1.00)	MPN/100 mL
Enterococci			1.00	MPN/100 mL
Fecal Coliform			ND(1.00)	CFU/100 mL

SP-10, Duplicate of Effluent from Wastewater Treatment System	**Grab 1**			**Unit**
Day 5	**65289**			
Pathogen Indicators				
E. coli	ND(1.00)			MPN/100 mL
Enterococci	ND(1.00)			MPN/100 mL
Fecal Coliform	ND(1.00)			CFU/100 mL

SP-10, Duplicate of Effluent from Wastewater Treatment System			**Grab 3**	**Unit**
Day 5			**65305**	
Pathogen Indicators				
E. coli			ND(1.00)	MPN/100 mL
Enterococci			ND(1.00)	MPN/100 mL
Fecal Coliform			ND(1.00)	CFU/100 mL

SP-15, Source Water	**Grab 1**			**Unit**
Day 1	**65295**			
Pathogen Indicators				
E. coli	ND(1.00)			MPN/100 mL
Enterococci	ND(1.00)			MPN/100 mL
Fecal Coliform	ND(1.00)			CFU/100 mL

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Appendix A-1
(continued)
Pathogen Indicators Analytical Results
Holland America Veendam

SP-15, Source Water **Day 2**	**Grab 1** **65296**	**Unit**
Pathogen Indicators		
E. coli	ND(1.00)	MPN/100 mL
Enterococci	ND(1.00)	MPN/100 mL
Fecal Coliform	ND(1.00)	CFU/100 mL
SP-15, Source Water **Day 3**	**Grab 1** **65297**	**Unit**
Pathogen Indicators		
E. coli	ND(1.00)	MPN/100 mL
Enterococci	ND(1.00)	MPN/100 mL
Fecal Coliform	ND(1.00)	CFU/100 mL
SP-15, Source Water **Day 4**	**Grab 1** **65298**	**Unit**
Pathogen Indicators		
E. coli	ND(1.00)	MPN/100 mL
Enterococci	ND(1.00)	MPN/100 mL
Fecal Coliform	ND(1.00)	CFU/100 mL
SP-15, Source Water **Day 5**	**Grab 1** **65299**	**Unit**
Pathogen Indicators		
E. coli	ND(1.00)	MPN/100 mL
Enterococci	ND(1.00)	MPN/100 mL
Fecal Coliform	ND(1.00)	CFU/100 mL

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Appendix A-2

Sample Numbers, Except for Pathogen Indicators
Holland America Veendam

	Sample Numbers				
	6/20/04 - 6/21/04	6/21/04 - 6/22/04	6/22/04 - 6/23/04	6/23/04 - 6/24/04	6/24/04 - 6/25/04
Sampling Point (SP)	Day 1	Day 2	Day 3	Day 4	Day 5
Laundry Wastewater (SP-1)				65202	
Laundry Graywater (SP-2)				65206	
Accommodations Wastewater (SP-3)				65207	
Food Pulper Wastewater (SP-4)			65211		
Galley Wastewater (SP-5)		65215			
Influent to Wastewater Treatment System (SP-6)	65219	65223	65227	65231	65235
Influent to Wastewater Treatment System Duplicate (SP-7)		65239	65240 65228	65232	
Effluent from Wastewater Treatment System (SP-9)	65261	65265	65269	65273	65277
Effluent from Wastewater Treatment System Duplicate (SP-10)	65281	65283	65285 65270	65287 65274	65289 65278
Screening Solids (SP-11)	65291				

Appendix A-2
(continued)
Sample Numbers, Except for Pathogen Indicators
Holland America Veendam

Sampling Point (SP)	Sample Numbers				
	6/20/04 - 6/21/04	6/21/04 - 6/22/04	6/22/04 - 6/23/04	6/23/04 - 6/24/04	6/24/04 - 6/25/04
	Day 1	Day 2	Day 3	Day 4	Day 5
Waste Biosludge (SP-12)		65292			
Incinerator Ash (SP-13)	65293				
Incinerator Ash Duplicate (SP-14)	65294				
Source Water (SP-15)	65295				
Trip Blank (SP-16)				65300	
Equipment Blank (SP-17)				65301	

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-1, Laundry Wastewater Characterization	Day 4 65202	Unit
Classical Pollutants		
Alkalinity	130	mg/L
Ammonia As Nitrogen (NH3-N)	0.360	mg/L
Available Cyanide	ND(2.00)	ug/L
Biochemical Oxygen Demand (BOD)	63.6	mg/L
Chemical Oxygen Demand (COD)	170	mg/L
Chloride	10.0	mg/L
Hardness	8.45	mg/L
Hexane Extractable Material (HEM)	20.0	mg/L
Nitrate/Nitrite (NO2 + NO3-N)	0.100	mg/L
Settleable residue	ND(0.110)	mL/L
Silica Gel Treated HEM (SGT-HEM)	ND(6.00)	mg/L
Sulfate	13.0	mg/L
P121 Total Cyanide	ND(0.00500)	mg/L
Total Dissolved Solids (TDS)	222	mg/L
Total Kjeldahl Nitrogen (TKN)	3.00	mg/L
Total Organic Carbon (TOC)	49.0	mg/L
Total Phosphorus	1.00	mg/L
Total Suspended Solids (TSS)	32.0	mg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-1, Laundry Wastewater Characterization		**65202**	
Total and Dissolved Metals			
	Aluminum	118	ug/L
P114	Antimony	ND(5.97)	ug/L
P115	Arsenic	ND(2.32)	ug/L
	Barium	14.7	ug/L
P117	Beryllium	ND(0.0540)	ug/L
	Boron	ND(3.37)	ug/L
P118	Cadmium	ND(0.446)	ug/L
	Calcium	2,520	ug/L
P119	Chromium	ND(1.68)	ug/L
	Cobalt	ND(0.914)	ug/L
P120	Copper	258	ug/L
	Iron	229	ug/L
P122	Lead	8.90	ug/L
	Magnesium	525	ug/L
	Manganese	6.50	ug/L
P123	Mercury	ND(0.0170)	ug/L
	Molybdenum	ND(1.50)	ug/L
P124	Nickel	10.7	ug/L
P125	Selenium	0.960	ug/L
P126	Silver	ND(1.28)	ug/L
	Sodium	63,700	ug/L
P127	Thallium	ND(0.00900)	ug/L
	Tin	ND(3.45)	ug/L
	Titanium	1.20	ug/L
	Vanadium	ND(0.679)	ug/L
	Yttrium	ND(0.222)	ug/L
P128	Zinc	303	ug/L
	Aluminum, Dissolved	63.3	ug/L
P114	Antimony, Dissolved	ND(5.97)	ug/L
P115	Arsenic, Dissolved	ND(2.32)	ug/L
	Barium, Dissolved	3.00	ug/L
P117	Beryllium, Dissolved	ND(0.0540)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-1, Laundry Wastewater Characterization		**65202**	
Total and Dissolved Metals			
	Boron, Dissolved	ND(3.37)	ug/L
P118	Cadmium, Dissolved	ND(0.446)	ug/L
	Calcium, Dissolved	1,970	ug/L
P119	Chromium, Dissolved	ND(1.68)	ug/L
	Cobalt, Dissolved	1.50	ug/L
P120	Copper, Dissolved	182	ug/L
	Iron, Dissolved	72.8	ug/L
P122	Lead, Dissolved	5.90	ug/L
	Magnesium, Dissolved	437	ug/L
	Manganese, Dissolved	5.80	ug/L
P123	Mercury, Dissolved	0.180	ug/L
	Molybdenum, Dissolved	ND(1.50)	ug/L
P124	Nickel, Dissolved	7.30	ug/L
P125	Selenium, Dissolved	ND(0.572)	ug/L
P126	Silver, Dissolved	ND(1.28)	ug/L
	Sodium, Dissolved	59,900	ug/L
P127	Thallium, Dissolved	0.0200	ug/L
	Tin, Dissolved	ND(3.45)	ug/L
	Titanium, Dissolved	1.70	ug/L
	Vanadium, Dissolved	1.20	ug/L
	Yttrium, Dissolved	ND(0.222)	ug/L
P128	Zinc, Dissolved	178	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-1, Laundry Wastewater Characterization		**65202**	
Volatile and Semivolatile Organics			
P011	1,1,1-Trichloroethane	ND(10.0)	ug/L
P015	1,1,2,2-Tetrachloroethane	ND(10.0)	ug/L
P014	1,1,2-Trichloroethane	ND(10.0)	ug/L
P013	1,1-Dichloroethane	ND(10.0)	ug/L
P029	1,1-Dichloroethene	ND(10.0)	ug/L
P008	1,2,4-Trichlorobenzene	ND(10.0)	ug/L
P025	1,2-Dichlorobenzene	ND(10.0)	ug/L
P010	1,2-Dichloroethane	ND(10.0)	ug/L
P032	1,2-Dichloropropane	ND(10.0)	ug/L
P026	1,3-Dichlorobenzene	ND(10.0)	ug/L
P027	1,4-Dichlorobenzene	ND(10.0)	ug/L
P021	2,4,6-Trichlorophenol	ND(10.0)	ug/L
P031	2,4-Dichlorophenol	ND(10.0)	ug/L
P034	2,4-Dimethylphenol	ND(10.0)	ug/L
P059	2,4-Dinitrophenol	ND(50.0)	ug/L
P035	2,4-Dinitrotoluene	ND(10.0)	ug/L
P036	2,6-Dinitrotoluene	ND(10.0)	ug/L
P019	2-Chloroethylvinyl Ether	ND(50.0)	ug/L
P020	2-Chloronaphthalene	ND(10.0)	ug/L
P024	2-Chlorophenol	ND(10.0)	ug/L
P057	2-Nitrophenol	ND(20.0)	ug/L
P028	3,3'-Dichlorobenzidine	ND(50.0)	ug/L
	4,6-Dinitro-2-methylphenol	ND(20.0)	ug/L
	4-Bromophenyl-phenylether	ND(10.0)	ug/L
P022	4-Chloro-3-methylphenol	ND(10.0)	ug/L
	4-Chlorophenyl-phenylether	ND(10.0)	ug/L
P058	4-Nitrophenol	ND(50.0)	ug/L
P001	Acenaphthene	ND(10.0)	ug/L
P077	Acenaphthylene	ND(10.0)	ug/L
P078	Anthracene	ND(10.0)	ug/L
P004	Benzene	ND(10.0)	ug/L
P005	Benzidine	ND(50.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-1, Laundry Wastewater Characterization		**65202**	
Volatile and Semivolatile Organics			
P072	Benzo(a)anthracene	ND(10.0)	ug/L
P073	Benzo(a)pyrene	ND(10.0)	ug/L
P074	Benzo(b)fluoranthene	ND(10.0)	ug/L
	Benzo(g,h,i)perylene	ND(20.0)	ug/L
P075	Benzo(k)fluoranthene	ND(10.0)	ug/L
P043	Bis(2-chloroethoxy)methane	ND(10.0)	ug/L
	bis(-2-Chloroethyl)ether	ND(10.0)	ug/L
P042	Bis(2-chloroisopropyl) Ether	ND(10.0)	ug/L
P066	Bis(2-ethylhexyl) Phthalate	29.1	ug/L
P048	Bromodichloromethane	ND(10.0)	ug/L
	Bromoform	ND(10.0)	ug/L
P046	Bromomethane	ND(10.0)	ug/L
P067	Butyl Benzyl Phthalate	ND(10.0)	ug/L
	Carbon tetrachloride	ND(10.0)	ug/L
P007	Chlorobenzene	ND(10.0)	ug/L
P016	Chloroethane	ND(10.0)	ug/L
P023	Chloroform	ND(10.0)	ug/L
P045	Chloromethane	ND(10.0)	ug/L
P076	Chrysene	ND(10.0)	ug/L
	cis-1,3-Dichloropropene	ND(10.0)	ug/L
	Dibenz(a,h)anthracene	ND(20.0)	ug/L
P051	Dibromochloromethane	ND(10.0)	ug/L
P070	Diethyl Phthalate	ND(10.0)	ug/L
P071	Dimethyl Phthalate	ND(10.0)	ug/L
P068	Di-n-butyl Phthalate	ND(10.0)	ug/L
P069	Di-n-octyl Phthalate	ND(10.0)	ug/L
P038	Ethylbenzene	ND(10.0)	ug/L
P039	Fluoranthene	ND(10.0)	ug/L
P080	Fluorene	ND(10.0)	ug/L
P009	Hexachlorobenzene	ND(10.0)	ug/L
P052	Hexachlorobutadiene	ND(10.0)	ug/L
P053	Hexachlorocyclopentadiene	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-1, Laundry Wastewater Characterization		**65202**	
Volatile and Semivolatile Organics			
P012	Hexachloroethane	ND(10.0)	ug/L
P083	Indeno(1,2,3-cd)pyrene	ND(20.0)	ug/L
P054	Isophorone	ND(10.0)	ug/L
P044	Methylene Chloride	ND(10.0)	ug/L
P055	Naphthalene	ND(10.0)	ug/L
P056	Nitrobenzene	ND(10.0)	ug/L
P061	N-Nitrosodimethylamine	ND(50.0)	ug/L
	N-Nitroso-di-n-propylamine	ND(20.0)	ug/L
P062	N-Nitrosodiphenylamine	ND(20.0)	ug/L
P064	Pentachlorophenol	ND(50.0)	ug/L
P081	Phenanthrene	ND(10.0)	ug/L
P065	Phenol	ND(10.0)	ug/L
P084	Pyrene	ND(10.0)	ug/L
P085	Tetrachloroethene	ND(10.0)	ug/L
P086	Toluene	ND(10.0)	ug/L
P030	trans-1,2-Dichloroethene	ND(10.0)	ug/L
P033	trans-1,3-Dichloropropene	ND(10.0)	ug/L
P087	Trichloroethene	ND(10.0)	ug/L
	Trichlorofluoromethane	ND(10.0)	ug/L
P088	Vinyl Chloride	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-1, Laundry Wastewater Characterization	Day 4 65202	Unit
Dioxins and Furans		
1,2,3,4,6,7,8-HpCDD	ND(53.7)	pg/L
1,2,3,4,6,7,8-HpCDF	ND(53.7)	pg/L
1,2,3,4,7,8,9-HpCDF	ND(53.7)	pg/L
1,2,3,4,7,8-HxCDD	ND(53.7)	pg/L
1,2,3,4,7,8-HxCDF	ND(53.7)	pg/L
1,2,3,6,7,8-HxCDD	ND(53.7)	pg/L
1,2,3,6,7,8-HxCDF	ND(53.7)	pg/L
1,2,3,7,8,9-HxCDD	ND(53.7)	pg/L
1,2,3,7,8,9-HxCDF	ND(53.7)	pg/L
1,2,3,7,8-PeCDD	ND(53.7)	pg/L
1,2,3,7,8-PeCDF	ND(53.7)	pg/L
2,3,4,6,7,8-HxCDF	ND(53.7)	pg/L
2,3,4,7,8-PeCDF	ND(53.7)	pg/L
2,3,7,8-TCDD	ND(10.7)	pg/L
2,3,7,8-TCDF	ND(10.7)	pg/L
Octachlorodibenzo-p-dioxin	ND(107)	pg/L
Octachlorodibenzofuran	ND(107)	pg/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-2, Duplicate of Laundry Wastewater Characterization	Day 4 65206	Unit
Dioxins and Furans		
1,2,3,4,6,7,8-HpCDD	ND(55.3)	pg/L
1,2,3,4,6,7,8-HpCDF	ND(55.3)	pg/L
1,2,3,4,7,8,9-HpCDF	ND(55.3)	pg/L
1,2,3,4,7,8-HxCDD	ND(55.3)	pg/L
1,2,3,4,7,8-HxCDF	ND(55.3)	pg/L
1,2,3,6,7,8-HxCDD	ND(55.3)	pg/L
1,2,3,6,7,8-HxCDF	ND(55.3)	pg/L
1,2,3,7,8,9-HxCDD	ND(55.3)	pg/L
1,2,3,7,8,9-HxCDF	ND(55.3)	pg/L
1,2,3,7,8-PeCDD	ND(55.3)	pg/L
1,2,3,7,8-PeCDF	ND(55.3)	pg/L
2,3,4,6,7,8-HxCDF	ND(55.3)	pg/L
2,3,4,7,8-PeCDF	ND(55.3)	pg/L
2,3,7,8-TCDD	ND(11.1)	pg/L
2,3,7,8-TCDF	ND(11.1)	pg/L
Octachlorodibenzo-p-dioxin	ND(111)	pg/L
Octachlorodibenzofuran	ND(111)	pg/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-3, Accommodations Wastewater Characterization		**65207**	
Classical Pollutants			
	Alkalinity	48.0	mg/L
	Ammonia As Nitrogen (NH3-N)	1.00	mg/L
	Available Cyanide	15.7	ug/L
	Biochemical Oxygen Demand (BOD)	391	mg/L
	Chemical Oxygen Demand (COD)	541	mg/L
	Chloride	38.0	mg/L
	Hardness	54.3	mg/L
	Hexane Extractable Material (HEM)	52.0	mg/L
	Nitrate/Nitrite (NO2 + NO3-N)	ND(0.0500)	mg/L
	Settleable residue	2.10	mL/L
	Silica Gel Treated HEM (SGT-HEM)	ND(7.00)	mg/L
	Sulfate	17.0	mg/L
P121	Total Cyanide	ND(0.00500)	mg/L
	Total Dissolved Solids (TDS)	242	mg/L
	Total Kjeldahl Nitrogen (TKN)	12.0	mg/L
	Total Organic Carbon (TOC)	144	mg/L
	Total Phosphorus	3.00	mg/L
	Total Suspended Solids (TSS)	254	mg/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-3, Accommodations Wastewater Characterization		**65207**	
Total and Dissolved Metals			
	Aluminum	745	ug/L
P114	Antimony	ND(5.97)	ug/L
P115	Arsenic	ND(2.32)	ug/L
	Barium	89.3	ug/L
P117	Beryllium	ND(0.0540)	ug/L
	Boron	55.5	ug/L
P118	Cadmium	ND(0.446)	ug/L
	Calcium	18,200	ug/L
P119	Chromium	6.50	ug/L
	Cobalt	ND(0.914)	ug/L
P120	Copper	975	ug/L
	Iron	5,730	ug/L
P122	Lead	50.2	ug/L
	Magnesium	2,160	ug/L
	Manganese	75.0	ug/L
P123	Mercury	0.330	ug/L
	Molybdenum	ND(1.50)	ug/L
P124	Nickel	29.4	ug/L
P125	Selenium	0.820	ug/L
P126	Silver	ND(1.28)	ug/L
	Sodium	30,100	ug/L
P127	Thallium	ND(0.00900)	ug/L
	Tin	4.50	ug/L
	Titanium	6.00	ug/L
	Vanadium	6.20	ug/L
	Yttrium	ND(0.222)	ug/L
P128	Zinc	1,500	ug/L
	Aluminum, Dissolved	268	ug/L
P114	Antimony, Dissolved	ND(5.97)	ug/L
P115	Arsenic, Dissolved	ND(2.32)	ug/L
	Barium, Dissolved	51.4	ug/L
P117	Beryllium, Dissolved	ND(0.0540)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-3, Accommodations Wastewater Characterization		**65207**	
Total and Dissolved Metals			
	Boron, Dissolved	61.4	ug/L
P118	Cadmium, Dissolved	ND(0.446)	ug/L
	Calcium, Dissolved	16,300	ug/L
P119	Chromium, Dissolved	ND(1.68)	ug/L
	Cobalt, Dissolved	ND(0.914)	ug/L
P120	Copper, Dissolved	90.3	ug/L
	Iron, Dissolved	3,270	ug/L
P122	Lead, Dissolved	3.70	ug/L
	Magnesium, Dissolved	1,960	ug/L
	Manganese, Dissolved	41.6	ug/L
P123	Mercury, Dissolved	0.390	ug/L
	Molybdenum, Dissolved	ND(1.50)	ug/L
P124	Nickel, Dissolved	19.6	ug/L
P125	Selenium, Dissolved	0.670	ug/L
P126	Silver, Dissolved	ND(1.28)	ug/L
	Sodium, Dissolved	29,300	ug/L
P127	Thallium, Dissolved	ND(0.00900)	ug/L
	Tin, Dissolved	ND(3.45)	ug/L
	Titanium, Dissolved	0.330	ug/L
	Vanadium, Dissolved	ND(0.679)	ug/L
	Yttrium, Dissolved	ND(0.222)	ug/L
P128	Zinc, Dissolved	635	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-3, Accommodations Wastewater Characterization		**65207**	
Volatile and Semivolatile Organics			
P011	1,1,1-Trichloroethane	ND(10.0)	ug/L
P015	1,1,2,2-Tetrachloroethane	ND(10.0)	ug/L
P014	1,1,2-Trichloroethane	ND(10.0)	ug/L
P013	1,1-Dichloroethane	ND(10.0)	ug/L
P029	1,1-Dichloroethene	ND(10.0)	ug/L
P008	1,2,4-Trichlorobenzene	ND(10.0)	ug/L
P025	1,2-Dichlorobenzene	ND(10.0)	ug/L
P010	1,2-Dichloroethane	ND(10.0)	ug/L
P032	1,2-Dichloropropane	ND(10.0)	ug/L
P026	1,3-Dichlorobenzene	ND(10.0)	ug/L
P027	1,4-Dichlorobenzene	ND(10.0)	ug/L
P021	2,4,6-Trichlorophenol	ND(10.0)	ug/L
P031	2,4-Dichlorophenol	ND(10.0)	ug/L
P034	2,4-Dimethylphenol	ND(10.0)	ug/L
P059	2,4-Dinitrophenol	ND(50.0)	ug/L
P035	2,4-Dinitrotoluene	ND(10.0)	ug/L
P036	2,6-Dinitrotoluene	ND(10.0)	ug/L
P019	2-Chloroethylvinyl Ether	ND(50.0)	ug/L
P020	2-Chloronaphthalene	ND(10.0)	ug/L
P024	2-Chlorophenol	ND(10.0)	ug/L
P057	2-Nitrophenol	ND(20.0)	ug/L
P028	3,3'-Dichlorobenzidine	ND(50.0)	ug/L
	4,6-Dinitro-2-methylphenol	ND(20.0)	ug/L
	4-Bromophenyl-phenylether	ND(10.0)	ug/L
P022	4-Chloro-3-methylphenol	ND(10.0)	ug/L
	4-Chlorophenyl-phenylether	ND(10.0)	ug/L
P058	4-Nitrophenol	ND(50.0)	ug/L
P001	Acenaphthene	ND(10.0)	ug/L
P077	Acenaphthylene	ND(10.0)	ug/L
P078	Anthracene	ND(10.0)	ug/L
P004	Benzene	ND(10.0)	ug/L
P005	Benzidine	ND(50.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-3, Accommodations Wastewater Characterization	Day 4 65207	Unit
Volatile and Semivolatile Organics		
P072 Benzo(a)anthracene	ND(10.0)	ug/L
P073 Benzo(a)pyrene	ND(10.0)	ug/L
P074 Benzo(b)fluoranthene	ND(10.0)	ug/L
Benzo(g,h,i)perylene	ND(20.0)	ug/L
P075 Benzo(k)fluoranthene	ND(10.0)	ug/L
P043 Bis(2-chloroethoxy)methane	ND(10.0)	ug/L
bis(-2-Chloroethyl)ether	ND(10.0)	ug/L
P042 Bis(2-chloroisopropyl) Ether	ND(10.0)	ug/L
P066 Bis(2-ethylhexyl) Phthalate	32.6	ug/L
P048 Bromodichloromethane	ND(10.0)	ug/L
Bromoform	ND(10.0)	ug/L
P046 Bromomethane	ND(10.0)	ug/L
P067 Butyl Benzyl Phthalate	ND(10.0)	ug/L
Carbon tetrachloride	ND(10.0)	ug/L
P007 Chlorobenzene	ND(10.0)	ug/L
P016 Chloroethane	ND(10.0)	ug/L
P023 Chloroform	ND(10.0)	ug/L
P045 Chloromethane	ND(10.0)	ug/L
P076 Chrysene	ND(10.0)	ug/L
cis-1,3-Dichloropropene	ND(10.0)	ug/L
Dibenz(a,h)anthracene	ND(20.0)	ug/L
P051 Dibromochloromethane	ND(10.0)	ug/L
P070 Diethyl Phthalate	ND(10.0)	ug/L
P071 Dimethyl Phthalate	ND(10.0)	ug/L
P068 Di-n-butyl Phthalate	ND(10.0)	ug/L
P069 Di-n-octyl Phthalate	ND(10.0)	ug/L
P038 Ethylbenzene	ND(10.0)	ug/L
P039 Fluoranthene	ND(10.0)	ug/L
P080 Fluorene	ND(10.0)	ug/L
P009 Hexachlorobenzene	ND(10.0)	ug/L
P052 Hexachlorobutadiene	ND(10.0)	ug/L
P053 Hexachlorocyclopentadiene	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-3, Accommodations Wastewater Characterization		**65207**	
Volatile and Semivolatile Organics			
P012	Hexachloroethane	ND(10.0)	ug/L
P083	Indeno(1,2,3-cd)pyrene	ND(20.0)	ug/L
P054	Isophorone	ND(10.0)	ug/L
P044	Methylene Chloride	ND(10.0)	ug/L
P055	Naphthalene	ND(10.0)	ug/L
P056	Nitrobenzene	ND(10.0)	ug/L
P061	N-Nitrosodimethylamine	ND(50.0)	ug/L
	N-Nitroso-di-n-propylamine	ND(20.0)	ug/L
P062	N-Nitrosodiphenylamine	ND(20.0)	ug/L
P064	Pentachlorophenol	ND(50.0)	ug/L
P081	Phenanthrene	ND(10.0)	ug/L
P065	Phenol	12.4	ug/L
P084	Pyrene	ND(10.0)	ug/L
P085	Tetrachloroethene	52.3	ug/L
P086	Toluene	ND(10.0)	ug/L
P030	trans-1,2-Dichloroethene	ND(10.0)	ug/L
P033	trans-1,3-Dichloropropene	ND(10.0)	ug/L
P087	Trichloroethene	20.9	ug/L
	Trichlorofluoromethane	ND(10.0)	ug/L
P088	Vinyl Chloride	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 3	Unit
SP-4, Food Pulper Wastewater Characterization		**65211**	
Classical Pollutants			
	Alkalinity	ND(10.0)	mg/L
	Ammonia As Nitrogen (NH3-N)	29.0	mg/L
	Available Cyanide	88.4	ug/L
	Biochemical Oxygen Demand (BOD)	17,300	mg/L
	Chemical Oxygen Demand (COD)	51,400	mg/L
	Chloride	655	mg/L
	Hardness	270	mg/L
	Hexane Extractable Material (HEM)	5,010	mg/L
	Nitrate/Nitrite (NO2 + NO3-N)	0.220	mg/L
	Settleable residue	900	mL/L
	Silica Gel Treated HEM (SGT-HEM)	2,240	mg/L
	Sulfate	35.0	mg/L
P121	Total Cyanide	0.0140	mg/L
	Total Dissolved Solids (TDS)	6,050	mg/L
	Total Kjeldahl Nitrogen (TKN)	166	mg/L
	Total Organic Carbon (TOC)	5,370	mg/L
	Total Phosphorus	46.0	mg/L
	Total Suspended Solids (TSS)	19,800	mg/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 3	Unit
SP-4, Food Pulper Wastewater Characterization		**65211**	
Total and Dissolved Metals			
	Aluminum	2,910	ug/L
P114	Antimony	13.6	ug/L
P115	Arsenic	ND(2.32)	ug/L
	Barium	108	ug/L
P117	Beryllium	ND(0.0540)	ug/L
	Boron	166	ug/L
P118	Cadmium	1.50	ug/L
	Calcium	71,200	ug/L
P119	Chromium	16.3	ug/L
	Cobalt	2.40	ug/L
P120	Copper	400	ug/L
	Iron	3,010	ug/L
P122	Lead	45.3	ug/L
	Magnesium	22,700	ug/L
	Manganese	434	ug/L
P123	Mercury	ND(0.0170)	ug/L
	Molybdenum	ND(1.50)	ug/L
P124	Nickel	41.6	ug/L
P125	Selenium	16.5	ug/L
P126	Silver	2.10	ug/L
	Sodium	376,000	ug/L
P127	Thallium	0.0100	ug/L
	Tin	88.6	ug/L
	Titanium	8.80	ug/L
	Vanadium	1.80	ug/L
	Yttrium	ND(0.222)	ug/L
P128	Zinc	4,210	ug/L
	Aluminum, Dissolved	614	ug/L
P114	Antimony, Dissolved	ND(5.97)	ug/L
P115	Arsenic, Dissolved	5.70	ug/L
	Barium, Dissolved	69.6	ug/L
P117	Beryllium, Dissolved	ND(0.0540)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 3	Unit
SP-4, Food Pulper Wastewater Characterization		**65211**	
Total and Dissolved Metals			
	Boron, Dissolved	147	ug/L
P118	Cadmium, Dissolved	ND(0.446)	ug/L
	Calcium, Dissolved	67,100	ug/L
P119	Chromium, Dissolved	2.40	ug/L
	Cobalt, Dissolved	7.60	ug/L
P120	Copper, Dissolved	17.5	ug/L
	Iron, Dissolved	527	ug/L
P122	Lead, Dissolved	4.90	ug/L
	Magnesium, Dissolved	20,900	ug/L
	Manganese, Dissolved	8.10	ug/L
P123	Mercury, Dissolved	0.260	ug/L
	Molybdenum, Dissolved	ND(1.50)	ug/L
P124	Nickel, Dissolved	38.1	ug/L
P125	Selenium, Dissolved	6.80	ug/L
P126	Silver, Dissolved	ND(1.28)	ug/L
	Sodium, Dissolved	388,000	ug/L
P127	Thallium, Dissolved	0.0800	ug/L
	Tin, Dissolved	29.9	ug/L
	Titanium, Dissolved	ND(0.253)	ug/L
	Vanadium, Dissolved	0.940	ug/L
	Yttrium, Dissolved	ND(0.222)	ug/L
P128	Zinc, Dissolved	3,780	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 3	Unit
SP-4, Food Pulper Wastewater Characterization		**65211**	
Volatile and Semivolatile Organics			
P011	1,1,1-Trichloroethane	ND(0.277)	ug/L
P015	1,1,2,2-Tetrachloroethane	ND(0.277)	ug/L
P014	1,1,2-Trichloroethane	ND(0.277)	ug/L
P013	1,1-Dichloroethane	ND(0.277)	ug/L
P029	1,1-Dichloroethene	ND(0.277)	ug/L
P008	1,2,4-Trichlorobenzene	ND(27.9)	ug/L
P025	1,2-Dichlorobenzene	ND(27.9)	ug/L
P010	1,2-Dichloroethane	ND(0.277)	ug/L
P032	1,2-Dichloropropane	ND(0.277)	ug/L
P026	1,3-Dichlorobenzene	ND(27.9)	ug/L
P027	1,4-Dichlorobenzene	ND(27.9)	ug/L
P021	2,4,6-Trichlorophenol	ND(27.9)	ug/L
P031	2,4-Dichlorophenol	ND(27.9)	ug/L
P034	2,4-Dimethylphenol	ND(27.9)	ug/L
P059	2,4-Dinitrophenol	ND(140)	ug/L
P035	2,4-Dinitrotoluene	ND(27.9)	ug/L
P036	2,6-Dinitrotoluene	ND(27.9)	ug/L
P019	2-Chloroethylvinyl Ether	ND(1.38)	ug/L
P020	2-Chloronaphthalene	ND(27.9)	ug/L
P024	2-Chlorophenol	ND(27.9)	ug/L
P057	2-Nitrophenol	ND(55.8)	ug/L
P028	3,3'-Dichlorobenzidine	ND(140)	ug/L
	4,6-Dinitro-2-methylphenol	ND(55.8)	ug/L
	4-Bromophenyl-phenylether	ND(27.9)	ug/L
P022	4-Chloro-3-methylphenol	ND(27.9)	ug/L
	4-Chlorophenyl-phenylether	ND(27.9)	ug/L
P058	4-Nitrophenol	ND(140)	ug/L
P001	Acenaphthene	ND(27.9)	ug/L
P077	Acenaphthylene	ND(27.9)	ug/L
P078	Anthracene	ND(27.9)	ug/L
P004	Benzene	ND(0.277)	ug/L
P005	Benzidine	ND(140)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 3	Unit
SP-4, Food Pulper Wastewater Characterization		**65211**	
Volatile and Semivolatile Organics			
P072	Benzo(a)anthracene	ND(27.9)	ug/L
P073	Benzo(a)pyrene	ND(27.9)	ug/L
P074	Benzo(b)fluoranthene	ND(27.9)	ug/L
	Benzo(g,h,i)perylene	ND(55.8)	ug/L
P075	Benzo(k)fluoranthene	ND(27.9)	ug/L
P043	Bis(2-chloroethoxy)methane	ND(27.9)	ug/L
	bis(-2-Chloroethyl)ether	ND(27.9)	ug/L
P042	Bis(2-chloroisopropyl) Ether	ND(27.9)	ug/L
P066	Bis(2-ethylhexyl) Phthalate	261	ug/L
P048	Bromodichloromethane	ND(0.277)	ug/L
	Bromoform	ND(0.277)	ug/L
P046	Bromomethane	ND(0.277)	ug/L
P067	Butyl Benzyl Phthalate	ND(27.9)	ug/L
	Carbon tetrachloride	ND(0.277)	ug/L
P007	Chlorobenzene	ND(0.277)	ug/L
P016	Chloroethane	ND(0.277)	ug/L
P023	Chloroform	ND(0.277)	ug/L
P045	Chloromethane	ND(0.277)	ug/L
P076	Chrysene	ND(27.9)	ug/L
	cis-1,3-Dichloropropene	ND(0.277)	ug/L
	Dibenz(a,h)anthracene	ND(55.8)	ug/L
P051	Dibromochloromethane	ND(0.277)	ug/L
P070	Diethyl Phthalate	ND(27.9)	ug/L
P071	Dimethyl Phthalate	ND(27.9)	ug/L
P068	Di-n-butyl Phthalate	ND(27.9)	ug/L
P069	Di-n-octyl Phthalate	ND(27.9)	ug/L
P038	Ethylbenzene	ND(0.277)	ug/L
P039	Fluoranthene	ND(27.9)	ug/L
P080	Fluorene	ND(27.9)	ug/L
P009	Hexachlorobenzene	ND(27.9)	ug/L
P052	Hexachlorobutadiene	ND(27.9)	ug/L
P053	Hexachlorocyclopentadiene	ND(27.9)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 3	Unit
SP-4, Food Pulper Wastewater Characterization		**65211**	
Volatile and Semivolatile Organics			
P012	Hexachloroethane	ND(27.9)	ug/L
P083	Indeno(1,2,3-cd)pyrene	ND(55.8)	ug/L
P054	Isophorone	ND(27.9)	ug/L
P044	Methylene Chloride	ND(0.277)	ug/L
P055	Naphthalene	ND(27.9)	ug/L
P056	Nitrobenzene	ND(27.9)	ug/L
P061	N-Nitrosodimethylamine	ND(140)	ug/L
	N-Nitroso-di-n-propylamine	ND(55.8)	ug/L
P062	N-Nitrosodiphenylamine	ND(55.8)	ug/L
P064	Pentachlorophenol	ND(140)	ug/L
P081	Phenanthrene	ND(27.9)	ug/L
P065	Phenol	32.4	ug/L
P084	Pyrene	ND(27.9)	ug/L
P085	Tetrachloroethene	ND(0.277)	ug/L
P086	Toluene	ND(0.277)	ug/L
P030	trans-1,2-Dichloroethene	ND(0.277)	ug/L
P033	trans-1,3-Dichloropropene	ND(0.277)	ug/L
P087	Trichloroethene	ND(0.277)	ug/L
	Trichlorofluoromethane	ND(0.277)	ug/L
P088	Vinyl Chloride	ND(0.277)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-5, Galley Wastewater Characterization	**65215**	
Classical Pollutants		
Alkalinity	ND(10.0)	mg/L
Ammonia As Nitrogen (NH3-N)	0.460	mg/L
Available Cyanide	ND(2.00)	ug/L
Biochemical Oxygen Demand (BOD)	1,050	mg/L
Chemical Oxygen Demand (COD)	1,490	mg/L
Chloride	42.0	mg/L
Hardness	56.9	mg/L
Hexane Extractable Material (HEM)	142	mg/L
Nitrate/Nitrite (NO2 + NO3-N)	ND(0.0500)	mg/L
Settleable residue	1.70	mL/L
Silica Gel Treated HEM (SGT-HEM)	7.00	mg/L
Sulfate	24.0	mg/L
P121 Total Cyanide	ND(0.00500)	mg/L
Total Dissolved Solids (TDS)	527	mg/L
Total Kjeldahl Nitrogen (TKN)	24.0	mg/L
Total Organic Carbon (TOC)	250	mg/L
Total Phosphorus	4.00	mg/L
Total Suspended Solids (TSS)	413	mg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-5, Galley Wastewater Characterization	**65215**	
Total and Dissolved Metals		
Aluminum	201	ug/L
P114 Antimony	ND(5.97)	ug/L
P115 Arsenic	ND(2.32)	ug/L
Barium	83.4	ug/L
P117 Beryllium	ND(0.0540)	ug/L
Boron	56.7	ug/L
P118 Cadmium	ND(0.446)	ug/L
Calcium	18,200	ug/L
P119 Chromium	ND(1.68)	ug/L
Cobalt	ND(0.914)	ug/L
P120 Copper	88.3	ug/L
Iron	2,530	ug/L
P122 Lead	10.7	ug/L
Magnesium	2,790	ug/L
Manganese	36.3	ug/L
P123 Mercury	ND(0.0170)	ug/L
Molybdenum	ND(1.50)	ug/L
P124 Nickel	25.8	ug/L
P125 Selenium	0.770	ug/L
P126 Silver	ND(1.28)	ug/L
Sodium	31,800	ug/L
P127 Thallium	ND(0.00900)	ug/L
Tin	4.00	ug/L
Titanium	2.20	ug/L
Vanadium	ND(0.679)	ug/L
Yttrium	ND(0.222)	ug/L
P128 Zinc	1,010	ug/L
Aluminum, Dissolved	114	ug/L
P114 Antimony, Dissolved	ND(5.97)	ug/L
P115 Arsenic, Dissolved	ND(2.32)	ug/L
Barium, Dissolved	57.3	ug/L
P117 Beryllium, Dissolved	ND(0.0540)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 2	Unit
SP-5, Galley Wastewater Characterization		**65215**	
Total and Dissolved Metals			
	Boron, Dissolved	56.3	ug/L
P118	Cadmium, Dissolved	ND(0.446)	ug/L
	Calcium, Dissolved	15,800	ug/L
P119	Chromium, Dissolved	ND(1.68)	ug/L
	Cobalt, Dissolved	1.20	ug/L
P120	Copper, Dissolved	50.9	ug/L
	Iron, Dissolved	1,510	ug/L
P122	Lead, Dissolved	4.00	ug/L
	Magnesium, Dissolved	2,510	ug/L
	Manganese, Dissolved	26.5	ug/L
P123	Mercury, Dissolved	0.270	ug/L
	Molybdenum, Dissolved	ND(1.50)	ug/L
P124	Nickel, Dissolved	22.2	ug/L
P125	Selenium, Dissolved	0.840	ug/L
P126	Silver, Dissolved	ND(1.28)	ug/L
	Sodium, Dissolved	29,800	ug/L
P127	Thallium, Dissolved	0.0100	ug/L
	Tin, Dissolved	6.40	ug/L
	Titanium, Dissolved	0.340	ug/L
	Vanadium, Dissolved	ND(0.679)	ug/L
	Yttrium, Dissolved	ND(0.222)	ug/L
P128	Zinc, Dissolved	599	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 2	Unit
SP-5, Galley Wastewater Characterization		**65215**	
Volatile and Semivolatile Organics			
P011	1,1,1-Trichloroethane	ND(10.0)	ug/L
P015	1,1,2,2-Tetrachloroethane	ND(10.0)	ug/L
P014	1,1,2-Trichloroethane	ND(10.0)	ug/L
P013	1,1-Dichloroethane	ND(10.0)	ug/L
P029	1,1-Dichloroethene	ND(10.0)	ug/L
P008	1,2,4-Trichlorobenzene	ND(10.0)	ug/L
P025	1,2-Dichlorobenzene	ND(10.0)	ug/L
P010	1,2-Dichloroethane	ND(10.0)	ug/L
P032	1,2-Dichloropropane	ND(10.0)	ug/L
P026	1,3-Dichlorobenzene	ND(10.0)	ug/L
P027	1,4-Dichlorobenzene	ND(10.0)	ug/L
P021	2,4,6-Trichlorophenol	ND(10.0)	ug/L
P031	2,4-Dichlorophenol	ND(10.0)	ug/L
P034	2,4-Dimethylphenol	ND(10.0)	ug/L
P059	2,4-Dinitrophenol	ND(50.0)	ug/L
P035	2,4-Dinitrotoluene	ND(10.0)	ug/L
P036	2,6-Dinitrotoluene	ND(10.0)	ug/L
P019	2-Chloroethylvinyl Ether	ND(50.0)	ug/L
P020	2-Chloronaphthalene	ND(10.0)	ug/L
P024	2-Chlorophenol	ND(10.0)	ug/L
P057	2-Nitrophenol	ND(20.0)	ug/L
P028	3,3'-Dichlorobenzidine	ND(50.0)	ug/L
	4,6-Dinitro-2-methylphenol	ND(20.0)	ug/L
	4-Bromophenyl-phenylether	ND(10.0)	ug/L
P022	4-Chloro-3-methylphenol	ND(10.0)	ug/L
	4-Chlorophenyl-phenylether	ND(10.0)	ug/L
P058	4-Nitrophenol	ND(50.0)	ug/L
P001	Acenaphthene	ND(10.0)	ug/L
P077	Acenaphthylene	ND(10.0)	ug/L
P078	Anthracene	ND(10.0)	ug/L
P004	Benzene	ND(10.0)	ug/L
P005	Benzidine	ND(50.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-5, Galley Wastewater Characterization	**65215**	
Volatile and Semivolatile Organics		
P072 Benzo(a)anthracene	ND(10.0)	ug/L
P073 Benzo(a)pyrene	ND(10.0)	ug/L
P074 Benzo(b)fluoranthene	ND(10.0)	ug/L
Benzo(g,h,i)perylene	ND(20.0)	ug/L
P075 Benzo(k)fluoranthene	ND(10.0)	ug/L
P043 Bis(2-chloroethoxy)methane	ND(10.0)	ug/L
bis(-2-Chloroethyl)ether	ND(10.0)	ug/L
P042 Bis(2-chloroisopropyl) Ether	ND(10.0)	ug/L
P066 Bis(2-ethylhexyl) Phthalate	33.2	ug/L
P048 Bromodichloromethane	ND(10.0)	ug/L
Bromoform	ND(10.0)	ug/L
P046 Bromomethane	ND(10.0)	ug/L
P067 Butyl Benzyl Phthalate	ND(10.0)	ug/L
Carbon tetrachloride	ND(10.0)	ug/L
P007 Chlorobenzene	ND(10.0)	ug/L
P016 Chloroethane	ND(10.0)	ug/L
P023 Chloroform	ND(10.0)	ug/L
P045 Chloromethane	ND(10.0)	ug/L
P076 Chrysene	ND(10.0)	ug/L
cis-1,3-Dichloropropene	ND(10.0)	ug/L
Dibenz(a,h)anthracene	ND(20.0)	ug/L
P051 Dibromochloromethane	ND(10.0)	ug/L
P070 Diethyl Phthalate	ND(10.0)	ug/L
P071 Dimethyl Phthalate	ND(10.0)	ug/L
P068 Di-n-butyl Phthalate	ND(10.0)	ug/L
P069 Di-n-octyl Phthalate	ND(10.0)	ug/L
P038 Ethylbenzene	ND(10.0)	ug/L
P039 Fluoranthene	ND(10.0)	ug/L
P080 Fluorene	ND(10.0)	ug/L
P009 Hexachlorobenzene	ND(10.0)	ug/L
P052 Hexachlorobutadiene	ND(10.0)	ug/L
P053 Hexachlorocyclopentadiene	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 2	Unit
SP-5, Galley Wastewater Characterization		**65215**	
Volatile and Semivolatile Organics			
P012	Hexachloroethane	ND(10.0)	ug/L
P083	Indeno(1,2,3-cd)pyrene	ND(20.0)	ug/L
P054	Isophorone	ND(10.0)	ug/L
P044	Methylene Chloride	ND(10.0)	ug/L
P055	Naphthalene	ND(10.0)	ug/L
P056	Nitrobenzene	ND(10.0)	ug/L
P061	N-Nitrosodimethylamine	ND(50.0)	ug/L
	N-Nitroso-di-n-propylamine	ND(20.0)	ug/L
P062	N-Nitrosodiphenylamine	ND(20.0)	ug/L
P064	Pentachlorophenol	ND(50.0)	ug/L
P081	Phenanthrene	ND(10.0)	ug/L
P065	Phenol	22.2	ug/L
P084	Pyrene	ND(10.0)	ug/L
P085	Tetrachloroethene	ND(10.0)	ug/L
P086	Toluene	ND(10.0)	ug/L
P030	trans-1,2-Dichloroethene	ND(10.0)	ug/L
P033	trans-1,3-Dichloropropene	ND(10.0)	ug/L
P087	Trichloroethene	ND(10.0)	ug/L
	Trichlorofluoromethane	ND(10.0)	ug/L
P088	Vinyl Chloride	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-5, Galley Wastewater Characterization	**65215**	
Pesticides		
1,2-Dibromo-3-chloropropane	ND(0.200)	ug/L
4,4'-DDD	ND(0.200)	ug/L
4,4'-DDE	ND(0.100)	ug/L
4,4'-DDT	ND(0.100)	ug/L
Acephate	ND(20.0)	ug/L
Alachlor	ND(0.200)	ug/L
Aldrin	ND(0.200)	ug/L
alpha-BHC	ND(0.0500)	ug/L
alpha-Chlordane	ND(0.100)	ug/L
Atrazine	ND(10.0)	ug/L
Azinphos Ethyl	ND(2.00)	ug/L
Azinphos Methyl	ND(1.00)	ug/L
Benfluralin	ND(0.200)	ug/L
beta-BHC	ND(0.100)	ug/L
Bromacil	ND(1.00)	ug/L
Bromoxynil Octanoate	ND(0.500)	ug/L
Butachlor	ND(0.500)	ug/L
Captafol	ND(2.00)	ug/L
Captan	ND(1.00)	ug/L
Carbophenothion	ND(1.00)	ug/L
Chlorfenvinphos	ND(2.00)	ug/L
Chlorobenzilate	ND(1.00)	ug/L
Chloroneb	ND(1.00)	ug/L
Chloropropylate	ND(1.00)	ug/L
Chlorothalonil	ND(0.200)	ug/L
Chlorpyrifos	ND(2.00)	ug/L
cis-Permethrin	ND(2.00)	ug/L
Coumaphos	ND(5.00)	ug/L
Crotoxyphos	ND(5.00)	ug/L
Dacthal (DCPS)	ND(0.0500)	ug/L
DEF	ND(2.00)	ug/L
delta-BHC	ND(0.0500)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-5, Galley Wastewater Characterization	**65215**	
Pesticides		
Demeton A	ND(4.00)	ug/L
Demeton B	ND(4.00)	ug/L
Diallate A	ND(2.00)	ug/L
Diallate B	ND(2.00)	ug/L
Diazinon	ND(2.00)	ug/L
Dichlofenthion	ND(2.00)	ug/L
Dichlone	ND(0.200)	ug/L
Dichlorvos	ND(5.00)	ug/L
Dicofol	ND(1.00)	ug/L
Dicrotophos	ND(2.00)	ug/L
Dieldrin	ND(0.0400)	ug/L
Dimethoate	ND(2.00)	ug/L
Dioxathion	ND(5.00)	ug/L
Disulfoton	ND(2.00)	ug/L
Endosulfan I	ND(0.100)	ug/L
Endosulfan II	ND(1.00)	ug/L
Endosulfan Sulfate	ND(0.100)	ug/L
Endrin	ND(0.200)	ug/L
Endrin Aldehyde	ND(0.100)	ug/L
Endrin Ketone	ND(0.100)	ug/L
EPN	ND(2.00)	ug/L
Ethalfluralin	ND(0.100)	ug/L
Ethion	ND(2.00)	ug/L
Ethoprop	ND(2.00)	ug/L
Etridiazole	ND(0.200)	ug/L
Famphur	ND(5.00)	ug/L
Fenarimol	ND(0.200)	ug/L
Fensulfothion	ND(5.00)	ug/L
Fenthion	ND(2.00)	ug/L
gamma-BHC	ND(0.0500)	ug/L
gamma-Chlordane	ND(0.0500)	ug/L
Heptachlor	ND(0.100)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-5, Galley Wastewater Characterization	**65215**	
Pesticides		
Heptachlor Epoxide	ND(0.0500)	ug/L
Hexamethylphosphoramide	ND(2.00)	ug/L
Isodrin	ND(0.100)	ug/L
Isopropalin	ND(0.200)	ug/L
Kepone	ND(1.00)	ug/L
Leptophos	ND(2.00)	ug/L
Malathion	ND(2.00)	ug/L
Merphos A	ND(2.00)	ug/L
Merphos B	ND(2.00)	ug/L
Methamidophos	ND(20.0)	ug/L
Methoxychlor	ND(0.200)	ug/L
Methyl Parathion	ND(2.00)	ug/L
Methyl Trithion	ND(5.00)	ug/L
Metribuzin	ND(0.100)	ug/L
Mevinphos	ND(5.00)	ug/L
Mirex	ND(0.200)	ug/L
Monocrotophos	ND(20.0)	ug/L
Naled	ND(2.00)	ug/L
Nitrofen	ND(0.200)	ug/L
Norflurazon	EXCLUDE	ug/L
Parathion (ethyl)	ND(2.00)	ug/L
PCB 1016	ND(1.00)	ug/L
PCB 1221	ND(1.00)	ug/L
PCB 1232	ND(1.00)	ug/L
PCB 1242	ND(1.00)	ug/L
PCB 1248	ND(1.00)	ug/L
PCB 1254	ND(1.00)	ug/L
PCB 1260	ND(1.00)	ug/L
Pendamethalin	ND(0.500)	ug/L
Pentachloronitrobenzene (PCNB)	ND(0.0500)	ug/L
Perthane	ND(10.0)	ug/L
Phorate	ND(2.00)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-5, Galley Wastewater Characterization	**65215**	
Pesticides		
Phosmet	ND(5.00)	ug/L
Phosphamidon E	ND(1.00)	ug/L
Phosphamidon Z	ND(1.00)	ug/L
Propachlor	ND(0.100)	ug/L
Propanil	ND(1.00)	ug/L
Propazine	ND(1.00)	ug/L
Ronnel	ND(2.00)	ug/L
Simazine	ND(8.00)	ug/L
Strobane	ND(5.00)	ug/L
Sulfotep	ND(2.00)	ug/L
Sulprofos	ND(2.00)	ug/L
Tepp	ND(2.00)	ug/L
Terbacil	ND(2.00)	ug/L
Terbufos	ND(2.00)	ug/L
Terbuthylazine	ND(5.00)	ug/L
Tetrachlorvinphos	ND(2.00)	ug/L
Tokuthion	ND(2.00)	ug/L
Toxaphene	ND(5.00)	ug/L
trans-Permethrin	ND(2.00)	ug/L
Triadimefon	ND(1.00)	ug/L
Trichlorfon	ND(5.00)	ug/L
Trichloronate	ND(2.00)	ug/L
Tricresylphosphate	ND(20.0)	ug/L
Trifluralin	ND(0.100)	ug/L
Trimethylphosphate	ND(2.00)	ug/L

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NC – Not collected.
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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Classical Pollutants						
Alkalinity	311	435	323	376	368	mg/L
Ammonia As Nitrogen (NH3-N)	60.0	84.0	63.0	80.0	68.0	mg/L
Available Cyanide	10.4	ND(2.00)	7.54	35.4	16.0	ug/L
Biochemical Oxygen Demand (BOD)	504	786	576	481	537	mg/L
Chemical Oxygen Demand (COD)	799	1,960	1,300	2,040	1,280	mg/L
Chloride	72.0	88.0	75.0	84.0	76.0	mg/L
Hardness	47.6	78.3	68.5	74.6	71.0	mg/L
Hexane Extractable Material (HEM)	41.0	79.0	127	154	88.0	mg/L
Nitrate/Nitrite (NO2 + NO3-N)	0.0600	0.0700	ND(0.0500)	ND(0.0500)	ND(0.0500)	mg/L
Settleable residue	40.0	82.0	22.0	66.0	69.0	mL/L
Silica Gel Treated HEM (SGT-HEM)	6.10	7.00	48.0	12.0	10.0	mg/L
Sulfate	26.0	33.0	30.0	32.0	28.0	mg/L
P121 Total Cyanide	ND(0.00500)	ND(0.00500)	ND(0.00500)	ND(0.00500)	ND(0.00500)	mg/L
Total Dissolved Solids (TDS)	453	492	510	435	432	mg/L
Total Kjeldahl Nitrogen (TKN)	91.0	141	103	86.0	103	mg/L
Total Organic Carbon (TOC)	182	187	192	235	195	mg/L
Total Phosphorus	10.0	13.0	13.0	19.0	20.0	mg/L
Total Suspended Solids (TSS)	473	805	630	655	710	mg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Total and Dissolved Metals						
Aluminum	419	597	508	597	532	ug/L
P114 Antimony	ND(5.97)	ND(5.97)	ND(5.97)	ND(5.97)	ND(5.97)	ug/L
P115 Arsenic	ND(2.32)	2.60	ND(2.32)	ND(2.32)	2.50	ug/L
Barium	59.1	71.0	64.6	65.2	60.6	ug/L
P117 Beryllium	ND(0.0540)	ND(0.0540)	ND(0.0540)	ND(0.0540)	ND(0.0540)	ug/L
Boron	62.1	69.3	77.9	72.1	59.0	ug/L
P118 Cadmium	ND(0.446)	0.460	ND(0.446)	ND(0.446)	ND(0.446)	ug/L
Calcium	13,300	23,200	20,900	22,600	20,800	ug/L
P119 Chromium	ND(1.68)	3.70	2.00	3.70	4.00	ug/L
Cobalt	ND(0.914)	ND(0.914)	ND(0.914)	ND(0.914)	ND(0.914)	ug/L
P120 Copper	185	314	285	263	184	ug/L
Iron	1,590	1,590	1,740	1,700	1,430	ug/L
P122 Lead	14.8	9.20	4.90	3.90	ND(3.08)	ug/L
Magnesium	3,500	4,940	3,970	4,420	4,630	ug/L
Manganese	48.3	67.7	56.5	61.8	61.1	ug/L
P123 Mercury	0.360	0.500	0.520	ND(0.0170)	0.720	ug/L
Molybdenum	ND(1.50)	ND(1.50)	ND(1.50)	ND(1.50)	ND(1.50)	ug/L
P124 Nickel	35.7	33.0	24.2	21.6	21.9	ug/L
P125 Selenium	1.10	1.50	1.00	1.30	1.40	ug/L
P126 Silver	ND(1.28)	1.70	ND(1.28)	1.30	3.90	ug/L
Sodium	76,000	91,900	80,200	74,400	68,200	ug/L
P127 Thallium	ND(0.00900)	ND(0.00900)	ND(0.00900)	ND(0.00900)	ND(0.00900)	ug/L
Tin	ND(3.45)	ND(3.45)	ND(3.45)	6.80	4.40	ug/L
Titanium	1.90	2.80	2.10	2.40	3.40	ug/L
Vanadium	ND(0.679)	ND(0.679)	ND(0.679)	ND(0.679)	ND(0.679)	ug/L
Yttrium	ND(0.222)	ND(0.222)	ND(0.222)	ND(0.222)	ND(0.222)	ug/L
P128 Zinc	1,300	1,080	841	797	719	ug/L
Aluminum, Dissolved	107	31.0	51.4	238	65.3	ug/L
P114 Antimony, Dissolved	ND(5.97)	ND(5.97)	ND(5.97)	ND(5.97)	ND(5.97)	ug/L
P115 Arsenic, Dissolved	ND(2.32)	ND(2.32)	ND(2.32)	ND(2.32)	ND(2.32)	ug/L
Barium, Dissolved	19.8	14.5	18.1	34.1	15.7	ug/L
P117 Beryllium, Dissolved	ND(0.0540)	ND(0.0540)	ND(0.0540)	ND(0.0540)	ND(0.0540)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Total and Dissolved Metals							
	Boron, Dissolved	63.2	68.8	71.2	72.8	62.3	ug/L
P118	Cadmium, Dissolved	ND(0.446)	ND(0.446)	ND(0.446)	ND(0.446)	ND(0.446)	ug/L
	Calcium, Dissolved	9,600	12,700	13,900	17,500	13,200	ug/L
P119	Chromium, Dissolved	ND(1.68)	ND(1.68)	ND(1.68)	ND(1.68)	ND(1.68)	ug/L
	Cobalt, Dissolved	4.00	4.10	3.00	2.10	4.20	ug/L
P120	Copper, Dissolved	44.5	37.1	42.8	136	34.4	ug/L
	Iron, Dissolved	624	395	512	921	419	ug/L
P122	Lead, Dissolved	3.10	ND(3.08)	ND(3.08)	ND(3.08)	ND(3.08)	ug/L
	Magnesium, Dissolved	2,780	3,680	3,020	3,900	3,480	ug/L
	Manganese, Dissolved	18.1	20.8	17.2	37.6	20.7	ug/L
P123	Mercury, Dissolved	0.350	0.320	0.330	0.420	0.380	ug/L
	Molybdenum, Dissolved	ND(1.50)	ND(1.50)	ND(1.50)	ND(1.50)	ND(1.50)	ug/L
P124	Nickel, Dissolved	33.3	26.3	20.7	17.2	16.0	ug/L
P125	Selenium, Dissolved	0.870	1.20	0.840	1.00	1.00	ug/L
P126	Silver, Dissolved	ND(1.28)	ND(1.28)	ND(1.28)	ND(1.28)	ND(1.28)	ug/L
	Sodium, Dissolved	73,900	86,000	72,900	75,200	65,400	ug/L
P127	Thallium, Dissolved	ND(0.00900)	ND(0.00900)	ND(0.00900)	ND(0.00900)	ND(0.00900)	ug/L
	Tin, Dissolved	ND(3.45)	ND(3.45)	ND(3.45)	ND(3.45)	ND(3.45)	ug/L
	Titanium, Dissolved	ND(0.253)	ND(0.253)	ND(0.253)	0.560	ND(0.253)	ug/L
	Vanadium, Dissolved	ND(0.679)	ND(0.679)	ND(0.679)	ND(0.679)	ND(0.679)	ug/L
	Yttrium, Dissolved	ND(0.222)	ND(0.222)	ND(0.222)	ND(0.222)	ND(0.222)	ug/L
P128	Zinc, Dissolved	634	288	199	357	111	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Volatile and Semivolatile Organics						
P011 1,1,1-Trichloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P015 1,1,2,2-Tetrachloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P014 1,1,2-Trichloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P013 1,1-Dichloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P029 1,1-Dichloroethene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P008 1,2,4-Trichlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P025 1,2-Dichlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P010 1,2-Dichloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P032 1,2-Dichloropropane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P026 1,3-Dichlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P027 1,4-Dichlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P021 2,4,6-Trichlorophenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P031 2,4-Dichlorophenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P034 2,4-Dimethylphenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P059 2,4-Dinitrophenol	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
P035 2,4-Dinitrotoluene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P036 2,6-Dinitrotoluene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P019 2-Chloroethylvinyl Ether	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
P020 2-Chloronaphthalene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P024 2-Chlorophenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P057 2-Nitrophenol	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P028 3,3'-Dichlorobenzidine	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
4,6-Dinitro-2-methylphenol	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
4-Bromophenyl-phenylether	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P022 4-Chloro-3-methylphenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
4-Chlorophenyl-phenylether	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P058 4-Nitrophenol	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
P001 Acenaphthene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P077 Acenaphthylene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P078 Anthracene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P004 Benzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P005 Benzidine	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Volatile and Semivolatile Organics						
P072 Benzo(a)anthracene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P073 Benzo(a)pyrene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P074 Benzo(b)fluoranthene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Benzo(g,h,i)perylene	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P075 Benzo(k)fluoranthene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P043 Bis(2-chloroethoxy)methane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
bis(-2-Chloroethyl)ether	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P042 Bis(2-chloroisopropyl) Ether	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P066 Bis(2-ethylhexyl) Phthalate	10.1	15.3	20.3	24.0	ND(10.0)	ug/L
P048 Bromodichloromethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Bromoform	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P046 Bromomethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P067 Butyl Benzyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Carbon tetrachloride	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P007 Chlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P016 Chloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P023 Chloroform	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P045 Chloromethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P076 Chrysene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
cis-1,3-Dichloropropene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Dibenz(a,h)anthracene	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P051 Dibromochloromethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P070 Diethyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P071 Dimethyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P068 Di-n-butyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P069 Di-n-octyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P038 Ethylbenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P039 Fluoranthene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P080 Fluorene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P009 Hexachlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P052 Hexachlorobutadiene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P053 Hexachlorocyclopentadiene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Volatile and Semivolatile Organics						
P012 Hexachloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P083 Indeno(1,2,3-cd)pyrene	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P054 Isophorone	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P044 Methylene Chloride	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P055 Naphthalene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P056 Nitrobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P061 N-Nitrosodimethylamine	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
N-Nitroso-di-n-propylamine	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P062 N-Nitrosodiphenylamine	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P064 Pentachlorophenol	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
P081 Phenanthrene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P065 Phenol	13.9	15.0	13.4	ND(10.0)	25.1	ug/L
P084 Pyrene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P085 Tetrachloroethene	443	274	147	1,360	2,740	ug/L
P086 Toluene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P030 trans-1,2-Dichloroethene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P033 trans-1,3-Dichloropropene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P087 Trichloroethene	32.2	20.1	24.4	66.9	58.0	ug/L
Trichlorofluoromethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P088 Vinyl Chloride	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Pesticides						
1,2-Dibromo-3-chloropropane	NC	NC	ND(0.200)	NC	NC	ug/L
4,4'-DDD	NC	NC	ND(0.200)	NC	NC	ug/L
4,4'-DDE	NC	NC	ND(0.100)	NC	NC	ug/L
4,4'-DDT	NC	NC	ND(0.100)	NC	NC	ug/L
Acephate	NC	NC	EXCLUDE	NC	NC	ug/L
Alachlor	NC	NC	ND(0.200)	NC	NC	ug/L
Aldrin	NC	NC	ND(0.200)	NC	NC	ug/L
alpha-BHC	NC	NC	ND(0.0500)	NC	NC	ug/L
alpha-Chlordane	NC	NC	ND(0.100)	NC	NC	ug/L
Atrazine	NC	NC	ND(10.0)	NC	NC	ug/L
Azinphos Ethyl	NC	ND(2.00)	NC	NC	NC	ug/L
Azinphos Methyl	NC	ND(1.00)	NC	NC	NC	ug/L
Benfluralin	NC	NC	ND(0.200)	NC	NC	ug/L
beta-BHC	NC	NC	ND(0.100)	NC	NC	ug/L
Bromacil	NC	NC	ND(1.00)	NC	NC	ug/L
Bromoxynil Octanoate	NC	NC	ND(0.500)	NC	NC	ug/L
Butachlor	NC	NC	ND(0.500)	NC	NC	ug/L
Captafol	NC	NC	ND(2.00)	NC	NC	ug/L
Captan	NC	NC	ND(1.00)	NC	NC	ug/L
Carbophenothion	NC	NC	ND(1.00)	NC	NC	ug/L
Chlorfenvinphos	NC	ND(2.00)	NC	NC	NC	ug/L
Chlorobenzilate	NC	NC	ND(1.00)	NC	NC	ug/L
Chloroneb	NC	NC	ND(1.00)	NC	NC	ug/L
Chloropropylate	NC	NC	ND(1.00)	NC	NC	ug/L
Chlorothalonil	NC	NC	ND(0.200)	NC	NC	ug/L
Chlorpyrifos	NC	ND(2.00)	NC	NC	NC	ug/L
cis-Permethrin	NC	NC	ND(2.00)	NC	NC	ug/L
Coumaphos	NC	ND(5.00)	NC	NC	NC	ug/L
Crotoxyphos	NC	ND(5.00)	NC	NC	NC	ug/L
Dacthal (DCPS)	NC	NC	ND(0.0500)	NC	NC	ug/L
DEF	NC	ND(2.00)	NC	NC	NC	ug/L
delta-BHC	NC	NC	ND(0.0500)	NC	NC	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Pesticides						
Demeton A	NC	ND(4.00)	NC	NC	NC	ug/L
Demeton B	NC	ND(4.00)	NC	NC	NC	ug/L
Diallate A	NC	NC	ND(2.00)	NC	NC	ug/L
Diallate B	NC	NC	ND(2.00)	NC	NC	ug/L
Diazinon	NC	ND(2.00)	NC	NC	NC	ug/L
Dichlofenthion	NC	ND(2.00)	NC	NC	NC	ug/L
Dichlone	NC	NC	ND(0.200)	NC	NC	ug/L
Dichlorvos	NC	ND(5.00)	NC	NC	NC	ug/L
Dicofol	NC	NC	ND(1.00)	NC	NC	ug/L
Dicrotophos	NC	ND(2.00)	NC	NC	NC	ug/L
Dieldrin	NC	NC	ND(0.0400)	NC	NC	ug/L
Dimethoate	NC	ND(2.00)	NC	NC	NC	ug/L
Dioxathion	NC	ND(5.00)	NC	NC	NC	ug/L
Disulfoton	NC	ND(2.00)	NC	NC	NC	ug/L
Endosulfan I	NC	NC	ND(0.100)	NC	NC	ug/L
Endosulfan II	NC	NC	ND(1.00)	NC	NC	ug/L
Endosulfan Sulfate	NC	NC	ND(0.100)	NC	NC	ug/L
Endrin	NC	NC	ND(0.200)	NC	NC	ug/L
Endrin Aldehyde	NC	NC	ND(0.100)	NC	NC	ug/L
Endrin Ketone	NC	NC	ND(0.100)	NC	NC	ug/L
EPN	NC	ND(2.00)	NC	NC	NC	ug/L
Ethalfluralin	NC	NC	ND(0.100)	NC	NC	ug/L
Ethion	NC	ND(2.00)	NC	NC	NC	ug/L
Ethoprop	NC	ND(2.00)	NC	NC	NC	ug/L
Etridiazole	NC	NC	ND(0.200)	NC	NC	ug/L
Famphur	NC	ND(5.00)	NC	NC	NC	ug/L
Fenarimol	NC	NC	ND(0.200)	NC	NC	ug/L
Fensulfothion	NC	ND(5.00)	NC	NC	NC	ug/L
Fenthion	NC	ND(2.00)	NC	NC	NC	ug/L
gamma-BHC	NC	NC	ND(0.0500)	NC	NC	ug/L
gamma-Chlordane	NC	NC	ND(0.0500)	NC	NC	ug/L
Heptachlor	NC	NC	ND(0.100)	NC	NC	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Pesticides						
Heptachlor Epoxide	NC	NC	ND(0.0500)	NC	NC	ug/L
Hexamethylphosphoramide	NC	ND(2.00)	NC	NC	NC	ug/L
Isodrin	NC	NC	ND(0.100)	NC	NC	ug/L
Isopropalin	NC	NC	ND(0.200)	NC	NC	ug/L
Kepone	NC	NC	ND(1.00)	NC	NC	ug/L
Leptophos	NC	ND(2.00)	NC	NC	NC	ug/L
Malathion	NC	ND(2.00)	NC	NC	NC	ug/L
Merphos A	NC	ND(2.00)	NC	NC	NC	ug/L
Merphos B	NC	ND(2.00)	NC	NC	NC	ug/L
Methamidophos	NC	ND(20.0)	NC	NC	NC	ug/L
Methoxychlor	NC	NC	ND(0.200)	NC	NC	ug/L
Methyl Parathion	NC	ND(2.00)	NC	NC	NC	ug/L
Methyl Trithion	NC	ND(5.00)	NC	NC	NC	ug/L
Metribuzin	NC	NC	ND(0.100)	NC	NC	ug/L
Mevinphos	NC	ND(5.00)	NC	NC	NC	ug/L
Mirex	NC	NC	ND(0.200)	NC	NC	ug/L
Monocrotophos	NC	ND(20.0)	NC	NC	NC	ug/L
Naled	NC	ND(2.00)	NC	NC	NC	ug/L
Nitrofen	NC	NC	ND(0.200)	NC	NC	ug/L
Norflurazon	NC	NC	EXCLUDE	NC	NC	ug/L
Parathion (ethyl)	NC	ND(2.00)	NC	NC	NC	ug/L
PCB 1016	NC	NC	ND(1.00)	NC	NC	ug/L
PCB 1221	NC	NC	ND(1.00)	NC	NC	ug/L
PCB 1232	NC	NC	ND(1.00)	NC	NC	ug/L
PCB 1242	NC	NC	ND(1.00)	NC	NC	ug/L
PCB 1248	NC	NC	ND(1.00)	NC	NC	ug/L
PCB 1254	NC	NC	ND(1.00)	NC	NC	ug/L
PCB 1260	NC	NC	ND(1.00)	NC	NC	ug/L
Pendamethalin	NC	NC	ND(0.500)	NC	NC	ug/L
Pentachloronitrobenzene (PCNB)	NC	NC	ND(0.0500)	NC	NC	ug/L
Perthane	NC	NC	ND(10.0)	NC	NC	ug/L
Phorate	NC	ND(2.00)	NC	NC	NC	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Pesticides						
Phosmet	NC	ND(5.00)	NC	NC	NC	ug/L
Phosphamidon E	NC	ND(1.00)	NC	NC	NC	ug/L
Phosphamidon Z	NC	ND(1.00)	NC	NC	NC	ug/L
Propachlor	NC	NC	ND(0.100)	NC	NC	ug/L
Propanil	NC	NC	ND(1.00)	NC	NC	ug/L
Propazine	NC	NC	ND(1.00)	NC	NC	ug/L
Ronnel	NC	ND(2.00)	NC	NC	NC	ug/L
Simazine	NC	NC	ND(0.100)	NC	NC	ug/L
Strobane	NC	NC	ND(5.00)	NC	NC	ug/L
Sulfotep	NC	ND(2.00)	NC	NC	NC	ug/L
Sulprofos	NC	ND(2.00)	NC	NC	NC	ug/L
Tepp	NC	ND(2.00)	NC	NC	NC	ug/L
Terbacil	NC	NC	ND(2.00)	NC	NC	ug/L
Terbufos	NC	ND(2.00)	NC	NC	NC	ug/L
Terbuthylazine	NC	NC	ND(5.00)	NC	NC	ug/L
Tetrachlorvinphos	NC	ND(2.00)	NC	NC	NC	ug/L
Tokuthion	NC	ND(2.00)	NC	NC	NC	ug/L
Toxaphene	NC	NC	ND(5.00)	NC	NC	ug/L
trans-Permethrin	NC	NC	ND(2.00)	NC	NC	ug/L
Triadimefon	NC	NC	ND(1.00)	NC	NC	ug/L
Trichlorfon	NC	ND(5.00)	NC	NC	NC	ug/L
Trichloronate	NC	ND(2.00)	NC	NC	NC	ug/L
Tricresylphosphate	NC	ND(20.0)	NC	NC	NC	ug/L
Trifluralin	NC	NC	ND(0.100)	NC	NC	ug/L
Trimethylphosphate	NC	ND(2.00)	NC	NC	NC	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Polychlorinated Biphenyls						
Decachloro biphenyl	ND(549)	NC	NC	NC	NC	pg/L
PCB-1	ND(220)	NC	NC	NC	NC	pg/L
PCB-2	ND(11.0)	NC	NC	NC	NC	pg/L
PCB-3	ND(220)	NC	NC	NC	NC	pg/L
PCB-4	ND(549)	NC	NC	NC	NC	pg/L
PCB-5	ND(54.9)	NC	NC	NC	NC	pg/L
PCB-6	60.0	NC	NC	NC	NC	pg/L
PCB-7	ND(54.9)	NC	NC	NC	NC	pg/L
PCB-8	ND(549)	NC	NC	NC	NC	pg/L
PCB-9	ND(54.9)	NC	NC	NC	NC	pg/L
PCB-10	ND(54.9)	NC	NC	NC	NC	pg/L
PCB-11	496	NC	NC	NC	NC	pg/L
PCB-12+PCB-13	ND(110)	NC	NC	NC	NC	pg/L
PCB-14	ND(110)	NC	NC	NC	NC	pg/L
PCB-15	ND(549)	NC	NC	NC	NC	pg/L
PCB-16	124	NC	NC	NC	NC	pg/L
PCB-17	ND(220)	NC	NC	NC	NC	pg/L
PCB-18+PCB-30	ND(549)	NC	NC	NC	NC	pg/L
PCB-19	ND(110)	NC	NC	NC	NC	pg/L
PCB-20+PCB-28	ND(549)	NC	NC	NC	NC	pg/L
PCB-21+PCB-33	230	NC	NC	NC	NC	pg/L
PCB-22	ND(220)	NC	NC	NC	NC	pg/L
PCB-23	ND(220)	NC	NC	NC	NC	pg/L
PCB-24	ND(220)	NC	NC	NC	NC	pg/L
PCB-25	ND(220)	NC	NC	NC	NC	pg/L
PCB-26+PCB-29	ND(220)	NC	NC	NC	NC	pg/L
PCB-27	ND(220)	NC	NC	NC	NC	pg/L
PCB-31	ND(549)	NC	NC	NC	NC	pg/L
PCB-32	ND(220)	NC	NC	NC	NC	pg/L
PCB-34	ND(220)	NC	NC	NC	NC	pg/L
PCB-35	ND(220)	NC	NC	NC	NC	pg/L
PCB-36	ND(220)	NC	NC	NC	NC	pg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Polychlorinated Biphenyls						
PCB-37	ND(549)	NC	NC	NC	NC	pg/L
PCB-38	ND(220)	NC	NC	NC	NC	pg/L
PCB-39	ND(220)	NC	NC	NC	NC	pg/L
PCB-40+PCB-41+PCB-71	ND(549)	NC	NC	NC	NC	pg/L
PCB-42	ND(220)	NC	NC	NC	NC	pg/L
PCB-43	ND(220)	NC	NC	NC	NC	pg/L
PCB-44+PCB-47+PCB-65	ND(549)	NC	NC	NC	NC	pg/L
PCB-45+PCB-51	ND(220)	NC	NC	NC	NC	pg/L
PCB-46	ND(220)	NC	NC	NC	NC	pg/L
PCB-48	ND(220)	NC	NC	NC	NC	pg/L
PCB-49+PCB-69	ND(549)	NC	NC	NC	NC	pg/L
PCB-50+PCB-53	ND(220)	NC	NC	NC	NC	pg/L
PCB-52	ND(549)	NC	NC	NC	NC	pg/L
PCB-54	ND(549)	NC	NC	NC	NC	pg/L
PCB-55	ND(549)	NC	NC	NC	NC	pg/L
PCB-56	ND(220)	NC	NC	NC	NC	pg/L
PCB-57	ND(549)	NC	NC	NC	NC	pg/L
PCB-58	ND(549)	NC	NC	NC	NC	pg/L
PCB-59+PCB-62+PCB-75	ND(220)	NC	NC	NC	NC	pg/L
PCB-60	ND(549)	NC	NC	NC	NC	pg/L
PCB-61+PCB-70+PCB-74+PCB-76	ND(549)	NC	NC	NC	NC	pg/L
PCB-63	ND(549)	NC	NC	NC	NC	pg/L
PCB-64	ND(220)	NC	NC	NC	NC	pg/L
PCB-66	ND(549)	NC	NC	NC	NC	pg/L
PCB-67	ND(549)	NC	NC	NC	NC	pg/L
PCB-68	ND(549)	NC	NC	NC	NC	pg/L
PCB-72	ND(549)	NC	NC	NC	NC	pg/L
PCB-73	ND(549)	NC	NC	NC	NC	pg/L
PCB-77	ND(549)	NC	NC	NC	NC	pg/L
PCB-78	ND(549)	NC	NC	NC	NC	pg/L
PCB-79	ND(549)	NC	NC	NC	NC	pg/L
PCB-80	ND(549)	NC	NC	NC	NC	pg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Polychlorinated Biphenyls						
PCB-81	ND(549)	NC	NC	NC	NC	pg/L
PCB-82	ND(549)	NC	NC	NC	NC	pg/L
PCB-83+PCB-99	ND(549)	NC	NC	NC	NC	pg/L
PCB-84	ND(549)	NC	NC	NC	NC	pg/L
PCB-85+PCB-116+PCB-117	ND(220)	NC	NC	NC	NC	pg/L
PCB-86+PCB-87+PCB-97+PCB-108+PCB-	ND(549)	NC	NC	NC	NC	pg/L
PCB-88+PCB-91	ND(549)	NC	NC	NC	NC	pg/L
PCB-89	ND(549)	NC	NC	NC	NC	pg/L
PCB-90+PCB-101+PCB-113	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-92	ND(549)	NC	NC	NC	NC	pg/L
PCB-93+PCB-95+PCB-98+PCB-100+PCB-	ND(549)	NC	NC	NC	NC	pg/L
PCB-94	ND(549)	NC	NC	NC	NC	pg/L
PCB-96	ND(549)	NC	NC	NC	NC	pg/L
PCB-103	ND(549)	NC	NC	NC	NC	pg/L
PCB-104	ND(549)	NC	NC	NC	NC	pg/L
PCB-105	ND(220)	NC	NC	NC	NC	pg/L
PCB-106	ND(549)	NC	NC	NC	NC	pg/L
PCB-107+PCB-124	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-109	ND(220)	NC	NC	NC	NC	pg/L
PCB-110+PCB-115	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-111	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-112	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-114	ND(549)	NC	NC	NC	NC	pg/L
PCB-118	ND(549)	NC	NC	NC	NC	pg/L
PCB-120	ND(549)	NC	NC	NC	NC	pg/L
PCB-121	ND(549)	NC	NC	NC	NC	pg/L
PCB-122	ND(549)	NC	NC	NC	NC	pg/L
PCB-123	ND(549)	NC	NC	NC	NC	pg/L
PCB-126	ND(549)	NC	NC	NC	NC	pg/L
PCB-127	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-128+PCB-166	ND(549)	NC	NC	NC	NC	pg/L
PCB-129+PCB-138+PCB-160+PCB-163	ND(549)	NC	NC	NC	NC	pg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Polychlorinated Biphenyls						
PCB-130	ND(549)	NC	NC	NC	NC	pg/L
PCB-131	ND(549)	NC	NC	NC	NC	pg/L
PCB-132	ND(549)	NC	NC	NC	NC	pg/L
PCB-133	ND(549)	NC	NC	NC	NC	pg/L
PCB-134+PCB-143	ND(549)	NC	NC	NC	NC	pg/L
PCB-135+PCB-151+PCB-154	ND(549)	NC	NC	NC	NC	pg/L
PCB-136	ND(220)	NC	NC	NC	NC	pg/L
PCB-137	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-139+PCB-140	ND(549)	NC	NC	NC	NC	pg/L
PCB-141	ND(220)	NC	NC	NC	NC	pg/L
PCB-142	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-144	ND(549)	NC	NC	NC	NC	pg/L
PCB-145	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-146	ND(549)	NC	NC	NC	NC	pg/L
PCB-147+PCB-149	ND(549)	NC	NC	NC	NC	pg/L
PCB-148	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-150	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-152	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-153+PCB-168	610	NC	NC	NC	NC	pg/L
PCB-155	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-156+PCB-157	ND(549)	NC	NC	NC	NC	pg/L
PCB-158	ND(220)	NC	NC	NC	NC	pg/L
PCB-159	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-161	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-162	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-164	ND(549)	NC	NC	NC	NC	pg/L
PCB-165	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-167	ND(549)	NC	NC	NC	NC	pg/L
PCB-169	ND(549)	NC	NC	NC	NC	pg/L
PCB-170	ND(549)	NC	NC	NC	NC	pg/L
PCB-171+PCB-173	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-172	ND(1,100)	NC	NC	NC	NC	pg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Polychlorinated Biphenyls						
PCB-174	ND(549)	NC	NC	NC	NC	pg/L
PCB-175	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-176	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-177	ND(549)	NC	NC	NC	NC	pg/L
PCB-178	ND(549)	NC	NC	NC	NC	pg/L
PCB-179	ND(549)	NC	NC	NC	NC	pg/L
PCB-180+PCB-193	ND(549)	NC	NC	NC	NC	pg/L
PCB-181	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-182	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-183+PCB-185	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-184	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-186	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-187	ND(549)	NC	NC	NC	NC	pg/L
PCB-188	ND(549)	NC	NC	NC	NC	pg/L
PCB-189	ND(549)	NC	NC	NC	NC	pg/L
PCB-190	ND(549)	NC	NC	NC	NC	pg/L
PCB-191	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-192	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-194	ND(549)	NC	NC	NC	NC	pg/L
PCB-195	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-196	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-197+PCB-200	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-198+PCB-199	ND(549)	NC	NC	NC	NC	pg/L
PCB-201	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-202	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-203	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-204	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-205	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-206	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-207	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-208	ND(1,100)	NC	NC	NC	NC	pg/L
PCB-209	ND(549)	NC	NC	NC	NC	pg/L

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Appendix A-2
(continued)
Analytical Results, Except Microbiologicals
Holland America Veendam

SP-6, Influent to Wastewater Treatment System	Day 1 65219	Day 2 65223	Day 3 65227	Day 4 65231	Day 5 65235	Unit
Polychlorinated Biphenyls						
Total Dichloro Biphenyls	556	NC	NC	NC	NC	pg/L
Total Heptachloro Biphenyls	ND(1,100)	NC	NC	NC	NC	pg/L
Toal Hexachloro Biphenyls	610	NC	NC	NC	NC	pg/L
Total Monochloro Biphenyls	ND(220)	NC	NC	NC	NC	pg/L
Total Nonachloro Biphenyls	ND(1,100)	NC	NC	NC	NC	pg/L
Total Octachloro Biphenyls	ND(1,100)	NC	NC	NC	NC	pg/L
Total PCBs	1,520	NC	NC	NC	NC	pg/L
Total Pentachloro Biphenyls	ND(1,100)	NC	NC	NC	NC	pg/L
Total Tetrachloro Biphenyls	ND(549)	NC	NC	NC	NC	pg/L
Total Trichloro Biphenyls	354	NC	NC	NC	NC	pg/L

EXCLUDE - Data excluded from the data set (see data review narratives in Appendix D for details).
NC - Not collected.
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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 3	Day 4	Unit
SP-7, Duplicate of Influent to Wastewater Treatment System	**65228**	**65232**	
Classical Pollutants			
Hexane Extractable Material (HEM)	131	174	mg/L
Silica Gel Treated HEM (SGT-HEM)	21.0	17.0	mg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-7, Duplicate of Influent to Wastewater Treatment System	Day 2 65239	Day 3 65240	Unit
Pesticides			
1,2-Dibromo-3-chloropropane	NC	ND(0.200)	ug/L
4,4'-DDD	NC	ND(0.200)	ug/L
4,4'-DDE	NC	ND(0.100)	ug/L
4,4'-DDT	NC	ND(0.100)	ug/L
Acephate	NC	ND(20.0)	ug/L
Alachlor	NC	ND(0.200)	ug/L
Aldrin	NC	ND(0.200)	ug/L
alpha-BHC	NC	ND(0.0500)	ug/L
alpha-Chlordane	NC	ND(0.100)	ug/L
Atrazine	NC	ND(10.0)	ug/L
Azinphos Ethyl	ND(2.00)	NC	ug/L
Azinphos Methyl	ND(1.00)	NC	ug/L
Benfluralin	NC	ND(0.200)	ug/L
beta-BHC	NC	ND(0.100)	ug/L
Bromacil	NC	ND(1.00)	ug/L
Bromoxynil Octanoate	NC	ND(0.500)	ug/L
Butachlor	NC	ND(0.500)	ug/L
Captafol	NC	ND(2.00)	ug/L
Captan	NC	ND(1.00)	ug/L
Carbophenothion	NC	ND(1.00)	ug/L
Chlorfenvinphos	ND(2.00)	NC	ug/L
Chlorobenzilate	NC	ND(1.00)	ug/L
Chloroneb	NC	ND(1.00)	ug/L
Chloropropylate	NC	ND(1.00)	ug/L
Chlorothalonil	NC	ND(0.200)	ug/L
Chlorpyrifos	ND(2.00)	NC	ug/L
cis-Permethrin	NC	ND(2.00)	ug/L
Coumaphos	ND(5.00)	NC	ug/L
Crotoxyphos	ND(5.00)	NC	ug/L
Dacthal (DCPS)	NC	ND(0.0500)	ug/L
DEF	ND(2.00)	NC	ug/L
delta-BHC	NC	ND(0.0500)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-7, Duplicate of Influent to Wastewater Treatment System	Day 2 65239	Day 3 65240	Unit
Pesticides			
Demeton A	ND(4.00)	NC	ug/L
Demeton B	ND(4.00)	NC	ug/L
Diallate A	NC	ND(2.00)	ug/L
Diallate B	NC	ND(2.00)	ug/L
Diazinon	ND(2.00)	NC	ug/L
Dichlofenthion	ND(2.00)	NC	ug/L
Dichlone	NC	ND(0.200)	ug/L
Dichlorvos	ND(5.00)	NC	ug/L
Dicofol	NC	ND(1.00)	ug/L
Dicrotophos	ND(2.00)	NC	ug/L
Dieldrin	NC	ND(0.0400)	ug/L
Dimethoate	ND(2.00)	NC	ug/L
Dioxathion	ND(5.00)	NC	ug/L
Disulfoton	ND(2.00)	NC	ug/L
Endosulfan I	NC	ND(0.100)	ug/L
Endosulfan II	NC	ND(1.00)	ug/L
Endosulfan Sulfate	NC	ND(0.100)	ug/L
Endrin	NC	ND(0.200)	ug/L
Endrin Aldehyde	NC	ND(0.100)	ug/L
Endrin Ketone	NC	ND(0.100)	ug/L
EPN	ND(2.00)	NC	ug/L
Ethalfluralin	NC	ND(0.100)	ug/L
Ethion	ND(2.00)	NC	ug/L
Ethoprop	ND(2.00)	NC	ug/L
Etridiazole	NC	ND(0.200)	ug/L
Famphur	ND(5.00)	NC	ug/L
Fenarimol	NC	ND(0.200)	ug/L
Fensulfothion	ND(5.00)	NC	ug/L
Fenthion	ND(2.00)	NC	ug/L
gamma-BHC	NC	ND(0.0500)	ug/L
gamma-Chlordane	NC	ND(0.0500)	ug/L
Heptachlor	NC	ND(0.100)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-7, Duplicate of Influent to Wastewater Treatment System	Day 2 65239	Day 3 65240	Unit
Pesticides			
Heptachlor Epoxide	NC	ND(0.0500)	ug/L
Hexamethylphosphoramide	ND(2.00)	NC	ug/L
Isodrin	NC	ND(0.100)	ug/L
Isopropalin	NC	ND(0.200)	ug/L
Kepone	NC	EXCLUDE	ug/L
Leptophos	ND(2.00)	NC	ug/L
Malathion	ND(2.00)	NC	ug/L
Merphos A	ND(2.00)	NC	ug/L
Merphos B	ND(2.00)	NC	ug/L
Methamidophos	ND(20.0)	NC	ug/L
Methoxychlor	NC	ND(0.200)	ug/L
Methyl Parathion	ND(2.00)	NC	ug/L
Methyl Trithion	ND(5.00)	NC	ug/L
Metribuzin	NC	ND(0.100)	ug/L
Mevinphos	ND(5.00)	NC	ug/L
Mirex	NC	ND(0.200)	ug/L
Monocrotophos	ND(20.0)	NC	ug/L
Naled	ND(2.00)	NC	ug/L
Nitrofen	NC	ND(0.200)	ug/L
Norflurazon	NC	EXCLUDE	ug/L
Parathion (ethyl)	ND(2.00)	NC	ug/L
PCB 1016	NC	ND(1.00)	ug/L
PCB 1221	NC	ND(1.00)	ug/L
PCB 1232	NC	ND(1.00)	ug/L
PCB 1242	NC	ND(1.00)	ug/L
PCB 1248	NC	ND(1.00)	ug/L
PCB 1254	NC	ND(1.00)	ug/L
PCB 1260	NC	ND(1.00)	ug/L
Pendamethalin	NC	ND(0.500)	ug/L
Pentachloronitrobenzene (PCNB)	NC	ND(0.0500)	ug/L
Perthane	NC	ND(10.0)	ug/L
Phorate	ND(2.00)	NC	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-7, Duplicate of Influent to Wastewater Treatment System	Day 2 65239	Day 3 65240	Unit
Pesticides			
Phosmet	ND(5.00)	NC	ug/L
Phosphamidon E	ND(1.00)	NC	ug/L
Phosphamidon Z	ND(1.00)	NC	ug/L
Propachlor	NC	ND(0.100)	ug/L
Propanil	NC	ND(1.00)	ug/L
Propazine	NC	ND(1.00)	ug/L
Ronnel	ND(2.00)	NC	ug/L
Simazine	NC	ND(8.00)	ug/L
Strobane	NC	ND(5.00)	ug/L
Sulfotep	ND(2.00)	NC	ug/L
Sulprofos	ND(2.00)	NC	ug/L
Tepp	ND(2.00)	NC	ug/L
Terbacil	NC	ND(2.00)	ug/L
Terbufos	ND(2.00)	NC	ug/L
Terbuthylazine	NC	ND(5.00)	ug/L
Tetrachlorvinphos	ND(2.00)	NC	ug/L
Tokuthion	ND(2.00)	NC	ug/L
Toxaphene	NC	ND(5.00)	ug/L
trans-Permethrin	NC	ND(2.00)	ug/L
Triadimefon	NC	ND(1.00)	ug/L
Trichlorfon	ND(5.00)	NC	ug/L
Trichloronate	ND(2.00)	NC	ug/L
Tricresylphosphate	ND(20.0)	NC	ug/L
Trifluralin	NC	ND(0.100)	ug/L
Trimethylphosphate	ND(2.00)	NC	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-9, Effluent from Wastewater Treatment	Day 1 65261	Day 2 65265	Day 3 65269	Day 4 65273	Day 5 65277	Unit
Classical Pollutants						
Alkalinity	222	261	252	244	242	mg/L
Ammonia As Nitrogen (NH3-N)	11.0	12.0	12.0	28.0	29.0	mg/L
Available Cyanide	ND(2.00)	5.86	ND(2.00)	ND(2.00)	2.01	ug/L
Biochemical Oxygen Demand (BOD)	3.64	5.95	ND(2.00)	2.05	2.24	mg/L
Chemical Oxygen Demand (COD)	34.0	37.0	34.0	38.0	39.0	mg/L
Chloride	60.0	68.0	70.0	68.0	64.0	mg/L
Hardness	24.4	36.0	40.4	45.1	45.3	mg/L
Hexane Extractable Material (HEM)	ND(5.00)	ND(6.00)	ND(5.00)	ND(5.00)	ND(6.00)	mg/L
Nitrate/Nitrite (NO2 + NO3-N)	ND(0.0500)	0.120	0.110	ND(0.0500)	ND(0.0500)	mg/L
Settleable residue	ND(0.100)	ND(0.130)	ND(0.110)	ND(0.110)	1.00	mL/L
Silica Gel Treated HEM (SGT-HEM)	ND(5.00)	ND(6.00)	ND(5.00)	ND(5.00)	ND(6.00)	mg/L
Sulfate	ND(3.00)	4.00	9.00	18.0	15.0	mg/L
P121 Total Cyanide	ND(0.00500)	ND(0.00500)	ND(0.00500)	ND(0.00500)	ND(0.00500)	mg/L
Total Dissolved Solids (TDS)	323	385	354	318	309	mg/L
Total Kjeldahl Nitrogen (TKN)	12.0	13.0	22.0	29.0	29.0	mg/L
Total Organic Carbon (TOC)	13.0	16.0	14.0	15.0	14.0	mg/L
Total Phosphorus	0.210	0.120	0.130	9.00	7.00	mg/L
Total Suspended Solids (TSS)	ND(5.00)	ND(5.00)	ND(5.00)	ND(5.00)	ND(5.00)	mg/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-9, Effluent from Wastewater Treatment	Day 1 65261	Day 2 65265	Day 3 65269	Day 4 65273	Day 5 65277	Unit
Total and Dissolved Metals						
Aluminum	36.8	43.6	28.4	40.3	40.0	ug/L
P114 Antimony	ND(5.97)	ND(5.97)	ND(5.97)	ND(5.97)	ND(5.97)	ug/L
P115 Arsenic	ND(2.32)	ND(2.32)	ND(2.32)	ND(2.32)	ND(2.32)	ug/L
Barium	16.2	24.7	25.7	18.6	14.6	ug/L
P117 Beryllium	ND(0.0540)	ND(0.0540)	ND(0.0540)	ND(0.0540)	ND(0.0540)	ug/L
Boron	ND(3.37)	ND(3.37)	ND(3.37)	ND(3.37)	ND(3.37)	ug/L
P118 Cadmium	ND(0.446)	ND(0.446)	ND(0.446)	ND(0.446)	ND(0.446)	ug/L
Calcium	7,290	11,300	12,900	14,200	14,100	ug/L
P119 Chromium	ND(1.68)	ND(1.68)	ND(1.68)	ND(1.68)	ND(1.68)	ug/L
Cobalt	ND(0.914)	ND(0.914)	ND(0.914)	ND(0.914)	ND(0.914)	ug/L
P120 Copper	10.1	11.8	9.00	6.90	6.90	ug/L
Iron	376	296	364	283	171	ug/L
P122 Lead	ND(3.08)	ND(3.08)	ND(3.08)	ND(3.08)	ND(3.08)	ug/L
Magnesium	1,500	1,900	1,990	2,350	2,460	ug/L
Manganese	12.3	16.2	18.0	18.4	15.8	ug/L
P123 Mercury	ND(0.0170)	ND(0.0170)	ND(0.0170)	0.320	0.320	ug/L
Molybdenum	ND(1.50)	ND(1.50)	ND(1.50)	ND(1.50)	ND(1.50)	ug/L
P124 Nickel	23.9	18.3	14.2	11.8	8.00	ug/L
P125 Selenium	ND(0.572)	0.840	0.720	0.830	0.970	ug/L
P126 Silver	ND(1.28)	ND(1.28)	ND(1.28)	ND(1.28)	ND(1.28)	ug/L
Sodium	94,800	107,000	88,700	74,600	69,600	ug/L
P127 Thallium	ND(0.00900)	0.0100	ND(0.00900)	ND(0.00900)	ND(0.00900)	ug/L
Tin	ND(3.45)	ND(3.45)	ND(3.45)	ND(3.45)	ND(3.45)	ug/L
Titanium	ND(0.253)	ND(0.253)	ND(0.253)	ND(0.253)	ND(0.253)	ug/L
Vanadium	ND(0.679)	ND(0.679)	ND(0.679)	ND(0.679)	ND(0.679)	ug/L
Yttrium	ND(0.222)	ND(0.222)	ND(0.222)	ND(0.222)	ND(0.222)	ug/L
P128 Zinc	553	562	320	196	162	ug/L
Aluminum, Dissolved	33.1	41.9	34.3	38.6	34.6	ug/L
P114 Antimony, Dissolved	ND(5.97)	ND(5.97)	ND(5.97)	ND(5.97)	ND(5.97)	ug/L
P115 Arsenic, Dissolved	ND(2.32)	ND(2.32)	ND(2.32)	ND(2.32)	ND(2.32)	ug/L
Barium, Dissolved	15.4	24.5	26.3	18.2	14.5	ug/L
P117 Beryllium, Dissolved	ND(0.0540)	ND(0.0540)	ND(0.0540)	ND(0.0540)	ND(0.0540)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-9, Effluent from Wastewater Treatment	Day 1 65261	Day 2 65265	Day 3 65269	Day 4 65273	Day 5 65277	Unit
Total and Dissolved Metals						
Boron, Dissolved	ND(3.37)	ND(3.37)	ND(3.37)	ND(3.37)	20.7	ug/L
P118 Cadmium, Dissolved	ND(0.446)	ND(0.446)	ND(0.446)	ND(0.446)	ND(0.446)	ug/L
Calcium, Dissolved	7,100	11,200	13,200	14,000	14,000	ug/L
P119 Chromium, Dissolved	ND(1.68)	ND(1.68)	ND(1.68)	ND(1.68)	ND(1.68)	ug/L
Cobalt, Dissolved	1.00	ND(0.914)	ND(0.914)	ND(0.914)	1.50	ug/L
P120 Copper, Dissolved	8.70	11.0	7.20	5.60	7.50	ug/L
Iron, Dissolved	354	296	363	266	152	ug/L
P122 Lead, Dissolved	ND(3.08)	ND(3.08)	ND(3.08)	ND(3.08)	ND(3.08)	ug/L
Magnesium, Dissolved	1,460	1,880	2,050	2,320	2,440	ug/L
Manganese, Dissolved	14.2	16.1	19.1	19.4	18.3	ug/L
P123 Mercury, Dissolved	0.250	0.270	0.270	0.360	0.390	ug/L
Molybdenum, Dissolved	ND(1.50)	ND(1.50)	ND(1.50)	ND(1.50)	ND(1.50)	ug/L
P124 Nickel, Dissolved	23.6	18.8	14.8	11.7	8.40	ug/L
P125 Selenium, Dissolved	ND(0.572)	0.720	0.810	0.700	0.900	ug/L
P126 Silver, Dissolved	ND(1.28)	ND(1.28)	ND(1.28)	ND(1.28)	ND(1.28)	ug/L
Sodium, Dissolved	91,400	105,000	90,600	73,500	69,700	ug/L
P127 Thallium, Dissolved	ND(0.00900)	ND(0.00900)	ND(0.00900)	ND(0.00900)	ND(0.00900)	ug/L
Tin, Dissolved	ND(3.45)	ND(3.45)	ND(3.45)	ND(3.45)	ND(3.45)	ug/L
Titanium, Dissolved	ND(0.253)	ND(0.253)	0.340	ND(0.253)	ND(0.253)	ug/L
Vanadium, Dissolved	ND(0.679)	0.760	ND(0.679)	ND(0.679)	ND(0.679)	ug/L
Yttrium, Dissolved	ND(0.222)	ND(0.222)	ND(0.222)	ND(0.222)	ND(0.222)	ug/L
P128 Zinc, Dissolved	536	553	329	191	164	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-9, Effluent from Wastewater Treatment	Day 1 65261	Day 2 65265	Day 3 65269	Day 4 65273	Day 5 65277	Unit
Volatile and Semivolatile Organics						
P011 1,1,1-Trichloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P015 1,1,2,2-Tetrachloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P014 1,1,2-Trichloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P013 1,1-Dichloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P029 1,1-Dichloroethene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P008 1,2,4-Trichlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P025 1,2-Dichlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P010 1,2-Dichloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P032 1,2-Dichloropropane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P026 1,3-Dichlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P027 1,4-Dichlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P021 2,4,6-Trichlorophenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P031 2,4-Dichlorophenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P034 2,4-Dimethylphenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P059 2,4-Dinitrophenol	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
P035 2,4-Dinitrotoluene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P036 2,6-Dinitrotoluene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P019 2-Chloroethylvinyl Ether	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
P020 2-Chloronaphthalene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P024 2-Chlorophenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P057 2-Nitrophenol	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P028 3,3'-Dichlorobenzidine	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
4,6-Dinitro-2-methylphenol	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
4-Bromophenyl-phenylether	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P022 4-Chloro-3-methylphenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
4-Chlorophenyl-phenylether	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P058 4-Nitrophenol	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
P001 Acenaphthene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P077 Acenaphthylene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P078 Anthracene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P004 Benzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P005 Benzidine	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L

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Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-9, Effluent from Wastewater Treatment	Day 1 65261	Day 2 65265	Day 3 65269	Day 4 65273	Day 5 65277	Unit
Volatile and Semivolatile Organics						
P072 Benzo(a)anthracene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P073 Benzo(a)pyrene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P074 Benzo(b)fluoranthene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Benzo(g,h,i)perylene	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P075 Benzo(k)fluoranthene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P043 Bis(2-chloroethoxy)methane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
bis(-2-Chloroethyl)ether	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P042 Bis(2-chloroisopropyl) Ether	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P066 Bis(2-ethylhexyl) Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P048 Bromodichloromethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Bromoform	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P046 Bromomethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P067 Butyl Benzyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Carbon tetrachloride	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P007 Chlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P016 Chloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P023 Chloroform	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P045 Chloromethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P076 Chrysene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
cis-1,3-Dichloropropene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Dibenz(a,h)anthracene	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P051 Dibromochloromethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P070 Diethyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P071 Dimethyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P068 Di-n-butyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P069 Di-n-octyl Phthalate	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P038 Ethylbenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P039 Fluoranthene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P080 Fluorene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P009 Hexachlorobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P052 Hexachlorobutadiene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P053 Hexachlorocyclopentadiene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-9, Effluent from Wastewater Treatment	Day 1 65261	Day 2 65265	Day 3 65269	Day 4 65273	Day 5 65277	Unit
Volatile and Semivolatile Organics						
P012 Hexachloroethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P083 Indeno(1,2,3-cd)pyrene	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P054 Isophorone	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P044 Methylene Chloride	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P055 Naphthalene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P056 Nitrobenzene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P061 N-Nitrosodimethylamine	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
N-Nitroso-di-n-propylamine	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P062 N-Nitrosodiphenylamine	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ND(20.0)	ug/L
P064 Pentachlorophenol	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ND(50.0)	ug/L
P081 Phenanthrene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P065 Phenol	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P084 Pyrene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P085 Tetrachloroethene	10.4	21.7	39.4	26.5	45.1	ug/L
P086 Toluene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P030 trans-1,2-Dichloroethene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P033 trans-1,3-Dichloropropene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P087 Trichloroethene	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
Trichlorofluoromethane	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L
P088 Vinyl Chloride	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-10, Duplicate of Effluent from Wastewater Treatment System	Day 3 65270	Day 4 65274	Day 5 65278	Unit
Classical Pollutants				
Hexane Extractable Material (HEM)	ND(5.00)	ND(6.00)	ND(6.00)	mg/L
Silica Gel Treated HEM (SGT-HEM)	ND(5.00)	ND(6.00)	ND(6.00)	mg/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-10, Duplicate of Effluent from Wastewater Treatment System	Day 1 65281	Day 2 65283	Day 3 65285	Day 4 65287	Day 5 65289	Unit
Classical Pollutants						
Alkalinity	222	269	NC	NC	NC	mg/L
Ammonia As Nitrogen (NH3-N)	11.0	NC	NC	NC	29.0	mg/L
Available Cyanide	8.96	ND(2.00)	NC	NC	NC	ug/L
Biochemical Oxygen Demand (BOD)	NC	NC	ND(2.00)	NC	2.49	mg/L
Chemical Oxygen Demand (COD)	33.0	NC	NC	NC	46.0	mg/L
Chloride	62.0	66.0	NC	NC	NC	mg/L
Hardness	24.0	NC	40.7	NC	NC	mg/L
Nitrate/Nitrite (NO2 + NO3-N)	ND(0.0500)	NC	NC	NC	ND(0.0500)	mg/L
Settleable residue	NC	NC	NC	ND(0.110)	ND(0.110)	mL/L
Sulfate	ND(3.00)	4.00	NC	NC	NC	mg/L
P121 Total Cyanide	ND(0.00500)	ND(0.00500)	NC	NC	NC	mg/L
Total Dissolved Solids (TDS)	324	386	NC	NC	NC	mg/L
Total Kjeldahl Nitrogen (TKN)	56.0	NC	NC	NC	28.0	mg/L
Total Organic Carbon (TOC)	12.0	NC	NC	NC	12.0	mg/L
Total Phosphorus	0.170	NC	NC	NC	8.00	mg/L
Total Suspended Solids (TSS)	ND(5.00)	ND(5.00)	NC	NC	NC	mg/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-10, Duplicate of Effluent from Wastewater Treatment System	Day 1 65281	Day 2 65283	Day 3 65285	Day 4 65287	Day 5 65289	Unit
Total and Dissolved Metals						
Aluminum	29.4	NC	63.9	NC	NC	ug/L
P114 Antimony	ND(5.97)	NC	ND(5.97)	NC	NC	ug/L
P115 Arsenic	ND(2.32)	NC	ND(2.32)	NC	NC	ug/L
Barium	15.8	NC	25.8	NC	NC	ug/L
P117 Beryllium	ND(0.0540)	NC	ND(0.0540)	NC	NC	ug/L
Boron	ND(3.37)	NC	ND(3.37)	NC	NC	ug/L
P118 Cadmium	ND(0.446)	NC	ND(0.446)	NC	NC	ug/L
Calcium	7,190	NC	13,000	NC	NC	ug/L
P119 Chromium	ND(1.68)	NC	ND(1.68)	NC	NC	ug/L
Cobalt	ND(0.914)	NC	ND(0.914)	NC	NC	ug/L
P120 Copper	11.0	NC	8.40	NC	NC	ug/L
Iron	375	NC	369	NC	NC	ug/L
P122 Lead	ND(3.08)	NC	ND(3.08)	NC	NC	ug/L
Magnesium	1,470	NC	2,010	NC	NC	ug/L
Manganese	12.1	NC	18.2	NC	NC	ug/L
P123 Mercury	ND(0.0170)	NC	0.310	NC	NC	ug/L
Molybdenum	ND(1.50)	NC	ND(1.50)	NC	NC	ug/L
P124 Nickel	23.7	NC	15.0	NC	NC	ug/L
P125 Selenium	0.600	NC	0.640	NC	NC	ug/L
P126 Silver	ND(1.28)	NC	ND(1.28)	NC	NC	ug/L
Sodium	92,300	NC	89,400	NC	NC	ug/L
P127 Thallium	ND(0.00900)	NC	ND(0.00900)	NC	NC	ug/L
Tin	ND(3.45)	NC	ND(3.45)	NC	NC	ug/L
Titanium	ND(0.253)	NC	ND(0.253)	NC	NC	ug/L
Vanadium	ND(0.679)	NC	ND(0.679)	NC	NC	ug/L
Yttrium	ND(0.222)	NC	ND(0.222)	NC	NC	ug/L
P128 Zinc	545	NC	346	NC	NC	ug/L
Aluminum, Dissolved	36.2	NC	40.0	NC	NC	ug/L
P114 Antimony, Dissolved	ND(5.97)	NC	ND(5.97)	NC	NC	ug/L
P115 Arsenic, Dissolved	ND(2.32)	NC	ND(2.32)	NC	NC	ug/L
Barium, Dissolved	15.7	NC	25.2	NC	NC	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-10, Duplicate of Effluent from Wastewater Treatment System	Day 1 65281	Day 2 65283	Day 3 65285	Day 4 65287	Day 5 65289	Unit
Total and Dissolved Metals						
Boron, Dissolved	ND(3.37)	NC	ND(3.37)	NC	NC	ug/L
P118 Cadmium, Dissolved	ND(0.446)	NC	ND(0.446)	NC	NC	ug/L
Calcium, Dissolved	7,070	NC	12,700	NC	NC	ug/L
P119 Chromium, Dissolved	ND(1.68)	NC	ND(1.68)	NC	NC	ug/L
Cobalt, Dissolved	ND(0.914)	NC	ND(0.914)	NC	NC	ug/L
P120 Copper, Dissolved	8.70	NC	7.20	NC	NC	ug/L
Iron, Dissolved	358	NC	351	NC	NC	ug/L
P122 Lead, Dissolved	ND(3.08)	NC	ND(3.08)	NC	NC	ug/L
Magnesium, Dissolved	1,460	NC	1,980	NC	NC	ug/L
Manganese, Dissolved	12.5	NC	19.5	NC	NC	ug/L
P123 Mercury, Dissolved	0.290	NC	0.390	NC	NC	ug/L
Molybdenum, Dissolved	ND(1.50)	NC	ND(1.50)	NC	NC	ug/L
P124 Nickel, Dissolved	23.3	NC	15.0	NC	NC	ug/L
P125 Selenium, Dissolved	0.640	NC	0.800	NC	NC	ug/L
P126 Silver, Dissolved	ND(1.28)	NC	ND(1.28)	NC	NC	ug/L
Sodium, Dissolved	90,900	NC	87,300	NC	NC	ug/L
P127 Thallium, Dissolved	ND(0.00900)	NC	ND(0.00900)	NC	NC	ug/L
Tin, Dissolved	ND(3.45)	NC	ND(3.45)	NC	NC	ug/L
Titanium, Dissolved	0.380	NC	ND(0.253)	NC	NC	ug/L
Vanadium, Dissolved	ND(0.679)	NC	ND(0.679)	NC	NC	ug/L
Yttrium, Dissolved	ND(0.222)	NC	ND(0.222)	NC	NC	ug/L
P128 Zinc, Dissolved	532	NC	316	NC	NC	ug/L

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ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-10, Duplicate of Effluent from Wastewater Treatment System	Day 1 65281	Day 2 65283	Day 3 65285	Day 4 65287	Day 5 65289	Unit
Volatile and Semivolatile Organics						
P011 1,1,1-Trichloroethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P015 1,1,2,2-Tetrachloroethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P014 1,1,2-Trichloroethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P013 1,1-Dichloroethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P029 1,1-Dichloroethene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P008 1,2,4-Trichlorobenzene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P025 1,2-Dichlorobenzene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P010 1,2-Dichloroethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P032 1,2-Dichloropropane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P026 1,3-Dichlorobenzene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P027 1,4-Dichlorobenzene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P021 2,4,6-Trichlorophenol	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P031 2,4-Dichlorophenol	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P034 2,4-Dimethylphenol	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P059 2,4-Dinitrophenol	NC	ND(50.0)	NC	NC	ND(50.0)	ug/L
P035 2,4-Dinitrotoluene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P036 2,6-Dinitrotoluene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P019 2-Chloroethylvinyl Ether	NC	ND(50.0)	ND(50.0)	NC	NC	ug/L
P020 2-Chloronaphthalene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P024 2-Chlorophenol	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P057 2-Nitrophenol	NC	ND(20.0)	NC	NC	ND(20.0)	ug/L
P028 3,3'-Dichlorobenzidine	NC	ND(50.0)	NC	NC	ND(50.0)	ug/L
4,6-Dinitro-2-methylphenol	NC	ND(20.0)	NC	NC	ND(20.0)	ug/L
4-Bromophenyl-phenylether	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P022 4-Chloro-3-methylphenol	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
4-Chlorophenyl-phenylether	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P058 4-Nitrophenol	NC	ND(50.0)	NC	NC	ND(50.0)	ug/L
P001 Acenaphthene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P077 Acenaphthylene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P078 Anthracene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P004 Benzene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P005 Benzidine	NC	ND(50.0)	NC	NC	ND(50.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-10, Duplicate of Effluent from Wastewater Treatment System	Day 1 65281	Day 2 65283	Day 3 65285	Day 4 65287	Day 5 65289	Unit
Volatile and Semivolatile Organics						
P072 Benzo(a)anthracene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P073 Benzo(a)pyrene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P074 Benzo(b)fluoranthene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
Benzo(g,h,i)perylene	NC	ND(20.0)	NC	NC	ND(20.0)	ug/L
P075 Benzo(k)fluoranthene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P043 Bis(2-chloroethoxy)methane	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
bis(-2-Chloroethyl)ether	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P042 Bis(2-chloroisopropyl) Ether	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P066 Bis(2-ethylhexyl) Phthalate	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P048 Bromodichloromethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
Bromoform	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P046 Bromomethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P067 Butyl Benzyl Phthalate	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
Carbon tetrachloride	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P007 Chlorobenzene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P016 Chloroethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P023 Chloroform	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P045 Chloromethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P076 Chrysene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
cis-1,3-Dichloropropene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
Dibenz(a,h)anthracene	NC	ND(20.0)	NC	NC	ND(20.0)	ug/L
P051 Dibromochloromethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P070 Diethyl Phthalate	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P071 Dimethyl Phthalate	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P068 Di-n-butyl Phthalate	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P069 Di-n-octyl Phthalate	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P038 Ethylbenzene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P039 Fluoranthene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P080 Fluorene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P009 Hexachlorobenzene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P052 Hexachlorobutadiene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P053 Hexachlorocyclopentadiene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-10, Duplicate of Effluent from Wastewater Treatment System	Day 1 65281	Day 2 65283	Day 3 65285	Day 4 65287	Day 5 65289	Unit
Volatile and Semivolatile Organics						
P012 Hexachloroethane	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P083 Indeno(1,2,3-cd)pyrene	NC	ND(20.0)	NC	NC	ND(20.0)	ug/L
P054 Isophorone	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P044 Methylene Chloride	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P055 Naphthalene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P056 Nitrobenzene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P061 N-Nitrosodimethylamine	NC	ND(50.0)	NC	NC	ND(50.0)	ug/L
N-Nitroso-di-n-propylamine	NC	ND(20.0)	NC	NC	ND(20.0)	ug/L
P062 N-Nitrosodiphenylamine	NC	ND(20.0)	NC	NC	ND(20.0)	ug/L
P064 Pentachlorophenol	NC	ND(50.0)	NC	NC	ND(50.0)	ug/L
P081 Phenanthrene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P065 Phenol	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P084 Pyrene	NC	ND(10.0)	NC	NC	ND(10.0)	ug/L
P085 Tetrachloroethene	NC	53.0	56.0	NC	NC	ug/L
P086 Toluene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P030 trans-1,2-Dichloroethene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P033 trans-1,3-Dichloropropene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P087 Trichloroethene	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
Trichlorofluoromethane	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L
P088 Vinyl Chloride	NC	ND(10.0)	ND(10.0)	NC	NC	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 1	Unit
SP-11, Screening Solids	**65291**	
Classical Pollutants		
Alkalinity	223	mg/L
Ammonia As Nitrogen (NH3-N)	21.6	mg/L
Available Cyanide	ND(2.00)	ug/L
Biochemical Oxygen Demand (BOD)	6,610	mg/L
Chemical Oxygen Demand (COD)	12,300	mg/L
Chloride	137	mg/L
Hardness	55.3	mg/L
Nitrate/Nitrite (NO2 + NO3-N)	ND(0.972)	mg/L
Settleable residue	1,000	mL/L
Sulfate	90.2	mg/L
P121 Total Cyanide	ND(0.00500)	mg/L
Total Kjeldahl Nitrogen (TKN)	470	mg/L
Total Organic Carbon (TOC)	348	mg/L
Total Phosphorus	75.9	mg/L
Total Solids	2.70	%

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-11, Screening Solids		**65291**	
Total and Dissolved Metals			
	Aluminum	19,200	ug/L
P114	Antimony	25.8	ug/L
P115	Arsenic	ND(2.32)	ug/L
	Barium	1,950	ug/L
P117	Beryllium	ND(0.0540)	ug/L
	Boron	286	ug/L
P118	Cadmium	3.50	ug/L
	Calcium	166,000	ug/L
P119	Chromium	72.4	ug/L
	Cobalt	9.30	ug/L
P120	Copper	2,180	ug/L
	Iron	59,600	ug/L
P122	Lead	40.6	ug/L
	Magnesium	33,600	ug/L
	Manganese	1,150	ug/L
P123	Mercury	ND(0.108)	ug/L
	Molybdenum	26.5	ug/L
P124	Nickel	160	ug/L
P125	Selenium	16.7	ug/L
P126	Silver	17.5	ug/L
	Sodium	157,000	ug/L
P127	Thallium	0.0800	ug/L
	Tin	76.9	ug/L
	Titanium	23.6	ug/L
	Vanadium	77.6	ug/L
	Yttrium	ND(0.222)	ug/L
P128	Zinc	6,390	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-11, Screening Solids		**65291**	
Volatile and Semivolatile Organics			
P011	1,1,1-Trichloroethane	ND(0.283)	ug/L
P015	1,1,2,2-Tetrachloroethane	ND(0.283)	ug/L
P014	1,1,2-Trichloroethane	ND(0.283)	ug/L
P013	1,1-Dichloroethane	ND(0.283)	ug/L
P029	1,1-Dichloroethene	ND(0.283)	ug/L
P008	1,2,4-Trichlorobenzene	ND(28.8)	ug/L
P025	1,2-Dichlorobenzene	ND(28.8)	ug/L
P010	1,2-Dichloroethane	ND(0.283)	ug/L
P032	1,2-Dichloropropane	ND(0.283)	ug/L
P026	1,3-Dichlorobenzene	ND(28.8)	ug/L
P027	1,4-Dichlorobenzene	ND(28.8)	ug/L
P021	2,4,6-Trichlorophenol	ND(28.8)	ug/L
P031	2,4-Dichlorophenol	ND(28.8)	ug/L
P034	2,4-Dimethylphenol	ND(28.8)	ug/L
P059	2,4-Dinitrophenol	ND(144)	ug/L
P035	2,4-Dinitrotoluene	ND(28.8)	ug/L
P036	2,6-Dinitrotoluene	ND(28.8)	ug/L
P019	2-Chloroethylvinyl Ether	ND(1.41)	ug/L
P020	2-Chloronaphthalene	ND(28.8)	ug/L
P024	2-Chlorophenol	ND(28.8)	ug/L
P057	2-Nitrophenol	ND(57.6)	ug/L
P028	3,3'-Dichlorobenzidine	ND(144)	ug/L
	4,6-Dinitro-2-methylphenol	ND(57.6)	ug/L
	4-Bromophenyl-phenylether	ND(28.8)	ug/L
P022	4-Chloro-3-methylphenol	ND(28.8)	ug/L
	4-Chlorophenyl-phenylether	ND(28.8)	ug/L
P058	4-Nitrophenol	ND(144)	ug/L
P001	Acenaphthene	ND(28.8)	ug/L
P077	Acenaphthylene	ND(28.8)	ug/L
P078	Anthracene	ND(28.8)	ug/L
P004	Benzene	ND(0.283)	ug/L
P005	Benzidine	ND(144)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-11, Screening Solids		**65291**	
Volatile and Semivolatile Organics			
P072	Benzo(a)anthracene	ND(28.8)	ug/L
P073	Benzo(a)pyrene	ND(28.8)	ug/L
P074	Benzo(b)fluoranthene	ND(28.8)	ug/L
	Benzo(g,h,i)perylene	ND(57.6)	ug/L
P075	Benzo(k)fluoranthene	ND(28.8)	ug/L
P043	Bis(2-chloroethoxy)methane	ND(28.8)	ug/L
	bis(-2-Chloroethyl)ether	ND(28.8)	ug/L
P042	Bis(2-chloroisopropyl) Ether	ND(28.8)	ug/L
P066	Bis(2-ethylhexyl) Phthalate	91.6	ug/L
P048	Bromodichloromethane	ND(0.283)	ug/L
	Bromoform	ND(0.283)	ug/L
P046	Bromomethane	ND(0.283)	ug/L
P067	Butyl Benzyl Phthalate	ND(28.8)	ug/L
	Carbon tetrachloride	ND(0.283)	ug/L
P007	Chlorobenzene	ND(0.283)	ug/L
P016	Chloroethane	ND(0.283)	ug/L
P023	Chloroform	ND(0.283)	ug/L
P045	Chloromethane	ND(0.283)	ug/L
P076	Chrysene	ND(28.8)	ug/L
	cis-1,3-Dichloropropene	ND(0.283)	ug/L
	Dibenz(a,h)anthracene	ND(57.6)	ug/L
P051	Dibromochloromethane	ND(0.283)	ug/L
P070	Diethyl Phthalate	ND(28.8)	ug/L
P071	Dimethyl Phthalate	ND(28.8)	ug/L
P068	Di-n-butyl Phthalate	ND(28.8)	ug/L
P069	Di-n-octyl Phthalate	ND(28.8)	ug/L
P038	Ethylbenzene	ND(0.283)	ug/L
P039	Fluoranthene	ND(28.8)	ug/L
P080	Fluorene	ND(28.8)	ug/L
P009	Hexachlorobenzene	ND(28.8)	ug/L
P052	Hexachlorobutadiene	ND(28.8)	ug/L
P053	Hexachlorocyclopentadiene	ND(28.8)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-11, Screening Solids		**65291**	
Volatile and Semivolatile Organics			
P012	Hexachloroethane	ND(28.8)	ug/L
P083	Indeno(1,2,3-cd)pyrene	ND(57.6)	ug/L
P054	Isophorone	ND(28.8)	ug/L
P044	Methylene Chloride	ND(0.283)	ug/L
P055	Naphthalene	ND(28.8)	ug/L
P056	Nitrobenzene	ND(28.8)	ug/L
P061	N-Nitrosodimethylamine	ND(144)	ug/L
	N-Nitroso-di-n-propylamine	ND(57.6)	ug/L
P062	N-Nitrosodiphenylamine	ND(57.6)	ug/L
P064	Pentachlorophenol	ND(144)	ug/L
P081	Phenanthrene	ND(28.8)	ug/L
P065	Phenol	700	ug/L
P084	Pyrene	ND(28.8)	ug/L
P085	Tetrachloroethene	1.66	ug/L
P086	Toluene	ND(0.283)	ug/L
P030	trans-1,2-Dichloroethene	ND(0.283)	ug/L
P033	trans-1,3-Dichloropropene	ND(0.283)	ug/L
P087	Trichloroethene	ND(0.283)	ug/L
	Trichlorofluoromethane	ND(0.283)	ug/L
P088	Vinyl Chloride	ND(0.283)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-12, Waste Biosludge (Desludge) Discharge	**65292**	
Classical Pollutants		
Alkalinity	499	mg/L
Ammonia As Nitrogen (NH3-N)	76.3	mg/L
Available Cyanide	ND(2.00)	ug/L
Biochemical Oxygen Demand (BOD)	3,870	mg/L
Chemical Oxygen Demand (COD)	14,800	mg/L
Chloride	62.4	mg/L
Hardness	49.2	mg/L
Nitrate/Nitrite (NO2 + NO3-N)	ND(1.95)	mg/L
Settleable residue	560	mL/L
Sulfate	398	mg/L
P121 Total Cyanide	ND(0.00500)	mg/L
Total Kjeldahl Nitrogen (TKN)	1,280	mg/L
Total Organic Carbon (TOC)	75.5	mg/L
Total Phosphorus	153	mg/L
Total Solids	1.30	%

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 2	Unit
SP-12, Waste Biosludge (Desludge) Discharge		**65292**	
Total and Dissolved Metals			
	Aluminum	10,500	ug/L
P114	Antimony	16.9	ug/L
P115	Arsenic	7.60	ug/L
	Barium	1,560	ug/L
P117	Beryllium	ND(0.0540)	ug/L
	Boron	775	ug/L
P118	Cadmium	5.20	ug/L
	Calcium	132,000	ug/L
P119	Chromium	64.1	ug/L
	Cobalt	7.90	ug/L
P120	Copper	4,230	ug/L
	Iron	43,800	ug/L
P122	Lead	59.8	ug/L
	Magnesium	39,400	ug/L
	Manganese	980	ug/L
P123	Mercury	ND(0.0520)	ug/L
	Molybdenum	36.5	ug/L
P124	Nickel	234	ug/L
P125	Selenium	25.7	ug/L
P126	Silver	30.1	ug/L
	Sodium	142,000	ug/L
P127	Thallium	ND(0.0450)	ug/L
	Tin	51.6	ug/L
	Titanium	7.10	ug/L
	Vanadium	21.8	ug/L
	Yttrium	ND(0.222)	ug/L
P128	Zinc	5,930	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 2	Unit
SP-12, Waste Biosludge (Desludge) Discharge		**65292**	
Volatile and Semivolatile Organics			
P011	1,1,1-Trichloroethane	ND(0.134)	ug/L
P015	1,1,2,2-Tetrachloroethane	ND(0.134)	ug/L
P014	1,1,2-Trichloroethane	ND(0.134)	ug/L
P013	1,1-Dichloroethane	ND(0.134)	ug/L
P029	1,1-Dichloroethene	ND(0.134)	ug/L
P008	1,2,4-Trichlorobenzene	ND(13.5)	ug/L
P025	1,2-Dichlorobenzene	ND(13.5)	ug/L
P010	1,2-Dichloroethane	ND(0.134)	ug/L
P032	1,2-Dichloropropane	ND(0.134)	ug/L
P026	1,3-Dichlorobenzene	ND(13.5)	ug/L
P027	1,4-Dichlorobenzene	ND(13.5)	ug/L
P021	2,4,6-Trichlorophenol	ND(13.5)	ug/L
P031	2,4-Dichlorophenol	ND(13.5)	ug/L
P034	2,4-Dimethylphenol	ND(13.5)	ug/L
P059	2,4-Dinitrophenol	ND(67.5)	ug/L
P035	2,4-Dinitrotoluene	ND(13.5)	ug/L
P036	2,6-Dinitrotoluene	ND(13.5)	ug/L
P019	2-Chloroethylvinyl Ether	ND(0.671)	ug/L
P020	2-Chloronaphthalene	ND(13.5)	ug/L
P024	2-Chlorophenol	ND(13.5)	ug/L
P057	2-Nitrophenol	ND(27.0)	ug/L
P028	3,3'-Dichlorobenzidine	ND(67.5)	ug/L
	4,6-Dinitro-2-methylphenol	ND(27.0)	ug/L
	4-Bromophenyl-phenylether	ND(13.5)	ug/L
P022	4-Chloro-3-methylphenol	ND(13.5)	ug/L
	4-Chlorophenyl-phenylether	ND(13.5)	ug/L
P058	4-Nitrophenol	ND(67.5)	ug/L
P001	Acenaphthene	ND(13.5)	ug/L
P077	Acenaphthylene	ND(13.5)	ug/L
P078	Anthracene	ND(13.5)	ug/L
P004	Benzene	ND(0.134)	ug/L
P005	Benzidine	ND(67.5)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 2	Unit
SP-12, Waste Biosludge (Desludge) Discharge	**65292**	
Volatile and Semivolatile Organics		
P072 Benzo(a)anthracene	ND(13.5)	ug/L
P073 Benzo(a)pyrene	ND(13.5)	ug/L
P074 Benzo(b)fluoranthene	ND(13.5)	ug/L
Benzo(g,h,i)perylene	ND(27.0)	ug/L
P075 Benzo(k)fluoranthene	ND(13.5)	ug/L
P043 Bis(2-chloroethoxy)methane	ND(13.5)	ug/L
bis(-2-Chloroethyl)ether	ND(13.5)	ug/L
P042 Bis(2-chloroisopropyl) Ether	ND(13.5)	ug/L
P066 Bis(2-ethylhexyl) Phthalate	21.1	ug/L
P048 Bromodichloromethane	ND(0.134)	ug/L
Bromoform	ND(0.134)	ug/L
P046 Bromomethane	ND(0.134)	ug/L
P067 Butyl Benzyl Phthalate	ND(13.5)	ug/L
Carbon tetrachloride	ND(0.134)	ug/L
P007 Chlorobenzene	ND(0.134)	ug/L
P016 Chloroethane	ND(0.134)	ug/L
P023 Chloroform	ND(0.134)	ug/L
P045 Chloromethane	ND(0.134)	ug/L
P076 Chrysene	ND(13.5)	ug/L
cis-1,3-Dichloropropene	ND(0.134)	ug/L
Dibenz(a,h)anthracene	ND(27.0)	ug/L
P051 Dibromochloromethane	ND(0.134)	ug/L
P070 Diethyl Phthalate	ND(13.5)	ug/L
P071 Dimethyl Phthalate	ND(13.5)	ug/L
P068 Di-n-butyl Phthalate	ND(13.5)	ug/L
P069 Di-n-octyl Phthalate	ND(13.5)	ug/L
P038 Ethylbenzene	ND(0.134)	ug/L
P039 Fluoranthene	ND(13.5)	ug/L
P080 Fluorene	ND(13.5)	ug/L
P009 Hexachlorobenzene	ND(13.5)	ug/L
P052 Hexachlorobutadiene	ND(13.5)	ug/L
P053 Hexachlorocyclopentadiene	ND(13.5)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 2	Unit
SP-12, Waste Biosludge (Desludge) Discharge		**65292**	
Volatile and Semivolatile Organics			
P012	Hexachloroethane	ND(13.5)	ug/L
P083	Indeno(1,2,3-cd)pyrene	ND(27.0)	ug/L
P054	Isophorone	ND(13.5)	ug/L
P044	Methylene Chloride	ND(0.134)	ug/L
P055	Naphthalene	ND(13.5)	ug/L
P056	Nitrobenzene	ND(13.5)	ug/L
P061	N-Nitrosodimethylamine	ND(67.5)	ug/L
	N-Nitroso-di-n-propylamine	ND(27.0)	ug/L
P062	N-Nitrosodiphenylamine	ND(27.0)	ug/L
P064	Pentachlorophenol	ND(67.5)	ug/L
P081	Phenanthrene	ND(13.5)	ug/L
P065	Phenol	875	ug/L
P084	Pyrene	ND(13.5)	ug/L
P085	Tetrachloroethene	2.63	ug/L
P086	Toluene	ND(0.134)	ug/L
P030	trans-1,2-Dichloroethene	ND(0.134)	ug/L
P033	trans-1,3-Dichloropropene	ND(0.134)	ug/L
P087	Trichloroethene	1.14	ug/L
	Trichlorofluoromethane	ND(0.134)	ug/L
P088	Vinyl Chloride	ND(0.134)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 1	Unit
SP-13, Incinerator Ash	**65293**	
Total and Dissolved Metals		
Aluminum	44,800	mg/kg
P114 Antimony	28.3	mg/kg
P115 Arsenic	5.20	mg/kg
Barium	837	mg/kg
P117 Beryllium	0.410	mg/kg
Boron	585	mg/kg
P118 Cadmium	1.40	mg/kg
Calcium	174,000	mg/kg
P119 Chromium	286	mg/kg
Cobalt	13.7	mg/kg
P120 Copper	6,510	mg/kg
Iron	28,500	mg/kg
P122 Lead	417	mg/kg
Magnesium	13,600	mg/kg
Manganese	673	mg/kg
P123 Mercury	ND(40.0)	ug/kg
Molybdenum	42.8	mg/kg
P124 Nickel	223	mg/kg
P125 Selenium	1.39	mg/kg
P126 Silver	15.4	mg/kg
Sodium	49,600	mg/kg
P127 Thallium	ND(1.53)	mg/kg
Tin	61.6	mg/kg
Titanium	1,060	mg/kg
Vanadium	484	mg/kg
Yttrium	3.10	mg/kg
P128 Zinc	2,700	mg/kg

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-13, Incinerator Ash		**65293**	
Volatile and Semivolatile Organics			
P008	1,2,4-Trichlorobenzene	ND(343)	ug/kg
P025	1,2-Dichlorobenzene	ND(343)	ug/kg
P026	1,3-Dichlorobenzene	ND(343)	ug/kg
P027	1,4-Dichlorobenzene	ND(343)	ug/kg
P021	2,4,6-Trichlorophenol	ND(343)	ug/kg
P031	2,4-Dichlorophenol	ND(343)	ug/kg
P034	2,4-Dimethylphenol	ND(343)	ug/kg
P059	2,4-Dinitrophenol	ND(1,710)	ug/kg
P035	2,4-Dinitrotoluene	ND(343)	ug/kg
P036	2,6-Dinitrotoluene	ND(343)	ug/kg
P020	2-Chloronaphthalene	ND(343)	ug/kg
P024	2-Chlorophenol	ND(343)	ug/kg
P057	2-Nitrophenol	ND(685)	ug/kg
P028	3,3'-Dichlorobenzidine	ND(1,710)	ug/kg
	4,6-Dinitro-2-methylphenol	ND(685)	ug/kg
	4-Bromophenyl-phenylether	ND(343)	ug/kg
P022	4-Chloro-3-methylphenol	ND(343)	ug/kg
	4-Chlorophenyl-phenylether	ND(343)	ug/kg
P058	4-Nitrophenol	ND(1,710)	ug/kg
P001	Acenaphthene	ND(343)	ug/kg
P077	Acenaphthylene	ND(343)	ug/kg
P078	Anthracene	ND(343)	ug/kg
P005	Benzidine	ND(1,710)	ug/kg
P072	Benzo(a)anthracene	ND(343)	ug/kg
P073	Benzo(a)pyrene	ND(343)	ug/kg
P074	Benzo(b)fluoranthene	ND(343)	ug/kg
	Benzo(g,h,i)perylene	ND(685)	ug/kg
P075	Benzo(k)fluoranthene	ND(343)	ug/kg
P043	Bis(2-chloroethoxy)methane	ND(343)	ug/kg
	bis(-2-Chloroethyl)ether	ND(343)	ug/kg
P042	Bis(2-chloroisopropyl) Ether	ND(343)	ug/kg
P066	Bis(2-ethylhexyl) Phthalate	2,260	ug/kg

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 1	Unit
SP-13, Incinerator Ash	**65293**	
Volatile and Semivolatile Organics		
P067 Butyl Benzyl Phthalate	ND(343)	ug/kg
P076 Chrysene	ND(343)	ug/kg
Dibenz(a,h)anthracene	ND(685)	ug/kg
P070 Diethyl Phthalate	ND(343)	ug/kg
P071 Dimethyl Phthalate	ND(343)	ug/kg
P068 Di-n-butyl Phthalate	ND(343)	ug/kg
P069 Di-n-octyl Phthalate	ND(343)	ug/kg
P039 Fluoranthene	ND(343)	ug/kg
P080 Fluorene	ND(343)	ug/kg
P009 Hexachlorobenzene	ND(343)	ug/kg
P052 Hexachlorobutadiene	ND(343)	ug/kg
P053 Hexachlorocyclopentadiene	ND(343)	ug/kg
P012 Hexachloroethane	ND(343)	ug/kg
P083 Indeno(1,2,3-cd)pyrene	ND(685)	ug/kg
P054 Isophorone	ND(343)	ug/kg
P055 Naphthalene	ND(343)	ug/kg
P056 Nitrobenzene	ND(343)	ug/kg
P061 N-Nitrosodimethylamine	ND(1,710)	ug/kg
N-Nitroso-di-n-propylamine	ND(685)	ug/kg
P062 N-Nitrosodiphenylamine	ND(685)	ug/kg
P064 Pentachlorophenol	ND(1,710)	ug/kg
P081 Phenanthrene	441	ug/kg
P065 Phenol	1,140	ug/kg
P084 Pyrene	ND(343)	ug/kg

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-15, Source Water		**65295**	
Classical Pollutants			
	Alkalinity	57.0	mg/L
	Ammonia As Nitrogen (NH3-N)	0.0570	mg/L
	Available Cyanide	19.1	ug/L
	Biochemical Oxygen Demand (BOD)	ND(2.00)	mg/L
	Chemical Oxygen Demand (COD)	ND(10.0)	mg/L
	Chloride	15.0	mg/L
	Hardness	68.5	mg/L
	Nitrate/Nitrite (NO2 + NO3-N)	0.270	mg/L
	Settleable residue	ND(0.110)	mL/L
	Sulfate	21.0	mg/L
P121	Total Cyanide	ND(0.00500)	mg/L
	Total Dissolved Solids (TDS)	121	mg/L
	Total Kjeldahl Nitrogen (TKN)	1.00	mg/L
	Total Organic Carbon (TOC)	ND(1.00)	mg/L
	Total Phosphorus	ND(0.0100)	mg/L
	Total Suspended Solids (TSS)	ND(5.00)	mg/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 1	Unit
SP-15, Source Water	**65295**	
Total and Dissolved Metals		
Aluminum	ND(9.93)	ug/L
P114 Antimony	ND(5.97)	ug/L
P115 Arsenic	ND(2.32)	ug/L
Barium	32.0	ug/L
P117 Beryllium	ND(0.0540)	ug/L
Boron	33.0	ug/L
P118 Cadmium	ND(0.446)	ug/L
Calcium	24,200	ug/L
P119 Chromium	ND(1.68)	ug/L
Cobalt	ND(0.914)	ug/L
P120 Copper	72.2	ug/L
Iron	30.6	ug/L
P122 Lead	ND(3.08)	ug/L
Magnesium	1,950	ug/L
Manganese	0.720	ug/L
P123 Mercury	0.310	ug/L
Molybdenum	ND(1.50)	ug/L
P124 Nickel	15.8	ug/L
P125 Selenium	ND(0.572)	ug/L
P126 Silver	ND(1.28)	ug/L
Sodium	10,500	ug/L
P127 Thallium	0.0200	ug/L
Tin	ND(3.45)	ug/L
Titanium	ND(0.253)	ug/L
Vanadium	ND(0.679)	ug/L
Yttrium	ND(0.222)	ug/L
P128 Zinc	13.6	ug/L
Aluminum, Dissolved	14.8	ug/L
P114 Antimony, Dissolved	ND(5.97)	ug/L
P115 Arsenic, Dissolved	ND(2.32)	ug/L
Barium, Dissolved	30.9	ug/L
P117 Beryllium, Dissolved	ND(0.0540)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-15, Source Water		**65295**	
Total and Dissolved Metals			
	Boron, Dissolved	39.1	ug/L
P118	Cadmium, Dissolved	ND(0.446)	ug/L
	Calcium, Dissolved	24,300	ug/L
P119	Chromium, Dissolved	ND(1.68)	ug/L
	Cobalt, Dissolved	1.70	ug/L
P120	Copper, Dissolved	59.7	ug/L
	Iron, Dissolved	ND(19.8)	ug/L
P122	Lead, Dissolved	ND(3.08)	ug/L
	Magnesium, Dissolved	1,960	ug/L
P123	Mercury, Dissolved	0.420	ug/L
	Molybdenum, Dissolved	ND(1.50)	ug/L
P124	Nickel, Dissolved	14.5	ug/L
P125	Selenium, Dissolved	ND(0.572)	ug/L
P126	Silver, Dissolved	ND(1.28)	ug/L
	Sodium, Dissolved	10,500	ug/L
P127	Thallium, Dissolved	ND(0.00900)	ug/L
	Tin, Dissolved	ND(3.45)	ug/L
	Titanium, Dissolved	ND(0.253)	ug/L
	Vanadium, Dissolved	ND(0.679)	ug/L
	Yttrium, Dissolved	ND(0.222)	ug/L
P128	Zinc, Dissolved	8.40	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-15, Source Water		**65295**	
Volatile and Semivolatile Organics			
P011	1,1,1-Trichloroethane	ND(10.0)	ug/L
P015	1,1,2,2-Tetrachloroethane	ND(10.0)	ug/L
P014	1,1,2-Trichloroethane	ND(10.0)	ug/L
P013	1,1-Dichloroethane	ND(10.0)	ug/L
P029	1,1-Dichloroethene	ND(10.0)	ug/L
P008	1,2,4-Trichlorobenzene	ND(10.0)	ug/L
P025	1,2-Dichlorobenzene	ND(10.0)	ug/L
P010	1,2-Dichloroethane	ND(10.0)	ug/L
P032	1,2-Dichloropropane	ND(10.0)	ug/L
P026	1,3-Dichlorobenzene	ND(10.0)	ug/L
P027	1,4-Dichlorobenzene	ND(10.0)	ug/L
P021	2,4,6-Trichlorophenol	ND(10.0)	ug/L
P031	2,4-Dichlorophenol	ND(10.0)	ug/L
P034	2,4-Dimethylphenol	ND(10.0)	ug/L
P059	2,4-Dinitrophenol	ND(50.0)	ug/L
P035	2,4-Dinitrotoluene	ND(10.0)	ug/L
P036	2,6-Dinitrotoluene	ND(10.0)	ug/L
P019	2-Chloroethylvinyl Ether	ND(50.0)	ug/L
P024	2-Chlorophenol	ND(10.0)	ug/L
P057	2-Nitrophenol	ND(20.0)	ug/L
P028	3,3'-Dichlorobenzidine	ND(50.0)	ug/L
	4,6-Dinitro-2-methylphenol	ND(20.0)	ug/L
	4-Bromophenyl-phenylether	ND(10.0)	ug/L
P022	4-Chloro-3-methylphenol	ND(10.0)	ug/L
	4-Chlorophenyl-phenylether	ND(10.0)	ug/L
P058	4-Nitrophenol	ND(50.0)	ug/L
P001	Acenaphthene	ND(10.0)	ug/L
P077	Acenaphthylene	ND(10.0)	ug/L
P078	Anthracene	ND(10.0)	ug/L
P004	Benzene	ND(10.0)	ug/L
P005	Benzidine	ND(50.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 1	Unit
SP-15, Source Water		**65295**	
Volatile and Semivolatile Organics			
P072	Benzo(a)anthracene	ND(10.0)	ug/L
P073	Benzo(a)pyrene	ND(10.0)	ug/L
P074	Benzo(b)fluoranthene	ND(10.0)	ug/L
	Benzo(g,h,i)perylene	ND(20.0)	ug/L
P075	Benzo(k)fluoranthene	ND(10.0)	ug/L
P043	Bis(2-chloroethoxy)methane	ND(10.0)	ug/L
	bis(-2-Chloroethyl)ether	ND(10.0)	ug/L
P042	Bis(2-chloroisopropyl) Ether	ND(10.0)	ug/L
P066	Bis(2-ethylhexyl) Phthalate	ND(10.0)	ug/L
P048	Bromodichloromethane	ND(10.0)	ug/L
	Bromoform	ND(10.0)	ug/L
P046	Bromomethane	ND(10.0)	ug/L
P067	Butyl Benzyl Phthalate	ND(10.0)	ug/L
	Carbon tetrachloride	ND(10.0)	ug/L
P007	Chlorobenzene	ND(10.0)	ug/L
P016	Chloroethane	ND(10.0)	ug/L
P023	Chloroform	ND(10.0)	ug/L
P045	Chloromethane	ND(10.0)	ug/L
P076	Chrysene	ND(10.0)	ug/L
	cis-1,3-Dichloropropene	ND(10.0)	ug/L
	Dibenz(a,h)anthracene	ND(20.0)	ug/L
P051	Dibromochloromethane	ND(10.0)	ug/L
P070	Diethyl Phthalate	ND(10.0)	ug/L
P071	Dimethyl Phthalate	ND(10.0)	ug/L
P068	Di-n-butyl Phthalate	ND(10.0)	ug/L
P069	Di-n-octyl Phthalate	ND(10.0)	ug/L
P038	Ethylbenzene	ND(10.0)	ug/L
P039	Fluoranthene	ND(10.0)	ug/L
P080	Fluorene	ND(10.0)	ug/L
P009	Hexachlorobenzene	ND(10.0)	ug/L
P052	Hexachlorobutadiene	ND(10.0)	ug/L
P053	Hexachlorocyclopentadiene	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 1	Unit
SP-15, Source Water	**65295**	
Volatile and Semivolatile Organics		
P012 Hexachloroethane	ND(10.0)	ug/L
P083 Indeno(1,2,3-cd)pyrene	ND(20.0)	ug/L
P054 Isophorone	ND(10.0)	ug/L
P044 Methylene Chloride	ND(10.0)	ug/L
P055 Naphthalene	ND(10.0)	ug/L
P056 Nitrobenzene	ND(10.0)	ug/L
P061 N-Nitrosodimethylamine	ND(50.0)	ug/L
N-Nitroso-di-n-propylamine	ND(20.0)	ug/L
P062 N-Nitrosodiphenylamine	ND(20.0)	ug/L
P064 Pentachlorophenol	ND(50.0)	ug/L
P081 Phenanthrene	ND(10.0)	ug/L
P065 Phenol	ND(10.0)	ug/L
P084 Pyrene	ND(10.0)	ug/L
P085 Tetrachloroethene	ND(10.0)	ug/L
P086 Toluene	ND(10.0)	ug/L
P030 trans-1,2-Dichloroethene	ND(10.0)	ug/L
P033 trans-1,3-Dichloropropene	ND(10.0)	ug/L
P087 Trichloroethene	ND(10.0)	ug/L
Trichlorofluoromethane	ND(10.0)	ug/L
P088 Vinyl Chloride	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

SP-16, Trip Blank	Day 4 65300	Unit
Volatile and Semivolatile Organics		
P011 1,1,1-Trichloroethane	ND(10.0)	ug/L
P015 1,1,2,2-Tetrachloroethane	ND(10.0)	ug/L
P014 1,1,2-Trichloroethane	ND(10.0)	ug/L
P013 1,1-Dichloroethane	ND(10.0)	ug/L
P029 1,1-Dichloroethene	ND(10.0)	ug/L
P010 1,2-Dichloroethane	ND(10.0)	ug/L
P032 1,2-Dichloropropane	ND(10.0)	ug/L
P019 2-Chloroethylvinyl Ether	ND(50.0)	ug/L
P004 Benzene	ND(10.0)	ug/L
P048 Bromodichloromethane	ND(10.0)	ug/L
Bromoform	ND(10.0)	ug/L
P046 Bromomethane	ND(10.0)	ug/L
Carbon tetrachloride	ND(10.0)	ug/L
P007 Chlorobenzene	ND(10.0)	ug/L
P016 Chloroethane	ND(10.0)	ug/L
P023 Chloroform	ND(10.0)	ug/L
P045 Chloromethane	ND(10.0)	ug/L
cis-1,3-Dichloropropene	ND(10.0)	ug/L
P051 Dibromochloromethane	ND(10.0)	ug/L
P038 Ethylbenzene	ND(10.0)	ug/L
P044 Methylene Chloride	ND(10.0)	ug/L
P085 Tetrachloroethene	ND(10.0)	ug/L
P086 Toluene	ND(10.0)	ug/L
P030 trans-1,2-Dichloroethene	ND(10.0)	ug/L
P033 trans-1,3-Dichloropropene	ND(10.0)	ug/L
P087 Trichloroethene	ND(10.0)	ug/L
Trichlorofluoromethane	ND(10.0)	ug/L
P088 Vinyl Chloride	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

	Day 4	Unit
SP-17, Equipment Blank	**65301**	
Classical Pollutants		
Hardness	0.170	mg/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-17, Equipment Blank		**65301**	
Total and Dissolved Metals			
	Aluminum	ND(9.93)	ug/L
P114	Antimony	ND(5.97)	ug/L
P115	Arsenic	ND(2.32)	ug/L
	Barium	8.00	ug/L
P117	Beryllium	ND(0.0540)	ug/L
	Boron	ND(3.37)	ug/L
P118	Cadmium	ND(0.446)	ug/L
	Calcium	58.2	ug/L
P119	Chromium	ND(1.68)	ug/L
	Cobalt	ND(0.914)	ug/L
P120	Copper	23.5	ug/L
	Iron	191	ug/L
P122	Lead	27.8	ug/L
	Magnesium	ND(10.2)	ug/L
	Manganese	5.20	ug/L
P123	Mercury	ND(0.0170)	ug/L
	Molybdenum	ND(1.50)	ug/L
P124	Nickel	ND(2.66)	ug/L
P125	Selenium	ND(0.572)	ug/L
P126	Silver	ND(1.28)	ug/L
	Sodium	197	ug/L
P127	Thallium	ND(0.00900)	ug/L
	Tin	ND(3.45)	ug/L
	Titanium	0.440	ug/L
	Vanadium	ND(0.679)	ug/L
	Yttrium	ND(0.222)	ug/L
P128	Zinc	256	ug/L
	Aluminum, Dissolved	406	ug/L
P114	Antimony, Dissolved	ND(5.97)	ug/L
P115	Arsenic, Dissolved	ND(2.32)	ug/L
	Barium, Dissolved	21.2	ug/L
P117	Beryllium, Dissolved	ND(0.0540)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-17, Equipment Blank		**65301**	
Total and Dissolved Metals			
	Boron, Dissolved	ND(3.37)	ug/L
P118	Cadmium, Dissolved	ND(0.446)	ug/L
	Calcium, Dissolved	53.2	ug/L
P119	Chromium, Dissolved	ND(1.68)	ug/L
	Cobalt, Dissolved	ND(0.914)	ug/L
P120	Copper, Dissolved	3.10	ug/L
	Iron, Dissolved	35.1	ug/L
P122	Lead, Dissolved	77.2	ug/L
	Magnesium, Dissolved	12.4	ug/L
	Manganese, Dissolved	5.80	ug/L
P123	Mercury, Dissolved	ND(0.0170)	ug/L
	Molybdenum, Dissolved	ND(1.50)	ug/L
P124	Nickel, Dissolved	ND(2.66)	ug/L
P125	Selenium, Dissolved	ND(0.572)	ug/L
P126	Silver, Dissolved	ND(1.28)	ug/L
	Sodium, Dissolved	260	ug/L
P127	Thallium, Dissolved	ND(0.00900)	ug/L
	Tin, Dissolved	ND(3.45)	ug/L
	Titanium, Dissolved	0.960	ug/L
	Vanadium, Dissolved	ND(0.679)	ug/L
	Yttrium, Dissolved	ND(0.222)	ug/L
P128	Zinc, Dissolved	46.5	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-17, Equipment Blank		**65301**	
Volatile and Semivolatile Organics			
P008	1,2,4-Trichlorobenzene	ND(10.0)	ug/L
P025	1,2-Dichlorobenzene	ND(10.0)	ug/L
P026	1,3-Dichlorobenzene	ND(10.0)	ug/L
P027	1,4-Dichlorobenzene	ND(10.0)	ug/L
P021	2,4,6-Trichlorophenol	ND(10.0)	ug/L
P031	2,4-Dichlorophenol	ND(10.0)	ug/L
P034	2,4-Dimethylphenol	ND(10.0)	ug/L
P059	2,4-Dinitrophenol	ND(50.0)	ug/L
P035	2,4-Dinitrotoluene	ND(10.0)	ug/L
P036	2,6-Dinitrotoluene	ND(10.0)	ug/L
P020	2-Chloronaphthalene	ND(10.0)	ug/L
P024	2-Chlorophenol	ND(10.0)	ug/L
P057	2-Nitrophenol	ND(20.0)	ug/L
P028	3,3'-Dichlorobenzidine	ND(50.0)	ug/L
	4,6-Dinitro-2-methylphenol	ND(20.0)	ug/L
	4-Bromophenyl-phenylether	ND(10.0)	ug/L
P022	4-Chloro-3-methylphenol	ND(10.0)	ug/L
	4-Chlorophenyl-phenylether	ND(10.0)	ug/L
P058	4-Nitrophenol	ND(50.0)	ug/L
P001	Acenaphthene	ND(10.0)	ug/L
P077	Acenaphthylene	ND(10.0)	ug/L
P078	Anthracene	ND(10.0)	ug/L
P005	Benzidine	ND(50.0)	ug/L
P072	Benzo(a)anthracene	ND(10.0)	ug/L
P073	Benzo(a)pyrene	ND(10.0)	ug/L
P074	Benzo(b)fluoranthene	ND(10.0)	ug/L
	Benzo(g,h,i)perylene	ND(20.0)	ug/L
P075	Benzo(k)fluoranthene	ND(10.0)	ug/L
P043	Bis(2-chloroethoxy)methane	ND(10.0)	ug/L
	bis(-2-Chloroethyl)ether	ND(10.0)	ug/L
P042	Bis(2-chloroisopropyl) Ether	ND(10.0)	ug/L
P066	Bis(2-ethylhexyl) Phthalate	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-2
(continued)
Analytical Results, Except Pathogen Indicators
Holland America Veendam

		Day 4	Unit
SP-17, Equipment Blank		**65301**	
Volatile and Semivolatile Organics			
P067	Butyl Benzyl Phthalate	ND(10.0)	ug/L
P076	Chrysene	ND(10.0)	ug/L
	Dibenz(a,h)anthracene	ND(20.0)	ug/L
P070	Diethyl Phthalate	ND(10.0)	ug/L
P071	Dimethyl Phthalate	ND(10.0)	ug/L
P068	Di-n-butyl Phthalate	ND(10.0)	ug/L
P069	Di-n-octyl Phthalate	ND(10.0)	ug/L
P039	Fluoranthene	ND(10.0)	ug/L
P080	Fluorene	ND(10.0)	ug/L
P009	Hexachlorobenzene	ND(10.0)	ug/L
P052	Hexachlorobutadiene	ND(10.0)	ug/L
P053	Hexachlorocyclopentadiene	ND(10.0)	ug/L
P012	Hexachloroethane	ND(10.0)	ug/L
P083	Indeno(1,2,3-cd)pyrene	ND(20.0)	ug/L
P054	Isophorone	ND(10.0)	ug/L
P055	Naphthalene	ND(10.0)	ug/L
P056	Nitrobenzene	ND(10.0)	ug/L
P061	N-Nitrosodimethylamine	ND(50.0)	ug/L
	N-Nitroso-di-n-propylamine	ND(20.0)	ug/L
P062	N-Nitrosodiphenylamine	ND(20.0)	ug/L
P064	Pentachlorophenol	ND(50.0)	ug/L
P081	Phenanthrene	ND(10.0)	ug/L
P065	Phenol	ND(10.0)	ug/L
P084	Pyrene	ND(10.0)	ug/L

EXCLUDE – Data excluded from the data set (see data review narratives in Appendix D for details).
NC – Not collected.
ND – Not detected (number in parentheses is detection limit).

Appendix A-3

Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Field measurement data and observations for each grab and grab composite sample for each sampling point. Figures 2-1 and 2-2 identify sampling point locations. Duplicate samples were not collected for field measurements; consequently, duplicate sampling points SP-2, SP-6, SP-10, and SP-14 are not shown on this table.

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Laundry Wastewater (SP-1)	2300 on 6/23/04	17	29.1	7	0.07	0.10	118.1	0.18	0.17	Turbid, greyish color
	0812 on 6/24/04	22	35.6	10	0.05	0.2	338.5	0.01	0.01	Turbid, greyish color
	1600 on 6/24/04	25	56.8	10	0.02	0.1	201.5	0.00	0.02	Turbid, greyish color
	2300 on 6/24/04	32	62.2	10	0.28	0.1	281.0	0.24	0.26	Turbid, greyish color, warm
Accommodations Wastewater (SP-3)	1330 on 6/23/04	24	104.0	6	0.18	0.1	227.3	0.00	0.00	Extremely turbid, brownish color
Food Pulper Wastewater (SP-4)	0745 on 6/22/04	28	FFF (b)	4	0.08	1.9	3540	0.24	0.00 (c)	Orange-yellow color, strong citrus smell
	1447 on 6/22/04	28	FFF (b)	4	0.00	1.5	2895	0.10	1.46	Orange-yellow color, strong citrus smell
	1940 on 6/22/04	28	FFF (b)	4	0.80 (d)	0.8	1653	2.20	2.10	Orange-yellow color, strong citrus smell

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Galley Wastewater (SP-5)	1200 on 6/21/04	26	125	6	0.00	0.1	215.5	0.50	0.34	Murky, turbid, brown
	1522 on 6/21/04	36	118	6	0.00	0.1	253.4	0.01	0.00	Murky, turbid, brown
	1928 on 6/21/04	25	346	6	0.80 (d)	0.1	304.5	0.00	0.00	Pinkish, turbid
	0906 on 6/22/04	25	236	6	0.00	0.1	213.4	0.37	0.22	Murky, turbid, brown
Influent to Wastewater Treatment System (SP-6) Day 1	0717 on 6/20/04	28.5	260	8	0.08	0.9	1840	1.44 (c)	0.0 9 (c)	Dark gold, settleable solids, strong odor
	1515 on 6/20/04	28.5	263	7	0.02	0.3	681	0.00 (c)	0.00 (c)	Dark gold, gritty, strong odor
	2230 on 6/20/04	30	244	7	0.80 (d)	0.8	1800	1.79	0.00 (c)	Dark, gold, strong odor
	0330 on 6/21/04	26	156	5	0.80 (d)	0.2	405.1	0.00	0.00 (c)	Color much lighter, less turbid

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Influent to Wastewater Treatment System (SP-6) Day 2	0650 on 6/21/04	27	259	6	0.16	0.3	488	0.00	0.01	Cloudy, strong odor, dark yellow, gritty
	1535 on 6/21/04	29	FFF (b)	6	0.30	0.5	1006	0.00	0.00 (c)	Cloudy, strong odor, dark yellow
	2230 on 6/21/04	26	FFF (b)	7	0.80 (d)	0.5	1083	1.86	1.86	Cloudy, strong odor, dark yellow
	0315 on 6/22/04	28	110	7	0.73	0.8	1450	0.00	0.05	Cloudy, strong odor, dark yellow
Influent to Wastewater Treatment System (SP-6) Day 3	0655 on 6/22/04	28	171	7	0.08	0.8	1496	0.00	0.27	Cloudy, strong odor, dark yellow, gritty
	1510 on 6/22/04	28	227	7	0.08	0.6	1165	0.00	0.00 (c)	Cloudy, strong odor, dark yellow
	2030 on 6/22/04	27	FFF (b)	7	0.80 (d)	0.7	1350	0.09	0.07	Cloudy, strong odor, dark yellow
	0315 on 6/23/04	25	FFF (b)	6	0.80 (d)	0.2	449	0.19	0.00	Cloudy, strong odor, dark yellow

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Influent to Wastewater Treatment System (SP-6) Day 4	0645 on 6/23/04	28	FFF (b)	7	0.06	0.8	1692	0.00 (c)	0.00 (c)	Dark yellow, settleable solids, strong odor
	1505 on 6/23/04	26	243	6	0.19	0.4	840	0.00	0.05	Dark yellow, gritty, strong odor
	2210 on 6/23/04	29	FFF (b)	6.5	0.08	0.4	891	2.2	2.2	Dark yellow, gritty, strong odor
	0315 on 6/24/04	30	385	8	0.80 (d)	1.1	2196	0.00	0.00	Dark yellow, gritty, strong odor
Influent to Wastewater Treatment System (SP-6) Day 5	0605 on 6/24/04	30	330	7	0.03	1.00	1978	0.00	0.00 (c)	Dark yellow/ brown settleable solids, strong odor
	1505 on 6/24/04	31	196	6	0.80 (d)	0.5	1072	0.00 (c)	0.00 (c)	Dark yellow/ brown gritty, strong odor
	2140 on 6/24/04	30	402	7	0.80 (d)	0.4	972	0.00	0.00	Dark yellow/ brown gritty, strong odor
	0315 on 6/25/04	28	386	7	0.80 (d)	0.3	1128	0.01	0.02	Dark yellow/ brown gritty, strong odor

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Influent to UV Disinfection (SP-8) Day 1	0740 on 6/20/04	27	0.2	7	0.01	0.3	483	0.00	0.01	Clear, light yellow color, slight odor
	1509 on 6/20/04	28	0.0	7	0.00	0.3	557	0.00	0.07	Clear, light yellow color, slight odor
	2230 on 6/20/04	28	0.0	6.5	0.02	0.3	633	0.04	NA	Clear, light yellow color, slight odor
	0330 on 6/21/04	28	0.0	7	0.03	0.3	622	0.00	0.01	Clear, light yellow color, slight odor
Influent to UV Disinfection (SP-8) Day 2	0700 on 6/21/04	28	0.0	6	0.02	0.3	566	0.00	0.02	Clear, yellow, mild odor
	1525 on 6/21/04	28	0.0	6	0.02	0.3	674	0.01	0.01	Clear, yellow, mild odor
	2230 on 6/21/04	28	0.0	6.5	0.07	0.3	678	0.00	0.09	Clear, yellow, mild odor
Influent to UV Disinfection (SP-8) Day 3	0655 on 6/22/04	28	0.1	6	0.03	0.3	603	0.02	0.04	Clear, yellow, mild odor
	1500 on 6/22/04	27	0.0	7	0.02	0.3	681	0.04	0.00	Clear, yellow, mild odor
	0315 on 6/23/04	28	0.0	7	0.04	0.4	729	0.06	0.10	Clear, yellow, mild odor

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Influent to UV Disinfection (SP-8) Day 4	0640 on 6/23/04	28	1.1	6	0.00	0.4	756	0.01	0.28	Light yellow, mild odor, clear
	1507 on 6/23/04	27	0.7	7	0.01	0.4	769	0.03	0.00	Light yellow, mild odor, clear
	2210 on 6/23/04	27	0.0	6.5	0.02	0.4	758	0.12	0.11	Light yellow, mild odor, clear
	0315 on 6/24/04	28	0.2	7	0.00	0.4	790	0.01	0.05	Light yellow, mild odor, clear
Influent to UV Disinfection (SP-8) Day 5	0611 on 6/24/04	29	55.5	7	0.01	0.4	840	0.00	0.00	Light yellow, mild odor, clear
	1500 on 6/24/04	29	35.7	6	0.00	0.4	796	0.01	0.01	Light yellow, mild odor, clear
	2140 on 6/24/04	29	40.2	7	0.00	0.3	816	0.01	0.01	Light yellow, mild odor, clear
	0315 on 6/25/04	28	31.8	7	0.02	0.4	866	0.00	0.01	Light yellow, mild odor, clear

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Effluent from Wastewater Treatment System (SP-9) Day 1	0708 on 6/20/04	27	2.3	7	0.00	0.3	489	0.01	0.02	Clear, light yellow, slight odor
	1503 on 6/20/04	28	0.9	7	0.02	0.3	511	0.00	0.04	Clear, light yellow, slight odor
	2230 on 6/20/04	28	0.0	6.5	0.01	0.3	575	0.00	0.00	Clear, yellow
	0330 on 6/21/04	27	0.0	7	0.02	0.3	623	0.00	0.03	Clear, little odor
Effluent from Wastewater Treatment System (SP-9) Day 2	0713 on 6/21/04	28	0.0	7	0.02	0.3	520	0.00	0.03	Clear, yellow, mild odor
	1515 on 6/21/04	28	0.0	6	0.00	0.3	650	0.05	0.04	Clear, yellow, mild odor
	2230 on 6/21/04	28	0.0	7	0.02	0.3	706	0.00	0.04	Clean, yellow, mild smell
	0315 on 6/22/04	27	0.0	6	0.02	0.3	669	0.02	0.16	Clean, yellow, mild smell

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Effluent from Wastewater Treatment System (SP-9) Day 3	0640 on 6/22/04	27	1.1	6	0.03	0.3	641	0.00	0.05	Clean, yellow
	1445 on 6/22/04	27	3.2	7	0.00	0.3	692	0.01	0.00	Clean, yellow
	2245 on 6/22/04	27	2.7	7	0.04	0.4	729	0.03	0.08	Clean, yellow
	0340 on 6/23/04	25	0.6	7	0.02	0.4	721	0.10	0.16	Clean, yellow
Effluent from Wastewater Treatment System (SP-9) Day 4	0647 on 6/23/04	28	0.0	7	0.00	0.4	739	0.12	0.01	Light yellow, clear, mild odor
	1505 on 6/23/04	27	0.0	6	0.01	0.4	773	0.01	0.00	Light yellow, clear, mild odor
	2210 on 6/23/04	28	0.0	6.5	0.03	0.4	788	0.10	0.07	Light yellow, clear, mild odor
	0315 on 6/24/04	29	0.5	7	0.04	0.4	798	0.10	0.12	Light yellow, clear, mild odor

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Effluent from Wastewater Treatment System (SP-9) Day 5	0610 on 6/24/04	28	0.8	7	0.01	0.4	810	0.05	0.01	Light yellow, clear, mild odor
	1510 on 6/24/04	29	0.2	6	0.01	0.4	795	0.05	0.03	Light yellow, clear, mild odor
	2140 on 6/24/04	28	0.4	6	0.80 (d)	0.4	816	0.05	0.02	Light yellow, clear, mild odor
	0315 on 6/25/04	28	0.3	7	0.6	0.3	702	0.02	0.02	Light yellow, clear, mild odor
Screening Solids (SP-11)	1500 on 6/20/04	NA	NA	NA	NA	NA	NA	NA	NA	Brown, strong smell, thick
Waste Biosludge Discharge (SP-12)	1832 on 6/21/04	25	NA	NA	NA	NA	NA	NA	NA	Chunky, brown, strong smell, thick
Incinerator Ash (SP-13)	1000 on 6/20/04	NA	NA	NA	NA	NA	NA	NA	NA	Gray, gritty, light-weight
Source Water (SP-15) Day 1	0600 on 6/20/04	NA	NA	NA	NA	NA	NA	NA	NA	Clear, slight chlorine smell
Source Water (SP-15) Day 2	0600 on 6/21/04	NA	NA	NA	NA	NA	NA	NA	NA	Clear, slight chlorine smell
Source Water (SP-15) Day 3	0600 on 6/23/04	NA	NA	NA	NA	NA	NA	NA	NA	Clear, slight chlorine smell

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix A-3
(continued)
Analytical Results Collected Onboard (Field Measurements)
Holland America Veendam - 20 June through 25 June 2004

Sampling Point	Sample Collection Times	Temperature (°C)	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (uS/cm)	Free Chlorine (mg/L) (a)	Total Chlorine (mg/L) (a)	Comments
Source Water (SP-15) Day 4	0600 on 6/24/04	NA	NA	NA	NA	NA	NA	NA	NA	Clear, slight chlorine smell
Source Water (SP-15) Day 5	1930 on 6/24/04	27	4.7	6	0.0	0.0	59	1.79	2.04	Clear, slight chlorine smell

NA - Not analyzed.
(a) Equipment used to measure free and total chlorine onboard is not suitable for measuring ultra-low levels of chlorine (detection limit of 0.02 mg/L compared to a standard of 0.01 mg/L) and is subject to various interferences, such as oxidized forms of manganese. Accordingly, field measurements should not be used to assess compliance with cruise ship discharge standards.
(b) Reading exceeds calibration range of 440 NTU.
(c) Reading under detection range of instrument caused by low light penetration.
(d) Sulfide meter has a maximum quantitation limit of 0.80 mg/L.

Appendix B

RAW FLOW DATA COLLECTED FROM 18 JUNE THROUGH 25 JUNE 2004

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.18.2004	9.2	0.026667	CU M/Min	716.49	CU M
SP6		06.18.2004	9.25	0.022367	CU M/Min	716.65	CU M
SP6		06.18.2004	9.3	0.016867	CU M/Min	716.81	CU M
SP6		06.18.2004	9.35	0.048383	CU M/Min	717.03	CU M
SP6		06.18.2004	9.4	0.110833	CU M/Min	717.26	CU M
SP6		06.18.2004	9.45	0.11125	CU M/Min	717.59	CU M
SP6		06.18.2004	9.5	0.030683	CU M/Min	717.87	CU M
SP6		06.18.2004	9.55	0.026867	CU M/Min	718.15	CU M
SP6		06.18.2004	10	0.02555	CU M/Min	718.34	CU M
SP6		06.18.2004	10.05	0.073367	CU M/Min	718.75	CU M
SP6		06.18.2004	10.1	0.076717	CU M/Min	718.89	CU M
SP6		06.18.2004	10.15	0.076633	CU M/Min	719.02	CU M
SP6		06.18.2004	10.2	0.035267	CU M/Min	719.27	CU M
SP6		06.18.2004	10.25	0.03385	CU M/Min	719.49	CU M
SP6		06.18.2004	10.3	0.01465	CU M/Min	719.7	CU M
SP6		06.18.2004	10.35	0.074067	CU M/Min	720.02	CU M
SP6		06.18.2004	10.4	0.01625	CU M/Min	720.15	CU M
SP6		06.18.2004	10.45	0.01355	CU M/Min	720.22	CU M
SP6		06.18.2004	10.5	0.236583	CU M/Min	720.51	CU M
SP6		06.18.2004	10.55	0.6389	CU M/Min	721.14	CU M
SP6		06.18.2004	11	0	CU M/Min	721.46	CU M
SP6		06.18.2004	11.05	0	CU M/Min	721.97	CU M
SP6		06.18.2004	11.1	0.056567	CU M/Min	722.31	CU M
SP6		06.18.2004	11.15	0	CU M/Min	723.24	CU M
SP6		06.18.2004	11.2	0.368083	CU M/Min	724.76	CU M
SP6		06.18.2004	11.25	0.903083	CU M/Min	726.51	CU M
SP6		06.18.2004	11.3	0.814983	CU M/Min	728.04	CU M
SP6		06.18.2004	11.35	0.03355	CU M/Min	728.37	CU M
SP6		06.18.2004	11.4	0.716033	CU M/Min	729.63	CU M
SP6		06.18.2004	11.45	0.01535	CU M/Min	730.42	CU M
SP6		06.18.2004	11.5	0.014167	CU M/Min	730.5	CU M
SP6		06.18.2004	11.55	0.022767	CU M/Min	730.7	CU M
SP6		06.18.2004	12	0	CU M/Min	731.06	CU M
SP6		06.18.2004	12.05	0	CU M/Min	731.12	CU M
SP6		06.18.2004	12.1	0	CU M/Min	731.55	CU M
SP6		06.18.2004	12.2	0	CU M/Min	731.68	CU M
SP6		06.18.2004	12.25	0.109567	CU M/Min	732.04	CU M
SP6		06.18.2004	12.3	0.1297	CU M/Min	732.42	CU M
SP6		06.18.2004	12.35	0.047867	CU M/Min	732.83	CU M
SP6		06.18.2004	12.4	0.04	CU M/Min	733.25	CU M
SP6		06.18.2004	12.45	0	CU M/Min	733.38	CU M
SP6		06.18.2004	12.5	0	CU M/Min	733.85	CU M
SP6		06.18.2004	12.55	0.037283	CU M/Min	734.32	CU M
SP6		06.18.2004	13	0.117267	CU M/Min	734.62	CU M
SP6		06.18.2004	13.05	0.133417	CU M/Min	735.01	CU M
SP6		06.18.2004	13.1	0.090833	CU M/Min	735.48	CU M
SP6		06.18.2004	13.15	0.048717	CU M/Min	735.78	CU M
SP6		06.18.2004	13.2	0.0198	CU M/Min	736.11	CU M
SP6		06.18.2004	13.25	0.101583	CU M/Min	736.43	CU M
SP6		06.18.2004	13.3	0.06465	CU M/Min	736.76	CU M
SP6		06.18.2004	13.35	0.0291	CU M/Min	736.99	CU M
SP6		06.18.2004	13.4	0.026367	CU M/Min	737.22	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.18.2004	13.42	0	CU M/Min	737.42	CU M
SP6		06.18.2004	13.43	0.019133	CU M/Min	737.42	CU M
SP6		06.18.2004	13.45	0.0277	CU M/Min	737.48	CU M
SP6		06.18.2004	13.5	0.018783	CU M/Min	737.66	CU M
SP6		06.18.2004	13.55	0.07935	CU M/Min	737.82	CU M
SP6		06.18.2004	14	0.0414	CU M/Min	737.98	CU M
SP6		06.18.2004	14.05	0.0264	CU M/Min	738.14	CU M
SP6		06.18.2004	14.1	0.106267	CU M/Min	738.44	CU M
SP6		06.18.2004	14.15	0.083	CU M/Min	738.85	CU M
SP6		06.18.2004	14.2	0.038867	CU M/Min	739.29	CU M
SP6		06.18.2004	14.25	0.0771	CU M/Min	739.72	CU M
SP6		06.18.2004	14.3	0.05895	CU M/Min	740.19	CU M
SP6		06.18.2004	14.35	0.096183	CU M/Min	740.47	CU M
SP6		06.18.2004	14.4	0.026283	CU M/Min	740.82	CU M
SP6		06.18.2004	14.45	0.051233	CU M/Min	741.18	CU M
SP6		06.18.2004	14.5	0.087833	CU M/Min	741.66	CU M
SP6		06.18.2004	14.55	0	CU M/Min	742.14	CU M
SP6		06.18.2004	15	0.0369	CU M/Min	742.51	CU M
SP6		06.18.2004	15.05	0.1102	CU M/Min	742.88	CU M
SP6		06.18.2004	15.1	0.130217	CU M/Min	743.21	CU M
SP6		06.18.2004	15.15	0	CU M/Min	743.79	CU M
SP6		06.18.2004	15.2	0	CU M/Min	744.41	CU M
SP6		06.18.2004	15.25	0	CU M/Min	745.31	CU M
SP6		06.18.2004	15.3	0.036633	CU M/Min	745.75	CU M
SP6		06.18.2004	15.35	0	CU M/Min	745.92	CU M
SP6		06.18.2004	15.4	0	CU M/Min	747.07	CU M
SP6		06.18.2004	15.45	0.273017	CU M/Min	747.88	CU M
SP6		06.18.2004	15.5	0.115383	CU M/Min	748.2	CU M
SP6		06.18.2004	15.55	0.037783	CU M/Min	748.53	CU M
SP6		06.18.2004	16	0.0294	CU M/Min	748.88	CU M
SP6		06.18.2004	16.05	0.143183	CU M/Min	749.33	CU M
SP6		06.18.2004	16.1	0.04875	CU M/Min	749.78	CU M
SP6		06.18.2004	16.15	0.11125	CU M/Min	750.06	CU M
SP6		06.18.2004	16.2	0.063867	CU M/Min	750.42	CU M
SP6		06.18.2004	16.25	0.128833	CU M/Min	750.72	CU M
SP6		06.18.2004	16.3	0.043967	CU M/Min	751.2	CU M
SP6		06.18.2004	16.35	0.1231	CU M/Min	751.8	CU M
SP6		06.18.2004	16.4	0	CU M/Min	752.12	CU M
SP6		06.18.2004	16.45	0.776717	CU M/Min	753.35	CU M
SP6		06.18.2004	16.5	0	CU M/Min	754.2	CU M
SP6		06.18.2004	16.55	0.042567	CU M/Min	754.55	CU M
SP6		06.18.2004	17	0.0278	CU M/Min	754.91	CU M
SP6		06.18.2004	17.05	0.01625	CU M/Min	755.19	CU M
SP6		06.18.2004	17.1	0.018783	CU M/Min	755.46	CU M
SP6		06.18.2004	17.15	0.1793	CU M/Min	755.91	CU M
SP6		06.18.2004	17.2	0.1345	CU M/Min	756.47	CU M
SP6		06.18.2004	17.25	0.118383	CU M/Min	756.92	CU M
SP6		06.18.2004	17.3	0.025683	CU M/Min	757.37	CU M
SP6		06.18.2004	17.35	0.019967	CU M/Min	757.71	CU M
SP6		06.18.2004	17.4	0.1145	CU M/Min	758.04	CU M
SP6		06.18.2004	17.45	0	CU M/Min	758.44	CU M
SP6		06.18.2004	17.5	0.760867	CU M/Min	758.8	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.18.2004	17.55	0.033683	CU M/Min	759.36	CU M
SP6		06.18.2004	18	0.02355	CU M/Min	759.71	CU M
SP6		06.18.2004	18.05	0.110483	CU M/Min	759.98	CU M
SP6		06.18.2004	18.1	0.162667	CU M/Min	760.22	CU M
SP6		06.18.2004	18.15	0.0452	CU M/Min	760.44	CU M
SP6		06.18.2004	18.2	0.021667	CU M/Min	760.64	CU M
SP6		06.18.2004	18.25	0.034217	CU M/Min	760.92	CU M
SP6		06.18.2004	18.3	0.029517	CU M/Min	761.12	CU M
SP6		06.18.2004	18.35	0	CU M/Min	761.28	CU M
SP6		06.18.2004	18.4	0	CU M/Min	761.77	CU M
SP6		06.18.2004	18.45	0.80655	CU M/Min	762.82	CU M
SP6		06.18.2004	18.5	0.032383	CU M/Min	763.42	CU M
SP6		06.18.2004	18.55	0.021483	CU M/Min	763.83	CU M
SP6		06.18.2004	19	0.029783	CU M/Min	764.14	CU M
SP6		06.18.2004	19.1	0.136167	CU M/Min	764.6	CU M
SP6		06.18.2004	19.15	0.028467	CU M/Min	765.05	CU M
SP6		06.18.2004	19.2	0.167383	CU M/Min	765.52	CU M
SP6		06.18.2004	19.25	0.1175	CU M/Min	765.92	CU M
SP6		06.18.2004	19.3	0.05065	CU M/Min	766.23	CU M
SP6		06.18.2004	19.35	0.16825	CU M/Min	766.57	CU M
SP6		06.18.2004	19.4	0.066333	CU M/Min	766.89	CU M
SP6		06.18.2004	19.45	0	CU M/Min	767.75	CU M
SP6		06.18.2004	19.5	0	CU M/Min	768.89	CU M
SP6		06.18.2004	19.55	0.1701	CU M/Min	769.95	CU M
SP6		06.18.2004	20	0.0594	CU M/Min	770.56	CU M
SP6		06.18.2004	20.05	0	CU M/Min	771.29	CU M
SP6		06.18.2004	20.1	0.0314	CU M/Min	771.56	CU M
SP6		06.18.2004	20.15	0.144917	CU M/Min	771.83	CU M
SP6		06.18.2004	20.2	0.092167	CU M/Min	772.28	CU M
SP6		06.18.2004	20.25	0.032083	CU M/Min	772.64	CU M
SP6		06.18.2004	20.3	0	CU M/Min	772.97	CU M
SP6		06.18.2004	20.4	0.045417	CU M/Min	773.57	CU M
SP6		06.18.2004	20.45	0.032767	CU M/Min	773.95	CU M
SP6		06.18.2004	20.5	0.01865	CU M/Min	774.12	CU M
SP6		06.18.2004	20.55	0.0261	CU M/Min	774.48	CU M
SP6		06.18.2004	21	0.18085	CU M/Min	774.8	CU M
SP6		06.18.2004	21.05	0	CU M/Min	775.13	CU M
SP6		06.18.2004	21.1	0.961733	CU M/Min	777.16	CU M
SP6		06.18.2004	21.15	0.149283	CU M/Min	780.91	CU M
SP6		06.18.2004	21.2	0.0152	CU M/Min	781.41	CU M
SP6		06.18.2004	21.25	0.070567	CU M/Min	781.64	CU M
SP6		06.18.2004	21.4	0.028267	CU M/Min	782.54	CU M
SP6		06.18.2004	21.45	0.021133	CU M/Min	782.65	CU M
SP6		06.18.2004	21.5	0.022767	CU M/Min	782.84	CU M
SP6		06.18.2004	21.55	0.175883	CU M/Min	783.19	CU M
SP6		06.18.2004	22	0.077933	CU M/Min	783.57	CU M
SP6		06.18.2004	22.05	0.05715	CU M/Min	784	CU M
SP6		06.18.2004	22.1	0.026217	CU M/Min	784.25	CU M
SP6		06.18.2004	22.15	0.0293	CU M/Min	784.49	CU M
SP6		06.18.2004	22.2	0	CU M/Min	784.58	CU M
SP6		06.18.2004	22.25	0	CU M/Min	784.58	CU M
SP6		06.18.2004	22.3	0	CU M/Min	784.8	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.18.2004	22.35	0	CU M/Min	784.8	CU M
SP6		06.18.2004	22.4	0.0103	CU M/Min	784.81	CU M
SP6		06.18.2004	22.45	0.032333	CU M/Min	785.14	CU M
SP6		06.18.2004	22.5	0.023717	CU M/Min	785.34	CU M
SP6		06.18.2004	22.55	0.132083	CU M/Min	785.66	CU M
SP6		06.18.2004	23	0.045767	CU M/Min	785.86	CU M
SP6		06.18.2004	23.05	0.045217	CU M/Min	786.22	CU M
SP6		06.18.2004	23.1	0.02665	CU M/Min	786.41	CU M
SP6		06.18.2004	23.15	0.02635	CU M/Min	786.56	CU M
SP6		06.18.2004	23.2	0.14195	CU M/Min	786.85	CU M
SP6		06.18.2004	23.25	0	CU M/Min	787.19	CU M
SP6		06.18.2004	23.3	0.8664	CU M/Min	788.2	CU M
SP6		06.18.2004	23.35	0	CU M/Min	789.46	CU M
SP6		06.18.2004	23.4	0.7474	CU M/Min	790.22	CU M
SP6		06.18.2004	23.45	0.012517	CU M/Min	790.86	CU M
SP6		06.18.2004	23.5	0.187833	CU M/Min	791.33	CU M
SP6		06.18.2004	23.55	0.075233	CU M/Min	791.77	CU M
SP6		06.19.2004	0	0.029167	CU M/Min	792.08	CU M
SP6		06.19.2004	0.05	0.032167	CU M/Min	792.37	CU M
SP6		06.19.2004	0.1	0.057517	CU M/Min	792.84	CU M
SP6		06.19.2004	0.15	0.074983	CU M/Min	793.25	CU M
SP6		06.19.2004	0.2	0	CU M/Min	793.65	CU M
SP6		06.19.2004	0.25	0.043083	CU M/Min	793.99	CU M
SP6		06.19.2004	0.3	0	CU M/Min	794.31	CU M
SP6		06.19.2004	0.35	0	CU M/Min	794.61	CU M
SP6		06.19.2004	0.4	0	CU M/Min	795.53	CU M
SP6		06.19.2004	0.45	0	CU M/Min	795.68	CU M
SP6		06.19.2004	0.5	0.049817	CU M/Min	796.17	CU M
SP6		06.19.2004	0.55	0.0225	CU M/Min	796.45	CU M
SP6		06.19.2004	1	0.017833	CU M/Min	796.71	CU M
SP6		06.19.2004	1.05	0.028767	CU M/Min	797	CU M
SP6		06.19.2004	1.1	0.0526	CU M/Min	797.45	CU M
SP6		06.19.2004	1.15	0	CU M/Min	797.9	CU M
SP6		06.19.2004	1.2	0.04665	CU M/Min	798.09	CU M
SP6		06.19.2004	1.25	0.047033	CU M/Min	798.52	CU M
SP6		06.19.2004	1.3	0.06515	CU M/Min	798.88	CU M
SP6		06.19.2004	1.35	0.027983	CU M/Min	799.17	CU M
SP6		06.19.2004	1.4	0.026133	CU M/Min	799.44	CU M
SP6		06.19.2004	1.45	0.83425	CU M/Min	799.79	CU M
SP6		06.19.2004	1.5	0	CU M/Min	799.87	CU M
SP6		06.19.2004	1.55	0	CU M/Min	800.29	CU M
SP6		06.19.2004	2	0	CU M/Min	800.62	CU M
SP6		06.19.2004	2.1	0.297567	CU M/Min	801.1	CU M
SP6		06.19.2004	2.15	0.121233	CU M/Min	801.59	CU M
SP6		06.19.2004	2.2	0.03995	CU M/Min	801.96	CU M
SP6		06.19.2004	2.25	0.03275	CU M/Min	802.22	CU M
SP6		06.19.2004	2.3	0	CU M/Min	802.58	CU M
SP6		06.19.2004	2.35	0.023117	CU M/Min	802.9	CU M
SP6		06.19.2004	2.4	0.285617	CU M/Min	803.29	CU M
SP6		06.19.2004	2.45	0.021733	CU M/Min	803.47	CU M
SP6		06.19.2004	2.5	0.010083	CU M/Min	803.78	CU M
SP6		06.19.2004	2.55	0.03275	CU M/Min	804.05	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.19.2004	3	0.042283	CU M/Min	804.49	CU M
SP6		06.19.2004	3.05	0	CU M/Min	804.69	CU M
SP6		06.19.2004	3.1	0	CU M/Min	804.69	CU M
SP6		06.19.2004	3.15	0	CU M/Min	804.72	CU M
SP6		06.19.2004	3.2	0.015833	CU M/Min	804.82	CU M
SP6		06.19.2004	3.25	0.021217	CU M/Min	805.03	CU M
SP6		06.19.2004	3.3	0.021183	CU M/Min	805.28	CU M
SP6		06.19.2004	3.35	0.093417	CU M/Min	805.55	CU M
SP6		06.19.2004	3.4	0.083883	CU M/Min	805.9	CU M
SP6		06.19.2004	3.45	0.0489	CU M/Min	806.11	CU M
SP6		06.19.2004	3.5	0.051633	CU M/Min	806.43	CU M
SP6		06.19.2004	3.55	0.037883	CU M/Min	806.74	CU M
SP6		06.19.2004	4	0.059433	CU M/Min	807.1	CU M
SP6		06.19.2004	4.05	0.101083	CU M/Min	807.42	CU M
SP6		06.19.2004	4.1	0.083767	CU M/Min	807.71	CU M
SP6		06.19.2004	4.15	0	CU M/Min	807.83	CU M
SP6		06.19.2004	4.2	0.398983	CU M/Min	807.7	CU M
SP6		06.19.2004	4.25	0	CU M/Min	808.15	CU M
SP6		06.19.2004	4.3	0	CU M/Min	808.39	CU M
SP6		06.19.2004	4.35	0.103033	CU M/Min	808.82	CU M
SP6		06.19.2004	4.4	0.031617	CU M/Min	809.05	CU M
SP6		06.19.2004	4.45	0.0307	CU M/Min	809.31	CU M
SP6		06.19.2004	4.5	0.018833	CU M/Min	809.46	CU M
SP6		06.19.2004	4.51	0	CU M/Min	809.54	CU M
SP6		06.19.2004	4.51	0.19555	CU M/Min	809.54	CU M
SP6		06.19.2004	4.55	0.022517	CU M/Min	809.69	CU M
SP6		06.19.2004	5	0.348483	CU M/Min	809.91	CU M
SP6		06.19.2004	5.05	0.035983	CU M/Min	810.26	CU M
SP6		06.19.2004	5.1	0.033817	CU M/Min	810.49	CU M
SP6		06.19.2004	5.15	0.034567	CU M/Min	810.76	CU M
SP6		06.19.2004	5.2	0	CU M/Min	811.22	CU M
SP6		06.19.2004	5.25	0	CU M/Min	811.52	CU M
SP6		06.19.2004	5.3	0	CU M/Min	812.11	CU M
SP6		06.19.2004	5.35	0	CU M/Min	812.73	CU M
SP6		06.19.2004	5.4	0	CU M/Min	813.51	CU M
SP6		06.19.2004	6.25	0	CU M/Min	820.42	CU M
SP6		06.19.2004	6.3	0.75105	CU M/Min	821.86	CU M
SP6		06.19.2004	6.35	0	CU M/Min	822.96	CU M
SP6		06.19.2004	6.4	0	CU M/Min	823.9	CU M
SP6		06.19.2004	6.45	0.017267	CU M/Min	824.11	CU M
SP6		06.19.2004	6.5	0.503217	CU M/Min	824.67	CU M
SP6		06.19.2004	6.55	0	CU M/Min	825.81	CU M
SP6		06.19.2004	7	0	CU M/Min	826.69	CU M
SP6		06.19.2004	7.1	0	CU M/Min	828.86	CU M
SP6		06.19.2004	7.15	0.021883	CU M/Min	829.5	CU M
SP6		06.19.2004	7.25	0	CU M/Min	830.33	CU M
SP6		06.19.2004	7.3	0	CU M/Min	831.54	CU M
SP6		06.19.2004	7.4	0.032767	CU M/Min	832.43	CU M
SP6		06.19.2004	7.45	0	CU M/Min	833.13	CU M
SP6		06.19.2004	7.5	0.0573	CU M/Min	833.67	CU M
SP6		06.19.2004	7.55	0.0454	CU M/Min	833.98	CU M
SP6		06.19.2004	8	0.038367	CU M/Min	834.42	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.19.2004	8.05	0.841967	CU M/Min	835.11	CU M
SP6		06.19.2004	8.1	0	CU M/Min	835.75	CU M
SP6		06.19.2004	8.15	0.0296	CU M/Min	835.99	CU M
SP6		06.19.2004	8.2	0	CU M/Min	836.36	CU M
SP6		06.19.2004	8.25	0.04575	CU M/Min	836.7	CU M
SP6		06.19.2004	8.3	0	CU M/Min	837.08	CU M
SP6		06.19.2004	8.35	0.033217	CU M/Min	838	CU M
SP6		06.19.2004	8.4	0.02525	CU M/Min	838.24	CU M
SP6		06.19.2004	8.45	0.056017	CU M/Min	838.72	CU M
SP6		06.19.2004	8.5	0.0491	CU M/Min	839.04	CU M
SP6		06.19.2004	8.55	0.101067	CU M/Min	839.64	CU M
SP6		06.19.2004	9	0.164767	CU M/Min	840.03	CU M
SP6		06.19.2004	9.05	0.7035	CU M/Min	840.44	CU M
SP6		06.19.2004	9.1	0	CU M/Min	841.73	CU M
SP6		06.19.2004	9.15	0.162217	CU M/Min	842.1	CU M
SP6		06.19.2004	9.2	0.1407	CU M/Min	842.49	CU M
SP6		06.19.2004	9.25	0	CU M/Min	843.6	CU M
SP6		06.19.2004	9.3	0	CU M/Min	844.43	CU M
SP6		06.19.2004	9.35	0.061483	CU M/Min	844.86	CU M
SP6		06.19.2004	9.4	0.097217	CU M/Min	845.26	CU M
SP6		06.19.2004	10.5	0	CU M/Min	845.8	CU M
SP6		06.19.2004	10.55	0.009183	CU M/Min	846.11	CU M
SP6		06.19.2004	11	0.100133	CU M/Min	846.5	CU M
SP6		06.19.2004	11.05	0.153917	CU M/Min	847	CU M
SP6		06.19.2004	11.1	0.237517	CU M/Min	847.5	CU M
SP6		06.19.2004	11.15	0.0385	CU M/Min	847.86	CU M
SP6		06.19.2004	11.2	0.0251	CU M/Min	848.15	CU M
SP6		06.19.2004	11.25	0	CU M/Min	848.66	CU M
SP6		06.19.2004	11.3	0.06225	CU M/Min	848.87	CU M
SP6		06.19.2004	11.35	0.099767	CU M/Min	849.53	CU M
SP6		06.19.2004	11.4	0.168683	CU M/Min	849.97	CU M
SP6		06.19.2004	11.45	0.043933	CU M/Min	850.29	CU M
SP6		06.19.2004	11.5	0.02835	CU M/Min	850.67	CU M
SP6		06.19.2004	11.55	0.818983	CU M/Min	850.91	CU M
SP6		06.19.2004	12	0	CU M/Min	851.98	CU M
SP6		06.19.2004	12.05	0.8137	CU M/Min	853.3	CU M
SP6		06.19.2004	12.1	0	CU M/Min	854.11	CU M
SP6		06.19.2004	12.15	0.038017	CU M/Min	854.62	CU M
SP6		06.19.2004	12.2	0	CU M/Min	855.08	CU M
SP6		06.19.2004	12.25	0.0449	CU M/Min	855.73	CU M
SP6		06.19.2004	12.3	0.140967	CU M/Min	856.15	CU M
SP6		06.19.2004	12.35	0	CU M/Min	856.66	CU M
SP6		06.19.2004	12.4	0	CU M/Min	857.31	CU M
SP6		06.19.2004	12.45	0	CU M/Min	858.11	CU M
SP6		06.19.2004	12.5	0.6025	CU M/Min	859.18	CU M
SP6		06.19.2004	12.55	0.56105	CU M/Min	859.61	CU M
SP6		06.19.2004	13	0.092183	CU M/Min	859.86	CU M
SP6		06.19.2004	13.05	0	CU M/Min	860.25	CU M
SP6		06.19.2004	13.1	0	CU M/Min	861.23	CU M
SP6		06.19.2004	13.15	0.03795	CU M/Min	862.12	CU M
SP6		06.19.2004	13.2	0.032567	CU M/Min	862.5	CU M
SP6		06.19.2004	13.25	0.045467	CU M/Min	862.91	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.19.2004	13.3	0.139667	CU M/Min	863.31	CU M
SP6		06.19.2004	13.35	0	CU M/Min	863.64	CU M
SP6		06.19.2004	13.4	0	CU M/Min	864.14	CU M
SP6		06.19.2004	13.45	0	CU M/Min	864.32	CU M
SP6		06.19.2004	13.5	0.176417	CU M/Min	864.98	CU M
SP6		06.19.2004	13.55	0	CU M/Min	865.35	CU M
SP6		06.19.2004	14	0	CU M/Min	865.79	CU M
SP6		06.19.2004	14.05	0.042183	CU M/Min	866.14	CU M
SP6		06.19.2004	14.1	0.13735	CU M/Min	866.49	CU M
SP6		06.19.2004	14.15	0	CU M/Min	866.86	CU M
SP6		06.19.2004	14.2	0	CU M/Min	867.51	CU M
SP6		06.19.2004	14.25	0	CU M/Min	868.08	CU M
SP6		06.19.2004	14.3	0.08815	CU M/Min	868.46	CU M
SP6		06.19.2004	14.35	0	CU M/Min	868.78	CU M
SP6		06.19.2004	14.4	0	CU M/Min	870.05	CU M
SP6		06.19.2004	14.45	0.017083	CU M/Min	870.39	CU M
SP6		06.19.2004	14.5	0.065117	CU M/Min	870.62	CU M
SP6		06.19.2004	14.55	0.157517	CU M/Min	870.96	CU M
SP6		06.19.2004	15	0.908633	CU M/Min	871.48	CU M
SP6		06.19.2004	15.05	0	CU M/Min	872.52	CU M
SP6		06.19.2004	15.1	0	CU M/Min	874.08	CU M
SP6		06.19.2004	15.15	0.027867	CU M/Min	874.79	CU M
SP6		06.19.2004	15.2	0.623867	CU M/Min	875.14	CU M
SP6		06.19.2004	15.25	0	CU M/Min	876.35	CU M
SP6		06.19.2004	15.3	0.930833	CU M/Min	876.8	CU M
SP6		06.19.2004	15.35	0.045517	CU M/Min	877.73	CU M
SP6		06.19.2004	15.4	0.067567	CU M/Min	878.14	CU M
SP6		06.19.2004	15.45	0.043633	CU M/Min	878.56	CU M
SP6		06.19.2004	15.5	0.067017	CU M/Min	879.01	CU M
SP6		06.19.2004	15.55	0	CU M/Min	879.47	CU M
SP6		06.19.2004	16	0	CU M/Min	880.25	CU M
SP6		06.19.2004	16.05	0	CU M/Min	881.07	CU M
SP6		06.19.2004	16.1	0	CU M/Min	881.98	CU M
SP6		06.19.2004	16.15	0.172583	CU M/Min	882.34	CU M
SP6		06.19.2004	16.2	0.92135	CU M/Min	883.75	CU M
SP6		06.19.2004	16.25	0.942167	CU M/Min	884.7	CU M
SP6		06.19.2004	16.3	0.260617	CU M/Min	885.44	CU M
SP6		06.19.2004	16.35	0.07175	CU M/Min	886.04	CU M
SP6		06.19.2004	16.4	0.023417	CU M/Min	886.22	CU M
SP6		06.19.2004	16.45	0.03435	CU M/Min	886.52	CU M
SP6		06.19.2004	16.5	0.6094	CU M/Min	887.46	CU M
SP6		06.19.2004	16.55	0	CU M/Min	888.81	CU M
SP6		06.19.2004	17	0.1041	CU M/Min	889.74	CU M
SP6		06.19.2004	17.05	0.333467	CU M/Min	890.19	CU M
SP6		06.19.2004	17.1	0	CU M/Min	891.66	CU M
SP6		06.19.2004	17.15	0.040933	CU M/Min	892.2	CU M
SP6		06.19.2004	17.2	0.0834	CU M/Min	892.5	CU M
SP6		06.19.2004	17.25	0.0361	CU M/Min	892.81	CU M
SP6		06.19.2004	17.3	0.043383	CU M/Min	893.21	CU M
SP6		06.19.2004	17.35	0	CU M/Min	894.74	CU M
SP6		06.19.2004	17.4	0	CU M/Min	896.58	CU M
SP6		06.19.2004	17.45	0.87015	CU M/Min	898.8	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.19.2004	17.5	0.082217	CU M/Min	899.83	CU M
SP6		06.19.2004	17.55	0.8737	CU M/Min	901.15	CU M
SP6		06.19.2004	18	0.021783	CU M/Min	902.34	CU M
SP6		06.19.2004	18.05	0.024583	CU M/Min	902.48	CU M
SP6		06.19.2004	18.1	0	CU M/Min	903.18	CU M
SP6		06.19.2004	18.15	0.669267	CU M/Min	904.59	CU M
SP6		06.19.2004	18.2	0	CU M/Min	905.82	CU M
SP6		06.19.2004	18.25	0.048967	CU M/Min	907.05	CU M
SP6		06.19.2004	18.3	0.815633	CU M/Min	907.9	CU M
SP6		06.19.2004	18.35	0	CU M/Min	910.09	CU M
SP6		06.19.2004	18.4	0	CU M/Min	911.61	CU M
SP6		06.19.2004	18.45	0.10785	CU M/Min	912.32	CU M
SP6		06.19.2004	18.5	0.040817	CU M/Min	912.65	CU M
SP6		06.19.2004	18.55	0.11975	CU M/Min	912.98	CU M
SP6		06.19.2004	19	0.209767	CU M/Min	913.45	CU M
SP6		06.19.2004	19.05	0	CU M/Min	914.13	CU M
SP6		06.19.2004	19.1	0	CU M/Min	915.77	CU M
SP6		06.19.2004	19.15	0.720567	CU M/Min	917.73	CU M
SP6		06.19.2004	19.2	0.184783	CU M/Min	918.31	CU M
SP6		06.19.2004	19.25	0.026283	CU M/Min	918.72	CU M
SP6		06.19.2004	19.3	0.221467	CU M/Min	919.04	CU M
SP6		06.19.2004	19.35	0	CU M/Min	919.8	CU M
SP6		06.19.2004	19.4	0	CU M/Min	920.8	CU M
SP6		06.19.2004	19.45	0	CU M/Min	922.18	CU M
SP6		06.19.2004	19.5	0.037133	CU M/Min	922.79	CU M
SP6		06.19.2004	19.55	0	CU M/Min	923.16	CU M
SP6		06.19.2004	20	0	CU M/Min	924.03	CU M
SP6		06.19.2004	20.05	0.087967	CU M/Min	925.14	CU M
SP6		06.19.2004	20.1	0.057333	CU M/Min	925.55	CU M
SP6		06.19.2004	20.15	0.036367	CU M/Min	926.02	CU M
SP6		06.19.2004	20.2	0.037083	CU M/Min	926.29	CU M
SP6		06.19.2004	20.25	0	CU M/Min	926.7	CU M
SP6		06.19.2004	20.3	0.781033	CU M/Min	927.38	CU M
SP6		06.19.2004	20.35	0.924817	CU M/Min	929.18	CU M
SP6		06.19.2004	20.4	0.047417	CU M/Min	929.61	CU M
SP6		06.19.2004	20.45	0	CU M/Min	930.05	CU M
SP6		06.19.2004	20.5	0	CU M/Min	930.96	CU M
SP6		06.19.2004	20.55	0.047167	CU M/Min	931.53	CU M
SP6		06.19.2004	21	0.05245	CU M/Min	931.83	CU M
SP6		06.19.2004	21.05	0.49145	CU M/Min	932.21	CU M
SP6		06.19.2004	21.1	0.047617	CU M/Min	932.65	CU M
SP6		06.19.2004	21.15	0	CU M/Min	933.09	CU M
SP6		06.19.2004	21.2	0	CU M/Min	934.81	CU M
SP6		06.19.2004	21.25	0	CU M/Min	935.66	CU M
SP6		06.19.2004	21.3	0.088267	CU M/Min	936.88	CU M
SP6		06.19.2004	21.35	0.246367	CU M/Min	937.17	CU M
SP6		06.19.2004	21.4	0	CU M/Min	937.84	CU M
SP6		06.19.2004	21.45	0	CU M/Min	939.07	CU M
SP6		06.19.2004	21.5	0.04435	CU M/Min	939.59	CU M
SP6		06.19.2004	21.55	0.036017	CU M/Min	939.89	CU M
SP6		06.19.2004	22	0	CU M/Min	940.23	CU M
SP6		06.19.2004	22.05	0	CU M/Min	940.77	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.19.2004	22.4	0.029983	CU M/Min	943.69	CU M
SP6		06.19.2004	22.45	0.046883	CU M/Min	944.07	CU M
SP6		06.19.2004	22.5	0	CU M/Min	944.59	CU M
SP6		06.19.2004	22.55	0	CU M/Min	945.47	CU M
SP6		06.19.2004	23	0.042017	CU M/Min	945.9	CU M
SP6		06.19.2004	23.05	0.814567	CU M/Min	946.7	CU M
SP6		06.19.2004	23.1	0.0244	CU M/Min	947.82	CU M
SP6		06.19.2004	23.15	0.036617	CU M/Min	948.07	CU M
SP6		06.19.2004	23.2	0	CU M/Min	948.52	CU M
SP6		06.19.2004	23.25	0.754667	CU M/Min	950.21	CU M
SP6		06.19.2004	23.3	0.0486	CU M/Min	950.93	CU M
SP6		06.19.2004	23.35	0	CU M/Min	951.78	CU M
SP6		06.19.2004	23.4	0.764683	CU M/Min	953.18	CU M
SP6		06.19.2004	23.45	0.071817	CU M/Min	953.57	CU M
SP6		06.19.2004	23.5	0	CU M/Min	954.35	CU M
SP6		06.19.2004	23.55	0	CU M/Min	955.54	CU M
SP6		06.20.2004	0	0.013517	CU M/Min	956.14	CU M
SP6		06.20.2004	0.05	0	CU M/Min	956.45	CU M
SP6		06.20.2004	0.1	0	CU M/Min	956.79	CU M
SP6		06.20.2004	0.15	0.046467	CU M/Min	957.4	CU M
SP6		06.20.2004	0.2	0	CU M/Min	957.95	CU M
SP6		06.20.2004	0.25	0	CU M/Min	958.98	CU M
SP6		06.20.2004	0.3	0.027467	CU M/Min	959.37	CU M
SP6		06.20.2004	0.35	0	CU M/Min	959.55	CU M
SP6		06.20.2004	0.4	0	CU M/Min	959.96	CU M
SP6		06.20.2004	0.45	0.08245	CU M/Min	960.24	CU M
SP6		06.20.2004	0.5	0	CU M/Min	960.58	CU M
SP6		06.20.2004	0.55	0	CU M/Min	961.11	CU M
SP6		06.20.2004	1	0.023117	CU M/Min	961.6	CU M
SP6		06.20.2004	1.05	0.04615	CU M/Min	961.89	CU M
SP6		06.20.2004	1.1	0	CU M/Min	962.05	CU M
SP6		06.20.2004	1.15	0.019583	CU M/Min	961.93	CU M
SP6		06.20.2004	1.2	0.121217	CU M/Min	962.44	CU M
SP6		06.20.2004	1.25	0	CU M/Min	962.66	CU M
SP6		06.20.2004	1.3	0	CU M/Min	962.74	CU M
SP6		06.20.2004	1.35	0	CU M/Min	963.21	CU M
SP6		06.20.2004	1.4	0	CU M/Min	964.26	CU M
SP6		06.20.2004	1.45	0.2892	CU M/Min	964.89	CU M
SP6		06.20.2004	1.5	0.057317	CU M/Min	965.31	CU M
SP6		06.20.2004	1.55	0.027633	CU M/Min	965.69	CU M
SP6		06.20.2004	2	0	CU M/Min	966.03	CU M
SP6		06.20.2004	2.05	0	CU M/Min	966.4	CU M
SP6		06.20.2004	2.1	0	CU M/Min	967.11	CU M
SP6		06.20.2004	2.15	0.8384	CU M/Min	967.69	CU M
SP6		06.20.2004	2.2	0.037867	CU M/Min	968.4	CU M
SP6		06.20.2004	2.25	0.040033	CU M/Min	968.83	CU M
SP6		06.20.2004	2.3	0.04635	CU M/Min	969.15	CU M
SP6		06.20.2004	2.35	0.03805	CU M/Min	969.5	CU M
SP6		06.20.2004	2.4	0.037117	CU M/Min	969.8	CU M
SP6		06.20.2004	2.45	0.114467	CU M/Min	970.15	CU M
SP6		06.20.2004	2.5	0	CU M/Min	971.02	CU M
SP6		06.20.2004	2.55	0	CU M/Min	972.73	CU M

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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6		06.20.2004	3	0	CU M/Min	974.4	CU M
SP6		06.20.2004	3.05	0.0443	CU M/Min	975.18	CU M
SP6		06.20.2004	3.1	0	CU M/Min	975.78	CU M
SP6		06.20.2004	3.15	0	CU M/Min	977.42	CU M
SP6		06.20.2004	3.2	0.661517	CU M/Min	979.03	CU M
SP6		06.20.2004	3.25	0.022083	CU M/Min	979.72	CU M
SP6		06.20.2004	3.3	0.027367	CU M/Min	980.05	CU M
SP6		06.20.2004	3.35	0.0236	CU M/Min	980.2	CU M
SP6		06.20.2004	3.4	0.0563	CU M/Min	980.63	CU M
SP6		06.20.2004	3.45	0	CU M/Min	981.32	CU M
SP6		06.20.2004	3.5	0	CU M/Min	982.78	CU M
SP6		06.20.2004	3.55	0	CU M/Min	983.23	CU M
SP6		06.20.2004	4	0.025083	CU M/Min	984.47	CU M
SP6		06.20.2004	4.05	0	CU M/Min	984.96	CU M
SP6		06.20.2004	4.1	0	CU M/Min	986.14	CU M
SP6		06.20.2004	4.15	0.047317	CU M/Min	987.49	CU M
SP6		06.20.2004	4.2	0.035917	CU M/Min	987.72	CU M
SP6		06.20.2004	4.25	0.037617	CU M/Min	988.13	CU M
SP6		06.20.2004	4.3	0.165417	CU M/Min	988.52	CU M
SP6		06.20.2004	4.35	0.170933	CU M/Min	989.2	CU M
SP6		06.20.2004	4.4	0.035667	CU M/Min	989.42	CU M
SP6		06.20.2004	4.45	0.034683	CU M/Min	989.6	CU M
SP6		06.20.2004	4.5	0	CU M/Min	989.95	CU M
SP6		06.20.2004	4.55	0	CU M/Min	991.28	CU M
SP6		06.20.2004	5	0.590317	CU M/Min	993.01	CU M
SP6		06.20.2004	5.05	0	CU M/Min	993.5	CU M
SP6		06.20.2004	5.1	0.070533	CU M/Min	993.83	CU M
SP6	Day 1	06.20.2004	6	0.235517	CU M/Min	1000.09	CU M
SP6	Day 1	06.20.2004	6.05	0.10735	CU M/Min	1000.48	CU M
SP6	Day 1	06.20.2004	6.1	0.047717	CU M/Min	1000.86	CU M
SP6	Day 1	06.20.2004	6.15	0.539517	CU M/Min	1002.46	CU M
SP6	Day 1	06.20.2004	6.2	0	CU M/Min	1003.7	CU M
SP6	Day 1	06.20.2004	6.25	0.038733	CU M/Min	1004.61	CU M
SP6	Day 1	06.20.2004	6.3	0.0868	CU M/Min	1005.02	CU M
SP6	Day 1	06.20.2004	6.35	0.0598	CU M/Min	1005.49	CU M
SP6	Day 1	06.20.2004	6.4	0.056283	CU M/Min	1005.92	CU M
SP6	Day 1	06.20.2004	6.45	0.033017	CU M/Min	1006.25	CU M
SP6	Day 1	06.20.2004	6.5	0.044133	CU M/Min	1006.6	CU M
SP6	Day 1	06.20.2004	6.55	0	CU M/Min	1007.21	CU M
SP6	Day 1	06.20.2004	7	0	CU M/Min	1008.53	CU M
SP6	Day 1	06.20.2004	7.05	0.045983	CU M/Min	1008.86	CU M
SP6	Day 1	06.20.2004	7.1	0.044133	CU M/Min	1009.17	CU M
SP6	Day 1	06.20.2004	7.15	0.038733	CU M/Min	1009.58	CU M
SP6	Day 1	06.20.2004	7.2	0.1235	CU M/Min	1009.93	CU M
SP6	Day 1	06.20.2004	7.25	0.189267	CU M/Min	1010.35	CU M
SP6	Day 1	06.20.2004	7.3	0.07325	CU M/Min	1010.72	CU M
SP6	Day 1	06.20.2004	7.35	0	CU M/Min	1011.26	CU M
SP6	Day 1	06.20.2004	7.4	0.542067	CU M/Min	1011.81	CU M
SP6	Day 1	06.20.2004	7.45	0	CU M/Min	1012.8	CU M
SP6	Day 1	06.20.2004	7.5	0.131367	CU M/Min	1013.35	CU M
SP6	Day 1	06.20.2004	7.55	0	CU M/Min	1013.8	CU M
SP6	Day 1	06.20.2004	8	0.055533	CU M/Min	1014.74	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 1	06.20.2004	8.05	0.0376	CU M/Min	1015.13	CU M
SP6	Day 1	06.20.2004	8.1	0.098717	CU M/Min	1015.56	CU M
SP6	Day 1	06.20.2004	8.15	0.100683	CU M/Min	1015.96	CU M
SP6	Day 1	06.20.2004	8.2	0	CU M/Min	1016.34	CU M
SP6	Day 1	06.20.2004	8.25	0	CU M/Min	1017.26	CU M
SP6	Day 1	06.20.2004	8.3	0	CU M/Min	1018.82	CU M
SP6	Day 1	06.20.2004	8.35	0.049133	CU M/Min	1019.82	CU M
SP6	Day 1	06.20.2004	8.4	0	CU M/Min	1020.16	CU M
SP6	Day 1	06.20.2004	8.45	0	CU M/Min	1020.93	CU M
SP6	Day 1	06.20.2004	8.5	0.062833	CU M/Min	1021.93	CU M
SP6	Day 1	06.20.2004	8.55	0.066017	CU M/Min	1022.3	CU M
SP6	Day 1	06.20.2004	9	0.14145	CU M/Min	1022.69	CU M
SP6	Day 1	06.20.2004	9.05	0.046983	CU M/Min	1023.01	CU M
SP6	Day 1	06.20.2004	9.1	0	CU M/Min	1023.67	CU M
SP6	Day 1	06.20.2004	9.15	0	CU M/Min	1024.8	CU M
SP6	Day 1	06.20.2004	9.2	0.61605	CU M/Min	1026.2	CU M
SP6	Day 1	06.20.2004	9.25	0.050267	CU M/Min	1027.43	CU M
SP6	Day 1	06.20.2004	9.3	0	CU M/Min	1027.87	CU M
SP6	Day 1	06.20.2004	9.35	0	CU M/Min	1029.01	CU M
SP6	Day 1	06.20.2004	9.4	0	CU M/Min	1029.7	CU M
SP6	Day 1	06.20.2004	9.45	0.02325	CU M/Min	1030.17	CU M
SP6	Day 1	06.20.2004	9.5	0.104483	CU M/Min	1030.95	CU M
SP6	Day 1	06.20.2004	9.55	0.039183	CU M/Min	1031.32	CU M
SP6	Day 1	06.20.2004	10	0.030567	CU M/Min	1031.62	CU M
SP6	Day 1	06.20.2004	10.05	0.069517	CU M/Min	1032.11	CU M
SP6	Day 1	06.20.2004	10.1	0	CU M/Min	1032.77	CU M
SP6	Day 1	06.20.2004	10.15	0	CU M/Min	1034.51	CU M
SP6	Day 1	06.20.2004	10.2	0.80445	CU M/Min	1036.43	CU M
SP6	Day 1	06.20.2004	10.25	0.037267	CU M/Min	1036.82	CU M
SP6	Day 1	06.20.2004	10.3	0	CU M/Min	1037.84	CU M
SP6	Day 1	06.20.2004	10.35	0.063733	CU M/Min	1039.04	CU M
SP6	Day 1	06.20.2004	10.4	0.0307	CU M/Min	1039.22	CU M
SP6	Day 1	06.20.2004	10.45	0	CU M/Min	1039.55	CU M
SP6	Day 1	06.20.2004	10.5	0.17005	CU M/Min	1040	CU M
SP6	Day 1	06.20.2004	10.55	0.233317	CU M/Min	1041.64	CU M
SP6	Day 1	06.20.2004	11	0	CU M/Min	1042.94	CU M
SP6	Day 1	06.20.2004	11.05	0	CU M/Min	1044.64	CU M
SP6	Day 1	06.20.2004	11.1	0.028467	CU M/Min	1045.71	CU M
SP6	Day 1	06.20.2004	11.15	0.4813	CU M/Min	1046.54	CU M
SP6	Day 1	06.20.2004	11.2	0	CU M/Min	1048.05	CU M
SP6	Day 1	06.20.2004	11.25	0.0397	CU M/Min	1049.13	CU M
SP6	Day 1	06.20.2004	11.3	0.108833	CU M/Min	1049.61	CU M
SP6	Day 1	06.20.2004	11.35	0.060717	CU M/Min	1050.02	CU M
SP6	Day 1	06.20.2004	11.4	0.083417	CU M/Min	1050.4	CU M
SP6	Day 1	06.20.2004	11.45	0.80035	CU M/Min	1051.86	CU M
SP6	Day 1	06.20.2004	11.5	0.935167	CU M/Min	1053.75	CU M
SP6	Day 1	06.20.2004	11.55	0	CU M/Min	1055.91	CU M
SP6	Day 1	06.20.2004	12	0.028433	CU M/Min	1056.68	CU M
SP6	Day 1	06.20.2004	12.05	0.834433	CU M/Min	1057.65	CU M
SP6	Day 1	06.20.2004	12.1	0.76765	CU M/Min	1059.65	CU M
SP6	Day 1	06.20.2004	12.15	0.10505	CU M/Min	1060.18	CU M
SP6	Day 1	06.20.2004	12.2	0.180133	CU M/Min	1060.53	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 1	06.20.2004	12.25	0.08245	CU M/Min	1060.95	CU M
SP6	Day 1	06.20.2004	12.3	0	CU M/Min	1061.82	CU M
SP6	Day 1	06.20.2004	12.35	0	CU M/Min	1063.49	CU M
SP6	Day 1	06.20.2004	12.4	0.819667	CU M/Min	1064.88	CU M
SP6	Day 1	06.20.2004	12.45	0.075333	CU M/Min	1065.34	CU M
SP6	Day 1	06.20.2004	12.5	0.448183	CU M/Min	1065.79	CU M
SP6	Day 1	06.20.2004	12.55	0.841267	CU M/Min	1066.95	CU M
SP6	Day 1	06.20.2004	13	0	CU M/Min	1067.85	CU M
SP6	Day 1	06.20.2004	13.05	0.2244	CU M/Min	1068.51	CU M
SP6	Day 1	06.20.2004	13.1	0.1746	CU M/Min	1068.97	CU M
SP6	Day 1	06.20.2004	13.15	0.042083	CU M/Min	1069.28	CU M
SP6	Day 1	06.20.2004	13.2	0.0312	CU M/Min	1069.64	CU M
SP6	Day 1	06.20.2004	13.25	0	CU M/Min	1070.9	CU M
SP6	Day 1	06.20.2004	13.3	0.282983	CU M/Min	1072.3	CU M
SP6	Day 1	06.20.2004	13.35	0	CU M/Min	1073.6	CU M
SP6	Day 1	06.20.2004	13.4	0.052667	CU M/Min	1074.64	CU M
SP6	Day 1	06.20.2004	13.45	0	CU M/Min	1075.8	CU M
SP6	Day 1	06.20.2004	13.5	0.23695	CU M/Min	1077.6	CU M
SP6	Day 1	06.20.2004	13.55	0	CU M/Min	1078.56	CU M
SP6	Day 1	06.20.2004	14	0.071717	CU M/Min	1078.98	CU M
SP6	Day 1	06.20.2004	14.05	0.104517	CU M/Min	1080	CU M
SP6	Day 1	06.20.2004	14.1	0.040017	CU M/Min	1080.23	CU M
SP6	Day 1	06.20.2004	14.15	0.1038	CU M/Min	1080.75	CU M
SP6	Day 1	06.20.2004	14.2	0.0321	CU M/Min	1081.15	CU M
SP6	Day 1	06.20.2004	14.25	0	CU M/Min	1081.97	CU M
SP6	Day 1	06.20.2004	14.3	0.972417	CU M/Min	1083.92	CU M
SP6	Day 1	06.20.2004	14.35	0	CU M/Min	1085.74	CU M
SP6	Day 1	06.20.2004	14.4	0.386183	CU M/Min	1086.5	CU M
SP6	Day 1	06.20.2004	14.45	0	CU M/Min	1087.96	CU M
SP6	Day 1	06.20.2004	14.5	0	CU M/Min	1090.05	CU M
SP6	Day 1	06.20.2004	14.55	0.991083	CU M/Min	1091.39	CU M
SP6	Day 1	06.20.2004	15	0.07185	CU M/Min	1092.12	CU M
SP6	Day 1	06.20.2004	15.05	0.049967	CU M/Min	1092.4	CU M
SP6	Day 1	06.20.2004	15.1	0.045533	CU M/Min	1092.83	CU M
SP6	Day 1	06.20.2004	15.15	0.038483	CU M/Min	1093.06	CU M
SP6	Day 1	06.20.2004	15.2	0.509217	CU M/Min	1094.01	CU M
SP6	Day 1	06.20.2004	15.25	0	CU M/Min	1095.29	CU M
SP6	Day 1	06.20.2004	15.3	0.865567	CU M/Min	1097.5	CU M
SP6	Day 1	06.20.2004	15.35	0.044283	CU M/Min	1098.88	CU M
SP6	Day 1	06.20.2004	15.4	0.989367	CU M/Min	1099.87	CU M
SP6	Day 1	06.20.2004	15.45	0	CU M/Min	1102.01	CU M
SP6	Day 1	06.20.2004	15.5	0	CU M/Min	1103.56	CU M
SP6	Day 1	06.20.2004	15.55	0.100433	CU M/Min	1104.1	CU M
SP6	Day 1	06.20.2004	16	0.046983	CU M/Min	1104.53	CU M
SP6	Day 1	06.20.2004	16.05	0.056467	CU M/Min	1104.99	CU M
SP6	Day 1	06.20.2004	16.1	0.02915	CU M/Min	1105.34	CU M
SP6	Day 1	06.20.2004	16.15	0.0295	CU M/Min	1105.69	CU M
SP6	Day 1	06.20.2004	16.2	0	CU M/Min	1106.68	CU M
SP6	Day 1	06.20.2004	16.25	0	CU M/Min	1107.51	CU M
SP6	Day 1	06.20.2004	16.3	0	CU M/Min	1107.87	CU M
SP6	Day 1	06.20.2004	16.35	0.129983	CU M/Min	1108.92	CU M
SP6	Day 1	06.20.2004	16.4	0.213133	CU M/Min	1109.42	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 1	06.20.2004	16.45	0	CU M/Min	1110.43	CU M
SP6	Day 1	06.20.2004	16.5	0.7281	CU M/Min	1112.05	CU M
SP6	Day 1	06.20.2004	16.55	0.0433	CU M/Min	1112.45	CU M
SP6	Day 1	06.20.2004	17	0.035783	CU M/Min	1112.62	CU M
SP6	Day 1	06.20.2004	17.05	0.03895	CU M/Min	1112.95	CU M
SP6	Day 1	06.20.2004	17.1	0.028	CU M/Min	1113.27	CU M
SP6	Day 1	06.20.2004	17.15	0.958133	CU M/Min	1113.99	CU M
SP6	Day 1	06.20.2004	17.2	0.430633	CU M/Min	1114.64	CU M
SP6	Day 1	06.20.2004	17.25	0.04595	CU M/Min	1115.23	CU M
SP6	Day 1	06.20.2004	17.3	0	CU M/Min	1115.66	CU M
SP6	Day 1	06.20.2004	17.35	0.47075	CU M/Min	1117.83	CU M
SP6	Day 1	06.20.2004	17.4	0.208167	CU M/Min	1118.55	CU M
SP6	Day 1	06.20.2004	17.45	0.04285	CU M/Min	1119.76	CU M
SP6	Day 1	06.20.2004	17.5	0.101517	CU M/Min	1120.06	CU M
SP6	Day 1	06.20.2004	17.55	0.038633	CU M/Min	1120.36	CU M
SP6	Day 1	06.20.2004	18	0.04515	CU M/Min	1120.67	CU M
SP6	Day 1	06.20.2004	18.05	0	CU M/Min	1121.09	CU M
SP6	Day 1	06.20.2004	18.1	0.884883	CU M/Min	1122.15	CU M
SP6	Day 1	06.20.2004	18.15	0	CU M/Min	1123.23	CU M
SP6	Day 1	06.20.2004	18.2	0.058167	CU M/Min	1124.52	CU M
SP6	Day 1	06.20.2004	18.25	0	CU M/Min	1124.78	CU M
SP6	Day 1	06.20.2004	18.3	0.8008	CU M/Min	1126.18	CU M
SP6	Day 1	06.20.2004	18.35	0.052183	CU M/Min	1127.34	CU M
SP6	Day 1	06.20.2004	18.5	0.075	CU M/Min	1128.77	CU M
SP6	Day 1	06.20.2004	18.55	0	CU M/Min	1129.4	CU M
SP6	Day 1	06.20.2004	19	0	CU M/Min	1129.98	CU M
SP6	Day 1	06.20.2004	19.05	0	CU M/Min	1131.35	CU M
SP6	Day 1	06.20.2004	19.1	0.052633	CU M/Min	1132.06	CU M
SP6	Day 1	06.20.2004	19.15	0	CU M/Min	1132.73	CU M
SP6	Day 1	06.20.2004	19.2	0	CU M/Min	1133.76	CU M
SP6	Day 1	06.20.2004	19.25	0.058867	CU M/Min	1134.77	CU M
SP6	Day 1	06.20.2004	19.3	0.03985	CU M/Min	1135.09	CU M
SP6	Day 1	06.20.2004	19.35	0.029517	CU M/Min	1135.45	CU M
SP6	Day 1	06.20.2004	19.4	0.155667	CU M/Min	1135.78	CU M
SP6	Day 1	06.20.2004	19.45	0	CU M/Min	1136.4	CU M
SP6	Day 1	06.20.2004	19.5	0	CU M/Min	1137.81	CU M
SP6	Day 1	06.20.2004	19.55	0	CU M/Min	1138.96	CU M
SP6	Day 1	06.20.2004	20	0.04375	CU M/Min	1139.46	CU M
SP6	Day 1	06.20.2004	20.05	0.186133	CU M/Min	1140.63	CU M
SP6	Day 1	06.20.2004	20.1	0	CU M/Min	1141.32	CU M
SP6	Day 1	06.20.2004	20.15	0.08205	CU M/Min	1142.31	CU M
SP6	Day 1	06.20.2004	20.2	0.031033	CU M/Min	1142.5	CU M
SP6	Day 1	06.20.2004	20.25	0.025133	CU M/Min	1142.97	CU M
SP6	Day 1	06.20.2004	20.3	0.02995	CU M/Min	1143.11	CU M
SP6	Day 1	06.20.2004	20.35	0.5181	CU M/Min	1143.64	CU M
SP6	Day 1	06.20.2004	20.4	0	CU M/Min	1145.14	CU M
SP6	Day 1	06.20.2004	20.45	0	CU M/Min	1146.31	CU M
SP6	Day 1	06.20.2004	20.5	0.036167	CU M/Min	1147.23	CU M
SP6	Day 1	06.20.2004	20.55	0.120483	CU M/Min	1147.6	CU M
SP6	Day 1	06.20.2004	21	0.568517	CU M/Min	1148.93	CU M
SP6	Day 1	06.20.2004	21.05	0.089767	CU M/Min	1151.89	CU M
SP6	Day 1	06.20.2004	21.1	0.038533	CU M/Min	1152.1	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 1	06.20.2004	21.15	0.035683	CU M/Min	1152.37	CU M
SP6	Day 1	06.20.2004	21.2	0.0371	CU M/Min	1152.67	CU M
SP6	Day 1	06.20.2004	21.25	0	CU M/Min	1153.06	CU M
SP6	Day 1	06.20.2004	21.3	0	CU M/Min	1153.98	CU M
SP6	Day 1	06.20.2004	21.35	0.939967	CU M/Min	1155.11	CU M
SP6	Day 1	06.20.2004	21.4	0.798983	CU M/Min	1156.17	CU M
SP6	Day 1	06.20.2004	21.45	0.02685	CU M/Min	1156.6	CU M
SP6	Day 1	06.20.2004	21.5	0	CU M/Min	1157.25	CU M
SP6	Day 1	06.20.2004	21.55	0.321617	CU M/Min	1158.8	CU M
SP6	Day 1	06.20.2004	22	0.0532	CU M/Min	1158.9	CU M
SP6	Day 1	06.20.2004	22.05	0	CU M/Min	1159.55	CU M
SP6	Day 1	06.20.2004	22.1	0.0443	CU M/Min	1159.92	CU M
SP6	Day 1	06.20.2004	22.15	0.247417	CU M/Min	1160.11	CU M
SP6	Day 1	06.20.2004	22.2	0.401883	CU M/Min	1160.88	CU M
SP6	Day 1	06.20.2004	22.25	0.022733	CU M/Min	1161.83	CU M
SP6	Day 1	06.20.2004	22.3	0.1547	CU M/Min	1162.15	CU M
SP6	Day 1	06.20.2004	22.35	0	CU M/Min	1162.41	CU M
SP6	Day 1	06.20.2004	22.4	0	CU M/Min	1162.7	CU M
SP6	Day 1	06.20.2004	22.45	0.2798	CU M/Min	1162.95	CU M
SP6	Day 1	06.20.2004	22.5	0	CU M/Min	1163.35	CU M
SP6	Day 1	06.20.2004	22.55	0.031117	CU M/Min	1163.62	CU M
SP6	Day 1	06.20.2004	23	0	CU M/Min	1163.97	CU M
SP6	Day 1	06.20.2004	23.05	0.168817	CU M/Min	1164.15	CU M
SP6	Day 1	06.20.2004	23.1	0.0283	CU M/Min	1164.44	CU M
SP6	Day 1	06.20.2004	23.15	0	CU M/Min	1164.73	CU M
SP6	Day 1	06.20.2004	23.2	0	CU M/Min	1165.44	CU M
SP6	Day 1	06.20.2004	23.25	0.014717	CU M/Min	1166.01	CU M
SP6	Day 1	06.20.2004	23.3	0	CU M/Min	1166.28	CU M
SP6	Day 1	06.20.2004	23.35	0	CU M/Min	1166.43	CU M
SP6	Day 1	06.20.2004	23.4	0.792167	CU M/Min	1167.12	CU M
SP6	Day 1	06.20.2004	23.45	0.025583	CU M/Min	1167.48	CU M
SP6	Day 1	06.20.2004	23.5	0.020967	CU M/Min	1167.72	CU M
SP6	Day 1	06.20.2004	23.55	0	CU M/Min	1167.99	CU M
SP6	Day 1	06.21.2004	0	0	CU M/Min	1168.62	CU M
SP6	Day 1	06.21.2004	0.05	0	CU M/Min	1169.32	CU M
SP6	Day 1	06.21.2004	0.1	0.011733	CU M/Min	1169.67	CU M
SP6	Day 1	06.21.2004	0.15	0.017033	CU M/Min	1169.86	CU M
SP6	Day 1	06.21.2004	0.2	0	CU M/Min	1170.49	CU M
SP6	Day 1	06.21.2004	0.25	0.41225	CU M/Min	1170.79	CU M
SP6	Day 1	06.21.2004	0.3	0.367883	CU M/Min	1171.25	CU M
SP6	Day 1	06.21.2004	0.35	0	CU M/Min	1171.25	CU M
SP6	Day 1	06.21.2004	0.4	0	CU M/Min	1171.85	CU M
SP6	Day 1	06.21.2004	0.45	0	CU M/Min	1172.26	CU M
SP6	Day 1	06.21.2004	0.5	0.03005	CU M/Min	1172.62	CU M
SP6	Day 1	06.21.2004	0.55	0	CU M/Min	1173.11	CU M
SP6	Day 1	06.21.2004	1	0.099183	CU M/Min	1173.48	CU M
SP6	Day 1	06.21.2004	1.05	0	CU M/Min	1173.74	CU M
SP6	Day 1	06.21.2004	1.1	0.861683	CU M/Min	1175.55	CU M
SP6	Day 1	06.21.2004	1.15	0.86475	CU M/Min	1177.72	CU M
SP6	Day 1	06.21.2004	1.2	0.1611	CU M/Min	1179.33	CU M
SP6	Day 1	06.21.2004	1.25	0.0654	CU M/Min	1179.75	CU M
SP6	Day 1	06.21.2004	1.3	0	CU M/Min	1180.96	CU M

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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 1	06.21.2004	1.35	0	CU M/Min	1182.43	CU M
SP6	Day 1	06.21.2004	1.4	0.06225	CU M/Min	1183.39	CU M
SP6	Day 1	06.21.2004	1.45	0.028583	CU M/Min	1183.61	CU M
SP6	Day 1	06.21.2004	1.5	0.040317	CU M/Min	1183.86	CU M
SP6	Day 1	06.21.2004	1.55	0.037767	CU M/Min	1184.16	CU M
SP6	Day 1	06.21.2004	2	0.534117	CU M/Min	1185.32	CU M
SP6	Day 1	06.21.2004	2.05	0	CU M/Min	1186.91	CU M
SP6	Day 1	06.21.2004	2.1	0	CU M/Min	1188.29	CU M
SP6	Day 1	06.21.2004	2.15	0.027117	CU M/Min	1188.7	CU M
SP6	Day 1	06.21.2004	2.2	0.793417	CU M/Min	1189.7	CU M
SP6	Day 1	06.21.2004	2.25	0.030017	CU M/Min	1190.03	CU M
SP6	Day 1	06.21.2004	2.3	0.021967	CU M/Min	1190.31	CU M
SP6	Day 1	06.21.2004	2.35	0.02495	CU M/Min	1190.57	CU M
SP6	Day 1	06.21.2004	2.4	0.031417	CU M/Min	1190.91	CU M
SP6	Day 1	06.21.2004	2.45	0.174317	CU M/Min	1191.07	CU M
SP6	Day 1	06.21.2004	2.5	0.036817	CU M/Min	1191.39	CU M
SP6	Day 1	06.21.2004	2.55	0.033733	CU M/Min	1191.75	CU M
SP6	Day 1	06.21.2004	3	0.0469	CU M/Min	1192.03	CU M
SP6	Day 1	06.21.2004	3.05	0	CU M/Min	1193.32	CU M
SP6	Day 1	06.21.2004	3.1	0.013017	CU M/Min	1193.61	CU M
SP6	Day 1	06.21.2004	3.15	0.18595	CU M/Min	1193.77	CU M
SP6	Day 1	06.21.2004	3.2	0.0734	CU M/Min	1194.09	CU M
SP6	Day 1	06.21.2004	3.25	0.0321	CU M/Min	1194.37	CU M
SP6	Day 1	06.21.2004	3.3	0.802	CU M/Min	1194.7	CU M
SP6	Day 1	06.21.2004	3.35	0.48345	CU M/Min	1196.25	CU M
SP6	Day 1	06.21.2004	3.4	0	CU M/Min	1197.63	CU M
SP6	Day 1	06.21.2004	3.45	0.261033	CU M/Min	1198.54	CU M
SP6	Day 1	06.21.2004	3.5	0	CU M/Min	1199.56	CU M
SP6	Day 1	06.21.2004	3.55	0.027133	CU M/Min	1199.83	CU M
SP6	Day 1	06.21.2004	4	0.024733	CU M/Min	1200.05	CU M
SP6	Day 1	06.21.2004	4.05	0.0426	CU M/Min	1200.54	CU M
SP6	Day 1	06.21.2004	4.1	0	CU M/Min	1200.92	CU M
SP6	Day 1	06.21.2004	4.15	0.833767	CU M/Min	1201.99	CU M
SP6	Day 1	06.21.2004	4.2	0	CU M/Min	1202.66	CU M
SP6	Day 1	06.21.2004	4.25	0.025933	CU M/Min	1203.75	CU M
SP6	Day 1	06.21.2004	4.3	0.02665	CU M/Min	1203.9	CU M
SP6	Day 1	06.21.2004	4.35	0.03965	CU M/Min	1204.34	CU M
SP6	Day 1	06.21.2004	4.4	0.0752	CU M/Min	1204.55	CU M
SP6	Day 1	06.21.2004	4.45	0.027983	CU M/Min	1204.71	CU M
SP6	Day 1	06.21.2004	4.5	0.792883	CU M/Min	1204.95	CU M
SP6	Day 1	06.21.2004	4.55	0	CU M/Min	1206.04	CU M
SP6	Day 1	06.21.2004	5	0.168983	CU M/Min	1207	CU M
SP6	Day 1	06.21.2004	5.05	0.04585	CU M/Min	1207.25	CU M
SP6	Day 1	06.21.2004	5.1	0.18485	CU M/Min	1207.58	CU M
SP6	Day 1	06.21.2004	5.15	0.075733	CU M/Min	1207.91	CU M
SP6	Day 1	06.21.2004	5.2	0.028983	CU M/Min	1208.1	CU M
SP6	Day 1	06.21.2004	5.25	0.028083	CU M/Min	1208.48	CU M
SP6	Day 1	06.21.2004	5.3	0	CU M/Min	1208.83	CU M
SP6	Day 1	06.21.2004	5.35	0	CU M/Min	1209.71	CU M
SP6	Day 1	06.21.2004	5.4	0	CU M/Min	1211.08	CU M
SP6	Day 1	06.21.2004	5.45	0.0231	CU M/Min	1211.58	CU M
SP6	Day 1	06.21.2004	5.5	0	CU M/Min	1211.85	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 1	06.21.2004	5.55	0	CU M/Min	1212.81	CU M
SP6	Day 2	06.21.2004	6	0.435733	CU M/Min	1213.71	CU M
SP6	Day 2	06.21.2004	6.05	0	CU M/Min	1214.07	CU M
SP6	Day 2	06.21.2004	6.2	0	CU M/Min	1215.56	CU M
SP6	Day 2	06.21.2004	6.25	0.339283	CU M/Min	1216.97	CU M
SP6	Day 2	06.21.2004	6.3	0	CU M/Min	1218.18	CU M
SP6	Day 2	06.21.2004	6.35	0	CU M/Min	1219.13	CU M
SP6	Day 2	06.21.2004	6.4	0.063067	CU M/Min	1219.38	CU M
SP6	Day 2	06.21.2004	6.45	0	CU M/Min	1220.83	CU M
SP6	Day 2	06.21.2004	6.5	0	CU M/Min	1221.97	CU M
SP6	Day 2	06.21.2004	6.55	0.054867	CU M/Min	1222.32	CU M
SP6	Day 2	06.21.2004	7	0.24615	CU M/Min	1222.79	CU M
SP6	Day 2	06.21.2004	7.05	0.04695	CU M/Min	1223.04	CU M
SP6	Day 2	06.21.2004	7.1	0.654683	CU M/Min	1223.35	CU M
SP6	Day 2	06.21.2004	7.15	0.814317	CU M/Min	1224.64	CU M
SP6	Day 2	06.21.2004	7.2	0.76775	CU M/Min	1225.87	CU M
SP6	Day 2	06.21.2004	7.25	0.56085	CU M/Min	1227.43	CU M
SP6	Day 2	06.21.2004	7.3	0.070417	CU M/Min	1228.45	CU M
SP6	Day 2	06.21.2004	7.35	0.789817	CU M/Min	1229.49	CU M
SP6	Day 2	06.21.2004	7.4	0.029283	CU M/Min	1229.96	CU M
SP6	Day 2	06.21.2004	7.45	0.045083	CU M/Min	1230.23	CU M
SP6	Day 2	06.21.2004	7.5	0.044267	CU M/Min	1230.67	CU M
SP6	Day 2	06.21.2004	7.55	0	CU M/Min	1231.06	CU M
SP6	Day 2	06.21.2004	8	0.7993	CU M/Min	1231.79	CU M
SP6	Day 2	06.21.2004	8.05	0.77175	CU M/Min	1233.2	CU M
SP6	Day 2	06.21.2004	8.1	0.864967	CU M/Min	1234.57	CU M
SP6	Day 2	06.21.2004	8.15	0.04475	CU M/Min	1235.28	CU M
SP6	Day 2	06.21.2004	8.2	0	CU M/Min	1236.18	CU M
SP6	Day 2	06.21.2004	8.25	0	CU M/Min	1236.84	CU M
SP6	Day 2	06.21.2004	8.3	0.0591	CU M/Min	1237.33	CU M
SP6	Day 2	06.21.2004	8.35	0.032583	CU M/Min	1237.65	CU M
SP6	Day 2	06.21.2004	8.4	0.027017	CU M/Min	1237.9	CU M
SP6	Day 2	06.21.2004	8.45	0.04995	CU M/Min	1238.21	CU M
SP6	Day 2	06.21.2004	8.5	0	CU M/Min	1239.11	CU M
SP6	Day 2	06.21.2004	8.55	0	CU M/Min	1239.67	CU M
SP6	Day 2	06.21.2004	9	0.059617	CU M/Min	1240.19	CU M
SP6	Day 2	06.21.2004	9.05	0	CU M/Min	1240.61	CU M
SP6	Day 2	06.21.2004	9.1	0	CU M/Min	1240.61	CU M
SP6	Day 2	06.21.2004	9.15	0	CU M/Min	1240.72	CU M
SP6	Day 2	06.21.2004	9.2	0.0245	CU M/Min	1241.22	CU M
SP6	Day 2	06.21.2004	9.25	0.148133	CU M/Min	1241.55	CU M
SP6	Day 2	06.21.2004	9.3	0.070383	CU M/Min	1242.02	CU M
SP6	Day 2	06.21.2004	9.35	0.131567	CU M/Min	1242.44	CU M
SP6	Day 2	06.21.2004	9.4	0.04285	CU M/Min	1242.8	CU M
SP6	Day 2	06.21.2004	9.45	0	CU M/Min	1243.01	CU M
SP6	Day 2	06.21.2004	9.5	0.7617	CU M/Min	1243.64	CU M
SP6	Day 2	06.21.2004	9.55	0	CU M/Min	1245.02	CU M
SP6	Day 2	06.21.2004	10	0.158283	CU M/Min	1245.62	CU M
SP6	Day 2	06.21.2004	10.05	0.792633	CU M/Min	1246.09	CU M
SP6	Day 2	06.21.2004	10.1	0.814717	CU M/Min	1246.88	CU M
SP6	Day 2	06.21.2004	10.15	0	CU M/Min	1248.34	CU M
SP6	Day 2	06.21.2004	10.2	0.146717	CU M/Min	1249	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 2	06.21.2004	10.25	0.827717	CU M/Min	1250.21	CU M
SP6	Day 2	06.21.2004	10.3	0.146283	CU M/Min	1250.84	CU M
SP6	Day 2	06.21.2004	10.35	0.10415	CU M/Min	1251.45	CU M
SP6	Day 2	06.21.2004	10.4	0.023833	CU M/Min	1251.8	CU M
SP6	Day 2	06.21.2004	10.45	0	CU M/Min	1252.14	CU M
SP6	Day 2	06.21.2004	10.5	0	CU M/Min	1252.45	CU M
SP6	Day 2	06.21.2004	10.55	0.76765	CU M/Min	1253.09	CU M
SP6	Day 2	06.21.2004	11	0.038933	CU M/Min	1253.52	CU M
SP6	Day 2	06.21.2004	11.05	0	CU M/Min	1255.15	CU M
SP6	Day 2	06.21.2004	11.1	0	CU M/Min	1256.67	CU M
SP6	Day 2	06.21.2004	11.15	0.06215	CU M/Min	1257.13	CU M
SP6	Day 2	06.21.2004	11.2	0.0332	CU M/Min	1257.41	CU M
SP6	Day 2	06.21.2004	11.25	0.02895	CU M/Min	1257.63	CU M
SP6	Day 2	06.21.2004	11.3	0.038983	CU M/Min	1257.94	CU M
SP6	Day 2	06.21.2004	11.35	0	CU M/Min	1258.63	CU M
SP6	Day 2	06.21.2004	11.4	0.938983	CU M/Min	1260.21	CU M
SP6	Day 2	06.21.2004	11.45	0.094	CU M/Min	1261.41	CU M
SP6	Day 2	06.21.2004	11.5	0	CU M/Min	1261.84	CU M
SP6	Day 2	06.21.2004	11.55	0.888367	CU M/Min	1263.68	CU M
SP6	Day 2	06.21.2004	12	0.029467	CU M/Min	1264.91	CU M
SP6	Day 2	06.21.2004	12.05	0.025467	CU M/Min	1265.31	CU M
SP6	Day 2	06.21.2004	12.1	0.030917	CU M/Min	1265.61	CU M
SP6	Day 2	06.21.2004	12.15	0.109067	CU M/Min	1266.07	CU M
SP6	Day 2	06.21.2004	12.2	0.761767	CU M/Min	1266.26	CU M
SP6	Day 2	06.21.2004	12.25	0.832333	CU M/Min	1268.43	CU M
SP6	Day 2	06.21.2004	12.3	0	CU M/Min	1270.61	CU M
SP6	Day 2	06.21.2004	12.35	0.027483	CU M/Min	1271.45	CU M
SP6	Day 2	06.21.2004	12.4	0.1377	CU M/Min	1271.98	CU M
SP6	Day 2	06.21.2004	12.45	0.077667	CU M/Min	1272.43	CU M
SP6	Day 2	06.21.2004	12.5	0.746017	CU M/Min	1272.86	CU M
SP6	Day 2	06.21.2004	12.55	0	CU M/Min	1275.32	CU M
SP6	Day 2	06.21.2004	13	0	CU M/Min	1276.68	CU M
SP6	Day 2	06.21.2004	13.05	0.042467	CU M/Min	1277.84	CU M
SP6	Day 2	06.21.2004	13.1	0	CU M/Min	1278.13	CU M
SP6	Day 2	06.21.2004	13.15	0.772833	CU M/Min	1278.57	CU M
SP6	Day 2	06.21.2004	13.2	0.014017	CU M/Min	1279.38	CU M
SP6	Day 2	06.21.2004	13.25	0.025817	CU M/Min	1279.65	CU M
SP6	Day 2	06.21.2004	14.35	0.042633	CU M/Min	1280.03	CU M
SP6	Day 2	06.21.2004	14.4	0	CU M/Min	1280.29	CU M
SP6	Day 2	06.21.2004	14.45	0.028133	CU M/Min	1280.51	CU M
SP6	Day 2	06.21.2004	14.5	0.169133	CU M/Min	1281.09	CU M
SP6	Day 2	06.21.2004	14.55	0	CU M/Min	1281.5	CU M
SP6	Day 2	06.21.2004	15	0	CU M/Min	1281.66	CU M
SP6	Day 2	06.21.2004	15.05	0	CU M/Min	1282.14	CU M
SP6	Day 2	06.21.2004	15.1	0.142917	CU M/Min	1282.5	CU M
SP6	Day 2	06.21.2004	15.15	0.099317	CU M/Min	1282.73	CU M
SP6	Day 2	06.21.2004	15.2	0.071617	CU M/Min	1283.13	CU M
SP6	Day 2	06.21.2004	15.25	0	CU M/Min	1283.35	CU M
SP6	Day 2	06.21.2004	15.3	0	CU M/Min	1283.35	CU M
SP6	Day 2	06.21.2004	15.35	0.047433	CU M/Min	1283.43	CU M
SP6	Day 2	06.21.2004	15.4	0.028683	CU M/Min	1283.77	CU M
SP6	Day 2	06.21.2004	15.45	0.03275	CU M/Min	1284.17	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 2	06.21.2004	15.5	0	CU M/Min	1284.45	CU M
SP6	Day 2	06.21.2004	15.55	0	CU M/Min	1284.45	CU M
SP6	Day 2	06.21.2004	16	0	CU M/Min	1284.45	CU M
SP6	Day 2	06.21.2004	16.05	0.189967	CU M/Min	1284.91	CU M
SP6	Day 2	06.21.2004	16.1	0.178817	CU M/Min	1285.41	CU M
SP6	Day 2	06.21.2004	16.15	0.349383	CU M/Min	1285.94	CU M
SP6	Day 2	06.21.2004	16.2	0.569417	CU M/Min	1286.15	CU M
SP6	Day 2	06.21.2004	16.25	0	CU M/Min	1286.81	CU M
SP6	Day 2	06.21.2004	16.3	0.066133	CU M/Min	1288.42	CU M
SP6	Day 2	06.21.2004	16.35	0.113483	CU M/Min	1289.02	CU M
SP6	Day 2	06.21.2004	16.4	0.06125	CU M/Min	1289.4	CU M
SP6	Day 2	06.21.2004	16.45	0.814667	CU M/Min	1290.75	CU M
SP6	Day 2	06.21.2004	16.5	0.141333	CU M/Min	1291.46	CU M
SP6	Day 2	06.21.2004	16.55	0.0867	CU M/Min	1291.83	CU M
SP6	Day 2	06.21.2004	17	0	CU M/Min	1292.04	CU M
SP6	Day 2	06.21.2004	17.05	0	CU M/Min	1293.5	CU M
SP6	Day 2	06.21.2004	17.1	0	CU M/Min	1294.55	CU M
SP6	Day 2	06.21.2004	17.15	0.039117	CU M/Min	1294.85	CU M
SP6	Day 2	06.21.2004	17.2	0	CU M/Min	1295.03	CU M
SP6	Day 2	06.21.2004	17.25	0.02985	CU M/Min	1295.33	CU M
SP6	Day 2	06.21.2004	17.3	0.033233	CU M/Min	1295.67	CU M
SP6	Day 2	06.21.2004	17.35	0	CU M/Min	1295.76	CU M
SP6	Day 2	06.21.2004	17.4	0	CU M/Min	1295.76	CU M
SP6	Day 2	06.21.2004	17.45	0.0209	CU M/Min	1295.84	CU M
SP6	Day 2	06.21.2004	17.5	0.244233	CU M/Min	1296.17	CU M
SP6	Day 2	06.21.2004	17.55	0.26	CU M/Min	1296.63	CU M
SP6	Day 2	06.21.2004	18	0	CU M/Min	1296.86	CU M
SP6	Day 2	06.21.2004	18.05	0	CU M/Min	1296.86	CU M
SP6	Day 2	06.21.2004	18.1	0.08505	CU M/Min	1297.04	CU M
SP6	Day 2	06.21.2004	18.15	0.12485	CU M/Min	1297.35	CU M
SP6	Day 2	06.21.2004	18.2	0.1844	CU M/Min	1297.91	CU M
SP6	Day 2	06.21.2004	18.25	0	CU M/Min	1298.54	CU M
SP6	Day 2	06.21.2004	18.3	0	CU M/Min	1298.93	CU M
SP6	Day 2	06.21.2004	18.35	0.008533	CU M/Min	1299.39	CU M
SP6	Day 2	06.21.2004	18.4	0.0189	CU M/Min	1299.61	CU M
SP6	Day 2	06.21.2004	18.55	0.687767	CU M/Min	1300.52	CU M
SP6	Day 2	06.21.2004	19	0	CU M/Min	1300.56	CU M
SP6	Day 2	06.21.2004	19.05	0	CU M/Min	1301.65	CU M
SP6	Day 2	06.21.2004	19.1	0.011183	CU M/Min	1301.86	CU M
SP6	Day 2	06.21.2004	19.15	0.076033	CU M/Min	1302.19	CU M
SP6	Day 2	06.21.2004	19.2	0	CU M/Min	1302.64	CU M
SP6	Day 2	06.21.2004	19.25	0	CU M/Min	1303.05	CU M
SP6	Day 2	06.21.2004	19.3	0	CU M/Min	1303.43	CU M
SP6	Day 2	06.21.2004	19.35	0.063433	CU M/Min	1304.14	CU M
SP6	Day 2	06.21.2004	19.4	0.13725	CU M/Min	1304.6	CU M
SP6	Day 2	06.21.2004	19.45	0.206467	CU M/Min	1304.98	CU M
SP6	Day 2	06.21.2004	19.5	0.891333	CU M/Min	1305.49	CU M
SP6	Day 2	06.21.2004	19.55	0	CU M/Min	1308.25	CU M
SP6	Day 2	06.21.2004	20	0.058667	CU M/Min	1310.83	CU M
SP6	Day 2	06.21.2004	20.05	0.187417	CU M/Min	1311.2	CU M
SP6	Day 2	06.21.2004	20.1	0.0332	CU M/Min	1311.54	CU M
SP6	Day 2	06.21.2004	20.15	0	CU M/Min	1311.87	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 2	06.21.2004	20.2	0	CU M/Min	1314.24	CU M
SP6	Day 2	06.21.2004	20.25	0	CU M/Min	1316.13	CU M
SP6	Day 2	06.21.2004	20.3	0.028633	CU M/Min	1317.05	CU M
SP6	Day 2	06.21.2004	20.35	0	CU M/Min	1317.71	CU M
SP6	Day 2	06.21.2004	20.4	0.86265	CU M/Min	1319.45	CU M
SP6	Day 2	06.21.2004	20.45	0.064733	CU M/Min	1320.96	CU M
SP6	Day 2	06.21.2004	20.5	0.0349	CU M/Min	1321.35	CU M
SP6	Day 2	06.21.2004	20.55	0.028517	CU M/Min	1321.67	CU M
SP6	Day 2	06.21.2004	21	0.953717	CU M/Min	1322.18	CU M
SP6	Day 2	06.21.2004	21.05	0.07085	CU M/Min	1326.55	CU M
SP6	Day 2	06.21.2004	21.1	0.17065	CU M/Min	1327	CU M
SP6	Day 2	06.21.2004	21.15	0	CU M/Min	1327.69	CU M
SP6	Day 2	06.21.2004	21.2	0.041917	CU M/Min	1328.14	CU M
SP6	Day 2	06.21.2004	21.25	0	CU M/Min	1328.57	CU M
SP6	Day 2	06.21.2004	21.3	0	CU M/Min	1329.04	CU M
SP6	Day 2	06.21.2004	21.35	0	CU M/Min	1330.04	CU M
SP6	Day 2	06.21.2004	21.4	0.06195	CU M/Min	1330.66	CU M
SP6	Day 2	06.21.2004	21.45	0	CU M/Min	1330.96	CU M
SP6	Day 2	06.21.2004	21.5	0.085833	CU M/Min	1331.3	CU M
SP6	Day 2	06.21.2004	21.55	0.07435	CU M/Min	1331.8	CU M
SP6	Day 2	06.21.2004	22	0	CU M/Min	1332.03	CU M
SP6	Day 2	06.21.2004	22.05	0	CU M/Min	1332.03	CU M
SP6	Day 2	06.21.2004	22.1	0	CU M/Min	1332.03	CU M
SP6	Day 2	06.21.2004	22.15	0.029567	CU M/Min	1332.53	CU M
SP6	Day 2	06.21.2004	22.2	0.044583	CU M/Min	1332.95	CU M
SP6	Day 2	06.21.2004	22.25	0.027433	CU M/Min	1333.29	CU M
SP6	Day 2	06.21.2004	22.3	0	CU M/Min	1333.58	CU M
SP6	Day 2	06.21.2004	22.35	0	CU M/Min	1334.67	CU M
SP6	Day 2	06.21.2004	22.4	0	CU M/Min	1335.78	CU M
SP6	Day 2	06.21.2004	22.45	0.040667	CU M/Min	1336.2	CU M
SP6	Day 2	06.21.2004	22.5	0.0537	CU M/Min	1336.62	CU M
SP6	Day 2	06.21.2004	22.55	0	CU M/Min	1337.02	CU M
SP6	Day 2	06.21.2004	23	0	CU M/Min	1339.71	CU M
SP6	Day 2	06.21.2004	23.05	0.757183	CU M/Min	1341.37	CU M
SP6	Day 2	06.21.2004	23.1	0.0351	CU M/Min	1342.09	CU M
SP6	Day 2	06.21.2004	23.15	0.027617	CU M/Min	1342.46	CU M
SP6	Day 2	06.21.2004	23.2	0.045383	CU M/Min	1342.88	CU M
SP6	Day 2	06.21.2004	23.25	0.826183	CU M/Min	1343.39	CU M
SP6	Day 2	06.21.2004	23.3	0.81945	CU M/Min	1346.09	CU M
SP6	Day 2	06.21.2004	23.35	0.1919	CU M/Min	1347.69	CU M
SP6	Day 2	06.21.2004	23.4	0.033767	CU M/Min	1348.2	CU M
SP6	Day 2	06.21.2004	23.45	0.026	CU M/Min	1348.42	CU M
SP6	Day 2	06.21.2004	23.5	0	CU M/Min	1348.75	CU M
SP6	Day 2	06.21.2004	23.55	0.74685	CU M/Min	1351.14	CU M
SP6	Day 2	06.22.2004	0	0.829733	CU M/Min	1352.95	CU M
SP6	Day 2	06.22.2004	0.05	0.060083	CU M/Min	1353.98	CU M
SP6	Day 2	06.22.2004	0.1	0.03845	CU M/Min	1354.33	CU M
SP6	Day 2	06.22.2004	0.15	0.030133	CU M/Min	1354.68	CU M
SP6	Day 2	06.22.2004	0.2	0.7372	CU M/Min	1356.28	CU M
SP6	Day 2	06.22.2004	0.25	0	CU M/Min	1357.97	CU M
SP6	Day 2	06.22.2004	0.3	0.7845	CU M/Min	1359.46	CU M
SP6	Day 2	06.22.2004	0.35	0.043983	CU M/Min	1359.95	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 2	06.22.2004	0.4	0.042067	CU M/Min	1360.28	CU M
SP6	Day 2	06.22.2004	0.45	0.110067	CU M/Min	1360.63	CU M
SP6	Day 2	06.22.2004	0.5	0	CU M/Min	1361.49	CU M
SP6	Day 2	06.22.2004	0.55	0	CU M/Min	1363.05	CU M
SP6	Day 2	06.22.2004	1	0	CU M/Min	1364.49	CU M
SP6	Day 2	06.22.2004	1.05	0.040167	CU M/Min	1364.88	CU M
SP6	Day 2	06.22.2004	1.1	0.083817	CU M/Min	1365.4	CU M
SP6	Day 2	06.22.2004	1.15	0	CU M/Min	1365.78	CU M
SP6	Day 2	06.22.2004	1.2	0	CU M/Min	1367.59	CU M
SP6	Day 2	06.22.2004	1.25	0	CU M/Min	1368.36	CU M
SP6	Day 2	06.22.2004	1.3	0.04245	CU M/Min	1369.42	CU M
SP6	Day 2	06.22.2004	1.35	0.875017	CU M/Min	1369.71	CU M
SP6	Day 2	06.22.2004	1.4	0.0273	CU M/Min	1370.47	CU M
SP6	Day 2	06.22.2004	1.45	0.038117	CU M/Min	1370.8	CU M
SP6	Day 2	06.22.2004	1.5	0.036667	CU M/Min	1371.23	CU M
SP6	Day 2	06.22.2004	1.55	0.791783	CU M/Min	1371.82	CU M
SP6	Day 2	06.22.2004	2	0	CU M/Min	1373.1	CU M
SP6	Day 2	06.22.2004	2.05	0.038367	CU M/Min	1374.12	CU M
SP6	Day 2	06.22.2004	2.1	0.03385	CU M/Min	1374.49	CU M
SP6	Day 2	06.22.2004	2.15	0.01975	CU M/Min	1374.63	CU M
SP6	Day 2	06.22.2004	2.2	0.028767	CU M/Min	1374.77	CU M
SP6	Day 2	06.22.2004	2.25	0.033683	CU M/Min	1375.04	CU M
SP6	Day 2	06.22.2004	2.3	0	CU M/Min	1375.39	CU M
SP6	Day 2	06.22.2004	2.35	0.136617	CU M/Min	1376.9	CU M
SP6	Day 2	06.22.2004	2.4	0.028633	CU M/Min	1377.46	CU M
SP6	Day 2	06.22.2004	2.45	0.070867	CU M/Min	1377.9	CU M
SP6	Day 2	06.22.2004	2.5	0.0802	CU M/Min	1378.27	CU M
SP6	Day 2	06.22.2004	2.55	0.05425	CU M/Min	1378.76	CU M
SP6	Day 2	06.22.2004	3	0.227	CU M/Min	1378.95	CU M
SP6	Day 2	06.22.2004	3.05	0.038267	CU M/Min	1379.23	CU M
SP6	Day 2	06.22.2004	3.1	0.02785	CU M/Min	1379.52	CU M
SP6	Day 2	06.22.2004	3.15	0.06165	CU M/Min	1379.78	CU M
SP6	Day 2	06.22.2004	3.2	0.12435	CU M/Min	1380.18	CU M
SP6	Day 2	06.22.2004	3.25	0	CU M/Min	1380.52	CU M
SP6	Day 2	06.22.2004	3.3	0	CU M/Min	1381.05	CU M
SP6	Day 2	06.22.2004	3.35	0.016433	CU M/Min	1381.62	CU M
SP6	Day 2	06.22.2004	3.4	0	CU M/Min	1381.95	CU M
SP6	Day 2	06.22.2004	3.45	0.2799	CU M/Min	1382.83	CU M
SP6	Day 2	06.22.2004	3.5	0.103067	CU M/Min	1383.15	CU M
SP6	Day 2	06.22.2004	3.55	0.797417	CU M/Min	1383.35	CU M
SP6	Day 2	06.22.2004	4	0.27675	CU M/Min	1384.28	CU M
SP6	Day 2	06.22.2004	4.05	0	CU M/Min	1385.6	CU M
SP6	Day 2	06.22.2004	4.1	0.026483	CU M/Min	1385.87	CU M
SP6	Day 2	06.22.2004	4.15	0.082517	CU M/Min	1387.04	CU M
SP6	Day 2	06.22.2004	4.2	0.032033	CU M/Min	1387.35	CU M
SP6	Day 2	06.22.2004	4.25	0.026733	CU M/Min	1387.6	CU M
SP6	Day 2	06.22.2004	4.3	0.0205	CU M/Min	1387.83	CU M
SP6	Day 2	06.22.2004	4.35	0	CU M/Min	1388.04	CU M
SP6	Day 2	06.22.2004	4.4	0.797067	CU M/Min	1389.09	CU M
SP6	Day 2	06.22.2004	4.45	0.052617	CU M/Min	1389.51	CU M
SP6	Day 2	06.22.2004	4.5	0.0444	CU M/Min	1389.91	CU M
SP6	Day 2	06.22.2004	4.55	0.020783	CU M/Min	1390.17	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 2	06.22.2004	5	0.024883	CU M/Min	1390.31	CU M
SP6	Day 2	06.22.2004	5.05	0.12975	CU M/Min	1390.96	CU M
SP6	Day 2	06.22.2004	5.1	0.050817	CU M/Min	1391.16	CU M
SP6	Day 2	06.22.2004	5.15	0.075667	CU M/Min	1391.5	CU M
SP6	Day 2	06.22.2004	5.2	0	CU M/Min	1391.87	CU M
SP6	Day 2	06.22.2004	5.25	0.877433	CU M/Min	1393.22	CU M
SP6	Day 2	06.22.2004	5.3	0	CU M/Min	1395.07	CU M
SP6	Day 2	06.22.2004	5.35	0.02785	CU M/Min	1396.44	CU M
SP6	Day 2	06.22.2004	5.4	0	CU M/Min	1396.95	CU M
SP6	Day 2	06.22.2004	5.45	0.0425	CU M/Min	1397.94	CU M
SP6	Day 2	06.22.2004	5.5	0.0366	CU M/Min	1398.1	CU M
SP6	Day 2	06.22.2004	5.55	0.038383	CU M/Min	1398.34	CU M
SP6	Day 3	06.22.2004	6	0.504883	CU M/Min	1399.28	CU M
SP6	Day 3	06.22.2004	6.05	0.87855	CU M/Min	1401.23	CU M
SP6	Day 3	06.22.2004	6.1	0.07005	CU M/Min	1402.73	CU M
SP6	Day 3	06.22.2004	6.15	0.039133	CU M/Min	1402.98	CU M
SP6	Day 3	06.22.2004	6.2	0.031717	CU M/Min	1403.26	CU M
SP6	Day 3	06.22.2004	6.25	0.027583	CU M/Min	1403.56	CU M
SP6	Day 3	06.22.2004	6.4	0	CU M/Min	1407.02	CU M
SP6	Day 3	06.22.2004	6.45	0.049083	CU M/Min	1407.57	CU M
SP6	Day 3	06.22.2004	6.5	0.74595	CU M/Min	1409.32	CU M
SP6	Day 3	06.22.2004	6.55	0.016033	CU M/Min	1410.41	CU M
SP6	Day 3	06.22.2004	7	0.22175	CU M/Min	1410.65	CU M
SP6	Day 3	06.22.2004	7.05	0.2013	CU M/Min	1411.04	CU M
SP6	Day 3	06.22.2004	7.1	0	CU M/Min	1412.96	CU M
SP6	Day 3	06.22.2004	7.15	0.850767	CU M/Min	1414.6	CU M
SP6	Day 3	06.22.2004	7.2	0	CU M/Min	1416.41	CU M
SP6	Day 3	06.22.2004	7.25	0.058817	CU M/Min	1416.78	CU M
SP6	Day 3	06.22.2004	7.3	0.024533	CU M/Min	1417.08	CU M
SP6	Day 3	06.22.2004	7.35	0.836617	CU M/Min	1419.53	CU M
SP6	Day 3	06.22.2004	7.4	0.099917	CU M/Min	1421.84	CU M
SP6	Day 3	06.22.2004	7.45	0.0212	CU M/Min	1423.12	CU M
SP6	Day 3	06.22.2004	7.5	0	CU M/Min	1423.54	CU M
SP6	Day 3	06.22.2004	7.55	0.84045	CU M/Min	1424.08	CU M
SP6	Day 3	06.22.2004	8	0.160217	CU M/Min	1425.37	CU M
SP6	Day 3	06.22.2004	8.05	0.074467	CU M/Min	1425.79	CU M
SP6	Day 3	06.22.2004	8.1	0.0356	CU M/Min	1426.11	CU M
SP6	Day 3	06.22.2004	8.15	0.02995	CU M/Min	1426.44	CU M
SP6	Day 3	06.22.2004	8.2	0	CU M/Min	1428.18	CU M
SP6	Day 3	06.22.2004	8.25	0.732283	CU M/Min	1429.06	CU M
SP6	Day 3	06.22.2004	8.3	0.069483	CU M/Min	1430.5	CU M
SP6	Day 3	06.22.2004	8.35	0.258467	CU M/Min	1431.03	CU M
SP6	Day 3	06.22.2004	8.4	0	CU M/Min	1432.85	CU M
SP6	Day 3	06.22.2004	8.45	0.04505	CU M/Min	1433.28	CU M
SP6	Day 3	06.22.2004	8.5	0.0289	CU M/Min	1433.69	CU M
SP6	Day 3	06.22.2004	8.55	0.1082	CU M/Min	1434.04	CU M
SP6	Day 3	06.22.2004	9	0.18495	CU M/Min	1434.44	CU M
SP6	Day 3	06.22.2004	9.05	0	CU M/Min	1434.65	CU M
SP6	Day 3	06.22.2004	9.1	0	CU M/Min	1434.65	CU M
SP6	Day 3	06.22.2004	9.15	0	CU M/Min	1434.65	CU M
SP6	Day 3	06.22.2004	9.2	0.154267	CU M/Min	1435.07	CU M
SP6	Day 3	06.22.2004	9.25	0	CU M/Min	1435.57	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 3	06.22.2004	9.3	0	CU M/Min	1435.57	CU M
SP6	Day 3	06.22.2004	9.35	0.033817	CU M/Min	1436.04	CU M
SP6	Day 3	06.22.2004	9.4	0.033067	CU M/Min	1436.48	CU M
SP6	Day 3	06.22.2004	9.45	0.031167	CU M/Min	1437.02	CU M
SP6	Day 3	06.22.2004	9.5	0.019817	CU M/Min	1437.4	CU M
SP6	Day 3	06.22.2004	9.55	0	CU M/Min	1437.53	CU M
SP6	Day 3	06.22.2004	10	0	CU M/Min	1437.53	CU M
SP6	Day 3	06.22.2004	10.05	0.0827	CU M/Min	1437.71	CU M
SP6	Day 3	06.22.2004	10.1	0.0284	CU M/Min	1438.28	CU M
SP6	Day 3	06.22.2004	10.15	0	CU M/Min	1438.43	CU M
SP6	Day 3	06.22.2004	10.2	0	CU M/Min	1438.43	CU M
SP6	Day 3	06.22.2004	10.25	0.051667	CU M/Min	1438.88	CU M
SP6	Day 3	06.22.2004	10.3	0.201817	CU M/Min	1439.4	CU M
SP6	Day 3	06.22.2004	10.35	0.08785	CU M/Min	1439.91	CU M
SP6	Day 3	06.22.2004	10.4	0.0362	CU M/Min	1440.12	CU M
SP6	Day 3	06.22.2004	10.45	0.031983	CU M/Min	1440.55	CU M
SP6	Day 3	06.22.2004	10.5	0.74835	CU M/Min	1441.34	CU M
SP6	Day 3	06.22.2004	10.55	0	CU M/Min	1442.37	CU M
SP6	Day 3	06.22.2004	11	0	CU M/Min	1442.2	CU M
SP6	Day 3	06.22.2004	11.05	0.084967	CU M/Min	1442.63	CU M
SP6	Day 3	06.22.2004	11.1	0	CU M/Min	1442.87	CU M
SP6	Day 3	06.22.2004	11.15	0.813217	CU M/Min	1444.24	CU M
SP6	Day 3	06.22.2004	11.2	0.887133	CU M/Min	1445.89	CU M
SP6	Day 3	06.22.2004	11.25	0.8918	CU M/Min	1447.74	CU M
SP6	Day 3	06.22.2004	11.3	0.042367	CU M/Min	1448.72	CU M
SP6	Day 3	06.22.2004	11.35	0.917417	CU M/Min	1450.11	CU M
SP6	Day 3	06.22.2004	11.4	0	CU M/Min	1452.65	CU M
SP6	Day 3	06.22.2004	11.45	0.093783	CU M/Min	1454.13	CU M
SP6	Day 3	06.22.2004	11.5	0.166867	CU M/Min	1454.49	CU M
SP6	Day 3	06.22.2004	11.55	0	CU M/Min	1456.21	CU M
SP6	Day 3	06.22.2004	12	0	CU M/Min	1457.16	CU M
SP6	Day 3	06.22.2004	12.05	0.03665	CU M/Min	1457.51	CU M
SP6	Day 3	06.22.2004	12.1	0.783967	CU M/Min	1459.1	CU M
SP6	Day 3	06.22.2004	12.15	0	CU M/Min	1460.61	CU M
SP6	Day 3	06.22.2004	12.2	0	CU M/Min	1461.64	CU M
SP6	Day 3	06.22.2004	12.25	0.19565	CU M/Min	1462.33	CU M
SP6	Day 3	06.22.2004	12.3	0.523783	CU M/Min	1463.45	CU M
SP6	Day 3	06.22.2004	12.35	0.197167	CU M/Min	1465.19	CU M
SP6	Day 3	06.22.2004	12.4	0.037167	CU M/Min	1465.68	CU M
SP6	Day 3	06.22.2004	12.45	0.203433	CU M/Min	1466.01	CU M
SP6	Day 3	06.22.2004	12.5	0	CU M/Min	1466.3	CU M
SP6	Day 3	06.22.2004	12.55	0.74225	CU M/Min	1468.6	CU M
SP6	Day 3	06.22.2004	13	0.807983	CU M/Min	1470.2	CU M
SP6	Day 3	06.22.2004	13.05	0.3153	CU M/Min	1471.23	CU M
SP6	Day 3	06.22.2004	13.1	0	CU M/Min	1472.02	CU M
SP6	Day 3	06.22.2004	13.15	0.135033	CU M/Min	1472.78	CU M
SP6	Day 3	06.22.2004	13.2	0.160283	CU M/Min	1473.27	CU M
SP6	Day 3	06.22.2004	13.25	0.021233	CU M/Min	1473.53	CU M
SP6	Day 3	06.22.2004	13.3	0	CU M/Min	1473.77	CU M
SP6	Day 3	06.22.2004	13.35	1.005783	CU M/Min	1476.55	CU M
SP6	Day 3	06.22.2004	13.4	0.06005	CU M/Min	1478.15	CU M
SP6	Day 3	06.22.2004	13.45	0	CU M/Min	1478.86	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 3	06.22.2004	13.5	0	CU M/Min	1480.3	CU M
SP6	Day 3	06.22.2004	13.55	0	CU M/Min	1481.38	CU M
SP6	Day 3	06.22.2004	14	0.0363	CU M/Min	1481.78	CU M
SP6	Day 3	06.22.2004	14.05	0.045017	CU M/Min	1482.16	CU M
SP6	Day 3	06.22.2004	14.1	0.05035	CU M/Min	1482.59	CU M
SP6	Day 3	06.22.2004	14.15	0.068517	CU M/Min	1483.06	CU M
SP6	Day 3	06.22.2004	14.2	0.02155	CU M/Min	1483.4	CU M
SP6	Day 3	06.22.2004	14.25	0	CU M/Min	1483.66	CU M
SP6	Day 3	06.22.2004	14.3	0.785283	CU M/Min	1484.29	CU M
SP6	Day 3	06.22.2004	14.35	0.811017	CU M/Min	1485.57	CU M
SP6	Day 3	06.22.2004	14.4	0.176533	CU M/Min	1486.15	CU M
SP6	Day 3	06.22.2004	14.45	0	CU M/Min	1486.43	CU M
SP6	Day 3	06.22.2004	14.5	0	CU M/Min	1486.16	CU M
SP6	Day 3	06.22.2004	14.55	0.092217	CU M/Min	1486.52	CU M
SP6	Day 3	06.22.2004	15	0.031683	CU M/Min	1486.79	CU M
SP6	Day 3	06.22.2004	15.05	0.27435	CU M/Min	1487.07	CU M
SP6	Day 3	06.22.2004	15.1	0.088483	CU M/Min	1487.6	CU M
SP6	Day 3	06.22.2004	15.15	0.077617	CU M/Min	1488.01	CU M
SP6	Day 3	06.22.2004	15.2	0.6046	CU M/Min	1490.88	CU M
SP6	Day 3	06.22.2004	15.25	0	CU M/Min	1492.5	CU M
SP6	Day 3	06.22.2004	15.3	0.049633	CU M/Min	1493.19	CU M
SP6	Day 3	06.22.2004	15.35	0	CU M/Min	1493.45	CU M
SP6	Day 3	06.22.2004	15.4	0	CU M/Min	1494.75	CU M
SP6	Day 3	06.22.2004	15.45	0.038633	CU M/Min	1495.72	CU M
SP6	Day 3	06.22.2004	15.5	0.0297	CU M/Min	1496.08	CU M
SP6	Day 3	06.22.2004	15.55	0.044517	CU M/Min	1496.54	CU M
SP6	Day 3	06.22.2004	16	0.08495	CU M/Min	1496.84	CU M
SP6	Day 3	06.22.2004	16.05	0.2728	CU M/Min	1497.42	CU M
SP6	Day 3	06.22.2004	16.1	0.767833	CU M/Min	1499.26	CU M
SP6	Day 3	06.22.2004	16.15	0	CU M/Min	1500.69	CU M
SP6	Day 3	06.22.2004	16.2	0	CU M/Min	1502.18	CU M
SP6	Day 3	06.22.2004	16.25	0.03255	CU M/Min	1502.48	CU M
SP6	Day 3	06.22.2004	16.3	0.75855	CU M/Min	1504.85	CU M
SP6	Day 3	06.22.2004	16.35	0	CU M/Min	1506.63	CU M
SP6	Day 3	06.22.2004	16.4	0.035	CU M/Min	1507.69	CU M
SP6	Day 3	06.22.2004	16.45	0.022717	CU M/Min	1508.15	CU M
SP6	Day 3	06.22.2004	16.5	0.014917	CU M/Min	1508.37	CU M
SP6	Day 3	06.22.2004	16.55	0.06025	CU M/Min	1508.62	CU M
SP6	Day 3	06.22.2004	17	0.86945	CU M/Min	1509.82	CU M
SP6	Day 3	06.22.2004	17.05	0.816033	CU M/Min	1512.59	CU M
SP6	Day 3	06.22.2004	17.1	0.863217	CU M/Min	1514.4	CU M
SP6	Day 3	06.22.2004	17.15	0.071033	CU M/Min	1515.51	CU M
SP6	Day 3	06.22.2004	17.2	0	CU M/Min	1516.66	CU M
SP6	Day 3	06.22.2004	17.25	0	CU M/Min	1518.5	CU M
SP6	Day 3	06.22.2004	17.3	0.030083	CU M/Min	1520.29	CU M
SP6	Day 3	06.22.2004	17.35	0.023883	CU M/Min	1520.4	CU M
SP6	Day 3	06.22.2004	17.4	0.040417	CU M/Min	1520.77	CU M
SP6	Day 3	06.22.2004	17.45	0.03495	CU M/Min	1521.09	CU M
SP6	Day 3	06.22.2004	17.5	0.893283	CU M/Min	1522.16	CU M
SP6	Day 3	06.22.2004	17.55	0	CU M/Min	1524.81	CU M
SP6	Day 3	06.22.2004	18	0	CU M/Min	1524.94	CU M
SP6	Day 3	06.22.2004	18.05	0.021033	CU M/Min	1525.63	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 3	06.22.2004	18.1	0	CU M/Min	1526.01	CU M
SP6	Day 3	06.22.2004	18.15	0.045867	CU M/Min	1527.54	CU M
SP6	Day 3	06.22.2004	18.2	0.0977	CU M/Min	1527.88	CU M
SP6	Day 3	06.22.2004	18.25	0.169767	CU M/Min	1528.36	CU M
SP6	Day 3	06.22.2004	18.3	0.077483	CU M/Min	1528.97	CU M
SP6	Day 3	06.22.2004	18.35	0.79045	CU M/Min	1529.4	CU M
SP6	Day 3	06.22.2004	18.4	0.7147	CU M/Min	1532.1	CU M
SP6	Day 3	06.22.2004	18.45	0	CU M/Min	1533.85	CU M
SP6	Day 3	06.22.2004	18.5	0.046333	CU M/Min	1536.61	CU M
SP6	Day 3	06.22.2004	19.05	0.19875	CU M/Min	1538.59	CU M
SP6	Day 3	06.22.2004	19.1	0	CU M/Min	1539.98	CU M
SP6	Day 3	06.22.2004	19.15	0.086417	CU M/Min	1540.28	CU M
SP6	Day 3	06.22.2004	19.2	0.048083	CU M/Min	1540.7	CU M
SP6	Day 3	06.22.2004	19.25	0.061517	CU M/Min	1541.07	CU M
SP6	Day 3	06.22.2004	19.3	0.036733	CU M/Min	1541.47	CU M
SP6	Day 3	06.22.2004	19.35	0.813667	CU M/Min	1543.08	CU M
SP6	Day 3	06.22.2004	19.4	0.740167	CU M/Min	1544.62	CU M
SP6	Day 3	06.22.2004	19.45	0	CU M/Min	1544.98	CU M
SP6	Day 3	06.22.2004	19.5	0.242433	CU M/Min	1545.38	CU M
SP6	Day 3	06.22.2004	19.55	0	CU M/Min	1545.65	CU M
SP6	Day 3	06.22.2004	20	0.0297	CU M/Min	1546.39	CU M
SP6	Day 3	06.22.2004	20.05	0.12365	CU M/Min	1546.74	CU M
SP6	Day 3	06.22.2004	20.1	0.123867	CU M/Min	1547.05	CU M
SP6	Day 3	06.22.2004	20.15	0.049083	CU M/Min	1547.47	CU M
SP6	Day 3	06.22.2004	20.2	0.73575	CU M/Min	1550.49	CU M
SP6	Day 3	06.22.2004	20.25	0	CU M/Min	1553.32	CU M
SP6	Day 3	06.22.2004	20.3	0.137133	CU M/Min	1555.12	CU M
SP6	Day 3	06.22.2004	20.35	0.878217	CU M/Min	1556.4	CU M
SP6	Day 3	06.22.2004	20.4	0.547783	CU M/Min	1558.16	CU M
SP6	Day 3	06.22.2004	20.45	0.062083	CU M/Min	1559.54	CU M
SP6	Day 3	06.22.2004	20.5	0.037417	CU M/Min	1559.79	CU M
SP6	Day 3	06.22.2004	20.55	0.022433	CU M/Min	1560.13	CU M
SP6	Day 3	06.22.2004	21	0	CU M/Min	1560.55	CU M
SP6	Day 3	06.22.2004	21.05	0	CU M/Min	1560.55	CU M
SP6	Day 3	06.22.2004	21.1	0	CU M/Min	1560.95	CU M
SP6	Day 3	06.22.2004	21.15	0	CU M/Min	1561.13	CU M
SP6	Day 3	06.22.2004	21.2	0.0329	CU M/Min	1561.39	CU M
SP6	Day 3	06.22.2004	21.25	0	CU M/Min	1561.57	CU M
SP6	Day 3	06.22.2004	21.3	0.02215	CU M/Min	1561.9	CU M
SP6	Day 3	06.22.2004	21.35	0	CU M/Min	1562.5	CU M
SP6	Day 3	06.22.2004	21.4	0	CU M/Min	1562.5	CU M
SP6	Day 3	06.22.2004	21.45	0.131817	CU M/Min	1563.02	CU M
SP6	Day 3	06.22.2004	21.5	0.03635	CU M/Min	1563.45	CU M
SP6	Day 3	06.22.2004	21.55	0.0362	CU M/Min	1563.77	CU M
SP6	Day 3	06.22.2004	22	0	CU M/Min	1564.19	CU M
SP6	Day 3	06.22.2004	22.05	0	CU M/Min	1565.21	CU M
SP6	Day 3	06.22.2004	22.1	0.165967	CU M/Min	1565.66	CU M
SP6	Day 3	06.22.2004	22.15	0.134517	CU M/Min	1566.14	CU M
SP6	Day 3	06.22.2004	22.2	0	CU M/Min	1566.36	CU M
SP6	Day 3	06.22.2004	22.25	0	CU M/Min	1567.33	CU M
SP6	Day 3	06.22.2004	22.3	0.024917	CU M/Min	1568.72	CU M
SP6	Day 3	06.22.2004	22.35	0.077333	CU M/Min	1569.2	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 3	06.22.2004	22.4	0.0704	CU M/Min	1569.49	CU M
SP6	Day 3	06.22.2004	22.45	0	CU M/Min	1570.64	CU M
SP6	Day 3	06.22.2004	22.5	0.790083	CU M/Min	1572.01	CU M
SP6	Day 3	06.22.2004	22.55	0.00415	CU M/Min	1573.74	CU M
SP6	Day 3	06.22.2004	23	0.011317	CU M/Min	1573.9	CU M
SP6	Day 3	06.22.2004	23.05	0	CU M/Min	1574.1	CU M
SP6	Day 3	06.22.2004	23.1	0.799233	CU M/Min	1575.89	CU M
SP6	Day 3	06.22.2004	23.15	0	CU M/Min	1577.44	CU M
SP6	Day 3	06.22.2004	23.2	0.1475	CU M/Min	1577.96	CU M
SP6	Day 3	06.22.2004	23.25	0.134183	CU M/Min	1578.16	CU M
SP6	Day 3	06.22.2004	23.3	0	CU M/Min	1579.09	CU M
SP6	Day 3	06.22.2004	23.35	0.40565	CU M/Min	1579.8	CU M
SP6	Day 3	06.22.2004	23.4	0.782383	CU M/Min	1580.28	CU M
SP6	Day 3	06.22.2004	23.45	0	CU M/Min	1582.01	CU M
SP6	Day 3	06.22.2004	23.5	0.057433	CU M/Min	1583.95	CU M
SP6	Day 3	06.22.2004	23.55	0.038933	CU M/Min	1584.19	CU M
SP6	Day 3	06.23.2004	0	0.0146	CU M/Min	1584.36	CU M
SP6	Day 3	06.23.2004	0.05	0.745667	CU M/Min	1585.04	CU M
SP6	Day 3	06.23.2004	0.1	0	CU M/Min	1586.73	CU M
SP6	Day 3	06.23.2004	0.15	0	CU M/Min	1588.28	CU M
SP6	Day 3	06.23.2004	0.2	0.03595	CU M/Min	1588.59	CU M
SP6	Day 3	06.23.2004	0.25	0.023283	CU M/Min	1588.91	CU M
SP6	Day 3	06.23.2004	0.3	0.04175	CU M/Min	1589.33	CU M
SP6	Day 3	06.23.2004	0.35	0	CU M/Min	1589.49	CU M
SP6	Day 3	06.23.2004	0.4	0	CU M/Min	1591.04	CU M
SP6	Day 3	06.23.2004	0.45	0.383383	CU M/Min	1592.37	CU M
SP6	Day 3	06.23.2004	0.5	0.02235	CU M/Min	1592.71	CU M
SP6	Day 3	06.23.2004	0.55	0.038167	CU M/Min	1593.11	CU M
SP6	Day 3	06.23.2004	1	0	CU M/Min	1593.66	CU M
SP6	Day 3	06.23.2004	1.05	0.82685	CU M/Min	1593.88	CU M
SP6	Day 3	06.23.2004	1.1	0.0209	CU M/Min	1594.26	CU M
SP6	Day 3	06.23.2004	1.15	0.030017	CU M/Min	1594.49	CU M
SP6	Day 3	06.23.2004	1.2	0.78495	CU M/Min	1594.85	CU M
SP6	Day 3	06.23.2004	1.25	0.029583	CU M/Min	1595.59	CU M
SP6	Day 3	06.23.2004	1.3	0.046417	CU M/Min	1595.86	CU M
SP6	Day 3	06.23.2004	1.35	0.803883	CU M/Min	1596.06	CU M
SP6	Day 3	06.23.2004	1.4	0.377367	CU M/Min	1596.81	CU M
SP6	Day 3	06.23.2004	1.45	0.0179	CU M/Min	1597.26	CU M
SP6	Day 3	06.23.2004	1.5	0.032867	CU M/Min	1597.55	CU M
SP6	Day 3	06.23.2004	1.55	0	CU M/Min	1597.89	CU M
SP6	Day 3	06.23.2004	2	0	CU M/Min	1598.48	CU M
SP6	Day 3	06.23.2004	2.05	0.041233	CU M/Min	1599.29	CU M
SP6	Day 3	06.23.2004	2.1	0.046767	CU M/Min	1599.73	CU M
SP6	Day 3	06.23.2004	2.15	0	CU M/Min	1600.05	CU M
SP6	Day 3	06.23.2004	2.2	0.01345	CU M/Min	1600.63	CU M
SP6	Day 3	06.23.2004	2.25	0.242183	CU M/Min	1600.9	CU M
SP6	Day 3	06.23.2004	2.3	0	CU M/Min	1601.24	CU M
SP6	Day 3	06.23.2004	2.35	0.026533	CU M/Min	1601.59	CU M
SP6	Day 3	06.23.2004	2.4	0.02705	CU M/Min	1601.79	CU M
SP6	Day 3	06.23.2004	2.45	0.116833	CU M/Min	1602.08	CU M
SP6	Day 3	06.23.2004	2.5	0.0234	CU M/Min	1602.34	CU M
SP6	Day 3	06.23.2004	2.55	0.118867	CU M/Min	1602.58	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 3	06.23.2004	3	0.039433	CU M/Min	1602.9	CU M
SP6	Day 3	06.23.2004	3.05	0.130683	CU M/Min	1603.27	CU M
SP6	Day 3	06.23.2004	3.1	0.026733	CU M/Min	1603.58	CU M
SP6	Day 3	06.23.2004	3.15	0.021	CU M/Min	1603.77	CU M
SP6	Day 3	06.23.2004	3.2	0	CU M/Min	1604.31	CU M
SP6	Day 3	06.23.2004	3.25	0.601733	CU M/Min	1606.89	CU M
SP6	Day 3	06.23.2004	3.3	0	CU M/Min	1608.12	CU M
SP6	Day 3	06.23.2004	3.35	0.72665	CU M/Min	1609.27	CU M
SP6	Day 3	06.23.2004	3.4	0.039283	CU M/Min	1609.63	CU M
SP6	Day 3	06.23.2004	3.45	0.04395	CU M/Min	1611.35	CU M
SP6	Day 3	06.23.2004	3.5	0.07365	CU M/Min	1611.77	CU M
SP6	Day 3	06.23.2004	3.55	0.06465	CU M/Min	1612.25	CU M
SP6	Day 3	06.23.2004	4	0.79725	CU M/Min	1613.53	CU M
SP6	Day 3	06.23.2004	4.05	0.72455	CU M/Min	1616.63	CU M
SP6	Day 3	06.23.2004	4.1	0	CU M/Min	1619.31	CU M
SP6	Day 3	06.23.2004	4.15	0.034733	CU M/Min	1620.38	CU M
SP6	Day 3	06.23.2004	4.2	0	CU M/Min	1620.67	CU M
SP6	Day 3	06.23.2004	4.25	0.03715	CU M/Min	1621.01	CU M
SP6	Day 3	06.23.2004	4.3	0.038417	CU M/Min	1621.32	CU M
SP6	Day 3	06.23.2004	4.35	0.070867	CU M/Min	1621.76	CU M
SP6	Day 3	06.23.2004	4.4	0.761917	CU M/Min	1622.59	CU M
SP6	Day 3	06.23.2004	4.45	0.103183	CU M/Min	1624.18	CU M
SP6	Day 3	06.23.2004	4.5	0.033183	CU M/Min	1624.39	CU M
SP6	Day 3	06.23.2004	4.55	0.035567	CU M/Min	1624.76	CU M
SP6	Day 3	06.23.2004	5	0	CU M/Min	1625.91	CU M
SP6	Day 3	06.23.2004	5.05	0.018067	CU M/Min	1627.35	CU M
SP6	Day 3	06.23.2004	5.1	0.015567	CU M/Min	1627.52	CU M
SP6	Day 3	06.23.2004	5.15	0.162217	CU M/Min	1627.74	CU M
SP6	Day 3	06.23.2004	5.2	0.039483	CU M/Min	1628.11	CU M
SP6	Day 3	06.23.2004	5.25	0	CU M/Min	1628.49	CU M
SP6	Day 3	06.23.2004	5.3	0	CU M/Min	1629.53	CU M
SP6	Day 3	06.23.2004	5.35	0	CU M/Min	1630.74	CU M
SP6	Day 3	06.23.2004	5.4	0.832017	CU M/Min	1631.87	CU M
SP6	Day 3	06.23.2004	5.45	0.186183	CU M/Min	1632.32	CU M
SP6	Day 3	06.23.2004	5.5	0.0375	CU M/Min	1632.73	CU M
SP6	Day 3	06.23.2004	5.55	0.190267	CU M/Min	1633.13	CU M
SP6	Day 4	06.23.2004	6	0.039633	CU M/Min	1633.43	CU M
SP6	Day 4	06.23.2004	6.05	0.147233	CU M/Min	1633.9	CU M
SP6	Day 4	06.23.2004	6.1	0.768533	CU M/Min	1636.35	CU M
SP6	Day 4	06.23.2004	6.15	0.706583	CU M/Min	1638.33	CU M
SP6	Day 4	06.23.2004	6.2	0	CU M/Min	1640.4	CU M
SP6	Day 4	06.23.2004	6.25	0.022267	CU M/Min	1641.05	CU M
SP6	Day 4	06.23.2004	6.3	0	CU M/Min	1642.44	CU M
SP6	Day 4	06.23.2004	6.35	0.87605	CU M/Min	1643.94	CU M
SP6	Day 4	06.23.2004	6.4	0.862867	CU M/Min	1644.89	CU M
SP6	Day 4	06.23.2004	6.45	0.067467	CU M/Min	1645.6	CU M
SP6	Day 4	06.23.2004	6.5	0.2167	CU M/Min	1646.08	CU M
SP6	Day 4	06.23.2004	6.55	0.044917	CU M/Min	1646.45	CU M
SP6	Day 4	06.23.2004	7	0.08185	CU M/Min	1646.85	CU M
SP6	Day 4	06.23.2004	7.05	0.932217	CU M/Min	1647.39	CU M
SP6	Day 4	06.23.2004	7.1	0.782717	CU M/Min	1650.26	CU M
SP6	Day 4	06.23.2004	7.15	0.9369	CU M/Min	1651.31	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 4	06.23.2004	7.2	0.852083	CU M/Min	1653.04	CU M
SP6	Day 4	06.23.2004	7.25	0.031433	CU M/Min	1653.52	CU M
SP6	Day 4	06.23.2004	7.3	0.134967	CU M/Min	1653.92	CU M
SP6	Day 4	06.23.2004	7.35	0.052717	CU M/Min	1654.3	CU M
SP6	Day 4	06.23.2004	7.4	0	CU M/Min	1654.63	CU M
SP6	Day 4	06.23.2004	7.45	0.05605	CU M/Min	1654.92	CU M
SP6	Day 4	06.23.2004	7.5	0.474383	CU M/Min	1658.02	CU M
SP6	Day 4	06.23.2004	7.55	0	CU M/Min	1660.63	CU M
SP6	Day 4	06.23.2004	8	0.036433	CU M/Min	1662.82	CU M
SP6	Day 4	06.23.2004	8.05	0	CU M/Min	1663.07	CU M
SP6	Day 4	06.23.2004	8.1	0	CU M/Min	1665.6	CU M
SP6	Day 4	06.23.2004	8.15	0.6752	CU M/Min	1667.47	CU M
SP6	Day 4	06.23.2004	8.2	0.050833	CU M/Min	1668.28	CU M
SP6	Day 4	06.23.2004	8.25	0.04395	CU M/Min	1668.56	CU M
SP6	Day 4	06.23.2004	8.3	0.037133	CU M/Min	1668.86	CU M
SP6	Day 4	06.23.2004	8.35	0	CU M/Min	1669.24	CU M
SP6	Day 4	06.23.2004	8.4	0.852	CU M/Min	1670.86	CU M
SP6	Day 4	06.23.2004	8.45	0.7645	CU M/Min	1673.07	CU M
SP6	Day 4	06.23.2004	9	0.7588	CU M/Min	1676.67	CU M
SP6	Day 4	06.23.2004	9.05	0.075867	CU M/Min	1678.42	CU M
SP6	Day 4	06.23.2004	9.1	0.036917	CU M/Min	1678.79	CU M
SP6	Day 4	06.23.2004	9.15	0.036467	CU M/Min	1679.11	CU M
SP6	Day 4	06.23.2004	9.2	0.128283	CU M/Min	1679.48	CU M
SP6	Day 4	06.23.2004	9.25	0.041617	CU M/Min	1679.81	CU M
SP6	Day 4	06.23.2004	9.3	0.8702	CU M/Min	1682.25	CU M
SP6	Day 4	06.23.2004	9.35	0	CU M/Min	1684.08	CU M
SP6	Day 4	06.23.2004	9.4	0.0465	CU M/Min	1685.77	CU M
SP6	Day 4	06.23.2004	9.45	0	CU M/Min	1685.98	CU M
SP6	Day 4	06.23.2004	9.5	0.69145	CU M/Min	1688.54	CU M
SP6	Day 4	06.23.2004	9.55	0	CU M/Min	1690.83	CU M
SP6	Day 4	06.23.2004	10	0.253383	CU M/Min	1691.42	CU M
SP6	Day 4	06.23.2004	10.05	0.133883	CU M/Min	1692	CU M
SP6	Day 4	06.23.2004	10.1	0.09355	CU M/Min	1692.45	CU M
SP6	Day 4	06.23.2004	10.15	0.026067	CU M/Min	1692.8	CU M
SP6	Day 4	06.23.2004	10.2	0	CU M/Min	1694.53	CU M
SP6	Day 4	06.23.2004	10.25	0	CU M/Min	1696.23	CU M
SP6	Day 4	06.23.2004	10.3	0.755183	CU M/Min	1699	CU M
SP6	Day 4	06.23.2004	10.35	0.116883	CU M/Min	1700.15	CU M
SP6	Day 4	06.23.2004	10.4	0	CU M/Min	1701.97	CU M
SP6	Day 4	06.23.2004	10.45	0.8773	CU M/Min	1703.55	CU M
SP6	Day 4	06.23.2004	10.5	0.0216	CU M/Min	1704.49	CU M
SP6	Day 4	06.23.2004	10.55	0.03275	CU M/Min	1704.79	CU M
SP6	Day 4	06.23.2004	11	0.054333	CU M/Min	1705.05	CU M
SP6	Day 4	06.23.2004	11.05	0.089767	CU M/Min	1705.34	CU M
SP6	Day 4	06.23.2004	11.1	0	CU M/Min	1707.41	CU M
SP6	Day 4	06.23.2004	11.15	0	CU M/Min	1708.79	CU M
SP6	Day 4	06.23.2004	11.2	0	CU M/Min	1710.5	CU M
SP6	Day 4	06.23.2004	11.25	0.04795	CU M/Min	1710.84	CU M
SP6	Day 4	06.23.2004	11.3	0.680367	CU M/Min	1713.02	CU M
SP6	Day 4	06.23.2004	11.35	0.025467	CU M/Min	1713.52	CU M
SP6	Day 4	06.23.2004	11.4	0.01985	CU M/Min	1713.74	CU M
SP6	Day 4	06.23.2004	11.45	0.0202	CU M/Min	1713.96	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 4	06.23.2004	11.5	0	CU M/Min	1714.35	CU M
SP6	Day 4	06.23.2004	11.55	0.79255	CU M/Min	1717.07	CU M
SP6	Day 4	06.23.2004	12	0	CU M/Min	1719.39	CU M
SP6	Day 4	06.23.2004	12.05	0.04935	CU M/Min	1720.35	CU M
SP6	Day 4	06.23.2004	12.1	0.770983	CU M/Min	1721.72	CU M
SP6	Day 4	06.23.2004	12.15	0	CU M/Min	1722.82	CU M
SP6	Day 4	06.23.2004	12.2	0	CU M/Min	1724.07	CU M
SP6	Day 4	06.23.2004	12.25	0.057933	CU M/Min	1724.4	CU M
SP6	Day 4	06.23.2004	12.3	0.031083	CU M/Min	1724.79	CU M
SP6	Day 4	06.23.2004	12.35	0.089633	CU M/Min	1725.12	CU M
SP6	Day 4	06.23.2004	12.4	0.037817	CU M/Min	1725.6	CU M
SP6	Day 4	06.23.2004	12.45	0	CU M/Min	1726.7	CU M
SP6	Day 4	06.23.2004	12.5	0	CU M/Min	1728.72	CU M
SP6	Day 4	06.23.2004	12.55	0	CU M/Min	1730.01	CU M
SP6	Day 4	06.23.2004	13	0.029467	CU M/Min	1730.4	CU M
SP6	Day 4	06.23.2004	13.05	0	CU M/Min	1731.15	CU M
SP6	Day 4	06.23.2004	13.1	0	CU M/Min	1731.77	CU M
SP6	Day 4	06.23.2004	13.15	0.21035	CU M/Min	1732.38	CU M
SP6	Day 4	06.23.2004	13.2	0.052317	CU M/Min	1732.82	CU M
SP6	Day 4	06.23.2004	13.25	0.037333	CU M/Min	1733.21	CU M
SP6	Day 4	06.23.2004	13.3	0.034533	CU M/Min	1733.7	CU M
SP6	Day 4	06.23.2004	13.35	0	CU M/Min	1734.06	CU M
SP6	Day 4	06.23.2004	13.4	0	CU M/Min	1735.61	CU M
SP6	Day 4	06.23.2004	13.45	0	CU M/Min	1736.84	CU M
SP6	Day 4	06.23.2004	13.5	0.027983	CU M/Min	1738.08	CU M
SP6	Day 4	06.23.2004	13.55	0	CU M/Min	1738.28	CU M
SP6	Day 4	06.23.2004	14	0	CU M/Min	1739.24	CU M
SP6	Day 4	06.23.2004	14.05	0.120267	CU M/Min	1739.83	CU M
SP6	Day 4	06.23.2004	14.1	0.042	CU M/Min	1740.2	CU M
SP6	Day 4	06.23.2004	14.15	0.045267	CU M/Min	1740.52	CU M
SP6	Day 4	06.23.2004	14.2	0.083017	CU M/Min	1740.83	CU M
SP6	Day 4	06.23.2004	14.25	0	CU M/Min	1741.9	CU M
SP6	Day 4	06.23.2004	14.3	0	CU M/Min	1742.91	CU M
SP6	Day 4	06.23.2004	14.35	0.137967	CU M/Min	1743.61	CU M
SP6	Day 4	06.23.2004	14.4	0.164233	CU M/Min	1744	CU M
SP6	Day 4	06.23.2004	14.45	0	CU M/Min	1744.93	CU M
SP6	Day 4	06.23.2004	14.5	0.037767	CU M/Min	1745.24	CU M
SP6	Day 4	06.23.2004	14.55	0.034467	CU M/Min	1745.59	CU M
SP6	Day 4	06.23.2004	15	0.022	CU M/Min	1745.88	CU M
SP6	Day 4	06.23.2004	15.05	0.0249	CU M/Min	1746.14	CU M
SP6	Day 4	06.23.2004	15.1	0	CU M/Min	1746.71	CU M
SP6	Day 4	06.23.2004	15.15	0	CU M/Min	1747.2	CU M
SP6	Day 4	06.23.2004	15.2	0	CU M/Min	1748.28	CU M
SP6	Day 4	06.23.2004	15.25	0.027033	CU M/Min	1748.7	CU M
SP6	Day 4	06.23.2004	15.3	0.339	CU M/Min	1749.22	CU M
SP6	Day 4	06.23.2004	15.35	0.048183	CU M/Min	1749.88	CU M
SP6	Day 4	06.23.2004	15.4	0	CU M/Min	1750.23	CU M
SP6	Day 4	06.23.2004	15.45	0.046333	CU M/Min	1750.56	CU M
SP6	Day 4	06.23.2004	15.5	0.13695	CU M/Min	1750.87	CU M
SP6	Day 4	06.23.2004	15.55	0	CU M/Min	1751.61	CU M
SP6	Day 4	06.23.2004	16	0.847867	CU M/Min	1753.17	CU M
SP6	Day 4	06.23.2004	16.05	0	CU M/Min	1754.79	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 4	06.23.2004	16.1	0.041983	CU M/Min	1755.04	CU M
SP6	Day 4	06.23.2004	16.15	0	CU M/Min	1755.6	CU M
SP6	Day 4	06.23.2004	16.2	0.038717	CU M/Min	1756.04	CU M
SP6	Day 4	06.23.2004	16.25	0.021017	CU M/Min	1756.52	CU M
SP6	Day 4	06.23.2004	16.3	0.022317	CU M/Min	1756.73	CU M
SP6	Day 4	06.23.2004	16.35	0.2513	CU M/Min	1757.35	CU M
SP6	Day 4	06.23.2004	16.4	0	CU M/Min	1757.65	CU M
SP6	Day 4	06.23.2004	16.45	0	CU M/Min	1758.37	CU M
SP6	Day 4	06.23.2004	16.5	0.07395	CU M/Min	1758.86	CU M
SP6	Day 4	06.23.2004	16.55	0.187967	CU M/Min	1759.17	CU M
SP6	Day 4	06.23.2004	17	0	CU M/Min	1759.83	CU M
SP6	Day 4	06.23.2004	17.05	0.280017	CU M/Min	1760.09	CU M
SP6	Day 4	06.23.2004	17.1	0.050633	CU M/Min	1760.4	CU M
SP6	Day 4	06.23.2004	17.15	0.024967	CU M/Min	1760.63	CU M
SP6	Day 4	06.23.2004	17.2	0.264683	CU M/Min	1760.9	CU M
SP6	Day 4	06.23.2004	17.25	0	CU M/Min	1761.59	CU M
SP6	Day 4	06.23.2004	17.3	0.926283	CU M/Min	1762.18	CU M
SP6	Day 4	06.23.2004	17.35	0.048583	CU M/Min	1762.96	CU M
SP6	Day 4	06.23.2004	17.4	0	CU M/Min	1763.42	CU M
SP6	Day 4	06.23.2004	17.45	0	CU M/Min	1763.99	CU M
SP6	Day 4	06.23.2004	17.5	0.0281	CU M/Min	1764.38	CU M
SP6	Day 4	06.23.2004	17.55	0.128817	CU M/Min	1764.69	CU M
SP6	Day 4	06.23.2004	18	0	CU M/Min	1765.02	CU M
SP6	Day 4	06.23.2004	18.05	0	CU M/Min	1765.39	CU M
SP6	Day 4	06.23.2004	18.1	0	CU M/Min	1765.61	CU M
SP6	Day 4	06.23.2004	18.15	0.10925	CU M/Min	1765.84	CU M
SP6	Day 4	06.23.2004	18.2	0.121983	CU M/Min	1766.68	CU M
SP6	Day 4	06.23.2004	18.25	0.89155	CU M/Min	1767.78	CU M
SP6	Day 4	06.23.2004	18.3	0	CU M/Min	1769.22	CU M
SP6	Day 4	06.23.2004	18.35	0	CU M/Min	1770.21	CU M
SP6	Day 4	06.23.2004	18.4	0.027917	CU M/Min	1770.55	CU M
SP6	Day 4	06.23.2004	19	0	CU M/Min	1772.46	CU M
SP6	Day 4	06.23.2004	19.05	0	CU M/Min	1772.46	CU M
SP6	Day 4	06.23.2004	19.1	0	CU M/Min	1772.51	CU M
SP6	Day 4	06.23.2004	19.15	0.012517	CU M/Min	1772.72	CU M
SP6	Day 4	06.23.2004	19.2	0	CU M/Min	1772.98	CU M
SP6	Day 4	06.23.2004	19.25	0	CU M/Min	1773.81	CU M
SP6	Day 4	06.23.2004	19.3	0	CU M/Min	1775.23	CU M
SP6	Day 4	06.23.2004	19.35	0.0429	CU M/Min	1776.41	CU M
SP6	Day 4	06.23.2004	19.4	0.043717	CU M/Min	1776.79	CU M
SP6	Day 4	06.23.2004	19.45	0	CU M/Min	1777.27	CU M
SP6	Day 4	06.23.2004	19.5	0	CU M/Min	1777.7	CU M
SP6	Day 4	06.23.2004	19.55	0.20375	CU M/Min	1778.05	CU M
SP6	Day 4	06.23.2004	20	0.049017	CU M/Min	1778.46	CU M
SP6	Day 4	06.23.2004	20.05	0	CU M/Min	1778.78	CU M
SP6	Day 4	06.23.2004	20.1	0.827967	CU M/Min	1778.94	CU M
SP6	Day 4	06.23.2004	20.15	0.031067	CU M/Min	1779.57	CU M
SP6	Day 4	06.23.2004	20.2	0.049883	CU M/Min	1780	CU M
SP6	Day 4	06.23.2004	20.25	0	CU M/Min	1780.26	CU M
SP6	Day 4	06.23.2004	20.3	0.019783	CU M/Min	1780.78	CU M
SP6	Day 4	06.23.2004	20.35	0	CU M/Min	1781.09	CU M
SP6	Day 4	06.23.2004	20.4	0.016733	CU M/Min	1782.42	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 4	06.23.2004	20.45	0.087633	CU M/Min	1782.7	CU M
SP6	Day 4	06.23.2004	20.5	0	CU M/Min	1783.24	CU M
SP6	Day 4	06.23.2004	20.55	0	CU M/Min	1783.98	CU M
SP6	Day 4	06.23.2004	21	0.02045	CU M/Min	1784.47	CU M
SP6	Day 4	06.23.2004	21.05	0.01465	CU M/Min	1784.77	CU M
SP6	Day 4	06.23.2004	21.1	0	CU M/Min	1784.91	CU M
SP6	Day 4	06.23.2004	21.15	0	CU M/Min	1785.37	CU M
SP6	Day 4	06.23.2004	21.2	0.04935	CU M/Min	1786.28	CU M
SP6	Day 4	06.23.2004	21.25	0.02725	CU M/Min	1786.62	CU M
SP6	Day 4	06.23.2004	21.3	0	CU M/Min	1786.92	CU M
SP6	Day 4	06.23.2004	21.35	0.0138	CU M/Min	1788.2	CU M
SP6	Day 4	06.23.2004	21.4	0.147983	CU M/Min	1788.62	CU M
SP6	Day 4	06.23.2004	21.45	0	CU M/Min	1788.82	CU M
SP6	Day 4	06.23.2004	21.5	0	CU M/Min	1789.11	CU M
SP6	Day 4	06.23.2004	21.55	0.023233	CU M/Min	1789.63	CU M
SP6	Day 4	06.23.2004	22	0.099317	CU M/Min	1790.13	CU M
SP6	Day 4	06.23.2004	22.05	0	CU M/Min	1790.61	CU M
SP6	Day 4	06.23.2004	22.1	0.53335	CU M/Min	1791.11	CU M
SP6	Day 4	06.23.2004	22.15	0.168017	CU M/Min	1791.56	CU M
SP6	Day 4	06.23.2004	22.2	0	CU M/Min	1792.01	CU M
SP6	Day 4	06.23.2004	22.25	0.892483	CU M/Min	1792.08	CU M
SP6	Day 4	06.23.2004	22.3	0.159317	CU M/Min	1792.87	CU M
SP6	Day 4	06.23.2004	22.35	0	CU M/Min	1793.39	CU M
SP6	Day 4	06.23.2004	22.4	0.223417	CU M/Min	1793.66	CU M
SP6	Day 4	06.23.2004	22.45	0.120383	CU M/Min	1794.07	CU M
SP6	Day 4	06.23.2004	22.5	0	CU M/Min	1793.95	CU M
SP6	Day 4	06.23.2004	22.55	0.006667	CU M/Min	1794.76	CU M
SP6	Day 4	06.23.2004	23	0	CU M/Min	1794.96	CU M
SP6	Day 4	06.23.2004	23.05	0.176717	CU M/Min	1796.32	CU M
SP6	Day 4	06.23.2004	23.1	0.062467	CU M/Min	1796.65	CU M
SP6	Day 4	06.23.2004	23.15	0.088267	CU M/Min	1796.91	CU M
SP6	Day 4	06.23.2004	23.2	0.238683	CU M/Min	1798.6	CU M
SP6	Day 4	06.23.2004	23.25	0.011	CU M/Min	1800.36	CU M
SP6	Day 4	06.23.2004	23.3	0.4002	CU M/Min	1800.83	CU M
SP6	Day 4	06.23.2004	23.35	0	CU M/Min	1801.74	CU M
SP6	Day 4	06.23.2004	23.4	0.0201	CU M/Min	1802.13	CU M
SP6	Day 4	06.23.2004	23.45	0.0273	CU M/Min	1802.13	CU M
SP6	Day 4	06.23.2004	23.5	0.381733	CU M/Min	1802.54	CU M
SP6	Day 4	06.23.2004	23.55	0.774483	CU M/Min	1802.97	CU M
SP6	Day 4	06.24.2004	0	0	CU M/Min	1804.14	CU M
SP6	Day 4	06.24.2004	0.05	0.264667	CU M/Min	1805.76	CU M
SP6	Day 4	06.24.2004	0.1	0.1344	CU M/Min	1806.16	CU M
SP6	Day 4	06.24.2004	0.15	0	CU M/Min	1806.44	CU M
SP6	Day 4	06.24.2004	0.2	0.054483	CU M/Min	1806.74	CU M
SP6	Day 4	06.24.2004	0.25	0.036333	CU M/Min	1807.14	CU M
SP6	Day 4	06.24.2004	0.3	0.137517	CU M/Min	1807.57	CU M
SP6	Day 4	06.24.2004	0.35	0.857617	CU M/Min	1808.06	CU M
SP6	Day 4	06.24.2004	0.4	0	CU M/Min	1808.16	CU M
SP6	Day 4	06.24.2004	0.45	0	CU M/Min	1808.64	CU M
SP6	Day 4	06.24.2004	0.5	0.107217	CU M/Min	1808.95	CU M
SP6	Day 4	06.24.2004	0.55	0.028017	CU M/Min	1809.38	CU M
SP6	Day 4	06.24.2004	1	0	CU M/Min	1810.32	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 4	06.24.2004	1.05	0	CU M/Min	1810.61	CU M
SP6	Day 4	06.24.2004	1.1	0	CU M/Min	1810.95	CU M
SP6	Day 4	06.24.2004	1.15	0.029083	CU M/Min	1811.42	CU M
SP6	Day 4	06.24.2004	1.2	0	CU M/Min	1811.58	CU M
SP6	Day 4	06.24.2004	1.25	0	CU M/Min	1812.3	CU M
SP6	Day 4	06.24.2004	1.3	0.79595	CU M/Min	1812.85	CU M
SP6	Day 4	06.24.2004	1.35	0.077433	CU M/Min	1813.49	CU M
SP6	Day 4	06.24.2004	1.4	0.20065	CU M/Min	1813.79	CU M
SP6	Day 4	06.24.2004	1.45	0.02295	CU M/Min	1814.04	CU M
SP6	Day 4	06.24.2004	1.5	0.020767	CU M/Min	1814.28	CU M
SP6	Day 4	06.24.2004	1.55	0	CU M/Min	1814.59	CU M
SP6	Day 4	06.24.2004	2	0.859783	CU M/Min	1815.93	CU M
SP6	Day 4	06.24.2004	2.05	0	CU M/Min	1817.53	CU M
SP6	Day 4	06.24.2004	2.1	0	CU M/Min	1819.18	CU M
SP6	Day 4	06.24.2004	2.15	0.046383	CU M/Min	1819.75	CU M
SP6	Day 4	06.24.2004	2.2	0.034917	CU M/Min	1820.04	CU M
SP6	Day 4	06.24.2004	2.25	0.0213	CU M/Min	1820.21	CU M
SP6	Day 4	06.24.2004	2.3	0	CU M/Min	1820.44	CU M
SP6	Day 4	06.24.2004	2.35	0.027933	CU M/Min	1820.62	CU M
SP6	Day 4	06.24.2004	2.4	0.031617	CU M/Min	1820.84	CU M
SP6	Day 4	06.24.2004	2.45	0.039833	CU M/Min	1821.09	CU M
SP6	Day 4	06.24.2004	2.5	0.03895	CU M/Min	1821.4	CU M
SP6	Day 4	06.24.2004	2.55	0	CU M/Min	1821.83	CU M
SP6	Day 4	06.24.2004	3	0.815133	CU M/Min	1822.9	CU M
SP6	Day 4	06.24.2004	3.05	0.029017	CU M/Min	1823.1	CU M
SP6	Day 4	06.24.2004	3.1	0.021233	CU M/Min	1823.36	CU M
SP6	Day 4	06.24.2004	3.15	0.01855	CU M/Min	1823.57	CU M
SP6	Day 4	06.24.2004	3.2	0.029817	CU M/Min	1823.81	CU M
SP6	Day 4	06.24.2004	3.25	0	CU M/Min	1824.17	CU M
SP6	Day 4	06.24.2004	3.3	0	CU M/Min	1825.29	CU M
SP6	Day 4	06.24.2004	3.35	0	CU M/Min	1826.42	CU M
SP6	Day 4	06.24.2004	3.4	0.080617	CU M/Min	1827.87	CU M
SP6	Day 4	06.24.2004	3.45	0	CU M/Min	1828.23	CU M
SP6	Day 4	06.24.2004	3.5	0	CU M/Min	1829.38	CU M
SP6	Day 4	06.24.2004	3.55	0.064467	CU M/Min	1829.9	CU M
SP6	Day 4	06.24.2004	4	0.043917	CU M/Min	1830.21	CU M
SP6	Day 4	06.24.2004	4.05	0.0869	CU M/Min	1830.82	CU M
SP6	Day 4	06.24.2004	4.1	0.02775	CU M/Min	1831.15	CU M
SP6	Day 4	06.24.2004	4.15	0.947367	CU M/Min	1831.95	CU M
SP6	Day 4	06.24.2004	4.2	0	CU M/Min	1833.68	CU M
SP6	Day 4	06.24.2004	4.25	0.054283	CU M/Min	1834.51	CU M
SP6	Day 4	06.24.2004	4.3	0.02795	CU M/Min	1834.8	CU M
SP6	Day 4	06.24.2004	4.35	0.0994	CU M/Min	1835.4	CU M
SP6	Day 4	06.24.2004	4.4	0.03915	CU M/Min	1835.67	CU M
SP6	Day 4	06.24.2004	4.45	0.023633	CU M/Min	1836.02	CU M
SP6	Day 4	06.24.2004	4.5	0.1887	CU M/Min	1836.2	CU M
SP6	Day 4	06.24.2004	4.55	0.886967	CU M/Min	1836.95	CU M
SP6	Day 4	06.24.2004	5	0.794917	CU M/Min	1839.5	CU M
SP6	Day 4	06.24.2004	5.05	0.035217	CU M/Min	1840.5	CU M
SP6	Day 4	06.24.2004	5.1	0.021417	CU M/Min	1840.66	CU M
SP6	Day 4	06.24.2004	5.15	0.048233	CU M/Min	1841.04	CU M
SP6	Day 4	06.24.2004	5.2	0.054917	CU M/Min	1841.32	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 4	06.24.2004	5.25	0.047067	CU M/Min	1841.68	CU M
SP6	Day 4	06.24.2004	5.3	0.2916	CU M/Min	1843.01	CU M
SP6	Day 4	06.24.2004	5.35	0.929367	CU M/Min	1845.94	CU M
SP6	Day 4	06.24.2004	5.4	0	CU M/Min	1847.94	CU M
SP6	Day 4	06.24.2004	5.45	0.044233	CU M/Min	1848.42	CU M
SP6	Day 4	06.24.2004	5.5	0	CU M/Min	1849.79	CU M
SP6	Day 4	06.24.2004	5.55	0.030933	CU M/Min	1850.08	CU M
SP6	Day 5	06.24.2004	6	0.03965	CU M/Min	1850.41	CU M
SP6	Day 5	06.24.2004	6.05	0.031967	CU M/Min	1850.93	CU M
SP6	Day 5	06.24.2004	6.1	0	CU M/Min	1852.29	CU M
SP6	Day 5	06.24.2004	6.15	0.81205	CU M/Min	1853.61	CU M
SP6	Day 5	06.24.2004	6.2	0	CU M/Min	1854.43	CU M
SP6	Day 5	06.24.2004	6.25	0.02435	CU M/Min	1855.12	CU M
SP6	Day 5	06.24.2004	6.3	0	CU M/Min	1856.22	CU M
SP6	Day 5	06.24.2004	6.35	0.040083	CU M/Min	1857.13	CU M
SP6	Day 5	06.24.2004	6.4	0.035683	CU M/Min	1857.31	CU M
SP6	Day 5	06.24.2004	6.45	0.059617	CU M/Min	1857.78	CU M
SP6	Day 5	06.24.2004	6.5	0.0413	CU M/Min	1858.13	CU M
SP6	Day 5	06.24.2004	6.55	0	CU M/Min	1859.21	CU M
SP6	Day 5	06.24.2004	7	0.80805	CU M/Min	1860.84	CU M
SP6	Day 5	06.24.2004	7.05	0.777283	CU M/Min	1862.51	CU M
SP6	Day 5	06.24.2004	7.1	0.107633	CU M/Min	1863.58	CU M
SP6	Day 5	06.24.2004	7.15	0	CU M/Min	1864.98	CU M
SP6	Day 5	06.24.2004	7.2	0.043317	CU M/Min	1866.59	CU M
SP6	Day 5	06.24.2004	7.25	0.041067	CU M/Min	1866.86	CU M
SP6	Day 5	06.24.2004	7.3	0.066917	CU M/Min	1867.09	CU M
SP6	Day 5	06.24.2004	7.35	0.0366	CU M/Min	1867.64	CU M
SP6	Day 5	06.24.2004	7.4	0.891433	CU M/Min	1868.77	CU M
SP6	Day 5	06.24.2004	7.45	0.755517	CU M/Min	1871.08	CU M
SP6	Day 5	06.24.2004	7.5	0	CU M/Min	1873.24	CU M
SP6	Day 5	06.24.2004	7.55	0.04685	CU M/Min	1874.21	CU M
SP6	Day 5	06.24.2004	8	0.829633	CU M/Min	1876.26	CU M
SP6	Day 5	06.24.2004	8.05	0.049483	CU M/Min	1877.63	CU M
SP6	Day 5	06.24.2004	8.1	0.056517	CU M/Min	1877.93	CU M
SP6	Day 5	06.24.2004	8.15	0.0333	CU M/Min	1878.28	CU M
SP6	Day 5	06.24.2004	8.2	0.0527	CU M/Min	1878.66	CU M
SP6	Day 5	06.24.2004	8.25	0.927917	CU M/Min	1879.58	CU M
SP6	Day 5	06.24.2004	8.3	0	CU M/Min	1881.5	CU M
SP6	Day 5	06.24.2004	8.35	0	CU M/Min	1882.81	CU M
SP6	Day 5	06.24.2004	8.4	0.087467	CU M/Min	1883.44	CU M
SP6	Day 5	06.24.2004	8.45	0	CU M/Min	1884.23	CU M
SP6	Day 5	06.24.2004	8.5	0.823117	CU M/Min	1885.96	CU M
SP6	Day 5	06.24.2004	8.55	0.028617	CU M/Min	1887.12	CU M
SP6	Day 5	06.24.2004	9	0.0285	CU M/Min	1887.47	CU M
SP6	Day 5	06.24.2004	9.05	0	CU M/Min	1887.95	CU M
SP6	Day 5	06.24.2004	9.1	0.063667	CU M/Min	1888.38	CU M
SP6	Day 5	06.24.2004	9.15	0.154117	CU M/Min	1888.78	CU M
SP6	Day 5	06.24.2004	9.2	0	CU M/Min	1889.24	CU M
SP6	Day 5	06.24.2004	9.25	0.760383	CU M/Min	1893	CU M
SP6	Day 5	06.24.2004	9.3	0	CU M/Min	1895.77	CU M
SP6	Day 5	06.24.2004	9.35	0.039733	CU M/Min	1897.49	CU M
SP6	Day 5	06.24.2004	9.4	0.801283	CU M/Min	1898.94	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 5	06.24.2004	9.45	0.036933	CU M/Min	1901.18	CU M
SP6	Day 5	06.24.2004	9.5	0.023767	CU M/Min	1901.42	CU M
SP6	Day 5	06.24.2004	9.55	0.16485	CU M/Min	1902	CU M
SP6	Day 5	06.24.2004	10	0.214817	CU M/Min	1902.56	CU M
SP6	Day 5	06.24.2004	10.05	0.13975	CU M/Min	1903.09	CU M
SP6	Day 5	06.24.2004	10.25	0.02605	CU M/Min	1909.36	CU M
SP6	Day 5	06.24.2004	10.3	0	CU M/Min	1910.96	CU M
SP6	Day 5	06.24.2004	10.35	0.157067	CU M/Min	1911.51	CU M
SP6	Day 5	06.24.2004	10.4	0.030217	CU M/Min	1911.99	CU M
SP6	Day 5	06.24.2004	10.45	0.046983	CU M/Min	1912.49	CU M
SP6	Day 5	06.24.2004	10.5	0	CU M/Min	1912.72	CU M
SP6	Day 5	06.24.2004	10.55	0.5872	CU M/Min	1916.14	CU M
SP6	Day 5	06.24.2004	11	0.792483	CU M/Min	1918.2	CU M
SP6	Day 5	06.24.2004	11.05	0.035167	CU M/Min	1919.83	CU M
SP6	Day 5	06.24.2004	11.1	0.778167	CU M/Min	1921.11	CU M
SP6	Day 5	06.24.2004	11.15	0.068933	CU M/Min	1922.88	CU M
SP6	Day 5	06.24.2004	11.2	0.159	CU M/Min	1923.21	CU M
SP6	Day 5	06.24.2004	11.25	0.171933	CU M/Min	1923.68	CU M
SP6	Day 5	06.24.2004	11.3	0.0414	CU M/Min	1924.04	CU M
SP6	Day 5	06.24.2004	11.35	0.866017	CU M/Min	1924.41	CU M
SP6	Day 5	06.24.2004	11.4	0.744883	CU M/Min	1927.75	CU M
SP6	Day 5	06.24.2004	11.45	0.742767	CU M/Min	1930.25	CU M
SP6	Day 5	06.24.2004	11.5	0.030567	CU M/Min	1930.25	CU M
SP6	Day 5	06.24.2004	11.55	0.764267	CU M/Min	1932.48	CU M
SP6	Day 5	06.24.2004	12	0.049283	CU M/Min	1934.33	CU M
SP6	Day 5	06.24.2004	12.05	0.026333	CU M/Min	1934.61	CU M
SP6	Day 5	06.24.2004	12.1	0.027967	CU M/Min	1934.94	CU M
SP6	Day 5	06.24.2004	12.15	0.03295	CU M/Min	1935.31	CU M
SP6	Day 5	06.24.2004	12.2	0.036333	CU M/Min	1935.66	CU M
SP6	Day 5	06.24.2004	12.25	0.79275	CU M/Min	1938.31	CU M
SP6	Day 5	06.24.2004	12.3	0.774383	CU M/Min	1940.81	CU M
SP6	Day 5	06.24.2004	12.35	0.033717	CU M/Min	1942.12	CU M
SP6	Day 5	06.24.2004	12.4	0.747733	CU M/Min	1943.25	CU M
SP6	Day 5	06.24.2004	12.45	0	CU M/Min	1945.74	CU M
SP6	Day 5	06.24.2004	12.5	0.261383	CU M/Min	1947.2	CU M
SP6	Day 5	06.24.2004	12.55	0.052083	CU M/Min	1947.65	CU M
SP6	Day 5	06.24.2004	13	0.029767	CU M/Min	1947.9	CU M
SP6	Day 5	06.24.2004	13.05	0.169417	CU M/Min	1948.19	CU M
SP6	Day 5	06.24.2004	13.1	0.034183	CU M/Min	1948.56	CU M
SP6	Day 5	06.24.2004	13.15	0	CU M/Min	1951.04	CU M
SP6	Day 5	06.24.2004	13.2	0.872567	CU M/Min	1952.97	CU M
SP6	Day 5	06.24.2004	13.25	0.016983	CU M/Min	1955.62	CU M
SP6	Day 5	06.24.2004	13.3	0.030783	CU M/Min	1956.26	CU M
SP6	Day 5	06.24.2004	13.35	0	CU M/Min	1958.75	CU M
SP6	Day 5	06.24.2004	13.4	0.035617	CU M/Min	1959.07	CU M
SP6	Day 5	06.24.2004	13.45	0.03435	CU M/Min	1959.46	CU M
SP6	Day 5	06.24.2004	13.5	0.034617	CU M/Min	1959.66	CU M
SP6	Day 5	06.24.2004	13.55	0	CU M/Min	1960.19	CU M
SP6	Day 5	06.24.2004	14	0.121967	CU M/Min	1961.65	CU M
SP6	Day 5	06.24.2004	14.05	0.832417	CU M/Min	1962.75	CU M
SP6	Day 5	06.24.2004	14.1	0.0327	CU M/Min	1963.75	CU M
SP6	Day 5	06.24.2004	14.15	0	CU M/Min	1964.83	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 5	06.24.2004	14.2	0.5341	CU M/Min	1965.97	CU M
SP6	Day 5	06.24.2004	14.25	0.04185	CU M/Min	1967.26	CU M
SP6	Day 5	06.24.2004	14.3	0.03645	CU M/Min	1967.52	CU M
SP6	Day 5	06.24.2004	14.35	0.039717	CU M/Min	1967.9	CU M
SP6	Day 5	06.24.2004	14.4	0.02935	CU M/Min	1968.37	CU M
SP6	Day 5	06.24.2004	14.45	0.330833	CU M/Min	1968.72	CU M
SP6	Day 5	06.24.2004	14.5	0	CU M/Min	1970.11	CU M
SP6	Day 5	06.24.2004	14.55	0	CU M/Min	1971.59	CU M
SP6	Day 5	06.24.2004	15	0.0677	CU M/Min	1972.89	CU M
SP6	Day 5	06.24.2004	15.05	0.532617	CU M/Min	1973.26	CU M
SP6	Day 5	06.24.2004	15.1	0	CU M/Min	1974.15	CU M
SP6	Day 5	06.24.2004	15.15	0.057767	CU M/Min	1974.92	CU M
SP6	Day 5	06.24.2004	15.2	0.044767	CU M/Min	1975.25	CU M
SP6	Day 5	06.24.2004	15.25	0.035383	CU M/Min	1975.65	CU M
SP6	Day 5	06.24.2004	15.3	0.032267	CU M/Min	1975.83	CU M
SP6	Day 5	06.24.2004	15.35	0	CU M/Min	1976.98	CU M
SP6	Day 5	06.24.2004	15.4	0.88315	CU M/Min	1978.54	CU M
SP6	Day 5	06.24.2004	15.45	0.885133	CU M/Min	1980.31	CU M
SP6	Day 5	06.24.2004	15.5	0.048433	CU M/Min	1981.21	CU M
SP6	Day 5	06.24.2004	15.55	0.902883	CU M/Min	1982.49	CU M
SP6	Day 5	06.24.2004	16	0.067217	CU M/Min	1983.97	CU M
SP6	Day 5	06.24.2004	16.05	0.0685	CU M/Min	1984.44	CU M
SP6	Day 5	06.24.2004	16.1	0.059283	CU M/Min	1984.78	CU M
SP6	Day 5	06.24.2004	16.15	0.037417	CU M/Min	1985.09	CU M
SP6	Day 5	06.24.2004	16.2	0	CU M/Min	1985.4	CU M
SP6	Day 5	06.24.2004	16.25	0	CU M/Min	1986.32	CU M
SP6	Day 5	06.24.2004	16.3	0.678867	CU M/Min	1987.41	CU M
SP6	Day 5	06.24.2004	16.35	0.143967	CU M/Min	1988.64	CU M
SP6	Day 5	06.24.2004	16.4	0.93175	CU M/Min	1989.43	CU M
SP6	Day 5	06.24.2004	16.45	0	CU M/Min	1991.29	CU M
SP6	Day 5	06.24.2004	16.5	0.025217	CU M/Min	1992.35	CU M
SP6	Day 5	06.24.2004	16.55	0.034583	CU M/Min	1992.52	CU M
SP6	Day 5	06.24.2004	17	0.03255	CU M/Min	1992.79	CU M
SP6	Day 5	06.24.2004	17.05	0.392017	CU M/Min	1993.09	CU M
SP6	Day 5	06.24.2004	17.1	0.3236	CU M/Min	1993.56	CU M
SP6	Day 5	06.24.2004	17.15	0	CU M/Min	1995.43	CU M
SP6	Day 5	06.24.2004	17.2	0.775317	CU M/Min	1996.33	CU M
SP6	Day 5	06.24.2004	17.25	0.0508	CU M/Min	1997.44	CU M
SP6	Day 5	06.24.2004	17.3	0.781367	CU M/Min	1998.31	CU M
SP6	Day 5	06.24.2004	17.35	0.91975	CU M/Min	1999.69	CU M
SP6	Day 5	06.24.2004	17.4	0.041967	CU M/Min	2000.33	CU M
SP6	Day 5	06.24.2004	17.45	0.047533	CU M/Min	2000.63	CU M
SP6	Day 5	06.24.2004	17.5	0.19325	CU M/Min	2001.08	CU M
SP6	Day 5	06.24.2004	17.55	0.039517	CU M/Min	2001.6	CU M
SP6	Day 5	06.24.2004	18	0	CU M/Min	2002.01	CU M
SP6	Day 5	06.24.2004	18.05	0	CU M/Min	2003.97	CU M
SP6	Day 5	06.24.2004	18.1	0	CU M/Min	2004.93	CU M
SP6	Day 5	06.24.2004	18.15	0.0473	CU M/Min	2005.46	CU M
SP6	Day 5	06.24.2004	18.2	0	CU M/Min	2006.15	CU M
SP6	Day 5	06.24.2004	18.25	0	CU M/Min	2007.03	CU M
SP6	Day 5	06.24.2004	18.3	0.970783	CU M/Min	2009.82	CU M
SP6	Day 5	06.24.2004	18.35	0	CU M/Min	2010.66	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 5	06.24.2004	18.4	0	CU M/Min	2010.87	CU M
SP6	Day 5	06.24.2004	18.45	0.558233	CU M/Min	2011.42	CU M
SP6	Day 5	06.24.2004	18.5	0.2004	CU M/Min	2012.82	CU M
SP6	Day 5	06.24.2004	18.55	0	CU M/Min	2015.05	CU M
SP6	Day 5	06.24.2004	19	0.849583	CU M/Min	2016.25	CU M
SP6	Day 5	06.24.2004	19.05	0.0273	CU M/Min	2016.66	CU M
SP6	Day 5	06.24.2004	19.1	0	CU M/Min	2018.33	CU M
SP6	Day 5	06.24.2004	19.15	0.664833	CU M/Min	2020.23	CU M
SP6	Day 5	06.24.2004	19.2	0.042283	CU M/Min	2021.37	CU M
SP6	Day 5	06.24.2004	19.25	0	CU M/Min	2021.65	CU M
SP6	Day 5	06.24.2004	19.3	0.866483	CU M/Min	2023.3	CU M
SP6	Day 5	06.24.2004	19.35	0	CU M/Min	2025	CU M
SP6	Day 5	06.24.2004	19.4	0.022283	CU M/Min	2025.23	CU M
SP6	Day 5	06.24.2004	19.45	0.0358	CU M/Min	2025.46	CU M
SP6	Day 5	06.24.2004	19.5	0.038583	CU M/Min	2025.83	CU M
SP6	Day 5	06.24.2004	19.55	0.481517	CU M/Min	2026.19	CU M
SP6	Day 5	06.24.2004	20	0	CU M/Min	2027.99	CU M
SP6	Day 5	06.24.2004	20.05	0.845	CU M/Min	2029.28	CU M
SP6	Day 5	06.24.2004	20.1	0.08575	CU M/Min	2030.66	CU M
SP6	Day 5	06.24.2004	20.15	0	CU M/Min	2031.01	CU M
SP6	Day 5	06.24.2004	20.2	0.06525	CU M/Min	2032.13	CU M
SP6	Day 5	06.24.2004	20.25	0.043517	CU M/Min	2032.37	CU M
SP6	Day 5	06.24.2004	20.3	0.03335	CU M/Min	2032.54	CU M
SP6	Day 5	06.24.2004	20.35	0.933183	CU M/Min	2032.99	CU M
SP6	Day 5	06.24.2004	20.4	0	CU M/Min	2034.07	CU M
SP6	Day 5	06.24.2004	20.45	0	CU M/Min	2035.03	CU M
SP6	Day 5	06.24.2004	20.5	0	CU M/Min	2036.37	CU M
SP6	Day 5	06.24.2004	20.55	0.067533	CU M/Min	2036.58	CU M
SP6	Day 5	06.24.2004	21	0.043767	CU M/Min	2037.49	CU M
SP6	Day 5	06.24.2004	21.05	0.051717	CU M/Min	2037.77	CU M
SP6	Day 5	06.24.2004	21.1	0.033683	CU M/Min	2038.1	CU M
SP6	Day 5	06.24.2004	21.15	0.028317	CU M/Min	2038.39	CU M
SP6	Day 5	06.24.2004	21.2	0	CU M/Min	2039.54	CU M
SP6	Day 5	06.24.2004	21.25	0.757583	CU M/Min	2041.44	CU M
SP6	Day 5	06.24.2004	21.3	0	CU M/Min	2042.34	CU M
SP6	Day 5	06.24.2004	21.35	0.044133	CU M/Min	2043.04	CU M
SP6	Day 5	06.24.2004	21.4	0.046967	CU M/Min	2043.37	CU M
SP6	Day 5	06.24.2004	21.45	0.03725	CU M/Min	2043.7	CU M
SP6	Day 5	06.24.2004	21.5	0.054833	CU M/Min	2044.11	CU M
SP6	Day 5	06.24.2004	21.55	0	CU M/Min	2044.33	CU M
SP6	Day 5	06.24.2004	22	0.8391	CU M/Min	2045.82	CU M
SP6	Day 5	06.24.2004	22.05	0	CU M/Min	2047.17	CU M
SP6	Day 5	06.24.2004	22.1	0.24045	CU M/Min	2047.57	CU M
SP6	Day 5	06.24.2004	22.15	0	CU M/Min	2048.05	CU M
SP6	Day 5	06.24.2004	22.2	0	CU M/Min	2048.63	CU M
SP6	Day 5	06.24.2004	22.25	0.047417	CU M/Min	2049.29	CU M
SP6	Day 5	06.24.2004	22.3	0.036933	CU M/Min	2049.56	CU M
SP6	Day 5	06.24.2004	22.35	0.106133	CU M/Min	2050.13	CU M
SP6	Day 5	06.24.2004	22.4	0.0442	CU M/Min	2050.45	CU M
SP6	Day 5	06.24.2004	22.45	0	CU M/Min	2051.16	CU M
SP6	Day 5	06.24.2004	22.5	0.238667	CU M/Min	2051.81	CU M
SP6	Day 5	06.24.2004	22.55	0	CU M/Min	2053.55	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 5	06.24.2004	23	0.041433	CU M/Min	2054.11	CU M
SP6	Day 5	06.24.2004	23.05	0	CU M/Min	2054.43	CU M
SP6	Day 5	06.24.2004	23.1	0	CU M/Min	2055.29	CU M
SP6	Day 5	06.24.2004	23.15	0.0955	CU M/Min	2055.92	CU M
SP6	Day 5	06.24.2004	23.2	0.069383	CU M/Min	2056.35	CU M
SP6	Day 5	06.24.2004	23.25	0.04455	CU M/Min	2056.75	CU M
SP6	Day 5	06.24.2004	23.3	0.039083	CU M/Min	2056.95	CU M
SP6	Day 5	06.24.2004	23.35	0	CU M/Min	2057.19	CU M
SP6	Day 5	06.24.2004	23.4	0	CU M/Min	2058.19	CU M
SP6	Day 5	06.24.2004	23.45	0	CU M/Min	2058.99	CU M
SP6	Day 5	06.24.2004	23.5	0.055983	CU M/Min	2060.01	CU M
SP6	Day 5	06.24.2004	23.55	0.045033	CU M/Min	2060.4	CU M
SP6	Day 5	06.25.2004	0	0.054783	CU M/Min	2060.75	CU M
SP6	Day 5	06.25.2004	0.05	0.20285	CU M/Min	2061.13	CU M
SP6	Day 5	06.25.2004	0.1	0.185367	CU M/Min	2061.54	CU M
SP6	Day 5	06.25.2004	0.15	0	CU M/Min	2063.01	CU M
SP6	Day 5	06.25.2004	0.2	0	CU M/Min	2065.1	CU M
SP6	Day 5	06.25.2004	0.25	0	CU M/Min	2066.47	CU M
SP6	Day 5	06.25.2004	0.3	0.053	CU M/Min	2066.88	CU M
SP6	Day 5	06.25.2004	0.35	0	CU M/Min	2069.55	CU M
SP6	Day 5	06.25.2004	0.4	0	CU M/Min	2070.85	CU M
SP6	Day 5	06.25.2004	0.45	0	CU M/Min	2071.18	CU M
SP6	Day 5	06.25.2004	0.5	0.03585	CU M/Min	2071.56	CU M
SP6	Day 5	06.25.2004	0.55	0.017433	CU M/Min	2071.68	CU M
SP6	Day 5	06.25.2004	1	0	CU M/Min	2073.25	CU M
SP6	Day 5	06.25.2004	1.15	0.050883	CU M/Min	2076.96	CU M
SP6	Day 5	06.25.2004	1.2	0.038467	CU M/Min	2077.22	CU M
SP6	Day 5	06.25.2004	1.25	0.034467	CU M/Min	2077.41	CU M
SP6	Day 5	06.25.2004	1.3	0	CU M/Min	2078.09	CU M
SP6	Day 5	06.25.2004	1.35	0.637017	CU M/Min	2079.68	CU M
SP6	Day 5	06.25.2004	1.4	0	CU M/Min	2080.15	CU M
SP6	Day 5	06.25.2004	1.45	0.071433	CU M/Min	2081.29	CU M
SP6	Day 5	06.25.2004	1.5	0	CU M/Min	2081.85	CU M
SP6	Day 5	06.25.2004	1.55	0.058	CU M/Min	2082.9	CU M
SP6	Day 5	06.25.2004	2	0.04065	CU M/Min	2083.18	CU M
SP6	Day 5	06.25.2004	2.05	0	CU M/Min	2083.49	CU M
SP6	Day 5	06.25.2004	2.1	0.039367	CU M/Min	2083.75	CU M
SP6	Day 5	06.25.2004	2.15	0.900933	CU M/Min	2085.1	CU M
SP6	Day 5	06.25.2004	2.2	0	CU M/Min	2086.87	CU M
SP6	Day 5	06.25.2004	2.25	0.1004	CU M/Min	2087.99	CU M
SP6	Day 5	06.25.2004	2.3	0.13865	CU M/Min	2088.31	CU M
SP6	Day 5	06.25.2004	2.35	0	CU M/Min	2088.65	CU M
SP6	Day 5	06.25.2004	2.4	0.043183	CU M/Min	2088.89	CU M
SP6	Day 5	06.25.2004	2.45	0.026967	CU M/Min	2089.14	CU M
SP6	Day 5	06.25.2004	2.5	0.02175	CU M/Min	2089.27	CU M
SP6	Day 5	06.25.2004	2.55	0.042033	CU M/Min	2089.59	CU M
SP6	Day 5	06.25.2004	3	0.422383	CU M/Min	2089.85	CU M
SP6	Day 5	06.25.2004	3.05	0.039717	CU M/Min	2090.04	CU M
SP6	Day 5	06.25.2004	3.1	0.03595	CU M/Min	2090.29	CU M
SP6	Day 5	06.25.2004	3.15	0.1528	CU M/Min	2090.52	CU M
SP6	Day 5	06.25.2004	3.2	0.03675	CU M/Min	2090.87	CU M
SP6	Day 5	06.25.2004	3.25	0.740717	CU M/Min	2091.68	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Influent (SP-6)
18 June through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP6	Day 5	06.25.2004	3.3	0	CU M/Min	2092.48	CU M
SP6	Day 5	06.25.2004	3.35	0.034683	CU M/Min	2093.23	CU M
SP6	Day 5	06.25.2004	3.4	0.046533	CU M/Min	2093.41	CU M
SP6	Day 5	06.25.2004	3.45	0.044633	CU M/Min	2093.76	CU M
SP6	Day 5	06.25.2004	3.5	0.167733	CU M/Min	2094.14	CU M
SP6	Day 5	06.25.2004	3.55	0	CU M/Min	2096.14	CU M
SP6	Day 5	06.25.2004	4	0	CU M/Min	2097.31	CU M
SP6	Day 5	06.25.2004	4.05	0.1497	CU M/Min	2098.25	CU M
SP6	Day 5	06.25.2004	4.1	0	CU M/Min	2098.58	CU M
SP6	Day 5	06.25.2004	4.15	0.799083	CU M/Min	2099.32	CU M
SP6	Day 5	06.25.2004	4.2	0.037767	CU M/Min	2100	CU M
SP6	Day 5	06.25.2004	4.25	0.1532	CU M/Min	2100.32	CU M
SP6	Day 5	06.25.2004	4.3	0.053733	CU M/Min	2100.68	CU M
SP6	Day 5	06.25.2004	4.35	0.064517	CU M/Min	2101.21	CU M
SP6	Day 5	06.25.2004	4.4	0.02785	CU M/Min	2101.42	CU M
SP6	Day 5	06.25.2004	4.45	0.026733	CU M/Min	2101.7	CU M
SP6	Day 5	06.25.2004	4.5	0.61335	CU M/Min	2102.67	CU M
SP6	Day 5	06.25.2004	4.55	0	CU M/Min	2104.25	CU M
SP6	Day 5	06.25.2004	5	0.038733	CU M/Min	2104.94	CU M
SP6	Day 5	06.25.2004	5.05	0.037367	CU M/Min	2105.25	CU M
SP6	Day 5	06.25.2004	5.1	0.051267	CU M/Min	2105.51	CU M
SP6	Day 5	06.25.2004	5.15	0.047283	CU M/Min	2105.87	CU M
SP6	Day 5	06.25.2004	5.2	0.088283	CU M/Min	2106.14	CU M
SP6	Day 5	06.25.2004	5.25	0.134117	CU M/Min	2106.5	CU M
SP6	Day 5	06.25.2004	5.3	0	CU M/Min	2107.22	CU M
SP6	Day 5	06.25.2004	5.35	0	CU M/Min	2108.22	CU M
SP6	Day 5	06.25.2004	5.4	0	CU M/Min	2109.25	CU M
SP6	Day 5	06.25.2004	5.45	0	CU M/Min	2109.86	CU M
SP6	Day 5	06.25.2004	5.5	0	CU M/Min	2110.28	CU M
SP6	Day 5	06.25.2004	5.55	0	CU M/Min	2111.08	CU M
SP6	Day 6	06.25.2004	6	0.025983	CU M/Min	2112.9	CU M
SP6	Day 6	06.25.2004	6.05	0.030867	CU M/Min	2113.07	CU M
SP6	Day 6	06.25.2004	6.1	0.156717	CU M/Min	2113.47	CU M
SP6	Day 6	06.25.2004	6.15	0.041633	CU M/Min	2113.83	CU M
SP6	Day 6	06.25.2004	6.2	0	CU M/Min	2114.34	CU M
SP6	Day 6	06.25.2004	6.25	0.802183	CU M/Min	2115.26	CU M
SP6	Day 6	06.25.2004	6.3	0	CU M/Min	2116.9	CU M
SP6	Day 6	06.25.2004	6.35	0.05075	CU M/Min	2118.11	CU M
SP6	Day 6	06.25.2004	6.4	0	CU M/Min	2118.5	CU M
SP6	Day 6	06.25.2004	6.45	0	CU M/Min	2120.08	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.18.2004	16.35	0.7282	CU M/Min	180.72	CU M
SP1		06.18.2004	16.4	0	CU M/Min	181.9	CU M
SP1		06.18.2004	16.45	0	CU M/Min	181.9	CU M
SP1		06.18.2004	16.5	0	CU M/Min	181.9	CU M
SP1		06.18.2004	16.55	0	CU M/Min	181.9	CU M
SP1		06.18.2004	17	0	CU M/Min	181.9	CU M
SP1		06.18.2004	17.05	0	CU M/Min	181.9	CU M
SP1		06.18.2004	17.1	0	CU M/Min	181.9	CU M
SP1		06.18.2004	17.15	0	CU M/Min	181.9	CU M
SP1		06.18.2004	17.2	0	CU M/Min	181.9	CU M
SP1		06.18.2004	17.25	0	CU M/Min	181.9	CU M
SP1		06.18.2004	17.3	0.332133	CU M/Min	183.37	CU M
SP1		06.18.2004	17.35	0.338583	CU M/Min	185.03	CU M
SP1		06.18.2004	17.4	0.0857	CU M/Min	186.11	CU M
SP1		06.18.2004	17.45	0	CU M/Min	187.3	CU M
SP1		06.18.2004	17.5	0	CU M/Min	187.3	CU M
SP1		06.18.2004	17.55	0	CU M/Min	187.29	CU M
SP1		06.18.2004	18	0	CU M/Min	187.28	CU M
SP1		06.18.2004	18.05	0	CU M/Min	187.22	CU M
SP1		06.18.2004	18.1	0	CU M/Min	187.3	CU M
SP1		06.18.2004	18.15	0	CU M/Min	187.24	CU M
SP1		06.18.2004	18.2	0	CU M/Min	187.26	CU M
SP1		06.18.2004	18.25	0	CU M/Min	187.26	CU M
SP1		06.18.2004	18.3	0	CU M/Min	187.49	CU M
SP1		06.18.2004	18.35	0	CU M/Min	164.99	CU M
SP1		06.18.2004	18.4	0	CU M/Min	159.81	CU M
SP1		06.18.2004	18.45	0	CU M/Min	137.17	CU M
SP1		06.18.2004	18.5	0	CU M/Min	129.88	CU M
SP1		06.18.2004	18.55	0	CU M/Min	129.88	CU M
SP1		06.18.2004	19	0	CU M/Min	129.88	CU M
SP1		06.18.2004	19.05	0	CU M/Min	129.88	CU M
SP1		06.18.2004	19.1	0	CU M/Min	129.88	CU M
SP1		06.18.2004	19.15	0	CU M/Min	115.72	CU M
SP1		06.18.2004	19.2	0	CU M/Min	109.54	CU M
SP1		06.18.2004	19.25	0	CU M/Min	109.54	CU M
SP1		06.18.2004	19.3	0.677083	CU M/Min	112.52	CU M
SP1		06.18.2004	19.35	0	CU M/Min	114.66	CU M
SP1		06.18.2004	19.4	0	CU M/Min	110.42	CU M
SP1		06.18.2004	19.45	0	CU M/Min	85.36	CU M
SP1		06.18.2004	19.5	0	CU M/Min	60.27	CU M
SP1		06.18.2004	19.55	0	CU M/Min	50.43	CU M
SP1		06.18.2004	20	0	CU M/Min	50.43	CU M
SP1		06.18.2004	20.05	0	CU M/Min	50.43	CU M
SP1		06.18.2004	20.1	0	CU M/Min	50.43	CU M
SP1		06.18.2004	20.15	0	CU M/Min	50.43	CU M
SP1		06.18.2004	20.2	0	CU M/Min	50.43	CU M
SP1		06.18.2004	20.25	0	CU M/Min	50.43	CU M
SP1		06.18.2004	20.3	0	CU M/Min	53.42	CU M
SP1		06.18.2004	20.35	0	CU M/Min	53.42	CU M
SP1		06.18.2004	20.4	0	CU M/Min	53.42	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.18.2004	20.45	0	CU M/Min	53.42	CU M
SP1		06.18.2004	20.5	0	CU M/Min	53.42	CU M
SP1		06.18.2004	20.55	0	CU M/Min	53.42	CU M
SP1		06.18.2004	21	0	CU M/Min	53.42	CU M
SP1		06.18.2004	21.05	0	CU M/Min	53.42	CU M
SP1		06.18.2004	21.1	0	CU M/Min	53.42	CU M
SP1		06.18.2004	21.15	0	CU M/Min	53.42	CU M
SP1		06.18.2004	21.2	0	CU M/Min	53.42	CU M
SP1		06.18.2004	21.25	0.572533	CU M/Min	53.53	CU M
SP1		06.18.2004	21.3	0.429	CU M/Min	55.43	CU M
SP1		06.18.2004	21.35	0.616583	CU M/Min	58.13	CU M
SP1		06.18.2004	21.4	0.000317	CU M/Min	60.04	CU M
SP1		06.18.2004	21.45	0	CU M/Min	60.04	CU M
SP1		06.18.2004	21.5	0	CU M/Min	60.04	CU M
SP1		06.18.2004	21.55	0	CU M/Min	60.04	CU M
SP1		06.18.2004	22	0	CU M/Min	60.04	CU M
SP1		06.18.2004	22.05	0	CU M/Min	60.04	CU M
SP1		06.18.2004	22.1	0	CU M/Min	60.04	CU M
SP1		06.18.2004	22.15	0	CU M/Min	60.04	CU M
SP1		06.18.2004	22.2	0	CU M/Min	60.04	CU M
SP1		06.18.2004	22.25	0.6456	CU M/Min	60.34	CU M
SP1		06.18.2004	22.3	0	CU M/Min	62.93	CU M
SP1		06.18.2004	22.35	0	CU M/Min	46.82	CU M
SP1		06.18.2004	22.4	0	CU M/Min	46.82	CU M
SP1		06.18.2004	22.45	0	CU M/Min	46.82	CU M
SP1		06.18.2004	22.5	0	CU M/Min	46.82	CU M
SP1		06.18.2004	22.55	0	CU M/Min	46.82	CU M
SP1		06.18.2004	23	0	CU M/Min	46.82	CU M
SP1		06.18.2004	23.05	0	CU M/Min	46.82	CU M
SP1		06.18.2004	23.1	0	CU M/Min	46.82	CU M
SP1		06.18.2004	23.15	0	CU M/Min	46.82	CU M
SP1		06.18.2004	23.2	0	CU M/Min	46.82	CU M
SP1		06.18.2004	23.25	0.552933	CU M/Min	47.3	CU M
SP1		06.18.2004	23.3	0.665167	CU M/Min	50.25	CU M
SP1		06.18.2004	23.35	0	CU M/Min	50.74	CU M
SP1		06.18.2004	23.4	0	CU M/Min	50.73	CU M
SP1		06.18.2004	23.45	0	CU M/Min	50.73	CU M
SP1		06.18.2004	23.5	0	CU M/Min	50.72	CU M
SP1		06.18.2004	23.55	0	CU M/Min	50.72	CU M
SP1		06.19.2004	0	0	CU M/Min	50.72	CU M
SP1		06.19.2004	0.05	0	CU M/Min	50.72	CU M
SP1		06.19.2004	0.1	0	CU M/Min	50.72	CU M
SP1		06.19.2004	0.15	0	CU M/Min	50.72	CU M
SP1		06.19.2004	0.2	0	CU M/Min	50.72	CU M
SP1		06.19.2004	0.25	0.6164	CU M/Min	51.36	CU M
SP1		06.19.2004	0.3	0.743133	CU M/Min	54.8	CU M
SP1		06.19.2004	0.35	0.570317	CU M/Min	58	CU M
SP1		06.19.2004	0.4	0	CU M/Min	58.13	CU M
SP1		06.19.2004	0.45	0	CU M/Min	58.13	CU M
SP1		06.19.2004	0.5	0	CU M/Min	58.13	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.19.2004	0.55	0	CU M/Min	58.13	CU M
SP1		06.19.2004	1	0	CU M/Min	58.13	CU M
SP1		06.19.2004	1.05	0	CU M/Min	58.13	CU M
SP1		06.19.2004	1.1	0	CU M/Min	58.13	CU M
SP1		06.19.2004	1.15	0	CU M/Min	58.13	CU M
SP1		06.19.2004	1.2	0	CU M/Min	58.13	CU M
SP1		06.19.2004	1.25	0.639617	CU M/Min	58.54	CU M
SP1		06.19.2004	1.3	0	CU M/Min	61.53	CU M
SP1		06.19.2004	1.35	0	CU M/Min	61.53	CU M
SP1		06.19.2004	1.4	0	CU M/Min	61.53	CU M
SP1		06.19.2004	1.45	0	CU M/Min	61.53	CU M
SP1		06.19.2004	1.5	0	CU M/Min	61.53	CU M
SP1		06.19.2004	1.55	0	CU M/Min	61.53	CU M
SP1		06.19.2004	2	0	CU M/Min	61.53	CU M
SP1		06.19.2004	2.05	0	CU M/Min	61.53	CU M
SP1		06.19.2004	2.1	0	CU M/Min	61.53	CU M
SP1		06.19.2004	2.15	0	CU M/Min	61.53	CU M
SP1		06.19.2004	2.2	0	CU M/Min	61.53	CU M
SP1		06.19.2004	2.25	0.5903	CU M/Min	62.43	CU M
SP1		06.19.2004	2.3	0.708083	CU M/Min	65.73	CU M
SP1		06.19.2004	2.35	0	CU M/Min	68.24	CU M
SP1		06.19.2004	2.4	0	CU M/Min	68.24	CU M
SP1		06.19.2004	2.45	0	CU M/Min	68.24	CU M
SP1		06.19.2004	2.5	0	CU M/Min	68.24	CU M
SP1		06.19.2004	2.55	0	CU M/Min	68.24	CU M
SP1		06.19.2004	3	0	CU M/Min	68.24	CU M
SP1		06.19.2004	3.05	0	CU M/Min	68.24	CU M
SP1		06.19.2004	3.1	0	CU M/Min	68.24	CU M
SP1		06.19.2004	3.15	0	CU M/Min	68.24	CU M
SP1		06.19.2004	3.2	0	CU M/Min	68.24	CU M
SP1		06.19.2004	3.25	0.573717	CU M/Min	69.29	CU M
SP1		06.19.2004	3.3	0.7039	CU M/Min	72.6	CU M
SP1		06.19.2004	3.35	0	CU M/Min	75.28	CU M
SP1		06.19.2004	3.4	0	CU M/Min	75.28	CU M
SP1		06.19.2004	3.45	0	CU M/Min	75.28	CU M
SP1		06.19.2004	3.5	0	CU M/Min	75.28	CU M
SP1		06.19.2004	3.55	0	CU M/Min	75.28	CU M
SP1		06.19.2004	4	0	CU M/Min	75.28	CU M
SP1		06.19.2004	4.05	0	CU M/Min	75.28	CU M
SP1		06.19.2004	4.1	0	CU M/Min	75.28	CU M
SP1		06.19.2004	4.15	0	CU M/Min	75.28	CU M
SP1		06.19.2004	4.2	0	CU M/Min	75.28	CU M
SP1		06.19.2004	4.25	0.000933	CU M/Min	75.88	CU M
SP1		06.19.2004	4.3	0	CU M/Min	75.87	CU M
SP1		06.19.2004	4.35	0	CU M/Min	75.87	CU M
SP1		06.19.2004	4.4	0	CU M/Min	75.86	CU M
SP1		06.19.2004	4.45	0	CU M/Min	75.86	CU M
SP1		06.19.2004	4.5	0	CU M/Min	75.85	CU M
SP1		06.19.2004	4.55	0	CU M/Min	75.84	CU M
SP1		06.19.2004	5	0	CU M/Min	75.83	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.19.2004	5.05	0	CU M/Min	75.82	CU M
SP1		06.19.2004	5.1	0	CU M/Min	75.81	CU M
SP1		06.19.2004	5.15	0	CU M/Min	75.81	CU M
SP1		06.19.2004	5.2	0	CU M/Min	75.8	CU M
SP1		06.19.2004	5.25	0	CU M/Min	76.2	CU M
SP1		06.19.2004	5.3	0	CU M/Min	76.19	CU M
SP1		06.19.2004	5.35	0	CU M/Min	76.19	CU M
SP1		06.19.2004	5.4	0	CU M/Min	76.18	CU M
SP1		06.19.2004	5.45	0	CU M/Min	76.17	CU M
SP1		06.19.2004	5.5	0	CU M/Min	76.16	CU M
SP1		06.19.2004	5.55	0	CU M/Min	76.2	CU M
SP1		06.19.2004	6	0	CU M/Min	76.37	CU M
SP1		06.19.2004	6.05	0	CU M/Min	75.98	CU M
SP1		06.19.2004	6.1	0	CU M/Min	74.8	CU M
SP1		06.19.2004	6.15	0.000467	CU M/Min	74.87	CU M
SP1		06.19.2004	6.2	0	CU M/Min	74.78	CU M
SP1		06.19.2004	6.25	0	CU M/Min	75.24	CU M
SP1		06.19.2004	6.3	0	CU M/Min	75.24	CU M
SP1		06.19.2004	6.35	0	CU M/Min	75.24	CU M
SP1		06.19.2004	6.4	0	CU M/Min	75.24	CU M
SP1		06.19.2004	6.45	0	CU M/Min	75.24	CU M
SP1		06.19.2004	6.5	0	CU M/Min	75.24	CU M
SP1		06.19.2004	6.55	0	CU M/Min	75.24	CU M
SP1		06.19.2004	7	0	CU M/Min	75.24	CU M
SP1		06.19.2004	7.05	0	CU M/Min	75.24	CU M
SP1		06.19.2004	7.1	0	CU M/Min	75.24	CU M
SP1		06.19.2004	7.15	0	CU M/Min	75.24	CU M
SP1		06.19.2004	7.2	0	CU M/Min	75.24	CU M
SP1		06.19.2004	7.25	0	CU M/Min	76.18	CU M
SP1		06.19.2004	7.3	0	CU M/Min	76.17	CU M
SP1		06.19.2004	7.35	0	CU M/Min	76.16	CU M
SP1		06.19.2004	8.25	0.646867	CU M/Min	246.95	CU M
SP1		06.19.2004	8.3	0.71525	CU M/Min	250.3	CU M
SP1		06.19.2004	8.35	0	CU M/Min	251.07	CU M
SP1		06.19.2004	8.4	0	CU M/Min	251.07	CU M
SP1		06.19.2004	8.45	0	CU M/Min	251.07	CU M
SP1		06.19.2004	8.5	0	CU M/Min	251.07	CU M
SP1		06.19.2004	8.55	0	CU M/Min	251.07	CU M
SP1		06.19.2004	9	0	CU M/Min	251.07	CU M
SP1		06.19.2004	9.05	0	CU M/Min	251.07	CU M
SP1		06.19.2004	9.1	0	CU M/Min	251.07	CU M
SP1		06.19.2004	9.15	0	CU M/Min	251.07	CU M
SP1		06.19.2004	9.2	0	CU M/Min	251.07	CU M
SP1		06.19.2004	9.25	0.5846	CU M/Min	252.8	CU M
SP1		06.19.2004	9.3	0.680867	CU M/Min	255.98	CU M
SP1		06.19.2004	9.35	0	CU M/Min	257.52	CU M
SP1		06.19.2004	9.4	0	CU M/Min	257.52	CU M
SP1		06.19.2004	9.45	0	CU M/Min	257.52	CU M
SP1		06.19.2004	9.5	0	CU M/Min	257.52	CU M
SP1		06.19.2004	9.55	0	CU M/Min	257.52	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.19.2004	10	0	CU M/Min	257.52	CU M
SP1		06.19.2004	10.05	0	CU M/Min	257.52	CU M
SP1		06.19.2004	10.1	0	CU M/Min	257.52	CU M
SP1		06.19.2004	10.15	0	CU M/Min	257.52	CU M
SP1		06.19.2004	10.2	0	CU M/Min	257.52	CU M
SP1		06.19.2004	10.25	0	CU M/Min	259.15	CU M
SP1		06.19.2004	10.3	0	CU M/Min	259.15	CU M
SP1		06.19.2004	10.35	0	CU M/Min	259.15	CU M
SP1		06.19.2004	10.4	0	CU M/Min	259.15	CU M
SP1		06.19.2004	10.45	0	CU M/Min	259.15	CU M
SP1		06.19.2004	10.5	0	CU M/Min	259.15	CU M
SP1		06.19.2004	10.55	0	CU M/Min	259.15	CU M
SP1		06.19.2004	11	0	CU M/Min	259.15	CU M
SP1		06.19.2004	11.05	0	CU M/Min	259.15	CU M
SP1		06.19.2004	11.1	0	CU M/Min	259.15	CU M
SP1		06.19.2004	11.15	0	CU M/Min	259.15	CU M
SP1		06.19.2004	11.2	0	CU M/Min	259.15	CU M
SP1		06.19.2004	11.25	0.444617	CU M/Min	260.83	CU M
SP1		06.19.2004	11.3	0.551167	CU M/Min	263.39	CU M
SP1		06.19.2004	11.35	0	CU M/Min	264.38	CU M
SP1		06.19.2004	11.4	0	CU M/Min	264.38	CU M
SP1		06.19.2004	11.45	0	CU M/Min	264.38	CU M
SP1		06.19.2004	11.5	0	CU M/Min	264.38	CU M
SP1		06.19.2004	11.55	0	CU M/Min	264.38	CU M
SP1		06.19.2004	12	0	CU M/Min	264.38	CU M
SP1		06.19.2004	12.05	0	CU M/Min	264.38	CU M
SP1		06.19.2004	12.1	0	CU M/Min	264.38	CU M
SP1		06.19.2004	12.15	0	CU M/Min	264.38	CU M
SP1		06.19.2004	12.2	0	CU M/Min	264.38	CU M
SP1		06.19.2004	12.25	0	CU M/Min	266.46	CU M
SP1		06.19.2004	12.3	0	CU M/Min	266.47	CU M
SP1		06.19.2004	12.35	0	CU M/Min	266.47	CU M
SP1		06.19.2004	12.4	0	CU M/Min	266.47	CU M
SP1		06.19.2004	12.45	0	CU M/Min	266.47	CU M
SP1		06.19.2004	12.5	0	CU M/Min	266.47	CU M
SP1		06.19.2004	12.55	0	CU M/Min	266.47	CU M
SP1		06.19.2004	13	0	CU M/Min	266.47	CU M
SP1		06.19.2004	13.05	0	CU M/Min	266.47	CU M
SP1		06.19.2004	13.1	0	CU M/Min	266.47	CU M
SP1		06.19.2004	13.15	0	CU M/Min	266.47	CU M
SP1		06.19.2004	13.2	0	CU M/Min	266.47	CU M
SP1		06.19.2004	13.25	0.604417	CU M/Min	268.79	CU M
SP1		06.19.2004	13.3	0.631417	CU M/Min	271.88	CU M
SP1		06.19.2004	13.35	0	CU M/Min	272.62	CU M
SP1		06.19.2004	13.4	0	CU M/Min	272.63	CU M
SP1		06.19.2004	13.45	0	CU M/Min	272.63	CU M
SP1		06.19.2004	13.5	0	CU M/Min	272.63	CU M
SP1		06.19.2004	13.55	0	CU M/Min	272.63	CU M
SP1		06.19.2004	14	0	CU M/Min	272.63	CU M
SP1		06.19.2004	14.05	0	CU M/Min	272.63	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.19.2004	14.1	0	CU M/Min	272.63	CU M
SP1		06.19.2004	14.15	0	CU M/Min	272.63	CU M
SP1		06.19.2004	14.2	0	CU M/Min	272.63	CU M
SP1		06.19.2004	14.25	0.710767	CU M/Min	275.64	CU M
SP1		06.19.2004	14.3	0	CU M/Min	276.79	CU M
SP1		06.19.2004	14.35	0	CU M/Min	276.79	CU M
SP1		06.19.2004	14.4	0	CU M/Min	276.79	CU M
SP1		06.19.2004	14.45	0	CU M/Min	276.79	CU M
SP1		06.19.2004	14.5	0	CU M/Min	276.79	CU M
SP1		06.19.2004	14.55	0	CU M/Min	276.79	CU M
SP1		06.19.2004	15	0	CU M/Min	276.79	CU M
SP1		06.19.2004	15.05	0	CU M/Min	276.79	CU M
SP1		06.19.2004	15.1	0	CU M/Min	276.79	CU M
SP1		06.19.2004	15.15	0	CU M/Min	276.79	CU M
SP1		06.19.2004	15.2	0	CU M/Min	276.79	CU M
SP1		06.19.2004	15.25	0.5587	CU M/Min	279.3	CU M
SP1		06.19.2004	15.3	0.742533	CU M/Min	282.46	CU M
SP1		06.19.2004	15.35	0	CU M/Min	284.15	CU M
SP1		06.19.2004	15.4	0	CU M/Min	284.15	CU M
SP1		06.19.2004	15.45	0	CU M/Min	284.15	CU M
SP1		06.19.2004	15.5	0	CU M/Min	284.15	CU M
SP1		06.19.2004	15.55	0	CU M/Min	284.15	CU M
SP1		06.19.2004	16	0	CU M/Min	284.15	CU M
SP1		06.19.2004	16.05	0	CU M/Min	284.15	CU M
SP1		06.19.2004	16.1	0	CU M/Min	284.15	CU M
SP1		06.19.2004	16.15	0	CU M/Min	284.15	CU M
SP1		06.19.2004	16.2	0.627483	CU M/Min	284.23	CU M
SP1		06.19.2004	16.25	0.000383	CU M/Min	285.55	CU M
SP1		06.19.2004	16.3	0	CU M/Min	285.55	CU M
SP1		06.19.2004	16.35	0	CU M/Min	285.55	CU M
SP1		06.19.2004	16.4	0	CU M/Min	285.55	CU M
SP1		06.19.2004	16.45	0	CU M/Min	285.55	CU M
SP1		06.19.2004	16.5	0	CU M/Min	285.55	CU M
SP1		06.19.2004	16.55	0	CU M/Min	285.55	CU M
SP1		06.19.2004	17	0	CU M/Min	285.55	CU M
SP1		06.19.2004	17.05	0	CU M/Min	285.55	CU M
SP1		06.19.2004	17.1	0	CU M/Min	285.55	CU M
SP1		06.19.2004	17.15	0	CU M/Min	285.55	CU M
SP1		06.19.2004	17.2	0.656417	CU M/Min	285.96	CU M
SP1		06.19.2004	17.25	0.662833	CU M/Min	289.08	CU M
SP1		06.19.2004	17.3	0.675067	CU M/Min	292.42	CU M
SP1		06.19.2004	17.35	0	CU M/Min	294.82	CU M
SP1		06.19.2004	17.4	0	CU M/Min	294.82	CU M
SP1		06.19.2004	17.45	0	CU M/Min	294.82	CU M
SP1		06.19.2004	17.5	0	CU M/Min	294.82	CU M
SP1		06.19.2004	17.55	0	CU M/Min	294.82	CU M
SP1		06.19.2004	18	0	CU M/Min	294.82	CU M
SP1		06.19.2004	18.05	0	CU M/Min	294.82	CU M
SP1		06.19.2004	18.1	0	CU M/Min	294.82	CU M
SP1		06.19.2004	18.15	0	CU M/Min	294.82	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.19.2004	18.2	0.7115	CU M/Min	295.47	CU M
SP1		06.19.2004	18.25	0	CU M/Min	297.25	CU M
SP1		06.19.2004	18.3	0	CU M/Min	297.25	CU M
SP1		06.19.2004	18.35	0	CU M/Min	297.25	CU M
SP1		06.19.2004	18.4	0	CU M/Min	297.25	CU M
SP1		06.19.2004	18.45	0	CU M/Min	297.25	CU M
SP1		06.19.2004	18.5	0	CU M/Min	297.25	CU M
SP1		06.19.2004	18.55	0	CU M/Min	297.25	CU M
SP1		06.19.2004	19	0	CU M/Min	297.25	CU M
SP1		06.19.2004	19.05	0	CU M/Min	297.25	CU M
SP1		06.19.2004	19.1	0	CU M/Min	297.25	CU M
SP1		06.19.2004	19.15	0	CU M/Min	297.25	CU M
SP1		06.19.2004	19.2	0.006883	CU M/Min	297.68	CU M
SP1		06.19.2004	19.25	0	CU M/Min	297.68	CU M
SP1		06.19.2004	19.3	0	CU M/Min	297.68	CU M
SP1		06.19.2004	19.35	0	CU M/Min	297.68	CU M
SP1		06.19.2004	19.4	0	CU M/Min	297.68	CU M
SP1		06.19.2004	19.45	0	CU M/Min	297.68	CU M
SP1		06.19.2004	19.5	0	CU M/Min	297.68	CU M
SP1		06.19.2004	19.55	0	CU M/Min	297.68	CU M
SP1		06.19.2004	20	0	CU M/Min	297.68	CU M
SP1		06.19.2004	20.05	0	CU M/Min	297.68	CU M
SP1		06.19.2004	20.1	0	CU M/Min	297.68	CU M
SP1		06.19.2004	20.15	0	CU M/Min	297.68	CU M
SP1		06.19.2004	20.2	0	CU M/Min	298.36	CU M
SP1		06.19.2004	20.25	0	CU M/Min	298.36	CU M
SP1		06.19.2004	20.3	0	CU M/Min	298.36	CU M
SP1		06.19.2004	20.35	0	CU M/Min	298.36	CU M
SP1		06.19.2004	20.4	0	CU M/Min	298.36	CU M
SP1		06.19.2004	20.45	0	CU M/Min	298.36	CU M
SP1		06.19.2004	20.5	0	CU M/Min	298.36	CU M
SP1		06.19.2004	20.55	0	CU M/Min	298.36	CU M
SP1		06.19.2004	21	0	CU M/Min	298.36	CU M
SP1		06.19.2004	21.05	0	CU M/Min	298.36	CU M
SP1		06.19.2004	21.1	0	CU M/Min	298.36	CU M
SP1		06.19.2004	21.15	0	CU M/Min	298.36	CU M
SP1		06.19.2004	21.2	0.651933	CU M/Min	299.69	CU M
SP1		06.19.2004	21.25	0.505533	CU M/Min	302.92	CU M
SP1		06.19.2004	21.3	0	CU M/Min	304.08	CU M
SP1		06.19.2004	21.35	0	CU M/Min	304.08	CU M
SP1		06.19.2004	21.4	0	CU M/Min	304.08	CU M
SP1		06.19.2004	21.45	0	CU M/Min	304.08	CU M
SP1		06.19.2004	21.5	0	CU M/Min	304.08	CU M
SP1		06.19.2004	21.55	0	CU M/Min	304.08	CU M
SP1		06.19.2004	22	0	CU M/Min	304.08	CU M
SP1		06.19.2004	22.05	0	CU M/Min	304.08	CU M
SP1		06.19.2004	22.1	0	CU M/Min	304.08	CU M
SP1		06.19.2004	22.15	0	CU M/Min	304.08	CU M
SP1		06.19.2004	22.2	0.631467	CU M/Min	305.52	CU M
SP1		06.19.2004	22.25	0	CU M/Min	307.67	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.19.2004	22.3	0	CU M/Min	307.67	CU M
SP1		06.19.2004	22.35	0	CU M/Min	307.67	CU M
SP1		06.19.2004	22.55	0	CU M/Min	307.67	CU M
SP1		06.19.2004	23	0	CU M/Min	307.67	CU M
SP1		06.19.2004	23.05	0	CU M/Min	307.67	CU M
SP1		06.19.2004	23.1	0	CU M/Min	307.67	CU M
SP1		06.19.2004	23.15	0	CU M/Min	307.67	CU M
SP1		06.19.2004	23.2	0.537533	CU M/Min	309.19	CU M
SP1		06.19.2004	23.25	0.516083	CU M/Min	312.12	CU M
SP1		06.19.2004	23.3	0	CU M/Min	313.74	CU M
SP1		06.19.2004	23.35	0	CU M/Min	313.74	CU M
SP1		06.19.2004	23.4	0	CU M/Min	313.86	CU M
SP1		06.19.2004	23.45	0	CU M/Min	313.86	CU M
SP1		06.19.2004	23.5	0	CU M/Min	313.86	CU M
SP1		06.19.2004	23.55	0	CU M/Min	313.86	CU M
SP1		06.20.2004	0	0	CU M/Min	313.86	CU M
SP1		06.20.2004	0.05	0	CU M/Min	313.86	CU M
SP1		06.20.2004	0.1	0	CU M/Min	313.86	CU M
SP1		06.20.2004	0.15	0	CU M/Min	313.86	CU M
SP1		06.20.2004	0.2	0.526683	CU M/Min	315.44	CU M
SP1		06.20.2004	0.25	0	CU M/Min	316.23	CU M
SP1		06.20.2004	0.3	0	CU M/Min	316.23	CU M
SP1		06.20.2004	0.35	0	CU M/Min	316.23	CU M
SP1		06.20.2004	0.4	0	CU M/Min	316.23	CU M
SP1		06.20.2004	0.45	0	CU M/Min	316.23	CU M
SP1		06.20.2004	0.5	0	CU M/Min	316.23	CU M
SP1		06.20.2004	0.55	0.004583	CU M/Min	316.23	CU M
SP1		06.20.2004	1	0	CU M/Min	316.24	CU M
SP1		06.20.2004	1.05	0	CU M/Min	316.24	CU M
SP1		06.20.2004	1.1	0	CU M/Min	316.24	CU M
SP1		06.20.2004	1.15	0	CU M/Min	316.24	CU M
SP1		06.20.2004	1.2	0.705233	CU M/Min	318.33	CU M
SP1		06.20.2004	1.25	0.730917	CU M/Min	322.02	CU M
SP1		06.20.2004	1.3	0.76865	CU M/Min	325.68	CU M
SP1		06.20.2004	1.35	0	CU M/Min	326.26	CU M
SP1		06.20.2004	1.4	0	CU M/Min	326.26	CU M
SP1		06.20.2004	1.45	0	CU M/Min	326.26	CU M
SP1		06.20.2004	1.5	0	CU M/Min	326.26	CU M
SP1		06.20.2004	1.55	0	CU M/Min	326.26	CU M
SP1		06.20.2004	2	0	CU M/Min	326.26	CU M
SP1		06.20.2004	2.05	0	CU M/Min	326.26	CU M
SP1		06.20.2004	2.1	0	CU M/Min	326.26	CU M
SP1		06.20.2004	2.15	0	CU M/Min	326.26	CU M
SP1		06.20.2004	2.2	0.714283	CU M/Min	328.75	CU M
SP1		06.20.2004	2.25	0	CU M/Min	328.9	CU M
SP1		06.20.2004	2.3	0	CU M/Min	328.9	CU M
SP1		06.20.2004	2.35	0	CU M/Min	328.9	CU M
SP1		06.20.2004	2.4	0	CU M/Min	328.9	CU M
SP1		06.20.2004	2.45	0	CU M/Min	328.9	CU M
SP1		06.20.2004	2.5	0	CU M/Min	328.9	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1		06.20.2004	2.55	0	CU M/Min	328.9	CU M
SP1		06.20.2004	3	0	CU M/Min	328.9	CU M
SP1		06.20.2004	3.05	0	CU M/Min	328.9	CU M
SP1		06.20.2004	3.1	0	CU M/Min	328.9	CU M
SP1		06.20.2004	3.15	0	CU M/Min	328.9	CU M
SP1		06.20.2004	3.2	0	CU M/Min	330.85	CU M
SP1		06.20.2004	3.25	0	CU M/Min	330.85	CU M
SP1		06.20.2004	3.3	0	CU M/Min	330.85	CU M
SP1		06.20.2004	3.35	0	CU M/Min	330.85	CU M
SP1		06.20.2004	3.4	0	CU M/Min	330.85	CU M
SP1		06.20.2004	3.45	0	CU M/Min	330.85	CU M
SP1		06.20.2004	3.5	0	CU M/Min	330.85	CU M
SP1		06.20.2004	3.55	0	CU M/Min	330.85	CU M
SP1		06.20.2004	4	0	CU M/Min	330.85	CU M
SP1		06.20.2004	4.05	0	CU M/Min	330.85	CU M
SP1		06.20.2004	4.1	0	CU M/Min	330.85	CU M
SP1		06.20.2004	4.15	0	CU M/Min	330.85	CU M
SP1		06.20.2004	4.2	0	CU M/Min	331.45	CU M
SP1		06.20.2004	4.25	0	CU M/Min	331.45	CU M
SP1		06.20.2004	4.3	0	CU M/Min	331.45	CU M
SP1		06.20.2004	4.35	0	CU M/Min	331.45	CU M
SP1		06.20.2004	4.4	0	CU M/Min	331.45	CU M
SP1		06.20.2004	4.45	0	CU M/Min	331.45	CU M
SP1		06.20.2004	4.5	0	CU M/Min	331.45	CU M
SP1		06.20.2004	4.55	0	CU M/Min	331.45	CU M
SP1		06.20.2004	5	0	CU M/Min	331.45	CU M
SP1		06.20.2004	5.05	0	CU M/Min	331.45	CU M
SP1		06.20.2004	5.1	0	CU M/Min	331.45	CU M
SP1		06.20.2004	5.15	0	CU M/Min	331.45	CU M
SP1		06.20.2004	5.2	0	CU M/Min	331.59	CU M
SP1		06.20.2004	5.25	0	CU M/Min	331.59	CU M
SP1		06.20.2004	5.3	0	CU M/Min	331.59	CU M
SP1		06.20.2004	5.35	0	CU M/Min	331.59	CU M
SP1		06.20.2004	5.4	0	CU M/Min	331.59	CU M
SP1		06.20.2004	5.45	0	CU M/Min	331.59	CU M
SP1		06.20.2004	5.5	0	CU M/Min	331.59	CU M
SP1		06.20.2004	5.55	0	CU M/Min	331.6	CU M
SP1	Day 1	06.20.2004	6	0	CU M/Min	331.65	CU M
SP1	Day 1	06.20.2004	6.05	0	CU M/Min	331.65	CU M
SP1	Day 1	06.20.2004	6.1	0	CU M/Min	331.65	CU M
SP1	Day 1	06.20.2004	6.15	0	CU M/Min	331.65	CU M
SP1	Day 1	06.20.2004	6.2	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	6.25	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	6.3	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	6.35	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	6.4	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	6.45	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	6.5	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	6.55	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	7	0	CU M/Min	331.71	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 1	06.20.2004	7.05	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	7.1	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	7.15	0	CU M/Min	331.71	CU M
SP1	Day 1	06.20.2004	7.2	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	7.25	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	7.3	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	7.35	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	7.4	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	7.45	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	7.5	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	7.55	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	8	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	8.05	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	8.1	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	8.15	0	CU M/Min	332.12	CU M
SP1	Day 1	06.20.2004	8.2	0.642417	CU M/Min	334.71	CU M
SP1	Day 1	06.20.2004	8.25	0.695317	CU M/Min	338.07	CU M
SP1	Day 1	06.20.2004	8.3	0	CU M/Min	338.51	CU M
SP1	Day 1	06.20.2004	8.35	0	CU M/Min	338.51	CU M
SP1	Day 1	06.20.2004	8.4	0	CU M/Min	338.51	CU M
SP1	Day 1	06.20.2004	8.45	0	CU M/Min	338.55	CU M
SP1	Day 1	06.20.2004	8.5	0	CU M/Min	338.55	CU M
SP1	Day 1	06.20.2004	8.55	0	CU M/Min	338.55	CU M
SP1	Day 1	06.20.2004	9	0	CU M/Min	338.55	CU M
SP1	Day 1	06.20.2004	9.05	0	CU M/Min	338.55	CU M
SP1	Day 1	06.20.2004	9.1	0	CU M/Min	338.55	CU M
SP1	Day 1	06.20.2004	9.15	0.774217	CU M/Min	338.79	CU M
SP1	Day 1	06.20.2004	9.2	0.700967	CU M/Min	342.33	CU M
SP1	Day 1	06.20.2004	9.25	0.735517	CU M/Min	345.8	CU M
SP1	Day 1	06.20.2004	9.3	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	9.35	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	9.4	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	9.45	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	9.5	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	9.55	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	10	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	10.05	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	10.1	0	CU M/Min	346.16	CU M
SP1	Day 1	06.20.2004	10.15	0.486517	CU M/Min	346.47	CU M
SP1	Day 1	06.20.2004	10.2	0.020467	CU M/Min	348.92	CU M
SP1	Day 1	06.20.2004	10.25	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	10.3	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	10.35	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	10.4	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	10.45	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	10.5	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	10.55	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	11	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	11.05	0	CU M/Min	348.93	CU M
SP1	Day 1	06.20.2004	11.1	0	CU M/Min	348.93	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 1	06.20.2004	11.15	0.598817	CU M/Min	349.45	CU M
SP1	Day 1	06.20.2004	11.2	0.69485	CU M/Min	352.83	CU M
SP1	Day 1	06.20.2004	11.25	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	11.3	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	11.35	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	11.4	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	11.45	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	11.5	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	11.55	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	12	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	12.05	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	12.1	0	CU M/Min	353.74	CU M
SP1	Day 1	06.20.2004	12.15	0.611233	CU M/Min	354.38	CU M
SP1	Day 1	06.20.2004	12.2	0.448333	CU M/Min	357.6	CU M
SP1	Day 1	06.20.2004	12.25	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	12.3	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	12.35	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	12.4	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	12.45	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	12.5	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	12.55	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	13	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	13.05	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	13.1	0	CU M/Min	357.61	CU M
SP1	Day 1	06.20.2004	13.15	0.518017	CU M/Min	358.34	CU M
SP1	Day 1	06.20.2004	13.2	0.717917	CU M/Min	361.57	CU M
SP1	Day 1	06.20.2004	13.25	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	13.3	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	13.35	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	13.4	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	13.45	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	13.5	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	13.55	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	14	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	14.05	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	14.1	0	CU M/Min	362.18	CU M
SP1	Day 1	06.20.2004	14.15	0.481067	CU M/Min	363.05	CU M
SP1	Day 1	06.20.2004	14.2	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	14.25	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	14.3	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	14.35	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	14.4	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	14.45	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	14.5	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	14.55	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	15	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	15.05	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	15.1	0	CU M/Min	365.6	CU M
SP1	Day 1	06.20.2004	15.15	0.700817	CU M/Min	366.87	CU M
SP1	Day 1	06.20.2004	15.2	0.7586	CU M/Min	370.49	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 1	06.20.2004	15.25	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	15.3	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	15.35	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	15.4	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	15.45	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	15.5	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	15.55	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	16	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	16.05	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	16.1	0	CU M/Min	372.32	CU M
SP1	Day 1	06.20.2004	16.15	0.52685	CU M/Min	373.54	CU M
SP1	Day 1	06.20.2004	16.2	0.69295	CU M/Min	376.61	CU M
SP1	Day 1	06.20.2004	16.25	0	CU M/Min	378.88	CU M
SP1	Day 1	06.20.2004	16.5	0	CU M/Min	378.89	CU M
SP1	Day 1	06.20.2004	16.55	0	CU M/Min	378.89	CU M
SP1	Day 1	06.20.2004	17	0	CU M/Min	378.89	CU M
SP1	Day 1	06.20.2004	17.05	0	CU M/Min	378.89	CU M
SP1	Day 1	06.20.2004	17.1	0	CU M/Min	378.89	CU M
SP1	Day 1	06.20.2004	17.15	0.608467	CU M/Min	380.37	CU M
SP1	Day 1	06.20.2004	17.2	0.727533	CU M/Min	383.83	CU M
SP1	Day 1	06.20.2004	17.25	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	17.3	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	17.35	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	17.4	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	17.45	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	17.5	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	17.55	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	18	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	18.05	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	18.1	0	CU M/Min	385.4	CU M
SP1	Day 1	06.20.2004	18.15	0.62625	CU M/Min	387.06	CU M
SP1	Day 1	06.20.2004	18.2	0	CU M/Min	388.17	CU M
SP1	Day 1	06.20.2004	18.25	0	CU M/Min	388.17	CU M
SP1	Day 1	06.20.2004	18.3	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	18.35	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	18.4	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	18.45	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	18.5	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	18.55	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	19	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	19.05	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	19.1	0	CU M/Min	388.18	CU M
SP1	Day 1	06.20.2004	19.15	0.65595	CU M/Min	390.23	CU M
SP1	Day 1	06.20.2004	19.2	0.667383	CU M/Min	393.58	CU M
SP1	Day 1	06.20.2004	19.25	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	19.3	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	19.35	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	19.4	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	19.45	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	19.5	0	CU M/Min	394.45	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 1	06.20.2004	19.55	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	20	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	20.05	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	20.1	0	CU M/Min	394.45	CU M
SP1	Day 1	06.20.2004	20.15	0.564333	CU M/Min	396.55	CU M
SP1	Day 1	06.20.2004	20.2	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	20.25	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	20.3	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	20.35	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	20.4	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	20.45	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	20.5	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	20.55	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	21	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	21.05	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	21.1	0	CU M/Min	398.16	CU M
SP1	Day 1	06.20.2004	21.15	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	21.2	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	21.25	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	21.3	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	21.35	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	21.4	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	21.45	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	21.5	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	21.55	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	22	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	22.05	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	22.1	0	CU M/Min	398.94	CU M
SP1	Day 1	06.20.2004	22.15	0.6932	CU M/Min	401.33	CU M
SP1	Day 1	06.20.2004	22.2	0.76735	CU M/Min	405.02	CU M
SP1	Day 1	06.20.2004	22.25	0	CU M/Min	407.17	CU M
SP1	Day 1	06.20.2004	22.3	0	CU M/Min	407.17	CU M
SP1	Day 1	06.20.2004	22.35	0	CU M/Min	407.18	CU M
SP1	Day 1	06.20.2004	22.4	0	CU M/Min	407.18	CU M
SP1	Day 1	06.20.2004	22.45	0	CU M/Min	407.18	CU M
SP1	Day 1	06.20.2004	22.5	0	CU M/Min	407.18	CU M
SP1	Day 1	06.20.2004	22.55	0	CU M/Min	407.18	CU M
SP1	Day 1	06.20.2004	23	0	CU M/Min	407.18	CU M
SP1	Day 1	06.20.2004	23.05	0	CU M/Min	407.18	CU M
SP1	Day 1	06.20.2004	23.1	0	CU M/Min	407.18	CU M
SP1	Day 1	06.20.2004	23.15	0.519	CU M/Min	409.47	CU M
SP1	Day 1	06.20.2004	23.2	0.694683	CU M/Min	412.57	CU M
SP1	Day 1	06.20.2004	23.25	0	CU M/Min	414.63	CU M
SP1	Day 1	06.20.2004	23.3	0	CU M/Min	414.69	CU M
SP1	Day 1	06.20.2004	23.35	0	CU M/Min	414.7	CU M
SP1	Day 1	06.20.2004	23.4	0	CU M/Min	414.7	CU M
SP1	Day 1	06.20.2004	23.45	0	CU M/Min	414.7	CU M
SP1	Day 1	06.20.2004	23.5	0	CU M/Min	414.7	CU M
SP1	Day 1	06.20.2004	23.55	0	CU M/Min	414.7	CU M
SP1	Day 1	06.21.2004	0	0	CU M/Min	414.7	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 1	06.21.2004	0.05	0	CU M/Min	414.7	CU M
SP1	Day 1	06.21.2004	0.1	0	CU M/Min	414.7	CU M
SP1	Day 1	06.21.2004	0.15	0	CU M/Min	416.17	CU M
SP1	Day 1	06.21.2004	0.2	0	CU M/Min	416.17	CU M
SP1	Day 1	06.21.2004	0.25	0	CU M/Min	416.17	CU M
SP1	Day 1	06.21.2004	0.3	0	CU M/Min	416.18	CU M
SP1	Day 1	06.21.2004	0.35	0	CU M/Min	416.18	CU M
SP1	Day 1	06.21.2004	0.4	0	CU M/Min	416.18	CU M
SP1	Day 1	06.21.2004	0.45	0	CU M/Min	416.18	CU M
SP1	Day 1	06.21.2004	0.5	0	CU M/Min	416.18	CU M
SP1	Day 1	06.21.2004	0.55	0	CU M/Min	416.18	CU M
SP1	Day 1	06.21.2004	1	0	CU M/Min	416.18	CU M
SP1	Day 1	06.21.2004	1.05	0	CU M/Min	416.18	CU M
SP1	Day 1	06.21.2004	1.1	0.722067	CU M/Min	416.43	CU M
SP1	Day 1	06.21.2004	1.15	0.68725	CU M/Min	419.43	CU M
SP1	Day 1	06.21.2004	1.2	0.737783	CU M/Min	422.99	CU M
SP1	Day 1	06.21.2004	1.25	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	1.3	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	1.35	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	1.4	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	1.45	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	1.5	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	1.55	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	2	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	2.05	0	CU M/Min	424.36	CU M
SP1	Day 1	06.21.2004	2.1	0.589467	CU M/Min	424.77	CU M
SP1	Day 1	06.21.2004	2.15	0.026283	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	2.2	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	2.25	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	2.3	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	2.35	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	2.4	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	2.45	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	2.5	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	2.55	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	3	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	3.05	0	CU M/Min	427.33	CU M
SP1	Day 1	06.21.2004	3.1	0.511533	CU M/Min	427.8	CU M
SP1	Day 1	06.21.2004	3.15	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	3.2	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	3.25	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	3.3	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	3.35	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	3.4	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	3.45	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	3.5	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	3.55	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	4	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	4.05	0	CU M/Min	427.89	CU M
SP1	Day 1	06.21.2004	4.1	0.514567	CU M/Min	428.63	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 1	06.21.2004	4.15	0.650183	CU M/Min	431.53	CU M
SP1	Day 1	06.21.2004	4.2	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	4.25	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	4.3	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	4.35	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	4.4	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	4.45	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	4.5	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	4.55	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	5	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	5.05	0	CU M/Min	432.12	CU M
SP1	Day 1	06.21.2004	5.1	0.0037	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.15	0	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.2	0	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.25	0	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.3	0	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.35	0	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.4	0	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.45	0	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.5	0	CU M/Min	432.57	CU M
SP1	Day 1	06.21.2004	5.55	0	CU M/Min	432.57	CU M
SP1	Day 2	06.21.2004	6	0	CU M/Min	432.57	CU M
SP1	Day 2	06.21.2004	6.05	0	CU M/Min	432.57	CU M
SP1	Day 2	06.21.2004	6.1	0	CU M/Min	432.75	CU M
SP1	Day 2	06.21.2004	6.15	0	CU M/Min	432.75	CU M
SP1	Day 2	06.21.2004	6.2	0	CU M/Min	432.75	CU M
SP1	Day 2	06.21.2004	6.35	0	CU M/Min	432.75	CU M
SP1	Day 2	06.21.2004	6.4	0	CU M/Min	432.75	CU M
SP1	Day 2	06.21.2004	6.45	0	CU M/Min	432.75	CU M
SP1	Day 2	06.21.2004	6.5	0	CU M/Min	432.75	CU M
SP1	Day 2	06.21.2004	6.55	0	CU M/Min	432.75	CU M
SP1	Day 2	06.21.2004	7	7.476283	CU M/Min	432.95	CU M
SP1	Day 2	06.21.2004	7.05	0	CU M/Min	433.12	CU M
SP1	Day 2	06.21.2004	7.1	0.310267	CU M/Min	433.53	CU M
SP1	Day 2	06.21.2004	7.15	0.4983	CU M/Min	435.38	CU M
SP1	Day 2	06.21.2004	7.2	0	CU M/Min	435.78	CU M
SP1	Day 2	06.21.2004	7.25	0	CU M/Min	435.78	CU M
SP1	Day 2	06.21.2004	7.3	0	CU M/Min	435.78	CU M
SP1	Day 2	06.21.2004	7.35	0	CU M/Min	435.78	CU M
SP1	Day 2	06.21.2004	7.4	0	CU M/Min	435.78	CU M
SP1	Day 2	06.21.2004	7.45	0	CU M/Min	435.78	CU M
SP1	Day 2	06.21.2004	7.5	0	CU M/Min	435.78	CU M
SP1	Day 2	06.21.2004	7.55	0	CU M/Min	435.78	CU M
SP1	Day 2	06.21.2004	8	0.0022	CU M/Min	435.82	CU M
SP1	Day 2	06.21.2004	8.05	0	CU M/Min	435.82	CU M
SP1	Day 2	06.21.2004	8.1	0.480517	CU M/Min	436.93	CU M
SP1	Day 2	06.21.2004	8.15	0.6182	CU M/Min	439.84	CU M
SP1	Day 2	06.21.2004	8.2	0	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	8.25	0	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	8.3	0	CU M/Min	440.82	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 2	06.21.2004	8.35	0	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	8.4	0	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	8.45	0	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	8.5	0	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	8.55	0	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	9	0.00015	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	9.05	0.0002	CU M/Min	440.82	CU M
SP1	Day 2	06.21.2004	9.1	0.520117	CU M/Min	441.94	CU M
SP1	Day 2	06.21.2004	9.15	0.67515	CU M/Min	445.12	CU M
SP1	Day 2	06.21.2004	9.2	0	CU M/Min	446.55	CU M
SP1	Day 2	06.21.2004	9.25	0	CU M/Min	446.55	CU M
SP1	Day 2	06.21.2004	9.3	0	CU M/Min	446.55	CU M
SP1	Day 2	06.21.2004	9.35	0	CU M/Min	446.55	CU M
SP1	Day 2	06.21.2004	9.4	0	CU M/Min	446.62	CU M
SP1	Day 2	06.21.2004	9.45	0	CU M/Min	446.62	CU M
SP1	Day 2	06.21.2004	9.5	0	CU M/Min	446.62	CU M
SP1	Day 2	06.21.2004	9.55	0	CU M/Min	446.62	CU M
SP1	Day 2	06.21.2004	10	0	CU M/Min	446.62	CU M
SP1	Day 2	06.21.2004	10.05	0	CU M/Min	446.62	CU M
SP1	Day 2	06.21.2004	10.1	0.017667	CU M/Min	447.71	CU M
SP1	Day 2	06.21.2004	10.15	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	10.2	0.0003	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	10.25	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	10.3	0.000367	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	10.35	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	10.4	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	10.45	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	10.5	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	10.55	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	11	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	11.05	0	CU M/Min	447.72	CU M
SP1	Day 2	06.21.2004	11.1	0.6902	CU M/Min	449.51	CU M
SP1	Day 2	06.21.2004	11.15	0.712067	CU M/Min	453.06	CU M
SP1	Day 2	06.21.2004	11.2	0.008983	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	11.25	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	11.3	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	11.35	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	11.4	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	11.45	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	11.5	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	11.55	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	12	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	12.05	0	CU M/Min	456.17	CU M
SP1	Day 2	06.21.2004	12.1	0.0222	CU M/Min	457.49	CU M
SP1	Day 2	06.21.2004	12.15	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	12.2	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	12.25	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	12.3	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	12.35	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	12.4	0	CU M/Min	457.5	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 2	06.21.2004	12.45	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	12.5	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	12.55	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	13	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	13.05	0	CU M/Min	457.5	CU M
SP1	Day 2	06.21.2004	13.1	0.625833	CU M/Min	459.37	CU M
SP1	Day 2	06.21.2004	13.15	0.70575	CU M/Min	462.65	CU M
SP1	Day 2	06.21.2004	13.2	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	13.25	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	13.3	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	13.35	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	13.4	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	13.45	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	13.5	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	13.55	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	14	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	14.05	0	CU M/Min	463.25	CU M
SP1	Day 2	06.21.2004	14.1	0.647967	CU M/Min	465.33	CU M
SP1	Day 2	06.21.2004	14.15	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	14.2	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	14.25	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	14.3	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	14.35	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	14.4	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	14.45	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	14.5	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	14.55	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	15	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	15.05	0	CU M/Min	467.5	CU M
SP1	Day 2	06.21.2004	15.1	0.541467	CU M/Min	469.41	CU M
SP1	Day 2	06.21.2004	15.15	0.634533	CU M/Min	472.31	CU M
SP1	Day 2	06.21.2004	15.2	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	15.25	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	15.3	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	15.35	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	15.4	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	15.45	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	15.5	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	15.55	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.05	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.1	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.15	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.2	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.25	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.3	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.35	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.4	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.45	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	16.5	0	CU M/Min	475.45	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 2	06.21.2004	16.55	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	17	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	17.05	0	CU M/Min	475.45	CU M
SP1	Day 2	06.21.2004	17.1	0.004383	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.15	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.2	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.25	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.3	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.35	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.4	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.45	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.5	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	17.55	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	18	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	18.05	0	CU M/Min	477.68	CU M
SP1	Day 2	06.21.2004	18.1	0.00075	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	18.15	0	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	18.3	0	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	18.35	0	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	18.4	0	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	18.45	0	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	18.5	0	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	18.55	0	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	19	0	CU M/Min	479.67	CU M
SP1	Day 2	06.21.2004	19.05	0	CU M/Min	479.84	CU M
SP1	Day 2	06.21.2004	19.1	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.15	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.2	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.25	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.3	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.35	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.4	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.45	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.5	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	19.55	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	20	0	CU M/Min	481.31	CU M
SP1	Day 2	06.21.2004	20.05	0.518317	CU M/Min	481.7	CU M
SP1	Day 2	06.21.2004	20.1	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.15	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.2	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.25	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.3	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.35	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.4	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.45	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.5	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	20.55	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	21	0	CU M/Min	482.66	CU M
SP1	Day 2	06.21.2004	21.05	0.735683	CU M/Min	483.42	CU M
SP1	Day 2	06.21.2004	21.1	0.7664	CU M/Min	487.1	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 2	06.21.2004	21.15	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	21.2	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	21.25	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	21.3	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	21.35	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	21.4	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	21.45	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	21.5	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	21.55	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	22	0	CU M/Min	489.8	CU M
SP1	Day 2	06.21.2004	22.05	0.595983	CU M/Min	490.61	CU M
SP1	Day 2	06.21.2004	22.1	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.15	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.2	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.25	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.3	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.35	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.4	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.45	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.5	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	22.55	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	23	0	CU M/Min	492.28	CU M
SP1	Day 2	06.21.2004	23.05	0.507517	CU M/Min	493.04	CU M
SP1	Day 2	06.21.2004	23.1	0.695533	CU M/Min	496.23	CU M
SP1	Day 2	06.21.2004	23.15	0	CU M/Min	498.93	CU M
SP1	Day 2	06.21.2004	23.2	0	CU M/Min	498.93	CU M
SP1	Day 2	06.21.2004	23.25	0	CU M/Min	498.93	CU M
SP1	Day 2	06.21.2004	23.3	0	CU M/Min	498.93	CU M
SP1	Day 2	06.21.2004	23.35	0	CU M/Min	498.93	CU M
SP1	Day 2	06.21.2004	23.4	0	CU M/Min	498.93	CU M
SP1	Day 2	06.21.2004	23.45	0	CU M/Min	498.93	CU M
SP1	Day 2	06.21.2004	23.5	0	CU M/Min	498.93	CU M
SP1	Day 2	06.21.2004	23.55	0	CU M/Min	498.93	CU M
SP1	Day 2	06.22.2004	0	0	CU M/Min	498.93	CU M
SP1	Day 2	06.22.2004	0.05	0.62975	CU M/Min	500.08	CU M
SP1	Day 2	06.22.2004	0.1	0.722367	CU M/Min	503.54	CU M
SP1	Day 2	06.22.2004	0.15	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	0.2	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	0.25	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	0.3	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	0.35	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	0.4	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	0.45	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	0.5	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	0.55	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	1	0	CU M/Min	504.67	CU M
SP1	Day 2	06.22.2004	1.05	0.64125	CU M/Min	505.96	CU M
SP1	Day 2	06.22.2004	1.1	0.746067	CU M/Min	509.54	CU M
SP1	Day 2	06.22.2004	1.15	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	1.2	0	CU M/Min	509.99	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 2	06.22.2004	1.25	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	1.3	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	1.35	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	1.4	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	1.45	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	1.5	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	1.55	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	2	0	CU M/Min	509.99	CU M
SP1	Day 2	06.22.2004	2.05	0.534	CU M/Min	511.33	CU M
SP1	Day 2	06.22.2004	2.1	0.7013	CU M/Min	514.48	CU M
SP1	Day 2	06.22.2004	2.15	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	2.2	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	2.25	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	2.3	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	2.35	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	2.4	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	2.45	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	2.5	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	2.55	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	3	0	CU M/Min	515.97	CU M
SP1	Day 2	06.22.2004	3.05	0.64255	CU M/Min	517.82	CU M
SP1	Day 2	06.22.2004	3.1	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.15	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.2	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.25	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.3	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.35	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.4	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.45	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.5	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	3.55	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.05	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.1	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.15	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.2	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.25	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.3	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.35	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.4	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.45	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.5	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	4.55	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	5	0	CU M/Min	519.06	CU M
SP1	Day 2	06.22.2004	5.05	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.1	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.15	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.2	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.25	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.3	0	CU M/Min	520.07	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 2	06.22.2004	5.35	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.4	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.45	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.5	0	CU M/Min	520.07	CU M
SP1	Day 2	06.22.2004	5.55	0	CU M/Min	520.07	CU M
SP1	Day 3	06.22.2004	6	0	CU M/Min	520.07	CU M
SP1	Day 3	06.22.2004	6.05	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	6.1	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	6.15	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	6.2	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	6.25	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	6.3	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	6.35	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	6.4	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	6.45	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	7	0	CU M/Min	520.99	CU M
SP1	Day 3	06.22.2004	7.05	0.462167	CU M/Min	522.92	CU M
SP1	Day 3	06.22.2004	7.1	0.002833	CU M/Min	525.19	CU M
SP1	Day 3	06.22.2004	7.15	0	CU M/Min	525.19	CU M
SP1	Day 3	06.22.2004	7.2	0	CU M/Min	525.19	CU M
SP1	Day 3	06.22.2004	7.25	6.67E-05	CU M/Min	525.32	CU M
SP1	Day 3	06.22.2004	7.3	0	CU M/Min	525.37	CU M
SP1	Day 3	06.22.2004	7.35	0	CU M/Min	525.38	CU M
SP1	Day 3	06.22.2004	7.4	0	CU M/Min	525.4	CU M
SP1	Day 3	06.22.2004	7.45	0	CU M/Min	525.4	CU M
SP1	Day 3	06.22.2004	7.5	0	CU M/Min	525.4	CU M
SP1	Day 3	06.22.2004	7.55	0	CU M/Min	525.4	CU M
SP1	Day 3	06.22.2004	8	0	CU M/Min	525.4	CU M
SP1	Day 3	06.22.2004	8.05	0.0873	CU M/Min	527.96	CU M
SP1	Day 3	06.22.2004	8.1	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.15	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.2	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.25	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.3	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.35	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.4	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.45	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.5	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	8.55	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	9	0	CU M/Min	527.98	CU M
SP1	Day 3	06.22.2004	9.05	0.605767	CU M/Min	530.44	CU M
SP1	Day 3	06.22.2004	9.1	0.582567	CU M/Min	533.46	CU M
SP1	Day 3	06.22.2004	9.15	0.69055	CU M/Min	536.82	CU M
SP1	Day 3	06.22.2004	9.2	0	CU M/Min	537.37	CU M
SP1	Day 3	06.22.2004	9.25	0	CU M/Min	537.37	CU M
SP1	Day 3	06.22.2004	9.3	0	CU M/Min	537.37	CU M
SP1	Day 3	06.22.2004	9.35	0	CU M/Min	537.37	CU M
SP1	Day 3	06.22.2004	9.4	0	CU M/Min	537.37	CU M
SP1	Day 3	06.22.2004	9.45	0	CU M/Min	537.37	CU M
SP1	Day 3	06.22.2004	9.5	0	CU M/Min	537.37	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 3	06.22.2004	9.55	0	CU M/Min	537.37	CU M
SP1	Day 3	06.22.2004	10	0	CU M/Min	537.37	CU M
SP1	Day 3	06.22.2004	10.05	0.001467	CU M/Min	538.91	CU M
SP1	Day 3	06.22.2004	10.1	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.15	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.2	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.25	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.3	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.35	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.4	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.45	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.5	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	10.55	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	11	0	CU M/Min	538.92	CU M
SP1	Day 3	06.22.2004	11.05	0.664283	CU M/Min	541.77	CU M
SP1	Day 3	06.22.2004	11.1	0.0481	CU M/Min	545.1	CU M
SP1	Day 3	06.22.2004	11.15	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	11.2	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	11.25	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	11.3	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	11.35	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	11.4	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	11.45	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	11.5	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	11.55	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	12	0	CU M/Min	545.11	CU M
SP1	Day 3	06.22.2004	12.05	0	CU M/Min	545.88	CU M
SP1	Day 3	06.22.2004	12.1	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.15	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.2	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.25	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.3	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.35	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.4	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.45	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.5	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	12.55	0	CU M/Min	545.97	CU M
SP1	Day 3	06.22.2004	13	0.58235	CU M/Min	546.17	CU M
SP1	Day 3	06.22.2004	13.05	0.67945	CU M/Min	549.17	CU M
SP1	Day 3	06.22.2004	13.1	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.15	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.2	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.25	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.3	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.35	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.4	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.45	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.5	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	13.55	0	CU M/Min	550.95	CU M
SP1	Day 3	06.22.2004	14	0.562567	CU M/Min	551.39	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 3	06.22.2004	14.05	0.656267	CU M/Min	554.5	CU M
SP1	Day 3	06.22.2004	14.1	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.15	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.2	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.25	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.3	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.35	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.4	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.45	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.5	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	14.55	0	CU M/Min	555.19	CU M
SP1	Day 3	06.22.2004	15	0.570433	CU M/Min	555.77	CU M
SP1	Day 3	06.22.2004	15.05	0.693317	CU M/Min	559.04	CU M
SP1	Day 3	06.22.2004	15.1	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.15	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.2	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.25	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.3	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.35	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.4	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.45	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.5	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	15.55	0	CU M/Min	559.41	CU M
SP1	Day 3	06.22.2004	16	0.548417	CU M/Min	560.2	CU M
SP1	Day 3	06.22.2004	16.05	0.721467	CU M/Min	563.53	CU M
SP1	Day 3	06.22.2004	16.1	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.15	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.2	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.25	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.3	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.35	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.4	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.45	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.5	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	16.55	0	CU M/Min	564.47	CU M
SP1	Day 3	06.22.2004	17	0.46315	CU M/Min	565.32	CU M
SP1	Day 3	06.22.2004	17.05	0.4309	CU M/Min	567.13	CU M
SP1	Day 3	06.22.2004	17.1	0.419117	CU M/Min	569.26	CU M
SP1	Day 3	06.22.2004	17.15	0.418033	CU M/Min	571.33	CU M
SP1	Day 3	06.22.2004	17.2	0	CU M/Min	571.57	CU M
SP1	Day 3	06.22.2004	17.25	0	CU M/Min	571.57	CU M
SP1	Day 3	06.22.2004	17.3	0	CU M/Min	571.57	CU M
SP1	Day 3	06.22.2004	17.35	0	CU M/Min	571.57	CU M
SP1	Day 3	06.22.2004	17.4	0	CU M/Min	571.57	CU M
SP1	Day 3	06.22.2004	17.45	0	CU M/Min	571.57	CU M
SP1	Day 3	06.22.2004	17.5	0	CU M/Min	571.57	CU M
SP1	Day 3	06.22.2004	17.55	0	CU M/Min	571.58	CU M
SP1	Day 3	06.22.2004	18	0.652167	CU M/Min	572.69	CU M
SP1	Day 3	06.22.2004	18.05	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.1	0	CU M/Min	572.82	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 3	06.22.2004	18.15	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.2	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.25	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.3	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.35	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.4	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.45	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.5	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	18.55	0	CU M/Min	572.82	CU M
SP1	Day 3	06.22.2004	19	0.3908	CU M/Min	573.59	CU M
SP1	Day 3	06.22.2004	19.05	0.426033	CU M/Min	575.69	CU M
SP1	Day 3	06.22.2004	19.2	0	CU M/Min	576.53	CU M
SP1	Day 3	06.22.2004	19.25	0	CU M/Min	576.53	CU M
SP1	Day 3	06.22.2004	19.3	0	CU M/Min	576.53	CU M
SP1	Day 3	06.22.2004	19.35	0	CU M/Min	576.53	CU M
SP1	Day 3	06.22.2004	19.4	0	CU M/Min	576.53	CU M
SP1	Day 3	06.22.2004	19.45	0	CU M/Min	576.53	CU M
SP1	Day 3	06.22.2004	19.5	0	CU M/Min	576.53	CU M
SP1	Day 3	06.22.2004	19.55	0	CU M/Min	576.53	CU M
SP1	Day 3	06.22.2004	20	0.695417	CU M/Min	578.18	CU M
SP1	Day 3	06.22.2004	20.05	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.1	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.15	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.2	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.25	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.3	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.35	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.4	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.45	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.5	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	20.55	0	CU M/Min	579.3	CU M
SP1	Day 3	06.22.2004	21	0.432483	CU M/Min	580.54	CU M
SP1	Day 3	06.22.2004	21.05	0	CU M/Min	582.77	CU M
SP1	Day 3	06.22.2004	21.1	0	CU M/Min	582.78	CU M
SP1	Day 3	06.22.2004	21.15	0	CU M/Min	582.84	CU M
SP1	Day 3	06.22.2004	21.2	0	CU M/Min	583.4	CU M
SP1	Day 3	06.22.2004	21.25	0	CU M/Min	583.4	CU M
SP1	Day 3	06.22.2004	21.3	0	CU M/Min	583.4	CU M
SP1	Day 3	06.22.2004	21.35	0	CU M/Min	583.4	CU M
SP1	Day 3	06.22.2004	21.4	0	CU M/Min	583.4	CU M
SP1	Day 3	06.22.2004	21.45	0	CU M/Min	583.4	CU M
SP1	Day 3	06.22.2004	21.5	0	CU M/Min	583.4	CU M
SP1	Day 3	06.22.2004	21.55	0	CU M/Min	583.4	CU M
SP1	Day 3	06.22.2004	22	0.666733	CU M/Min	585.4	CU M
SP1	Day 3	06.22.2004	22.05	0.666633	CU M/Min	588.76	CU M
SP1	Day 3	06.22.2004	22.1	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	22.15	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	22.2	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	22.25	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	22.3	0	CU M/Min	589.89	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 3	06.22.2004	22.35	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	22.4	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	22.45	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	22.5	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	22.55	0	CU M/Min	589.89	CU M
SP1	Day 3	06.22.2004	23	0.5855	CU M/Min	591.52	CU M
SP1	Day 3	06.22.2004	23.05	0.01565	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.1	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.15	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.2	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.25	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.3	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.35	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.4	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.45	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.5	0	CU M/Min	594.33	CU M
SP1	Day 3	06.22.2004	23.55	0	CU M/Min	594.33	CU M
SP1	Day 3	06.23.2004	0	0.57005	CU M/Min	596.11	CU M
SP1	Day 3	06.23.2004	0.05	0.650467	CU M/Min	599.19	CU M
SP1	Day 3	06.23.2004	0.1	0	CU M/Min	599.84	CU M
SP1	Day 3	06.23.2004	0.15	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	0.2	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	0.25	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	0.3	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	0.35	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	0.4	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	0.45	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	0.5	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	0.55	0	CU M/Min	599.85	CU M
SP1	Day 3	06.23.2004	1	0.575283	CU M/Min	602.12	CU M
SP1	Day 3	06.23.2004	1.05	0.673217	CU M/Min	605.3	CU M
SP1	Day 3	06.23.2004	1.1	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.15	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.2	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.25	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.3	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.35	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.4	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.45	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.5	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	1.55	0	CU M/Min	606.32	CU M
SP1	Day 3	06.23.2004	2	0.616217	CU M/Min	608.68	CU M
SP1	Day 3	06.23.2004	2.05	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.1	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.15	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.2	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.25	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.3	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.35	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.4	0	CU M/Min	611.4	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 3	06.23.2004	2.45	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.5	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	2.55	0	CU M/Min	611.4	CU M
SP1	Day 3	06.23.2004	3	0.499517	CU M/Min	613.38	CU M
SP1	Day 3	06.23.2004	3.05	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.1	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.15	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.2	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.25	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.3	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.35	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.4	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.45	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.5	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	3.55	0	CU M/Min	614.17	CU M
SP1	Day 3	06.23.2004	4	0.51325	CU M/Min	616.41	CU M
SP1	Day 3	06.23.2004	4.05	0.02665	CU M/Min	618.89	CU M
SP1	Day 3	06.23.2004	4.1	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.15	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.2	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.25	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.3	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.35	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.4	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.45	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.5	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	4.55	0	CU M/Min	618.9	CU M
SP1	Day 3	06.23.2004	5	0	CU M/Min	620.71	CU M
SP1	Day 3	06.23.2004	5.05	0	CU M/Min	620.71	CU M
SP1	Day 3	06.23.2004	5.1	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.15	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.2	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.25	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.3	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.35	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.4	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.45	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.5	0	CU M/Min	620.72	CU M
SP1	Day 3	06.23.2004	5.55	0	CU M/Min	620.72	CU M
SP1	Day 4	06.23.2004	6	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.05	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.1	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.15	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.2	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.25	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.3	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.35	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.4	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.45	0	CU M/Min	621.31	CU M
SP1	Day 4	06.23.2004	6.5	0	CU M/Min	621.31	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 4	06.23.2004	6.55	0.685283	CU M/Min	621.5	CU M
SP1	Day 4	06.23.2004	7	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.05	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.1	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.15	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.2	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.25	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.3	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.35	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.4	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.45	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.5	0	CU M/Min	622.76	CU M
SP1	Day 4	06.23.2004	7.55	0.516417	CU M/Min	623.04	CU M
SP1	Day 4	06.23.2004	8	0	CU M/Min	624.66	CU M
SP1	Day 4	06.23.2004	8.05	0	CU M/Min	624.66	CU M
SP1	Day 4	06.23.2004	8.1	0	CU M/Min	624.66	CU M
SP1	Day 4	06.23.2004	8.15	0	CU M/Min	624.66	CU M
SP1	Day 4	06.23.2004	8.35	0	CU M/Min	624.66	CU M
SP1	Day 4	06.23.2004	8.4	0	CU M/Min	624.66	CU M
SP1	Day 4	06.23.2004	8.45	0	CU M/Min	624.66	CU M
SP1	Day 4	06.23.2004	8.5	0	CU M/Min	624.66	CU M
SP1	Day 4	06.23.2004	8.55	0.545533	CU M/Min	625.06	CU M
SP1	Day 4	06.23.2004	9	0.61315	CU M/Min	628.04	CU M
SP1	Day 4	06.23.2004	9.05	0.001217	CU M/Min	630.62	CU M
SP1	Day 4	06.23.2004	9.1	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.15	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.2	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.25	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.3	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.35	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.4	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.45	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.5	0	CU M/Min	630.63	CU M
SP1	Day 4	06.23.2004	9.55	0.376533	CU M/Min	630.98	CU M
SP1	Day 4	06.23.2004	10	0.52335	CU M/Min	633.17	CU M
SP1	Day 4	06.23.2004	10.05	0.73705	CU M/Min	636	CU M
SP1	Day 4	06.23.2004	10.1	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.15	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.2	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.25	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.3	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.35	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.4	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.45	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.5	0	CU M/Min	637.45	CU M
SP1	Day 4	06.23.2004	10.55	0.3091	CU M/Min	637.81	CU M
SP1	Day 4	06.23.2004	11	0.36675	CU M/Min	639.57	CU M
SP1	Day 4	06.23.2004	11.05	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.1	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.15	0	CU M/Min	639.71	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 4	06.23.2004	11.2	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.25	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.3	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.35	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.4	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.45	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.5	0	CU M/Min	639.71	CU M
SP1	Day 4	06.23.2004	11.55	0.59065	CU M/Min	640.6	CU M
SP1	Day 4	06.23.2004	12	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.05	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.1	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.15	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.2	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.25	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.3	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.35	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.4	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.45	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.5	0	CU M/Min	642.71	CU M
SP1	Day 4	06.23.2004	12.55	0.005217	CU M/Min	643.66	CU M
SP1	Day 4	06.23.2004	13	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.05	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.1	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.15	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.2	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.25	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.3	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.35	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.4	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.45	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.5	0	CU M/Min	643.67	CU M
SP1	Day 4	06.23.2004	13.55	0.548267	CU M/Min	644.92	CU M
SP1	Day 4	06.23.2004	14	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.05	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.1	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.15	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.2	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.25	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.3	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.35	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.4	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.45	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.5	0	CU M/Min	646.37	CU M
SP1	Day 4	06.23.2004	14.55	0.646167	CU M/Min	647.97	CU M
SP1	Day 4	06.23.2004	15	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.05	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.1	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.15	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.2	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.25	0	CU M/Min	650.81	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 4	06.23.2004	15.3	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.35	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.4	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.45	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.5	0	CU M/Min	650.81	CU M
SP1	Day 4	06.23.2004	15.55	0.6399	CU M/Min	652.66	CU M
SP1	Day 4	06.23.2004	16	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.05	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.1	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.15	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.2	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.25	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.3	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.35	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.4	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.45	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.5	0	CU M/Min	654.69	CU M
SP1	Day 4	06.23.2004	16.55	0.586517	CU M/Min	656.63	CU M
SP1	Day 4	06.23.2004	17	0.007367	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.05	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.1	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.15	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.2	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.25	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.3	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.35	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.4	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.45	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.5	0	CU M/Min	659.34	CU M
SP1	Day 4	06.23.2004	17.55	0.689317	CU M/Min	661.74	CU M
SP1	Day 4	06.23.2004	18.1	0	CU M/Min	663.21	CU M
SP1	Day 4	06.23.2004	18.15	0	CU M/Min	663.22	CU M
SP1	Day 4	06.23.2004	18.2	0	CU M/Min	663.22	CU M
SP1	Day 4	06.23.2004	18.25	0	CU M/Min	663.22	CU M
SP1	Day 4	06.23.2004	18.3	0	CU M/Min	663.22	CU M
SP1	Day 4	06.23.2004	18.35	0	CU M/Min	663.22	CU M
SP1	Day 4	06.23.2004	18.4	0	CU M/Min	663.22	CU M
SP1	Day 4	06.23.2004	18.45	0	CU M/Min	663.22	CU M
SP1	Day 4	06.23.2004	18.5	0	CU M/Min	663.22	CU M
SP1	Day 4	06.23.2004	18.55	0.735683	CU M/Min	666.12	CU M
SP1	Day 4	06.23.2004	19	0.752	CU M/Min	669.84	CU M
SP1	Day 4	06.23.2004	19.05	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.1	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.15	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.2	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.25	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.3	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.35	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.4	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.45	0	CU M/Min	669.96	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 4	06.23.2004	19.5	0	CU M/Min	669.96	CU M
SP1	Day 4	06.23.2004	19.55	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.05	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.1	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.15	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.2	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.25	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.3	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.35	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.4	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.45	0	CU M/Min	671.54	CU M
SP1	Day 4	06.23.2004	20.5	0	CU M/Min	671.55	CU M
SP1	Day 4	06.23.2004	20.55	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.05	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.1	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.15	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.2	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.25	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.3	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.35	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.4	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.45	0	CU M/Min	672.29	CU M
SP1	Day 4	06.23.2004	21.5	0.697967	CU M/Min	672.35	CU M
SP1	Day 4	06.23.2004	21.55	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22	0.005033	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.05	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.1	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.15	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.2	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.25	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.3	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.35	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.4	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.45	0	CU M/Min	673.94	CU M
SP1	Day 4	06.23.2004	22.5	0.7253	CU M/Min	674.23	CU M
SP1	Day 4	06.23.2004	22.55	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.05	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.1	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.15	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.2	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.25	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.3	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.35	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.4	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.45	0	CU M/Min	675.65	CU M
SP1	Day 4	06.23.2004	23.5	0.5968	CU M/Min	676.05	CU M
SP1	Day 4	06.23.2004	23.55	0.695517	CU M/Min	679.26	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 4	06.24.2004	0	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.05	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.1	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.15	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.2	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.25	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.3	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.35	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.4	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.45	0	CU M/Min	681.53	CU M
SP1	Day 4	06.24.2004	0.5	0.529433	CU M/Min	681.89	CU M
SP1	Day 4	06.24.2004	0.55	0.635267	CU M/Min	684.9	CU M
SP1	Day 4	06.24.2004	1	0.651117	CU M/Min	688.01	CU M
SP1	Day 4	06.24.2004	1.05	0	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.1	0	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.15	0	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.2	0	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.25	0	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.3	0.000867	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.35	0	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.4	0	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.45	0	CU M/Min	690.35	CU M
SP1	Day 4	06.24.2004	1.5	0.626933	CU M/Min	690.9	CU M
SP1	Day 4	06.24.2004	1.55	0.71075	CU M/Min	694.21	CU M
SP1	Day 4	06.24.2004	2	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.05	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.1	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.15	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.2	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.25	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.3	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.35	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.4	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.45	0	CU M/Min	697.12	CU M
SP1	Day 4	06.24.2004	2.5	0.5099	CU M/Min	697.86	CU M
SP1	Day 4	06.24.2004	2.55	0.00925	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.05	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.1	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.15	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.2	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.25	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.3	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.35	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.4	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.45	0	CU M/Min	700.53	CU M
SP1	Day 4	06.24.2004	3.5	0.000183	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	3.55	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.05	0	CU M/Min	700.98	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 4	06.24.2004	4.1	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.15	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.2	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.25	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.3	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.35	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.4	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.45	0	CU M/Min	700.98	CU M
SP1	Day 4	06.24.2004	4.5	0.011983	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	4.55	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.05	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.1	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.15	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.2	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.25	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.3	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.35	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.4	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.45	0	CU M/Min	701.7	CU M
SP1	Day 4	06.24.2004	5.5	0	CU M/Min	702.15	CU M
SP1	Day 4	06.24.2004	5.55	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6	0.000917	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.05	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.1	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.15	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.2	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.25	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.3	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.35	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.4	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.45	0	CU M/Min	702.15	CU M
SP1	Day 5	06.24.2004	6.5	0.548883	CU M/Min	703.53	CU M
SP1	Day 5	06.24.2004	6.55	0.6936	CU M/Min	706.73	CU M
SP1	Day 5	06.24.2004	7	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.05	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.1	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.15	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.2	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.25	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.3	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.35	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.4	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.45	0	CU M/Min	708.91	CU M
SP1	Day 5	06.24.2004	7.5	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	7.55	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.05	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.1	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.15	0	CU M/Min	709.26	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 5	06.24.2004	8.2	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.25	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.3	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.35	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.4	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.45	0	CU M/Min	709.26	CU M
SP1	Day 5	06.24.2004	8.5	0.6086	CU M/Min	710.96	CU M
SP1	Day 5	06.24.2004	8.55	0.7154	CU M/Min	714.28	CU M
SP1	Day 5	06.24.2004	9	0	CU M/Min	714.44	CU M
SP1	Day 5	06.24.2004	9.2	0	CU M/Min	714.44	CU M
SP1	Day 5	06.24.2004	9.25	0	CU M/Min	714.44	CU M
SP1	Day 5	06.24.2004	9.3	0	CU M/Min	714.44	CU M
SP1	Day 5	06.24.2004	9.35	0	CU M/Min	714.44	CU M
SP1	Day 5	06.24.2004	9.4	0	CU M/Min	714.44	CU M
SP1	Day 5	06.24.2004	9.45	0	CU M/Min	714.44	CU M
SP1	Day 5	06.24.2004	9.5	0.642083	CU M/Min	716.39	CU M
SP1	Day 5	06.24.2004	9.55	0	CU M/Min	718.23	CU M
SP1	Day 5	06.24.2004	10	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.05	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.1	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.15	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.2	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.25	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.3	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.35	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.4	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.45	0	CU M/Min	718.27	CU M
SP1	Day 5	06.24.2004	10.5	0.741533	CU M/Min	720.94	CU M
SP1	Day 5	06.24.2004	10.55	0.749733	CU M/Min	724.7	CU M
SP1	Day 5	06.24.2004	11	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.05	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.1	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.15	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.2	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.25	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.3	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.35	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.4	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.45	0	CU M/Min	725.06	CU M
SP1	Day 5	06.24.2004	11.5	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	11.55	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.05	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.1	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.15	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.2	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.25	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.3	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.35	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.4	0	CU M/Min	725.94	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 5	06.24.2004	12.45	0	CU M/Min	725.94	CU M
SP1	Day 5	06.24.2004	12.5	0.6944	CU M/Min	729.01	CU M
SP1	Day 5	06.24.2004	12.55	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.05	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.1	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.15	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.2	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.25	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.3	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.35	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.4	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.45	0	CU M/Min	730.28	CU M
SP1	Day 5	06.24.2004	13.5	0.641333	CU M/Min	733.27	CU M
SP1	Day 5	06.24.2004	13.55	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.05	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.1	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.15	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.2	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.25	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.3	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.35	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.4	0	CU M/Min	734.12	CU M
SP1	Day 5	06.24.2004	14.45	0.8212	CU M/Min	734.39	CU M
SP1	Day 5	06.24.2004	14.5	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	14.55	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.05	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.1	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.15	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.2	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.25	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.3	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.35	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.4	0	CU M/Min	736.53	CU M
SP1	Day 5	06.24.2004	15.45	0.6989	CU M/Min	737.13	CU M
SP1	Day 5	06.24.2004	15.5	0.722067	CU M/Min	740.7	CU M
SP1	Day 5	06.24.2004	15.55	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.05	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.1	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.15	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.2	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.25	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.3	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.35	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.4	0	CU M/Min	741.75	CU M
SP1	Day 5	06.24.2004	16.45	0.487783	CU M/Min	742.47	CU M
SP1	Day 5	06.24.2004	16.5	0.006033	CU M/Min	745.09	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 5	06.24.2004	16.55	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.05	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.1	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.15	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.2	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.25	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.3	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.35	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.4	0	CU M/Min	745.09	CU M
SP1	Day 5	06.24.2004	17.45	0.501867	CU M/Min	745.83	CU M
SP1	Day 5	06.24.2004	17.5	0.110433	CU M/Min	746.64	CU M
SP1	Day 5	06.24.2004	17.55	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.05	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.1	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.15	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.2	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.25	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.3	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.35	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.4	0	CU M/Min	746.66	CU M
SP1	Day 5	06.24.2004	18.45	0.3998	CU M/Min	747.53	CU M
SP1	Day 5	06.24.2004	18.5	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	18.55	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.05	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.1	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.15	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.2	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.25	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.3	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.35	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.4	0	CU M/Min	748.22	CU M
SP1	Day 5	06.24.2004	19.45	0.496833	CU M/Min	749.43	CU M
SP1	Day 5	06.24.2004	19.5	0.030883	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	19.55	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.05	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.1	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.15	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.2	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.25	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.3	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.35	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.4	0	CU M/Min	752.24	CU M
SP1	Day 5	06.24.2004	20.45	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	20.5	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	20.55	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21	0	CU M/Min	753.07	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 5	06.24.2004	21.05	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21.1	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21.15	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21.2	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21.25	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21.3	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21.35	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21.4	0	CU M/Min	753.07	CU M
SP1	Day 5	06.24.2004	21.45	0.664183	CU M/Min	755.18	CU M
SP1	Day 5	06.24.2004	21.5	0.000317	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	21.55	0.0161	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.05	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.1	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.15	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.2	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.25	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.3	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.35	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.4	0	CU M/Min	757.88	CU M
SP1	Day 5	06.24.2004	22.45	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	22.5	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	22.55	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.05	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.1	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.15	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.2	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.25	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.3	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.35	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.4	0	CU M/Min	758.85	CU M
SP1	Day 5	06.24.2004	23.45	0.743233	CU M/Min	761.75	CU M
SP1	Day 5	06.24.2004	23.5	0	CU M/Min	765.02	CU M
SP1	Day 5	06.24.2004	23.55	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.05	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.1	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.15	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.2	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.25	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.3	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.35	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.4	0	CU M/Min	765.02	CU M
SP1	Day 5	06.25.2004	0.45	0.62395	CU M/Min	767.51	CU M
SP1	Day 5	06.25.2004	0.5	0.690767	CU M/Min	770.85	CU M
SP1	Day 5	06.25.2004	0.55	0	CU M/Min	772.78	CU M
SP1	Day 5	06.25.2004	1	0	CU M/Min	772.79	CU M
SP1	Day 5	06.25.2004	1.05	0	CU M/Min	772.79	CU M
SP1	Day 5	06.25.2004	1.1	0	CU M/Min	772.79	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
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Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 5	06.25.2004	1.15	0	CU M/Min	772.79	CU M
SP1	Day 5	06.25.2004	1.2	0	CU M/Min	772.79	CU M
SP1	Day 5	06.25.2004	1.25	0	CU M/Min	772.79	CU M
SP1	Day 5	06.25.2004	1.3	0	CU M/Min	772.79	CU M
SP1	Day 5	06.25.2004	1.35	0	CU M/Min	772.79	CU M
SP1	Day 5	06.25.2004	1.4	0	CU M/Min	772.79	CU M
SP1	Day 5	06.25.2004	1.45	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	1.5	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	1.55	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.05	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.1	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.15	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.2	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.25	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.3	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.35	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.4	0	CU M/Min	773.15	CU M
SP1	Day 5	06.25.2004	2.45	0.72685	CU M/Min	775.9	CU M
SP1	Day 5	06.25.2004	2.5	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	2.55	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.05	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.1	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.15	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.2	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.25	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.3	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.35	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.4	0	CU M/Min	777.95	CU M
SP1	Day 5	06.25.2004	3.45	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	3.5	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	3.55	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.05	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.1	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.15	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.2	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.25	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.3	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.35	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.4	0	CU M/Min	779.13	CU M
SP1	Day 5	06.25.2004	4.45	0	CU M/Min	779.97	CU M
SP1	Day 5	06.25.2004	5.05	0	CU M/Min	779.97	CU M
SP1	Day 5	06.25.2004	5.1	0	CU M/Min	779.97	CU M
SP1	Day 5	06.25.2004	5.15	0	CU M/Min	779.97	CU M
SP1	Day 5	06.25.2004	5.2	0	CU M/Min	779.97	CU M
SP1	Day 5	06.25.2004	5.25	0	CU M/Min	779.97	CU M
SP1	Day 5	06.25.2004	5.3	0	CU M/Min	779.97	CU M
SP1	Day 5	06.25.2004	5.35	0	CU M/Min	779.97	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Laundry (SP-1)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Unit	Total Flow	Flow Unit
SP1	Day 5	06.25.2004	5.4	0	CU M/Min	779.97	CU M
SP1	Day 5	06.25.2004	5.45	0	CU M/Min	780.26	CU M
SP1	Day 5	06.25.2004	5.5	0	CU M/Min	780.26	CU M
SP1	Day 5	06.25.2004	5.55	0	CU M/Min	780.26	CU M
SP1	Day 6	06.25.2004	6	0	CU M/Min	780.26	CU M
SP1	Day 6	06.25.2004	6.05	0	CU M/Min	780.26	CU M
SP1	Day 6	06.25.2004	6.1	0	CU M/Min	780.26	CU M
SP1	Day 6	06.25.2004	6.15	0	CU M/Min	780.26	CU M
SP1	Day 6	06.25.2004	6.2	0	CU M/Min	780.26	CU M
SP1	Day 6	06.25.2004	6.25	0	CU M/Min	780.26	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.18.2004	13.25	0	CU M/Min	1477.65	CU M
SP9		06.18.2004	13.3	0	CU M/Min	1477.64	CU M
SP9		06.18.2004	13.35	0	CU M/Min	1477.64	CU M
SP9		06.18.2004	13.4	0	CU M/Min	1477.64	CU M
SP9		06.18.2004	13.45	0	CU M/Min	1477.64	CU M
SP9		06.18.2004	13.5	0	CU M/Min	1477.63	CU M
SP9		06.18.2004	13.55	0	CU M/Min	1477.63	CU M
SP9		06.18.2004	14	0	CU M/Min	1477.63	CU M
SP9		06.18.2004	14.05	0	CU M/Min	1477.63	CU M
SP9		06.18.2004	14.1	0	CU M/Min	1477.62	CU M
SP9		06.18.2004	14.15	0	CU M/Min	1477.62	CU M
SP9		06.18.2004	14.2	0	CU M/Min	1477.62	CU M
SP9		06.18.2004	14.25	0	CU M/Min	1477.62	CU M
SP9		06.18.2004	14.3	0	CU M/Min	1477.61	CU M
SP9		06.18.2004	14.35	0	CU M/Min	1477.61	CU M
SP9		06.18.2004	14.4	0	CU M/Min	1477.61	CU M
SP9		06.18.2004	14.45	0	CU M/Min	1477.61	CU M
SP9		06.18.2004	14.5	0	CU M/Min	1477.6	CU M
SP9		06.18.2004	14.55	0	CU M/Min	1477.6	CU M
SP9		06.18.2004	15	0	CU M/Min	1477.6	CU M
SP9		06.18.2004	15.05	0	CU M/Min	1477.6	CU M
SP9		06.18.2004	15.1	0	CU M/Min	1477.6	CU M
SP9		06.18.2004	15.15	0	CU M/Min	1477.59	CU M
SP9		06.18.2004	15.2	0	CU M/Min	1477.59	CU M
SP9		06.18.2004	15.25	0	CU M/Min	1477.59	CU M
SP9		06.18.2004	15.3	0	CU M/Min	1477.59	CU M
SP9		06.18.2004	15.35	0	CU M/Min	1477.59	CU M
SP9		06.18.2004	15.4	0	CU M/Min	1477.58	CU M
SP9		06.18.2004	15.45	0	CU M/Min	1477.58	CU M
SP9		06.18.2004	15.5	0	CU M/Min	1477.58	CU M
SP9		06.18.2004	15.55	0	CU M/Min	1477.58	CU M
SP9		06.18.2004	16	0	CU M/Min	1477.58	CU M
SP9		06.18.2004	16.05	0.000216667	CU M/Min	1477.58	CU M
SP9		06.18.2004	16.1	0	CU M/Min	1477.57	CU M
SP9		06.18.2004	16.15	0	CU M/Min	1477.57	CU M
SP9		06.18.2004	16.2	0	CU M/Min	1477.57	CU M
SP9		06.18.2004	16.25	0	CU M/Min	1477.57	CU M
SP9		06.18.2004	16.3	1.66667E-05	CU M/Min	1477.57	CU M
SP9		06.18.2004	16.35	0	CU M/Min	1477.57	CU M
SP9		06.18.2004	16.4	0.0006	CU M/Min	1477.56	CU M
SP9		06.18.2004	16.45	0	CU M/Min	1477.56	CU M
SP9		06.18.2004	16.5	0.000566667	CU M/Min	1477.56	CU M
SP9		06.18.2004	16.55	0	CU M/Min	1477.56	CU M
SP9		06.18.2004	17	0.00005	CU M/Min	1477.56	CU M
SP9		06.18.2004	17.05	0	CU M/Min	1477.56	CU M
SP9		06.18.2004	17.1	0.000133333	CU M/Min	1477.55	CU M
SP9		06.18.2004	17.15	0	CU M/Min	1477.55	CU M
SP9		06.18.2004	17.2	8.33333E-05	CU M/Min	1477.55	CU M
SP9		06.18.2004	17.25	0	CU M/Min	1477.55	CU M
SP9		06.18.2004	17.3	0.000583333	CU M/Min	1477.55	CU M
SP9		06.18.2004	17.35	0.000116667	CU M/Min	1477.55	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.18.2004	17.4	1.66667E-05	CU M/Min	1477.54	CU M
SP9		06.18.2004	17.45	0	CU M/Min	1477.54	CU M
SP9		06.18.2004	17.5	0.000516667	CU M/Min	1477.54	CU M
SP9		06.18.2004	17.55	0	CU M/Min	1477.54	CU M
SP9		06.18.2004	18	0	CU M/Min	1477.54	CU M
SP9		06.18.2004	18.05	0	CU M/Min	1477.53	CU M
SP9		06.18.2004	18.1	0	CU M/Min	1477.53	CU M
SP9		06.18.2004	18.15	0.2892	CU M/Min	1477.79	CU M
SP9		06.18.2004	18.2	0.289983333	CU M/Min	1479.24	CU M
SP9		06.18.2004	18.25	0.287033333	CU M/Min	1479.9	CU M
SP9		06.18.2004	18.3	0.291966667	CU M/Min	1481.34	CU M
SP9		06.18.2004	18.35	0.288416667	CU M/Min	1482.02	CU M
SP9		06.18.2004	18.4	0.2896	CU M/Min	1483.46	CU M
SP9		06.18.2004	18.45	0.2904	CU M/Min	1484.13	CU M
SP9		06.18.2004	18.5	0.281916667	CU M/Min	1485.59	CU M
SP9		06.18.2004	18.55	0.288266667	CU M/Min	1486.26	CU M
SP9		06.18.2004	19	0.288166667	CU M/Min	1487.7	CU M
SP9		06.18.2004	19.05	0	CU M/Min	1488.44	CU M
SP9		06.18.2004	19.1	0.291016667	CU M/Min	1489.82	CU M
SP9		06.18.2004	19.15	0.000883333	CU M/Min	1490.64	CU M
SP9		06.18.2004	19.2	0.28525	CU M/Min	1491.94	CU M
SP9		06.18.2004	19.25	0	CU M/Min	1492.82	CU M
SP9		06.18.2004	19.3	0.28235	CU M/Min	1494.04	CU M
SP9		06.18.2004	19.35	0	CU M/Min	1495	CU M
SP9		06.18.2004	19.4	0.292766667	CU M/Min	1496.14	CU M
SP9		06.18.2004	19.45	0.2518	CU M/Min	1497.15	CU M
SP9		06.18.2004	19.5	0.283766667	CU M/Min	1498.23	CU M
SP9		06.18.2004	19.55	0.240166667	CU M/Min	1499.26	CU M
SP9		06.18.2004	20	0.285533333	CU M/Min	1500.34	CU M
SP9		06.18.2004	20.05	0.20785	CU M/Min	1501.38	CU M
SP9		06.18.2004	20.1	0.281583333	CU M/Min	1502.44	CU M
SP9		06.18.2004	20.15	0	CU M/Min	1503.52	CU M
SP9		06.18.2004	20.2	0.290333333	CU M/Min	1504.54	CU M
SP9		06.18.2004	20.25	0.001816667	CU M/Min	1505.7	CU M
SP9		06.18.2004	20.3	0.286433333	CU M/Min	1506.65	CU M
SP9		06.18.2004	20.35	0.000183333	CU M/Min	1507.88	CU M
SP9		06.18.2004	20.4	0.287866667	CU M/Min	1508.74	CU M
SP9		06.18.2004	20.45	0.00055	CU M/Min	1510.05	CU M
SP9		06.18.2004	20.5	0.282916667	CU M/Min	1510.84	CU M
SP9		06.18.2004	20.55	0.0008	CU M/Min	1512.23	CU M
SP9		06.18.2004	21	0.28815	CU M/Min	1512.94	CU M
SP9		06.18.2004	21.05	0.300233333	CU M/Min	1514.4	CU M
SP9		06.18.2004	21.1	0.291883333	CU M/Min	1515.08	CU M
SP9		06.18.2004	21.15	0.28755	CU M/Min	1516.52	CU M
SP9		06.18.2004	21.2	0.286466667	CU M/Min	1517.2	CU M
SP9		06.18.2004	21.25	0.290516667	CU M/Min	1518.64	CU M
SP9		06.18.2004	21.3	0.286483333	CU M/Min	1519.3	CU M
SP9		06.18.2004	21.35	0.2775	CU M/Min	1520.74	CU M
SP9		06.18.2004	21.4	0.286133333	CU M/Min	1521.41	CU M
SP9		06.18.2004	21.45	0.275316667	CU M/Min	1522.84	CU M
SP9		06.18.2004	21.5	0.279433333	CU M/Min	1523.51	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.18.2004	21.55	0.27905	CU M/Min	1524.94	CU M
SP9		06.18.2004	22	0.2787	CU M/Min	1525.62	CU M
SP9		06.18.2004	22.05	0.283433333	CU M/Min	1527.04	CU M
SP9		06.18.2004	22.1	0	CU M/Min	1527.74	CU M
SP9		06.18.2004	22.15	0.289066667	CU M/Min	1529.15	CU M
SP9		06.18.2004	22.2	0	CU M/Min	1529.92	CU M
SP9		06.18.2004	22.25	0.311966667	CU M/Min	1531.25	CU M
SP9		06.18.2004	22.3	0.00075	CU M/Min	1532.12	CU M
SP9		06.18.2004	22.35	0.2894	CU M/Min	1533.4	CU M
SP9		06.18.2004	22.4	0.001066667	CU M/Min	1534.34	CU M
SP9		06.18.2004	22.45	0.29165	CU M/Min	1535.52	CU M
SP9		06.18.2004	22.5	0.016816667	CU M/Min	1536.53	CU M
SP9		06.18.2004	22.55	0.292516667	CU M/Min	1537.63	CU M
SP9		06.18.2004	23	0.24365	CU M/Min	1538.66	CU M
SP9		06.18.2004	23.05	0.283616667	CU M/Min	1539.74	CU M
SP9		06.18.2004	23.1	0.22875	CU M/Min	1540.78	CU M
SP9		06.18.2004	23.15	0.2932	CU M/Min	1541.84	CU M
SP9		06.18.2004	23.2	0.1926	CU M/Min	1542.9	CU M
SP9		06.18.2004	23.25	0.282416667	CU M/Min	1543.95	CU M
SP9		06.18.2004	23.3	0	CU M/Min	1545.07	CU M
SP9		06.18.2004	23.35	0.287933333	CU M/Min	1546.05	CU M
SP9		06.18.2004	23.4	0	CU M/Min	1547.25	CU M
SP9		06.18.2004	23.45	0.2928	CU M/Min	1548.15	CU M
SP9		06.18.2004	23.5	0.001166667	CU M/Min	1549.44	CU M
SP9		06.18.2004	23.55	0.289766667	CU M/Min	1550.26	CU M
SP9		06.19.2004	0	0	CU M/Min	1551.61	CU M
SP9		06.19.2004	0.05	0.28245	CU M/Min	1552.36	CU M
SP9		06.19.2004	0.1	0.2851	CU M/Min	1553.79	CU M
SP9		06.19.2004	0.15	0.293183333	CU M/Min	1554.45	CU M
SP9		06.19.2004	0.2	0.27525	CU M/Min	1555.88	CU M
SP9		06.19.2004	0.25	0.298283333	CU M/Min	1556.55	CU M
SP9		06.19.2004	0.3	0.289116667	CU M/Min	1557.99	CU M
SP9		06.19.2004	0.35	0.293666667	CU M/Min	1558.65	CU M
SP9		06.19.2004	0.4	0.309366667	CU M/Min	1560.12	CU M
SP9		06.19.2004	0.45	0.290033333	CU M/Min	1560.8	CU M
SP9		06.19.2004	0.5	0.293883333	CU M/Min	1562.27	CU M
SP9		06.19.2004	0.55	0.281716667	CU M/Min	1562.94	CU M
SP9		06.19.2004	1	0.293916667	CU M/Min	1564.4	CU M
SP9		06.19.2004	1.05	0.28635	CU M/Min	1565.07	CU M
SP9		06.19.2004	1.1	0.286116667	CU M/Min	1566.52	CU M
SP9		06.19.2004	1.15	0.2342	CU M/Min	1567.19	CU M
SP9		06.19.2004	1.2	0.28905	CU M/Min	1568.63	CU M
SP9		06.19.2004	1.25	0	CU M/Min	1569.39	CU M
SP9		06.19.2004	1.3	0.296133333	CU M/Min	1570.75	CU M
SP9		06.19.2004	1.35	0.00115	CU M/Min	1571.58	CU M
SP9		06.19.2004	1.4	0.2853	CU M/Min	1572.86	CU M
SP9		06.19.2004	1.45	0.000533333	CU M/Min	1573.75	CU M
SP9		06.19.2004	1.5	0.285216667	CU M/Min	1574.96	CU M
SP9		06.19.2004	1.55	0.000616667	CU M/Min	1575.95	CU M
SP9		06.19.2004	2	0.28985	CU M/Min	1577.07	CU M
SP9		06.19.2004	2.05	0	CU M/Min	1577.94	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.19.2004	2.1	0.000383333	CU M/Min	1577.94	CU M
SP9		06.19.2004	2.15	0.225616667	CU M/Min	1578.03	CU M
SP9		06.19.2004	2.2	0.2572	CU M/Min	1578.68	CU M
SP9		06.19.2004	2.25	0	CU M/Min	1579.84	CU M
SP9		06.19.2004	2.3	0.292666667	CU M/Min	1580.66	CU M
SP9		06.19.2004	2.35	0	CU M/Min	1582.03	CU M
SP9		06.19.2004	2.4	0.290216667	CU M/Min	1582.77	CU M
SP9		06.19.2004	2.45	0.279633333	CU M/Min	1584.2	CU M
SP9		06.19.2004	2.5	0.285133333	CU M/Min	1584.87	CU M
SP9		06.19.2004	2.55	0.28445	CU M/Min	1586.3	CU M
SP9		06.19.2004	3	0.29225	CU M/Min	1586.97	CU M
SP9		06.19.2004	3.05	0.2826	CU M/Min	1588.41	CU M
SP9		06.19.2004	3.1	0.29695	CU M/Min	1589.07	CU M
SP9		06.19.2004	3.15	0.282283333	CU M/Min	1590.51	CU M
SP9		06.19.2004	3.2	0.2928	CU M/Min	1591.18	CU M
SP9		06.19.2004	3.25	0.281083333	CU M/Min	1592.62	CU M
SP9		06.19.2004	3.3	0.27555	CU M/Min	1593.29	CU M
SP9		06.19.2004	3.35	0.295333333	CU M/Min	1594.73	CU M
SP9		06.19.2004	3.4	0.282183333	CU M/Min	1595.4	CU M
SP9		06.19.2004	3.45	0.283116667	CU M/Min	1596.85	CU M
SP9		06.19.2004	3.5	0.000366667	CU M/Min	1597.52	CU M
SP9		06.19.2004	3.55	0.285	CU M/Min	1598.96	CU M
SP9		06.19.2004	4	0	CU M/Min	1599.72	CU M
SP9		06.19.2004	4.05	0.289316667	CU M/Min	1601.08	CU M
SP9		06.19.2004	4.1	0.001983333	CU M/Min	1601.92	CU M
SP9		06.19.2004	4.15	0.28085	CU M/Min	1603.19	CU M
SP9		06.19.2004	4.2	0.000566667	CU M/Min	1604.11	CU M
SP9		06.19.2004	4.25	0.283933333	CU M/Min	1604.82	CU M
SP9		06.19.2004	4.3	0	CU M/Min	1605.82	CU M
SP9		06.19.2004	4.35	0.284633333	CU M/Min	1606.9	CU M
SP9		06.19.2004	4.4	0.250083333	CU M/Min	1607.92	CU M
SP9		06.19.2004	4.45	0.2917	CU M/Min	1609.01	CU M
SP9		06.19.2004	4.5	0.232583333	CU M/Min	1610.05	CU M
SP9		06.19.2004	4.55	0.283316667	CU M/Min	1611.12	CU M
SP9		06.19.2004	5	0.199833333	CU M/Min	1612.17	CU M
SP9		06.19.2004	5.05	0.289516667	CU M/Min	1613.23	CU M
SP9		06.19.2004	5.1	0.001566667	CU M/Min	1614.35	CU M
SP9		06.19.2004	5.15	0.293083333	CU M/Min	1615.34	CU M
SP9		06.19.2004	5.2	0.00255	CU M/Min	1616.54	CU M
SP9		06.19.2004	5.25	0.000233333	CU M/Min	1616.54	CU M
SP9		06.19.2004	5.3	0.00015	CU M/Min	1616.54	CU M
SP9		06.19.2004	5.35	0.000216667	CU M/Min	1616.54	CU M
SP9		06.19.2004	5.4	0	CU M/Min	1616.54	CU M
SP9		06.19.2004	5.45	0.000866667	CU M/Min	1616.54	CU M
SP9		06.19.2004	5.5	0.0007	CU M/Min	1616.59	CU M
SP9		06.19.2004	5.55	0.162483333	CU M/Min	1617.26	CU M
SP9		06.19.2004	6	0.001083333	CU M/Min	1617.51	CU M
SP9		06.19.2004	6.05	0.001033333	CU M/Min	1617.51	CU M
SP9		06.19.2004	6.1	0.191566667	CU M/Min	1617.53	CU M
SP9		06.19.2004	6.15	0	CU M/Min	1618.56	CU M
SP9		06.19.2004	6.2	0.000683333	CU M/Min	1619.5	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.19.2004	6.21	0.474383333	CU M/Min	1619.92	CU M
SP9		06.19.2004	6.25	0.013683333	CU M/Min	1620.77	CU M
SP9		06.19.2004	6.3	0.010433333	CU M/Min	1621.93	CU M
SP9		06.19.2004	6.35	0.0029	CU M/Min	1623.13	CU M
SP9		06.19.2004	6.4	0.286666667	CU M/Min	1623.86	CU M
SP9		06.19.2004	6.45	0.289783333	CU M/Min	1625.33	CU M
SP9		06.19.2004	6.5	0.285066667	CU M/Min	1626	CU M
SP9		06.19.2004	6.55	0.28655	CU M/Min	1627.28	CU M
SP9		06.19.2004	7.2	0.0741	CU M/Min	1634.35	CU M
SP9		06.19.2004	7.25	0.286333333	CU M/Min	1635.57	CU M
SP9		06.19.2004	7.3	0.00325	CU M/Min	1636.91	CU M
SP9		06.19.2004	7.35	0.280016667	CU M/Min	1638.31	CU M
SP9		06.19.2004	7.4	0.007716667	CU M/Min	1639.76	CU M
SP9		06.19.2004	7.45	0.286966667	CU M/Min	1641	CU M
SP9		06.19.2004	7.5	0.005866667	CU M/Min	1642.44	CU M
SP9		06.19.2004	7.55	0.292683333	CU M/Min	1644.08	CU M
SP9		06.19.2004	8	0.00215	CU M/Min	1645.52	CU M
SP9		06.19.2004	8.05	0.289216667	CU M/Min	1647.14	CU M
SP9		06.19.2004	8.15	0.284533333	CU M/Min	1649.73	CU M
SP9		06.19.2004	8.2	0	CU M/Min	1651.16	CU M
SP9		06.19.2004	8.25	0.07765	CU M/Min	1652.77	CU M
SP9		06.19.2004	8.3	0.0022	CU M/Min	1654.2	CU M
SP9		06.19.2004	8.35	0.284083333	CU M/Min	1655.52	CU M
SP9		06.19.2004	8.4	0	CU M/Min	1656.95	CU M
SP9		06.19.2004	8.45	0.006816667	CU M/Min	1658.35	CU M
SP9		06.19.2004	8.5	0.000283333	CU M/Min	1659.79	CU M
SP9		06.19.2004	8.55	0.055933333	CU M/Min	1661.24	CU M
SP9		06.19.2004	9	0.033133333	CU M/Min	1662.66	CU M
SP9		06.19.2004	9.05	0.0017	CU M/Min	1664.41	CU M
SP9		06.19.2004	9.1	0.349466667	CU M/Min	1665.9	CU M
SP9		06.19.2004	9.15	0.004633333	CU M/Min	1667.68	CU M
SP9		06.19.2004	9.2	0.002516667	CU M/Min	1669.14	CU M
SP9		06.19.2004	9.25	0.21365	CU M/Min	1670.6	CU M
SP9		06.19.2004	9.3	0.00375	CU M/Min	1671.8	CU M
SP9		06.19.2004	9.35	0.22615	CU M/Min	1673.28	CU M
SP9		06.19.2004	9.4	0.001	CU M/Min	1674.47	CU M
SP9		06.19.2004	9.45	0.224816667	CU M/Min	1675.95	CU M
SP9		06.19.2004	9.5	0.001883333	CU M/Min	1677.13	CU M
SP9		06.19.2004	9.55	0.0014	CU M/Min	1678.69	CU M
SP9		06.19.2004	10	0.324466667	CU M/Min	1680.03	CU M
SP9		06.19.2004	10.05	0	CU M/Min	1681.58	CU M
SP9		06.19.2004	10.1	0.422616667	CU M/Min	1682.98	CU M
SP9		06.19.2004	10.15	0.016066667	CU M/Min	1684.55	CU M
SP9		06.19.2004	10.2	0.427066667	CU M/Min	1685.95	CU M
SP9		06.19.2004	10.25	0.432133333	CU M/Min	1687.52	CU M
SP9		06.19.2004	10.3	0.424833333	CU M/Min	1688.92	CU M
SP9		06.19.2004	10.35	0.352083333	CU M/Min	1690.48	CU M
SP9		06.19.2004	10.4	0.4323	CU M/Min	1691.89	CU M
SP9		06.19.2004	10.45	0.000833333	CU M/Min	1693.25	CU M
SP9		06.19.2004	10.5	0.149433333	CU M/Min	1693.96	CU M
SP9		06.19.2004	10.55	0.000333333	CU M/Min	1694.4	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.19.2004	11	0.149316667	CU M/Min	1694.99	CU M
SP9		06.19.2004	11.05	0	CU M/Min	1695.47	CU M
SP9		06.19.2004	11.1	0.150016667	CU M/Min	1696.02	CU M
SP9		06.19.2004	11.15	0.0008	CU M/Min	1696.53	CU M
SP9		06.19.2004	11.2	0.141916667	CU M/Min	1697.16	CU M
SP9		06.19.2004	11.25	0.20125	CU M/Min	1698.31	CU M
SP9		06.19.2004	11.3	0.150333333	CU M/Min	1699.47	CU M
SP9		06.19.2004	11.35	0.225466667	CU M/Min	1700.87	CU M
SP9		06.19.2004	11.4	0.151016667	CU M/Min	1702.3	CU M
SP9		06.19.2004	11.45	0.296783333	CU M/Min	1703.7	CU M
SP9		06.19.2004	11.5	0.150816667	CU M/Min	1705.32	CU M
SP9		06.19.2004	11.55	0.29645	CU M/Min	1706.95	CU M
SP9		06.19.2004	12	0.151916667	CU M/Min	1708.6	CU M
SP9		06.19.2004	12.05	0.300366667	CU M/Min	1710.5	CU M
SP9		06.19.2004	12.1	0.1502	CU M/Min	1712.14	CU M
SP9		06.19.2004	12.15	0.315483333	CU M/Min	1714.04	CU M
SP9		06.19.2004	12.2	0.1534	CU M/Min	1715.68	CU M
SP9		06.19.2004	12.25	0.295116667	CU M/Min	1717.58	CU M
SP9		06.19.2004	12.3	0.153866667	CU M/Min	1719.22	CU M
SP9		06.19.2004	12.35	0.299116667	CU M/Min	1721.12	CU M
SP9		06.19.2004	12.4	0.144933333	CU M/Min	1722.76	CU M
SP9		06.19.2004	12.45	0.290683333	CU M/Min	1724.6	CU M
SP9		06.19.2004	12.5	0.153483333	CU M/Min	1726.24	CU M
SP9		06.19.2004	12.55	0.3108	CU M/Min	1728.11	CU M
SP9		06.19.2004	13	0.1527	CU M/Min	1729.74	CU M
SP9		06.19.2004	13.05	0.294733333	CU M/Min	1731.6	CU M
SP9		06.19.2004	13.1	0.14475	CU M/Min	1733.23	CU M
SP9		06.19.2004	13.15	0.301733333	CU M/Min	1735.14	CU M
SP9		06.19.2004	13.2	0.153433333	CU M/Min	1736.78	CU M
SP9		06.19.2004	13.25	0.292083333	CU M/Min	1738.57	CU M
SP9		06.19.2004	13.3	0.153816667	CU M/Min	1740.2	CU M
SP9		06.19.2004	13.35	0.290766667	CU M/Min	1742.11	CU M
SP9		06.19.2004	13.4	0.15245	CU M/Min	1743.72	CU M
SP9		06.19.2004	13.45	0.2991	CU M/Min	1745.64	CU M
SP9		06.19.2004	13.5	0.05055	CU M/Min	1747.13	CU M
SP9		06.19.2004	13.55	0.0194	CU M/Min	1749.04	CU M
SP9		06.19.2004	14	0.00095	CU M/Min	1750.66	CU M
SP9		06.19.2004	14.05	0.016483333	CU M/Min	1752.58	CU M
SP9		06.19.2004	14.1	0.00275	CU M/Min	1754.19	CU M
SP9		06.19.2004	14.15	1.66667E-05	CU M/Min	1756.08	CU M
SP9		06.19.2004	14.2	0	CU M/Min	1757.71	CU M
SP9		06.19.2004	14.25	0.0034	CU M/Min	1759.62	CU M
SP9		06.19.2004	14.3	0.001366667	CU M/Min	1761.24	CU M
SP9		06.19.2004	14.35	0.003233333	CU M/Min	1763.17	CU M
SP9		06.19.2004	14.4	0.002916667	CU M/Min	1764.79	CU M
SP9		06.19.2004	14.45	0.000566667	CU M/Min	1766.68	CU M
SP9		06.19.2004	14.5	0	CU M/Min	1768.31	CU M
SP9		06.19.2004	14.55	0.4963	CU M/Min	1770.22	CU M
SP9		06.19.2004	15	0.402166667	CU M/Min	1771.85	CU M
SP9		06.19.2004	15.05	0.000233333	CU M/Min	1773.77	CU M
SP9		06.19.2004	15.1	0.493033333	CU M/Min	1775.39	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.19.2004	15.15	0.084233333	CU M/Min	1777.31	CU M
SP9		06.19.2004	15.2	0.48235	CU M/Min	1778.94	CU M
SP9		06.19.2004	15.25	0.50875	CU M/Min	1780.86	CU M
SP9		06.19.2004	15.3	0.4807	CU M/Min	1782.49	CU M
SP9		06.19.2004	15.35	0.506366667	CU M/Min	1784.39	CU M
SP9		06.19.2004	15.4	0	CU M/Min	1784.55	CU M
SP9		06.19.2004	15.45	0.000133333	CU M/Min	1784.55	CU M
SP9		06.19.2004	15.5	0	CU M/Min	1784.55	CU M
SP9		06.19.2004	15.55	0.000766667	CU M/Min	1784.55	CU M
SP9		06.19.2004	16	0.0005	CU M/Min	1784.55	CU M
SP9		06.19.2004	16.05	0	CU M/Min	1784.55	CU M
SP9		06.19.2004	16.1	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.15	0.00085	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.2	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.25	0.00055	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.3	0.0005	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.35	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.4	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.45	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.5	0.000433333	CU M/Min	1784.54	CU M
SP9		06.19.2004	16.55	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	17	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	17.05	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	17.1	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	17.15	0	CU M/Min	1784.54	CU M
SP9		06.19.2004	17.2	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	17.25	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	17.3	0.001116667	CU M/Min	1784.53	CU M
SP9		06.19.2004	17.35	1.66667E-05	CU M/Min	1784.53	CU M
SP9		06.19.2004	17.4	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	17.45	0.001566667	CU M/Min	1784.53	CU M
SP9		06.19.2004	17.5	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	17.55	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	18	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	18.05	0.000333333	CU M/Min	1784.53	CU M
SP9		06.19.2004	18.1	0.001	CU M/Min	1784.53	CU M
SP9		06.19.2004	18.15	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	18.2	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	18.25	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	18.3	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	18.35	0	CU M/Min	1784.53	CU M
SP9		06.19.2004	18.4	0	CU M/Min	1784.52	CU M
SP9		06.19.2004	18.45	0.501566667	CU M/Min	1785.88	CU M
SP9		06.19.2004	18.5	0.500016667	CU M/Min	1787.45	CU M
SP9		06.19.2004	18.55	0.5002	CU M/Min	1789.37	CU M
SP9		06.19.2004	19	0.494966667	CU M/Min	1791	CU M
SP9		06.19.2004	19.05	0.497	CU M/Min	1792.92	CU M
SP9		06.19.2004	19.1	0.505116667	CU M/Min	1794.5	CU M
SP9		06.19.2004	19.15	0.486383333	CU M/Min	1796.44	CU M
SP9		06.19.2004	19.2	0.485316667	CU M/Min	1798.06	CU M
SP9		06.19.2004	19.25	0.49805	CU M/Min	1799.98	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.19.2004	19.3	0.4975	CU M/Min	1801.61	CU M
SP9		06.19.2004	19.35	0.482716667	CU M/Min	1803.51	CU M
SP9		06.19.2004	19.4	0.486516667	CU M/Min	1805.13	CU M
SP9		06.19.2004	19.45	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	19.5	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	19.55	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.05	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.1	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.15	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.2	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.25	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.3	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.35	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.4	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.45	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.5	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	20.55	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	21	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	21.05	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	21.1	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	21.15	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	21.2	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	21.25	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.05	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.1	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.15	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.2	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.25	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.3	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.35	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.4	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.45	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.5	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	22.55	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	23	0	CU M/Min	1806.47	CU M
SP9		06.19.2004	23.05	0.503383333	CU M/Min	1807.84	CU M
SP9		06.19.2004	23.1	0.498033333	CU M/Min	1809.45	CU M
SP9		06.19.2004	23.15	0.5102	CU M/Min	1811.38	CU M
SP9		06.19.2004	23.2	0.49445	CU M/Min	1813	CU M
SP9		06.19.2004	23.25	0.50555	CU M/Min	1814.93	CU M
SP9		06.19.2004	23.3	0.5076	CU M/Min	1816.55	CU M
SP9		06.19.2004	23.35	0.505	CU M/Min	1818.48	CU M
SP9		06.19.2004	23.4	0.505	CU M/Min	1820.1	CU M
SP9		06.19.2004	23.45	0.483166667	CU M/Min	1822.03	CU M
SP9		06.19.2004	23.5	0.499616667	CU M/Min	1823.54	CU M
SP9		06.19.2004	23.55	0.504916667	CU M/Min	1825.47	CU M
SP9		06.20.2004	0	0.500133333	CU M/Min	1827.08	CU M
SP9		06.20.2004	0.05	0.496966667	CU M/Min	1829.01	CU M
SP9		06.20.2004	0.1	0.508133333	CU M/Min	1830.62	CU M
SP9		06.20.2004	0.15	0.50805	CU M/Min	1832.56	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.20.2004	0.2	0.49855	CU M/Min	1834.17	CU M
SP9		06.20.2004	0.25	0.489	CU M/Min	1836.1	CU M
SP9		06.20.2004	0.3	0.500833333	CU M/Min	1837.67	CU M
SP9		06.20.2004	0.35	0.520966667	CU M/Min	1839.62	CU M
SP9		06.20.2004	0.4	0.4956	CU M/Min	1841.24	CU M
SP9		06.20.2004	0.45	0.51385	CU M/Min	1843.17	CU M
SP9		06.20.2004	0.5	0.49825	CU M/Min	1844.79	CU M
SP9		06.20.2004	0.55	0.50505	CU M/Min	1846.71	CU M
SP9		06.20.2004	1	0.4991	CU M/Min	1847.88	CU M
SP9		06.20.2004	1.05	0.4991	CU M/Min	1849.76	CU M
SP9		06.20.2004	1.1	0.501966667	CU M/Min	1851.14	CU M
SP9		06.20.2004	1.15	0.496216667	CU M/Min	1853.08	CU M
SP9		06.20.2004	1.2	0.51005	CU M/Min	1854.36	CU M
SP9		06.20.2004	1.25	0.5039	CU M/Min	1856.14	CU M
SP9		06.20.2004	1.3	0.4999	CU M/Min	1857.31	CU M
SP9		06.20.2004	1.35	0.491683333	CU M/Min	1859.23	CU M
SP9		06.20.2004	1.4	0.506083333	CU M/Min	1860.79	CU M
SP9		06.20.2004	1.45	0.5137	CU M/Min	1862.72	CU M
SP9		06.20.2004	1.5	0.50565	CU M/Min	1864.34	CU M
SP9		06.20.2004	1.55	0.504883333	CU M/Min	1866.27	CU M
SP9		06.20.2004	2	0.497733333	CU M/Min	1867.65	CU M
SP9		06.20.2004	2.05	0.496633333	CU M/Min	1869.57	CU M
SP9		06.20.2004	2.1	0.1389	CU M/Min	1870.46	CU M
SP9		06.20.2004	2.15	0.153233333	CU M/Min	1870.78	CU M
SP9		06.20.2004	2.2	0.144766667	CU M/Min	1871.51	CU M
SP9		06.20.2004	2.25	0.504416667	CU M/Min	1872.09	CU M
SP9		06.20.2004	2.3	0.486333333	CU M/Min	1873.68	CU M
SP9		06.20.2004	2.35	0.507833333	CU M/Min	1875.57	CU M
SP9		06.20.2004	2.4	0.4927	CU M/Min	1877.19	CU M
SP9		06.20.2004	2.45	0.495866667	CU M/Min	1879.11	CU M
SP9		06.20.2004	2.5	0.491	CU M/Min	1880.72	CU M
SP9		06.20.2004	2.55	0.500933333	CU M/Min	1882.64	CU M
SP9		06.20.2004	3	0.499216667	CU M/Min	1884.26	CU M
SP9		06.20.2004	3.05	0.5012	CU M/Min	1886.18	CU M
SP9		06.20.2004	3.1	0.49555	CU M/Min	1887.8	CU M
SP9		06.20.2004	3.15	0.49495	CU M/Min	1889.46	CU M
SP9		06.20.2004	3.2	0.497583333	CU M/Min	1891.07	CU M
SP9		06.20.2004	3.25	0.5066	CU M/Min	1892.9	CU M
SP9		06.20.2004	3.3	0.496316667	CU M/Min	1894.51	CU M
SP9		06.20.2004	3.35	0.497366667	CU M/Min	1896.44	CU M
SP9		06.20.2004	3.4	0.490333333	CU M/Min	1898.06	CU M
SP9		06.20.2004	3.45	0.501983333	CU M/Min	1899.98	CU M
SP9		06.20.2004	3.5	0.496666667	CU M/Min	1901.6	CU M
SP9		06.20.2004	3.55	0.510783333	CU M/Min	1903.52	CU M
SP9		06.20.2004	4	0.48825	CU M/Min	1905.14	CU M
SP9		06.20.2004	4.05	0.313116667	CU M/Min	1906.7	CU M
SP9		06.20.2004	4.1	0.001933333	CU M/Min	1907.49	CU M
SP9		06.20.2004	4.15	0.305	CU M/Min	1908.9	CU M
SP9		06.20.2004	4.2	0	CU M/Min	1909.75	CU M
SP9		06.20.2004	4.25	0.297766667	CU M/Min	1910.81	CU M
SP9		06.20.2004	4.3	0	CU M/Min	1911.75	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9		06.20.2004	4.35	0.30275	CU M/Min	1913.02	CU M
SP9		06.20.2004	4.4	0.097316667	CU M/Min	1914.04	CU M
SP9		06.20.2004	4.45	0.295383333	CU M/Min	1915.23	CU M
SP9		06.20.2004	4.5	0.21905	CU M/Min	1916.28	CU M
SP9		06.20.2004	4.55	0.3057	CU M/Min	1917.44	CU M
SP9		06.20.2004	5	0.173566667	CU M/Min	1918.5	CU M
SP9		06.20.2004	5.05	0.296883333	CU M/Min	1919.64	CU M
SP9		06.20.2004	5.1	0.1271	CU M/Min	1920.74	CU M
SP9		06.20.2004	5.15	0.30045	CU M/Min	1921.84	CU M
SP9		06.20.2004	5.2	0	CU M/Min	1923.03	CU M
SP9		06.20.2004	5.25	0.296783333	CU M/Min	1924.05	CU M
SP9		06.20.2004	5.35	0.29705	CU M/Min	1926.26	CU M
SP9		06.20.2004	5.4	0.000383333	CU M/Min	1927.6	CU M
SP9		06.20.2004	5.45	0.299916667	CU M/Min	1928.45	CU M
SP9		06.20.2004	5.5	0	CU M/Min	1929.87	CU M
SP9		06.20.2004	5.55	0.299933333	CU M/Min	1930.64	CU M
SP9	Day 1	06.20.2004	6	0.279316667	CU M/Min	1932.13	CU M
SP9	Day 1	06.20.2004	6.05	0.293666667	CU M/Min	1932.83	CU M
SP9	Day 1	06.20.2004	6.1	0.274416667	CU M/Min	1934.33	CU M
SP9	Day 1	06.20.2004	6.15	0.306383333	CU M/Min	1935.02	CU M
SP9	Day 1	06.20.2004	6.2	0.291733333	CU M/Min	1936.52	CU M
SP9	Day 1	06.20.2004	6.25	0.311766667	CU M/Min	1937.2	CU M
SP9	Day 1	06.20.2004	6.3	0.295816667	CU M/Min	1938.7	CU M
SP9	Day 1	06.20.2004	6.35	0.307433333	CU M/Min	1939.39	CU M
SP9	Day 1	06.20.2004	6.4	0.296516667	CU M/Min	1940.89	CU M
SP9	Day 1	06.20.2004	6.45	0.3014	CU M/Min	1941.57	CU M
SP9	Day 1	06.20.2004	6.5	0.300783333	CU M/Min	1943.09	CU M
SP9	Day 1	06.20.2004	6.55	0.2991	CU M/Min	1943.77	CU M
SP9	Day 1	06.20.2004	7	0.306766667	CU M/Min	1945.28	CU M
SP9	Day 1	06.20.2004	7.05	0.2768	CU M/Min	1945.96	CU M
SP9	Day 1	06.20.2004	7.1	0.306033333	CU M/Min	1947.46	CU M
SP9	Day 1	06.20.2004	7.15	0.001566667	CU M/Min	1948.19	CU M
SP9	Day 1	06.20.2004	7.2	0.298583333	CU M/Min	1949.64	CU M
SP9	Day 1	06.20.2004	7.25	0.140866667	CU M/Min	1950.49	CU M
SP9	Day 1	06.20.2004	7.3	0.373916667	CU M/Min	1952.13	CU M
SP9	Day 1	06.20.2004	7.35	0.485666667	CU M/Min	1953.81	CU M
SP9	Day 1	06.20.2004	7.4	0.3746	CU M/Min	1955.58	CU M
SP9	Day 1	06.20.2004	7.45	0.48795	CU M/Min	1957.23	CU M
SP9	Day 1	06.20.2004	7.5	0.36715	CU M/Min	1958.89	CU M
SP9	Day 1	06.20.2004	7.55	0.488516667	CU M/Min	1960.43	CU M
SP9	Day 1	06.20.2004	8	0.36655	CU M/Min	1962.2	CU M
SP9	Day 1	06.20.2004	8.05	0.499633333	CU M/Min	1963.4	CU M
SP9	Day 1	06.20.2004	8.1	0.376933333	CU M/Min	1965.08	CU M
SP9	Day 1	06.20.2004	8.15	0.481483333	CU M/Min	1966.86	CU M
SP9	Day 1	06.20.2004	8.2	0.374416667	CU M/Min	1968.61	CU M
SP9	Day 1	06.20.2004	8.25	0.489616667	CU M/Min	1969.97	CU M
SP9	Day 1	06.20.2004	8.3	0.376166667	CU M/Min	1971.72	CU M
SP9	Day 1	06.20.2004	8.35	0.488883333	CU M/Min	1973.15	CU M
SP9	Day 1	06.20.2004	8.4	0.375833333	CU M/Min	1974.91	CU M
SP9	Day 1	06.20.2004	8.45	0.506783333	CU M/Min	1976.63	CU M
SP9	Day 1	06.20.2004	8.5	0.394833333	CU M/Min	1978.39	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 1	06.20.2004	8.55	0.4951	CU M/Min	1980.12	CU M
SP9	Day 1	06.20.2004	9	0.389066667	CU M/Min	1981.87	CU M
SP9	Day 1	06.20.2004	9.05	0.49365	CU M/Min	1983.6	CU M
SP9	Day 1	06.20.2004	9.1	0.39555	CU M/Min	1985.35	CU M
SP9	Day 1	06.20.2004	9.15	0.49785	CU M/Min	1987.12	CU M
SP9	Day 1	06.20.2004	9.2	0.408266667	CU M/Min	1988.87	CU M
SP9	Day 1	06.20.2004	9.25	0.495833333	CU M/Min	1990.42	CU M
SP9	Day 1	06.20.2004	9.3	0.40845	CU M/Min	1992.16	CU M
SP9	Day 1	06.20.2004	9.35	0.489516667	CU M/Min	1993.94	CU M
SP9	Day 1	06.20.2004	9.4	0.407116667	CU M/Min	1995.69	CU M
SP9	Day 1	06.20.2004	9.45	0.478183333	CU M/Min	1997.13	CU M
SP9	Day 1	06.20.2004	9.5	0.403683333	CU M/Min	1998.87	CU M
SP9	Day 1	06.20.2004	9.55	0.484783333	CU M/Min	2000.47	CU M
SP9	Day 1	06.20.2004	10	0.412616667	CU M/Min	2002.18	CU M
SP9	Day 1	06.20.2004	10.05	0.49885	CU M/Min	2003.93	CU M
SP9	Day 1	06.20.2004	10.1	0.412283333	CU M/Min	2005.66	CU M
SP9	Day 1	06.20.2004	10.15	0.500033333	CU M/Min	2007.47	CU M
SP9	Day 1	06.20.2004	10.2	0.420716667	CU M/Min	2009.2	CU M
SP9	Day 1	06.20.2004	10.25	0.499666667	CU M/Min	2011.01	CU M
SP9	Day 1	06.20.2004	10.3	0.423866667	CU M/Min	2012.74	CU M
SP9	Day 1	06.20.2004	10.35	0.493583333	CU M/Min	2014.55	CU M
SP9	Day 1	06.20.2004	10.4	0.44005	CU M/Min	2016.28	CU M
SP9	Day 1	06.20.2004	10.45	0.498216667	CU M/Min	2017.94	CU M
SP9	Day 1	06.20.2004	10.5	0.431583333	CU M/Min	2019.66	CU M
SP9	Day 1	06.20.2004	10.55	0.492533333	CU M/Min	2021.47	CU M
SP9	Day 1	06.20.2004	11	0.430683333	CU M/Min	2023.19	CU M
SP9	Day 1	06.20.2004	11.05	0.49645	CU M/Min	2024.97	CU M
SP9	Day 1	06.20.2004	11.1	0.439033333	CU M/Min	2026.69	CU M
SP9	Day 1	06.20.2004	11.15	0.494916667	CU M/Min	2028.49	CU M
SP9	Day 1	06.20.2004	11.2	0.442166667	CU M/Min	2030.2	CU M
SP9	Day 1	06.20.2004	11.25	0.489116667	CU M/Min	2032.03	CU M
SP9	Day 1	06.20.2004	11.3	0.431166667	CU M/Min	2033.74	CU M
SP9	Day 1	06.20.2004	11.35	0.500716667	CU M/Min	2035.57	CU M
SP9	Day 1	06.20.2004	11.4	0.443966667	CU M/Min	2037.28	CU M
SP9	Day 1	06.20.2004	11.45	0.501716667	CU M/Min	2039.11	CU M
SP9	Day 1	06.20.2004	11.5	0.445666667	CU M/Min	2040.82	CU M
SP9	Day 1	06.20.2004	11.55	0.5053	CU M/Min	2042.65	CU M
SP9	Day 1	06.20.2004	12	0.442016667	CU M/Min	2044.36	CU M
SP9	Day 1	06.20.2004	12.05	0.49705	CU M/Min	2046.2	CU M
SP9	Day 1	06.20.2004	12.1	0.447683333	CU M/Min	2047.91	CU M
SP9	Day 1	06.20.2004	12.15	0.4979	CU M/Min	2049.74	CU M
SP9	Day 1	06.20.2004	12.2	0.444083333	CU M/Min	2051.45	CU M
SP9	Day 1	06.20.2004	12.25	0.500966667	CU M/Min	2053.24	CU M
SP9	Day 1	06.20.2004	12.3	0.4557	CU M/Min	2054.94	CU M
SP9	Day 1	06.20.2004	12.35	0.149083333	CU M/Min	2056.78	CU M
SP9	Day 1	06.20.2004	12.4	0.119383333	CU M/Min	2058.49	CU M
SP9	Day 1	06.20.2004	12.45	0.03905	CU M/Min	2060.31	CU M
SP9	Day 1	06.20.2004	12.5	0.02685	CU M/Min	2062.02	CU M
SP9	Day 1	06.20.2004	12.55	0.0083	CU M/Min	2063.84	CU M
SP9	Day 1	06.20.2004	13	0.006666667	CU M/Min	2065.55	CU M
SP9	Day 1	06.20.2004	13.05	0.006233333	CU M/Min	2067.37	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 1	06.20.2004	13.1	0.005816667	CU M/Min	2069.08	CU M
SP9	Day 1	06.20.2004	13.15	0.007316667	CU M/Min	2070.9	CU M
SP9	Day 1	06.20.2004	13.2	0	CU M/Min	2072.61	CU M
SP9	Day 1	06.20.2004	13.25	0	CU M/Min	2074.41	CU M
SP9	Day 1	06.20.2004	13.3	0.0037	CU M/Min	2076.11	CU M
SP9	Day 1	06.20.2004	13.35	0	CU M/Min	2077.91	CU M
SP9	Day 1	06.20.2004	13.4	0.006833333	CU M/Min	2079.62	CU M
SP9	Day 1	06.20.2004	13.45	0	CU M/Min	2081.41	CU M
SP9	Day 1	06.20.2004	13.5	0	CU M/Min	2083.12	CU M
SP9	Day 1	06.20.2004	13.55	0.001933333	CU M/Min	2084.92	CU M
SP9	Day 1	06.20.2004	14	0.000216667	CU M/Min	2086.62	CU M
SP9	Day 1	06.20.2004	14.05	0	CU M/Min	2088.44	CU M
SP9	Day 1	06.20.2004	14.1	0	CU M/Min	2090.15	CU M
SP9	Day 1	06.20.2004	14.15	0.006566667	CU M/Min	2091.97	CU M
SP9	Day 1	06.20.2004	14.2	0	CU M/Min	2093.68	CU M
SP9	Day 1	06.20.2004	14.25	0	CU M/Min	2095.49	CU M
SP9	Day 1	06.20.2004	14.3	0	CU M/Min	2097.17	CU M
SP9	Day 1	06.20.2004	14.35	0.13	CU M/Min	2098.99	CU M
SP9	Day 1	06.20.2004	14.4	0.020366667	CU M/Min	2100.63	CU M
SP9	Day 1	06.20.2004	14.45	0.273583333	CU M/Min	2102.42	CU M
SP9	Day 1	06.20.2004	14.5	0.116716667	CU M/Min	2104.05	CU M
SP9	Day 1	06.20.2004	14.55	0.302033333	CU M/Min	2105.94	CU M
SP9	Day 1	06.20.2004	15	0.142533333	CU M/Min	2107.63	CU M
SP9	Day 1	06.20.2004	15.05	0.308283333	CU M/Min	2109.46	CU M
SP9	Day 1	06.20.2004	15.1	0.151716667	CU M/Min	2111.11	CU M
SP9	Day 1	06.20.2004	15.15	0.30085	CU M/Min	2112.94	CU M
SP9	Day 1	06.20.2004	15.2	0.154083333	CU M/Min	2114.64	CU M
SP9	Day 1	06.20.2004	15.25	0.30885	CU M/Min	2116.46	CU M
SP9	Day 1	06.20.2004	15.3	0.145316667	CU M/Min	2118.17	CU M
SP9	Day 1	06.20.2004	15.35	0.310833333	CU M/Min	2120	CU M
SP9	Day 1	06.20.2004	15.4	0.154566667	CU M/Min	2121.7	CU M
SP9	Day 1	06.20.2004	15.45	0.300966667	CU M/Min	2123.53	CU M
SP9	Day 1	06.20.2004	15.5	0.146466667	CU M/Min	2125.23	CU M
SP9	Day 1	06.20.2004	15.55	0.307433333	CU M/Min	2126.97	CU M
SP9	Day 1	06.20.2004	16	0.148083333	CU M/Min	2128.67	CU M
SP9	Day 1	06.20.2004	16.05	0.307916667	CU M/Min	2130.44	CU M
SP9	Day 1	06.20.2004	16.1	0.14075	CU M/Min	2132.13	CU M
SP9	Day 1	06.20.2004	16.15	0.299466667	CU M/Min	2133.89	CU M
SP9	Day 1	06.20.2004	16.2	0.140816667	CU M/Min	2135.58	CU M
SP9	Day 1	06.20.2004	16.25	0.295783333	CU M/Min	2137.37	CU M
SP9	Day 1	06.20.2004	16.3	0.147066667	CU M/Min	2139.06	CU M
SP9	Day 1	06.20.2004	16.35	0.3027	CU M/Min	2140.82	CU M
SP9	Day 1	06.20.2004	16.4	0.1516	CU M/Min	2142.5	CU M
SP9	Day 1	06.20.2004	16.45	0.300616667	CU M/Min	2144.31	CU M
SP9	Day 1	06.20.2004	16.5	0.147166667	CU M/Min	2145.99	CU M
SP9	Day 1	06.20.2004	16.55	0.29685	CU M/Min	2147.84	CU M
SP9	Day 1	06.20.2004	17	0.1444	CU M/Min	2149.52	CU M
SP9	Day 1	06.20.2004	17.05	0.293033333	CU M/Min	2151.38	CU M
SP9	Day 1	06.20.2004	17.1	0.147666667	CU M/Min	2153.05	CU M
SP9	Day 1	06.20.2004	17.15	0.025416667	CU M/Min	2154.9	CU M
SP9	Day 1	06.20.2004	17.2	0.151616667	CU M/Min	2156.57	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 1	06.20.2004	17.25	0.000733333	CU M/Min	2158.43	CU M
SP9	Day 1	06.20.2004	17.3	0.14635	CU M/Min	2160.1	CU M
SP9	Day 1	06.20.2004	17.35	0.0018	CU M/Min	2161.96	CU M
SP9	Day 1	06.20.2004	17.4	0.154483333	CU M/Min	2163.64	CU M
SP9	Day 1	06.20.2004	17.45	0.000433333	CU M/Min	2165.5	CU M
SP9	Day 1	06.20.2004	17.5	0.15605	CU M/Min	2167.18	CU M
SP9	Day 1	06.20.2004	17.55	0.000133333	CU M/Min	2169.04	CU M
SP9	Day 1	06.20.2004	18	0.149333333	CU M/Min	2170.72	CU M
SP9	Day 1	06.20.2004	18.05	0.002183333	CU M/Min	2172.57	CU M
SP9	Day 1	06.20.2004	18.1	0.151516667	CU M/Min	2174.25	CU M
SP9	Day 1	06.20.2004	18.35	0.000333333	CU M/Min	2183.17	CU M
SP9	Day 1	06.20.2004	18.4	0.14815	CU M/Min	2184.84	CU M
SP9	Day 1	06.20.2004	18.45	0.156816667	CU M/Min	2186.69	CU M
SP9	Day 1	06.20.2004	18.5	0.146183333	CU M/Min	2188.37	CU M
SP9	Day 1	06.20.2004	18.55	0.444	CU M/Min	2190.22	CU M
SP9	Day 1	06.20.2004	19	0.146833333	CU M/Min	2191.9	CU M
SP9	Day 1	06.20.2004	19.05	0.50315	CU M/Min	2193.75	CU M
SP9	Day 1	06.20.2004	19.1	0.153233333	CU M/Min	2195.42	CU M
SP9	Day 1	06.20.2004	19.15	0.501683333	CU M/Min	2197.26	CU M
SP9	Day 1	06.20.2004	19.2	0.144533333	CU M/Min	2198.92	CU M
SP9	Day 1	06.20.2004	19.25	0.495983333	CU M/Min	2200.76	CU M
SP9	Day 1	06.20.2004	19.3	0.055483333	CU M/Min	2202.42	CU M
SP9	Day 1	06.20.2004	19.35	0.508683333	CU M/Min	2204.28	CU M
SP9	Day 1	06.20.2004	19.4	0.017766667	CU M/Min	2205.94	CU M
SP9	Day 1	06.20.2004	19.45	0.5053	CU M/Min	2207.8	CU M
SP9	Day 1	06.20.2004	19.5	0.00315	CU M/Min	2209.45	CU M
SP9	Day 1	06.20.2004	19.55	0.505933333	CU M/Min	2211.34	CU M
SP9	Day 1	06.20.2004	20	0.0078	CU M/Min	2212.97	CU M
SP9	Day 1	06.20.2004	20.05	0.50495	CU M/Min	2214.87	CU M
SP9	Day 1	06.20.2004	20.1	0.000566667	CU M/Min	2216.5	CU M
SP9	Day 1	06.20.2004	20.15	0.50735	CU M/Min	2218.4	CU M
SP9	Day 1	06.20.2004	20.2	0.003183333	CU M/Min	2220.03	CU M
SP9	Day 1	06.20.2004	20.25	0.502616667	CU M/Min	2221.93	CU M
SP9	Day 1	06.20.2004	20.3	0	CU M/Min	2223.57	CU M
SP9	Day 1	06.20.2004	20.35	0.49975	CU M/Min	2225.47	CU M
SP9	Day 1	06.20.2004	20.4	0.004633333	CU M/Min	2227.09	CU M
SP9	Day 1	06.20.2004	20.45	0.49915	CU M/Min	2229.01	CU M
SP9	Day 1	06.20.2004	20.5	0.00035	CU M/Min	2230.63	CU M
SP9	Day 1	06.20.2004	20.55	0.488	CU M/Min	2232.54	CU M
SP9	Day 1	06.20.2004	21	0	CU M/Min	2234.15	CU M
SP9	Day 1	06.20.2004	21.05	0.50165	CU M/Min	2236.08	CU M
SP9	Day 1	06.20.2004	21.1	0	CU M/Min	2237.67	CU M
SP9	Day 1	06.20.2004	21.15	0.497816667	CU M/Min	2239.61	CU M
SP9	Day 1	06.20.2004	21.2	0.004083333	CU M/Min	2241.21	CU M
SP9	Day 1	06.20.2004	21.25	0.496966667	CU M/Min	2243.15	CU M
SP9	Day 1	06.20.2004	21.3	0.4766	CU M/Min	2244.74	CU M
SP9	Day 1	06.20.2004	21.35	0.503766667	CU M/Min	2246.68	CU M
SP9	Day 1	06.20.2004	21.4	0.488483333	CU M/Min	2248.27	CU M
SP9	Day 1	06.20.2004	21.45	0.492466667	CU M/Min	2250.21	CU M
SP9	Day 1	06.20.2004	21.5	0.4988	CU M/Min	2251.8	CU M
SP9	Day 1	06.20.2004	21.55	0.5031	CU M/Min	2253.74	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 1	06.20.2004	22	0.488083333	CU M/Min	2255.33	CU M
SP9	Day 1	06.20.2004	22.05	0.4955	CU M/Min	2257.27	CU M
SP9	Day 1	06.20.2004	22.1	0.493133333	CU M/Min	2258.86	CU M
SP9	Day 1	06.20.2004	22.15	0.4981	CU M/Min	2260.81	CU M
SP9	Day 1	06.20.2004	22.2	0.485583333	CU M/Min	2262.4	CU M
SP9	Day 1	06.20.2004	22.25	0.510583333	CU M/Min	2264.34	CU M
SP9	Day 1	06.20.2004	22.3	0.486833333	CU M/Min	2265.93	CU M
SP9	Day 1	06.20.2004	22.35	0.5126	CU M/Min	2267.87	CU M
SP9	Day 1	06.20.2004	22.4	0.49895	CU M/Min	2269.46	CU M
SP9	Day 1	06.20.2004	22.45	0.499633333	CU M/Min	2271.41	CU M
SP9	Day 1	06.20.2004	22.5	0.48835	CU M/Min	2273	CU M
SP9	Day 1	06.20.2004	22.55	0.5116	CU M/Min	2274.95	CU M
SP9	Day 1	06.20.2004	23	0.495983333	CU M/Min	2276.54	CU M
SP9	Day 1	06.20.2004	23.05	0.5044	CU M/Min	2278.48	CU M
SP9	Day 1	06.20.2004	23.1	0.496016667	CU M/Min	2280.08	CU M
SP9	Day 1	06.20.2004	23.15	0.5037	CU M/Min	2282.02	CU M
SP9	Day 1	06.20.2004	23.2	0.497266667	CU M/Min	2283.61	CU M
SP9	Day 1	06.20.2004	23.25	0.5045	CU M/Min	2285.56	CU M
SP9	Day 1	06.20.2004	23.3	0.483	CU M/Min	2287.15	CU M
SP9	Day 1	06.20.2004	23.35	0.49865	CU M/Min	2289.09	CU M
SP9	Day 1	06.20.2004	23.4	0.481516667	CU M/Min	2290.68	CU M
SP9	Day 1	06.20.2004	23.45	0.5144	CU M/Min	2292.57	CU M
SP9	Day 1	06.20.2004	23.5	0.503316667	CU M/Min	2294.17	CU M
SP9	Day 1	06.20.2004	23.55	0.50695	CU M/Min	2296.11	CU M
SP9	Day 1	06.21.2004	0	0.49485	CU M/Min	2297.7	CU M
SP9	Day 1	06.21.2004	0.05	0.5046	CU M/Min	2299.65	CU M
SP9	Day 1	06.21.2004	0.1	0.50095	CU M/Min	2301.24	CU M
SP9	Day 1	06.21.2004	0.15	0.4996	CU M/Min	2303.14	CU M
SP9	Day 1	06.21.2004	0.2	0.506033333	CU M/Min	2304.74	CU M
SP9	Day 1	06.21.2004	0.25	0.492633333	CU M/Min	2306.69	CU M
SP9	Day 1	06.21.2004	0.3	0.490916667	CU M/Min	2308.27	CU M
SP9	Day 1	06.21.2004	0.35	0.5009	CU M/Min	2310.22	CU M
SP9	Day 1	06.21.2004	0.4	0.8019	CU M/Min	2311.82	CU M
SP9	Day 1	06.21.2004	0.45	0.509233333	CU M/Min	2313.77	CU M
SP9	Day 1	06.21.2004	0.5	0.498433333	CU M/Min	2315.32	CU M
SP9	Day 1	06.21.2004	0.55	0.49595	CU M/Min	2317.26	CU M
SP9	Day 1	06.21.2004	1	0.497133333	CU M/Min	2318.86	CU M
SP9	Day 1	06.21.2004	1.05	0.49195	CU M/Min	2320.8	CU M
SP9	Day 1	06.21.2004	1.1	0.49085	CU M/Min	2322.4	CU M
SP9	Day 1	06.21.2004	1.15	0.504816667	CU M/Min	2324.34	CU M
SP9	Day 1	06.21.2004	1.2	0.498583333	CU M/Min	2325.91	CU M
SP9	Day 1	06.21.2004	1.25	0.504283333	CU M/Min	2327.82	CU M
SP9	Day 1	06.21.2004	1.3	0.492833333	CU M/Min	2329.42	CU M
SP9	Day 1	06.21.2004	1.35	0.50655	CU M/Min	2331.35	CU M
SP9	Day 1	06.21.2004	1.4	0.49615	CU M/Min	2332.94	CU M
SP9	Day 1	06.21.2004	1.45	0.50145	CU M/Min	2334.9	CU M
SP9	Day 1	06.21.2004	1.5	0.49365	CU M/Min	2336.48	CU M
SP9	Day 1	06.21.2004	1.55	0.50095	CU M/Min	2338.43	CU M
SP9	Day 1	06.21.2004	2	0.495216667	CU M/Min	2340.02	CU M
SP9	Day 1	06.21.2004	2.05	0.500583333	CU M/Min	2341.98	CU M
SP9	Day 1	06.21.2004	2.1	0.146916667	CU M/Min	2343.19	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 1	06.21.2004	2.15	0	CU M/Min	2343.55	CU M
SP9	Day 1	06.21.2004	2.2	0.147133333	CU M/Min	2343.71	CU M
SP9	Day 1	06.21.2004	2.25	0	CU M/Min	2344.11	CU M
SP9	Day 1	06.21.2004	2.3	0.145783333	CU M/Min	2344.62	CU M
SP9	Day 1	06.21.2004	2.35	0.000883333	CU M/Min	2345.06	CU M
SP9	Day 1	06.21.2004	2.4	0.146033333	CU M/Min	2345.44	CU M
SP9	Day 1	06.21.2004	2.45	0	CU M/Min	2345.91	CU M
SP9	Day 1	06.21.2004	2.5	0.148366667	CU M/Min	2346.26	CU M
SP9	Day 1	06.21.2004	2.55	0.004866667	CU M/Min	2346.77	CU M
SP9	Day 1	06.21.2004	3	0.145283333	CU M/Min	2347.07	CU M
SP9	Day 1	06.21.2004	3.05	0.1667	CU M/Min	2347.6	CU M
SP9	Day 1	06.21.2004	3.1	0.473416667	CU M/Min	2348.91	CU M
SP9	Day 1	06.21.2004	3.15	0.46065	CU M/Min	2350.91	CU M
SP9	Day 1	06.21.2004	3.2	0.3948	CU M/Min	2352.53	CU M
SP9	Day 1	06.21.2004	3.25	0.494816667	CU M/Min	2354.32	CU M
SP9	Day 1	06.21.2004	3.3	0.405083333	CU M/Min	2356.05	CU M
SP9	Day 1	06.21.2004	3.35	0.5057	CU M/Min	2357.85	CU M
SP9	Day 1	06.21.2004	3.4	0.416316667	CU M/Min	2359.57	CU M
SP9	Day 1	06.21.2004	3.45	0.494066667	CU M/Min	2361.37	CU M
SP9	Day 1	06.21.2004	3.5	0.000183333	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	3.55	0.00045	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4	0	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.05	0	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.1	0	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.15	0	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.2	0.000483333	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.25	0.000266667	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.3	0	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.35	0.001483333	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.4	0.0017	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.45	0.000416667	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.5	0	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	4.55	0	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	5	0	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	5.05	-0.000316667	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	5.1	0.000683333	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	5.15	0.000633333	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	5.2	0.00065	CU M/Min	2361.55	CU M
SP9	Day 1	06.21.2004	5.25	-0.00085	CU M/Min	2361.54	CU M
SP9	Day 1	06.21.2004	5.3	-0.000383333	CU M/Min	2361.54	CU M
SP9	Day 1	06.21.2004	5.35	-0.000616667	CU M/Min	2361.54	CU M
SP9	Day 1	06.21.2004	5.4	0.000966667	CU M/Min	2361.54	CU M
SP9	Day 1	06.21.2004	5.45	0.0001	CU M/Min	2361.54	CU M
SP9	Day 1	06.21.2004	5.5	0.000533333	CU M/Min	2361.54	CU M
SP9	Day 2	06.21.2004	6.05	0	CU M/Min	2361.54	CU M
SP9	Day 2	06.21.2004	6.1	0	CU M/Min	2361.54	CU M
SP9	Day 2	06.21.2004	6.15	0	CU M/Min	2361.53	CU M
SP9	Day 2	06.21.2004	6.2	0	CU M/Min	2361.53	CU M
SP9	Day 2	06.21.2004	6.25	0	CU M/Min	2361.53	CU M
SP9	Day 2	06.21.2004	6.3	0	CU M/Min	2361.53	CU M
SP9	Day 2	06.21.2004	6.35	0	CU M/Min	2361.53	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 2	06.21.2004	6.4	0	CU M/Min	2361.53	CU M
SP9	Day 2	06.21.2004	6.45	0	CU M/Min	2361.52	CU M
SP9	Day 2	06.21.2004	6.5	0	CU M/Min	2361.52	CU M
SP9	Day 2	06.21.2004	6.55	0	CU M/Min	2361.52	CU M
SP9	Day 2	06.21.2004	7	0	CU M/Min	2361.52	CU M
SP9	Day 2	06.21.2004	7.05	0	CU M/Min	2361.52	CU M
SP9	Day 2	06.21.2004	7.1	0	CU M/Min	2361.52	CU M
SP9	Day 2	06.21.2004	7.15	0.000383333	CU M/Min	2361.51	CU M
SP9	Day 2	06.21.2004	7.2	0	CU M/Min	2361.51	CU M
SP9	Day 2	06.21.2004	7.25	0.0002	CU M/Min	2361.51	CU M
SP9	Day 2	06.21.2004	7.3	0	CU M/Min	2361.51	CU M
SP9	Day 2	06.21.2004	7.35	0	CU M/Min	2361.5	CU M
SP9	Day 2	06.21.2004	7.4	0	CU M/Min	2361.5	CU M
SP9	Day 2	06.21.2004	7.45	0	CU M/Min	2361.5	CU M
SP9	Day 2	06.21.2004	7.5	0	CU M/Min	2361.5	CU M
SP9	Day 2	06.21.2004	7.55	0	CU M/Min	2361.49	CU M
SP9	Day 2	06.21.2004	8	0	CU M/Min	2361.49	CU M
SP9	Day 2	06.21.2004	8.05	0	CU M/Min	2361.49	CU M
SP9	Day 2	06.21.2004	8.1	0	CU M/Min	2361.48	CU M
SP9	Day 2	06.21.2004	8.15	0.295266667	CU M/Min	2362.41	CU M
SP9	Day 2	06.21.2004	8.2	0.142916667	CU M/Min	2364.29	CU M
SP9	Day 2	06.21.2004	8.25	0.299383333	CU M/Min	2365.9	CU M
SP9	Day 2	06.21.2004	8.3	0.148883333	CU M/Min	2367.67	CU M
SP9	Day 2	06.21.2004	8.35	0.29375	CU M/Min	2369.28	CU M
SP9	Day 2	06.21.2004	8.4	0.147	CU M/Min	2371.15	CU M
SP9	Day 2	06.21.2004	8.45	0.286166667	CU M/Min	2372.77	CU M
SP9	Day 2	06.21.2004	8.5	0.150883333	CU M/Min	2374.63	CU M
SP9	Day 2	06.21.2004	8.55	0.297466667	CU M/Min	2376.26	CU M
SP9	Day 2	06.21.2004	9	0.146783333	CU M/Min	2378.12	CU M
SP9	Day 2	06.21.2004	9.05	0.292583333	CU M/Min	2379.74	CU M
SP9	Day 2	06.21.2004	9.1	0.146633333	CU M/Min	2381.61	CU M
SP9	Day 2	06.21.2004	9.15	0.292	CU M/Min	2383.23	CU M
SP9	Day 2	06.21.2004	9.2	0.14285	CU M/Min	2385.09	CU M
SP9	Day 2	06.21.2004	9.25	0.28875	CU M/Min	2386.72	CU M
SP9	Day 2	06.21.2004	9.3	0.148366667	CU M/Min	2388.56	CU M
SP9	Day 2	06.21.2004	9.35	0.300283333	CU M/Min	2390.21	CU M
SP9	Day 2	06.21.2004	9.4	0.142883333	CU M/Min	2392.05	CU M
SP9	Day 2	06.21.2004	9.45	0.301383333	CU M/Min	2393.7	CU M
SP9	Day 2	06.21.2004	9.5	0.146033333	CU M/Min	2395.53	CU M
SP9	Day 2	06.21.2004	9.55	0.293566667	CU M/Min	2397.17	CU M
SP9	Day 2	06.21.2004	10	0.1451	CU M/Min	2399	CU M
SP9	Day 2	06.21.2004	10.05	0.291516667	CU M/Min	2400.65	CU M
SP9	Day 2	06.21.2004	10.1	0.1453	CU M/Min	2402.49	CU M
SP9	Day 2	06.21.2004	10.15	0.30185	CU M/Min	2404.14	CU M
SP9	Day 2	06.21.2004	10.2	0.151616667	CU M/Min	2405.98	CU M
SP9	Day 2	06.21.2004	10.25	0.294816667	CU M/Min	2407.63	CU M
SP9	Day 2	06.21.2004	10.3	0.1491	CU M/Min	2409.47	CU M
SP9	Day 2	06.21.2004	10.35	0.285883333	CU M/Min	2411.12	CU M
SP9	Day 2	06.21.2004	10.4	0.139083333	CU M/Min	2412.96	CU M
SP9	Day 2	06.21.2004	10.45	0.292183333	CU M/Min	2414.61	CU M
SP9	Day 2	06.21.2004	10.5	0.143616667	CU M/Min	2416.45	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 2	06.21.2004	10.55	0.3016	CU M/Min	2418.09	CU M
SP9	Day 2	06.21.2004	11	0.143866667	CU M/Min	2419.93	CU M
SP9	Day 2	06.21.2004	11.05	0.293116667	CU M/Min	2421.59	CU M
SP9	Day 2	06.21.2004	11.1	0.146366667	CU M/Min	2423.42	CU M
SP9	Day 2	06.21.2004	11.15	0.304466667	CU M/Min	2425.07	CU M
SP9	Day 2	06.21.2004	11.2	0.140566667	CU M/Min	2426.9	CU M
SP9	Day 2	06.21.2004	11.25	0.292433333	CU M/Min	2428.55	CU M
SP9	Day 2	06.21.2004	11.3	0.145166667	CU M/Min	2430.38	CU M
SP9	Day 2	06.21.2004	11.35	0.299883333	CU M/Min	2432.04	CU M
SP9	Day 2	06.21.2004	11.4	0.139683333	CU M/Min	2433.87	CU M
SP9	Day 2	06.21.2004	11.45	0.283883333	CU M/Min	2435.53	CU M
SP9	Day 2	06.21.2004	11.5	0.148566667	CU M/Min	2437.35	CU M
SP9	Day 2	06.21.2004	11.55	0.293766667	CU M/Min	2439.02	CU M
SP9	Day 2	06.21.2004	12	0.142333333	CU M/Min	2440.83	CU M
SP9	Day 2	06.21.2004	12.05	0.294866667	CU M/Min	2442.47	CU M
SP9	Day 2	06.21.2004	12.1	0.149516667	CU M/Min	2444.27	CU M
SP9	Day 2	06.21.2004	12.15	0.2976	CU M/Min	2445.96	CU M
SP9	Day 2	06.21.2004	12.2	0.149566667	CU M/Min	2447.76	CU M
SP9	Day 2	06.21.2004	12.25	0.295783333	CU M/Min	2449.45	CU M
SP9	Day 2	06.21.2004	12.3	0.146383333	CU M/Min	2451.17	CU M
SP9	Day 2	06.21.2004	12.35	0.286616667	CU M/Min	2452.87	CU M
SP9	Day 2	06.21.2004	12.4	0.1453	CU M/Min	2454.66	CU M
SP9	Day 2	06.21.2004	12.45	0.287766667	CU M/Min	2456.28	CU M
SP9	Day 2	06.21.2004	12.5	0.141516667	CU M/Min	2458.08	CU M
SP9	Day 2	06.21.2004	12.55	0.302816667	CU M/Min	2459.77	CU M
SP9	Day 2	06.21.2004	13	0.14335	CU M/Min	2461.45	CU M
SP9	Day 2	06.21.2004	13.05	0.300083333	CU M/Min	2463.15	CU M
SP9	Day 2	06.21.2004	13.1	0.139533333	CU M/Min	2464.93	CU M
SP9	Day 2	06.21.2004	13.15	0.286916667	CU M/Min	2466.62	CU M
SP9	Day 2	06.21.2004	13.2	0.142333333	CU M/Min	2468.41	CU M
SP9	Day 2	06.21.2004	13.25	0.297383333	CU M/Min	2470.1	CU M
SP9	Day 2	06.21.2004	13.3	0.138533333	CU M/Min	2471.88	CU M
SP9	Day 2	06.21.2004	13.35	0.28565	CU M/Min	2473.56	CU M
SP9	Day 2	06.21.2004	13.4	0.137983333	CU M/Min	2475.35	CU M
SP9	Day 2	06.21.2004	13.45	0.298833333	CU M/Min	2477.03	CU M
SP9	Day 2	06.21.2004	13.5	0.1393	CU M/Min	2478.81	CU M
SP9	Day 2	06.21.2004	13.55	0.288733333	CU M/Min	2480.5	CU M
SP9	Day 2	06.21.2004	14	0.147066667	CU M/Min	2482.28	CU M
SP9	Day 2	06.21.2004	14.05	0.29035	CU M/Min	2483.97	CU M
SP9	Day 2	06.21.2004	14.1	0.143233333	CU M/Min	2485.75	CU M
SP9	Day 2	06.21.2004	14.15	0.299	CU M/Min	2487.44	CU M
SP9	Day 2	06.21.2004	14.2	0.147183333	CU M/Min	2489.21	CU M
SP9	Day 2	06.21.2004	14.25	0.295533333	CU M/Min	2490.9	CU M
SP9	Day 2	06.21.2004	14.3	0.152616667	CU M/Min	2492.67	CU M
SP9	Day 2	06.21.2004	14.35	0.308266667	CU M/Min	2494.37	CU M
SP9	Day 2	06.21.2004	14.4	0.15435	CU M/Min	2496.13	CU M
SP9	Day 2	06.21.2004	14.45	0.29035	CU M/Min	2497.83	CU M
SP9	Day 2	06.21.2004	14.5	0.1444	CU M/Min	2499.59	CU M
SP9	Day 2	06.21.2004	14.55	0.297166667	CU M/Min	2501.27	CU M
SP9	Day 2	06.21.2004	15	0.137566667	CU M/Min	2503.03	CU M
SP9	Day 2	06.21.2004	15.05	0.290766667	CU M/Min	2504.74	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 2	06.21.2004	15.1	0.1477	CU M/Min	2506.44	CU M
SP9	Day 2	06.21.2004	15.15	0.28855	CU M/Min	2508.15	CU M
SP9	Day 2	06.21.2004	15.2	0.134566667	CU M/Min	2509.9	CU M
SP9	Day 2	06.21.2004	15.25	0.299083333	CU M/Min	2511.61	CU M
SP9	Day 2	06.21.2004	15.3	0.148316667	CU M/Min	2513.36	CU M
SP9	Day 2	06.21.2004	15.35	0.2925	CU M/Min	2515.07	CU M
SP9	Day 2	06.21.2004	15.4	0.140316667	CU M/Min	2516.81	CU M
SP9	Day 2	06.21.2004	15.45	0.299733333	CU M/Min	2518.52	CU M
SP9	Day 2	06.21.2004	15.5	0.151483333	CU M/Min	2520.25	CU M
SP9	Day 2	06.21.2004	15.55	0.289433333	CU M/Min	2521.96	CU M
SP9	Day 2	06.21.2004	16	0.146166667	CU M/Min	2523.7	CU M
SP9	Day 2	06.21.2004	16.05	0.2929	CU M/Min	2525.42	CU M
SP9	Day 2	06.21.2004	16.1	0.140916667	CU M/Min	2527.15	CU M
SP9	Day 2	06.21.2004	16.15	0.2987	CU M/Min	2528.87	CU M
SP9	Day 2	06.21.2004	16.2	0.124033333	CU M/Min	2530.6	CU M
SP9	Day 2	06.21.2004	16.25	0.205316667	CU M/Min	2532.32	CU M
SP9	Day 2	06.21.2004	16.3	0.040016667	CU M/Min	2534.05	CU M
SP9	Day 2	06.21.2004	16.35	0.05405	CU M/Min	2535.78	CU M
SP9	Day 2	06.21.2004	16.4	0.016366667	CU M/Min	2537.4	CU M
SP9	Day 2	06.21.2004	16.45	0.01435	CU M/Min	2539.13	CU M
SP9	Day 2	06.21.2004	16.5	0.003233333	CU M/Min	2540.85	CU M
SP9	Day 2	06.21.2004	16.55	0.00595	CU M/Min	2542.58	CU M
SP9	Day 2	06.21.2004	17	0	CU M/Min	2544.3	CU M
SP9	Day 2	06.21.2004	17.05	0.005033333	CU M/Min	2546.02	CU M
SP9	Day 2	06.21.2004	17.1	0	CU M/Min	2547.75	CU M
SP9	Day 2	06.21.2004	17.15	0.004233333	CU M/Min	2549.48	CU M
SP9	Day 2	06.21.2004	17.2	0.0031	CU M/Min	2551.2	CU M
SP9	Day 2	06.21.2004	17.25	0.004983333	CU M/Min	2552.93	CU M
SP9	Day 2	06.21.2004	17.3	0.004883333	CU M/Min	2554.65	CU M
SP9	Day 2	06.21.2004	17.35	0.0061	CU M/Min	2556.34	CU M
SP9	Day 2	06.21.2004	17.4	0	CU M/Min	2558.06	CU M
SP9	Day 2	06.21.2004	17.45	0.003533333	CU M/Min	2559.76	CU M
SP9	Day 2	06.21.2004	17.5	0	CU M/Min	2561.39	CU M
SP9	Day 2	06.21.2004	17.55	0.00205	CU M/Min	2563.12	CU M
SP9	Day 2	06.21.2004	18	0	CU M/Min	2564.83	CU M
SP9	Day 2	06.21.2004	18.05	0.00265	CU M/Min	2566.56	CU M
SP9	Day 2	06.21.2004	18.1	0.001033333	CU M/Min	2568.27	CU M
SP9	Day 2	06.21.2004	18.15	0.302083333	CU M/Min	2570.05	CU M
SP9	Day 2	06.21.2004	18.2	0	CU M/Min	2571.08	CU M
SP9	Day 2	06.21.2004	18.25	0.301366667	CU M/Min	2572.15	CU M
SP9	Day 2	06.21.2004	18.4	0	CU M/Min	2575.41	CU M
SP9	Day 2	06.21.2004	18.45	0.297416667	CU M/Min	2576.31	CU M
SP9	Day 2	06.21.2004	18.5	0	CU M/Min	2577.66	CU M
SP9	Day 2	06.21.2004	18.55	0	CU M/Min	2579.18	CU M
SP9	Day 2	06.21.2004	19	0.364766667	CU M/Min	2580.89	CU M
SP9	Day 2	06.21.2004	19.05	0.199366667	CU M/Min	2582.59	CU M
SP9	Day 2	06.21.2004	19.1	0.4507	CU M/Min	2584.32	CU M
SP9	Day 2	06.21.2004	19.15	0.290683333	CU M/Min	2586.02	CU M
SP9	Day 2	06.21.2004	19.2	0.480083333	CU M/Min	2587.69	CU M
SP9	Day 2	06.21.2004	19.25	0.322483333	CU M/Min	2589.38	CU M
SP9	Day 2	06.21.2004	19.3	0.4855	CU M/Min	2591.13	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 2	06.21.2004	19.35	0.328816667	CU M/Min	2592.82	CU M
SP9	Day 2	06.21.2004	19.4	0.489016667	CU M/Min	2594.56	CU M
SP9	Day 2	06.21.2004	19.45	0.32685	CU M/Min	2596.25	CU M
SP9	Day 2	06.21.2004	19.5	0.478433333	CU M/Min	2597.98	CU M
SP9	Day 2	06.21.2004	19.55	0.333533333	CU M/Min	2599.64	CU M
SP9	Day 2	06.21.2004	20	0.4846	CU M/Min	2601.39	CU M
SP9	Day 2	06.21.2004	20.05	0.331016667	CU M/Min	2603.02	CU M
SP9	Day 2	06.21.2004	20.1	0.485333333	CU M/Min	2604.76	CU M
SP9	Day 2	06.21.2004	20.15	0.3305	CU M/Min	2606.44	CU M
SP9	Day 2	06.21.2004	20.2	0.4887	CU M/Min	2608.14	CU M
SP9	Day 2	06.21.2004	20.25	0.33225	CU M/Min	2609.8	CU M
SP9	Day 2	06.21.2004	20.3	0.484783333	CU M/Min	2611.55	CU M
SP9	Day 2	06.21.2004	20.35	0.347633333	CU M/Min	2613.22	CU M
SP9	Day 2	06.21.2004	20.4	0.480883333	CU M/Min	2614.97	CU M
SP9	Day 2	06.21.2004	20.45	0.351633333	CU M/Min	2616.65	CU M
SP9	Day 2	06.21.2004	20.5	0.489166667	CU M/Min	2618.4	CU M
SP9	Day 2	06.21.2004	20.55	0.3478	CU M/Min	2620.06	CU M
SP9	Day 2	06.21.2004	21	0.4861	CU M/Min	2621.81	CU M
SP9	Day 2	06.21.2004	21.05	0.367066667	CU M/Min	2623.47	CU M
SP9	Day 2	06.21.2004	21.1	0.473	CU M/Min	2625.15	CU M
SP9	Day 2	06.21.2004	21.15	0.346116667	CU M/Min	2626.75	CU M
SP9	Day 2	06.21.2004	21.2	0.4713	CU M/Min	2628.44	CU M
SP9	Day 2	06.21.2004	21.25	0.34915	CU M/Min	2630.04	CU M
SP9	Day 2	06.21.2004	21.3	0	CU M/Min	2631.7	CU M
SP9	Day 2	06.21.2004	21.35	0.347416667	CU M/Min	2633.31	CU M
SP9	Day 2	06.21.2004	21.4	0.477683333	CU M/Min	2635	CU M
SP9	Day 2	06.21.2004	21.45	0.359233333	CU M/Min	2636.61	CU M
SP9	Day 2	06.21.2004	21.5	0.4802	CU M/Min	2638.3	CU M
SP9	Day 2	06.21.2004	21.55	0.362216667	CU M/Min	2639.91	CU M
SP9	Day 2	06.21.2004	22	0.472183333	CU M/Min	2641.61	CU M
SP9	Day 2	06.21.2004	22.05	0.3612	CU M/Min	2643.21	CU M
SP9	Day 2	06.21.2004	22.1	0.464383333	CU M/Min	2644.92	CU M
SP9	Day 2	06.21.2004	22.15	0.361066667	CU M/Min	2646.52	CU M
SP9	Day 2	06.21.2004	22.2	0.475283333	CU M/Min	2648.22	CU M
SP9	Day 2	06.21.2004	22.25	0.355516667	CU M/Min	2649.82	CU M
SP9	Day 2	06.21.2004	22.3	0.472916667	CU M/Min	2651.52	CU M
SP9	Day 2	06.21.2004	22.35	0.368766667	CU M/Min	2653.11	CU M
SP9	Day 2	06.21.2004	22.4	0.4798	CU M/Min	2654.81	CU M
SP9	Day 2	06.21.2004	22.45	0.3792	CU M/Min	2656.43	CU M
SP9	Day 2	06.21.2004	22.5	0.48745	CU M/Min	2658.2	CU M
SP9	Day 2	06.21.2004	22.55	0.38135	CU M/Min	2659.83	CU M
SP9	Day 2	06.21.2004	23	0.495083333	CU M/Min	2661.61	CU M
SP9	Day 2	06.21.2004	23.05	0.382966667	CU M/Min	2663.24	CU M
SP9	Day 2	06.21.2004	23.1	0.5028	CU M/Min	2665.03	CU M
SP9	Day 2	06.21.2004	23.15	0.390083333	CU M/Min	2666.65	CU M
SP9	Day 2	06.21.2004	23.2	0.4886	CU M/Min	2668.43	CU M
SP9	Day 2	06.21.2004	23.25	0.392833333	CU M/Min	2670.05	CU M
SP9	Day 2	06.21.2004	23.3	0.494783333	CU M/Min	2671.83	CU M
SP9	Day 2	06.21.2004	23.35	0.4047	CU M/Min	2673.45	CU M
SP9	Day 2	06.21.2004	23.4	0.492433333	CU M/Min	2675.24	CU M
SP9	Day 2	06.21.2004	23.45	0.383466667	CU M/Min	2676.85	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 2	06.21.2004	23.5	0.484016667	CU M/Min	2678.62	CU M
SP9	Day 2	06.21.2004	23.55	0.3923	CU M/Min	2680.23	CU M
SP9	Day 2	06.22.2004	0	0	CU M/Min	2681.96	CU M
SP9	Day 2	06.22.2004	0.05	0.405233333	CU M/Min	2683.53	CU M
SP9	Day 2	06.22.2004	0.1	0.496083333	CU M/Min	2685.3	CU M
SP9	Day 2	06.22.2004	0.15	0.402083333	CU M/Min	2686.9	CU M
SP9	Day 2	06.22.2004	0.2	0.499533333	CU M/Min	2688.69	CU M
SP9	Day 2	06.22.2004	0.25	0.407933333	CU M/Min	2690.28	CU M
SP9	Day 2	06.22.2004	0.3	0.485366667	CU M/Min	2692.02	CU M
SP9	Day 2	06.22.2004	0.35	0.416016667	CU M/Min	2693.62	CU M
SP9	Day 2	06.22.2004	0.4	0.487833333	CU M/Min	2695.41	CU M
SP9	Day 2	06.22.2004	0.45	0.4084	CU M/Min	2697.01	CU M
SP9	Day 2	06.22.2004	0.5	0.488233333	CU M/Min	2698.8	CU M
SP9	Day 2	06.22.2004	0.55	0.400883333	CU M/Min	2700.4	CU M
SP9	Day 2	06.22.2004	1	0.49055	CU M/Min	2702.03	CU M
SP9	Day 2	06.22.2004	1.05	0.396733333	CU M/Min	2703.63	CU M
SP9	Day 2	06.22.2004	1.1	0.494183333	CU M/Min	2705.38	CU M
SP9	Day 2	06.22.2004	1.15	0.424716667	CU M/Min	2706.98	CU M
SP9	Day 2	06.22.2004	1.2	0.491583333	CU M/Min	2708.77	CU M
SP9	Day 2	06.22.2004	1.25	0.40955	CU M/Min	2710.36	CU M
SP9	Day 2	06.22.2004	1.3	0.5003	CU M/Min	2712.15	CU M
SP9	Day 2	06.22.2004	1.35	0.405583333	CU M/Min	2713.74	CU M
SP9	Day 2	06.22.2004	1.4	0.483266667	CU M/Min	2715.53	CU M
SP9	Day 2	06.22.2004	1.45	0.41355	CU M/Min	2717.12	CU M
SP9	Day 2	06.22.2004	1.5	0.483816667	CU M/Min	2718.92	CU M
SP9	Day 2	06.22.2004	1.55	0.412766667	CU M/Min	2720.5	CU M
SP9	Day 2	06.22.2004	2	0.488166667	CU M/Min	2722.28	CU M
SP9	Day 2	06.22.2004	2.05	0.139466667	CU M/Min	2723.78	CU M
SP9	Day 2	06.22.2004	2.1	0.133683333	CU M/Min	2724.32	CU M
SP9	Day 2	06.22.2004	2.15	0	CU M/Min	2724.4	CU M
SP9	Day 2	06.22.2004	2.2	0.03235	CU M/Min	2724.84	CU M
SP9	Day 2	06.22.2004	2.25	0.141466667	CU M/Min	2725.21	CU M
SP9	Day 2	06.22.2004	2.3	0	CU M/Min	2725.79	CU M
SP9	Day 2	06.22.2004	2.35	0.143266667	CU M/Min	2726.02	CU M
SP9	Day 2	06.22.2004	2.4	0	CU M/Min	2726.64	CU M
SP9	Day 2	06.22.2004	2.45	0.136633333	CU M/Min	2726.84	CU M
SP9	Day 2	06.22.2004	2.5	0	CU M/Min	2727.49	CU M
SP9	Day 2	06.22.2004	2.55	0.143866667	CU M/Min	2727.65	CU M
SP9	Day 2	06.22.2004	3	0.00085	CU M/Min	2728.34	CU M
SP9	Day 2	06.22.2004	3.05	0.45865	CU M/Min	2728.93	CU M
SP9	Day 2	06.22.2004	3.1	0.467016667	CU M/Min	2731.25	CU M
SP9	Day 2	06.22.2004	3.15	0.46775	CU M/Min	2733.04	CU M
SP9	Day 2	06.22.2004	3.2	0.49485	CU M/Min	2734.57	CU M
SP9	Day 2	06.22.2004	3.25	0.4562	CU M/Min	2736.42	CU M
SP9	Day 2	06.22.2004	3.3	0.497416667	CU M/Min	2738	CU M
SP9	Day 2	06.22.2004	3.35	0.456616667	CU M/Min	2739.84	CU M
SP9	Day 2	06.22.2004	3.4	0.50825	CU M/Min	2741.41	CU M
SP9	Day 2	06.22.2004	3.45	0.447466667	CU M/Min	2743.25	CU M
SP9	Day 2	06.22.2004	3.5	0.494666667	CU M/Min	2744.82	CU M
SP9	Day 2	06.22.2004	3.55	0.455933333	CU M/Min	2746.66	CU M
SP9	Day 2	06.22.2004	4	0.506966667	CU M/Min	2748.22	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 2	06.22.2004	4.05	0.2407	CU M/Min	2749.55	CU M
SP9	Day 2	06.22.2004	4.1	0.000616667	CU M/Min	2749.78	CU M
SP9	Day 2	06.22.2004	4.15	0.2472	CU M/Min	2751.14	CU M
SP9	Day 2	06.22.2004	4.2	0.2963	CU M/Min	2751.58	CU M
SP9	Day 2	06.22.2004	4.25	0.24445	CU M/Min	2753	CU M
SP9	Day 2	06.22.2004	4.3	0.296683333	CU M/Min	2753.44	CU M
SP9	Day 2	06.22.2004	4.35	0.25125	CU M/Min	2754.86	CU M
SP9	Day 2	06.22.2004	4.4	0	CU M/Min	2755.3	CU M
SP9	Day 2	06.22.2004	4.45	0.245283333	CU M/Min	2756.72	CU M
SP9	Day 2	06.22.2004	4.5	0.000216667	CU M/Min	2757.22	CU M
SP9	Day 2	06.22.2004	4.55	0.248683333	CU M/Min	2758.58	CU M
SP9	Day 2	06.22.2004	5	0.000516667	CU M/Min	2759.22	CU M
SP9	Day 2	06.22.2004	5.05	0.44875	CU M/Min	2761.26	CU M
SP9	Day 2	06.22.2004	5.1	0.469233333	CU M/Min	2762.7	CU M
SP9	Day 2	06.22.2004	5.15	0.44875	CU M/Min	2764.57	CU M
SP9	Day 2	06.22.2004	5.2	0.489083333	CU M/Min	2766.06	CU M
SP9	Day 2	06.22.2004	5.25	0.459266667	CU M/Min	2767.96	CU M
SP9	Day 2	06.22.2004	5.3	0.478166667	CU M/Min	2769.45	CU M
SP9	Day 2	06.22.2004	5.35	0.449983333	CU M/Min	2771.36	CU M
SP9	Day 2	06.22.2004	5.4	0.487	CU M/Min	2772.84	CU M
SP9	Day 2	06.22.2004	5.45	0.450966667	CU M/Min	2774.75	CU M
SP9	Day 2	06.22.2004	5.5	0.4941	CU M/Min	2776.24	CU M
SP9	Day 2	06.22.2004	5.55	0.45575	CU M/Min	2778.09	CU M
SP9	Day 3	06.22.2004	6	0.494616667	CU M/Min	2779.58	CU M
SP9	Day 3	06.22.2004	6.05	0.446166667	CU M/Min	2781.47	CU M
SP9	Day 3	06.22.2004	6.1	0.484	CU M/Min	2782.97	CU M
SP9	Day 3	06.22.2004	6.15	0.451566667	CU M/Min	2784.86	CU M
SP9	Day 3	06.22.2004	6.05	0.446166667	CU M/Min	2781.47	CU M
SP9	Day 3	06.22.2004	6.1	0.484	CU M/Min	2782.97	CU M
SP9	Day 3	06.22.2004	6.15	0.451566667	CU M/Min	2784.86	CU M
SP9	Day 3	06.22.2004	6.3	0.492633333	CU M/Min	2789.64	CU M
SP9	Day 3	06.22.2004	6.35	0.443833333	CU M/Min	2791.53	CU M
SP9	Day 3	06.22.2004	6.4	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	6.45	0.00185	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	6.5	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	6.55	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.05	0.00065	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.1	0.000766667	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.15	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.2	8.33333E-05	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.25	0.000566667	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.3	0.001633333	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.35	0.00155	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.4	0.0006	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.45	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.5	0.000366667	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	7.55	0.000733333	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	8	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	8.05	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	8.1	0	CU M/Min	2792.91	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 3	06.22.2004	8.15	0	CU M/Min	2792.91	CU M
SP9	Day 3	06.22.2004	8.2	0	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	8.25	0	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	8.3	0	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	8.35	0.00105	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	8.4	0	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	8.45	0.00025	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	8.5	0	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	8.55	0	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	9	0	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	9.05	0	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	9.1	0.000316667	CU M/Min	2792.9	CU M
SP9	Day 3	06.22.2004	9.15	0.000116667	CU M/Min	2792.89	CU M
SP9	Day 3	06.22.2004	9.2	0	CU M/Min	2792.89	CU M
SP9	Day 3	06.22.2004	9.25	0.000916667	CU M/Min	2792.89	CU M
SP9	Day 3	06.22.2004	9.3	0	CU M/Min	2792.89	CU M
SP9	Day 3	06.22.2004	9.35	0	CU M/Min	2792.89	CU M
SP9	Day 3	06.22.2004	9.4	0	CU M/Min	2792.89	CU M
SP9	Day 3	06.22.2004	9.45	0	CU M/Min	2792.88	CU M
SP9	Day 3	06.22.2004	9.5	0.00005	CU M/Min	2792.88	CU M
SP9	Day 3	06.22.2004	9.55	0	CU M/Min	2792.88	CU M
SP9	Day 3	06.22.2004	10	0	CU M/Min	2792.88	CU M
SP9	Day 3	06.22.2004	10.05	0	CU M/Min	2792.88	CU M
SP9	Day 3	06.22.2004	10.1	0	CU M/Min	2792.87	CU M
SP9	Day 3	06.22.2004	10.15	0	CU M/Min	2792.87	CU M
SP9	Day 3	06.22.2004	10.2	0	CU M/Min	2792.87	CU M
SP9	Day 3	06.22.2004	10.25	0	CU M/Min	2792.87	CU M
SP9	Day 3	06.22.2004	10.3	0	CU M/Min	2792.86	CU M
SP9	Day 3	06.22.2004	10.35	0	CU M/Min	2792.86	CU M
SP9	Day 3	06.22.2004	10.4	0	CU M/Min	2792.86	CU M
SP9	Day 3	06.22.2004	10.45	0	CU M/Min	2792.86	CU M
SP9	Day 3	06.22.2004	10.5	0	CU M/Min	2792.85	CU M
SP9	Day 3	06.22.2004	10.55	0.000416667	CU M/Min	2792.85	CU M
SP9	Day 3	06.22.2004	11	0	CU M/Min	2792.85	CU M
SP9	Day 3	06.22.2004	11.05	0	CU M/Min	2792.85	CU M
SP9	Day 3	06.22.2004	11.1	0	CU M/Min	2792.84	CU M
SP9	Day 3	06.22.2004	11.15	0	CU M/Min	2792.84	CU M
SP9	Day 3	06.22.2004	11.2	0.00005	CU M/Min	2792.84	CU M
SP9	Day 3	06.22.2004	11.25	0	CU M/Min	2792.84	CU M
SP9	Day 3	06.22.2004	11.3	0.0006	CU M/Min	2792.83	CU M
SP9	Day 3	06.22.2004	11.35	0	CU M/Min	2792.83	CU M
SP9	Day 3	06.22.2004	11.4	0	CU M/Min	2792.83	CU M
SP9	Day 3	06.22.2004	11.45	0.000533333	CU M/Min	2792.82	CU M
SP9	Day 3	06.22.2004	11.5	0	CU M/Min	2792.82	CU M
SP9	Day 3	06.22.2004	11.55	0	CU M/Min	2792.82	CU M
SP9	Day 3	06.22.2004	12	0	CU M/Min	2792.81	CU M
SP9	Day 3	06.22.2004	12.05	0.00035	CU M/Min	2792.81	CU M
SP9	Day 3	06.22.2004	12.1	0.00075	CU M/Min	2792.81	CU M
SP9	Day 3	06.22.2004	12.15	0	CU M/Min	2792.81	CU M
SP9	Day 3	06.22.2004	12.2	0.000483333	CU M/Min	2792.8	CU M
SP9	Day 3	06.22.2004	12.25	0	CU M/Min	2792.8	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 3	06.22.2004	12.3	0	CU M/Min	2792.8	CU M
SP9	Day 3	06.22.2004	12.35	0	CU M/Min	2792.79	CU M
SP9	Day 3	06.22.2004	12.4	0	CU M/Min	2792.79	CU M
SP9	Day 3	06.22.2004	12.45	0.00015	CU M/Min	2792.78	CU M
SP9	Day 3	06.22.2004	12.5	0	CU M/Min	2792.78	CU M
SP9	Day 3	06.22.2004	12.55	0	CU M/Min	2792.78	CU M
SP9	Day 3	06.22.2004	13	0	CU M/Min	2792.77	CU M
SP9	Day 3	06.22.2004	13.05	0	CU M/Min	2792.77	CU M
SP9	Day 3	06.22.2004	13.1	0	CU M/Min	2792.77	CU M
SP9	Day 3	06.22.2004	13.15	0	CU M/Min	2792.76	CU M
SP9	Day 3	06.22.2004	13.2	0	CU M/Min	2792.76	CU M
SP9	Day 3	06.22.2004	13.25	0	CU M/Min	2792.76	CU M
SP9	Day 3	06.22.2004	13.3	0	CU M/Min	2792.75	CU M
SP9	Day 3	06.22.2004	13.35	0	CU M/Min	2792.75	CU M
SP9	Day 3	06.22.2004	13.4	0	CU M/Min	2792.75	CU M
SP9	Day 3	06.22.2004	13.45	0	CU M/Min	2792.74	CU M
SP9	Day 3	06.22.2004	13.5	0	CU M/Min	2792.74	CU M
SP9	Day 3	06.22.2004	13.55	0	CU M/Min	2792.74	CU M
SP9	Day 3	06.22.2004	14	0	CU M/Min	2792.73	CU M
SP9	Day 3	06.22.2004	14.05	0	CU M/Min	2792.73	CU M
SP9	Day 3	06.22.2004	14.1	0	CU M/Min	2792.72	CU M
SP9	Day 3	06.22.2004	14.15	0	CU M/Min	2792.72	CU M
SP9	Day 3	06.22.2004	14.2	0	CU M/Min	2792.72	CU M
SP9	Day 3	06.22.2004	14.25	0	CU M/Min	2792.71	CU M
SP9	Day 3	06.22.2004	14.3	0	CU M/Min	2792.71	CU M
SP9	Day 3	06.22.2004	14.35	1.66667E-05	CU M/Min	2792.71	CU M
SP9	Day 3	06.22.2004	14.4	0	CU M/Min	2792.7	CU M
SP9	Day 3	06.22.2004	14.45	0	CU M/Min	2792.7	CU M
SP9	Day 3	06.22.2004	14.5	0	CU M/Min	2792.69	CU M
SP9	Day 3	06.22.2004	14.55	0	CU M/Min	2792.69	CU M
SP9	Day 3	06.22.2004	15	0	CU M/Min	2792.69	CU M
SP9	Day 3	06.22.2004	15.05	0	CU M/Min	2792.68	CU M
SP9	Day 3	06.22.2004	15.1	0	CU M/Min	2792.68	CU M
SP9	Day 3	06.22.2004	15.15	0	CU M/Min	2792.68	CU M
SP9	Day 3	06.22.2004	15.2	0	CU M/Min	2792.67	CU M
SP9	Day 3	06.22.2004	15.25	0	CU M/Min	2792.67	CU M
SP9	Day 3	06.22.2004	15.3	0	CU M/Min	2792.66	CU M
SP9	Day 3	06.22.2004	15.35	0	CU M/Min	2792.66	CU M
SP9	Day 3	06.22.2004	15.4	0	CU M/Min	2792.66	CU M
SP9	Day 3	06.22.2004	15.45	0	CU M/Min	2792.65	CU M
SP9	Day 3	06.22.2004	15.5	0	CU M/Min	2792.65	CU M
SP9	Day 3	06.22.2004	15.55	0	CU M/Min	2792.65	CU M
SP9	Day 3	06.22.2004	16	0	CU M/Min	2792.64	CU M
SP9	Day 3	06.22.2004	16.05	0	CU M/Min	2792.64	CU M
SP9	Day 3	06.22.2004	16.1	0	CU M/Min	2792.64	CU M
SP9	Day 3	06.22.2004	16.15	0	CU M/Min	2792.63	CU M
SP9	Day 3	06.22.2004	16.2	0	CU M/Min	2792.63	CU M
SP9	Day 3	06.22.2004	16.25	0	CU M/Min	2792.62	CU M
SP9	Day 3	06.22.2004	16.3	0.000633333	CU M/Min	2792.62	CU M
SP9	Day 3	06.22.2004	16.35	0	CU M/Min	2792.62	CU M
SP9	Day 3	06.22.2004	16.4	0	CU M/Min	2792.61	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 3	06.22.2004	16.45	0	CU M/Min	2792.61	CU M
SP9	Day 3	06.22.2004	16.5	0	CU M/Min	2792.6	CU M
SP9	Day 3	06.22.2004	16.55	0	CU M/Min	2792.6	CU M
SP9	Day 3	06.22.2004	17	0	CU M/Min	2792.6	CU M
SP9	Day 3	06.22.2004	17.05	0	CU M/Min	2792.59	CU M
SP9	Day 3	06.22.2004	17.1	0	CU M/Min	2792.59	CU M
SP9	Day 3	06.22.2004	17.15	0	CU M/Min	2792.58	CU M
SP9	Day 3	06.22.2004	17.2	0	CU M/Min	2792.58	CU M
SP9	Day 3	06.22.2004	17.25	0	CU M/Min	2792.58	CU M
SP9	Day 3	06.22.2004	17.3	0	CU M/Min	2792.57	CU M
SP9	Day 3	06.22.2004	17.35	0	CU M/Min	2792.57	CU M
SP9	Day 3	06.22.2004	17.4	0.00045	CU M/Min	2792.56	CU M
SP9	Day 3	06.22.2004	17.45	0	CU M/Min	2792.56	CU M
SP9	Day 3	06.22.2004	17.5	0	CU M/Min	2792.56	CU M
SP9	Day 3	06.22.2004	17.55	0	CU M/Min	2792.55	CU M
SP9	Day 3	06.22.2004	18	0	CU M/Min	2792.55	CU M
SP9	Day 3	06.22.2004	18.05	0.0009	CU M/Min	2792.54	CU M
SP9	Day 3	06.22.2004	18.1	0	CU M/Min	2792.54	CU M
SP9	Day 3	06.22.2004	18.15	0	CU M/Min	2792.53	CU M
SP9	Day 3	06.22.2004	18.2	0	CU M/Min	2792.53	CU M
SP9	Day 3	06.22.2004	18.25	0	CU M/Min	2792.53	CU M
SP9	Day 3	06.22.2004	18.3	0	CU M/Min	2792.52	CU M
SP9	Day 3	06.22.2004	18.35	0	CU M/Min	2792.52	CU M
SP9	Day 3	06.22.2004	18.5	0	CU M/Min	2792.51	CU M
SP9	Day 3	06.22.2004	18.55	0	CU M/Min	2792.5	CU M
SP9	Day 3	06.22.2004	19	0	CU M/Min	2792.5	CU M
SP9	Day 3	06.22.2004	19.05	0	CU M/Min	2792.49	CU M
SP9	Day 3	06.22.2004	19.1	0	CU M/Min	2792.49	CU M
SP9	Day 3	06.22.2004	19.15	0	CU M/Min	2792.49	CU M
SP9	Day 3	06.22.2004	19.2	0	CU M/Min	2792.48	CU M
SP9	Day 3	06.22.2004	19.25	0	CU M/Min	2792.48	CU M
SP9	Day 3	06.22.2004	19.3	0	CU M/Min	2792.47	CU M
SP9	Day 3	06.22.2004	19.35	0	CU M/Min	2792.47	CU M
SP9	Day 3	06.22.2004	19.4	0	CU M/Min	2792.46	CU M
SP9	Day 3	06.22.2004	19.45	0	CU M/Min	2792.46	CU M
SP9	Day 3	06.22.2004	19.5	0	CU M/Min	2792.46	CU M
SP9	Day 3	06.22.2004	19.55	0	CU M/Min	2792.45	CU M
SP9	Day 3	06.22.2004	20	0	CU M/Min	2792.45	CU M
SP9	Day 3	06.22.2004	20.05	0	CU M/Min	2792.44	CU M
SP9	Day 3	06.22.2004	20.1	0	CU M/Min	2792.44	CU M
SP9	Day 3	06.22.2004	20.15	0	CU M/Min	2792.44	CU M
SP9	Day 3	06.22.2004	20.2	0	CU M/Min	2792.43	CU M
SP9	Day 3	06.22.2004	20.25	0	CU M/Min	2792.43	CU M
SP9	Day 3	06.22.2004	20.3	0	CU M/Min	2792.43	CU M
SP9	Day 3	06.22.2004	20.35	0.00035	CU M/Min	2792.42	CU M
SP9	Day 3	06.22.2004	20.4	0	CU M/Min	2792.42	CU M
SP9	Day 3	06.22.2004	20.45	0	CU M/Min	2792.42	CU M
SP9	Day 3	06.22.2004	20.5	0	CU M/Min	2792.41	CU M
SP9	Day 3	06.22.2004	20.55	0	CU M/Min	2792.41	CU M
SP9	Day 3	06.22.2004	21	0	CU M/Min	2792.4	CU M
SP9	Day 3	06.22.2004	21.05	0	CU M/Min	2792.4	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 3	06.22.2004	21.1	0	CU M/Min	2792.4	CU M
SP9	Day 3	06.22.2004	21.15	0	CU M/Min	2792.39	CU M
SP9	Day 3	06.22.2004	21.2	0	CU M/Min	2792.39	CU M
SP9	Day 3	06.22.2004	21.25	0.45055	CU M/Min	2792.53	CU M
SP9	Day 3	06.22.2004	21.3	0.384316667	CU M/Min	2794.02	CU M
SP9	Day 3	06.22.2004	21.35	0.445033333	CU M/Min	2795.77	CU M
SP9	Day 3	06.22.2004	21.4	0.397916667	CU M/Min	2797.35	CU M
SP9	Day 3	06.22.2004	21.45	0.4446	CU M/Min	2799.1	CU M
SP9	Day 3	06.22.2004	21.5	0.40965	CU M/Min	2800.67	CU M
SP9	Day 3	06.22.2004	21.55	0.456716667	CU M/Min	2802.42	CU M
SP9	Day 3	06.22.2004	22	0.4065	CU M/Min	2803.99	CU M
SP9	Day 3	06.22.2004	22.05	0.44095	CU M/Min	2805.75	CU M
SP9	Day 3	06.22.2004	22.1	0.417466667	CU M/Min	2807.31	CU M
SP9	Day 3	06.22.2004	22.15	0.445833333	CU M/Min	2809.07	CU M
SP9	Day 3	06.22.2004	22.2	0.410883333	CU M/Min	2810.64	CU M
SP9	Day 3	06.22.2004	22.25	0.4452	CU M/Min	2812.4	CU M
SP9	Day 3	06.22.2004	22.3	0.421116667	CU M/Min	2813.97	CU M
SP9	Day 3	06.22.2004	22.35	0.450266667	CU M/Min	2815.73	CU M
SP9	Day 3	06.22.2004	22.4	0.42675	CU M/Min	2817.26	CU M
SP9	Day 3	06.22.2004	22.45	0.4531	CU M/Min	2819.04	CU M
SP9	Day 3	06.22.2004	22.5	0.43015	CU M/Min	2820.59	CU M
SP9	Day 3	06.22.2004	22.55	0.4481	CU M/Min	2822.35	CU M
SP9	Day 3	06.22.2004	23	0.42935	CU M/Min	2823.91	CU M
SP9	Day 3	06.22.2004	23.05	0.435866667	CU M/Min	2825.67	CU M
SP9	Day 3	06.22.2004	23.1	0.428266667	CU M/Min	2827.22	CU M
SP9	Day 3	06.22.2004	23.15	0.449883333	CU M/Min	2828.99	CU M
SP9	Day 3	06.22.2004	23.2	0.432383333	CU M/Min	2830.54	CU M
SP9	Day 3	06.22.2004	23.25	0.452383333	CU M/Min	2832.31	CU M
SP9	Day 3	06.22.2004	23.3	0.4356	CU M/Min	2833.85	CU M
SP9	Day 3	06.22.2004	23.35	0.4443	CU M/Min	2835.61	CU M
SP9	Day 3	06.22.2004	23.4	0.438316667	CU M/Min	2837.15	CU M
SP9	Day 3	06.22.2004	23.45	0.435633333	CU M/Min	2838.92	CU M
SP9	Day 3	06.22.2004	23.5	0.454066667	CU M/Min	2840.46	CU M
SP9	Day 3	06.22.2004	23.55	0.449566667	CU M/Min	2842.23	CU M
SP9	Day 3	06.23.2004	0	0.435966667	CU M/Min	2843.76	CU M
SP9	Day 3	06.23.2004	0.05	0.433866667	CU M/Min	2845.54	CU M
SP9	Day 3	06.23.2004	0.1	0.443166667	CU M/Min	2847.08	CU M
SP9	Day 3	06.23.2004	0.15	0.446133333	CU M/Min	2848.84	CU M
SP9	Day 3	06.23.2004	0.2	0.445466667	CU M/Min	2850.39	CU M
SP9	Day 3	06.23.2004	0.25	0.4466	CU M/Min	2852.15	CU M
SP9	Day 3	06.23.2004	0.3	0.44475	CU M/Min	2853.7	CU M
SP9	Day 3	06.23.2004	0.35	0.3421	CU M/Min	2855.45	CU M
SP9	Day 3	06.23.2004	0.4	0.0603	CU M/Min	2856.99	CU M
SP9	Day 3	06.23.2004	0.45	0.0047	CU M/Min	2858.74	CU M
SP9	Day 3	06.23.2004	0.5	0.000533333	CU M/Min	2860.28	CU M
SP9	Day 3	06.23.2004	0.55	0	CU M/Min	2862.01	CU M
SP9	Day 3	06.23.2004	1	0.0034	CU M/Min	2863.57	CU M
SP9	Day 3	06.23.2004	1.05	0	CU M/Min	2865.3	CU M
SP9	Day 3	06.23.2004	1.1	0.001883333	CU M/Min	2866.84	CU M
SP9	Day 3	06.23.2004	1.15	0	CU M/Min	2868.58	CU M
SP9	Day 3	06.23.2004	1.2	0.0037	CU M/Min	2870.13	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 3	06.23.2004	1.25	0.075433333	CU M/Min	2871.87	CU M
SP9	Day 3	06.23.2004	1.3	0.132383333	CU M/Min	2873.42	CU M
SP9	Day 3	06.23.2004	1.35	0.249516667	CU M/Min	2875.17	CU M
SP9	Day 3	06.23.2004	1.4	0.154766667	CU M/Min	2876.71	CU M
SP9	Day 3	06.23.2004	1.45	0.249866667	CU M/Min	2878.45	CU M
SP9	Day 3	06.23.2004	1.5	0.1621	CU M/Min	2879.99	CU M
SP9	Day 3	06.23.2004	1.55	0.245133333	CU M/Min	2881.74	CU M
SP9	Day 3	06.23.2004	2	0.146033333	CU M/Min	2883.27	CU M
SP9	Day 3	06.23.2004	2.05	0.23775	CU M/Min	2885.04	CU M
SP9	Day 3	06.23.2004	2.1	0.144383333	CU M/Min	2886.39	CU M
SP9	Day 3	06.23.2004	2.15	0.15265	CU M/Min	2886.94	CU M
SP9	Day 3	06.23.2004	2.2	0	CU M/Min	2886.95	CU M
SP9	Day 3	06.23.2004	2.25	0.1369	CU M/Min	2887.48	CU M
SP9	Day 3	06.23.2004	2.3	0.152933333	CU M/Min	2887.88	CU M
SP9	Day 3	06.23.2004	2.35	0.146566667	CU M/Min	2888.43	CU M
SP9	Day 3	06.23.2004	2.4	0.1476	CU M/Min	2888.73	CU M
SP9	Day 3	06.23.2004	2.45	0.125083333	CU M/Min	2889.29	CU M
SP9	Day 3	06.23.2004	2.5	0.156683333	CU M/Min	2889.58	CU M
SP9	Day 3	06.23.2004	2.55	0	CU M/Min	2890.17	CU M
SP9	Day 3	06.23.2004	3	0.151766667	CU M/Min	2890.43	CU M
SP9	Day 3	06.23.2004	3.05	0	CU M/Min	2891.06	CU M
SP9	Day 3	06.23.2004	3.1	0.47155	CU M/Min	2891.94	CU M
SP9	Day 3	06.23.2004	3.15	0.2611	CU M/Min	2894.16	CU M
SP9	Day 3	06.23.2004	3.2	0.150466667	CU M/Min	2895.8	CU M
SP9	Day 3	06.23.2004	3.25	0.29035	CU M/Min	2897.45	CU M
SP9	Day 3	06.23.2004	3.3	0.154716667	CU M/Min	2899.1	CU M
SP9	Day 3	06.23.2004	3.35	0.295616667	CU M/Min	2900.75	CU M
SP9	Day 3	06.23.2004	3.4	0.156266667	CU M/Min	2902.41	CU M
SP9	Day 3	06.23.2004	3.45	0.2786	CU M/Min	2904.06	CU M
SP9	Day 3	06.23.2004	3.5	0.148466667	CU M/Min	2905.68	CU M
SP9	Day 3	06.23.2004	3.55	0.269133333	CU M/Min	2907.35	CU M
SP9	Day 3	06.23.2004	4	0.151683333	CU M/Min	2908.93	CU M
SP9	Day 3	06.23.2004	4.05	0.253766667	CU M/Min	2910.59	CU M
SP9	Day 3	06.23.2004	4.1	0	CU M/Min	2911.69	CU M
SP9	Day 3	06.23.2004	4.15	0.26385	CU M/Min	2911.98	CU M
SP9	Day 3	06.23.2004	4.2	0.216066667	CU M/Min	2913.16	CU M
SP9	Day 3	06.23.2004	4.25	0.281333333	CU M/Min	2913.64	CU M
SP9	Day 3	06.23.2004	4.3	0.22605	CU M/Min	2914.83	CU M
SP9	Day 3	06.23.2004	4.35	0.309283333	CU M/Min	2915.29	CU M
SP9	Day 3	06.23.2004	4.4	0.223633333	CU M/Min	2916.5	CU M
SP9	Day 3	06.23.2004	4.45	0.3031	CU M/Min	2916.95	CU M
SP9	Day 3	06.23.2004	4.5	0.231616667	CU M/Min	2918.19	CU M
SP9	Day 3	06.23.2004	4.55	0.295583333	CU M/Min	2918.6	CU M
SP9	Day 3	06.23.2004	5	0.2323	CU M/Min	2919.87	CU M
SP9	Day 3	06.23.2004	5.05	0	CU M/Min	2920.35	CU M
SP9	Day 3	06.23.2004	5.1	0.417433333	CU M/Min	2922.42	CU M
SP9	Day 3	06.23.2004	5.15	0.474433333	CU M/Min	2923.84	CU M
SP9	Day 3	06.23.2004	5.2	0.416983333	CU M/Min	2925.56	CU M
SP9	Day 3	06.23.2004	5.25	0.48705	CU M/Min	2927.01	CU M
SP9	Day 3	06.23.2004	5.3	0.434133333	CU M/Min	2928.76	CU M
SP9	Day 3	06.23.2004	5.35	0.487266667	CU M/Min	2930.2	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
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Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 3	06.23.2004	5.4	0.432133333	CU M/Min	2931.9	CU M
SP9	Day 3	06.23.2004	5.45	0.499483333	CU M/Min	2933.39	CU M
SP9	Day 3	06.23.2004	5.5	0.4336	CU M/Min	2935.14	CU M
SP9	Day 3	06.23.2004	5.55	0.49725	CU M/Min	2936.65	CU M
SP9	Day 4	06.23.2004	6	0.421816667	CU M/Min	2938.37	CU M
SP9	Day 4	06.23.2004	6.05	0.513233333	CU M/Min	2939.88	CU M
SP9	Day 4	06.23.2004	6.1	0.423483333	CU M/Min	2941.6	CU M
SP9	Day 4	06.23.2004	6.15	0.505866667	CU M/Min	2943.11	CU M
SP9	Day 4	06.23.2004	6.2	0.436766667	CU M/Min	2944.82	CU M
SP9	Day 4	06.23.2004	6.25	0.50805	CU M/Min	2946.32	CU M
SP9	Day 4	06.23.2004	6.3	0.429183333	CU M/Min	2948.04	CU M
SP9	Day 4	06.23.2004	6.35	0.500483333	CU M/Min	2949.55	CU M
SP9	Day 4	06.23.2004	6.4	0.4418	CU M/Min	2951.27	CU M
SP9	Day 4	06.23.2004	6.45	0.514733333	CU M/Min	2952.78	CU M
SP9	Day 4	06.23.2004	6.5	0.42915	CU M/Min	2954.5	CU M
SP9	Day 4	06.23.2004	6.55	0.48765	CU M/Min	2956	CU M
SP9	Day 4	06.23.2004	7	0.425566667	CU M/Min	2957.72	CU M
SP9	Day 4	06.23.2004	7.05	0.49665	CU M/Min	2959.22	CU M
SP9	Day 4	06.23.2004	7.1	0.422366667	CU M/Min	2960.93	CU M
SP9	Day 4	06.23.2004	7.15	0.512483333	CU M/Min	2962.43	CU M
SP9	Day 4	06.23.2004	7.2	0.439466667	CU M/Min	2964.13	CU M
SP9	Day 4	06.23.2004	7.25	0.504233333	CU M/Min	2965.65	CU M
SP9	Day 4	06.23.2004	7.3	0.419266667	CU M/Min	2967.36	CU M
SP9	Day 4	06.23.2004	7.35	0.506133333	CU M/Min	2968.86	CU M
SP9	Day 4	06.23.2004	7.4	0.428766667	CU M/Min	2970.56	CU M
SP9	Day 4	06.23.2004	7.45	0.502683333	CU M/Min	2972.08	CU M
SP9	Day 4	06.23.2004	7.5	0.4222	CU M/Min	2973.77	CU M
SP9	Day 4	06.23.2004	7.55	0.508683333	CU M/Min	2975.29	CU M
SP9	Day 4	06.23.2004	8	0.422433333	CU M/Min	2976.97	CU M
SP9	Day 4	06.23.2004	8.05	0.499716667	CU M/Min	2978.49	CU M
SP9	Day 4	06.23.2004	8.1	0.4254	CU M/Min	2980.17	CU M
SP9	Day 4	06.23.2004	8.15	0.505233333	CU M/Min	2981.7	CU M
SP9	Day 4	06.23.2004	8.2	0.4153	CU M/Min	2983.38	CU M
SP9	Day 4	06.23.2004	8.25	0.5077	CU M/Min	2984.9	CU M
SP9	Day 4	06.23.2004	8.3	0.417316667	CU M/Min	2986.58	CU M
SP9	Day 4	06.23.2004	8.5	0.421033333	CU M/Min	2992.99	CU M
SP9	Day 4	06.23.2004	8.55	0.51125	CU M/Min	2994.52	CU M
SP9	Day 4	06.23.2004	9	0.427766667	CU M/Min	2996.19	CU M
SP9	Day 4	06.23.2004	9.05	0.49895	CU M/Min	2997.72	CU M
SP9	Day 4	06.23.2004	9.1	0.4206	CU M/Min	2999.39	CU M
SP9	Day 4	06.23.2004	9.15	0.513383333	CU M/Min	3000.93	CU M
SP9	Day 4	06.23.2004	9.2	0.422666667	CU M/Min	3002.58	CU M
SP9	Day 4	06.23.2004	9.25	0.501066667	CU M/Min	3004.11	CU M
SP9	Day 4	06.23.2004	9.3	0.4321	CU M/Min	3005.78	CU M
SP9	Day 4	06.23.2004	9.35	0.500966667	CU M/Min	3007.31	CU M
SP9	Day 4	06.23.2004	9.4	0.423816667	CU M/Min	3008.97	CU M
SP9	Day 4	06.23.2004	9.45	0.498116667	CU M/Min	3010.5	CU M
SP9	Day 4	06.23.2004	9.5	0.429083333	CU M/Min	3012.15	CU M
SP9	Day 4	06.23.2004	9.55	0.512216667	CU M/Min	3013.69	CU M
SP9	Day 4	06.23.2004	10	0.41785	CU M/Min	3015.35	CU M
SP9	Day 4	06.23.2004	10.05	0.508333333	CU M/Min	3016.83	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 4	06.23.2004	10.1	0.43045	CU M/Min	3018.5	CU M
SP9	Day 4	06.23.2004	10.15	0.50535	CU M/Min	3020.03	CU M
SP9	Day 4	06.23.2004	10.2	0.431516667	CU M/Min	3021.7	CU M
SP9	Day 4	06.23.2004	10.25	0.5132	CU M/Min	3023.23	CU M
SP9	Day 4	06.23.2004	10.3	0.415166667	CU M/Min	3024.89	CU M
SP9	Day 4	06.23.2004	10.35	0.494333333	CU M/Min	3026.42	CU M
SP9	Day 4	06.23.2004	10.4	0.427466667	CU M/Min	3028.08	CU M
SP9	Day 4	06.23.2004	10.45	0.500666667	CU M/Min	3029.62	CU M
SP9	Day 4	06.23.2004	10.5	0.426483333	CU M/Min	3031.28	CU M
SP9	Day 4	06.23.2004	10.55	0.508683333	CU M/Min	3032.81	CU M
SP9	Day 4	06.23.2004	11	0.409816667	CU M/Min	3034.43	CU M
SP9	Day 4	06.23.2004	11.05	0.503266667	CU M/Min	3035.97	CU M
SP9	Day 4	06.23.2004	11.1	0.424933333	CU M/Min	3037.62	CU M
SP9	Day 4	06.23.2004	11.15	0.517233333	CU M/Min	3039.16	CU M
SP9	Day 4	06.23.2004	11.2	0.426316667	CU M/Min	3040.81	CU M
SP9	Day 4	06.23.2004	11.25	0.504916667	CU M/Min	3042.35	CU M
SP9	Day 4	06.23.2004	11.3	0.424316667	CU M/Min	3044	CU M
SP9	Day 4	06.23.2004	11.35	0.505333333	CU M/Min	3045.52	CU M
SP9	Day 4	06.23.2004	11.4	0.4193	CU M/Min	3047.18	CU M
SP9	Day 4	06.23.2004	11.45	0.5126	CU M/Min	3048.72	CU M
SP9	Day 4	06.23.2004	11.5	0.42655	CU M/Min	3050.37	CU M
SP9	Day 4	06.23.2004	11.55	0.48545	CU M/Min	3051.92	CU M
SP9	Day 4	06.23.2004	12	0.416766667	CU M/Min	3053.56	CU M
SP9	Day 4	06.23.2004	12.05	0.4925	CU M/Min	3055.1	CU M
SP9	Day 4	06.23.2004	12.1	0.42145	CU M/Min	3056.75	CU M
SP9	Day 4	06.23.2004	12.15	0.491216667	CU M/Min	3058.29	CU M
SP9	Day 4	06.23.2004	12.2	0.417916667	CU M/Min	3059.94	CU M
SP9	Day 4	06.23.2004	12.25	0.492416667	CU M/Min	3061.43	CU M
SP9	Day 4	06.23.2004	12.3	0.413283333	CU M/Min	3063.08	CU M
SP9	Day 4	06.23.2004	12.35	0.494566667	CU M/Min	3064.62	CU M
SP9	Day 4	06.23.2004	12.4	0.42385	CU M/Min	3066.28	CU M
SP9	Day 4	06.23.2004	12.45	0.492	CU M/Min	3067.82	CU M
SP9	Day 4	06.23.2004	12.5	0.42025	CU M/Min	3069.46	CU M
SP9	Day 4	06.23.2004	12.55	0.469483333	CU M/Min	3071	CU M
SP9	Day 4	06.23.2004	13	0.42635	CU M/Min	3072.63	CU M
SP9	Day 4	06.23.2004	13.05	0.482883333	CU M/Min	3074.18	CU M
SP9	Day 4	06.23.2004	13.1	0.42915	CU M/Min	3075.82	CU M
SP9	Day 4	06.23.2004	13.15	0.488583333	CU M/Min	3077.3	CU M
SP9	Day 4	06.23.2004	13.2	0.422183333	CU M/Min	3078.95	CU M
SP9	Day 4	06.23.2004	13.25	0.49385	CU M/Min	3080.49	CU M
SP9	Day 4	06.23.2004	13.3	0.415066667	CU M/Min	3082.14	CU M
SP9	Day 4	06.23.2004	13.35	0.47405	CU M/Min	3083.68	CU M
SP9	Day 4	06.23.2004	13.4	0.4237	CU M/Min	3085.32	CU M
SP9	Day 4	06.23.2004	13.45	0.4764	CU M/Min	3086.87	CU M
SP9	Day 4	06.23.2004	13.5	0.424466667	CU M/Min	3088.49	CU M
SP9	Day 4	06.23.2004	13.55	0.475333333	CU M/Min	3090.04	CU M
SP9	Day 4	06.23.2004	14	0.418233333	CU M/Min	3091.67	CU M
SP9	Day 4	06.23.2004	14.05	0.47045	CU M/Min	3093.22	CU M
SP9	Day 4	06.23.2004	14.1	0.427783333	CU M/Min	3094.86	CU M
SP9	Day 4	06.23.2004	14.15	0.455166667	CU M/Min	3096.41	CU M
SP9	Day 4	06.23.2004	14.2	0.42495	CU M/Min	3098.04	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 4	06.23.2004	14.25	0.453366667	CU M/Min	3099.58	CU M
SP9	Day 4	06.23.2004	14.3	0.425133333	CU M/Min	3101.21	CU M
SP9	Day 4	06.23.2004	14.35	0.454766667	CU M/Min	3102.76	CU M
SP9	Day 4	06.23.2004	14.4	0.4209	CU M/Min	3104.38	CU M
SP9	Day 4	06.23.2004	14.45	0.474733333	CU M/Min	3105.88	CU M
SP9	Day 4	06.23.2004	14.5	0.411883333	CU M/Min	3107.5	CU M
SP9	Day 4	06.23.2004	14.55	0.47175	CU M/Min	3109.05	CU M
SP9	Day 4	06.23.2004	15	0.417083333	CU M/Min	3110.68	CU M
SP9	Day 4	06.23.2004	15.05	0.4504	CU M/Min	3112.22	CU M
SP9	Day 4	06.23.2004	15.1	0.417183333	CU M/Min	3113.84	CU M
SP9	Day 4	06.23.2004	15.15	0.449183333	CU M/Min	3115.38	CU M
SP9	Day 4	06.23.2004	15.2	0.424266667	CU M/Min	3116.99	CU M
SP9	Day 4	06.23.2004	15.25	0.455316667	CU M/Min	3118.54	CU M
SP9	Day 4	06.23.2004	15.3	0.416616667	CU M/Min	3120.15	CU M
SP9	Day 4	06.23.2004	15.35	0.45645	CU M/Min	3121.66	CU M
SP9	Day 4	06.23.2004	15.4	0.415283333	CU M/Min	3123.28	CU M
SP9	Day 4	06.23.2004	15.45	0.457783333	CU M/Min	3124.82	CU M
SP9	Day 4	06.23.2004	15.5	0.410933333	CU M/Min	3126.43	CU M
SP9	Day 4	06.23.2004	15.55	0.45245	CU M/Min	3127.98	CU M
SP9	Day 4	06.23.2004	16	0.411716667	CU M/Min	3129.59	CU M
SP9	Day 4	06.23.2004	16.05	0.438133333	CU M/Min	3131.14	CU M
SP9	Day 4	06.23.2004	16.1	0.404783333	CU M/Min	3132.75	CU M
SP9	Day 4	06.23.2004	16.15	0.4566	CU M/Min	3134.3	CU M
SP9	Day 4	06.23.2004	16.2	0.411883333	CU M/Min	3135.92	CU M
SP9	Day 4	06.23.2004	16.25	0.44985	CU M/Min	3137.46	CU M
SP9	Day 4	06.23.2004	16.3	0.41405	CU M/Min	3139.08	CU M
SP9	Day 4	06.23.2004	16.35	0.449116667	CU M/Min	3140.62	CU M
SP9	Day 4	06.23.2004	16.4	0.415616667	CU M/Min	3142.23	CU M
SP9	Day 4	06.23.2004	16.45	0.458333333	CU M/Min	3143.65	CU M
SP9	Day 4	06.23.2004	16.5	0.419983333	CU M/Min	3145.25	CU M
SP9	Day 4	06.23.2004	16.55	0.454983333	CU M/Min	3146.8	CU M
SP9	Day 4	06.23.2004	17	0.414966667	CU M/Min	3148.41	CU M
SP9	Day 4	06.23.2004	17.05	0.449216667	CU M/Min	3149.96	CU M
SP9	Day 4	06.23.2004	17.1	0.412633333	CU M/Min	3151.57	CU M
SP9	Day 4	06.23.2004	17.15	0.456216667	CU M/Min	3153.12	CU M
SP9	Day 4	06.23.2004	17.2	0.41945	CU M/Min	3154.73	CU M
SP9	Day 4	06.23.2004	17.25	0.42565	CU M/Min	3156.27	CU M
SP9	Day 4	06.23.2004	17.3	0.34365	CU M/Min	3157.88	CU M
SP9	Day 4	06.23.2004	17.35	0.2045	CU M/Min	3159.42	CU M
SP9	Day 4	06.23.2004	17.4	0.1554	CU M/Min	3161.02	CU M
SP9	Day 4	06.23.2004	17.45	0.026816667	CU M/Min	3162.56	CU M
SP9	Day 4	06.23.2004	17.5	0.038366667	CU M/Min	3164.17	CU M
SP9	Day 4	06.23.2004	17.55	0.012383333	CU M/Min	3165.71	CU M
SP9	Day 4	06.23.2004	18	0	CU M/Min	3167.33	CU M
SP9	Day 4	06.23.2004	18.05	0.25255	CU M/Min	3168.64	CU M
SP9	Day 4	06.23.2004	18.1	0.215416667	CU M/Min	3169.76	CU M
SP9	Day 4	06.23.2004	18.15	0.246166667	CU M/Min	3170.43	CU M
SP9	Day 4	06.23.2004	18.2	0.212533333	CU M/Min	3171.56	CU M
SP9	Day 4	06.23.2004	18.25	0.4123	CU M/Min	3172.93	CU M
SP9	Day 4	06.23.2004	18.3	0.460866667	CU M/Min	3174.45	CU M
SP9	Day 4	06.23.2004	18.45	0.4234	CU M/Min	3179.23	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 4	06.23.2004	18.5	0.46435	CU M/Min	3180.77	CU M
SP9	Day 4	06.23.2004	18.55	0.43145	CU M/Min	3182.42	CU M
SP9	Day 4	06.23.2004	19	0.474816667	CU M/Min	3183.95	CU M
SP9	Day 4	06.23.2004	19.05	0.429683333	CU M/Min	3185.61	CU M
SP9	Day 4	06.23.2004	19.1	0.47795	CU M/Min	3187.05	CU M
SP9	Day 4	06.23.2004	19.15	0.423116667	CU M/Min	3188.71	CU M
SP9	Day 4	06.23.2004	19.2	0.467116667	CU M/Min	3190.22	CU M
SP9	Day 4	06.23.2004	19.25	0.432466667	CU M/Min	3191.89	CU M
SP9	Day 4	06.23.2004	19.3	0.475783333	CU M/Min	3193.37	CU M
SP9	Day 4	06.23.2004	19.35	0.434733333	CU M/Min	3195.02	CU M
SP9	Day 4	06.23.2004	19.4	0.49215	CU M/Min	3196.57	CU M
SP9	Day 4	06.23.2004	19.45	0.42905	CU M/Min	3198.27	CU M
SP9	Day 4	06.23.2004	19.5	0.48085	CU M/Min	3199.83	CU M
SP9	Day 4	06.23.2004	19.55	0.4294	CU M/Min	3201.53	CU M
SP9	Day 4	06.23.2004	20	0.494116667	CU M/Min	3203.02	CU M
SP9	Day 4	06.23.2004	20.05	0.424033333	CU M/Min	3204.67	CU M
SP9	Day 4	06.23.2004	20.1	0.496283333	CU M/Min	3206.24	CU M
SP9	Day 4	06.23.2004	20.15	0.431816667	CU M/Min	3207.93	CU M
SP9	Day 4	06.23.2004	20.2	0.492566667	CU M/Min	3209.49	CU M
SP9	Day 4	06.23.2004	20.25	0.4289	CU M/Min	3211.19	CU M
SP9	Day 4	06.23.2004	20.3	0.496633333	CU M/Min	3212.7	CU M
SP9	Day 4	06.23.2004	20.35	0.443333333	CU M/Min	3214.41	CU M
SP9	Day 4	06.23.2004	20.4	0.5039	CU M/Min	3215.98	CU M
SP9	Day 4	06.23.2004	20.45	0.4358	CU M/Min	3217.68	CU M
SP9	Day 4	06.23.2004	20.5	0.50095	CU M/Min	3219.25	CU M
SP9	Day 4	06.23.2004	20.55	0.445983333	CU M/Min	3220.96	CU M
SP9	Day 4	06.23.2004	21	0.506366667	CU M/Min	3222.52	CU M
SP9	Day 4	06.23.2004	21.05	0.436066667	CU M/Min	3224.22	CU M
SP9	Day 4	06.23.2004	21.1	0.508133333	CU M/Min	3225.79	CU M
SP9	Day 4	06.23.2004	21.15	0.429016667	CU M/Min	3227.51	CU M
SP9	Day 4	06.23.2004	21.2	0.507133333	CU M/Min	3229.08	CU M
SP9	Day 4	06.23.2004	21.25	0.432533333	CU M/Min	3230.78	CU M
SP9	Day 4	06.23.2004	21.3	0.490883333	CU M/Min	3232.35	CU M
SP9	Day 4	06.23.2004	21.35	0.432533333	CU M/Min	3234.05	CU M
SP9	Day 4	06.23.2004	21.4	0.514566667	CU M/Min	3235.62	CU M
SP9	Day 4	06.23.2004	21.45	0.436833333	CU M/Min	3237.32	CU M
SP9	Day 4	06.23.2004	21.5	0.504266667	CU M/Min	3238.88	CU M
SP9	Day 4	06.23.2004	21.55	0.419166667	CU M/Min	3240.58	CU M
SP9	Day 4	06.23.2004	22	0.50435	CU M/Min	3242.16	CU M
SP9	Day 4	06.23.2004	22.05	0.438716667	CU M/Min	3243.85	CU M
SP9	Day 4	06.23.2004	22.1	0.506266667	CU M/Min	3245.43	CU M
SP9	Day 4	06.23.2004	22.15	0.430516667	CU M/Min	3247.12	CU M
SP9	Day 4	06.23.2004	22.2	0.50005	CU M/Min	3248.7	CU M
SP9	Day 4	06.23.2004	22.25	0.43795	CU M/Min	3250.39	CU M
SP9	Day 4	06.23.2004	22.3	0.4992	CU M/Min	3251.97	CU M
SP9	Day 4	06.23.2004	22.35	0.43535	CU M/Min	3253.66	CU M
SP9	Day 4	06.23.2004	22.4	0.504	CU M/Min	3255.23	CU M
SP9	Day 4	06.23.2004	22.45	0.440983333	CU M/Min	3256.92	CU M
SP9	Day 4	06.23.2004	22.5	0.508833333	CU M/Min	3258.51	CU M
SP9	Day 4	06.23.2004	22.55	0.44035	CU M/Min	3260.2	CU M
SP9	Day 4	06.23.2004	23	0.5141	CU M/Min	3261.79	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 4	06.23.2004	23.05	0.43065	CU M/Min	3263.48	CU M
SP9	Day 4	06.23.2004	23.1	0.000933333	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.15	0	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.2	0.000133333	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.25	0.000516667	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.3	0	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.35	0.00045	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.4	0.000816667	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.45	1.66667E-05	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.5	0	CU M/Min	3264.17	CU M
SP9	Day 4	06.23.2004	23.55	0	CU M/Min	3264.17	CU M
SP9	Day 4	06.24.2004	0	0	CU M/Min	3264.17	CU M
SP9	Day 4	06.24.2004	0.05	0	CU M/Min	3264.17	CU M
SP9	Day 4	06.24.2004	0.1	0	CU M/Min	3264.17	CU M
SP9	Day 4	06.24.2004	0.15	0	CU M/Min	3264.17	CU M
SP9	Day 4	06.24.2004	0.2	0	CU M/Min	3264.16	CU M
SP9	Day 4	06.24.2004	0.25	0	CU M/Min	3264.16	CU M
SP9	Day 4	06.24.2004	0.3	0	CU M/Min	3264.16	CU M
SP9	Day 4	06.24.2004	0.35	0.000166667	CU M/Min	3264.16	CU M
SP9	Day 4	06.24.2004	0.4	0.000366667	CU M/Min	3264.16	CU M
SP9	Day 4	06.24.2004	0.45	0.0001	CU M/Min	3264.16	CU M
SP9	Day 4	06.24.2004	0.5	3.33333E-05	CU M/Min	3264.16	CU M
SP9	Day 4	06.24.2004	0.55	0	CU M/Min	3264.16	CU M
SP9	Day 4	06.24.2004	1	0	CU M/Min	3264.15	CU M
SP9	Day 4	06.24.2004	1.05	0.00015	CU M/Min	3264.15	CU M
SP9	Day 4	06.24.2004	1.1	0	CU M/Min	3264.15	CU M
SP9	Day 4	06.24.2004	1.15	0	CU M/Min	3264.15	CU M
SP9	Day 4	06.24.2004	1.2	0	CU M/Min	3264.15	CU M
SP9	Day 4	06.24.2004	1.25	0	CU M/Min	3264.15	CU M
SP9	Day 4	06.24.2004	1.3	0	CU M/Min	3264.14	CU M
SP9	Day 4	06.24.2004	1.35	0	CU M/Min	3264.14	CU M
SP9	Day 4	06.24.2004	1.4	0	CU M/Min	3264.14	CU M
SP9	Day 4	06.24.2004	1.45	0	CU M/Min	3264.14	CU M
SP9	Day 4	06.24.2004	1.5	0	CU M/Min	3264.14	CU M
SP9	Day 4	06.24.2004	1.55	0.027983333	CU M/Min	3265.49	CU M
SP9	Day 4	06.24.2004	2	0.007283333	CU M/Min	3267.08	CU M
SP9	Day 4	06.24.2004	2.05	0.001316667	CU M/Min	3268.74	CU M
SP9	Day 4	06.24.2004	2.1	0.158966667	CU M/Min	3269.49	CU M
SP9	Day 4	06.24.2004	2.15	0	CU M/Min	3269.64	CU M
SP9	Day 4	06.24.2004	2.2	0.1464	CU M/Min	3270.02	CU M
SP9	Day 4	06.24.2004	2.25	0.140583333	CU M/Min	3270.22	CU M
SP9	Day 4	06.24.2004	2.3	0.146483333	CU M/Min	3270.97	CU M
SP9	Day 4	06.24.2004	2.35	0.001033333	CU M/Min	3271.22	CU M
SP9	Day 4	06.24.2004	2.4	0.146483333	CU M/Min	3271.83	CU M
SP9	Day 4	06.24.2004	2.45	0	CU M/Min	3272.11	CU M
SP9	Day 4	06.24.2004	2.5	0.14655	CU M/Min	3272.68	CU M
SP9	Day 4	06.24.2004	2.55	0	CU M/Min	3273	CU M
SP9	Day 4	06.24.2004	3	0.150566667	CU M/Min	3273.53	CU M
SP9	Day 4	06.24.2004	3.05	0	CU M/Min	3274.01	CU M
SP9	Day 4	06.24.2004	3.1	0.481533333	CU M/Min	3275.92	CU M
SP9	Day 4	06.24.2004	3.15	0.439666667	CU M/Min	3277.68	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 4	06.24.2004	3.2	0.500433333	CU M/Min	3279.14	CU M
SP9	Day 4	06.24.2004	3.25	0.43645	CU M/Min	3280.97	CU M
SP9	Day 4	06.24.2004	3.3	0.493066667	CU M/Min	3282.44	CU M
SP9	Day 4	06.24.2004	3.35	0.437233333	CU M/Min	3284.25	CU M
SP9	Day 4	06.24.2004	3.4	0.492283333	CU M/Min	3285.71	CU M
SP9	Day 4	06.24.2004	3.45	0.438966667	CU M/Min	3287.51	CU M
SP9	Day 4	06.24.2004	3.5	0.495216667	CU M/Min	3288.97	CU M
SP9	Day 4	06.24.2004	3.55	0.422283333	CU M/Min	3290.75	CU M
SP9	Day 4	06.24.2004	4	0.49385	CU M/Min	3292.23	CU M
SP9	Day 4	06.24.2004	4.05	0.233866667	CU M/Min	3293.89	CU M
SP9	Day 4	06.24.2004	4.1	0.0007	CU M/Min	3294.53	CU M
SP9	Day 4	06.24.2004	4.15	0.239916667	CU M/Min	3295.29	CU M
SP9	Day 4	06.24.2004	4.2	0	CU M/Min	3295.99	CU M
SP9	Day 4	06.24.2004	4.25	0.229616667	CU M/Min	3296.94	CU M
SP9	Day 4	06.24.2004	4.3	0	CU M/Min	3297.71	CU M
SP9	Day 4	06.24.2004	4.35	0.235283333	CU M/Min	3298.59	CU M
SP9	Day 4	06.24.2004	4.4	0.245633333	CU M/Min	3299.4	CU M
SP9	Day 4	06.24.2004	4.45	0.237716667	CU M/Min	3300.24	CU M
SP9	Day 4	06.24.2004	4.5	0.226266667	CU M/Min	3301.05	CU M
SP9	Day 4	06.24.2004	4.55	0.234283333	CU M/Min	3301.88	CU M
SP9	Day 4	06.24.2004	5	0.168466667	CU M/Min	3302.69	CU M
SP9	Day 4	06.24.2004	5.05	0.423233333	CU M/Min	3304.05	CU M
SP9	Day 4	06.24.2004	5.1	0	CU M/Min	3305.72	CU M
SP9	Day 4	06.24.2004	5.15	0.005933333	CU M/Min	3307.26	CU M
SP9	Day 4	06.24.2004	5.2	0.1944	CU M/Min	3308.79	CU M
SP9	Day 4	06.24.2004	5.25	0.324	CU M/Min	3310.48	CU M
SP9	Day 4	06.24.2004	5.3	0.300683333	CU M/Min	3312	CU M
SP9	Day 4	06.24.2004	5.35	0.405766667	CU M/Min	3313.68	CU M
SP9	Day 4	06.24.2004	5.4	0.334416667	CU M/Min	3315.19	CU M
SP9	Day 4	06.24.2004	5.45	0.428616667	CU M/Min	3316.88	CU M
SP9	Day 4	06.24.2004	5.5	0.335466667	CU M/Min	3318.4	CU M
SP9	Day 4	06.24.2004	5.55	0.428233333	CU M/Min	3320.06	CU M
SP9	Day 5	06.24.2004	6	0.342666667	CU M/Min	3321.59	CU M
SP9	Day 5	06.24.2004	6.05	0.4293	CU M/Min	3323.24	CU M
SP9	Day 5	06.24.2004	6.1	0.332	CU M/Min	3324.77	CU M
SP9	Day 5	06.24.2004	6.15	0.425016667	CU M/Min	3326.45	CU M
SP9	Day 5	06.24.2004	6.2	0.33925	CU M/Min	3327.97	CU M
SP9	Day 5	06.24.2004	6.25	0.421483333	CU M/Min	3329.66	CU M
SP9	Day 5	06.24.2004	6.3	0.353883333	CU M/Min	3331.17	CU M
SP9	Day 5	06.24.2004	6.35	0.43055	CU M/Min	3332.87	CU M
SP9	Day 5	06.24.2004	6.4	0.34005	CU M/Min	3334.38	CU M
SP9	Day 5	06.24.2004	6.45	0.429466667	CU M/Min	3336.08	CU M
SP9	Day 5	06.24.2004	6.5	0.347983333	CU M/Min	3337.59	CU M
SP9	Day 5	06.24.2004	6.55	0.421616667	CU M/Min	3339.27	CU M
SP9	Day 5	06.24.2004	7	0.360266667	CU M/Min	3340.78	CU M
SP9	Day 5	06.24.2004	7.05	0.423233333	CU M/Min	3342.47	CU M
SP9	Day 5	06.24.2004	7.1	0.363933333	CU M/Min	3343.97	CU M
SP9	Day 5	06.24.2004	7.15	0.426033333	CU M/Min	3345.66	CU M
SP9	Day 5	06.24.2004	7.2	0.3684	CU M/Min	3347.17	CU M
SP9	Day 5	06.24.2004	7.25	0.42575	CU M/Min	3348.86	CU M
SP9	Day 5	06.24.2004	7.3	0.363633333	CU M/Min	3350.36	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 5	06.24.2004	7.35	0.419183333	CU M/Min	3352.01	CU M
SP9	Day 5	06.24.2004	7.4	0.373533333	CU M/Min	3353.51	CU M
SP9	Day 5	06.24.2004	7.45	0.425	CU M/Min	3355.2	CU M
SP9	Day 5	06.24.2004	7.5	0.370366667	CU M/Min	3356.7	CU M
SP9	Day 5	06.24.2004	7.55	0.421483333	CU M/Min	3358.38	CU M
SP9	Day 5	06.24.2004	8	0.377766667	CU M/Min	3359.88	CU M
SP9	Day 5	06.24.2004	8.05	0.423133333	CU M/Min	3361.57	CU M
SP9	Day 5	06.24.2004	8.1	0.3734	CU M/Min	3363.06	CU M
SP9	Day 5	06.24.2004	8.15	0.415016667	CU M/Min	3364.75	CU M
SP9	Day 5	06.24.2004	8.2	0.368166667	CU M/Min	3366.25	CU M
SP9	Day 5	06.24.2004	8.25	0.429566667	CU M/Min	3367.98	CU M
SP9	Day 5	06.24.2004	8.3	0.3797	CU M/Min	3369.47	CU M
SP9	Day 5	06.24.2004	8.35	0.405166667	CU M/Min	3371.15	CU M
SP9	Day 5	06.24.2004	8.4	0.382583333	CU M/Min	3372.65	CU M
SP9	Day 5	06.24.2004	8.45	0.415383333	CU M/Min	3374.34	CU M
SP9	Day 5	06.24.2004	8.5	0.398416667	CU M/Min	3375.82	CU M
SP9	Day 5	06.24.2004	8.55	0.424583333	CU M/Min	3377.52	CU M
SP9	Day 5	06.24.2004	9	0.402166667	CU M/Min	3379	CU M
SP9	Day 5	06.24.2004	9.05	0.4269	CU M/Min	3380.68	CU M
SP9	Day 5	06.24.2004	9.1	0.410916667	CU M/Min	3382.17	CU M
SP9	Day 5	06.24.2004	9.15	0.432216667	CU M/Min	3383.87	CU M
SP9	Day 5	06.24.2004	9.2	0.413766667	CU M/Min	3385.35	CU M
SP9	Day 5	06.24.2004	10	0.437133333	CU M/Min	3397.97	CU M
SP9	Day 5	06.24.2004	10.05	0.423016667	CU M/Min	3399.67	CU M
SP9	Day 5	06.24.2004	10.1	0.418383333	CU M/Min	3401.14	CU M
SP9	Day 5	06.24.2004	10.15	0.419766667	CU M/Min	3402.84	CU M
SP9	Day 5	06.24.2004	10.2	0.419866667	CU M/Min	3404.31	CU M
SP9	Day 5	06.24.2004	10.25	0.428483333	CU M/Min	3406	CU M
SP9	Day 5	06.24.2004	10.3	0.419916667	CU M/Min	3407.48	CU M
SP9	Day 5	06.24.2004	10.35	0.429583333	CU M/Min	3409.11	CU M
SP9	Day 5	06.24.2004	10.4	0.43185	CU M/Min	3410.59	CU M
SP9	Day 5	06.24.2004	10.45	0.4264	CU M/Min	3412.29	CU M
SP9	Day 5	06.24.2004	10.5	0.432833333	CU M/Min	3413.77	CU M
SP9	Day 5	06.24.2004	10.55	0.42885	CU M/Min	3415.45	CU M
SP9	Day 5	06.24.2004	11	0.428816667	CU M/Min	3416.93	CU M
SP9	Day 5	06.24.2004	11.05	0.4296	CU M/Min	3418.62	CU M
SP9	Day 5	06.24.2004	11.1	0.427666667	CU M/Min	3420.1	CU M
SP9	Day 5	06.24.2004	11.15	0.42595	CU M/Min	3421.79	CU M
SP9	Day 5	06.24.2004	11.2	0.437966667	CU M/Min	3423.27	CU M
SP9	Day 5	06.24.2004	11.25	0.429816667	CU M/Min	3424.93	CU M
SP9	Day 5	06.24.2004	11.3	0.43425	CU M/Min	3426.41	CU M
SP9	Day 5	06.24.2004	11.35	0.432683333	CU M/Min	3428.1	CU M
SP9	Day 5	06.24.2004	11.4	0.435366667	CU M/Min	3429.58	CU M
SP9	Day 5	06.24.2004	11.45	0.432966667	CU M/Min	3431.27	CU M
SP9	Day 5	06.24.2004	11.5	0.4488	CU M/Min	3432.75	CU M
SP9	Day 5	06.24.2004	11.55	0.426283333	CU M/Min	3434.44	CU M
SP9	Day 5	06.24.2004	12	0.451833333	CU M/Min	3435.91	CU M
SP9	Day 5	06.24.2004	12.05	0.43255	CU M/Min	3437.6	CU M
SP9	Day 5	06.24.2004	12.1	0.449183333	CU M/Min	3439.08	CU M
SP9	Day 5	06.24.2004	12.15	0.418883333	CU M/Min	3440.83	CU M
SP9	Day 5	06.24.2004	12.2	0.4075	CU M/Min	3442.31	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 5	06.24.2004	12.25	0.076983333	CU M/Min	3443.99	CU M
SP9	Day 5	06.24.2004	12.3	0.017333333	CU M/Min	3445.45	CU M
SP9	Day 5	06.24.2004	12.35	0.007733333	CU M/Min	3447.12	CU M
SP9	Day 5	06.24.2004	12.4	0.005616667	CU M/Min	3448.59	CU M
SP9	Day 5	06.24.2004	12.45	0	CU M/Min	3450.27	CU M
SP9	Day 5	06.24.2004	12.5	0	CU M/Min	3451.74	CU M
SP9	Day 5	06.24.2004	12.55	0	CU M/Min	3453.42	CU M
SP9	Day 5	06.24.2004	13	0.003883333	CU M/Min	3454.89	CU M
SP9	Day 5	06.24.2004	13.05	0.004383333	CU M/Min	3456.57	CU M
SP9	Day 5	06.24.2004	13.1	0.000333333	CU M/Min	3458.04	CU M
SP9	Day 5	06.24.2004	13.15	0	CU M/Min	3459.71	CU M
SP9	Day 5	06.24.2004	13.2	0	CU M/Min	3461.18	CU M
SP9	Day 5	06.24.2004	13.25	0.002066667	CU M/Min	3462.85	CU M
SP9	Day 5	06.24.2004	13.3	0.000783333	CU M/Min	3464.33	CU M
SP9	Day 5	06.24.2004	13.35	0.1233	CU M/Min	3466	CU M
SP9	Day 5	06.24.2004	13.4	0.0352	CU M/Min	3467.47	CU M
SP9	Day 5	06.24.2004	13.45	0.1874	CU M/Min	3469.13	CU M
SP9	Day 5	06.24.2004	13.5	0.153733333	CU M/Min	3470.59	CU M
SP9	Day 5	06.24.2004	13.55	0.230466667	CU M/Min	3472.27	CU M
SP9	Day 5	06.24.2004	14	0.1519	CU M/Min	3473.74	CU M
SP9	Day 5	06.24.2004	14.05	0.2202	CU M/Min	3475.4	CU M
SP9	Day 5	06.24.2004	14.1	0.163283333	CU M/Min	3476.87	CU M
SP9	Day 5	06.24.2004	14.15	0.2236	CU M/Min	3478.53	CU M
SP9	Day 5	06.24.2004	14.2	0.149866667	CU M/Min	3480	CU M
SP9	Day 5	06.24.2004	14.25	0.220733333	CU M/Min	3481.67	CU M
SP9	Day 5	06.24.2004	14.3	0.143166667	CU M/Min	3483.14	CU M
SP9	Day 5	06.24.2004	14.35	0.218483333	CU M/Min	3484.81	CU M
SP9	Day 5	06.24.2004	14.4	0.1474	CU M/Min	3486.29	CU M
SP9	Day 5	06.24.2004	14.45	0.22005	CU M/Min	3487.95	CU M
SP9	Day 5	06.24.2004	14.5	0.154983333	CU M/Min	3489.42	CU M
SP9	Day 5	06.24.2004	14.55	0.218633333	CU M/Min	3491.09	CU M
SP9	Day 5	06.24.2004	15	0.158383333	CU M/Min	3492.56	CU M
SP9	Day 5	06.24.2004	15.05	0.223233333	CU M/Min	3494.23	CU M
SP9	Day 5	06.24.2004	15.1	0.153783333	CU M/Min	3495.69	CU M
SP9	Day 5	06.24.2004	15.15	0.231166667	CU M/Min	3497.37	CU M
SP9	Day 5	06.24.2004	15.2	0.159533333	CU M/Min	3498.83	CU M
SP9	Day 5	06.24.2004	15.25	0.219216667	CU M/Min	3500.51	CU M
SP9	Day 5	06.24.2004	15.3	0.152633333	CU M/Min	3501.97	CU M
SP9	Day 5	06.24.2004	15.35	0.21975	CU M/Min	3503.62	CU M
SP9	Day 5	06.24.2004	15.4	0.159933333	CU M/Min	3505.07	CU M
SP9	Day 5	06.24.2004	15.45	0.228166667	CU M/Min	3506.76	CU M
SP9	Day 5	06.24.2004	15.5	0.154566667	CU M/Min	3508.21	CU M
SP9	Day 5	06.24.2004	15.55	0.220233333	CU M/Min	3509.89	CU M
SP9	Day 5	06.24.2004	16	0.1576	CU M/Min	3511.34	CU M
SP9	Day 5	06.24.2004	16.05	0.21805	CU M/Min	3513.04	CU M
SP9	Day 5	06.24.2004	16.1	0.149583333	CU M/Min	3514.49	CU M
SP9	Day 5	06.24.2004	16.15	0.212733333	CU M/Min	3516.18	CU M
SP9	Day 5	06.24.2004	16.2	0.157633333	CU M/Min	3517.62	CU M
SP9	Day 5	06.24.2004	16.25	0.21335	CU M/Min	3519.3	CU M
SP9	Day 5	06.24.2004	16.3	0.153433333	CU M/Min	3520.74	CU M
SP9	Day 5	06.24.2004	16.35	0.212283333	CU M/Min	3522.43	CU M

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Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 5	06.24.2004	16.4	0.1572	CU M/Min	3523.86	CU M
SP9	Day 5	06.24.2004	16.45	0.214633333	CU M/Min	3525.56	CU M
SP9	Day 5	06.24.2004	16.5	0.1564	CU M/Min	3527	CU M
SP9	Day 5	06.24.2004	16.55	0.00825	CU M/Min	3528.69	CU M
SP9	Day 5	06.24.2004	17	0.148716667	CU M/Min	3530.14	CU M
SP9	Day 5	06.24.2004	17.05	0	CU M/Min	3531.82	CU M
SP9	Day 5	06.24.2004	17.1	0.158416667	CU M/Min	3533.27	CU M
SP9	Day 5	06.24.2004	17.15	0	CU M/Min	3534.85	CU M
SP9	Day 5	06.24.2004	17.2	0.00815	CU M/Min	3536.29	CU M
SP9	Day 5	06.24.2004	17.25	0.004833333	CU M/Min	3537.97	CU M
SP9	Day 5	06.24.2004	17.3	0	CU M/Min	3539.41	CU M
SP9	Day 5	06.24.2004	17.35	0.003966667	CU M/Min	3541.09	CU M
SP9	Day 5	06.24.2004	17.4	0.00155	CU M/Min	3542.53	CU M
SP9	Day 5	06.24.2004	17.45	0	CU M/Min	3544.22	CU M
SP9	Day 5	06.24.2004	17.5	0	CU M/Min	3545.67	CU M
SP9	Day 5	06.24.2004	17.55	0.409966667	CU M/Min	3547.33	CU M
SP9	Day 5	06.24.2004	18	0.0008	CU M/Min	3548.76	CU M
SP9	Day 5	06.24.2004	18.05	0.412	CU M/Min	3550.45	CU M
SP9	Day 5	06.24.2004	18.1	0.000866667	CU M/Min	3551.14	CU M
SP9	Day 5	06.24.2004	18.15	0.2103	CU M/Min	3552.29	CU M
SP9	Day 5	06.24.2004	18.2	0.002866667	CU M/Min	3552.93	CU M
SP9	Day 5	06.24.2004	18.25	0.425683333	CU M/Min	3554.16	CU M
SP9	Day 5	06.24.2004	18.3	0.4631	CU M/Min	3555.56	CU M
SP9	Day 5	06.24.2004	18.35	0.418366667	CU M/Min	3557.23	CU M
SP9	Day 5	06.24.2004	18.4	0.44445	CU M/Min	3558.71	CU M
SP9	Day 5	06.24.2004	18.45	0.42205	CU M/Min	3560.38	CU M
SP9	Day 5	06.24.2004	18.5	0.454733333	CU M/Min	3561.88	CU M
SP9	Day 5	06.24.2004	18.55	0.4282	CU M/Min	3563.56	CU M
SP9	Day 5	06.24.2004	19	0.452116667	CU M/Min	3565.06	CU M
SP9	Day 5	06.24.2004	19.05	0.433	CU M/Min	3566.76	CU M
SP9	Day 5	06.24.2004	19.1	0.4276	CU M/Min	3568.23	CU M
SP9	Day 5	06.24.2004	19.15	0.409283333	CU M/Min	3569.86	CU M
SP9	Day 5	06.24.2004	19.2	0.4339	CU M/Min	3571.29	CU M
SP9	Day 5	06.24.2004	19.25	0.425033333	CU M/Min	3572.92	CU M
SP9	Day 5	06.24.2004	19.3	0.436933333	CU M/Min	3574.39	CU M
SP9	Day 5	06.24.2004	19.35	0.433583333	CU M/Min	3576.09	CU M
SP9	Day 5	06.24.2004	19.4	0.452266667	CU M/Min	3577.6	CU M
SP9	Day 5	06.24.2004	19.45	0.4352	CU M/Min	3579.31	CU M
SP9	Day 5	06.24.2004	19.5	0.444033333	CU M/Min	3580.83	CU M
SP9	Day 5	06.24.2004	19.55	0.226483333	CU M/Min	3582.53	CU M
SP9	Day 5	06.24.2004	20	0.117366667	CU M/Min	3584.05	CU M
SP9	Day 5	06.24.2004	20.05	0.0198	CU M/Min	3585.76	CU M
SP9	Day 5	06.24.2004	20.1	0.029383333	CU M/Min	3587.27	CU M
SP9	Day 5	06.24.2004	20.15	0.018833333	CU M/Min	3588.98	CU M
SP9	Day 5	06.24.2004	20.2	0.008866667	CU M/Min	3590.49	CU M
SP9	Day 5	06.24.2004	20.25	0.000416667	CU M/Min	3592.2	CU M
SP9	Day 5	06.24.2004	20.3	0.0025	CU M/Min	3593.72	CU M
SP9	Day 5	06.24.2004	20.35	0	CU M/Min	3595.41	CU M
SP9	Day 5	06.24.2004	20.4	0	CU M/Min	3596.93	CU M
SP9	Day 5	06.24.2004	20.45	0.003766667	CU M/Min	3598.59	CU M
SP9	Day 5	06.24.2004	20.5	0.004716667	CU M/Min	3600.1	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 5	06.24.2004	20.55	0	CU M/Min	3601.82	CU M
SP9	Day 5	06.24.2004	21	0	CU M/Min	3603.32	CU M
SP9	Day 5	06.24.2004	21.05	0	CU M/Min	3605.04	CU M
SP9	Day 5	06.24.2004	21.1	0.002383333	CU M/Min	3606.55	CU M
SP9	Day 5	06.24.2004	21.15	0.002616667	CU M/Min	3608.22	CU M
SP9	Day 5	06.24.2004	21.2	0	CU M/Min	3609.73	CU M
SP9	Day 5	06.24.2004	21.25	0.003433333	CU M/Min	3611.45	CU M
SP9	Day 5	06.24.2004	21.3	0.004816667	CU M/Min	3612.95	CU M
SP9	Day 5	06.24.2004	21.35	0.002	CU M/Min	3614.67	CU M
SP9	Day 5	06.24.2004	21.4	0.000866667	CU M/Min	3616.18	CU M
SP9	Day 5	06.24.2004	21.45	0	CU M/Min	3617.9	CU M
SP9	Day 5	06.24.2004	21.5	0	CU M/Min	3619.4	CU M
SP9	Day 5	06.24.2004	21.55	0.0872	CU M/Min	3621.11	CU M
SP9	Day 5	06.24.2004	22	0.0642	CU M/Min	3622.61	CU M
SP9	Day 5	06.24.2004	22.05	0.191933333	CU M/Min	3624.33	CU M
SP9	Day 5	06.24.2004	22.1	0.130083333	CU M/Min	3625.84	CU M
SP9	Day 5	06.24.2004	22.15	0.22575	CU M/Min	3627.55	CU M
SP9	Day 5	06.24.2004	22.2	0.153933333	CU M/Min	3629.05	CU M
SP9	Day 5	06.24.2004	22.25	0.2411	CU M/Min	3630.77	CU M
SP9	Day 5	06.24.2004	22.3	0.153383333	CU M/Min	3632.27	CU M
SP9	Day 5	06.24.2004	22.35	0.242733333	CU M/Min	3633.99	CU M
SP9	Day 5	06.24.2004	22.4	0.14735	CU M/Min	3635.5	CU M
SP9	Day 5	06.24.2004	22.45	0.241566667	CU M/Min	3637.21	CU M
SP9	Day 5	06.24.2004	22.5	0.158833333	CU M/Min	3638.72	CU M
SP9	Day 5	06.24.2004	22.55	0.232383333	CU M/Min	3640.24	CU M
SP9	Day 5	06.24.2004	23	0.16665	CU M/Min	3641.74	CU M
SP9	Day 5	06.24.2004	23.05	0.2404	CU M/Min	3643.45	CU M
SP9	Day 5	06.24.2004	23.1	0.152666667	CU M/Min	3644.96	CU M
SP9	Day 5	06.24.2004	23.15	0.232866667	CU M/Min	3646.66	CU M
SP9	Day 5	06.24.2004	23.2	0.156483333	CU M/Min	3648.17	CU M
SP9	Day 5	06.24.2004	23.25	0.233783333	CU M/Min	3649.89	CU M
SP9	Day 5	06.24.2004	23.3	0.1479	CU M/Min	3651.4	CU M
SP9	Day 5	06.24.2004	23.35	0.237383333	CU M/Min	3653.1	CU M
SP9	Day 5	06.24.2004	23.4	0.148216667	CU M/Min	3654.61	CU M
SP9	Day 5	06.24.2004	23.45	0.236233333	CU M/Min	3656.31	CU M
SP9	Day 5	06.24.2004	23.5	0.14975	CU M/Min	3657.81	CU M
SP9	Day 5	06.24.2004	23.55	0.238216667	CU M/Min	3659.5	CU M
SP9	Day 5	06.25.2004	0	0.152183333	CU M/Min	3661	CU M
SP9	Day 5	06.25.2004	0.05	0.232016667	CU M/Min	3662.76	CU M
SP9	Day 5	06.25.2004	0.1	0.145816667	CU M/Min	3664.26	CU M
SP9	Day 5	06.25.2004	0.15	0.236666667	CU M/Min	3665	CU M
SP9	Day 5	06.25.2004	0.2	0.151133333	CU M/Min	3665.99	CU M
SP9	Day 5	06.25.2004	0.25	0.237966667	CU M/Min	3667.04	CU M
SP9	Day 5	06.25.2004	0.3	0.148533333	CU M/Min	3668.52	CU M
SP9	Day 5	06.25.2004	0.35	0.240816667	CU M/Min	3669.87	CU M
SP9	Day 5	06.25.2004	1	0.155	CU M/Min	3677.65	CU M
SP9	Day 5	06.25.2004	1.05	0.2323	CU M/Min	3679.11	CU M
SP9	Day 5	06.25.2004	1.1	0.150716667	CU M/Min	3680.59	CU M
SP9	Day 5	06.25.2004	1.15	0.2436	CU M/Min	3682.05	CU M
SP9	Day 5	06.25.2004	1.2	0.153083333	CU M/Min	3683.54	CU M
SP9	Day 5	06.25.2004	1.25	0.238883333	CU M/Min	3685.19	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 5	06.25.2004	1.3	0.14485	CU M/Min	3686.69	CU M
SP9	Day 5	06.25.2004	1.35	0.2348	CU M/Min	3688.22	CU M
SP9	Day 5	06.25.2004	1.4	0.156383333	CU M/Min	3689.39	CU M
SP9	Day 5	06.25.2004	1.45	0.237033333	CU M/Min	3691.13	CU M
SP9	Day 5	06.25.2004	1.5	0.15525	CU M/Min	3692.62	CU M
SP9	Day 5	06.25.2004	1.55	0.222366667	CU M/Min	3694.36	CU M
SP9	Day 5	06.25.2004	2	0.156033333	CU M/Min	3695.85	CU M
SP9	Day 5	06.25.2004	2.05	0.234483333	CU M/Min	3697.61	CU M
SP9	Day 5	06.25.2004	2.1	0.150316667	CU M/Min	3698.92	CU M
SP9	Day 5	06.25.2004	2.15	0.00235	CU M/Min	3699.45	CU M
SP9	Day 5	06.25.2004	2.2	0.146716667	CU M/Min	3699.45	CU M
SP9	Day 5	06.25.2004	2.25	0.1393	CU M/Min	3700	CU M
SP9	Day 5	06.25.2004	2.3	0.158933333	CU M/Min	3700.39	CU M
SP9	Day 5	06.25.2004	2.35	0.14035	CU M/Min	3700.94	CU M
SP9	Day 5	06.25.2004	2.4	0.147	CU M/Min	3701.23	CU M
SP9	Day 5	06.25.2004	2.45	0.135983333	CU M/Min	3701.78	CU M
SP9	Day 5	06.25.2004	2.5	0.151883333	CU M/Min	3702.07	CU M
SP9	Day 5	06.25.2004	2.55	0.001333333	CU M/Min	3702.63	CU M
SP9	Day 5	06.25.2004	3	0.144166667	CU M/Min	3702.91	CU M
SP9	Day 5	06.25.2004	3.05	0.001183333	CU M/Min	3703.51	CU M
SP9	Day 5	06.25.2004	3.1	0.475783333	CU M/Min	3704.4	CU M
SP9	Day 5	06.25.2004	3.15	0.243983333	CU M/Min	3706.59	CU M
SP9	Day 5	06.25.2004	3.2	0.146416667	CU M/Min	3708.17	CU M
SP9	Day 5	06.25.2004	3.25	0.27015	CU M/Min	3709.77	CU M
SP9	Day 5	06.25.2004	3.3	0.15615	CU M/Min	3711.38	CU M
SP9	Day 5	06.25.2004	3.35	0.259283333	CU M/Min	3713.03	CU M
SP9	Day 5	06.25.2004	3.4	0.152083333	CU M/Min	3714.63	CU M
SP9	Day 5	06.25.2004	3.45	0.24795	CU M/Min	3716.28	CU M
SP9	Day 5	06.25.2004	3.5	0.145883333	CU M/Min	3717.86	CU M
SP9	Day 5	06.25.2004	3.55	0.2379	CU M/Min	3719.52	CU M
SP9	Day 5	06.25.2004	4	0.154616667	CU M/Min	3721.09	CU M
SP9	Day 5	06.25.2004	4.05	0.246333333	CU M/Min	3722.74	CU M
SP9	Day 5	06.25.2004	4.1	0.000133333	CU M/Min	3723.77	CU M
SP9	Day 5	06.25.2004	4.15	0.253683333	CU M/Min	3724.11	CU M
SP9	Day 5	06.25.2004	4.2	0.004566667	CU M/Min	3725.22	CU M
SP9	Day 5	06.25.2004	4.25	0.270316667	CU M/Min	3725.73	CU M
SP9	Day 5	06.25.2004	4.3	0.21345	CU M/Min	3726.88	CU M
SP9	Day 5	06.25.2004	4.45	0.300783333	CU M/Min	3728.94	CU M
SP9	Day 5	06.25.2004	4.5	0.210383333	CU M/Min	3730.12	CU M
SP9	Day 5	06.25.2004	4.55	0.298316667	CU M/Min	3730.54	CU M
SP9	Day 5	06.25.2004	5	0.216516667	CU M/Min	3731.74	CU M
SP9	Day 5	06.25.2004	5.05	0.493133333	CU M/Min	3732.22	CU M
SP9	Day 5	06.25.2004	5.1	0.408366667	CU M/Min	3734.39	CU M
SP9	Day 5	06.25.2004	5.15	0.472933333	CU M/Min	3735.84	CU M
SP9	Day 5	06.25.2004	5.2	0.4151	CU M/Min	3737.53	CU M
SP9	Day 5	06.25.2004	5.25	0	CU M/Min	3738.83	CU M
SP9	Day 5	06.25.2004	5.3	0.434266667	CU M/Min	3740.03	CU M
SP9	Day 5	06.25.2004	5.35	0.511916667	CU M/Min	3741.53	CU M
SP9	Day 5	06.25.2004	5.4	0.4188	CU M/Min	3743.24	CU M
SP9	Day 5	06.25.2004	5.45	0.49875	CU M/Min	3744.73	CU M
SP9	Day 5	06.25.2004	5.5	0.418183333	CU M/Min	3746.43	CU M

Appendix B-1
Raw Flow Data from Strap-On Flow Meter Installed at Effluent (SP-9)
18 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow	Flow Units	Total Flow	Flow Units
SP9	Day 5	06.25.2004	5.55	0.501633333	CU M/Min	3747.92	CU M
SP9	Day 6	06.25.2004	6	0.426216667	CU M/Min	3749.61	CU M
SP9	Day 6	06.25.2004	6.05	0.502933333	CU M/Min	3751.11	CU M
SP9	Day 6	06.25.2004	6.1	0.4253	CU M/Min	3752.81	CU M
SP9	Day 6	06.25.2004	6.15	0.493633333	CU M/Min	3754.32	CU M
SP9	Day 6	06.25.2004	6.2	0.42115	CU M/Min	3756.01	CU M
SP9	Day 6	06.25.2004	6.25	0.507783333	CU M/Min	3757.51	CU M
SP9	Day 6	06.25.2004	6.3	0.4257	CU M/Min	3759.2	CU M
SP9	Day 6	06.25.2004	6.35	0	CU M/Min	3760.51	CU M

Appendix B-2
Raw Flow Data From Veendam's In-Line Flow Meter
Blackwater Influent to Treatment
20 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow Meter Reading (cu m)	Total Flow Between Totalizer Readings (cu m)
BW	Day 1	6/20/2004	0625	75,815	
BW	Day 1	6/20/2004	0744	75,822	7
BW	Day 1	6/20/2004	1210	75,846	24
BW	Day 1	6/20/2004	1840	75,878	32
BW	Day 1	6/21/2004	0055	75,908	30
BW	Day 2	6/21/2004	0654	75,935	27
BW	Day 2	6/21/2004	1237	75,967	32
BW	Day 2	6/21/2004	1915	76,002	35
BW	Day 2	6/22/2004	0213	76,040	38
BW	Day 3	6/22/2004	0903	76,071	31
BW	Day 3	6/22/2004	1122	76,085	14
BW	Day 3	6/22/2004	1910	76,125	40
BW	Day 3	6/23/2004	0140	76,159	34
BW	Day 4	6/23/2004	0750	76,185	26
BW	Day 4	6/23/2004	1251	76,210	25
BW	Day 4	6/23/2004	1833	76,237	27
BW	Day 4	6/24/2004	0545	76,288	51
BW	Day 5	6/24/2004	1253	76,329	41
BW	Day 5	6/24/2004	1940	76,362	33
BW	Day 5	6/25/2004	0340	76,396	34

Appendix B-2
Raw Flow Data From Veendam's In-Line Flow Meter
Graywater Influent to Treatment
20 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow Meter Reading (cu m)	Total Flow Between Totalizer Readings (cu m)
GW	Day 1	6/20/2004	0624	372,575	
GW	Day 1	6/20/2004	0744	372,586	11
GW	Day 1	6/20/2004	1210	372,640	54
GW	Day 1	6/20/2004	1840	372,735	95
GW	Day 1	6/21/2004	0055	372,823	88
GW	Day 2	6/21/2004	0654	372,893	70
GW	Day 2	6/21/2004	1238	372,970	77
GW	Day 2	6/21/2004	1915	373,063	93
GW	Day 2	6/22/2004	0212	373,154	91
GW	Day 3	6/22/2004	0902	373,228	74
GW	Day 3	6/22/2004	1124	373,263	35
GW	Day 3	6/22/2004	1910	373,376	113
GW	Day 3	6/23/2004	0140	373,462	86
GW	Day 4	6/23/2004	0749	373,522	60
GW	Day 4	6/23/2004	1250	373,586	64
GW	Day 4	6/23/2004	1833	373,666	80
GW	Day 5	6/24/2004	0545	373,805	139
GW	Day 5	6/24/2004	1252	373,893	88
GW	Day 5	6/24/2004	1940	373,985	92
GW	Day 5	6/25/2004	0340	374,078	93

Appendix B-2
Raw Flow Data From Veendam's In-Line Flow Meter
Effluent from Treatment (SP-9)
20 June Through 25 June 2004

Sample Point	Day	Date	Time	Flow Meter Reading (cu m)	Total Flow Between Totalizer Readings (cu m)
SP-9	Day 1	6/20/2004	0623	299,704	
SP-9	Day 1	6/20/2004	0744	299,724	20
SP-9	Day 1	6/20/2004	1210	299,816	92
SP-9	Day 1	6/20/2004	1840	299,951	135
SP-9	Day 1	6/21/2004	0055	300,000	49
SP-9	Day 2	6/21/2004	0654	300,125	125
SP-9	Day 2	6/21/2004	1234	300,215	90
SP-9	Day 2	6/21/2004	1915	300,346	131
SP-9	Day 2	6/22/2004	0215	300,483	137
SP-9	Day 3	6/22/2004	0915	300,551	68
SP-9	Day 3	6/22/2004	1121	300,551	0
SP-9	Day 3	6/22/2004	1910	300,551	0
SP-9	Day 3	6/23/2004	0140	300,634	83
SP-9	Day 4	6/23/2004	0748	300,729	95
SP-9	Day 4	6/23/2004	1249	300,824	95
SP-9	Day 4	6/23/2004	1833	300,929	105
SP-9	Day 4	6/24/2004	0545	301,067	138
SP-9	Day 5	6/24/2004	1251	301,201	134
SP-9	Day 5	6/24/2004	1940	301,326	125
SP-9	Day 5	6/25/2004	0340	301,464	138

Appendix C

INTERVIEW RESULTS FOR ACTIVITIES THAT IMPACT WASTEWATER GENERATION

GRAYWATER GENERATION DATA SHEET

Vessel: Holland America Veendam
Date: 6/22/04
Recorded By: D. Falatko
Vessel Point(s) of Contact: Stephen Schuetz, Assistant Food and Beverage Manager
Hobben Sitanggang, Chief Housekeeper

Number of Passengers and Number of Crew Actually on Board:
This cruise includes 1,300 passengers and 520 crew.

Unusual Maintenance or Operational Activities Described By Vessel Point(s) of Contact:

None

Number and Time of Meals Served by Day (include passengers and crew) :
On average, passengers and crew eat 3.5 to 4 meals per day. This includes late night snacks and food at bars. The Veendam budgets for 5,500 to 6,000 meals per day, including crew. The galleys operate at different times on port days, but basically the same number of meals as during ocean days.

Lido
Breakfast: 1,300 passengers + 150 officers
Lunch: 1,200 passengers + 150 officers
Dinner: 180 passengers + 150 officers
Late Night Snack: 30 passengers + 30 officers

Rotterdam Dining Room
Breakfast: 150 passengers
Lunch: 200 passengers
Dinner: 1,200 passengers

Room Service, Teatime, Snacks approx. 250 meals.

Were Dishwashers Operated? (Circle one) Yes / No
Yes. The main galley (Rotterdam) has 2 dishwashers (china and cutlery), 1 glass washer, and 1 pot wash (hand wash and rinse, plus SOMAT). The Lido has 1 pot wash and 1 dish/cutlery washer.

In the main galley (Rotterdam), the dishwashers operate from 1800 to 2400.

If yes, what weight, number of pieces, or number of loads were washed?
What times were dishes washed by day? Main galley dishwashers operate from1800 to 2400. All main galley washers operate in the evening. Only one dishwasher operates in the morning to handle to small number of meals served at that time.

Was Laundry Washed? (Circle one) **Yes** / No
Yes.

If yes, number of hours per day laundry was operated: 24 hours per day.
Weight, number of pieces, or number of loads washed per day:
Approximately 5 loads of towels and 2 loads of linens are washed each day. On change-over days, such as in Vancouver, more loads of linen are washed. The current washers are loaded until full of laundry (i.e., not filled by weight or number of pieces). Next month the Veendam will receive a new washer that measures the weight (kg) of each load.
What times were laundry washed by day?
Most laundry is washed from approx 9 pm or 10 pm to 2 am each day. Most laundry wastewater is generated during these times. From 2 am to 10 pm, much less laundry is washed.
Estimated volume of water per load: Unknown.
Detergent and other chemicals names (obtain MSDS if available):
All laundry chemicals provided by Johnson Diversey:
Diver Alik - Liquid alkali. Contains 10% to 30% NaOH and 3% to 7% sodium nitrolotriacetate.
Renew Extra - Liquid laundry detergent. Contains 10% to 30% linear alcohol ethoxylate, 3% to 7% sodium dodecylbenzene solfonate, and 3% to 7% ethylene glycol monobutyl ether.
Super Impede - Stain remover.
Divercide 6F - Liquid laundry sour. A silicofluorides mineral acid. Contains 10% to 30% hydrofluorosilicic acid.
Valid II - Fabric softener. A cationic surfactant containing 10% to 30% ditallow diamido methosulphate and 1% to 5% isopropanol.

SPECIAL WASTES GENERATION AND DISPOSITION DATA SHEET

Vessel: Holland America Veendam
Date:6/25/04
Recorded by: D. Falatko

Photo Lab(s) On Board: yes or no (circle one)
Yes

Waste handling and disposition:
Waste photographic chemicals are collected into drums.

Any waste treatment (e.g., silver recovery in photo lab)? What is the disposition of treated waste and any residuals (e.g., silver recovery filter and filtrate)?
A silver recovery unit retains silver within the filter. The filtrate is collected into a drum and tested for silver to determine whether or not it is hazardous. The filtrate is off loaded for disposal as either a hazardous or nonhazardous waste.

Inspect area for floor drains. Are drains blocked or open? Where do the floor drains lead? Describe any streams that enter the floor drains.
The photo lab has no floor drains. The lab experienced a burst pipe a few days prior, which flooded into public areas.

Inspect area for sinks. Is sink drain blocked or open? What is the disposition of sink water? What streams enter or potentially the sink (e.g., hand washing, rinse/clean equipment, prepare chemical solutions)?
A lab sink is used to rinse chemical trays, etc. The sink is completely blocked. Lab staff try to minimize rinse water because the sink contents are pumped to the silver recovery unit.

Inspect area for chemical storage. Are chemicals stored over a sump or other secondary containment?
The drums are located on a sump/containment area to catch any spills.

SPECIAL WASTES GENERATION AND DISPOSITION DATA SHEET

Vessel: Holland America Veendam
Date:6/25/04
Recorded by: D. Falatko

Print Shop(s) On Board: yes or no (circle one)
Yes

Waste handling and disposition:
Did not observe any print shop wastes.

Any waste treatment (e.g., silver recovery in photo lab)? What is the disposition of treated waste and any residuals (e.g., silver recovery filter and filtrate)?
No waste treatment.

Inspect area for floor drains. Are drains blocked or open? Where do the floor drains lead? Describe any streams that enter the floor drains.
The print shop has no floor drains.

Inspect area for sinks. Is sink drain blocked or open? What is the disposition of sink water? What streams enter or potentially the sink (e.g., hand washing, rinse/clean equipment, prepare chemical solutions)?
A print shop sink is used for hand washing (print inks) and to dilute chemicals for use. The sink is plumbed to the accommodations graywater system. Print shop staff are careful not to overflow chemicals into the sink.

Inspect area for chemical storage. Are chemicals stored over a sump or other secondary containment?
Did not observe any chemical storage.

SPECIAL WASTES GENERATION AND DISPOSITION DATA SHEET

Vessel: Holland America Veendam
Date:6/25/04
Recorded by: D. Falatko

Dry Cleaning On Board: yes or no (circle one)
Yes

Waste handling and disposition:
Solvent waste is disposed of on shore as a hazardous waste.

Any waste treatment (e.g., silver recovery in photo lab)? What is the disposition of treated waste and any residuals (e.g., silver recovery filter and filtrate)?
No waste treatment.

Inspect area for floor drains. Are drains blocked or open? Where do the floor drains lead? Describe any streams that enter the floor drains.
Condensate cooling water drains to the forward holding tank, which joins the accommodations graywater system.

Inspect area for sinks. Is sink drain blocked or open? What is the disposition of sink water? What streams enter or potentially the sink (e.g., hand washing, rinse/clean equipment, prepare chemical solutions)?
A sink adjacent to the dry cleaning machine is used for hand washing. Squirt bottles containing stain removal chemicals are stored over the sink.

Inspect area for chemical storage. Are chemicals stored over a sump or other secondary containment?
Solvent is stored in plastic drums.
The dry cleaning machine, machine piping, and solvent storage are all located on containment sumps.

SPECIAL WASTES GENERATION AND DISPOSITION DATA SHEET

Vessel: Holland America Veendam
Date:6/25/04
Recorded by: D. Falatko

Chemical Storage Area On Board: yes or no (circle one)
Yes

Waste handling and disposition:
No wastes, only chemical storage.

Any waste treatment (e.g., silver recovery in photo lab)? What is the disposition of treated waste and any residuals (e.g., silver recovery filter and filtrate)?
Not applicable.

Inspect area for floor drains. Are drains blocked or open? Where do the floor drains lead? Describe any streams that enter the floor drains.
Didn't observe any floor drains, but difficult to inspect since storage pallets covered the floor.

Inspect area for sinks. Is sink drain blocked or open? What is the disposition of sink water? What streams enter or potentially the sink (e.g., hand washing, rinse/clean equipment, prepare chemical solutions)?
No sinks present in the chemical storage area.

Inspect area for chemical storage. Are chemicals stored over a sump or other secondary containment?
Chemicals include primarily laundry chemicals, general purpose cleaner for rooms, hand cleaner, etc. All chemicals are stored on pallets with no containment.

PESTICIDE, FUNGICIDE, AND RODENTICIDE USE DATA SHEET

Vessel: Holland America Veendam
Date: 6/23/04
Recorded by: D. Falatko
Vessel Point(s) of Contact: Paul Young, Second Officer, Safety/Pest Control

Pesticides Used On board: yes or no (circle one)
Yes.

Insect Monitoring: Use Maxforce (a.i. Fipronil) capsules to monitor ship for insects. The capsules contain the attractant, but don't allow water wash to enter (i.e., capsules protects against splashes, etc.). Traps the insects inside.
Insect Infestation: Veendam uses two types of poisons: Cykick (spray insecticide; a.i. Cyfluthrin) and Siegebait (crack, crevice, grout, tiles; a.i. Hydramethylnon). Insects that eat the poison lose the desire to eat. The poison is spread to other insects by eating the dead, pesticide-contaminated insects.
Amount used is unknown.
Did not obtain MSDS.

List Locations Where Pesticides are Normally Applied and Stored On Board and Dates Applied:
Monitoring capsules are placed in the galleys, bars, garbage rooms, and some cabins. They are tucked under refrigerators, ovens, etc. Bait traps are used at all times. The traps are inspected once per week.
Insect infestation sprays are used in insect harborages (cracks, crevices, etc.). Sprays are used when monitoring identifies an infestation. In general, sprays are used less often than once per week. Mr. Young would like to spray in the galley once per week as a precaution; however, his program is not quite yet organized.
Pesticides and traps are stored in a locker on B-deck.

Potential to Enter Graywater/Blackwater Systems (e.g., application, spills, floor drains)?
Floor washing is only possible means to enter graywater system. Storage locker does not have a floor drain.

There are always insects aboard, and the pest control officer's job is to keep the insects from becoming a problem. Insect traps don't work if the insects have alternative food sources. Once or twice per week the ship's crew takes apart and disinfects the galley equipment to remove potential insect food sources.

Person(s) Responsible for Pesticide Application: Second Officer, Safety/Pest Control

Fungicides Used On board: yes or no (circle one)
Fungicides not used on board Veendam.

Fungicide Name	Target Fungi	Amount Used/yr	MSDS Obtained (yes/no)
_____	_____	_____	_____
_____	_____	_____	_____

List Locations Where Fungicides are Normally Applied and Stored On Board and Dates Applied:

Potential to Enter Graywater/Blackwater Systems (e.g., application, spills, floor drains)?

Person(s) Responsible for Fungicide Application:

Rodenticide Used On Board: yes or no (circle one)
No rodenticides used. They have traps on board that they inspect; however, Mr. Young has never found any rats.
Every 6 months a contractor conducts an inspection and issues the ship a derat certificate.

Rodenticide Name	Target Rodent	Amount Used/yr	MSDS Obtained (yes/no)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

List Locations Where Rodenticides are Normally Applied and Stored On Board and Dates Applied:

Potential to Enter Graywater/Blackwater Systems (e.g., applications, spills, floor drains)?

Person(s) Responsible for Rodenticide Application:

COLLECTION, HOLDING, AND TRANSFER (CHT) TANK DATA SHEET

Vessel: Holland America Veendam
Date: 6/26/04
Recorded by: D. Falatko

Tank Number or Identification:
(1) Galley 1P* (capacity 37 m^3)
(2) Laundry 4C (capacity 47.4 m^3)
(3) Accommodations 1P*/2P/3S (capacities 11.1 m^3, 12.2 m^3, and 12.2 m^3)
(4) Graywater storage tanks 4S/4P (capacities 120 m^3 and 119 m^3)
(5) Graywater storage tanks 2S/2P (capacities 89 m^3 and 89 m^3)
(6) Graywater storage tanks 5S/5C/5P (capacities 183 m^3, 232 m^3, and 146 m^3)
(7) Biosolids and membrane cleaning wastewater (capacities 118 m^3 and 118 m^3)
(8) Food pulper wastewater (capacity unknown)
(9) Blackwater evacuation tanks (4 tanks, capacities unknown)

* The tank identification numbers for either the galley or accommodations holding tanks are incorrect. Tank log located in engine control room included this inconsistency.

Wastewater Source(s):
Galley, laundry, accommodations, and biosolids/membrane cleaning wastewater tanks as listed above. Other minor sources include:
- Garbage room floor drains to galley wastewater.
- Dry cleaning condensate cooling water drains to accommodations graywater system.
- Medical sinks and floor drains to blackwater system.
- All scuppers throughout ship, except for the galley and garbage room scuppers, drain to the accommodations graywater system.

The graywater storage tanks are used when additional untreated graywater storage capacity is needed (e.g., wastewater treatment system is down or operating at reduced capacity). Tanks 4S/4P are filled first, followed by 2S/2P, and then 5S/5C/5P. Note that only some double bottom holding tanks can be pumped to the wastewater treatment system. Tanks that cannot be pumped to treatment are pumped to direct discharge at sea outside 12 nm.

Tank Volume:_____ m^3 or gallons
See above.

Does the Tank Have Vacuum: yes or no (circle one):
Graywater is not under vacuum. Blackwater evacuation tanks are under vacuum.

Vacuum: ____ mm Hg
Blackwater tank volume unknown.
Tank Material of Construction:
Unknown.
Is this a double bottom tank: yes or no (circle one)?
Graywater storage tanks 4S/4P, 2S/2P, and 5S/5C/5P are double bottom tanks. The remaining graywater and blackwater tanks are not. The double bottom tanks are generally not used.

Normal Operating Volume: _____ m^3
Unknown.

Automated Tank Gauging and Discharge System: yes or no (circle one)
None of the graywater/blackwater holding tanks are tied into the engine control room monitoring system. All tanks discharge to the treatment system (or graywater storage) based on automatic high and low tank level indicators. Laundry holding tank appeared to operate on a timer, presumably to maintain a more constant feed to the wastewater treatment system.

Discharge Type: batch or continuous (circle one)
Tanks discharge based on tank level indicators.

Totalizer or Flow Meter on Discharge Line: yes or no (circle one)
No totalizers or flow meters on any holding or storage tanks.

Discharge Flow Rate: _____ m^3/min or m^3/day
See flow data collected via strap-on ultrasonic flow meters (Appendix D).

Wastewater Destination After Leaving the Tank:
Graywater holding tanks discharge to two graywater equalization tanks, each with 121 m^3 capacity, and then into the wastewater treatment system. Blackwater evacuation tanks discharge directly to the wastewater treatment system.

Approximate Diameter of Discharge Line: _____ inches
Pipe diameter information collected from measurement of pipe circumferences
(1) Galley - 6.05 in
(2) Laundry - 4.8 in
(3) Accommodations - 3.82 in
(4) Influent to Treatment - 4.77 in

Screens or Filters Present on Either Influent or Discharge Lines (describe):
Galley wastewater is pretreated using grease traps. Accommodations wastewater also pretreated by gross particle filters.

Chemical Additions to Tank:
No chemical addition to CHT tanks.

Chemical Name	Purpose	Amount	MSDS (yes/no)
_____	_____	_____ kg/day	_____
_____	_____	_____ kg/day	_____
_____	_____	_____ kg/day	_____

Is sludge removed from this tank (describe frequency, amount, destination)?:
Unknown whether CHT tanks are cleaned.

WASTEWATER TREATMENT UNIT DATA SHEET

Vessel: Holland America Veendam
Date: 6/26/04
Recorded by: D. Falatko

Description of Treatment Unit: ZeeWeed Membrane Bioreactor

Manufacturer: Zenon Environmental Inc.

Model: Unknown.

Design Drawings Obtained: yes or no (circle one) Yes

Design Capacity: _____ gpd or gpm (circle one)
Unknown.

Typical Operating Flow Rate: _____ gpd or gpm (circle one)
Daily wastewater treatment system production is approximately 600 m^3/day.

Operational period: _____ hours
The wastewater treatment system operates 24-hours per day.

Chemical Additions:
(1) Defoamer (rarely used) and caustic are added to the bioreactor. Nitrogen addition (ammonia) is no longer used, and has been disabled.
(2) The membrane chamber is periodically cleaned with sodium hypochlorite and acid.
(3) Citric acid and sodium hypochlorite are added to the membrane backwash tank on alternate days.

The membrane cleaning cycle is initiated when Zenon operators recommend, which is generally when the TMP (differential pressure across the membranes) reaches approximately -0.45 bars. The cleaning cycle requires two days. The first step of the cleaning cycle is to add two drums (406 L) of sodium hypochlorite to the membrane chamber, plus water from the permeate tanks to fill the chamber. The hypochlorite solution remains in the chamber overnight and is then wasted to tanks 6S/6P. Next, six bags at 25 kg each of citric acid are added to the chamber, plus water from the permeate tanks to fill the chamber. The solution remains in the chamber for six hours and is then wasted to tanks 6S/6P.

Electrical Requirements:
Unknown.

Sludge Generation: yes or no (circle one) Yes.

Screening solids are removed to the solids collection tank, which is equipped with a macerator pump to chop and recirculate the solids. Macerating the solids also serves to release additional water. As a result, four to five times per day the Zenon operator pumps the solids tank to screen filters to remove water. Approximately 15 to 20 m^3 of screening solids are generated monthly and disposed of on shore.

The Zenon operator measures the bioreactor TSS concentration to calculate the recommended waste biosludge volume. The typical TSS concentration is 11,759 mg/L. In Alaska, the target TSS concentration is 9,000 to 10,000, while in the Caribbean the target TSS concentration is 10,000 to 12,000. This difference is caused by differences in operating temperatures.

The waste biosludge volume is calculated as follows:
Waste (m^3) = Mixed liquor volume (m^3) x (1 - [Target TSS (mg/L)/Current TSS (mg/L)])
The calculated TSS values and other key measurements are provided to Zenon representatives daily via the internet.

The typical waste biosludge volume actually wasted is generally 15 m^3, regardless of the calculation. If additional waste volume is recommended by Zenon representatives, for example 20 m^3, then 15 m^3 would be wasted in the morning, with an additional 5 m^3 wasted in the evening.

Was maintenance performed on treatment unit: yes or no (circle one)
If maintenance was performed, estimate labor: _____ hours
Solids do accumulate on the membranes, and the membranes need to be cleaned physically. Physical cleaning is performed by the Zenon service technician. The membranes are cleaned with hoses, and the chamber is then pumped to tanks 6S/6P for discharge at sea outside 12 nm.

The UV lamp bulbs (quartz sleeves) are replaced every 13,000 hours. Lights on the ends of the lamps indicate any failures or clogging.

The rubber paddles on the screen filters wear off at the bottom that presses against the screens. The rubber periodically needs to be lowered and ultimately replaced.

The Zenon operator also periodically inspects and maintains the blowers on the aerators (to ensure adequate air production) and the solids screens.

List operating parameters recorded (e.g., flow, temperature, pressure, pH), typical values, and range for this unit. Record or obtain copy or printout of logs for the duration of the sampling episode.
See the daily operator log in the Cruise Ship Rulemaking Record.

Wastewater flow through the treatment system is typically controlled by the graywater pumps. However, during periods of high membrane TMP, the TMP control automatically reduces the

wastewater flow rate to maintain TMP.

When not discharging permeate overboard (e.g., when cruising in Glacier Bay), the permeate is routed to double bottom ballast tanks (tank 1C, capacity 411 m^3). The double bottom tanks are discharged at sea outside 12 nm.

SOURCE WATER DATA SHEET

Vessel: Holland America Veendam
Date: 6/24/04
Recorded by: D. Falatko

Is Potable Water Generated On Board the Vessel: yes or no (circle one)
Yes. Water is produced every day, as soon as the engines start. Approximately ½ of the water used is produced, and the other ½ is bunkered in ports.

Describe the On-board Potable Water Treatment and Disinfection Method:
The ship operates two tubular vacuum evaporators. Each evaporator produces 14 m^3/hr, for a total ship production of 28 m^3/hr and 250 m^3/day. Produced water is "prechlorinated" to approx 2.5 ppm chlorine and then pumped to storage tanks. From the storage tanks the water is "postchlorinated" to approx 1.5 ppm chlorine. The water is 1.3 ppm at the highest point, which is the bridge, which is equipped with a chorine meter. The chlorination system is inspected every 2 hours.

Port (City) Where Source Water is Obtained if Not Generated On board: _____
Water is also bunkered at selected ports: Vancouver, Juneau, and Ketchikan have the best water.

Treatment Method for Source Water Obtained in Port:
Bunkered water passes through a mineralizer filter (adds minerals and controls pH), followed by chlorination.

Disinfection Method for Source Water Obtained in Port:
Bunker water chlorination is the same process as for produced water, but performed in a separate system.

Fluoride Added to Water Obtained in Port: yes or no (circle one)
No. Fluorination is not performed on board or in port.

Additional Disinfection Performed On Water Obtained in Port: yes or no (circle one)
No. The Alaska municipalities do not chlorinate their water. Method of drinking water treatment in ports is unknown.

Describe Additional On-board Disinfection Method:
Bromination for pools only.

Description of Source Water Sample Collection Point On Board Cruse Ship:
For bunkered water, ship's crew test for total coliform and E. coli. Testing is not required for water produced on board because water temperatures exceed 65°C.

Appendix D

DATA REVIEW NARRATIVES AND ISSUES ASSOCIATED WITH RESULTS FOR TOTAL CYANIDE VERSUS AVAILABLE CYANIDE

Quality Assurance Review of Laboratory Data Collected From Large Cruise Ships in Alaska Waters

Sampling Episode 6503

Data Validation Report For BOD_5 Samples

Prepared By:

Eastern Research Group
14555 Avion Parkway, Suite 200
Chantilly, Virginia 20151

December 13, 2004

BOD_5 Method 405.1

Completeness

During Sampling Episode 6503 aboard the HAL Veendam, at total of 19 samples (excluding QC samples) were collected for analysis of 5-day Biochemical Oxygen Demand (BOD_5) by EPA Method 405.1. All 19 samples received by the laboratory were analyzed for BOD_5 for a completeness of 100% (all planned samples were collected and analyzed). Sample numbers for BOD_5 are provided in Table 1.

Table 1. BOD_5 Samples Collected During Sampling Episode 6503

Sample Numbers	Sample Point Description
65219, 65223, 65227,65231,65235	Treatment System Influent
65261, 65265, 65269, 65273, 65277, 65285, 65289	Treatment System Effluent
65207	Accommodations
65215	Galley
65202	Laundry
65211	Food Pulper
65291	Screening Solids
65292	Waste Biosludge
65295	Source Water

The data package submitted by the analytical laboratory, Analytica Alaska Southeast, contained complete BOD_5 data for the samples listed in Table 1.

Holding Times

Method 405.1 requires that all BOD_5 samples be analyzed within 48 hours following collection. Analysis of traffic reports and laboratory data sheets indicates 4 of the 19 BOD_5 samples were analyzed outside the 48 hour hold time window. Table 2 shows the sample numbers, the total hold time from collection to analysis, and the measured BOD_5 result for the four samples analyzed past the method-specified holding time.

Table 2. BOD_5 Samples Exceeding Hold Times

Sample Number	Sample Description	Sample Hold Time	Method Hold Time	BOD_5 Result
65235	Treatment System Influent	57.2 hours	48 hours	537 mg/L
65277	Treatment System Effluent	56.8 hours	48 hours	2.2 mg/L
65289	Treatment System Effluent	56.5 hours	48 hours	2.5 mg/L
65207	Accommodations	64.5 hours	48 hours	391 mg/L

To determine the impact of exceeding the holding times for these four samples, results of similar samples collected the same sampling point were reviewed. The BOD_5 concentration in the treatment system influent ranged from 481 mg/L to 786 mg/L. The BOD_5 concentration in the effluent samples ranged from <2 mg/L to 6 mg/L. Since the BOD_5 results for the samples that exceeded holding times are within the range of values reported for samples that did not exceed holding times, BOD_5 results from samples 65277, 65289, and 65235 should be considered valid for the cruise ship rulemaking.

The BOD_5 results from the accommodations wastewater sample can not be compared to similar data within the data set since only a single accommodations wastewater sample was collected. Accommodations wastewater is a component of the treatment system influent. Further, the holding time for this sample falls within the same period as the other samples that exceeded holding times. Consequently, the BOD_5 result from this sample should also be considered valid.

Calibration

The calibration of the BOD_5 test was performed with a method blank and glucose spiked blanks to verify seed effectiveness and analytical technique. Method blanks consist of potable water passed through an activated carbon bed to remove residual organic compounds. During Sampling Episode 6503, a total of 3 method blanks were prepared and analyzed for BOD_5. The results of the 3 method blank analysis showed BOD_5 concentrations less than 2 mg/L.

To verify seed effectiveness and analytical technique, method blanks were spiked with a sufficient amount of glucose to yield a theoretical BOD_5 concentration of 200 mg/L. Spiked method blanks are then analyzed for BOD_5 and results of the analysis, reported as percent recovery, are compared to the recovery limits for Method 405.1. Table 3 shows the results of the spiked samples. Results of the spike sample analyses indicate all recoveries are within the method-specified limits.

Table 3. Analysis of BOD_5 Recovery Data for Spiked Samples

Sample	Spike Result	Spike Level	Recovery	Recovery Limits
Method Blank	184 mg/L	200 mg/L	92%	60% - 140 %
Method Blank	154 mg/L	200 mg/L	77%	60% - 140%
Method Blank	166 mg/L	200 mg/L	83%	60% - 140%
Method Blank	167 mg/L	200 mg/L	84%	60% - 140%

Precision Analysis

Reproducibility for BOD_5 is measured as relative percent difference (RPD) between laboratory and field duplicate samples. Laboratory duplicate samples measure the precision of the method and analyst by comparing the results of two separate analyses of the same sample. Field duplicate samples measure the precision of the field sampling method by comparing the BOD_5 results for split samples prepared in the field. The QAPP for the Cruse Ship Rulemaking provides RPD targets for all laboratory duplicate samples and field duplicates samples as less than 20% and 30%, respectively.

Table 4 shows the RPD results for laboratory duplicate samples and a duplicate method blank spiked sample. The RPDs shown in Table 4 indicate the method blank spike sample is within the RPD and only one laboratory duplicate sample (65261) was outside the QAPP-specified target of less than 20%. Also, for sample 65273, the RPD cannot be calculated. For both samples, the BOD_5 concentration was near the detection limit of 2 mg/L, where analytical variability increases. Therefore, the associated variability between the sample result and its duplicate are acceptable for this program and the reported BOD_5 results are valid.

Table 4. Relative Percent Difference Between Laboratory Duplicate Samples

Sample No.	BOD_5 Result	Duplicate BOD_5 Result	RPD	RPD Target
Spiked Method Blank	184 mg/L	154 mg/L	17.8%	<20%
65231	481 mg/L	480 mg/L	0.2%	<20%
65273	2.05 mg/L	<2 mg/L	NA	<20%
65277	2.24 mg/L	2.39 mg/L	6.5%	<20%
65261	3.64 mg/L	2.63 mg/L	**32.2%**	<20%

NA: RPD can not be calculated since one or both of the sample results is less than the PQL.
RPD target from QAPP for Rulemaking Support for Large Cruise Ships in Alaska Waters, May 2004.
RPDs outside the QAPP target are represented in bold.

Table 5 shows the RPD results for field duplicate samples. RPDs for one sample pair in Table 5 is within the QAPP-specified target of less than 30%. For the second sample pair, RPD cannot be calculated because both results were reported as less than the detection limit. The field data precision is acceptable and the BOD_5 results are valid.

Table 5. Relative Percent Difference Between Field Duplicate Samples

Sample No.	BOD_5 Result	Sample No.	BOD_5 Result	RPD	RPD Target
65269	<2 mg/L	65285	<2 mg/L	NA	<30%
65277	2.24 mg/L	65289	2.49 mg/L	10.6%	<30%

NA: RPD can not be calculated since one or both of the sample results is less than the PQL.
RPD target from QAPP for Rulemaking Support for Large Cruise Ships in Alaska Waters, May 2004.

Data Quality Assessment

This data validation assessment indicates all the BOD_5 data collected during Sampling Episode 6503 can be used for the large cruise ship rulemaking effort.

Computer Sciences Corporation
www.csc.com

MEMORANDUM

DATE: January 10, 2005

TO: Don Anderson, Project Officer
EPA EAD

FROM: Pornkeo Chinyavong, Quality Assurance Chemist PC
Sample Control Center

SUBJECT: Data Review Narrative for Classical Analyses for the Alaska Cruise Ship Industry
Episode 6503

OVERVIEW

Under EPA Contract Number 68-C-03-068, Analytical Laboratory Services, Inc. (ALSI) submitted classical wet chemistry data for 25 samples in Episode 6503. Table 1 provides a complete listing of samples, matrices, and the analytes of interest.

Table 1 - Sample Identifiers, Descriptions, Sampling Dates, and Analytes of Interest

EPA Sample #	Matrix	Sample Description	Sampling Date	Analytes
65202	Aqueous	SP1, Laundry wastewater	6/23/04	alkalinity, ammonia-N, COD, chloride, nitrate/nitrite, sulfate, total phosphorus, TKN, TDS, TSS, TOC, total cyanide, HEM, SGT-HEM
65207	Aqueous	SP3, Accommodations wastewater	6/24/04	
65211	Aqueous	SP4, Food Pulper wastewater	6/22/04	
65215	Aqueous	SP5, Galley wastewater	6/22/04	
65219	Aqueous	SP6, Influent to wastewater treatment	6/21/04	
65223	Aqueous	SP6, Influent to wastewater treatment	6/22/04	
65227	Aqueous	SP6, Influent to wastewater treatment	6/23/04	
65228	Aqueous	SP6, Influent to wastewater treatment	6/23/04	HEM, SGT-HEM
65231	Aqueous	SP6, Influent to wastewater treatment	6/23/04	alkalinity, ammonia-N, COD, chloride, nitrate/nitrite, sulfate, total phosphorus, TKN, TDS, TSS, TOC, total cyanide, HEM, SGT-HEM
65232	Aqueous	SP6, Influent to wastewater treatment	6/23/04	HEM, SGT-HEM

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Table 1 - Sample Identifiers, Descriptions, Sampling Dates, and Analytes of Interest

EPA Sample #	Matrix	Sample Description	Sampling Date	Analytes
65235	Aqueous	SP6, Influent to wastewater treatment	6/25/04	alkalinity, ammonia-N, COD, chloride, nitrate/nitrite, sulfate, total phosphorus, TKN, TDS, TSS, TOC, total cyanide, HEM, SGT-HEM
65261	Aqueous	SP9, Effluent from wastewater treatment	6/21/04	
65265	Aqueous	SP9, Effluent from wastewater treatment	6/22/04	
65269	Aqueous	SP9, Effluent from wastewater treatment	6/23/04	
65270	Aqueous	SP9, Effluent from wastewater treatment	6/23/04	HEM, SGT-HEM
65273	Aqueous	SP9, Effluent from wastewater treatment	6/23/04	alkalinity, ammonia-N, COD, chloride, nitrate/nitrite, sulfate, total phosphorus, TKN, TDS, TSS, TOC, total cyanide, HEM, SGT-HEM
65274	Aqueous	SP9, Effluent from wastewater treatment	6/23/04	HEM, SGT-HEM
65277	Aqueous	SP9, Effluent from wastewater treatment	6/24/04	alkalinity, ammonia-N, COD, chloride, nitrate/nitrite, sulfate, total phosphorus, TKN, TDS, TSS, TOC, total cyanide, HEM, SGT-HEM
65278	Aqueous	SP10, Effluent from wastewater treatment	6/24/04	HEM, SGT-HEM
65281	Aqueous	SP10, Effluent from wastewater treatment	6/21/04	alkalinity, ammonia-N, COD, chloride, nitrate/nitrite, sulfate, total phosphorus, TKN, TDS, TSS, TOC, total cyanide
65283	Aqueous	SP10, Effluent from wastewater treatment	6/23/04	alkalinity, chloride, sulfate, TDS, TSS, total cyanide
65289	Aqueous	SP10, Effluent from wastewater treatment	6/25/04	ammonia-N, COD, nitrate/nitrite, total phosphorus, TKN, TOC
65291	Solid	SP11, Screening solid	6/22/04	alkalinity, ammonia-N, COD, chloride, nitrate/nitrite, sulfate, total phosphorus, TKN, TOC, total cyanide, total solid, HEM, SGT-HEM
65292	Sludge	SP12, Waste biosludge (desludge)	6/22/04	
65295	Aqueous	SP15, Source water	6/21/04	alkalinity, ammonia-N, COD, chloride, nitrate/nitrite, sulfate, total phosphorus, TKN, TDS, TSS, TOC, total cyanide

These data have been reviewed in accordance with SCC's *Data Review Guidelines for Classical Wet Chemistry Analyses* (November 2004) and with the specifications listed in the contract. Below is a summary of the results of the data review process, followed by detailed descriptions of data issues identified with these samples. Based on this review, all data in this episode are considered to be of acceptable quality with the qualifications described below and detailed in the attached data review summary table (Table 2).

SUMMARY

All samples were successfully analyzed within the contract-specified holding times for all classical wet chemistry parameters specified in the sampling and analysis plan with the exception of sample 65207, which was analyzed outside of the contract-specified holding time for the COD analysis. The calibration and continuing calibration standards were successfully analyzed, where required by the methods. Laboratory blanks were performed for each analysis, and there was no contamination detected above the laboratory reporting limits. The QC samples, including the ongoing and precision recovery sample (OPR) and matrix spike/matrix spike duplicate (MS/MSD) samples, demonstrated that laboratory performance for these analyses was acceptable with the exception of the data issues described below.

DATA ISSUES: CHEMICAL OXYGEN DEMAND (COD)

Holding Times

Sample 65207 was initially analyzed within the holding time for COD; however, this sample result exceeded calibration range and required dilution. The dilution analysis was performed 3 days after the holding time had expired. Therefore, SCC considers the COD result of 541 mg/L in sample 65207 to be an estimated value.

DATA ISSUES: AVAILABLE CYANIDE GREATER THAN TOTAL CYANIDE

Sample Results

For all samples in this episode, SCC evaluated total cyanide results against available cyanide results, and found that available cyanide was detected in samples 65207, 65219, 65227, 65231, 65235, 65265, 65281, and 65295, while total cyanide were not detected in these samples. In theory, the total cyanide results in any given sample will be greater than either the free or available cyanide results for the same sample. However, for these samples, it is important to recognize that the total cyanide is determined using a separate sample from that used for free or available cyanide, and that the available cyanide determination was performed by a different laboratory. In addition, the overall homogeneity of the waste stream being sampled can have a significant effect on the cyanide results. Therefore, it may not be possible to identify problems that would invalidate one cyanide fraction or the other.

A review of the traffic reports (TRs) for the samples indicates that some of the samples in Episode 6503 were not treated with lead carbonate to remove sulfides. SCC consulted EPA and the sampling contractor and determined that the following 11 samples were not treated with lead carbonate:

65202, 65207, 65211, 65227, 65231, 65235, 65269, 65273, 65277, 65283, and 65295

Three sets of matrix spike/matrix spike duplicate (MS/MSD) samples were prepared for total cyanide analysis on samples 65207 (accommodations wastewater), 65269 (an effluent), and 65273 (an effluent). The MS/MSD recoveries for the three aqueous MS/MSD pairs were below the acceptance limits:

- 22% and 21% for sample 65207,
- 30% and 33% for sample 65269, and
- 5% and 1% for sample 65273

suggesting a potential for low bias in the total cyanide results for the associated aqueous samples.

The recoveries for the laboratory control samples (LCS, OPR, or QC check sample) analyzed along with the field samples were acceptable, indicating that the laboratory's overall analytical process was in control and suggesting either problems with the distillation process or an interference present in the sample matrix. Because the focus of the EAD analytical contracts is on effluent samples and because there are no acceptance criteria for aqueous matrices other than effluents, no MS/MSD analyses were performed on samples representing influents to the treatment process.

The total cyanide result for Sample 65273 (effluent) was reported as a non-detect at 5 µg/L and available cyanide was a non-detect at 2 µg/L. An MS/MSD pair for available cyanide was prepared from this sample and had recoveries of 101% and 102% respectively, while the MS/MSD recoveries for total cyanide were 5% and 1%, as noted earlier. This suggests a significant potential for low bias in the total cyanide result. Therefore, based on the low MS/MSD recoveries for total cyanide in this sample, the total cyanide non-detect is considered a minimum value and the available cyanide result is considered acceptable without qualification.

There were nine other samples in Episode 6503 that exhibited the pattern of total cyanide results less than the available cyanide results. Samples 65219, 65227, 65231, and 65235 are influents to treatment and, as noted above, there are no MS/MSD analyses that demonstrate the performance of either method for this matrix type. Samples 65227, 65231, and 65235 also are among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, lacking matrix-specific supporting data that might explain the observed differences, and given the potential for positive interferences in the available cyanide measurements, SCC recommends flagging both cyanide results for samples 65227, 65231, and 65235 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in these samples. Sample 65219 was treated in the field, therefore SCC recommends including both cyanide results for sample 65219 in the database, but flagging them to indicate the irreconcilable differences.

The total cyanide results for Sample 65207 (accommodations wastewater) were reported as a non-detect at 5 µg/L, while available cyanide was detected in this sample at 15.7 µg/L. The MS/MSD recoveries for total cyanide were 21% and 22%, as noted earlier. Sample 65207 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, given the low MS/MSD recoveries for total cyanide in this sample and the potential for positive interferences in the available cyanide measurements, SCC recommends flagging both cyanide results for sample 65207 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in this sample.

Sample 65211 is listed as the food pulper wastewater. This description suggests that this matrix is not a treated effluent, but may be a component of the influent to the treatment system. Total cyanide was detected at 14 µg/L, while available cyanide was reported at 88.4 µg/L. Sample 65211 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, lacking matrix-specific supporting data that might explain the observed differences, and the potential for positive interferences in the available cyanide measurements, SCC recommends flagging

both cyanide results for sample 65211 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in this sample.

Sample 65295 is listed as a source water sample, a matrix type that should not present significant analytical difficulties. Sulfide was not detected in this sample by the field test performed at the time of collection and therefore, this sample is among the 11 samples that were not treated with lead carbonate. Although the presence of available cyanide at 19 µg/L in the source water is unexpected, there is no analytical evidence to suggest that the available cyanide result be excluded. However, an engineering review or other information not available to SCC may lead to a different conclusion. Therefore, SCC recommends including both cyanide results for sample 65295 in the database, but flagging them to indicate the irreconcilable differences.

Episode 6503 included two sets of field duplicate samples that were sent to the laboratories blind. SCC does not normally evaluate the agreement between field duplicate samples. However, because of concerns about the cyanide data, at EPA's request, SCC obtained information about the field duplicates from the sampling contractor and performed some simple comparisons. The two field duplicate pairs were samples 65261 and 65281, and samples 65265 and 65283, all effluent samples. The total cyanide results in sample 65261 were reported as a non-detect at 5 µg/L, while available cyanide was reported as a non-detect at 2 µg/L. For sample 65281, the blind field duplicate, the total cyanide results were reported as a non-detect at 5 µg/L, while available cyanide was detected in this sample at 8.96 µg/L. A similar pattern occurs for the cyanide results in the other field duplicate pair. Total cyanide was reported as a non-detect at 5 µg/L in both samples 65265 and 65283, while available cyanide was detected at 5.86 µg/L in sample 65265 and as a non-detect a 2 µg/L in sample 65283.

The MS/MSD recoveries for total cyanide in effluent sample 65273 were very low (1% and 5%), and low (33% and 30%) in sample 65269, suggesting a potential negative basis that may affect the total cyanide results in samples 65261, 65281, 65265, and 65283. Therefore, SCC recommends that the total cyanide results in sample 65261 and 65281 be considered minimum values. The difference between the available cyanide results in the two field duplicate samples (e.g., a non-detect at 2 µg/L and a detect at 8.96 µg/L) cannot be explained on the basis of the MS/MSD results for available cyanide in sample 65273, which was also an effluent. Given the discrepancy between the field duplicate results for available cyanide, SCC recommends including the available cyanide results for samples 65261 and 65281 in the database, but flagging them to indicate the irreconcilable differences. SCC recommends that the total cyanide results for samples 65261 and 65281 also be flagged to indicate the irreconcilable differences, as a further precaution.

Because of the low MS/MSD recoveries in the other effluent samples, the total cyanide result for sample 65265 is considered a minimum value. The available cyanide result of 5.86 µg/L is well within 30% of the reported detection limit for total cyanide (e.g., 5 µg/L), and therefore would normally not be qualified. However, because the available cyanide result in the field duplicate of the sample, 65283 is a non-detect at 2 µg/L, SCC recommends including both the total and available cyanide results for sample 65265 in the database, but flagging them to indicate the irreconcilable differences.

Sample 65283 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Given the very low MS/MSD recoveries for total cyanide in effluent samples in this episode, SCC recommends flagging both cyanide results for sample 65283 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in these samples.

The samples were analyzed for available cyanide by Bayer Laboratory. A separate data narrative has been prepared for the available cyanide analysis.

TECHNICAL NOTES:

Total Cyanide

For total cyanide, the solid samples 65291 and 65292 were prepared and analyzed as aqueous samples, due to the low percent solids content. Therefore, the data were included in the database as aqueous samples, as reported by the laboratory.

Silica Gel Treated N-Hexane Extractable Material (SGT-HEM)

Samples 65261, 65265, 65269, 65270, 65273, and 65274 were not analyzed for SGT-HEM because the HEM results were non-detects. At EPA's request, SCC created SGT-HEM records in the database, but the results for SGT-HEM are reported as NA, with the SCC qualifier reading "SGT-HEM was not analyzed because HEM was a non-detect."

If you have any questions regarding the analyses of these samples or the review of these data, please contact me by telephone at (703) 461-2346 or by facsimile at (703) 461-8056.

Attachments

cc: Beverly Randolph, EPA
Marla Smith, EPA
Nelson Andrews, EPA
Deb Falatko, ERG
Jodi King, ERG
Deb Miller, CSC
Harry McCarty, CSC

Table 2
Data Review Summary Table

Episode: 6503 **Analysis:** Classicals

Industry: Alaska Cruise Ship **Reviewer:** P. Chinyavong

Sample	Analyte	Action	Reason	SCC Qual	Level
65207	COD	Estimated value	Holding time exceeded	NA	541 mg/L
65207	Total cyanide	—	Sample not treated with lead carbonate to remove sulfides. Low MS/MSD recoveries for total cyanide. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.	MISCA	ND
65211	Total cyanide	—	Samples not treated with lead carbonate to remove sulfides. No matrix-specific performance data. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.	MISCA	0.014 mg/L
65219	Total cyanide	—	Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.	IRR	ND
65227	Total cyanide	—	Samples not treated with lead carbonate to remove sulfides. No matrix-specific performance data. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.	MISCA	ND
65231	Total cyanide				
65235	Total cyanide				
65261	Total cyanide	—	Total cyanide qualified as minimum value. Based on field duplicate results, irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.	IRR	ND
65265	Total cyanide	—			
65273	Total cyanide	Minimum value	Low MS/MSD % recoveries	NA	ND
65281	Total cyanide	Minimum value	Total cyanide qualified as minimum value. Based on field duplicate results, irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.	IRR	ND
65283	Total cyanide	—	Total cyanide qualified as minimum value. Sample not treated with lead carbonate to remove sulfides. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.	MISCA	ND
65295	Total cyanide	—	Irreconcilable results for total and available cyanide.	IRR	ND

ND = Non-detect at the laboratory's reporting limit. See the level in the database.
NA = Not applicable
MIN = Minimum value
IRR = Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
MISCA = Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.

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MEMORANDUM

DATE: March 31, 2005

TO: Don Anderson, Project Officer
EPA EAD

FROM: Jody Donnelly, Quality Assurance Chemist JHD
Sample Control Center

SUBJECT: Data Review Narrative for Dioxin/Furan Analysis for the Alaskan Cruise Ship Industry, Episode 6503

OVERVIEW

Under CSC Purchase Order 637415SSD, Axys Analytical Services submitted data for the analysis of dioxins and furans by EPA Method 1613B for two solid samples in Episode 6503. Table 1 provides a list of the samples, matrix, sample descriptions, and the required analytical method.

Table 1 - Sample Identifier, Description, Sampling Date, and Analysis Method

Episode	EPA Sample #	Matrix	Sample Description	Sampling Date	Method
6503	65293	Solid	SP1, Incinerator ash	06/20/04	1613B
6503	65294	Solid	SP1, Incinerator ash	06/20/04	1613B

These data have been reviewed in accordance with SCC's Data Review Guidelines for Dioxin/Furan Analysis by Method 1613B (November 2004). Below is a summary of the results of the data review process, followed by detailed descriptions of data issues identified with these samples. Based on this review, all data in this episode are considered to be of acceptable quality.

SUMMARY

Samples were successfully extracted and analyzed for the target analytes in EPA Method 1613B within the method-specified holding times. The calibration and continuing calibration standards were successfully analyzed. Preparation blanks performed for the analysis detected no contamination above the laboratory's reporting limits. The QC samples, including the ongoing precision and recovery (OPR) samples, demonstrated that laboratory performance for these analyses was acceptable.

Reporting Limits

The samples were extracted using approximately 5 grams instead of the method-specified 10 grams. As a result, the minimum levels (MLs) provided in the database for samples 65293 and 65294 increased by approximately a factor of 2. The laboratory's past experience with ash samples shows that they tend to have significant matrix interference, which is why the sample size was reduced. Because the laboratory calibrated their instrument to 5 times lower than the lowest calibration standard specified in Method 1613B, the difference in sample size has no impact on the quality of the data. The MLs provided in the database for these samples reflect the smaller sample size.

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Some analytes in samples 65293 and 65294 were qualified by SCC with a "J" flag, which indicates an estimated result that is below the laboratory's reporting limit but above the method detection limit. These analytes are annotated as such in the database and are detailed in Table 2.

Sample Reanalysis - Labeled Compound Recoveries

Sample 65294 was reextracted and reanalyzed (e.g., a new aliquot of the original sample was extracted) due to low labeled compound recoveries in the initial analysis. The reextraction was performed within method-specified holding times and the results met the acceptance limits for the labeled compounds. Therefore, the results for sample 65294 in the database as those from the reanalysis.

If you have any questions regarding the analysis of these samples or the review of these data, please contact me, by telephone at (703) 461-2203 or by facsimile at (703) 461-8056.

cc: Beverly Randolph, EPA
Marla Smith, EPA
Nelson Andrews, EPA
Deb Falatko, ERG
Jodi King, ERG
Deb Miller, CSC
Harry McCarty, CSC

Table 2
Data Review Summary Table

Episode: 6503 **Analysis:** Method 1613B

Industry: Alaskan Cruise Ship **Reviewer:** J. Donnelly

Sample	Analyte	Action	Reason	SCC Qual	Level (ng/kg)
65293	2,3,7,8-TCDD	Estimated value	Analyte detected below laboratory's reporting limit but above method detection limit	J	1.63
	1,2,3,6,7,8-HxCDD				6.12
	1,2,3,7,8,9-HxCDD				9.34
65294	2,3,7,8-TCDD	Estimated value	Analyte detected below laboratory's reporting limit but above method detection limit	J	1.37
	1,2,3,7,8-PeCDD				6.40

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MEMORANDUM

DATE: December 16, 2004

TO: Don Anderson, Project Officer
EPA EAD

FROM: Pornkeo Chinyavong, Quality Assurance Chemist PC
Sample Control Center

SUBJECT: Data Review Narrative for Dioxin/Furan Analyses for the Alaskan Cruise Ship Industry
Episode 6503

OVERVIEW

Under EPA Purchase Order EP-C-04-047, Axys Analytical Services submitted data for the analysis of dioxins/furans by EPA Method 1613B for two aqueous samples in Episode 6503. Table 1 provides a complete listing of samples, matrices, sample descriptions, and the required analytical method.

Table 1 - Sample Identifiers, Descriptions, Sampling Dates, and Analysis Methods

Episode	EPA Sample #	Matrix	Sample Description	Sampling Date	Method
6503	65202	Aqueous	SP1, Laundry Wastewater	6/23/04	1613B
	65206	Aqueous	SP1, Laundry Wastewater	6/23/04	1613B

These data have been reviewed in accordance with SCC's Data Review Guidelines for Dioxins/Furans Analyses (November 2004). Below is a summary of the results of the data review process, followed by detailed descriptions of data issues identified with these samples. Based on this review, all data in this episode are considered to be of acceptable quality.

SUMMARY

All samples were successfully extracted and analyzed for the target analytes in EPA Method 1613B within the method-specified holding times. The calibration and continuing calibration standards were successfully analyzed. Preparation blanks performed for the analysis detected no contamination above the laboratory's reporting limits. Instead of using the method-specified clean up procedure, all samples were processed by an automated clean up procedure that employs the Fluid Management System Inc., *"Power-Prep™ System,"* using standard chromatographic clean up columns. The QC samples, including the ongoing precision and recovery (OPR) sample, demonstrated that laboratory performance for these analyses was acceptable. None of the dioxins/furans were detected in either sample in this episode.

Reporting Limits

The laboratory's reporting limits are at the method-specified minimum levels (MLs). All samples were extracted using less than the method-specified 1000-mL aliquot, due to volume constraints. This variation in sample size increased the MLs for these samples by as much as 10%. As reported by the laboratory, the MLs provided in the database for these samples reflect the smaller sample volumes.

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If you have any questions regarding the analyses of these samples or the review of these data, please contact me, by telephone at (703) 461-2346 or by facsimile at (703) 461-8056.

cc: Beverly Randolph, EPA
Marla Smith, EPA
Nelson Andrews, EPA
Deb Falatko, ERG
Jodi King, ERG
Deb Miller, CSC
Harry McCarty, CSC

Quality Assurance Review of Laboratory Data Collected From Large Cruise Ships in Alaska Waters

Sampling Episode 6503

Data Validation Report For Microbiological Analyses

Prepared By:

Eastern Research Group
14555 Avion Parkway, Suite 200
Chantilly, Virginia 20151

January 27, 2005

Enterococci by MPN Method ASTM D6503-99
Fecal Coliform by MF SM 9222D
***E. Coli* by MPN Enzyme Substrate SM 9223B**

Completeness

During Sampling Episode 6503, a total of 66 samples (excluding QC samples) were collected for analysis of enterococci, fecal coliform, and *E. coli* by the methods listed above. Sample numbers ranged between 65202 and 65311. The number of grab samples collected for microbiologicals analyses was reduced from that described in the SAP because of capacity limitations of the onboard laboratory. ERG collected and analyzed as many microbiologicals samples as feasible, with an emphasis on wastewater treatment samples. EPA considers the microbiologicals dataset to be representative of the wastestreams sampled and acceptable for use in technical analyses.

The data package submitted by the analytical laboratory, Analytica Alaska Southeast, contained complete microbiological data for all submitted samples. Only one sample (Sample No. 65246) was not analyzed for all three types of bacteria, resulting in an analytical completeness of greater than 99%. A list of the samples collected and analyzed during Sampling Episode 6503 is provided in Table 1.

Table 1. List of Samples and Required Microbiological Analyses for Sampling Episode 6503

Sample Numbers	Sample Point Description
65219, 65220, 65221, 65222, 65223, 65224, 65225, 65227, 65228, 65231, 65232, 65234, 65235, 65236, 65237, 65310	Influent to Treatment
65241, 65242, 65243, 65244, 65245, 65246*, 65247, 65249, 65250, 65253, 65254, 65256, 65257, 65258, 65259, 65304	Influent to UV Disinfection
65261, 65262, 65263, 65264, 65265, 65266, 65267, 65269, 65270, 65273, 65274, 65276, 65277, 65278, 65279, 65281, 65283, 65287, 65288, 65289, 65302, 65303, 65305, 65311	Effluent from Treatment
65205	Laundry
65207	Accommodations
65211, 65212	Food Pulper
65215	Galley
65295, 65296, 65297, 65298, 65299	Source Water

* Analyzed for only *E. Coli* and fecal coliform.

Holding Times

The QAPP developed for the cruise ship rulemaking requires all microbiological samples be analyzed within 6 hours following collection. Analysis of traffic reports and laboratory data sheets indicates all microbiological samples submitted field laboratory for analysis were analyzed within 6 hours following collection.

Detection Limits

Some microbiological results were reported by Analytica Alaska as "greater than" a specified value (e.g., >600,000,000 CFU/100 mL). These results are qualified in the analytical database by a ">" flag and are listed in Table 2. This qualifier indicates the sample was not diluted sufficiently (i.e., the measured concentration exceeds the range of dilutions). The reported results in the database are the upper limit of the measurement range, and the ">" flag indicates that the actual concentrations are some level greater than the reported upper limit. Although the results are valid, data users should consider this data qualification in using the data.

Table 2. Microbiological Sample Results with ">" Qualifier

Analysis	Sample Numbers
Enterococci	65219, 65221, 65224,
E. Coli	65219, 65220, 65221, 65224, 65225

During onboard analysis, one effluent from treatment sample for enterococci analysis (sample 65262) was overly diluted to a level which generated a non-detect (ND) result, but with a detection limit (1,000 MPN/100 mL) much greater than both the expected concentration in the sample and the typical detection limit of 1 MPN/100 mL. Although the result is valid, its use for engineering analyses is limited due to the high detection limit.

Calculation of Fecal Coliform Density

Fecal coliform density should be computed from sample quantities that produced membrane filtration counts within the desired range of 20 to 60 fecal coliform colonies. This was not always possible for many cruise vessel samples for various reasons. First, many samples, such as wastewater treatment effluent samples, had low concentrations of microbiological contaminants, and the occurrence of fecal coliform colonies was minimal. In these cases, as specified by the method, the analyst counted all fecal coliform colonies, disregarding the lower limit of 20.

Second, most samples (other than wastewater treatment effluent) required a series of sample dilutions to obtain between 20 and 60 colony forming units per filter pad. In most cases, the analyst obtained a result within this range using one of the prepared dilutions. However, in a few instances, no single filter generated a result within the desired range (i.e., two results within

the desired range, two results either above or below the desired range, one result above and one result below the desired range, etc). In these cases, as specified by the method, the analyst totaled the counts on the two filters and reported the result as a number per 100 mL. Table 3 lists the fecal coliform samples for Sampling Episode 6503 that did not yield a single result within the desired range, and for which the analyst computed the number of colony forming units based on a calculation of the results from multiple plates. Calculations for these samples are provided in the Cruise Ship Rulemaking Record.

Table 3. Fecal Coliform Samples For Which Multiple Plates Were Used to Compute CFU/mL

Sample Number	Sample Description
65207	Accommodations Wastewater
65234	Influent to UV Disinfection
65237	Influent to Treatment
65253, 65259, 65304	Influent to UV Disinfection

In summary, calculation of fecal coliform density was performed as specified by the method, and the reported results are valid.

Laboratory QC Measures

QC measures for microbiologicals include positive and negative controls, media sterility checks, dilution water sterility checks, sample bottle blanks, membrane filter preparation blanks, and verification of incubator temperatures. The following describes the results of each of these QC checks used during Sampling Episode 6503. (The actual QC results are contained in Analytica Alaska's laboratory report, which is provided in the Cruise Ship Rulemaking Record.)

Positive and Negative Controls

Positive and negative controls are known cultures that are analyzed exactly like the field samples, and will produce an expected positive or negative result for a given type of medium. For Sampling Episode 6503, one medium-specific positive and negative control was analyzed for each medium lot used. Results of the positive and negative controls indicate the media used by the field laboratory for Sampling Episode 6503 produced expected results.

Media Sterility Checks

Media are checked for sterility by incubating the media at the appropriate temperature without sample and observed for growth. For Sampling Episode 6503, one medium sterility check was performed for each medium lot used. The media sterility check verified the media used by the field laboratory had not been contaminated with any of the microorganisms being analyzed for this work.

Dilution Water Sterility Checks

Dilution water is analyzed exactly like a field sample and observed for growth of fecal coliform, *E. coli*, and enterococci to verify the water is not contaminated with these organisms prior to use. For Sampling Episode 6503, one sample dilution blank was analyzed for each lot of dilution water used. Results of dilution water blank analysis verified the water had not been contaminated with any of the microorganisms being analyzed for this work.

Sample Bottle Blank

A sample bottle blank was analyzed for each bottle lot used during Sampling Episode 6503 to determine adequate bottle sterilization prior to use by the sampling crew. Results of the sample bottle blank (dilution water poured into the sample bottle and analyzed) verified the sample bottles had not been contaminated with any of the microorganisms being analyzed for this work.

Membrane Filter Preparation Blank

Membrane filter blanks were analyzed at the beginning of each set of filtered samples to document adequate sterilization of membrane filtration equipment. Membrane blanks verified that the equipment used for filtration during Sampling Episode 6503 had not been contaminated with any of the microorganisms being analyzed for this work.

Incubator Temperature

Incubator temperatures were monitored in the onboard laboratory to verify that prepared microbiological samples were being incubated at the correct temperatures. Review of the laboratories incubator log sheets generated during Sampling Episode 6503 verified the temperature was measured and recorded twice daily, no less than four hours apart, and the temperature checks were ±0.5°C apart.

Precision Analysis

Reproducibility for the microbiological analyses is measured as relative percent difference (RPD) between duplicate samples. The QAPP for the Cruse Ship Rulemaking presents the target RPD for all laboratory and field duplicate samples as less than 20% and 30%,

respectively. During Sampling Episode 6503, additional 100-ml sample volumes were collected for a number of grab samples with the intent that the laboratory would prepare a single composite and then analyze duplicate samples from the composite to evaluate laboratory precision (i.e., laboratory duplicates). The laboratory did not prepare a composite, but instead analyzed each of the 100-ml sample volumes individually. Because a composite was not prepared, laboratory precision could not be evaluated. The results obtained from analysis of these individual sample volumes are field duplicates, not laboratory duplicates, and because they were collected as laboratory duplicates, the original sample and the duplicate sample have the same sample number. In order to differentiate the original from the duplicate, ERG assigned new SCC numbers (65302, 65303, 65304, 65305, 65310, and 65311) to the duplicate samples.

During Sampling Episode 6503, five additional sets of intended field duplicate samples (i.e., different sample numbers) were also collected and analyzed by each of the three microbiological methods. These field duplicate samples were prepared to determine the precision of the field sampling equipment. Duplicate sample data for the samples described above, along with the five intended field duplicate samples, are provided for *E. coli*, fecal coliform, and enterococci in Tables 4, 5 and 6.

Table 4. *E. Coli* Results for Duplicate Samples

Sample No.	Dup Sample No.	Sample Result	Dup Sample Result	RPD	Target RPD
65261	65281	ND	ND	NA	<30%
65265	65283	ND	ND	NA	<30%
65273	65287	ND	ND	NA	<30%
65274	65288	ND	ND	NA	<30%
65277	65289	ND	ND	NA	<30%
65264	65302*	ND	ND	NA	<30%
65267	65303*	ND	ND	NA	<30%
65259	65304*	75.4 MPN/100mL	77.1 MPN/100mL	2.2%	<30%
65279	65305*	ND	ND	NA	<30%
65224	65310*	>2,420,000 MPN/100mL	75,900 MPN/100mL	NA	<30%
65276	65311*	ND	ND	NA	<30%

NA: RPD can not be calculated since one or both of the sample results is less and/or greater than the laboratory reporting limit.
ND: Measured concentration less than the laboratory reporting limit of 1 MPN/100 mL.
Target RPD from QAPP for Rulemaking Support for Large Cruise Ships in Alaska Waters, May 2004.
*SCC numbers were fabricated to distinguish original sample from intended laboratory duplicate.

Table 5. Fecal Coliform Results for Duplicate Samples

Sample No.	Dup Sample No.	Sample Result	Dup Sample Result	RPD	Target RPD
65261	65281	ND	ND	NA	<30%
65265	65283	ND	ND	NA	<30%
65273	65287	ND	ND	NA	<30%
65274	65288	ND	ND	NA	<30%
65277	65289	ND	ND	NA	<30%
65264	65302*	ND	ND	NA	<30%
65267	65303*	ND	ND	NA	<30%
65259	65304*	18.2 CFU/100mL	8.2 CFU/100mL	**76%**	<30%
65279	65305*	ND	ND	NA	<30%
65224	65310*	14,500,000 CFU/100mL	3,600,000 CFU/100mL	**120%**	<30%
65276	65311*	ND	ND	NA	<30%

NA: RPD can not be calculated since one or both of the sample results is less than the laboratory reporting limit.
ND: Measured concentration less than the laboratory reporting limit of 1 CFU/100ml.
Target RPD from QAPP for Rulemaking Support for Large Cruise Ships in Alaska Waters, May 2004.
*SCC numbers were fabricated to distinguish original sample from intended laboratory duplicate.

Table 6. Enterococci Results for Duplicate Samples

Sample No.	Dup Sample No.	Sample Result	Dup Sample Result	RPD	Target RPD
65261	65281	ND	ND	NA	<30%
65265	65283	ND	ND	NA	<30%
65273	65287	ND	ND	NA	<30%
65274	65288	5.10 MPN/100mL	ND	NA	<30%
65277	65289	ND	ND	NA	<30%
65264	65302*	ND	ND	NA	<30%
65267	65303*	ND	ND	NA	<30%
65259	65304*	60.8 MPN/100mL	35.4 MPN/100mL	**52.8%**	<30%
65279	65305*	ND	ND	NA	<30%
65224	65310*	>2,420,000 MPN/100mL	201,000 MPN/100mL	NA	<30%

Sample No.	Dup Sample No.	Sample Result	Dup Sample Result	RPD	Target RPD
65276	65311*	1 MPN/100mL	1 MPN/100mL	0%	<30%

NA: RPD can not be calculated since one or both of the sample results is less and/or greater than the laboratory reporting limit.

ND: Measured concentration less than the laboratory reporting limit of 1 MPN/100 mL.

Target RPD from QAPP for Rulemaking Support for Large Cruise Ships in Alaska Waters, May 2004.

*SCC numbers were fabricated to distinguish original sample from intended laboratory duplicate.

The data provided in Tables 4, 5, and 6 show that approximately 90% of the field duplicate samples analyzed by the laboratory gave nearly the same measured values. Two duplicate fecal coliform analyses and one duplicate enterococci analysis had RPDs outside the QAPP-specified target of less than 30%. All of these results were from a sample collected at the influent to the disinfection system. Data users should consider limitations in the precision of these microbiological analyses of untreated wastewater as they use the results.

One duplicate sample analyzed for enterococci (Sample Number 65274) measured 5.1 MPN/100 mL in the first sample and <1 MPN/100 mL in the second sample. The RPDs for this sample pair, as well as for a number of other samples could not be calculated because one or both of the duplicate sample results was less than the laboratory reporting limit. Although the RPD for these samples cannot be calculated, the microbiological analysis precision is acceptable for this program and the reported microbiological results are valid.

Data Quality Assessment

This data validation assessment indicates all the microbiological data collected during Sampling Episode 6503 can be used for the large cruise ship rulemaking effort.

Data users should consider limitations in the precision of microbiological analyses of untreated wastewater, as well as sample results derived from overly high or low sample dilution, as they use the data.

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MEMORANDUM

DATE: December 16, 2004

TO: Don Anderson, Project Officer
EPA EAD

FROM: Julie Rest, Quality Assurance Chemist
Sample Control Center

SUBJECT: Data Review Narrative for Total and Dissolved Metals Analyses for the Alaskan Cruise Ship Industry, Episode 6503

OVERVIEW

Under EPA contract number 68-C-03-045, Southwest Research Institute (SWRI) submitted data for the analysis of total and dissolved metals by EPA Methods 200.7, 200.8, 245.1, and 245.5 in Episode 6503. The 18 aqueous samples and 3 solid samples in this episode were analyzed for 24 metals by Method 200.7 (ICP-AES) and for selenium and thallium by Method 200.8 (ICP-MS). Mercury analyses of the aqueous samples were performed by Method 245.1, and by Method 24.55 for the solid samples. Table 1 provides a list of samples, matrices, sampling dates, and the required analytical methods.

All of the aqueous samples were analyzed for both total and dissolved forms of the metals. The three solid samples were analyzed for total metals. The laboratory added the suffixes "D" and "T" to the sample numbers on the hard copy reports to differentiate the analyses for dissolved metals and total metals, respectively. These suffixes are also used in this data review narrative. However, the sample numbers in the database will not contain these suffixes. Consistent with current EAD protocols, the total and dissolved metals distinctions are provided in the "procedure" field of the database.

This episode included data for two matrix spike/matrix spike duplicate (MS/MSD) pairs for aqueous effluent samples, and one MS/MSD pair for the solid samples.

Table 1 - Sample Identifiers, Descriptions, and Analysis Methods

EPA Sample #	Matrix	Sample Description	Sampling Date	Methods
65202	Aqueous	SP1, Laundry waste	6/23/04	200.7, 200.8, and 245.1
65207	Aqueous	SP3, Accommodations wastewater	6/24/04	
65211	Aqueous	SP4, Food pulper	6/22/04	
65215	Aqueous	SP5, Galley wastewater	6/22/04	
65219	Aqueous	SP6, Influent to wastewater treatment	6/21/04	
65223	Aqueous	SP6, Influent to wastewater treatment	6/21/04	
65227	Aqueous	SP6, Influent to wastewater treatment	6/23/04	
65231	Aqueous	SP6, Influent to wastewater treatment	6/24/04	
65235	Aqueous	SP6, Influent to wastewater treatment	6/25/04	
65261	Aqueous	SP9, Effluent from wastewater treatment	6/21/04	
65265	Aqueous	SP9, Effluent from wastewater treatment	6/22/04	

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Table 1 - Sample Identifiers, Descriptions, and Analysis Methods

EPA Sample #	Matrix	Sample Description	Sampling Date	Methods
65269	Aqueous	SP9, Effluent from wastewater treatment	6/23/04	200.7, 200.8, and 245.1
65273	Aqueous	SP9, Effluent from wastewater treatment	6/24/04	
65277	Aqueous	SP9, Effluent from wastewater treatment	6/25/04	
65281	Aqueous	SP10, Effluent from wastewater treatment	6/21/04	
65285	Aqueous	SP10, Effluent from wastewater treatment	6/23/04	
65291	Solid	SP11, Screening Solids	6/22/04	200.7, 200.8, and 245.5
65292	Solid	SP12, Waste Biosludge	6/22/04	
65293	Solid	SP13, Incinerator Ash	6/21/04	
65295	Aqueous	SP15, Source water	6/21/04	200.7, 200.8, and 245.1
65301	Aqueous	SP17, Equipment blank	6/20/04	

These data have been reviewed in accordance with SCC's Data Review Guidelines for Metals Analyses (November 2004) and with the specifications listed in EPA Methods 200.7 (Rev. 5), 200.8 (Rev. 5.4), 245.1 (03/83), and 245.5 (03/83). All data are of acceptable quality with the qualifiers described below and detailed in the data review summary table (Table 2).

Following SCC's initial review of the data, EPA inquired about modifying the reporting convention used for metals to address EPA's need to compare sample results to the water quality criteria for Alaskan coastal waters. The current EAD metals contracts specify that the laboratory report results down to the minimum level (ML) for each analyte. By examining both the hard copy raw data and the laboratory's electronic submission, SCC determined that results between the ML and the method detection limit (MDL) were available for all of the metals. After consultation with EPA, SCC modified the reported results such that any analytes not detected in the sample were reported as a non-detect at the laboratory's MDL rather than at the ML. As a result, there are also some analytes that are reported as detected between the ML and the laboratory's MDL. These results are flagged "J" in the database. This change also means that the hard copy data reported by the laboratory may not match the results in the database for values in the database between the MDL and ML of the analyte. This change also necessitated an additional review of all of the blank results to ensure that the low-level results reported in samples were not simply artifacts of the blanks.

SUMMARY

All 21 samples were successfully analyzed within the specified holding times. The initial precision and recovery analyses and the MDL study were performed and met the specified criteria. Calibration curves, calibration standards, and calibration blanks and preparation blanks were successfully analyzed. Some elements were detected in blanks above the MDLs, but none were found above the laboratory's reporting limits or minimum levels. For Method 200.8, instrument tuning reports and internal standard data indicate that the system was in control. QC samples, including the laboratory control sample, matrix spike sample, matrix duplicate sample, and laboratory serial dilution sample demonstrated that laboratory performance for these analyses was acceptable, with the exception of the issue described below.

DATA ISSUES

Blanks

One or more elements were detected in the preparation blanks and some of the continuing calibration blanks (CCBs) associated with the samples in this episode at concentrations greater than the respective MDLs but less than the method-specified MLs. (Note: This is a function of the change in reporting limits requested by EPA after the fact and not an issue of laboratory performance.) The data quality is affected as follows:

- Sample Results Less than Five Times Blank Results: When the sample result is less than five times the blank result, there are no means by which to ascertain whether or not the presence of the analyte may be attributed to contamination. Therefore, SCC recommends that the data be reported in the database as a non-detect at the MDLs, adjusted sample size, dilution, and matrices. These instances are detailed in the attached data review summary table.

- Sample Results Greater than Five Times but Less than Ten Times Blank Results: SCC considers these results to be of acceptable quality, but they may be maximum values. These instances are detailed in the attached data review summary table.

- Sample Results Greater than Ten Times Blank Results or Analyte Not Detected in Sample: SCC does not consider the presence of the analyte in the blank to adversely affect the data in cases where the sample results are greater than ten times the associated blank results or where the analyte is not detected in associated samples. Because SCC considers such data to be acceptable without qualification, these cases do not merit further detail.

Matrix Spike/Matrix Spike Duplicate

Silver was recovered above the method-specified criteria and antimony was recovered below the method-specified criteria in the MS/MSD prepared for sample 65293. The relative percent difference exceeded the criteria in the MS/MSD for both analytes. Both of these analytes were detected in this sample, and therefore, SCC believes that the results for antimony and silver in sample 65293 should be considered estimated values.

TECHNICAL NOTES

According to the laboratory narrative, due to low percent solids in samples 65291 and 65292, these two samples were prepared and analyzed as aqueous samples for the Method 200.7 and 200.8 analyses, but as solid samples for the Method 245.5 analysis.

If you have any questions regarding the analyses of these samples or the review of these data, please contact SCC's Data Review Team Leader, Pornkeo Chinyavong, by telephone at (703) 461-2346 or by facsimile at (703) 461-8056.

Attachment

cc: Marla Smith, EPA
Beverly Randolf, EPA
Nelson Andrews, EPA
Deb Falatko, ERG
Jodie King, ERG
Deb Miller, CSC
Harry McCarty, CSC

Table 2
Data Review Summary Table

Episode: 6503 **Analysis:** Metals

Industry: Alaskan Cruise Ship **Reviewer:** J. Rest

Sample	Analyte	Action	Reason	SCC Qual	Level
Total 65202, 65211, 65215, 65231, 65261, 65265, 65269, 65281, 65301	Hg	Report in database as non-detects	Sample results <5x blank results	NA	ND
Total 65207, 65219, 65223, 65227, 65273, 65277, 65285, 65295	Hg	Maximum values	Sample results >5x but <10x blank results	NA	See database report
Dissolved 65301	Hg	Report in database as non-detects	Sample results <5x blank results	NA	ND
Dissolved 65202, 65211, 65215, 65261, 65265, 65269, 65281	Hg	Maximum values	Sample results >5x but <10x blank results	NA	See database report
Total 65202, 65261, 65265, 65269, 65273, 65277, 65281, 65285	B	Report in database as non-detects	Sample results <5x blank results	NA	ND
Total 65215, 65219, 65223, 65295	B	Maximum values	Sample results >5x but <10x blank results	NA	See database report
Dissolved 65281, 65207	V	Report in database as non-detects	Sample result <5x blank results	NA	ND
Total 65202	Ba	Maximum value	Sample result >5x but <10x blank result	NA	See database report
Total 65202, 65219, 65223, 65227, 65231, 65235	V	Report in database as non-detects	Sample result <5x blank results	NA	ND
Total 65291, 65292	Mo	Maximum values	Sample results >5x but <10x blank results	NA	See database report
Total 65207	V	Maximum values	Sample results >5x but <10x blank results	NA	See database report
Total 65211, 65291, 65292	Be	Report in database as non-detects	Sample result <5x blank results	NA	ND

Table 2
Data Review Summary Table

Episode: 6503 **Analysis:** Metals

Industry: Alaskan Cruise Ship **Reviewer:** J. Rest

Sample	Analyte	Action	Reason	SCC Qual	Level
Total 65211, 65231, 65235	Mo	Report in database as non-detects	Sample result <5x blank results	NA	ND
Dissolved 65211	Mo	Report in database as non-detects	Sample result <5x blank results	NA	ND
Dissolved 65202, 65261, 65265, 65269, 65273, 65281, 65285, 65301	B	Report in database as non-detects	Sample result <5x blank results	NA	ND
Dissolved 65207, 65215, 65235, 65295	B	Maximum values	Sample results >5x but <10x blank results	NA	See database report
Total 65291, 65292	Y	Report in database as non-detect	Sample result <5x blank results	NA	ND
Dissolved 65231	Sn	Report in database as non-detect	Sample result <5x blank results	NA	ND
Total 65293	Ag	Estimated value	MS/MSD % recoveries above criteria; RPD exceeded criteria	NA	15.4 mg/kg
Total 65293	Sb	Estimated value	MS/MSD % recoveries below criteria; RPD exceeded criteria	NA	28.3 mg/kg

NA = Not applicable
ND = Not detected

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MEMORANDUM

DATE: December 16, 2004

TO: Don Anderson, Project Officer
EPA EAD

FROM: Julie Rest, Quality Assurance Chemist
Sample Control Center

SUBJECT: Data Review Narrative for Organics Analyses for the Alaskan Cruise Ship Industry, Episode 6503

OVERVIEW

Under EPA Contract Number 68-C-03-033, Pacific Analytical, Inc. (PAI) submitted data for the analysis of volatiles by Method 624 and semivolatile organics by Method 625 in Episode 6503. Table 1 provides a list of samples, sampling dates, matrices and the required analytical methods. This episode included two solid samples and eighteen aqueous samples for Method 624 analysis, and three solid samples and eighteen aqueous samples for Method 625 analysis. The package included data for three matrix spike (MS) and matrix spike duplicate (MSD) pairs for Method 625 analysis and one MS/MSD pair for Method 624 analysis.

Table 1 - Sample Identifiers, Descriptions, Sampling Dates, and Analysis Methods

EPA Sample #	Matrix	Sample Description	Sampling Date	Methods
65202	Aqueous	SP1, Laundry	6/23/04	624, 625
65207	Aqueous	SP3, Accommodations, Graywater	6/24/04	624, 625
65211	Solid	SP4, Food Pulper	6/22/04	624, 625
65215	Aqueous	SP5, Galley wastewater	6/22/04	624, 625
65219	Aqueous	SP6, Influent to wastewater treatment	6/21/04	624, 625
65223	Aqueous	SP6, Influent to wastewater treatment	6/22/04	624, 625
65227	Aqueous	SP6, Influent to wastewater treatment	6/23/04	624, 625
65231	Aqueous	SP6, Influent to wastewater treatment	6/24/04	624, 625
65235	Aqueous	SP6, Influent to wastewater treatment	6/25/04	624, 625
65261	Aqueous	SP9, Effluent from wastewater treatment	6/21/04	624, 624
65265	Aqueous	SP9, Effluent from wastewater treatment	6/21/04, 6/22/04	624, 625
65269	Aqueous	SP9, Effluent from wastewater treatment	6/23/04	624, 625
65273	Aqueous	SP9, Effluent from wastewater treatment	6/28/04, 6/24/04	624, 625
65277	Aqueous	SP9, Effluent from wastewater treatment	6/25/04	624, 625
65283	Aqueous	SP10, Effluent from wastewater treatment	6/22/04	624, 625
65285	Aqueous	SP10, Effluent from wastewater treatment	6/23/04	624
65289	Aqueous	SP10, Effluent from wastewater treatment	6/25/04	625

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EPA Sample #	Matrix	Sample Description	Sampling Date	Methods
65291	Solid	SP11, Screening Solids	6/22/04	624, 625
65292	Solid	SP12, Biosludge Waste	6/21/04	624, 625
65293	Solid	SP13, Incinerator Ash	6/21/04	625
65295	Aqueous	SP15, Source water	6/21/04	624, 625
65300	Aqueous	SP16,Trip Blank	6/03/04	624
65301	Aqueous	SP17, Equipment Blank	6/20/04	625

These data have been reviewed in accordance with SCC's General Data Review Guidelines for Organics Methods (Draft, October 2004) and according to the specifications in the methods. Below is a summary of the results of the data review process, followed by detailed descriptions of data issues identified with these samples. Based on this review, all data in this episode are considered to be of acceptable quality with the qualifications described below and detailed in the attached data review summary tables (Table 2 and 3).

SUMMARY

Method 625 samples were extracted and analyzed within the method-specified holding times, and GPC clean-up procedures were performed on all samples. Method 624 samples were prepared and analyzed within holding times, with the exception detailed below and in the data review summary table (Table 2). All calibration and continuing calibration standards were successfully analyzed. Preparation blanks performed for each analysis detected no contamination above the laboratory's reporting limits. The QC samples, including the ongoing and precision recovery samples (OPR), and MS/MSD samples; as well as surrogate and internal standard recoveries, demonstrated that laboratory performance for these analyses was acceptable with the exception of the data issues described below.

DATA ISSUES: METHOD 624

Holding Times

EPA sample 65223 was diluted and reanalyzed for tetrachloroethene because the result in the neat analysis exceeded the calibration range. The dilution was analyzed one day outside of the method-specified holding time. Therefore, the tetrachloroethene result in sample 65223 should be considered a minimum value.

Some of the other samples in this episode required dilutions for tetrachloroethene. The laboratory narrative pointed out that samples 65261 and 65273 were analyzed immediately following two samples that were high in tetrachloroethene, sample 65219 (440 µg/L tetrachloroethene) and sample 65231 (1400 µg/L tetrachloroethene). Since reanalyses were not performed for samples 65261 or 65273, it is unclear whether or not the concentration of tetrachloroethene in either sample was affected by carry-over from the previous samples. Other sample data were examined for similar instances and it was found that sample 65295, which yielded a non-detect for tetrachloroethene, was run immediately following sample 65292, that contained 190 µg/L of tetrachloroethene. Although no carry-over occurred in this instance, since the concentrations of tetrachloroethene in samples 65219 and 65231 were significantly higher than the 190 µg/L found in sample 65292, the possibility of carry-over cannot be ruled out. Therefore, SCC considers the tetrachloroethene results in samples 65261 and 65273 to be estimated values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

According to the scheduling facsimile, the MS/MSD samples were to be prepared and analyzed at the rate of one MS/MSD per every ten samples (double the method-specified frequency of 5%). For the volatiles analysis, MS/MSD aliquots were provided for samples 65265 and 65269. Due to a laboratory oversight, however, the MS/MSD for sample 65269 was not analyzed. SCC was not aware of this oversight until the data review was performed. By that time, the holding time for the samples had long expired, and therefore, SCC decided not to request that the laboratory prepare and analyze the MS/MSD. As a result, there are no MS/MSD data with which to evaluate the effect of the sample matrix on this specific sample. However, both samples are wastewater effluents from the same sampling point and could be expected to behave similarly, such that the lack of the one of these MS/MSD pairs is not a serious omission.

DATA ISSUES: METHOD 625

Ongoing Precision and Recovery (OPR)

Benzidine was either not recovered, or had very low percent recoveries, in the OPRs associated with samples in this episode. Although Method 625 does not provide QC limits for benzidine recovery, the lack of recovery in the OPRs indicates potential difficulties in the extraction of this compound in samples. Given this, and the fact that the recovery of benzidine has historically been problematic, SCC recommends that the benzidine results in all samples be excluded from the database (see Table 3).

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

An MS/MSD sample was prepared for solid sample 65293. Several analytes had recoveries that were either below the method-specified criteria, or were not recovered in the MS/MSD. Although Method 625 does not provide QC limits for some of these analytes, the low recoveries indicate the presence of matrix interference in this sample. Therefore, for analytes with low recoveries in the MS/MSD, SCC considers the results for these compounds in this sample to be of acceptable quality, but they may be minimum values. For analytes not recovered in the MS/MSD, SCC recommends that the results be excluded from the database. These instances are detailed in the data review summary table (Table 3).

TECHNICAL NOTES :

Reporting Limits

The reporting limits for this project are the same limits required for Methods 1624 and 1625, and are based on the lowest initial calibration standard, adjusted for sample size and dilution.

The laboratory increased the QC spiking concentrations and the minimum level (ML) for 2-chloroethyl-vinyl ether in the Method 624 by a factor of five because of problems with sensitivity for this analyte. The increased ML for this analyte is reflected in the database.

Sample Reporting

Due to a reporting error, the laboratory reported sample 65285 as sample 65284. The database has been corrected to reflect the actual sample number.

If you have any questions regarding the analyses of these samples or the review of these data, please contact SCC's data review team leader, Pornkeo Chinyavong, by telephone at (703) 461-2346 or by facsimile at (703) 461-8056.

Attachments

cc: Beverly Randolph, EPA
Marla Smith, EPA
Nelson Andrews, EPA
Deb Falatko, ERG
Jodi King, ERG
Deb Miller, CSC
Harry McCarty, CSC

Table 2 - Data Review Summary Table for Method 624

Episode: 6503 **Analysis:** Method 624

Industry: Alaskan Cruise Ship **Reviewer:** J. Rest

Sample	Analyte	Action	Reason	SCC Qual	Level
65223	Tetrachloroethene	Acceptable quality, but may be minimum value	Holding time exceeded	NA	270 µg/L
65261 65273	Tetrachloroethene	Estimated values	Potential carry-over from previous sample analysis	NA	10 µg/L 27 µg/L

Table 3 -Data Review Summary Table for Method 625

Episode: 6503 **Analysis:** Method 625

Industry: Alaskan Cruise Ship **Reviewer:** J. Rest

Sample	Analyte	Action	Reason	SCC Qual	Level
All samples	Benzidine	Exclude from database	No OPR % recoveries	Exclude	NA
65293	2-Nitrophenol, 2,4,6-Trichloro-phenol	Acceptable quality, but may be minimum value	Low MS/MSD % recoveries	NA	ND
65293	4-Nitrophenol, Pentachlorophenol, Hexachlorocyclo-pentadiene	Exclude from database	No MS/MSD % recoveries	Exclude	NA

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MEMORANDUM

DATE: December 14, 2004

TO: Don Anderson, Project Officer
EPA EAD

FROM: Pornkeo Chinyavong, Quality Assurance Chemist PC
Sample Control Center

SUBJECT: Data Review Narrative for PCB Congeners Analyses for the Alaskan Cruise Ship Industry
Episode 6503

OVERVIEW

Under EPA Purchase Order EP-C-04-047, Axys Analytical Services submitted data for the analysis of chlorinated biphenyl congeners by EPA Method 1668A for one sample in Episode 6503. Table 1 provides a complete listing of the sample, matrix, sample description, and the required analytical method.

Table 1 - Sample Identifiers, Descriptions, Sampling Dates, and Analysis Method

Episode	EPA Sample #	Matrix	Sample Description	Sampling Date	Method
6503	65219	Aqueous	SP6, Influent Wastewater	6/24/04	1668A

These data have been reviewed in accordance with SCC's Data Review Guidelines for Chlorinated Biphenyl Analysis (November 2004). Below is a summary of the results of the data review process, followed by detailed descriptions of data issues identified with this sample. Based on this review, all data in this episode are considered to be of acceptable quality.

SUMMARY

The sample was successfully extracted and analyzed for the target analytes in EPA Method 1668A within the method-specified holding times. The calibration and continuing calibration standards were successfully analyzed. Preparation blanks associated with this sample detected no contamination above the laboratory's reporting limits. The QC samples, including the ongoing precision and recovery (OPR) sample, demonstrated that laboratory performance for these analyses was acceptable, with the clarification provided below.

Reporting Limits

The laboratory's reporting limits are at the method-specified minimum levels (MLs). The sample was extracted using a 910-mL aliquot, rather than the method-specified 1000-mL aliquot, due to volume constraints. This variation in sample size increased the MLs for sample 65219 by 10%. As reported by the laboratory, the MLs provided in the database for this sample reflect the smaller sample volume.

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If you have any questions regarding the analyses of this sample or the review of these data, please contact me, by telephone at (703) 461-2346 or by facsimile at (703) 461-8056.

cc: Beverly Randolph, EPA
Marla Smith, EPA
Nelson Andrews, EPA
Deb Falatko, ERG
Jodi King, ERG
Deb Miller, CSC
Harry McCarty, CSC

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MEMORANDUM

DATE: December 16, 2004

TO: Don Anderson, Project Officer
EPA EAD

FROM: Pornkeo Chinyavong, Quality Assurance Chemist PC
Sample Control Center

SUBJECT: Data Review Narrative for Pesticide Analyses for the Alaskan Cruise Ship Industry, Episode 6503

OVERVIEW

This data review narrative supersedes the original narrative dated November 5, 2004. At EPA's request, a GC/MS analysis was conducted on sample 65227 because of the concern about potential false positive results for propachlor and simazine from the initial GC analysis. The presence of these two pesticides was not confirmed by GC/MS analysis. Therefore, the EAD database has been revised to report propachlor and simazine as non-detects for sample 65227. The revisions contained in this narrative are in **boldface.**

Under EPA Purchase Order EP-C-04-046, Pacific Analytical, Inc. (PAI) submitted data for the analysis of organohalide pesticides by EPA Method 1656A and organophosphorus pesticides by EPA Method 1657A for five samples in Episode 6503. Table 1 provides a list of samples, matrices, descriptions, and the required analytical methods.

Table 1 - Sample Identifiers, Descriptions, Sampling Dates, and Analysis Methods

EPA Sample #	Matrix	Sample Description	Sampling Date	Method (s)
65215	Aqueous	SP5, Galley wastewater	6/22/04	1656A, 1657A
65227	Aqueous	SP6, Influent to wastewater treatment	6/22/04	1656A
65240	Aqueous	SP7, Influent to wastewater treatment	6/23/04	1656A
65223	Aqueous	SP6, Influent to wastewater treatment	6/22/04	1657A
65239	Aqueous	SP7, Influent to wastewater treatment	6/22/04	1657A

These data have been reviewed in accordance with SCC's Data Review Guidelines for Pesticide Analyses (November 2004). Below is a summary of the results of the data review process, followed by detailed descriptions of data issues identified with these samples. Based on this review, all data in this episode are considered to be of acceptable quality with the qualifications described below and detailed in the attached data review summary tables (Tables 2A and 2B).

SUMMARY

All samples were successfully extracted and analyzed for the target analytes in EPA Methods 1656A and 1657A within the method-specified holding times. The calibration and continuing calibration standards were successfully analyzed. Preparation blanks performed for each analysis detected no contamination above the laboratory's reporting limits. All organohalide pesticides samples were processed through gel

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permeation chromatography (GPC), Florisil, and sulfur removal cleanups. All organophosphorus pesticides samples were processed through GPC and carbon column cleanup. The QC samples, including the ongoing precision and recovery sample (OPR) and the matrix spike/matrix spike duplicate (MS/MSD) samples, demonstrated that laboratory performance for these analyses was acceptable with the exception of the data issues described below.

Reporting Limits

The laboratory's reporting limits are based on the lowest calibration points specified in the methods, adjusted for dilution, rather than the minimum levels (MLs) listed in the methods. In most cases, the laboratory's reporting limits are lower than the method-specified MLs.

Some sample results in this episode were reported by the laboratory with a "J" flag, which indicates an estimated result that is below the laboratory's reporting limit. In keeping with current EAD practices, and to maintain consistency, all "J" flagged data will be reported in the database as non-detects at the laboratory's reporting limits.

Multiple Qualifiers

Some analytical results were affected by multiple qualifiers. In cases where these qualifiers suggest different biases, SCC considers the data to be estimated values. The effect of each QC failure and its associated qualifier are described in this data review narrative. Where multiple QC failures occur, the cumulative effects of the associated qualifiers are documented in the Tables 2A and 2B.

DATA ISSUES: METHOD 1656A

Ongoing Precision and Recovery (OPR)

Ethalfluralin, benfluralin, dichlone, and carbophenothion were recovered below the method-specified criteria in the OPRs associated with samples 65215, 65227, and 65240. Therefore, SCC considers the non-detect data in these samples to be of acceptable quality, but they may be minimum values. See Table 2A.

Norflurazon was not recovered in the OPR associated with all samples in this episode. Because it cannot be ascertained whether or not this analyte would have been detected if present in the samples, SCC recommends excluding norflurazon data from the database for these samples. See Table 2A

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD samples were prepared for sample 65227. Dichlone was recovered below the method-specified criteria. Therefore, SCC considers the non-detect dichlone data in this sample to be of acceptable quality, but it may be a minimum value. For captan and bromacil, the relative percent difference (RPD) between MS/MSD exceeded criteria, but these analytes were not detected in the sample. Therefore, SCC believes that the data quality is not affected.

Acephate was not recovered in the MS/MSD samples. This analyte also was not detected in any of the samples in this episode. Therefore, because it cannot be ascertained whether or not this analyte would have been detected if present in the sample, SCC recommends excluding acephate data from the database for sample 65227. See Table 2A.

Sample Results

According to the GC method, the computed result for a target analyte detected on the primary column analysis must be confirmed and agree within a factor of two with the result computed for that analyte on the confirmation column. For sample 65227, the propachlor result of 0.163 µg/L from the primary column differed by more than the method-specified factor of two from the confirmation column result of 3.27 µg/L, suggesting that a positive interference may be present.

Due to possible matrix interferences in sample 65227, the chromatograms from both primary and secondary columns show that the simazine peak, although distinct, is not completely resolved from other closely eluting compounds. Because other compounds elute within 20 seconds on the primary column, and non-target multi-component peaks surround the simazine peak on secondary column, the simazine identification and quantification are suspect.

After discussions with SCC, EPA authorized the analysis of sample 65227 by a GC/MS method utilizing selected ion monitoring (SIM) to determine if propachlor and simazine were, in fact, present in the samples, or if the original GC/ECD results were false positives. The results of the GC/MS SIM analysis were subsequently reviewed by SCC and the presence of these two pesticides could not be confirmed. Therefore, the EAD database has been revised to report propachlor and simazine as non-detects for sample 65227.

For sample 65240, kepone could not be confirmed on a secondary column because kepone does not elute on the ZB-1701 column used for confirmation. In addition, the chromatogram from the primary column showed poor baseline integration due to matrix interferences, which could lead to a false positive result. Without further efforts to confirm the results, it cannot be ascertained whether or not this analyte is present in the sample. Given the relatively low kepone concentration of 1.62 µg/L, it is likely that confirmation would require analysis by high resolution GC/MS. Considering the fact that kepone has not been manufactured or registered for use in the U.S. for many years, it seems unlikely that the peak tentatively identified as kepone during this analysis is actually kepone. **After consultation with SCC, EPA decided that high resolution GC/MS confirmation of this sample was not warranted.** Therefore, SCC recommends excluding kepone data from the database for sample 65240 due to a severe matrix interference (See Table 2A).

Surrogate Recoveries

For samples 65215 and 65227, the surrogate recoveries for decachlorobiphenyl on both columns are below the method-specified criteria due to matrix interferences. However, the other two surrogate recoveries are within the method-specified criteria, indicating that the extraction efficiency is in control. Therefore, SCC believes that the data quality for these samples is not affected by the low recovery of one surrogate.

DATA ISSUES: METHOD 1657A

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD samples were prepared for sample 65223. TEPP was recovered below the method-specified criteria. Therefore, SCC considers the non-detect value for TEPP data in this sample to be of acceptable quality, but it may be a minimum value. See Table 2B.

Surrogate Recoveries

For sample 65239, the surrogate recoveries for triphenylphosphate on both columns are below the method-specified criteria. However, the other surrogate recovery is within the method-specified criteria indicating that the extraction efficiency is in control. Therefore, SCC believes that the data quality for this sample is not affected by the low recovery. None of the organophosphorus pesticides were detected in any of the samples in this episode.

Technical Notes

Kepone was detected in the preparation blank associated with the samples in this episode at 0.322 µg/L, which was below the laboratory's reporting limit. However, the presence of kepone in the blank does not adversely affect the data for samples 65215 and 65227, because, kepone was not detected above the laboratory's reporting limit in these samples. For sample 65240, kepone data was excluded from the database, as described above.

If you have any questions regarding the analyses of these samples or the review of these data, please contact me by telephone at (703) 461-2346 or by facsimile at (703) 461-8056.

Attachments

cc: Beverly Randolph, EPA
Marla Smith, EPA
Nelson Andrews, EPA
Deb Falatko, ERG
Jodi King, ERG
Deb Miller, CSC
Harry McCarty, CSC

Table 2A
Data Review Summary Table

Episode: 6503 **Analysis:** 1656A

Industry: Alaskan Cruise Ship **Reviewer:** P. Chinyavong

Sample	Analytes	Action	Reason	SCC Qual	Level
65240	kepone	Exclude from database	Result is not confirmable on second column analysis; severe matrix interference	Exclude	NA
65215, 65240	ethalfluralin, benfluralin, dichlone, carbophenothion	Acceptable quality, but may be minimum values	Low OPR % recoveries	NA	ND
65227	ethalfluralin, benfluralin, carbophenothion	Acceptable quality, but may be minimum value	Low OPR % recoveries	NA	ND
65227	dichlone	Acceptable quality, but may be minimum value	Low OPR % recovery; low MS/MSD % recoveries	NA	ND
65227	**propachlor, simazine**	**Include in database as non-detects**	**Analytes not confirmed in GC/MS analysis**	**NA**	**ND**
65215, 65227, 65240	norflurazon	Exclude from database	No OPR % recoveries	Exclude	NA
65227	acephate	Exclude from database	No MS/MSD % recoveries	Exclude	NA

ND = Non-detect at the laboratory's reporting limit. See level in database.
NA = Not applicable

Table 2B
Data Review Summary Table

Episode: 6503 **Analysis:** 1657A

Industry: Alaskan Cruise Ship **Reviewer:** P. Chinyavong

Sample	Analyte	Action	Reason	SCC Qual	Level
65223	TEPP	Acceptable quality, but may be minimum value	Low MS/MSD % recoveries	NA	ND

ND = Non-detect at the laboratory's reporting limit. See level in database.
NA = Not applicable

Quality Assurance Review of Laboratory Data Collected From Large Cruise Ships in Alaska Waters

Sampling Episode 6503

Data Validation Report For Settleable Solids Samples

Prepared By:

Eastern Research Group
14555 Avion Parkway, Suite 200
Chantilly, Virginia 20151

December 13, 2004

Settleable Solids Method 160.5

Completeness

During Sampling Episode 6503, a total of 19 samples (excluding QC samples) were collected for analysis of settleable solids (SS) by EPA Method 160.5. All 19 samples received by the laboratory were analyzed for SS for a completeness of 100% (all planned samples were collected and analyzed). The data package submitted by the analytical laboratory, Analytica Alaska Southeast, contained complete SS data for the samples listed in Table 1.

Table 1. SS Samples Collected During Sampling Episode 6503

Sample Numbers	Sample Point Description
65219, 65223, 65227, 65231, 65235	Treatment System Influent
65261, 65265, 65269, 65273, 65277, 65287, 65289	Treatment System Effluent
65207	Accommodations
65215	Galley
65202	Laundry
65211	Food Pulper
65291	Screening Solids
65292	Waste Biosludge
65295	Source Water

Holding Times

Method 160.5 requires SS samples be analyzed within 48 hours following collection. Analysis of traffic reports and laboratory data sheets indicates five samples were analyzed outside the 48 hour holding time. Table 2 provides information on the samples analyzed outside the method-specified holding time.

Table 2. SS Samples Exceeding Hold Times

Sample Number	Sample Description	Sample Hold Time	Method Hold Time	SS Result
65235	Treatment System Influent	54.2 hours	48 hours	69 ml/L
65277	Treatment System Effluent	54.2 hours	48 hours	1.0 ml/L

Sample Number	Sample Description	Sample Hold Time	Method Hold Time	SS Result
65289	Treatment System Effluent	54.2 hours	48 hours	< 0.11 ml/L
65287	Treatment System Effluent	78 hours	48 hours	<0.11 ml/L
65207	Accommodations	84 hours	48 hours	2.1 ml/L

To determine the impact of exceeding the holding times for these five samples, results of similar samples were reviewed. Table 3 shows the SS results for treatment system influent and effluent samples that were analyzed within the 48 hour holding time. The data in Table 3 show the SS concentrations measured in the influent to the treatment system ranged from 22 to 82 ml/L. The SS concentration measured in the effluent from the treatment system ranged from <0.11 to <0.13 ml/L.

Table 3. SS Results for Samples Analyzed within the 48 Hour Holding Time

Sample Number	Sample Description	SS Concentration (ml/L)
65227	Treatment System Influent	22
65231	Treatment System Influent	66
65219	Treatment System Influent	40
65223	Treatment System Influent	82
65265	Treatment System Effluent	<0.13
65269	Treatment System Effluent	<0.11
65273	Treatment System Effluent	<0.11
65261	Treatment System Effluent	<0.11

The SS concentration measured on treatment system influent sample 65235, analyzed outside the 48-hour holding time, was 69 mL/L, which falls within the range of SS concentrations for the influent samples analyzed within the holding times shown in Table 3. The SS concentrations for treatment system effluent samples 65287 and 65289, analyzed outside the 48-hour holding time, were reported as below the detection limit of 0.11 mL/L. The four other effluent samples in this episode that were analyzed within the holding time were also reported as non-detects at a similar level (see Table 3).

The remaining effluent sample analyzed outside of the 48-hour holding time, sample 65277, had a measured SS concentration of 1 mL/L, which is above the non-detect results for the effluent samples measured within holding time. The result for this sample may represent a maximum value.

Based on these comparisons, the SS results from samples 65235, 65277, 65289, and 65287 should be considered valid for the cruise ship rulemaking.

The SS result from the accommodations wastewater sample, 65207, can not be compared to similar data within the data set since only a single accommodations wastewater sample was collected. Although the accommodations wastewater is a component of the treatment system influent, this sample was held longer than any other sample (influent or effluent) in this episode. Therefore, because there is no direct basis for comparison with similar samples analyzed within the holding time, the result for sample 65207 should be considered an estimated value.

Precision Analysis

Reproducibility for SS is measured as relative percent difference (RPD) between duplicate samples. The QAPP for the Cruse Ship Rulemaking specifies the target RPD for field duplicate samples as less than 30%. Field duplicate samples were collected for SS, and the results are shown in Table 4. The RPDs shown in Table 4 could not be calculated since one or both of the field duplicate sample results were less than the laboratory reported detection limit. Although the RPD for these samples cannot be calculated, SS analysis precision is acceptable for this program, and the reported SS results are valid.

Table 4. Relative Percent Difference Between Field Duplicate Samples

Sample No.	SS Result	Sample No	SS Result	RPD	RPD Target
65273	<0.11 ml/L	65287	<0.11ml/L	NA	<30%
65277	1.0 ml/L	65289	<0.11 ml/L	NA	<30%

NA: RPD cannot be calculated since one or both of the sample results is less than the detection limit.
RPD target from QAPP for Rulemaking Support for Large Cruise Ships in Alaska Waters, May 2004.

Data Quality Assessment

This data validation assessment indicates the SS data collected during Sampling Episode 6503 can be used for the large cruise ship rulemaking effort.

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MEMORANDUM

DATE: January 10, 2005

TO: Don Anderson, Project Officer
EPA EAD

FROM: Pornkeo Chinyavong, Quality Assurance Chemist PC
Sample Control Center

SUBJECT: Data Review Narrative for Available Cyanide Analyses by Method OIA-1677 for the Alaska Cruise Ship Industry, Episode 6503

OVERVIEW

Under EPA Purchase Order EP-C-04-048, Bayer Material Science LLC, submitted available cyanide data by EPA Method OIA-1677 for 19 samples in Episode 6503. Table 1 provides a complete listing of samples and matrices. Available cyanide was the only analysis performed by Bayer for these samples.

Table 1 - Sample Identifiers, Descriptions, and Sampling Dates

EPA Sample #	Matrix	Sample Description	Sampling Date
65202	Aqueous	SP1, Laundry wastewater	6/23/04
65207	Aqueous	SP3, Accommodations wastewater	6/24/04
65211	Aqueous	SP4, Food pulper wastewater	6/22/04
65215	Aqueous	SP5, Galley wastewater	6/22/04
65219	Aqueous	SP6, Influent to wastewater treatment	6/21/04
65223	Aqueous	SP6, Influent to wastewater treatment	6/22/04
65227	Aqueous	SP6, Influent to wastewater treatment	6/23/04
65231	Aqueous	SP6, Influent to wastewater treatment	6/23/04
65235	Aqueous	SP6, Influent to wastewater treatment	6/25/04
65261	Aqueous	SP9, Effluent from wastewater treatment	6/21/04
65265	Aqueous	SP9, Effluent from wastewater treatment	6/22/04
65269	Aqueous	SP9, Effluent from wastewater treatment	6/23/04
65273	Aqueous	SP9, Effluent from wastewater treatment	6/23/04
65277	Aqueous	SP9, Effluent from wastewater treatment	6/24/04
65281	Aqueous	SP10, Effluent from wastewater treatment	6/21/04
65283	Aqueous	SP10, Effluent from wastewater treatment	6/23/04
65291	Solid	SP11, Screening solid	6/22/04
65292	Sludge	SP12, Waste biosludge (desludge)	6/22/04
65295	Aqueous	SP15, Source water	6/21/04

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These data have been reviewed in accordance with SCC's *Data Review Guidelines for Classical Wet Chemistry Analyses* (November 2004), and with the specifications listed in the analytical requirements summary for this episode. Below is a summary of the results of the data review process, followed by detailed descriptions of data issues identified with these samples. Based on this review, all data in this episode are considered to be of acceptable quality with the qualifications described below and detailed in the attached data review summary table (Table 2).

SUMMARY

All samples were successfully analyzed within the method-specified holding times for available cyanide. Initial precision and recovery samples (IPRs) were successfully performed prior to sample analysis. The calibration and continuing calibration standards were successfully analyzed. Preparation blanks were performed and there was no contamination detected above the laboratory reporting limits. The QC samples, including the ongoing and precision recovery sample (OPR) and matrix spike/matrix spike duplicate (MS/MSD) samples, demonstrated that laboratory performance for these analyses was acceptable, with the exception of the data issues described below.

DATA ISSUES: AVAILABLE CYANIDE GREATER THAN TOTAL CYANIDE

Sample Results

For all samples in this episode, SCC evaluated total cyanide results against available cyanide results, and found that available cyanide was detected in samples 65207, 65219, 65227, 65231, 65235, 65265, 65281, and 65295, while total cyanide were not detected in these samples. In theory, the total cyanide results in any given sample will be greater than either the free or available cyanide results for the same sample. However, for these samples, it is important to recognize that the total cyanide is determined using a separate sample from that used for free or available cyanide, and that the available cyanide determination was performed by a different laboratory. In addition, the overall homogeneity of the waste stream being sampled can have a significant effect on the cyanide results. Therefore, it may not be possible to identify problems that would invalidate one cyanide fraction or the other.

A review of the traffic reports (TRs) for the samples indicates that some of the samples in Episode 6503 were not treated with lead carbonate to remove sulfides. SCC consulted EPA and the sampling contractor and determined that the following 11 samples were not treated with lead carbonate:

65202, 65207, 65211, 65227, 65231, 65235, 65269, 65273, 65277, 65283, and 65295

The total cyanide result for Sample 65273 (effluent) was reported as a non-detect at 5 µg/L and available cyanide was a non-detect at 2 µg/L. An MS/MSD pair for available cyanide was prepared from this sample and had recoveries of 101% and 102% respectively, while the MS/MSD recoveries for total cyanide were 5% and 1%, as noted earlier. This suggests a significant potential for low bias in the total cyanide result. Therefore, based on the low MS/MSD recoveries for total cyanide in this sample, the total cyanide non-detect is considered a minimum value and the available cyanide result is considered acceptable without qualification.

There were nine other samples in Episode 6503 that exhibited the pattern of total cyanide results less than the available cyanide results. Samples 65219, 65227, 65231, and 65235 are influents to treatment and, as noted above, there are no MS/MSD analyses that demonstrate the performance of either method for this matrix type. Samples 65227, 65231, and 65235 also are among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, lacking matrix-specific supporting data that might explain the observed differences, and given the potential for positive

interferences in the available cyanide measurements, SCC recommends flagging both cyanide results for samples 65227, 65231, and 65235 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in these samples. Sample 65219 was treated in the field, therefore SCC recommends including both cyanide results for sample 65219 in the database, but flagging them to indicate the irreconcilable differences.

The total cyanide results for Sample 65207 (accommodations wastewater) were reported as a non-detect at 5 µg/L, while available cyanide was detected in this sample at 15.7 µg/L. The MS/MSD recoveries for total cyanide were 21% and 22%. Sample 65207 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, given the low MS/MSD recoveries for total cyanide in this sample and the potential for positive interferences in the available cyanide measurements, SCC recommends flagging both cyanide results for sample 65207 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in this sample.

Sample 65211 is listed as the food pulper wastewater. This description suggests that this matrix is not a treated effluent, but may be a component of the influent to the treatment system. Total cyanide was detected at 14 µg/L, while available cyanide was reported at 88.4 µg/L. Sample 65211 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, lacking matrix-specific supporting data that might explain the observed differences, and the potential for positive interferences in the available cyanide measurements, SCC recommends flagging both cyanide results for sample 65211 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in this sample.

Sample 65295 is listed as a source water sample, a matrix type that should not present significant analytical difficulties. Sulfide was not detected in this sample by the field test performed at the time of collection and therefore, this sample is among the 11 samples that were not treated with lead carbonate. Although the presence of available cyanide at 19 µg/L in the source water is unexpected, there is no analytical evidence to suggest that the available cyanide result be excluded. However, an engineering review or other information not available to SCC may lead to a different conclusion. Therefore, SCC recommends including both cyanide results for sample 65295 in the database, but flagging them to indicate the irreconcilable differences.

Episode 6503 included two sets of field duplicate samples that were sent to the laboratories blind. SCC does not normally evaluate the agreement between field duplicate samples. However, because of concerns about the cyanide data, at EPA's request, SCC obtained information about the field duplicates from the sampling contractor and performed some simple comparisons. The two field duplicate pairs were samples 65261 and 65281, and samples 65265 and 65283, all effluent samples. The total cyanide results in sample 65261 were reported as a non-detect at 5 µg/L, while available cyanide was reported as a non-detect at 2 µg/L. For sample 65281, the blind field duplicate, the total cyanide results were reported as a non-detect at 5 µg/L, while available cyanide was detected in this sample at 8.96 µg/L. A similar pattern occurs for the cyanide results in the other field duplicate pair. Total cyanide was reported as a non-detect at 5 µg/L in both samples 65265 and 65283, while available cyanide was detected at 5.86 µg/L in sample 65265 and as a non-detect a 2 µg/L in sample 65283.

The MS/MSD recoveries for total cyanide in effluent sample 65273 were very low (1% and 5%), and low (33% and 30%) in sample 65269, suggesting a potential negative basis that may affect the total cyanide results in samples 65261, 65281, 65265, and 65283. Therefore, SCC recommends that the total cyanide results in sample 65261 and 65281 be considered minimum values. The difference between the available cyanide results in the two field duplicate samples (e.g., a non-detect at 2 µg/L and a detect at 8.96 µg/L) cannot be explained on the basis of the MS/MSD results for available cyanide in sample 65273, which was also an effluent. Given the discrepancy between the field duplicate results for available cyanide,

SCC recommends including the available cyanide results for samples 65261 and 65281 in the database, but flagging them to indicate the irreconcilable differences. SCC recommends that the total cyanide results for samples 65261 and 65281 also be flagged to indicate the irreconcilable differences, as a further precaution.

Because of the low MS/MSD recoveries in the other effluent samples, the total cyanide result for sample 65265 is considered a minimum value. The available cyanide result of 5.86 µg/L is well within 30% of the reported detection limit for total cyanide (e.g., 5 µg/L), and therefore would normally not be qualified. However, because the available cyanide result in the field duplicate of the sample, 65283 is a non-detect at 2 µg/L, SCC recommends including both the total and available cyanide results for sample 65265 in the database, but flagging them to indicate the irreconcilable differences.

Sample 65283 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Given the very low MS/MSD recoveries for total cyanide in effluent samples in this episode, SCC recommends flagging both cyanide results for sample 65283 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in these samples.

Please note that the samples were analyzed for total cyanide by Analytical Laboratory Services, Inc. A separate narrative has been prepared for the total cyanide analysis.

TECHNICAL NOTES:

Reporting Limits

The laboratory reported sample results down to the method detection limit (MDL), rather than the method-specified minimum level (ML). In keeping with current SCC practices, and in order to maintain consistency in the database, the reporting limits for available cyanide have been adjusted in the database to reflect the method-specified ML of 2.0 µg/L.

If you have any questions regarding the analysis of these samples or the review of these data, please contact me at (703) 461-2346 or by facsimile at (703) 461-8056.

Attachments

cc: Beverly Randolph, EPA
Marla Smith, EPA
Nelson Andrews, EPA
Deb Falatko, ERG
Jodi King, ERG
Deb Miller, CSC
Harry McCarty, CSC

Table 2
Data Review Summary Table

Episode: 6503 **Analysis:** Available Cyanide

Industry: Alaska Cruise Ship **Reviewer:** P. Chinyavong

Sample	Analyte	Action	Reason	SCC Qual	Level
65207, 65211	Available cyanide	—	Sample not treated with lead carbonate to remove sulfides. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.	MISCA	NA
65219		—	Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.	IRR	NA
65227, 65231, 65235		—	Samples not treated with lead carbonate to remove sulfides. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.	MISCA	NA
65261, 65265, 65281		—	Based on field duplicate results, irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.	IRR	NA
65283		—	Sample not treated with lead carbonate to remove sulfides. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.	MISCA	NA
65295		—	Irreconcilable results for total and available cyanide.	IRR	NA

NA = Not applicable
IRR = Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
MISCA = Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.

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MEMORANDUM

DATE: January 18, 2005

TO: Don Anderson, Project Officer
EPA EAD

FROM: Harry B. McCarty
Senior Scientist

SUBJECT: Issues Associated with Results for Total Cyanide versus Available Cyanide for Episodes 6503, 6504, 6505, and 6506

The purpose of this memorandum is to provide a general discussion of the analysis of various forms of cyanide in aqueous samples, describe the cyanide analyses conducted as part of EPA's investigation of discharges from Alaskan cruise ships, and provide recommendations regarding specific results from Sampling Episodes 6503, 6504, 6505, and 6506.

Forms of Cyanide

Cyanide is an inorganic moiety composed of one carbon atom and one nitrogen atom that is most often found as an anion with a charge of -1. The cyanide anion can bond with various metals or other elements to form a wide range of cyanide compounds. The simplest form of cyanide is hydrogen cyanide, HCN, which readily dissociates into H^+ and CN^- in water. HCN is known as "free cyanide" and is the most toxic form of cyanide. Most forms of cyanide are toxic, with their toxicities depending on their ability to release free cyanide.

"Total cyanide" (or "cyanide, total") is an operationally defined term used to describe the cyanides that are measured using the total cyanide test. Total cyanide methods attempt to measure the amount of CN^- present in a sample, regardless of its oxidation state or complexation to other ions or compounds. Some complexes and organic cyanide compounds are resistant to the dissociation that occurs during the digestion/distillation step, and others are completely decomposed. Therefore, total cyanide is a method-defined parameter because the analytical conditions determine the actual analyte quantity measured.

Compounds such as metallocyanides are resistant to oxidation, with iron cyanide being one of the most resistant, and nickel, copper, and noble metal cyanides being somewhat resistant. These compounds will contribute to the measured total cyanide to some degree, but are not always completely recovered by the digestion/distillation procedure. Cyanide compounds such as thiocyanate, cobaltocyanide compounds, and cyanohydrin organic compounds are not measured at all by this procedure include because they decompose during the digestion procedure.

Two other operationally defined groups of cyanide species are "available cyanide," and "cyanide amenable to chlorination" (or "amenable cyanide"). Available cyanide generally encompasses both the free cyanide and those complexed species that are relatively easily dissociated in a weak acid solution. Amenable cyanide is the term used to describe that fraction of cyanide that can be destroyed by the common wastewater treatment procedure of chlorinating the wastewater. Some cyanides in solution will react with chlorine (Cl_2) to form cyanogen chloride (CNCl), a highly toxic gas with limited solubility. The cyanogen chloride hydrolyzes at alkaline pH to form the cyanate ion (CNO^-), which is much less toxic than the parent cyanide. Amenable cyanide encompasses the true free cyanide portion, plus additional cyanides that easily dissociate in aqueous solutions.

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Analytical Methods for the Analysis of Cyanide in Aqueous Samples

Total Cyanide Methods

The seven methods approved at 40 CFR 136 for total cyanide in aqueous samples are:

- EPA Method 335.2
- EPA Method 335.3
- Standard Method 4500-CN^- D
- Standard Method 4500-CN^- E
- ASTM Method D2036-98A
- USGS Method I-3300-85
- USGS Method I-4302-85

EPA Methods 335.2 and 335.3 were employed by the two laboratories that analyzed samples from Episodes 6503, 6504, 6505, and 6506 for total cyanide. However, this general discussion applies to all seven approved methods.

All of the total cyanide methods involve digestion of the sample using concentrated sulfuric acid with magnesium ion in solution as a catalyst. (The digestion procedure is presented as the stand-alone procedure Standard Method 4500-CN^- C). The cyanide is converted to HCN gas, which is collected in a scrubber containing NaOH. This solution is then analyzed for the CN^- ion. The determinative methods use one of several techniques to measure CN^-, including titration with silver nitrate, colorimetry with an organic dye, or automated distillation-colorimetry for continuous flow analytical systems that utilizes UV oxidation of the sample to release bound cyanide.

Available Cyanide Methods

The four methods approved at 40 CFR 136 for available cyanide in aqueous samples are:

- EPA Method 335.1
- Standard Method 4500-CN^- G
- ASTM Method D2036-98B
- Method OIA-1677

Method OIA-1667 was employed for the analyses of available cyanide in Episodes 6503, 6504, 6505, and 6506. However, this general discussion applies to all four approved methods.

Although these four methods are approved at 40 CFR 136 for “available cyanide,” there are slight differences in forms of cyanide that are targeted by these methods. Generally speaking, the differences are not significant in compliance monitoring, but may be more important in other types of investigations.

The OIA-1677 procedure targets the weak acid dissociable cyanide by treating the sample with ligand-exchange reagents that release cyanide ions from the metal-cyano complexes. During the analysis, cyanide ions are converted to hydrogen cyanide (HCN) that passes through a gas diffusion membrane into an alkaline receiving solution where it is converted back to cyanide ion. The cyanide ion is monitored amperometrically, using a silver electrode.

EPA Method 335.1, SM 4500-CN^- G, and ASTM D2036-98B measure the cyanide amenable to chlorination. In these methods, two aliquots of the sample are analyzed. One aliquot is subjected to chlorination and the other aliquot is not. Both aliquots are distilled and analyzed for CN^-. The amenable

cyanide is calculated as the difference between the cyanide results from the chlorinated and nonchlorinated aliquots.

Difficulties and Interferences in the Analysis of Cyanide

A number of interferences affect cyanide determinations. Strong oxidizers, such as free chlorine, will destroy the "amenable" portion of cyanide. Sulfide present in the sample will oxidize cyanide into thiocyanate, which is not measurable in the cyanide methods. The sample should be tested for sulfide at the time of sample collection, and if sulfides are found, they should be removed by precipitation with lead carbonate or cadmium nitrate. This precipitation procedure should take place before the sample is preserved with NaOH, and any insoluble sulfide that is produced should be removed by filtration. Additional steps may be needed if the sample contains sulfide *and* particulate matter that may consist of alkali metal-heavy metal-cyanide complexes.

Most interferences in the total cyanide determination are removed by the distillation step, but some are not. Nitrate and nitrite can form cyanide as a reduction product of nitrogen-containing organic compounds, and are removed by the addition of sulfamic acid during distillation. Aldehydes can form cyanohydrins, which will convert to nitrile during the digestion. Sulfides also can be produced during distillation, and will distill along with cyanide and form thiocyanate. Sulfide production can be prevented by the addition of lead carbonate to the absorber solution, and the subsequent filtration of the absorber solution before analysis. Other potential interferences include sugars that can form cyanohydrins, sulfur compounds that may release sulfide, compounds that could release or form nitrite, as well as any sample constituent that could produce one of the interferences under the conditions of the digestion.

Method OIA-1677 does not employ a digestion step. Therefore, sulfides must be removed by the precipitation procedure described above. In addition to concerns about sulfides reacting with the cyanide in the sample before it can be measured (i.e., a negative interference), sulfides also can be a positive interference in this procedure if they react with acid in the sample to produce hydrogen sulfide (HS_2). The hydrogen sulfide will cross the membrane in the gas diffusion cell and produce a signal at the silver electrode that would be measured as cyanide. As noted in the method, "polysulfides" (compounds containing more than one sulfide) can be intractable interferences.

Interpretation of Cyanide Results

In theory, the total cyanide results in any given sample will be greater than either the free or available cyanide results for the same sample. While this usually holds true for wastewater effluent samples, some effluents and some other sample types, such as influents, may yield results in which the free or available cyanide results exceed the total cyanide results. For example, the results for free cyanide derived using the chlorination technique can result in free cyanide concentrations greatly in excess of total cyanide concentrations. When this occurs, it is likely due to the formation of cyanide by chlorination of nitrogen-containing organic compounds in the sample. While it might be possible to determine if such nitrogen-containing organics were present in the sample, this step is neither required nor practical for laboratories performing routine cyanide analyses.

Sulfides that may be in the sample present a significant possibility for false negative results for total cyanide through the oxidization of cyanide to thiocyanate, which is not measured by the cyanide methods, as discussed above. Sulfides can be both a negative interference and a positive interference with the determination of available cyanide by Method OIA-1677, as described above.

It is also important to recognize that the total cyanide is determined using a separate sample from that used for free or available cyanide, and that the amenable cyanide determination is made using

separate aliquots of a separate sample. Thus, the overall homogeneity of the waste stream being sampled can have a significant effect on the cyanide results.

While the results for any cyanide measurement are evaluated by SCC relative to the requirements of the methods used for the determinations, it may not be possible to identify problems that would invalidate one cyanide fraction or the other. In instances where there are one or more QC failures associated with one of the cyanide fractions, but not with the other fraction, the results for the fraction with the QC failures will be appropriately qualified.

In instances where there are no QC failures associated with either cyanide fraction, but the available cyanide results are greater than the total cyanide results by a large margin, there is no way to determine which analysis was correct. In such cases, both sets of cyanide results are suspect. For the purposes of reviewing results for EPA's Effluent Guidelines Program, when cyanide is reported as present (e.g., not a non-detect) in both fractions and there are no QC failures in either fraction, differences where the available cyanide results are more than 30% above the total cyanide results suggest that irreconcilable problems exist. The 30% difference is a consensus value used by SCC. Differences less than 30% are considered a function of the routine variability that could be present in both measurements.

When such irreconcilable problems exist with the results of paired samples analyzed for both total and available cyanide, SCC recommends that both results (total and available) be included in the database, and that both results be flagged to alert the data user to the presence of such problems.

Cyanide Methods Used for Samples from the Alaskan Cruise Ship Project

The following table lists the methods used for total and available cyanide for Episodes 6503, 6504, 6505, and 6506. Two different laboratories performed the total cyanide analyses for these four episodes, using two different methods approved at 40 CFR 136. One other laboratory analyzed the available cyanide for all four episodes using Method OIA-1677.

Episode #	Method for Total Cyanide	Method for Available Cyanide
6503	EPA Method 335.3	Method OIA-1677
6504	EPA Method 335.2	Method OIA-1677
6505	EPA Method 335.3	Method OIA-1677
6506	EPA Method 335.2	Method OIA-1677

Based on communications with the sampling contractor, the samples were tested for sulfide in the field, using a field colorimeter with a detection limit of approximately 10 µg/L. Samples testing positive for sulfides were treated in the field to minimize the interferences. Because of concerns regarding whether the treated samples were subsequently filtered in the field, the laboratories were instructed to filter any sample showing turbidity.

A review of the traffic reports (TRs) for the samples in these four episodes indicates that some of the samples in Episode 6503, the first episode in the Alaskan Cruise Ship project, were not treated with lead carbonate to remove sulfides. SCC consulted EPA and the sampling contractor and determined that the following 11 samples were not treated with lead carbonate:

65202, 65207, 65211, 65227, 65231, 65235, 65269, 65273, 65277, 65283, and 65295

In an effort to address the potential positive interference of nitrate and nitrite in the samples, the laboratories performing the total cyanide analyses were advised to increase the amount of sulfamic acid added to each sample during distillation by a factor of 2, from 2 g per sample to 4 g per sample.

Episode-specific Findings

SCC has reviewed the results for both total cyanide and available cyanide in Episodes 6503, 6504, 6505, and 6506. Episode-specific findings are detailed below.

In addition to the data qualifiers described in SCC's *Data Review Guidelines for Classical Wet Chemistry Analyses* (November 2004), two additional qualifiers were developed to address the total and available cyanide results from the Alaskan Cruise Ship Project. In cases where the available cyanide results exceed those for total cyanide by more than 30% and there are not any matrix-specific quality control data such as matrix spike recoveries, the total cyanide and available cyanide results will be flagged with the "IRR" qualifier. The "SCC Reason" field in the database for such results will read "Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose."

In other instances, when SCC's review identifies multiple concerns with the results for a given sample, including those that begin with sample collection and others involving the analysis of the sample itself or any associated quality control samples, the total cyanide and available cyanide results will be flagged with the "MISCA" qualifier. The "SCC Reason" field in the database for such results will read "Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample."

Episode 6503

Three sets of matrix spike/matrix spike duplicate (MS/MSD) samples were prepared for total cyanide analysis in Episode 6503 on samples 65207 (accommodations wastewater), 65269 (an effluent), and 65273 (an effluent). The MS/MSD recoveries for the three aqueous MS/MSD pairs were below the acceptance limits:

- 22% and 21% for sample 65207,
- 30% and 33% for sample 65269, and
- 5% and 1% for sample 65273

suggesting a potential for low bias in the total cyanide results for the associated aqueous samples.

The recoveries for the laboratory control samples (LCS, OPR, or QC check sample) analyzed along with the field samples were acceptable, indicating that the laboratory's overall analytical process was in control and suggesting either problems with the distillation process or an interference present in the sample matrix. Because the focus of the EAD analytical contracts is on effluent samples and because there are no acceptance criteria for aqueous matrices other than effluents, no MS/MSD analyses were performed on samples representing influents to the treatment process.

The total cyanide result for Sample 65273 (effluent) was reported as a non-detect at 5 µg/L and available cyanide was a non-detect at 2 µg/L. An MS/MSD pair for available cyanide was prepared from this sample and had recoveries of 101% and 102% respectively, while the MS/MSD recoveries for total cyanide were 5% and 1%, as noted earlier. This suggests a significant potential for low bias in the total cyanide result. Therefore, based on the low MS/MSD recoveries for total cyanide in this sample, the total

cyanide non-detect is considered a minimum value and the available cyanide result is considered acceptable without qualification.

There were nine other samples in Episode 6503 that exhibited the pattern of total cyanide results less than the available cyanide results. Samples 65219, 65227, 65231, and 65235 are influents to treatment and, as noted above, there are no MS/MSD analyses that demonstrate the performance of either method for this matrix type. Samples 65227, 65231, and 65235 also are among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, lacking matrix-specific supporting data that might explain the observed differences, and given the potential for positive interferences in the available cyanide measurements, SCC recommends flagging both cyanide results for samples 65227, 65231, and 65235 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in these samples. Sample 65219 was treated in the field, therefore SCC recommends including both cyanide results for sample 65219 in the database, but flagging them to indicate the irreconcilable differences.

The total cyanide results for Sample 65207 (accommodations wastewater) were reported as a non-detect at 5 µg/L, while available cyanide was detected in this sample at 15.7 µg/L. The MS/MSD recoveries for total cyanide were 21% and 22%, as noted earlier. Sample 65207 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, given the low MS/MSD recoveries for total cyanide in this sample and the potential for positive interferences in the available cyanide measurements, SCC recommends flagging both cyanide results for sample 65207 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in this sample.

Sample 65211 is listed as the food pulper wastewater. This description suggests that this matrix is not a treated effluent, but may be a component of the influent to the treatment system. Total cyanide was detected at 14 µg/L, while available cyanide was reported at 88.4 µg/L. Sample 65211 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Therefore, lacking matrix-specific supporting data that might explain the observed differences, and the potential for positive interferences in the available cyanide measurements, SCC recommends flagging both cyanide results for sample 65211 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in this sample.

Sample 65295 is listed as a source water sample, a matrix type that should not present significant analytical difficulties. Sulfide was not detected in this sample by the field test performed at the time of collection and therefore, this sample is among the 11 samples that were not treated with lead carbonate. Although the presence of available cyanide at 19 µg/L in the source water is unexpected, there is no analytical evidence to suggest that the available cyanide result be excluded. However, an engineering review or other information not available to SCC may lead to a different conclusion. Therefore, SCC recommends including both cyanide results for sample 65295 in the database, but flagging them to indicate the irreconcilable differences.

Episode 6503 included two sets of field duplicate samples that were sent to the laboratories blind. The two pairs were samples 65261 and 65281, and samples 65265 and 65283, all effluent samples. The total cyanide results in sample 65261 were reported as a non-detect at 5 µg/L, while available cyanide was reported as a non-detect at 2 µg/L. For sample 65281, the blind field duplicate, the total cyanide results were reported as a non-detect at 5 µg/L, while available cyanide was detected in this sample at 8.96 µg/L. A similar pattern occurs for the cyanide results in the other field duplicate pair. Total cyanide was reported as a non-detect at 5 µg/L in both samples 65265 and 65283, while available cyanide was detected at 5.86 µg/L in sample 65265 and as a non-detect a 2 µg/L in sample 65283.

The MS/MSD recoveries for total cyanide in effluent sample 65273 were very low (1% and 5%), and low (33% and 30%) in sample 65269, suggesting a potential negative basis that may affect the total cyanide results in samples 65261, 65281, 65265, and 65283. Therefore, SCC recommends that the total cyanide results in sample 65261 and 65281 be considered minimum values. The difference between the available cyanide results in the two field duplicate samples (e.g., a non-detect at 2 µg/L and a detect at 8.96 µg/L) cannot be explained on the basis of the MS/MSD results for available cyanide in sample 65273, which was also an effluent. Given the discrepancy between the field duplicate results for available cyanide, SCC recommends including the available cyanide results for samples 65261 and 65281 in the database, but flagging them to indicate the irreconcilable differences. SCC recommends that the total cyanide results for samples 65261 and 65281 also be flagged to indicate the irreconcilable differences, as a further precaution.

Because of the low MS/MSD recoveries in the other effluent samples, the total cyanide result for sample 65265 is considered a minimum value. The available cyanide result of 5.86 µg/L is well within 30% of the reported detection limit for total cyanide (e.g., 5 µg/L), and therefore would normally not be qualified. However, because the available cyanide result in the field duplicate of the sample, 65283 is a non-detect at 2 µg/L, SCC recommends including both the total and available cyanide results for sample 65265 in the database, but flagging them to indicate the irreconcilable differences.

Sample 65283 also is among the 11 samples in this episode that were not treated with lead carbonate in the field to remove sulfides. Given the very low MS/MSD recoveries for total cyanide in effluent samples in this episode, SCC recommends flagging both cyanide results for sample 65283 in the database to indicate that there are multiple issues with sample collection and analysis that may have led to the irreconcilable results observed in these samples.

Episode 6504

Three sets of MS/MSD samples were prepared for total cyanide analysis in Episode 6504 on samples 65519 (an effluent), 65523 (an effluent), and 65527 (accommodations wastewater), and all showed acceptable spike recoveries. Thus, there do not appear to be pervasive problems with the recovery of total cyanide in samples from this episode.

A comparison of the total cyanide results and available cyanide results for samples 65395, 65455, 65459, 65463, 65467, and 65471 indicates that the total cyanide results were non-detects at 5 µg/L, while available cyanide was detected in each of these samples at approximately 11 to 36 µg/L. In addition, total cyanide was reported as present in sample 65411 at 6 µg/L, while the available cyanide result was 35.7 µg/L (e.g., six time the total cyanide result).

Sample 65395 is listed as the galley wastewater. This description suggests that this matrix is not a treated effluent, but may be a component of the influent to the treatment system. Therefore, lacking matrix-specific supporting data that might explain the observed differences, SCC recommends including both cyanide results for sample 65395 in the database, but flagging them to indicate the irreconcilable differences.

Sample 65411 is listed as the food pulper wastewater. This description suggests that this matrix is not a treated effluent, but may be a component of the influent to the treatment system, and as noted above, there are no MS/MSD data that demonstrate method performance for matrices other than effluents. During the review of the data, SCC noted that the traffic report for the aliquot of Sample 65411 for total cyanide analysis indicated that the aliquot was collected at 14:00 on 8/10/04, while the traffic report for the aliquot submitted for available cyanide analysis indicated that that aliquot was collected at 3:00 PM (15:00) on 8/11/04. This concern was resolved following discussions with EPA and the sampling contractor, whose field records indicated that both aliquots were collected at the same time, and that the

one traffic report was incorrect. Having resolved the issue of the time of sample collection, but lacking matrix-specific supporting data that might explain the observed differences, SCC recommends including both cyanide results for sample 65411 in the database, but flagging them to indicate the irreconcilable differences.

Samples 65455, 65459, 65463, 65467, and 65471 are all influents to treatment, collected from the same sampling point on consecutive days. The results from samples 65463, 65467, and 65471 are remarkably consistent, varying by only 0.2 µg/L across all three samples. The results for samples 65455 and 65459 are similar to one another, but about twice the concentrations found in the other three samples from this sampling point. There are no MS/MSD analyses that demonstrate method performance for this matrix type, but the consistency in the results suggests that whatever matrix effects may be taking place, they are reproducible. However, lacking matrix-specific supporting data that might explain the observed differences, SCC recommends including both cyanide results for samples 65455, 65459, 65463, 65467, and 65471 in the database, but flagging them to indicate the irreconcilable differences.

Although there were three pairs of field duplicates collected for cyanide samples in Episode 6504, they all involved effluent samples, none of which showed disparate results between total and available cyanide.

Episode 6505

The data for total cyanide samples in Episode 6505 were delivered in five separate data packages, each with its own associated QC sample results. Six pairs of MS/MSD samples were prepared for total cyanide analyses in Episode 6505 on samples 65603 (galley wastewater), 65635 (accommodations wastewater), 65711 (an effluent), 65715 (an effluent), 65719 (an effluent), and 65741 (screening solids).

The data for a seventh pair of MS/MSD samples were delivered in the data package with the results for samples 65731 (galley wastewater) and 65745 (biosolids). However, because of limitations on the sample volume that was provided to the laboratory, the MS/MSD samples were prepared from a non-EPA sample of indeterminate origin and therefore are not useful in evaluating the performance of the total cyanide method on cruise ship samples.

Three of the MS/MSD pairs for aqueous samples and the one MS/MSD pair for the solid samples had acceptable recoveries of total cyanide. None of the samples used to prepare MS/MSD aliquots were samples where the available cyanide results exceeded the total cyanide results.

The MS/MSD results for sample 65603 (galley wastewater) showed recoveries of 59% in both aliquots, which is below the acceptance limits, and suggests a potential low bias in the total cyanide result for that sample. The available cyanide result of 2.2 µg/L is below the detection limit for the total cyanide analysis. Therefore, SCC recommends qualifying the total cyanide result as a minimum value and accepting the available cyanide result as reported.

Although MS/MSD samples were prepared from sample 65741 (screening solids) and met the acceptance criteria, there are no MS/MSD results for the biosolids matrix in this episode. This limits SCC's ability to evaluate the potential effects of the sample matrix for sample 65745 (biosolids), where the available cyanide results are almost 40% higher than the total cyanide results. Therefore, lacking matrix-specific supporting data that might explain the observed differences, SCC recommends including both cyanide results for sample 65745 in the database, but flagging them to indicate the irreconcilable differences.

Sample 65731 is a galley wastewater. The only MS/MSD results for galley wastewater in this episode are for sample 65603, where the recoveries were below the acceptance criteria. Given the

potential for low bias in this matrix, SCC recommends qualifying the total cyanide result as a minimum value. SCC recommends including both cyanide results for sample 65731 in the database, but flagging them to indicate the irreconcilable differences.

Sample 65659 is an influent sample and MS/MSD aliquots are not prepared for influents, as discussed earlier. Total cyanide was reported as not detected and the available cyanide was reported at 6 times the total cyanide detection limit. Therefore, lacking matrix-specific supporting data that might explain the observed differences, SCC recommends including both cyanide results for sample 65659 in the database, but flagging them to indicate the irreconcilable differences.

Although there were three pairs of field duplicates collected for cyanide samples in Episode 6505, they all involved effluent samples, none of which showed disparate results between total and available cyanide.

Episode 6506

A comparison of the total cyanide results and available cyanide results for samples 65896, 65900, 65904, 65908, and 65912 indicates that the total cyanide results were non-detects at 5 µg/L, while available cyanide was detected in each of these samples at levels from approximately 36 to 77 µg/L.

All five of these samples are from the same sampling point, SP 2, and represent influents to the black water and gray water treatment system. Thus, these samples are not treated effluents. Therefore, lacking matrix-specific supporting data that might explain the observed differences, SCC recommends including both cyanide results for samples 65896, 65900, 65904, 65908, and 65912 in the database, but flagging them to indicate the irreconcilable differences.

Although there were three pairs of field duplicates collected for cyanide samples in Episode 6506, they all involved effluent samples, none of which showed disparate results between total and available cyanide.

Summary of Results from Episodes 6503, 6504, 6505, and 6506

SCC's recommendations for handling the total and available cyanide results for the Alaskan Cruise Ship project samples are summarized in the table on the following page

Note: The results in the database are reported in the units provided by the laboratories that performed the analyses. Method OIA-1677 specifies reporting results in units of micrograms per liter (µg/L), whereas the older methods (335.2 and 335.3) specify reporting results in units of milligrams per liter (mg/L). However, for ease of comparison in the table the follows, the results for total cyanide have been converted to the same units as the available cyanide results, µg/L. "ND" indicates that cyanide was not detected. In these cases, the reported detection limit is shown in parentheses.

If you have any questions about the information in this memorandum or the cyanide results in the database, please do not hesitate to contact me at 703-461-2392, or by email at hmccarty@csc.com.

cc: Beverly Randolph, EPA
Marla Smith, EPA
Nelson Andrews, EPA
Jodi King, ERG
Deb Falatko, ERG
Deb Miller, CSC
Michael Walsh, CSC
Pornkeo Chinyavong, CSC

Summary of SCC Recommendations for Cyanide Results in the Alaskan Cruise Ship Project

Episode	Sample #	Matrix	Total Cyanide (µg/L)	Available Cyanide (µg/L)	SCC Recommendation
6503	65207	Accommodations wastewater	ND (5)	15.7	Sample not treated with lead carbonate to remove sulfides. Low MS/MSD recoveries for total cyanide. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.
6503	65211	Food pulper wastewater	14	88.4	Samples not treated with lead carbonate to remove sulfides. No matrix-specific performance data. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.
6503	65219	Influent to treatment	ND (5)	10.4	Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6503	65227	Influent to treatment	ND (5)	7.54	Samples not treated with lead carbonate to remove sulfides. No matrix-specific performance data for influents. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.
6503	65231		ND (5)	35.4	
6503	65235		ND (5)	16	
6503	65261	Effluent from treatment	ND (5)	ND (2)	Total cyanide qualified as minimum value. Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6503	65265		ND (5)	5.86	Total cyanide qualified as minimum value. Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6503	65273		ND (5)	ND (2)	Total cyanide qualified as minimum value.
6503	65281		ND (5)	8.96	Total cyanide qualified as minimum value. Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6503	65283	Effluent from treatment	ND (5)	ND (2)	Total cyanide qualified as minimum value. Sample not treated with lead carbonate to remove sulfides. Multiple issues with sample collection and analysis that may have led to the irreconcilable results for total and available cyanide observed in this sample.

Episode	Sample #	Matrix	Total Cyanide (µg/L)	Available Cyanide (µg/L)	SCC Recommendation
6503	65295	Source water	ND (5)	19.1	Total cyanide qualified as minimum value. Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6504	65395	Galley wastewater	ND (5)	22.4	Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6504	65411	Food pulper	6	35.7	
6504	65455	Influent to treatment	ND (5)	26.9	
6504	65459	Influent to treatment	ND (5)	29	
6504	65463	Influent to treatment	ND (5)	11.7	
6504	65467	Influent to treatment	ND (5)	11.5	
6504	65471	Influent to treatment	ND (5)	11.6	
6505	65603	Galley wastewater	ND (5)	2.2	Total cyanide qualified as minimum value
6505	65659	Influent to treatment	ND (5)	30.7	Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6505	65731	Galley wastewater	ND (5)	12.9	Total cyanide qualified as minimum value. Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6505	65745	Biosolids	11	15.2	Irreconcilable results for total and available cyanide. Results may not be suitable for the intended purpose.
6506	65896	Influent to treatment	ND (5)	45.5	
6506	65900	Influent to treatment	ND (5)	36.2	
6506	65904	Influent to treatment	ND (5)	75.6	
6506	65908	Influent to treatment	ND (5)	72.2	
6506	65912	Influent to treatment	ND (5)	76.5	

Computer Sciences Corporation
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MEMORANDUM

DATE: January 31, 2005

TO: Don Anderson, Project Officer
EPA EAD

FROM: Harry B. McCarty, Ph.D.
Senior Scientist

SUBJECT: Summary of Telephone Conversation with the Available Cyanide Laboratory

At your suggestion, I contacted the laboratory that ran the available cyanide analyses for Episodes 6503 to 6506 and asked about cross-contamination concerns, glassware washing procedures, and other aspects of the analysis that might explain the discrepancies between the total and available cyanide results. I spoke with John Sebroski, the laboratory director at Bayer Material Science on January 19, 2005. John gave me the following information:

- All of the "glassware" involved in the analysis is disposable. This includes the cups on the autosampler, the tubing on the flow injection system, etc. They do not reuse any of it, so there are no washing issues.

- The design of the flow injection instrumentation minimizes any concerns about carryover because the sample is injected into a continuous flow of solution that runs through the analyzer.

- They do run frequent blanks on the instrument, especially after QC samples such as the lab control sample (LCS or OPR). Those QC samples are run at relatively high levels, and there is no evidence of carryover or memory effects in the blanks. (I also confirmed this prior to calling him, using the data for these four episodes.)

- The OIA-1677 method has an ASTM counterpart that uses the same technique. There is a 2004 version of the ASTM standard that addresses the potential for sulfide interferences by introducing a bismuth nitrate reagent into the system to remove sulfides. John indicated that the use of the bismuth nitrate reagent could easily be accommodated using Method OIA-1677, since the instrumentation is the same as the ASTM standard.

- John indicated that sulfide problems for total cyanide are always a significant issue. He also said that the flow injection system for available cyanide can detect (and be affected by) sulfides at a much lower level than the field test methods will detect. Therefore, any sample not treated with lead carbonate in the field may well have an interference for available cyanide, even if the field test was negative for sulfides.

In summary, my conversation with Mr. Sebroski confirms much of the information SCC summarized in our lengthy discussion of the issues surrounding the total and available cyanide results for this project and generally rules out the chance that analytical concerns, such as carryover or glassware cleaning procedures, as an explanation for the observed cyanide results. Please do not hesitate to contact me at 703-461-2392, or by email at hmccarty@csc.com, if you have any questions.

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Appendix E

SAMPLING AND ANALYSIS PLAN FOR HOLLAND AMERICA VEENDAM SAMPLING EPISODE 6503

United States Environmental Protection Agency

Sampling and Analysis Plan for Holland America Veendam

Sampling Episode 6503
June 13-27, 2004

U.S. Environmental Protection Agency

Oceans and Coastal Protection Division
Office of Wetlands, Oceans, and Watersheds

Engineering and Analysis Division
Office of Science and Technology

Office of Water
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

June 2004

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1.0 INTRODUCTION

This plan describes the on-board sampling and analysis activities to characterize graywater and blackwater generated and discharged by the cruise vessel Holland America Veendam while in Alaska waters. This sampling program is being performed under the supervision of the Engineering and Analysis Division (EAD) and the Office of Wetlands, Oceans, and Watersheds (OWOW) of the U.S. Environmental Protection Agency (EPA).

This document presents information on the planned sampling episode. This document, in combination with the generic health and safety plan, is intended to serve as a guide to the field sampling crew, a review mechanism for EPA and sampling personnel, and a source of procedural information for vessel personnel. Personnel from EPA and supporting contractor performed an engineering ship visit to the Holland America Veendam on March 27, 2004. This sampling plan was prepared based on the results from that ship visit and from subsequent follow-up communication with Holland America personnel. Tables and figures are presented at the end of each section.

1.1 Background

The EPA is currently conducting a data collection effort aimed at ultimately developing new wastewater discharge regulations for large cruise vessels (greater than 500 passengers) that discharge treated sewage (blackwater) or graywater in the waters of the Alexander Archipelago or the navigable waters of the United States within the State of Alaska or within the Kachemak Bay National Estuarine Research Reserve (hereafter referred to as Alaska waters). Such regulations are authorized by "Title XIV - Certain Alaskan Cruise Ship Operations" of the Miscellaneous Appropriations Bill (H.R. 5666) passed by Congress on December 21, 2000 in the Consolidated Appropriations Act of 2001 (Pub. L. 106-554)(Sections 1401 - 1414), also known as the Murkowski Bill. The law defines sewage to mean human body

wastes and wastes from toilets and other receptacles intended to receive or retain body waste. Graywater means only galley, dishwasher, bath, and laundry wastewater; the term does not include other wastes or waste streams. Graywater and blackwater discharges to Alaska waters are also regulated by State law (AS 46-03.460 - 46.03.490).

The sampling program on-board the Holland America Veendam and the subsequent pollutant analyses, data analyses, and trip report preparation will focus on graywater and blackwater origins, intermediate stages of treatment, final treated effluent, and final discharges. EPA will use these data in evaluating pollutants in graywater and blackwater generated on-board the Veendam, and determine the capability of the Veendam's wastewater treatment system to remove pollutants prior to discharge.

Graywater and flow characterization data are also important focuses of the Veendam sampling program, as available graywater and flow characterization data are very limited. Sample collection will be established to provide information regarding pollutant concentrations and loadings for individual graywater sources (e.g., galley, laundry) and will provide information to develop time-phased "flow profiles" for the sampled waste streams to analyze patterns and variability in graywater and blackwater flows both throughout the day (e.g., day versus night, mealtimes) and between days (e.g., while underway, in port).

1.2 Ship Selection

EPA selected the Holland America Veendam in order to characterize the performance of the ZeeWeed Membrane Bioreactor (Zenon) wastewater treatment system. This system is one of several that received certification for continuous discharge in Alaska by the U.S. Coast Guard in 2003. Six of Holland America's vessels that cruised Alaska in 2003 were equipped with this wastewater treatment system, and sampling data for these ships show that they have equivalent treatment performance. EPA, therefore, based the decision to sample the Veendam on sampling logistics (i.e., the ship that is most easily accessible, is available at a convenient time, etc.). EPA will sample the Veendam to collect information regarding the system design and day-to-day operation and maintenance, and will focus sampling not only on

the treated effluent, but also include samples of the influent to wastewater treatment, effluent from individual treatment units, and treatment residues.

2.0 SHIP OVERVIEW

The Holland America Veendam is a 55,451 gross ton cruise vessel, capable of carrying 1,266 passengers and 588 crew. The Veendam's maximum cruising speed in 22 knots. The vessel has a length of 720 feet, a beam of 101 feet, and was built with 10 decks to accommodate the passengers and crew. The Veendam provides 16 dining, lounge, and bar areas, 4 pools/whirlpools, a casino, and a gift shop for passenger entertainment. Other amenities include a photo lab for developing pictures, a spa, a gymnasium, and a beauty salon.

The remainder of Section 2 is a discussion of the Veendam's wastewater sources, collection, holding, and transfer system, and the wastewater treatment system. The complete ship visit report is located in the administrative record for this project.

2.1 Graywater and Blackwater Generation

2.1.1 Graywater and Blackwater Sources

The Veendam generates graywater and blackwater that enter the graywater and blackwater treatment system, including:

- Graywater from the galleys (predominantly dishwasher wastewater);
- Graywater from the food pulper;
- Graywater from accommodations;
- Graywater from laundry;
- Blackwater from toilets, urinals, and other human waste receptacles;
- Bar wastewater;
- Salon wastewater;
- Passenger laundrettes wastewater; and
- Medical wastewater.

Galley wastewater is comprised predominantly of dishwasher wastewater from the two passenger galleys and one crew galley. (The food pulper system is separate from the galley wastewater system as discussed below.) Other minor galley influent sources are galley sinks and floor wash. Approximately 80 m^3 of galley wastewater is generated per day.

The Veendam uses a Somat system to grind and dewater food waste. Food wastewater is recirculated and dumped into the wastewater treatment system three to four times per day. The quantity of food wastewater generated by the Somat is relatively small (22 m^3/day), and the pH is acidic (pH = 4 to 5). Food wastewater and galley wastewater are pretreated through grease traps before entering the graywater holding tanks. An enzyme is added to the wastewater prior to the grease traps to help degrade the grease. Dewatered food waste is incinerated on-board.

The graywater from accommodations is generated from tubs, showers, and sinks in the passenger and crew rooms. In addition, wastewaters from bar sinks, passenger laundrettes, and beauty salons are routed through the accommodations graywater stream. Accommodations account for a large percentage of the graywater generated by the vessel (315 m^3/day); however, the amount and rate of accommodations graywater is highly variable as it is largely dependent upon passenger activities such as showering.

Laundry wastewater (83 m^3/day) from the passenger and crew laundries is collected and routed as a separate wastestream to the graywater holding tanks.

Blackwater is generated from toilets, urinals, and other human waste receptacles. These waste streams, along with medical waste (i.e., non-biohazardous wastewater from medical facility sinks), are routed to the blackwater collection system. Approximately 86 m^3 of blackwater is generated per day.

Photo lab waste is considered hazardous waste and is not routed through the treatment system, but is held for on-shore disposal. The Veendam has a silver recovery unit on board to treat waste from the photo labs and the infirmary x-ray.

Pools and jacuzzis are regulated by the CDC's Vessel Sanitation Program and use bromine for disinfection. The Veendam avoids routing pool water through blackwater or graywater streams because the bromine could potentially have a negative impact on the wastewater treatment system. As a result, pool water is discharged directly overboard when

necessary. The Veendam also has an emergency dump for its pools should the ship loose stability.

2.1.2 Graywater and Blackwater Collection, Holding, and Transfer System

Graywater and blackwater sources are collected and transferred via the collection, holding, and transfer system (CHT) to the graywater and blackwater treatment system.

Blackwater is conveyed to four collection tanks using a vacuum system. A portion of the final treated effluent (14 m^3/day) is added to one of the blackwater holding tanks for dilution. Figure 2-1 is a diagram of the blackwater CHT system.

Graywater is conveyed from graywater collection and holding tanks (accommodations, laundry, food pulper wastewater, and galley) to two 121 m^3 graywater holding (equalization) tanks, where the graywater sources are mixed prior to treatment. Some graywater holding tanks discharge by timer, rather than by high level indicators, as a means of maintaining more constant wastewater flows and loadings to the wastewater treatment system. Timers do not operate when tank contents are below the low level indicators. Figure 2-2 is a diagram of the graywater CHT system.

2.2 Graywater and Blackwater Treatment System

The Veendam operates a ZeeWeed Membrane Bioreactor (Zenon), an advanced graywater and blackwater treatment system manufactured by Zenon Environmental Inc. The Zenon system treats wastewater through aerobic biological oxidation combined with ultrafiltration. In the process, ultrafiltration membranes separate the treated water from the mixed liquor. In effect, the membranes perform the functions of the secondary settler and tertiary filter of the activated sludge process in a conventional wastewater treatment plant. Sludge is wasted directly from the aeration tank to maintain an operating mixed liquor suspended solids (MLSS) concentration between 10,000 and 15,000 mg/L (1).

Figure 2-3 presents a simplified layout of the Zenon system on-board the Veendam. Wastewater from the graywater and blackwater holding tanks are mixed in a common line and fed through two screens. The screened wastewater enters a screened raw water collection tank. The screened raw water is then pumped to the bioreactor and membrane chamber. As a part of the Veendam's retrofitting to the advanced treatment system, two potable water tanks were converted into two parallel treatment units, each comprised of a bioreactor and a membrane chamber. Nitrogen and caustic are added to the feed line before the wastewater enters the bioreactor. The wastewater enters the aerated bioreactors where the organic content of the mixed liquor is aerated by diffusers and degraded biologically.

The bioreactor mixed liquor is filtered through a hollow-fiber ultrafiltration membrane system. The membrane system operates under a vacuum, causing the wastewater to permeate through the membrane into the hollow cores of the fiber. A course bubbler air diffuser is located at the base of each membrane. The airflow from the coarse diffuser scours the external membrane surface to remove solids. The system is also designed with an eight minute back wash to keep the membranes clean. A small amount of chlorine is added to the backwash tanks. Particulate matter and mixed liquor are retained in the bioreactor and membrane chambers, with a portion of the mixed liquor recirculated between the bioreactor and the membrane chamber. The membrane permeate is sent through ultraviolet disinfection and is then discharged continuously or diverted to ballast tanks when discharge is not permitted. The line from the UV disinfection unit to the discharge port is 10.5 m. The final effluent (technical water) is not reused.

Two types of residuals are generated from the Zenon system: screening solids and waste biosludge. Screening solids are collected in a solids collection tank, located physically beneath the screens. Solids in the solids collection tank are sent through a macerator and recirculated. Approximately 15-20 m^3 of screening solids are generated monthly and disposed of on shore. Waste biosludge is removed from the treatment system in order to maintain a constant biomass concentration in the bioreactor. The typical wasted biosludge volume is 15-30 m^3/day. The waste biosludge is sent to a dedicated ballast tank and held for discharge outside of 12 nautical miles. Discharge generally takes place approximately five to six hours after collection. Waste biosludge is rarely disposed of on shore.

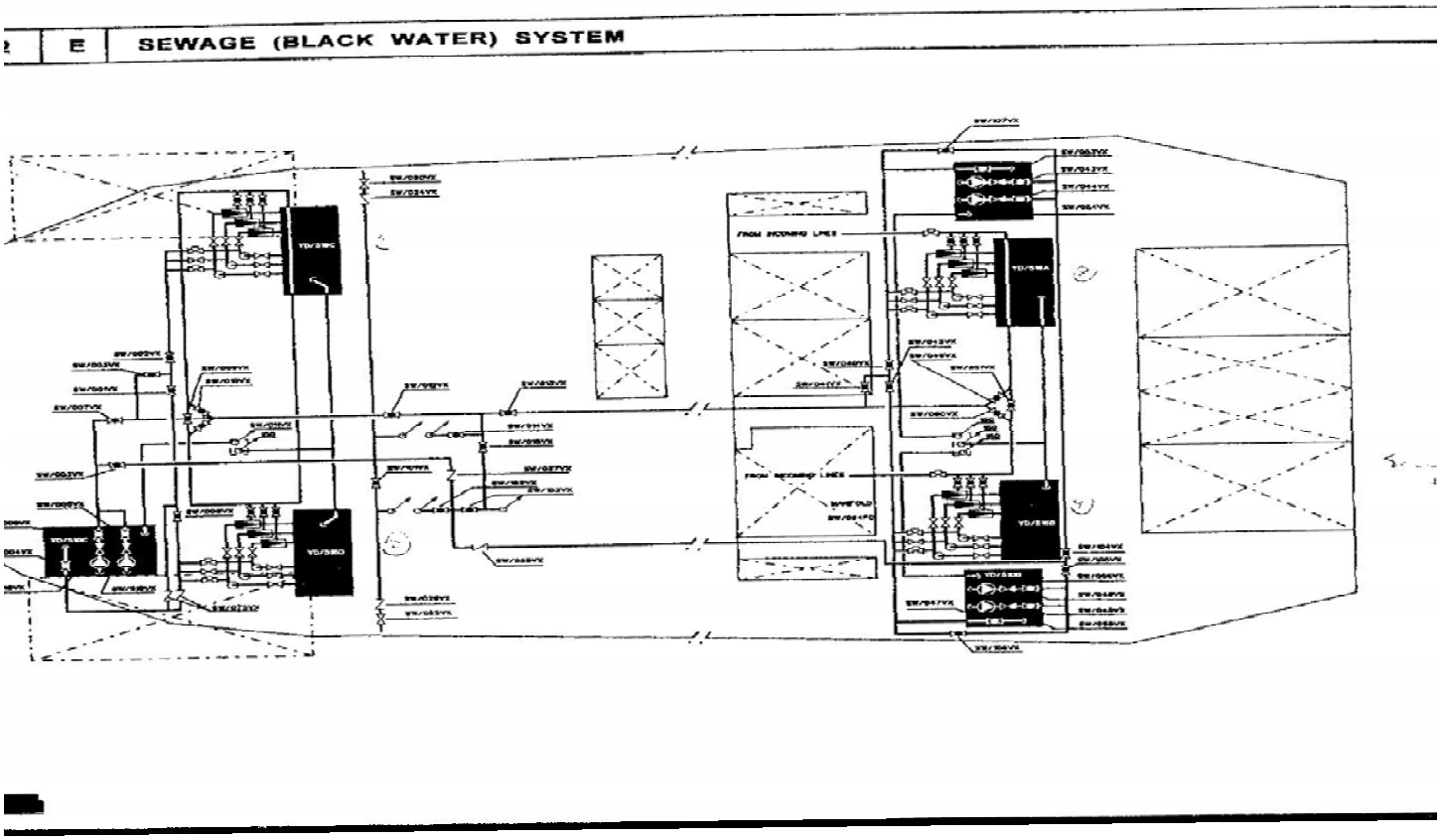

Figure 2-1. Veendam Blackwater Collection, Holding, and Transfer System

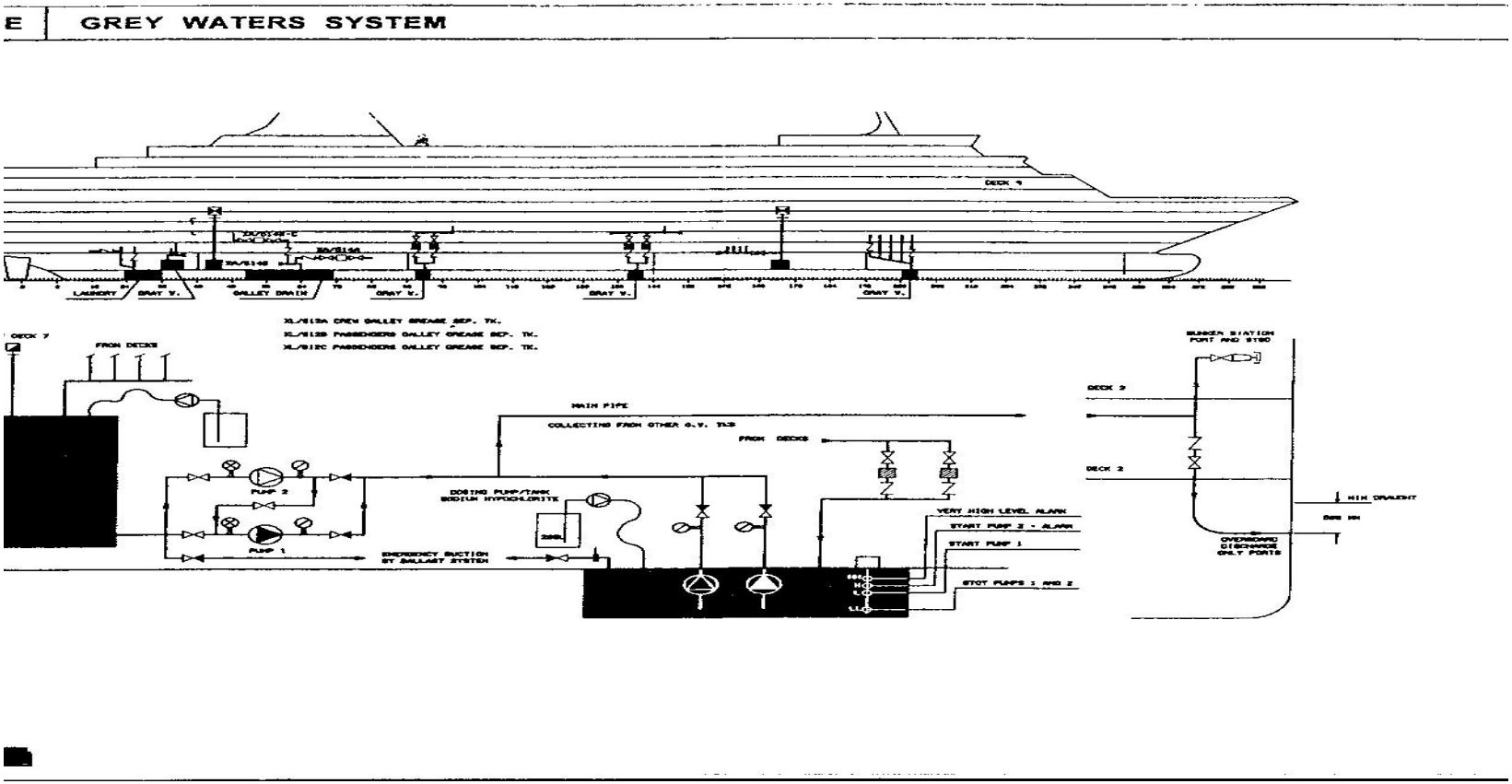

Figure 2-2. Veendam Graywater Collection, Holding, and Transfer System

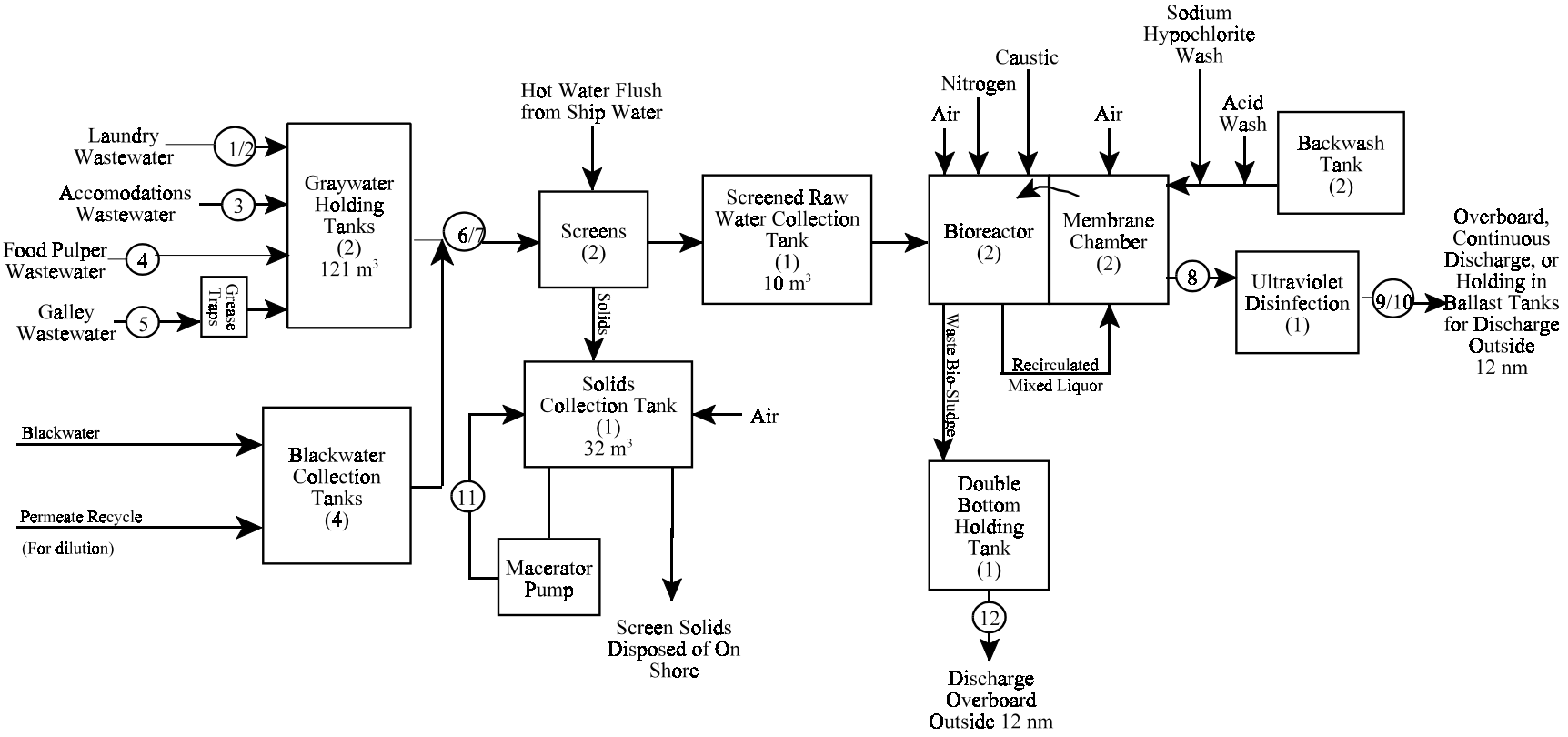

Figure 2-3. Veendam Blackwater/Graywater Treatment System

3.0 SAMPLING APPROACH

This section contains detailed information regarding specific sampling points and locations, sampling methodologies, analytes, sampling frequency and duration, schedule, and logistics for sampling on board the Holland America Veendam.

3.1 Sampling Point Selection

Table 3-1 lists the proposed sampling points, the number of samples to be collected, and the parameters for analysis for this sampling episode. Table 3-2 lists the sample type, sample container, sample volume, and on-board preservation for each parameter or parameter group which may be analyzed. Table 3-3 presents the sampling locations, flow measurement techniques, and the sample collection type (grab or composite).

Figure 2-3 shows the sampling point (SP) locations for the Veendam blackwater/ graywater treatment system. A brief description of what each sampling point will characterize is presented below:

- SP-1 Laundry wastewater characterization;
- SP-2 Laundry wastewater characterization duplicate;
- SP-3 Accommodations wastewater characterization;
- SP-4 Food pulper wastewater characterization;
- SP-5 Galley wastewater characterization;
- SP-6 Influent to wastewater treatment system;
- SP-7 Influent to wastewater treatment system duplicate;
- SP-8 Influent to UV disinfection;
- SP-9 Effluent from wastewater treatment system;
- SP-10 Effluent from wastewater treatment system duplicate;
- SP-11 Screening solids;
- SP-12 Waste biosludge (desludge) discharge;
- SP-13 Incinerator ash;
- SP-14 Incinerator ash duplicate;
- SP-15 Source water;
- SP-16 Trip blank; and
- SP-17 Equipment blank.

3.2 Analyte Selection

Analytes included in the sampling program for the Veendam include those in the classes of pollutants listed below.

- Fecal coliforms;
- Escherichia coli (E. coli);
- Enterococci;
- Biochemical oxygen demand, 5-day (BOD_5);
- Chemical oxygen demand (COD);
- Total organic carbon (TOC);
- Total suspended solids (TSS);
- Settleable solids (SS);
- Total dissolved solids (TDS);
- Total Kjeldahl nitrogen (TKN);
- Ammonia as nitrogen;
- Nitrate/nitrite as nitrogen;
- Total phosphorus;
- Sulfate;
- Chloride;
- Alkalinity;
- Hexane extractable material (HEM);
- Silica-Gel Treated Hexane Extractable Material (SGT-HEM);
- Volatile organics;
- Semivolatile organics;
- Metals (total and dissolved);
- Cyanide (total and available);
- Organo-phosphorous pesticides;
- Organo-halide pesticides;
- Chlorinated biphenyls congeners (PCBs); and
- Dioxins and furans.

Table 3-4 lists analyte and pollutant parameters along with their analytical method numbers and laboratory measurement techniques. Not all analytes and pollutant parameters will be analyzed at all sampling points. Appendix A of this document lists the individual parameters included in each analytical method. In addition to these analytes, the sampling crew will conduct field measurements at all sampling points, as identified in Table 3-5.

Certain conventional and non-conventional pollutants (Group I and Group II) will be collected in the same sample bottle at some sampling points. "Group I" parameters include

TDS, TSS, chloride, sulfate, and alkalinity. "Group II" parameters include TOC, COD, ammonia as nitrogen, nitrate/nitrite as nitrogen, TKN, and total phosphorus. HEM and SGT-HEM will also be collected in the same sample bottle at each sampling point. All parameters will be collected in individual bottles.

Due to the very short sample holding times for microbiologicals (fecal coliforms, E. coli, and enterococci - 6 hours), BOD_5 (48 hours), and SS (48 hours), an on-board laboratory will be used for analysis of these samples where necessary.

3.3 Sample Collection

Much of the information about the collection of samples for this sampling program is summarized in a series of tables as follows:

- Table 3-1, summarizes the sampling points and analytes to be studied;
- Table 3-2, summarizes the parameters, bottle types, sample volume, and preservation requirements; and
- Table 3-3, sampling locations, flow measurement techniques, and the sample collection type

To characterize the wastestreams on board the Veendam, the samplers will employ varying methods of sample collection depending on the sampling point, pollutant parameters, and the nature of the sample flow and composition at each sampling point. The following subsections provides a detailed description of the sample collection techniques.

Samplers will work in teams of two to ensure that proper sampling techniques are followed and adequate notes are taken at each sampling location. Samplers will wear disposable gloves, tyvek suit, and safety eyewear, and will observe precautions while collecting samples, remaining aware of the potential biohazards present.

Sample containers and bottles will be purchased pre-cleaned and certified and will not require rinsing with sample. Samplers will take care not to touch the insides of bottles or lids/caps during sampling. All samples collected during the sampling episode will be cooled immediately in an ice-water bath to 4°C and then placed into coolers containing bagged ice (or chemical ice) to maintain a sample temperature of 4°C throughout sample storage, shipment (or transfer for on-board analysis), and receipt at the analytical laboratories.

3.3.1 Flow Measurement Approach

Flow measurement data will be collected to support both the treatment system/ final effluent discharge and the graywater characterization sampling efforts. The availability of existing equipment on board the Veendam, accessibility of piping and tankage, and the capability of removing liquids from transfer lines will determine how flows are measured. Preferred flow measurement techniques, based on the ship visit to the Veendam are listed in Table 3-3, along with contingencies for obtaining flow data.

For those sampling points with existing flow totalizers, flow data will be recorded on the data sheet provided in Figure 3-1 at a minimum frequency of every six hours. If totalizer data is not available, then a series of instantaneous flow rates will be measured and recorded using an ultrasonic flow meter installed by the samplers. The flow measurements will provide the amount of wastewater processed in periods corresponding to analytical data collected. In the event that neither flow totalizer data nor reliable flow measurement can be made for a specific sampling point, flow rates will be estimated using tank level indicator readings or pump capacities and operating times.

Flow-weighted composite samples will be collected from the laundry graywater (SP-1/SP-2), accommodations graywater (SP-3), treatment system influent (SP-6/SP-7), and treatment system effluent (SP-9/SP-10) using an automatic sampling machine. The flow meter will signal the automatic sampling machine to collect a sample each time a fixed quantity of graywater has passed through the wastewater piping. Automatic composite samples will be

collected isokinetically. That is, the velocity in the sampling device should equal the velocity in the "main" pipe system to allow for collection of flow-proportional samples.

3.3.2 Graywater Characterization Samples

Graywater characterization samples that will be collected include laundry (SP-1/ SP-2), accommodations (SP-3), food pulper (SP-4), and galley wastewaters (SP-5). Note that graywater characterization samples will only be collected for one 24-hour period as compared to five 24-hour sampling periods for wastewater treatment samples. None of these sampling points have existing flow meters. In general, graywater samples are analyzed for all pollutant parameters. Exceptions include pesticides, which are analyzed for in only galley wastewater samples to characterize possible pesticide sources in food preparation and pest management, and dioxins and furans, which are analyzed for in only laundry wastewater samples to characterize possible generation of dioxins and furans by bleaching operations. PCBs will not be analyzed in any graywater samples.

In the case of SP-1/SP-2 and SP-3, sampling crew will install strap-on flow meters on the outlet pipes from the laundry and accommodations wastewater holding tanks, respectively, as described in Table 3-3. The flow meters will signal the automatic sampling machines to collect samples each time fixed quantities of wastewater have passed through tank discharge piping. At SP-4, food pulper wastewater is not generated continuously, but instead is recirculated and periodically discharged to the wastewater treatment system three to four times per day. Therefore, at this sampling point, the sampling crew will prepare a manual composite sample using equal volumes of wastewater discharge during a 24-hour sampling period. Finally sampling point SP-5 is located on a gravity drain pipe that is not appropriate for the installation of a strap-on flow meter. A composite sample will be collected at this sampling point via an automatic sampler that will collect time-weighted composite samples instead of flow-weighted composite samples.

During each 24-hour sampling period, a composite sample of up to 20-liters will be collected in 10-L glass composite sample containers from sample points SP-1 through SP-5 to

provide the required sample volume listed in Table 3-2, plus additional volume for laboratory quality control (see Section 3.4.6) and sample spillage. Composite sample containers will be maintained on ice throughout the 24-hours collection period. At the conclusion of each 24-hour sampling period, sample fractions will be poured from the composite sample containers into individual sample bottles using the procedure described in Section 5.1. Bottles will normally be filled to the shoulder of the bottle, leaving a small space for expansion and mixing. Filtering of samples for analysis of dissolved metals will be performed immediately upon receipt at the on-board field laboratory.

Up to four grab samples for HEM/SGT-HEM, VOCs, total and available cyanide, and microbiologicals will be collected at each sampling point during each 24-hour sampling period. An equal number of graywater grab samples will be collected during peak and off-peak generation periods, with sample times determined based on an analysis of collected flow data. Each grab sample for microbiologicals and HEM/SGT-HEM will be analyzed separately at the analytical laboratories. The total and available cyanide samples will be composited on-board for a single analysis per sampling point per day, while VOC grab fractions will be composited at the laboratory for one analysis per sampling point per day.

Grab samples will be collected directly into sample fraction bottles when possible. When not possible (e.g., the pump cycle on a graywater collection tank is too quick to allow for collection of all grab samples), VOC samples will be collected into a specially-cleaned 1-L widemouth jar; the 40-ml VOC vials will be subsequently filled with sample from the widemouth jar. All VOC vials will be filled leaving a convex meniscus at the top of the bottle, with no air bubbles present; when the VOC lid is screwed on a small volume of water will be displaced and no air should be present in the bottle. All VOC vials will be pre-preserved with two drops of HCl per vial for biological activity. If field measurements (see Section 3.6) indicate free chlorine is present in the graywater samples at concentrations greater than 0.03 mg/L, then 3 granules of sodium thiosulfate will be added to the sample vials prior to sample collection.

Graywater generation information will be recorded each day on the graywater generation data sheet provided in Figure 3-2. In addition, information regarding the use of pesticides, fungicides, and rodenticides and their potential to enter graywater and blackwater systems will be recorded on the data sheet provided in Figure 3-3. Finally, information regarding the graywater collection, holding, and transfer system will be recorded on the data sheet provided in Figure 3-4.

3.3.3 Graywater and Blackwater Treatment and Final Effluent Samples

Influent to wastewater treatment (SP-6/SP-7), influent to UV (SP-8), and effluent from wastewater treatment (SP-9/SP-10) samples will be collected from the wastewater treatment system on board the Veendam. Wastewater treatment influent samples will be analyzed for all pollutant groups except dioxins and furans. Samples collected at the influent to the UV will be analyzed only for microbiologicals. Wastewater treatment effluent samples will be analyzed for all pollutants except pesticides, dioxins and furans, and PCBs.Samplng

Sampling crew will install a strap-on flow meter at SP-6/SP-7 and will use the I/O on the existing flow meter at SP-9/SP-10 to signal automatic sampling machines to collect samples each time fixed quantities of wastewater have passed through sampling point piping. Sampling point SP-8 does not require flow measurement since the four microbiological samples collected at this sampling point per 24-hour sampling period are grab samples.

During each 24-hour sampling period, a composite sample and up to four grab samples will be collected at each of the SP-6/SP-7 and SP-9/SP-10 sampling points using the same procedure as described for graywater samples in Section 3.3.2.

Information regarding the design, operation, and maintenance of the wastewater treatment units will be recorded on the data sheet provided in Figure 3-5. In addition, information regarding the blackwater collection, holding, and transfer system will be recorded on the data sheet provided in Figure 3-4.

3.3.4 Treatment Residue Samples

Samples of the screening solids (SP-11) and incinerator ash (SP-13/SP-14) will be collected as one time grab samples during the sampling episode. Waste biosludge (SP-12) samples will be collected as a manual composite sample and up to four grab samples collected during waste biosludge discharge period using the same procedures as described for graywater samples in Section 3.3.2. Treatment residue samples will be collected to represent the actual material that is being either discharged, incinerated, or removed from the vessel. Specifically, screening solids will be collected from the macerator pump on the solids recirculation loop on the solids collection tank. Waste biosludge samples will be collected from a sampling port on the waste biosludge discharge line. Finally, incinerator ash samples will be collected from the incinerator ash storage hopper. Screening solids and waste biosludge samples will be analyzed for all pollutants except for microbiologicals, dissolved metals, pesticides, dioxins and furans, and PCBs. Ash samples will be analyzed for semivolatile organics, total metals, and dioxins and furans only.

3.3.5 Source Water Sample

A source water grab sample will be collected from the ship's potable water system (SP-15) to determine if any of the targeted pollutants are present as background contamination. The source water sample will be analyzed for all of the target parameters, except for pesticides, dioxins and furans, and PCBs.

Information regarding the potable water source and treatment will be recorded on the data sheet provided in Figure 3-6.

3.3.6 Quality Assessment Samples

Duplicate samples are collected as part of the quality assurance program for this sampling episode. Duplicate samples are collected as separate aliquots in the field. One field duplicate per every 10 samples will be collected from sampling point SP-10 and analyzed for all

pollutant parameters with the exception of HEM/SGT HEM, pesticides, dioxins and furans, and PCBs. Microbiological duplicate samples will also be collected from SP-10, but at a lesser frequency of one duplicate per 20 samples. Duplicate samples will be collected at SP-2 and SP-14 for dioxins and furans, and at SP-7 for pesticides. Results of the duplicate analyses will be used to evaluate precision, including variability in sample collection, handling, preparation, and analysis.

Sampling crew quality control samples will be collected once per day from the source water (SP-15) as a part of the quality assurance program to ensure that sampling members are not contaminating the samples with microbiologicals during sample collection.

One trip blank (SP-16) will be collected and analyzed for volatile organics. The sample will consist of high-performance liquid chromatography (HPLC) water poured into sampling bottles prior to the sampling episode and shipped to the sampling location. The trip blank will be shipped back (unopened) to the laboratory along with collected samples. This blank will be used to evaluate possible contamination during shipment and handling of samples.

An automatic sampler equipment blank (SP-17) will be collected and analyzed for semivolatile organics, total metals, and dissolved metals. The equipment blank will consist of HPLC water pumped through a sampler, tubing, and into a composite jar from which a fraction will be poured off. Equipment blanks are used to evaluate possible contamination caused by sampling equipment or by sampling equipment decontamination procedures.

As part of standard laboratory quality control (QC), matrix effects on analytical performance are assessed through the analysis of matrix spikes and laboratory duplicates. The matrix effects will be assessed on the effluent from the wastewater treatment system (SP-9) for all parameters except pesticides, dioxins and furans, and PCBs. The matrix effects will be assessed on the influent to the wastewater treatment system (SP-6) for pesticides. (Matrix effects assessment QC samples are not required for isotope dilution procedures (i.e., dioxins and furans by Method 1613 and chlorinated biphenyls congeners by Method 1668).) Matrix effects assessment analyses are conducted on 10 percent of the samples from a given matrix (e.g.,

aqueous, sludge) within a sampling event. Consequently, additional sample volume must be collected for these QC analyses. The sampling team will be responsible for collecting, labeling, and shipping the laboratory QC volumes. Laboratory QC volumes will be collected as part of the composite volume and poured into separate sample bottles at the same time as other sample aliquots are prepared.

Laboratory duplicates will be collected as QC samples specifically for microbiologicals and will be collected as a single sample that is split and analyzed as two separate samples. Laboratory duplicates will be collected at a frequency of one per 20 samples at SP-10. Several other microbiological QC procedures will be required prior to sampling, such as positive and negative controls, dilution water blanks, and media and sample bottle sterility checks. The procedures and frequencies for these analyses are outlined in the *Quality Assurance Project Plan for Rulemaking for Large Cruise Ships in Alaska Waters* (2).

3.4 Preservation, Shipping, and Analysis

All samples will be maintained on ice immediately upon collection. Chemical preservatives will be added on board according to method-specified protocols either upon sample collection (i.e., grab samples) or following preparation of sample fractions from the composite sample (see Section 5.1). Table 3-2 lists the analytical fraction type, sample container, sample volume, and preservation method for each type of analysis. Preservation may need to be repeated as chemical reactions progress in samples. The type and amount of preservation used will be recorded on sample preservation log sheets (Figure 3-7). The samples will be packed in ice chests with a sufficient quantity of wet ice to maintain a temperature of 4°C (+/- 2°C) until the Veendam arrives in port. Exceptions include metals samples which have no temperature requirements.

As the Veendam docks in Juneau, Alaska, samples will be prepared for overnight shipment via Federal Express to EPA specified laboratories. As the cruise ship docks in either Ketchikan or Sitka, Alaska, the samples will be shipped via Alaska Airlines Goldstreak Air Cargo to Juneau where the samples will be transferred to one of EPA's Juneau analytical contractors

laboratory (BOD_5) or to Federal Express for continued shipment to another laboratory. All samples being shipped via Federal Express from Juneau will be packed in ice chests containing either chemical ice or double-bagged wet ice. All samples shipped from Ketchikan or Sitka to Juneau via Alaska Airlines Gold Streak will be packed in ice chests containing chemical ice.

3.5 Field Measurements

Temperature, pH, salinity, conductivity, turbidity, sulfide, hardness, and free and total chlorine will be measured and recorded by the sampling crew at each sampling point when each grab sample is collected. A 1-liter glass jar will be filled during collection of each grab sample set for field measurements. Temperature and pH will be measured immediately after the collection of the field measurement aliquot; the other field measurements will be conducted shortly thereafter, either in the field (preferably) or in the sample staging area. Samplers will follow applicable test kit calibration procedures specified by the manufacturer. Table 3-5 summarizes the field measurements, how they are to be taken, and the measurement frequency. Test meters instructions and calibration requirements for conductivity, salinity, sulfide, and free and total chlorine field measurements can be found in Appendix B.

Field sampling log sheets (Figure 3-8) will be completed at each sampling point for each 24-hour sampling period. This sheet will record the sampling methodology, names of the samplers, sample collection times, field measurements, and any notes and observations.

3.6 Sample Labeling

Each sample will be coded with a unique sample number and labeled at the time of collection. The self-adhesive label will be completed in indelible ink and will contain the following information:

- Sample number;
- Sampling episode number;
- Sampling point description;

- Sampling point and day;
- Analysis to be performed;
- Sample bottle type;
- Date of sample collection; and
- Preservation used.

Once applied to the sample container, labels will be covered with clear tape to prevent tampering, abrasion, smearing, or loss during transit.

3.7 Chain-of-Custody Record

To maintain a record of sample collection, shipment, and receipt by the laboratory, a Traffic Report will be filled out for each sample fraction at each sampling location. These forms will be completed and used to document sample custody transfer from the field to the laboratory, regardless of whether the analyses are completed on board or shipped to a designated laboratory. At the time of sample shipment, a copy of the traffic report will be sent to Sampling Control Center, another copy will be kept by sampling personnel, and the remainder of the copies will be transmitted with the samples to the analytical laboratories. Figure 3-9 includes a sample Traffic Report. When the samples are received by the designated analytical laboratory, a copy of the traffic report will be sent to Sampling Control Center to acknowledge receipt and the condition of the samples.

3.8 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) procedures applicable to the Veendam sampling episode are outlined in the *Quality Assurance Project Plan for Rulemaking Support for Large Cruise Ships in Alaska Waters* (2). The QA/QC program for sample collection on board large cruise vessels will include the following:

- Documentation of sample custody using Traffic Reports;
- Collection of field duplicate samples;
- Collection of trip blank(s) for VOC analyses;

- Collection of equipment blank(s) for semivolatile organics and total and dissolved metals analyses;
- Collection of laboratory duplicate samples for microbiologicals; and
- Analysis of positive and negative controls, dilution water blanks, and sample bottle and media sterility checks for microbiologicals prior to use in sampling.

3.9 Sample Splitting

The Veendam has the option to collect duplicate samples (split samples) at each of the sampling points. If this option is exercised, the owner of the Veendam or their representative will supply all of the personnel, equipment, glassware, and reagents required to collect the split samples and to coordinate the analysis of samples. Holland America representatives have not indicated a desire to collect split samples.

Table 3-1

Samples for Collection On Board Holland America Veendam

Sampling Point Number	Sampling Point Name	Micros	Vol	Semivol	Total Metals	Dissolved Metals (a)	Cyanide (b)	HEM/ SGT-HEM	BOD	Solids	Group I	Group II	Pest (c)	D/F	PCB
SP-1	Laundry Wastewater Characterization	4	1	1	1	1	1	4	1	1	1	1		1	
SP-2	Laundry Wastewater Characterization (Duplicate)													1	
SP-3	Accommodations Wastewater Characterization	4	1	1	1	1	1	4	1	1	1	1			
SP-4	Food Pulper Wastewater Characterization	4	1	1	1	1	1	4	1	1	1	1			
SP-5	Galley Wastewater Characterization	4	1	1	1	1	1	4	1	1	1	1	1		
SP-6	Influent to Wastewater Treatment System	20	5	5	5	5	5	20	5	5	5	5	1+2QC		1
SP-7	Influent to Wastewater Treatment System (Duplicate)												1		
SP-8	Influent to UV Disinfection	20													
SP-9	Effluent from Wastewater Treatment System	20	5+4QC	5+4QC	5+4QC	5+4QC	5+4QC	20+ 12QC	5+4QC	5	5+4QC	5+4QC			
SP-10	Effluent from Wastewater Treatment System (Duplicate)	8+8QC	2	2	2	2	2		2	2	2	2			
SP-11	Screening Solids		1	1	1		1		1	1	1	1			
SP-12	Waste Biosludge (Desludge) Discharge		1	1	1		1		1	1	1	1			
SP-13	Incinerator Ash			1	1									1	
SP-14	Incinerator Ash (Duplicate)													1	
SP-15	Source Water	1+4QC	1	1	1	1	1		1	1	1	1			
SP-16	Trip Blank		1												

Table 3-1 (Continued)

Sampling Point Number	Sampling Point Name	Micros	Vol	Semivol	Total Metals	Dissolved Metals (a)	Cyanide (b)	HEM/ SGT-HEM	BOD	Solids	Group I	Group II	Pest (c)	D/F	PCB
SP-17	Equipment Blank			1	1	1									
Total Number of Samples (Excluding QC)		**85**	**20**	**21**	**21**	**18**	**19**	**56**	**19**	**19**	**19**	**19**	**3**	**4**	**1**

(a) Dissolved metals samples will be analyzed for filterable waste streams only.
(b) Cyanide includes both total and available cyanide.
(c) Pesticides includes both organo-phosphorous and organo-halide pesticides.

Micros - Fecal coliforms, E. coli, and enterococci.
Vol - Volatile organics.
Semivol - Semivolatile organics.
HEM/SGT-HEM - Hexane extractable material and silica gel treated hexane extractable material.
BOD - Biochemical oxygen demand.
Solids - Settleable solids.
Group I - Total suspended solids (TSS), total dissolved solids (TDS), sulfate, chloride, and alkalinity.
Group II - Total organic carbon (TOC), chemical oxygen demand (COD), ammonia as nitrogen, nitrate/nitrite as nitrogen, total Kjeldahl nitrogen (TKN), and total phosphorus.
QC - With the exception of microbiologicals, QC samples include sample volume for both a matrix spike and a matrix spike duplicate (i.e., two samples). For microbiologicals, QC samples refer to confirmation analyses performed on 10% of the samples
Pest-Organophosphorous pesticides
D/F-Dioxins and Furans
PCB-Chlorinated Biphenyls Congeners

Table 3-2

Summary of Sample Container and Preservation Requirements

Parameter	Sample Container	On-Board Preservation (d)
Fecal Coliforms	120 ml sterile bottle (c)	100 mg/L $Na_2S_2O_3$, 4°C
E. coli	120 ml sterile bottle (c)	100 mg/L $Na_2S_2O_3$, 4°C
Enterococci	120 ml sterile bottle (c)	100 mg/L $Na_2S_2O_3$, 4°C
Volatile Organics	Two 40-mL glass vials (c)	3 granules (10 mg) $Na_2S_2O_3$ per vial, 2 drops HCl per vial, 4°C
Semivolatile Organics	Two 1-L amber glass bottles	80 mg/L $Na_2S_2O_3$, 4°C
Total Metals	1-L plastic bottle	None required
Dissolved Metals	1-L plastic bottle	0.45 um filtration
HEM/SGT-HEM	1-L wide mouth glass jar (c)	HCl or H_2SO_4 to pH <2, 4°C
Cyanide, Total	500-mL plastic bottle	Ascorbic acid (0.6 g/L) to remove Cl_2, NaOH to pH >12, 4°C. If sulfide is present, add 2 g lead carbonate to precipitate sulfide prior to raising pH.
Cyanide, Available	500-mL amber glass bottle	Ascorbic acid (0.6 g/L) to remove Cl_2, NaOH to pH >12, 4°C. If sulfide is present, add 2 g lead carbonate to precipitate sulfide prior to raising pH.
Biochemical Oxygen Demand (5-day)	1-L plastic bottle	4°C
Settleable Solids	1-L plastic bottle	4°C
Group I (a)	1-L plastic bottle	4°C
Group II (b)	1-L and 500 mL glass bottles	H_2SO_4 to pH <2, 4°C
Dioxins and Furans	Two 1-L amber glass bottles	If pH>9, H_2SO_4 to pH 7-9 80 mg/L $Na_2S_2O_3$, 4ºC
Organo-Phosphorus Pesticides	Two 1-L amber glass bottles	NaOH or H_2SO_4 to pH 5-9 80 mg/L $Na_2S_2O_3$, 4ºC
Organo-Halide Pesticides	Two 1-L amber glass bottles	NaOH or H_2SO_4 to pH 5-9 80 mg/L $Na_2S_2O_3$, 4ºC
Chlorinated Biphenyls Congeners	Two 1-L amber glass bottles	H_2SO_4 to pH 2-3 80 mg/L $Na_2S_2O_3$, 4ºC

(a) Group I includes total dissolved solids (TDS), total suspended solids (TSS), sulfate, chloride, and alkalinity.
(b) Group II includes total organic carbon (TOC), chemical oxygen demand (COD), ammonia as nitrogen, nitrate/nitrite as nitrogen, total Kjeldahl nitrogen (TKN), and total phosphorus.
(c) Grab samples for microbiologicals, volatile organics, HEM/SGT-HEM analysis will be collected separately for each composite aliquot.
(d) Addition of sodium thiosulfate is required only if residual chlorine is present in the sample at a concentration greater than 0.03 mg/L.

Table 3-3

Summary of Sampling Locations, Flow Measurement Techniques, and Sample Collection Types
Holland America Veendam

Sampling Point Number	Sampling Point Description	Sampling Location	Flow Measurement Technique	Sample Collection Type
SP-1/SP-2	Laundry Wastewater Characterization	Inlet pipe to laundry holding tank.	Install strap-on flow meter on outlet pipe from holding tank (assuming pipe remains full and is not subject to backflow from other graywater sources). Alternative is to use holding tank level data collected by the ship. Please provide instantaneous tank level data recorded in the ship's control system for a typical multi-day cruise.	Need to install "T" sample tap on inlet pipe to laundry holding tank. Composite samples collected from one side of the sample tap, and grab samples collected from the other side of the sample tap.
SP-3	Accommodations Wastewater Characterization	Accommodations holding tank discharge pumps.	Install strap-on flow meter on length of pipe downstream of accommodations holding tank discharge pump, underneath decking. Please provide suggested location for flow monitoring. Pipe should be accessible and suitable for crew to install strap-on flow meter (pipe always full, at least 10 pipe diameters away from pumps, elbows, joints, and other sources of turbulence). Please estimate distance from suggested flow meter location to sampling location. Alternative is to use holding tank level data collected by the ship. Please provide instantaneous tank level data recorded in the ship's control system for a typical multi-day cruise.	Need to install "T" sample tap (if only one pump used) or "H" sample tap (if both pumps used). Composite samples collected from one side of the sample tap, and grab samples collected from the other side of the sample tap.
SP-4	Food Pulper Wastewater Characterization	Food pulper water recirculation tank.	None required. Will request typical food pulper wastewater generation rates and duration during sampling episode.	Use existing sample tap to collect grab samples each time food pulper wastewater is drained to the treatment system.

Table 3-3 (Continued)

Sampling Point Number	Sampling Point Description	Sampling Location	Flow Measurement Technique	Sample Collection Type
SP-5	Galley Wastewater Characterization	Influent to passenger galley grease trap.	Gravity-flow piping not suitable for crew to install strap-on flow meter. Please provide instantaneous tank level data recorded in the ship's control system for a typical multi-day cruise.	Install "T" sample tap at enzyme chemical feed on inlet pipe to passenger galley grease trap. Composite samples collected from one side of the sample tap, and grab samples collected from the other side of the sample tap.
SP-6/ SP-7	Influent to Wastewater Treatment System	Combined graywater and blackwater feed to screen filters.	Install strap-on flow meter on one of two possible locations: before or after screen filters. If data from Zenon control system can be downloaded to disk, please provide Zenon system data (pump operation, instantaneous tank levels, etc.) collected for a typical multi-day cruise.	Need to install "T" sample tap on the existing combined graywater and blackwater sample tap. Composite samples collected from one side of the sample tap, and grab samples collected from the other side of the sample tap.
SP-8	Influent to UV Disinfection	Inlet pipe to UV disinfection.	None required. If data from Zenon control system can be downloaded to disk, please provide Zenon system data (pump operation, instantaneous tank levels, etc.) collected for a typical multi-day cruise.	Need to install new sample tap at inlet to UV disinfection for grab samples for microbiologicals analysis only.
SP-9/SP-10	Effluent from Wastewater Treatment System	Effluent pipe from UV disinfection.	Existing flow meter on effluent discharge pipe. Use flow meter I/O to communicate with automatic sampling machine provided by sampling crew. If data from Zenon control system can be downloaded to disk, please provide Zenon system data (pump operation, instantaneous tank levels, etc.) collected for a typical multi-day cruise.	Need to install "T" sample tap on existing sample tap on effluent from UV disinfection. Composite samples collected from one side of the sample tap, and grab samples collected from the other side of the sample tap.
SP-11	Screening Solids	Screening solids recirculation loop, at mascerating pump.	Not applicable. Will request typical screening solids generation rates during sampling episode.	Install sample tap off pressure gauge on mascerator pump. Single grab sample.
SP-12	Waste Biosludge (Desludge) Discharge	Waste biosludge discharge pipe.	None required. Will request typical discharge pumping rate and duration prior to sampling.	Use existing sample tap; no modifications needed. Collect grab samples for manual compositing during overboard discharge period.

Table 3-3 (Continued)

Sampling Point Number	Sampling Point Description	Sampling Location	Flow Measurement Technique	Sample Collection Type
SP-13/SP-14	Incinerator Ash	Incinerator ash hopper.	Not applicable. Will request typical incinerator ash generation rates during sampling episode.	Manual grab sample from incinerator ash hopper.
SP-15	Source Water	Ship's potable water system following any chlorination, end of distribution.	None required. Will request information regarding water bunkering during sampling episode.	Single grab sample.
SP-16	Trip Blank	Sampling crew sampling room.	Not applicable.	Single grab sample.
SP-17	Equipment Blank	Sample tap and sampling equipment (i.e., automatic sampling machine).	Not applicable.	HPLC water pumped through representative sample tap and sampling equipment. Single grab sample. Please provide an extra sample tap ("T" or "H") for use in preparing the equipment blank.

Table 3-4

Standard Analytical Methods and Procedures for Samples Collected On Board the Veendam

Method No.	Title	Method Type
SM 9222D	Fecal Coliforms	Membrane filtration
SM 9223B	Escherichia Coli (E. coli)	Multiple tube/multiple well
ASTM D6503-99	Enterococci	Multiple tube/multiple well
EPA 160.2	Residue, Non-filterable (TSS)	Gravimetric
EPA 160.5	Settleable Matter (SS)	Volumetric
EPA 160.1	Total Dissolved Solids (TDS)	Gravimetric
SM 2320 B	Alkalinity	Titrimetric
EPA 375.1, 375.3, or 375.4	Sulfate	Colorimetric, Gravimetric, or Turbidimetric
EPA 325.2 or 325.3	Chloride	Colorimetric or Titrimetric
EPA 351.2, 351.3, or 351.4	Total Kjeldahl Nitrogen (TKN)	Colorimetric, Titrimetric, or Potentiometric
EPA 350.1, 350.2, or 350.3	Ammonia as Nitrogen	Colorimetric, Titrimetric, or Potentiometric
EPA 353.1, 353.2, or 353.3	Nitrate/Nitrite as Nitrogen	Colorimetric or Spectrophotometric
EPA 365.2 or 365.4	Total Phosphorus	Colorimetric
EPA 405.1	Biochemical Oxygen Demand (BOD_5)	Titrimetric
EPA 410.1, 410.2, 410.3, or 410.4	Chemical Oxygen Demand (COD)	Titrimetric or Colorimetric
EPA 415.1	Total Organic Carbon (TOC)	Combustion or Oxidation
EPA 335.2	Total Cyanide	Titrimetric or Spectrophotometric
EPA 1677	Available Cyanide	Flow Injection, Ligand Exchange, Amperometry
EPA 1664A	Hexane Extractable Material and Silica Gel Treated Hexane Extractable Material (HEM/SGT-HEM)	Gravimetric
EPA 200.7, 200.8, 200.9, and 245.7 (Mercury only)	Metals by Inductively Coupled Plasma Atomic Emission Spectrometry, Mass Spectrometry, and Atomic Absorption Spectroscopy	GFAA, ICP, ICP/MS and CVAA
EPA 624	Volatile Organic Compounds by GC/MS	GC/MS
EPA 625	Semivolatile Organic Compounds by GC/MS	GC/MS
EPA 1613B	Dioxins and Furans by Isotope Dilution HRGC/MS	HRGC/MS
EPA 1657	Organo-Phosphorous Pesticides	GC-FPD
EPA 1656	Organo-Halide Pesticides	GC-HSD
EPA 1668A	Chlorinated Biphenyls Congeners by Isotope Dilution HRGC/MS	HRGC/MS

Table 3-5

Sampling Point Field Measurements

Field Measurements	Method	Frequency
Temperature	Thermometer	Each time grab samples (e.g., VOCs) are collected
Turbidity	Turbidity meter	Each time grab samples (e.g., VOCs) are collected
Salinity	Salinity meter	Each time grab samples (e.g., VOCs) are collected
Conductivity	Conductivity meter	Each time grab samples (e.g., VOCs) are collected
Sulfide	Colorimetric test kit	Each time grab samples (e.g., VOCs) are collected.
pH	Four color indicator strip	Each time grab samples (e.g., VOCs) are collected
Hardness	Titrimetric test kit	Each time grab samples (e.g., VOCs) are collected
Free and Total Chlorine	Colorimetric test kit	Each time grab samples (e.g., VOCs) are collected

Flow Meter Measurement Data Sheet

Vessel:						**Discharge:**					
Meter Information											
Meter Type:		Serial #:				Calibration:					
Install Location:						Date:	Time:		Gallons:		
De-Install Information:						Date:	Time:		Gallons:		
Day/ Date	**Time**	**Gallons**		**V_s**	**Alarms**	**Day/Date**	**Time**	**Gallons**		**V_s**	**Alarms**
		Totalizer	**Daily**					**Totalizer**	**Daily**		

Figure 3-1. Flow Meter Measurement Data Sheet

GRAYWATER GENERATION DATA SHEET

Vessel:
Date:
Recorded By:

Vessel Point(s) of Contact:

Number of Passengers and Number of Crew Actually on Board:

Unusual Maintenance or Operational Activities Described By Vessel Point(s) of Contact:

Number and Time of Meals Served by Day (include passengers and crew) :

Breakfast:
Lunch:
Dinner:
Other Meals:

Were Dishwashers Operated? (Circle one) Yes / No

If yes, what weight, number of pieces, or number of loads were washed?
What times were dishes washed by day?
Estimated volume of water per load:
Detergent name (obtain MSDS if available):

Was Laundry Washed? (Circle one) Yes / No

If yes, number of hours per day laundry was operated:
Weight, number of pieces, or number of loads washed per day:
What times were dishes washed by day?
Estimated volume of water per load:
Detergent and other chemicals names (obtain MSDS if available):

Other Sources (e.g., small pantries, steward stations, cleaning stations):
Times these sources are generated:
Estimated volume per source:

Figure 3-2. Graywater Generation Data Sheet

PESTICIDE, FUNGICIDE, AND RODENTICIDE USE DATA SHEET

Vessel:
Date:
Recorded by:

Pesticides Used On-Board: yes or no (circle one)

Pesticide Name	Target Pest(s)	Amount Used/yr	MSDS Obtained (yes/no)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

List Locations Where Pesticides are Normally Applied and Stored On-Board and Dates Applied:

Potential to Enter Graywater/Blackwater Systems (e.g., application, spills, floor drains)?

Person(s) Responsible for Pesticide Application:

Fungicides Used On-Board: yes or no (circle one)

Fungicide Name	Target Fungi	Amount Used/yr	MSDS Obtained (yes/no)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

List Locations Where Fungicides are Normally Applied and Stored On-Board and Dates Applied:

Potential to Enter Graywater/Blackwater Systems (e.g., application, spills, floor drains)?

Person(s) Responsible for Fungicide Application:

Rodenticides Used On-Board: yes or no (circle one)

Rodenticide Name	Target Rodent	Amount Used/yr	MSDS Obtained (yes/no)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

List Locations Where Rodenticides are Normally Applied and Stored On-Board and Dates Applied:

Potential to Enter Graywater/Blackwater Systems (e.g., application, spills, floor drains)?

Person(s) Responsible for Rodenticide Application:

Figure 3-3. Pesticide, Fungicide, and Rodenticide Use Data Sheet

COLLECTION, HOLDING, AND TRANSFER (CHT) TANK DATA SHEET

Vessel:
Date:
Recorded by:

Tank Number or Identification:

Wastewater Source(s):

Tank Volume:_____ m^3 or gallons

Does the Tank Have Vacuum: yes or no (circle one):

Vacuum: ____ mm Hg

Tank Material of Construction:

Is this a double bottom tank: yes or no (circle one)?

Normal Operating Volume: _____ m^3

Automated Tank Gauging and Discharge System: yes or no (circle one)

Discharge Type: batch or continuous (circle one)

Totalizer or Flow Meter on Discharge Line: yes or no (circle one)

Discharge Flow Rate: _____ m^3/min or m^3/day

Wastewater Destination After Leaving the Tank:

Approximate Diameter of Discharge Line: _____ inches

Screens or Filters Present on Either Influent or Discharge Lines (describe):

Chemical Additions to Tank:

Chemical Name	Purpose	Amount	MSDS (yes/no)
_____	_____	_____ kg/day	_____
_____	_____	_____ kg/day	_____
_____	_____	_____ kg/day	_____

Is sludge removed from this tank (describe frequency, amount, destination)?:

Figure 3-4. Collection, Holding, and Transfer (CHT) Tank Data Sheet

WASTEWATER TREATMENT UNIT DATA SHEET

Vessel:
Date:
Recorded by:

Description of Treatment Unit:

Manufacturer:

Model:

Design Drawings Obtained: yes or no (circle one)

Design Capacity: _____ gpd or gpm (circle one)

Typical Operating Flow Rate: _____ gpd or gpm (circle one)

Operational period: _____ hours

Chemical Additions:

Chemical	Amount	Units	MSDS Obtained
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Electrical Requirements:

Volts: _____ Amps: _____ Horsepower: _____

Sludge Generation: yes or no (circle one)
If yes, describe frequency, amount, and destination:

Was maintenance performed on treatment unit: yes or no (circle one)
If maintenance was performed, estimate labor: _____ hours

List operating parameters recorded (e.g., flow, temperature, pressure, pH), typical values, and range for this unit. Record or obtain copy or printout of logs for the duration of the sampling episode.

Figure 3-5. Wastewater Treatment Unit Data Sheet

SOURCE WATER DATA SHEET

Vessel:
Date:
Recorded by:

Is Potable Water Generated On-Board the Vessel: yes or no (circle one)

Describe the On-Board Potable Water Treatment and Disinfection Method:

Port (City) Where Source Water is Obtained if Not Generated On-Board: _____

Treatment Method for Source Water Obtained in Port:

Disinfection Method for Source Water Obtained in Port:

Fluoride Added to Water Obtained in Port: yes or no (circle one)

Additional Disinfection Performed On Water Obtained in Port: yes or no (circle one)

Describe Additional On-Board Disinfection Method:

Description of Source Water Sample Collection Point On-Board Cruse Ship:

Figure 3-6. Source Water Data Sheet

Sampling Episode _____

Preservation Chemicals - List Strength of Solution from Bottle

HCl _____ Ascorbic Acid_____

H_2SO_4 _____ NaOH _____

$Na_2S_2O_3$ _____ Lead Carbonate_____

Sample Number	Analysis	Date	Name	Chemical	Initial pH	Final pH	Number of Drops

Figure 3-7. Sample Preservation Log Sheet

Date: _____

Sampling Episode: _____

Sampling Point: _____

Sample Numbers: _____

Manual Composite ☐ Grab ☐

Automatic Composite ☐

Time of Compositing period, if applicable:

Start Time _____ ☐ AM ☐ PM

End Time _____ ☐ AM ☐ PM

Equipment Used: _____

Samplers' Names: _____

Aliquot	Time	Temp °C	Turbidity (NTU)	pH	Sulfide (mg/L)	Salinity (ppt)	Conductivity (µS/cm)	Hardness (mg/L)	Free Chlorine (mg/L)	Total Chlorine (mg/L)
1										
2										
3										
4										
5										
6										
Composite										

Notes: (include observations of odor and color of each aliquot, take pictures if necessary)

_____

_____

_____

_____

_____

_____

Figure 3-8. Field Sampling Log Sheet

EPA

United States
Environmental Protection Agency
Washington, DC 20460

EPISODE NO:

RANGE OF SAMPLE NOS:

TRAFFIC REPORT
USEPA ENGINEERING AND ANALYSIS DIVISION
SAMPLE CONTROL CENTER

Return completed form to:
P.O. BOX 1407
ALEXANDRIA, VA 22313
(703) 519-1140

INDUSTRIAL FIRM SAMPLED	SHIPPING & INFORMATION
NAME:	SHIP TO:
CITY:	ATTN:
STATE:	CARRIER:
INDUSTRIAL CATEGORY:	AIRBILL:
	DATE SHIPPED:
CONFIDENTIAL (Y/N):	SAMPLING OFFICE/SAMPLER:

SAMPLE POINT DESCRIPTION											SAMPLE ANALYSES						
SAMPLE NUMBER	SOURCE WATER (city, river, well)	IN LINE PROCESS	UNREATED EFFLUENT (raw wastewater)	TREATED EFFLUENT	OTHER (specify)	ADDITIONAL SAMPLE DESCRIPTION	PH LEVEL	PRESERVED (Y/N)	G=GRAB / C=COMPOSITE	SAMPLE COLLECTION TIME / DATE							

Comments:

EPA Form 7500-50 (Rev 6-94) Previous editions are obselete.
Page 1: Sample Control Center Copy
Copy of Page 1: Sampler Copy
Page 2: Lab Copy
Copy of Page 2: Lab Copy for return

Figure 3-9. Example Traffic Report

4.0 SAMPLING ACTIVITIES

This section discusses the sampling team organization, ship visit preparation, and sampling activities.

4.1 Sampling Team Organization

The sampling crew will consist of a Donald Anderson from EPA, a crew chief (Jennifer Biancuzzo), seven crew members, and one of the laboratory analytical contractors who will be responsible for all on-board laboratory analyses. The crew chief will be responsible for all sample collection, preservation, and shipping activities on board. After completion of the sampling episode, the analytical results from each laboratory will be collated. This information will be summarized and transmitted, along with a trip report, to EPA. After EPA review, the report will be forwarded to the cruise line for their review.

4.2 Pre-Visit Preparation

As a part of preparing the team for the sampling event on-board the Veendam, the crew chief will distribute the Holland America Veendam Sampling and Analysis Plan to each team member and make sure they are completely familiar with the sampling plan and the health and safety requirements specific to the Veendam found in Section 6.0. Cruise vessel personnel shall also be given copies of this sampling and analysis plan prior to the start of sampling.

The crew chief will coordinate the procurement and shipment of all necessary sampling and health and safety equipment.

Upon arrival on Sunday June 13, two members of the sampling crew will attend a health and safety briefing lead by the ship's Environmental Officer and begin to set up sampling equipment. On Sunday June 20, six additional sampling crew members, the laboratory analyst, and Donald Anderson from EPA will arrive on ship. These individuals will also receive a health

and safety briefing and then will begin sampling. The crew will tour the sampling points and discuss the detailed health and safety considerations (e.g., the hazards associated with each sampling point, related personal protective equipment, and evacuation requirements). If conditions exist which are different than those anticipated, modifications will be made in consultation with EPA and Veendam personnel. If necessary, additional equipment and glassware will be obtained. A detailed schedule of the activities for the sampling episode is provided in Appendix C.

4.3 Field Sampling Activities

On board the Veendam, the two members of the sampling crew designated to set up sampling equipment, will meet with cruise vessel personnel to determine whether samples can be collected at each of the planned sampling points. Upon making the decision to collect samples, the descriptions of the proposed sampling points will be updated, if necessary, in consultation with EPA and cruise vessel personnel. If necessary, additional equipment and glassware will be obtained. The revised description shall include:

- A sample point description and collection procedure for each sample point;
- A list of the sample fractions to be collected at each point:
- A list of potential physical hazards (such as pH, temperature, and potentially hazardous equipment);
- A list of potential chemical hazards associated with each sample point; and
- A list of proposed health and safety procedures.

Prior to sampling, the crew chief will also notify the Health and Safety Coordinator (Matt Stein, Chantilly, VA) of any revised sampling activity descriptions along with recommended revisions to the proposed health and safety procedures. Together, they will review the proposed health and safety procedures, incorporate specific changes indicated by

the Health and Safety Coordinator, and gain approval for sampling from the Health and Safety Coordinator before proceeding with sampling activities.

Sample fractions collected will be labeled, sealed, and placed in coolers for shipment to the laboratory once the cruise vessel docks. The Traffic Report forms will be completed and placed in plastic sleeves inside the coolers. The coolers will then be transported to either the Juneau analytical laboratory or for continued shipment via Federal Express office to the Sampling Control Center laboratories. Because of the very short sample holding times for microbiologicals, BOD_5 (note that not all BOD_5 samples will be analyzed on-board), and SS an on-board laboratory will be used for analysis of these samples. At the conclusion of the sampling episode, the sampling equipment will be prepared for return shipping.

The crew chief will confirm the laboratories to be used for analysis and communicate the number of samples being collected. The crew chief will also contact Sampling Control center after shipping the samples to communicate shipping information.

4.4 Logistics

This section of the sampling plan summarizes cruise vessel contacts, analytical laboratory contacts and addresses, and sampling team personnel and support functions.

4.4.1 Cruise Ship Contacts

Nick Showengerdt
Director of Environment
Holland America Cruise Lines
206-298-3067

Environmental Officer
Holland America Veendam

Chief Engineer
Holland America Veendam

4.4.2 EPA Contacts

Don Anderson
Engineering and Analysis Division
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Mail Code 4303T
Washington, D.C. 20460
(202) 566-1021

Elizabeth Kim
Office of Wetlands, Oceans, and Watersheds
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Mail Code 4504T
Washington, D.C. 20460
(202) 566-1270

4.4.3 Sample Control Center

Erin Salo
Sample Control Center
6101 Stevenson Ave.
Fifth Floor
Alexandria, VA 22304
703-461-2350
703-461-8056 (fax)

4.4.4 Analytical Laboratories

To be determined.

4.4.5 Eastern Research Group Contacts

Debbie Falatko (Project Manager) - Chemical Engineer
Jennifer Biancuzzo - Chemical Engineer
Kim Porter - Environmental Scientist
Eastern Research Group, Inc.
14555 Avion Parkway, Suite 200
Chantilly, VA 20151
(703) 633-1600

4.4.6 Freight Forwarders

Federal Express
9203 Bonnett Way
Juneau, Alaska 99801
General Information (800) 238-5355
Weekday Hours: 7:30 am to 5 pm
Last Express Drop-off: 8:30 am, no Sat pickup

Alaska Airlines Goldstreak Air Cargo
General Information (800) 634-7113

4.4.7 Courier Services

To be determined.

5.0 SAMPLE SHIPMENT

All sample packages will be labeled with standard address labels. All samples will be tracked using Traffic Report forms. Custody will be maintained by the crew chief from sample collection through shipment (or transfer to one of the contractor's on-board laboratory).

All samples will be packaged and shipped in accordance with DOT or IATA regulations. The general IATA packaging requirements for air shipment are as follows:

- "Inner packaging must be so packed, secured or cushioned as to prevent their breakage or leakage and so as to control their movement within the outer packaging during normal conditions of transport. Cushioning material must not react dangerously with the contents of the inner packaging. Any leakage of the contents must not substantially impair the protective properties of the cushioning material. Unless otherwise provided in this paragraph or in the Packing Instructions, liquids in Classes, 3, 4, 5, 6, or 8 of Packing Groups I or II in glass or earthenware inner packaging, must be packaged using material capable of absorbing the liquid. Absorbent material must not react dangerously with the liquid. Absorbent material is not required...." (IATA Dangerous Goods Regulations, 5.0.16).

- "When filling receptacles for liquids, sufficient ullage (outage) must be left to ensure that neither leakage nor permanent distortion of the receptacle will occur as a result of an expansion of the liquid caused by temperatures likely to prevail during transport. Liquids must not completely fill a receptacle at a temperature of 55°C (130°F)." (IATA Dangerous Goods Regulations, 5.0.12).

The packing and labeling procedures in the following subsections may be used for non-hazardous samples. Hazardous samples will be identified based on consultation with the hazardous shipments contact, and appropriate hazardous shipping procedures will be followed. Based on process considerations, samples collected on board large cruise vessels will not be classified as IATA dangerous goods.

5.1 Sample Set Preparation

Samples are collected as a series of "fractions," or bottles designated for particular analyses requiring the same preservation. The comprehensive water sample set consists of sample fractions for all pollutants listed in Section 3.2 collected over a 24-hour period.

At the end of the compositing period, sampling points SP-1/SP-2, SP-3, SP-4, SP-5, SP-6/SP-7, SP-9/SP-10, and SP-12 will include approximately 20 liters of sample collected in two 10-L composite sample containers. The content of the composite sample containers will be thoroughly mixed using a third, clean composite sample container. To perform this mixing, half of each composite sample container will be poured into the third jar then the two half-full composite sample containers will be combined into one. Repeat this process two more times to ensure proper mixing. Field measurements (described in Section 3.5) of the mixed sample contained in each composite sample container will be used to verify mixing. Sample fractions will be poured from the composite sample containers into individual sample bottles using the following procedure.

- Swirl and shake the composite sample container to re-suspend settled solids;
- Fill each sample bottle to about ½ of its empty volume;
- Mix the remaining volume in the composite sample container; and
- In reverse order, fill the sample bottles.

Cyanide samples will be composited separately from the other pollutant parameters. Up to four grab samples during each 24-hour sampling period will be collected for cyanide analyses in separate 1-L amber glass jars and preserved according to Table 3-2. After the sampling period ends, the four one liter grab samples will be composited by mixing in a sampling point-specific composite jar and then poured into separate bottles for analysis of total and available cyanide.

5.2 Sample Packing

All samples from the Veendam will be packed according to the following guidelines:

1. Tighten the lid on each filled sample bottle, being careful not to overtighten the lid. Clean the sample bottle with a cloth rag or paper towel.

2. Label each sample bottle. (Sample labeling is discussed in Section 3.6 of this document.) Cover the label with clear tape to protect this information.

3. Wrap each glass sample bottle with “bubble wrap”. The bubble wrap must fit snugly and completely cover the sample bottle. Each "bubble-wrapped" container and plastic container must then be enclosed in an individual sealable plastic freezer bag.

4. Place two garbage bags inside each other in a cooler.

5. Place sample bottles in garbage bags in the cooler with proper end up and close bag with twist-tie.

6. Arrange sealed plastic freezer bags filled with ice (or chemical ice) on top of the sample bottles (if ice is to be used as a preservative). Put at least 4 x ½ gallons of ice (4 x 2.5 lbs of ice) in each large cooler and 2 x ½ gallons of ice (2 x 2.5 lbs of ice) in each small cooler. More ice should be used when ambient temperatures are very high. The ice should be placed inside the second garbage bag. Close the second garbage bag with a twist-tie. Any additional free space should be filled with packing material so that the sample containers will not shift during shipment.

7. Seal the Traffic Report form in a plastic sleeve and tape securely to the inside of the cooler lid.

8. Place a "Return to ..." label on the inside of the cooler lid.

9. Close cooler.

10. Make several wraps with strapping tape around the cooler perpendicular to the seal to ensure that the lid will remain closed if the latch is accidentally released or damaged.

11. Tape the cooler drain plug so it will not open.

12. Place a completed address label on the lid of the cooler including name, address, and telephone number of the receiving laboratory and the return address and telephone number of the shipper.

6.0 SHIP-SPECIFIC HEALTH AND SAFETY PROCEDURES

This section specifies the health and safety procedures and practices to be used by the sampling team during sampling on-board Holland America's Veendam. This section is a supplement to the General Health and Safety Plan for Large Cruise Ships, and provides general health and safety information for this sampling episode. The sampling team is obligated to follow all safety protocols delineated in the General Health and Safety Plan for Large Cruise Ships and the procedures specified in this section.

Sampling personnel are required to wear nonskid, steel-toed shoes, long sleeves, and long pants at all times while in sampling or preservation areas. Nitrile gloves, safety glasses with side shields (or goggles) must be worn when collecting and preserving samples. Contact lenses may be worn with goggles. Dust masks or face shields are optional equipment at sampling points unless there is a splash potential (i.e., sampling port is located at sampler's waist level or higher). Hearing protection will be worn in all ship machinery areas and other ship spaces where hearing protection requirements are posted. Heat resistant gloves and Tyvek suits will be worn as needed at each sampling station for protection from splash or hot samples, or as required by ship safety protocol. Ship supervisors in sampling areas will be notified prior to sampling. Sampling personnel will keep MSDSs for all chemical preservatives in the sampling file box for easy access. Sampling crew will not enter confined spaces (as defined by 29 CFR 1910.146) with any portion of the body.

Prior to the start of sampling activities, sampling crew personnel will attend a formal health and safety briefing conducted by the Veendam's Chief Environmental Officer. The briefing will address all health and safety issues for personnel working on the ship, including special signals, alarm systems, evacuation routes and assembly points, emergency phone numbers and procedures, and the location of the on-board medical clinic. In addition, the briefing tour will include a tour of the sampling areas, during which the sampling team will be advised of any sampling point-specific health and safety hazards, as well as the locations of to emergency eyewashes and safety showers.

Before sampling at any point, crew members will locate the nearest eyewash and safety shower. If an eyewash in not available in the immediate vicinity of the sampling area, a portable eyewash unit will be stationed in that area for use during sampling and sample preservation.

6.1 Sampling Point-Specific Safety Procedures

All sampling team members will be advised of any sampling point-specific safety protocol during the formal on-ship health and safety briefing. A summary of all the known sampling point-specific safety hazards is provided in Table 6-1 along with the personal protective equipment (PPE) required at each sampling point. The sampling crew health and safety officer (HSO) and the sampling team will inspect each sampling point area to identify unique or additional hazards not already covered in this plan or during the formal health and safety briefing. If additional hazards are found, the sampling crew will be informed of each hazard and required control measures prior to the start of work. Where identified hazards may affect the ship's personnel, the HSO will notify an appropriate member of the ship's crew.

6.1.1 Physical Hazards

The use of narrow walkways or steep stairs may be necessary to access sampling points. Prior to use, the walkways and stairs will be inspected. If platforms are defective (e.g., rails missing or unsecured walkways), ship personnel will be notified immediately. Sampling personnel will not use these access points until appropriate control measures have been implemented or an alternate route is established. Crew members must have one hand free to hold the railing when using narrow stairways. Samplers will not block aisles, walkways, or areas where ship's personnel routinely work in order to access the sampling point unless it is unavoidable, and the ship's crew is notified.

Noise will be a hazard on certain areas of the ship. Hearing protection will be used by the sampling team where required by the ship, when sampling members are having trouble hearing or being heard when standing three feet or less away from another person, or

when deemed necessary by the HSO. Sampling personnel will receive training on the proper use and fitting of hearing protection in the off-ship health and safety training.

6.1.2 Thermal Hazards

Heat stress may be a concern in the Veendam sampling episode. Sampling crew members will potentially become exposed to hot/humid sampling environments as well as thermal or radiant heat generated by equipment. Section 7.0 of the General Health and Safety Plan for Large Cruise Ships should be referred to for specific directions on heat stress prevention, treatment, and monitoring.

6.1.3 Chemical Hazards

The only chemical hazards expected are chemicals used for the preservation of samples. All sampling crew will be advised of any potential chemical hazards at each sampling point as well as any special PPE recommendations during the formal health and safety briefing on-board. If the sampling point is above waist height, a face shield or goggles must be worn during sample collection. In order to avoid the ingestion of chemicals, sampling crew members will be required to wash hands thoroughly before eating, drinking, or smoking. Sampling personnel will not be permitted to enter areas where the ship has determined that respiratory protection equipment is necessary to protect against inhalation hazards.

6.1.4 Biological Hazards

Domestic sewage may potentially contain blood or other potentially infectious material defined under OSHA's blood born pathogen regulations (29 CFR 1910.1030). Typically, blood will not be present in domestic sewage unless it comes directly from the infirmary area of the ship. OSHA recognizes that contact with raw sewage poses a number of health risks, but does not consider contact with diluted raw sewage is an exposure route for blood born pathogens. Nonetheless, sample crew members who sample the domestic sewage portion of the wastewater treatment system are to be aware of the potential danger and will be

outfitted with proper PPE (i.e., nitrile gloves, tyvek suites, splash goggles) to minimize the chance for exposure. PPE required or recommended at each sampling point is described in Table 6-1. Sampling crew members are also recommended to have current Tetanus and Hepatitis A and B immunizations to protect themselves against potential biological hazards.

Table 6-1

Sampling Point-Specific Safety Procedures
Holland America Veendam

Sampling Point Number	Sampling Point Description	Physical Hazards (a)	Personal Protective Equipment
SP-1/SP-2	Laundry wastewater	Potentially hot sample	Possible heat resistant gloves
SP-3	Accommodations wastewater	None anticipated	None
SP-4	Food pulper wastewater	None anticipated	None
SP-5	Galley wastewater	Potentially hot sample	Possible heat resistant gloves
SP-6/SP-7	Influent to wastewater treatment system	Splash potential	Tyvek and face shield (b)
SP-8	Influent to UV	Splash potential	Tyvek and face shield (b)
SP-9/SP-10	Effluent from wastewater treatment system	Splash potential	Tyvek and face shield (b)
SP-11	Screening solids	None anticipated	None
SP-12	Waste biosludge discharge	Splash potential	Tyvek and face shield (b)
SP-13, SP-14	Incinerator ash	Potentially hot sample	Possible heat resistant gloves
SP-15	Source water	None anticipated	None
SP-16	Trip blank	None anticipated	None
SP-17	Equipment blank	None anticipated	None

(a) Additional physical hazards, if any, will be identified during the formal on-ship health and safety briefing. Updates to this table should be made as found.
(b) Splash protection required if sampling port is waist high or above.

7.0 REFERENCES

1. Dixon, D., and Daly, J., "Enhanced MARPOL IV Sewage and Graywater Pollution Prevention - Holland America Line Westours Case Study," 2002.

2. Eastern Research Group, Inc., Quality Assurance Project Plan for Rulemaking Support for Large Cruise Ships in Alaska Water. March 2004.

Appendix A

LIST OF CONSTITUENTS FOR ANALYSIS

Table A-1

List of Constituents for Analysis - Volatile Organic Analytes

CAS Number	Common Name	Technique	Method
107131	ACRYLONITRILE	GCMS	1624
71432	BENZENE	GCMS	1624
75274	BROMODICHLOROMETHANE	GCMS	1624
74839	BROMOMETHANE	GCMS	1624
75150	CARBON DISULFIDE	GCMS	1624
107142	CHLOROACETONITRILE	GCMS	1624
108907	CHLOROBENZENE	GCMS	1624
75003	CHLOROETHANE	GCMS	1624
67663	CHLOROFORM	GCMS	1624
74873	CHLOROMETHANE	GCMS	1624
10061015	CIS-1,3-DICHLOROPROPENE	GCMS	1624
4170303	CROTONALDEHYDE	GCMS	1624
124481	DIBROMOCHLOROMETHANE	GCMS	1624
74953	DIBROMOMETHANE	GCMS	1624
60297	DIETHYL ETHER	GCMS	1624
107120	ETHYL CYANIDE	GCMS	1624
97632	ETHYL METHACRYLATE	GCMS	1624
100414	ETHYLBENZENE	GCMS	1624
74884	IODOMETHANE	GCMS	1624
78831	ISOBUTYL ALCOHOL	GCMS	1624
108383	M-XYLENE	GCMS	1624
80626	METHYL METHACRYLATE	GCMS	1624
75092	METHYLENE CHLORIDE	GCMS	1624
1-952	O+P XYLENE	GCMS	1624
127184	TETRACHLOROETHENE	GCMS	1624
56235	TETRACHLOROMETHANE	GCMS	1624
108883	TOLUENE	GCMS	1624
156605	TRANS-1,2-DICHLOROETHENE	GCMS	1624
10061026	TRANS-1,3-DICHLOROPROPENE	GCMS	1624
110576	TRANS-1,4-DICHLORO-2-BUTENE	GCMS	1624
75252	TRIBROMOMETHANE	GCMS	1624
79016	TRICHLOROETHENE	GCMS	1624
75694	TRICHLOROFLUOROMETHANE	GCMS	1624
108054	VINYL ACETATE	GCMS	1624
75014	VINYL CHLORIDE	GCMS	1624
75343	1,1-DICHLOROETHANE	GCMS	1624
75354	1,1-DICHLOROETHENE	GCMS	1624

Table A-1 (Continued)

CAS Number	Common Name	Technique	Method
71556	1,1,1-TRICHLOROETHANE	GCMS	1624
630206	1,1,1,2-TETRACHLOROETHANE	GCMS	1624
79005	1,1,2-TRICHLOROETHANE	GCMS	1624
79345	1,1,2,2-TETRACHLOROETHANE	GCMS	1624
106934	1,2-DIBROMOETHANE	GCMS	1624
107062	1,2-DICHLOROETHANE	GCMS	1624
78875	1,2-DICHLOROPROPANE	GCMS	1624
96184	1,2,3-TRICHLOROPROPANE	GCMS	1624
126998	1,3-BUTADIENE, 2-CHLORO	GCMS	1624
142289	1,3-DICHLOROPROPANE	GCMS	1624
123911	1,4-DIOXANE	GCMS	1624
78933	2-BUTANONE	GCMS	1624
110758	2-CHLOROETHYLVINYL ETHER	GCMS	1624
591786	2-HEXANONE	GCMS	1624
67641	2-PROPANONE	GCMS	1624
107186	2-PROPEN-1-OL	GCMS	1624
107028	2-PROPENAL	GCMS	1624
126987	2-PROPENENITRILE, 2-METHYL-	GCMS	1624
107051	3-CHLOROPROPENE	GCMS	1624
108101	4-METHYL-2-PENTANONE	GCMS	1624

57 VOLATILE ANALYTES

Table A-2

List of Constituents for Analysis - Semivolatile Organic Analytes

CAS Number	Common Name	Technique	Method
83329	ACENAPHTHENE	GCMS	1625
208968	ACENAPHTHYLENE	GCMS	1625
98862	ACETOPHENONE	GCMS	1625
98555	ALPHA-TERPINEOL	GCMS	1625
62533	ANILINE	GCMS	1625
137177	ANILINE, 2,4,5-TRIMETHYL-	GCMS	1625
120127	ANTHRACENE	GCMS	1625
140578	ARAMITE	GCMS	1625
82053	BENZANTHRONE	GCMS	1625
108985	BENZENETHIOL	GCMS	1625
92875	BENZIDINE	GCMS	1625
56553	BENZO(A)ANTHRACENE	GCMS	1625
50328	BENZO(A)PYRENE	GCMS	1625
205992	BENZO(B)FLUORANTHENE	GCMS	1625
191242	BENZO(GHI)PERYLENE	GCMS	1625
207089	BENZO(K)FLUORANTHENE	GCMS	1625
65850	BENZOIC ACID	GCMS	1625
1689845	BENZONITRILE, 3,5-DIBROMO-4-HYDROXY-	GCMS	1625
100516	BENZYL ALCOHOL	GCMS	1625
91598	BETA-NAPHTHYLAMINE	GCMS	1625
92524	BIPHENYL	GCMS	1625
92933	BIPHENYL, 4-NITRO	GCMS	1625
111911	BIS(2-CHLOROETHOXY)METHANE	GCMS	1625
111444	BIS(2-CHLOROETHYL) ETHER	GCMS	1625
108601	BIS(2-CHLOROISOPROPYL) ETHER	GCMS	1625
117817	BIS(2-ETHYLHEXYL) PHTHALATE	GCMS	1625
85687	BUTYL BENZYL PHTHALATE	GCMS	1625
86748	CARBAZOLE	GCMS	1625
218019	CHRYSENE	GCMS	1625
7700176	CROTOXYPHOS	GCMS	1625
84742	DI-N-BUTYL PHTHALATE	GCMS	1625
117840	DI-N-OCTYL PHTHALATE	GCMS	1625
621647	DI-N-PROPYLNITROSAMINE	GCMS	1625
53703	DIBENZO(A,H)ANTHRACENE	GCMS	1625
132649	DIBENZOFURAN	GCMS	1625
132650	DIBENZOTHIOPHENE	GCMS	1625

Table A-2 (Continued)

CAS Number	Common Name	Technique	Method
84662	DIETHYL PHTHALATE	GCMS	1625
131113	DIMETHYL PHTHALATE	GCMS	1625
67710	DIMETHYL SULFONE	GCMS	1625
101848	DIPHENYL ETHER	GCMS	1625
122394	DIPHENYLAMINE	GCMS	1625
882337	DIPHENYLDISULFIDE	GCMS	1625
76017	ETHANE, PENTACHLORO-	GCMS	1625
62500	ETHYL METHANESULFONATE	GCMS	1625
96457	ETHYLENETHIOUREA	GCMS	1625
206440	FLUORANTHENE	GCMS	1625
86737	FLUORENE	GCMS	1625
118741	HEXACHLOROBENZENE	GCMS	1625
87683	HEXACHLOROBUTADIENE	GCMS	1625
77474	HEXACHLOROCYCLOPENTADIENE	GCMS	1625
67721	HEXACHLOROETHANE	GCMS	1625
1888717	HEXACHLOROPROPENE	GCMS	1625
142621	HEXANOIC ACID	GCMS	1625
193395	INDENO(1,2,3-CD)PYRENE	GCMS	1625
78591	ISOPHORONE	GCMS	1625
120581	ISOSAFROLE	GCMS	1625
475207	LONGIFOLENE	GCMS	1625
569642	MALACHITE GREEN	GCMS	1625
72333	MESTRANOL	GCMS	1625
91805	METHAPYRILENE	GCMS	1625
66273	METHYL METHANESULFONATE	GCMS	1625
124185	N-DECANE	GCMS	1625
629970	N-DOCOSANE	GCMS	1625
112043	N-DODECANE	GCMS	1625
112958	N-EICOSANE	GCMS	1625
630013	N-HEXACOSANE	GCMS	1625
544763	N-HEXADECANE	GCMS	1625
924163	N-NITROSODI-N-BUTYLAMINE	GCMS	1625
55185	N-NITROSODIETHYLAMINE	GCMS	1625
62759	N-NITROSODIMETHYLAMINE	GCMS	1625
86306	N-NITROSODIPHENYLAMINE	GCMS	1625
10595956	N-NITROSOMETHYLETHYLAMINE	GCMS	1625
614006	N-NITROSOMETHYLPHENYLAMINE	GCMS	1625
59892	N-NITROSOMORPHOLINE	GCMS	1625
100754	N-NITROSOPIPERIDINE	GCMS	1625

Table A-2 (Continued)

CAS Number	Common Name	Technique	Method
630024	N-OCTACOSANE	GCMS	1625
593453	N-OCTADECANE	GCMS	1625
646311	N-TETRACOSANE	GCMS	1625
629594	N-TETRADECANE	GCMS	1625
638686	N-TRIACONTANE	GCMS	1625
68122	N,N-DIMETHYLFORMAMIDE	GCMS	1625
91203	NAPHTHALENE	GCMS	1625
98953	NITROBENZENE	GCMS	1625
90040	O-ANISIDINE	GCMS	1625
95487	O-CRESOL	GCMS	1625
95534	O-TOLUIDINE	GCMS	1625
95794	O-TOLUIDINE, 5-CHLORO-	GCMS	1625
106478	P-CHLOROANILINE	GCMS	1625
106445	P-CRESOL	GCMS	1625
99876	P-CYMENE	GCMS	1625
60117	P-DIMETHYLAMINOAZOBENZENE	GCMS	1625
100016	P-NITROANILINE	GCMS	1625
608935	PENTACHLOROBENZENE	GCMS	1625
87865	PENTACHLOROPHENOL	GCMS	1625
700129	PENTAMETHYLBENZENE	GCMS	1625
198550	PERYLENE	GCMS	1625
62442	PHENACETIN	GCMS	1625
85018	PHENANTHRENE	GCMS	1625
108952	PHENOL	GCMS	1625
534521	PHENOL, 2-METHYL-4,6-DINITRO-	GCMS	1625
92842	PHENOTHIAZINE	GCMS	1625
23950585	PRONAMIDE	GCMS	1625
129000	PYRENE	GCMS	1625
110861	PYRIDINE	GCMS	1625
108462	RESORCINOL	GCMS	1625
94597	SAFROLE	GCMS	1625
7683649	SQUALENE	GCMS	1625
100425	STYRENE	GCMS	1625
95158	THIANAPHTHENE	GCMS	1625
62555	THIOACETAMIDE	GCMS	1625
492228	THIOXANTHE-9-ONE	GCMS	1625
95807	TOLUENE, 2,4-DIAMINO-	GCMS	1625
217594	TRIPHENYLENE	GCMS	1625
20324338	TRIPROPYLENEGLYCOL METHYL ETHER	GCMS	1625

Table A-2 (Continued)

CAS Number	Common Name	Technique	Method
694804	1-BROMO-2-CHLOROBENZENE	GCMS	1625
108372	1-BROMO-3-CHLOROBENZENE	GCMS	1625
121733	1-CHLORO-3-NITROBENZENE	GCMS	1625
1730376	1-METHYLFLUORENE	GCMS	1625
832699	1-METHYLPHENANTHRENE	GCMS	1625
134327	1-NAPHTHYLAMINE	GCMS	1625
605027	1-PHENYLNAPHTHALENE	GCMS	1625
96128	1,2-DIBROMO-3-CHLOROPROPANE	GCMS	1625
95501	1,2-DICHLOROBENZENE	GCMS	1625
122667	1,2-DIPHENYLHYDRAZINE	GCMS	1625
87616	1,2,3-TRICHLOROBENZENE	GCMS	1625
634366	1,2,3-TRIMETHOXYBENZENE	GCMS	1625
120821	1,2,4-TRICHLOROBENZENE	GCMS	1625
95943	1,2,4,5-TETRACHLOROBENZENE	GCMS	1625
1464535	1,2,3,4-DIEPOXYBUTANE	GCMS	1625
96231	1,3-DICHLORO-2-PROPANOL	GCMS	1625
541731	1,3-DICHLOROBENZENE	GCMS	1625
291214	1,3,5-TRITHIANE	GCMS	1625
106467	1,4-DICHLOROBENZENE	GCMS	1625
100254	1,4-DINITROBENZENE	GCMS	1625
130154	1,4-NAPHTHOQUINONE	GCMS	1625
2243621	1,5-NAPHTHALENEDIAMINE	GCMS	1625
615225	2-(METHYLTHIO)BENZOTHIAZOLE	GCMS	1625
91587	2-CHLORONAPHTHALENE	GCMS	1625
95578	2-CHLOROPHENOL	GCMS	1625
2027170	2-ISOPROPYLNAPHTALENE	GCMS	1625
120752	2-METHYLBENZOTHIOAZOLE	GCMS	1625
91576	2-METHYLNAPHTHALENE	GCMS	1625
88744	2-NITROANILINE	GCMS	1625
88755	2-NITROPHENOL	GCMS	1625
612942	2-PHENYLNAPHTALENE	GCMS	1625
109068	2-PICOLINE	GCMS	1625
243174	2,3-BENZOFLUORENE	GCMS	1625
608275	2,3-DICHLOROANILINE	GCMS	1625
3209221	2,3-DICHLORONITROBENZENE	GCMS	1625
58902	2,3,4,6-TETRACHLOROPHENOL	GCMS	1625
933755	2,3,6-TRICHLOROPHENOL	GCMS	1625
120832	2,4-DICHLOROPHENOL	GCMS	1625
105679	2,4-DIMETHYLPHENOL	GCMS	1625

Table A-2 (Continued)

CAS Number	Common Name	Technique	Method
51285	2,4-DINITROPHENOL	GCMS	1625
121142	2,4-DINITROTOLUENE	GCMS	1625
95954	2,4,5-TRICHLOROPHENOL	GCMS	1625
88062	2,4,6-TRICHLOROPHENOL	GCMS	1625
719222	2,6-DI-TER-BUTYL-P-BENZOQUINONE	GCMS	1625
99309	2,6-DICHLORO-4-NITROANILINE	GCMS	1625
87650	2,6-DICHLOROPHENOL	GCMS	1625
606202	2,6-DINITROTOLUENE	GCMS	1625
56495	3-METHYLCHOLANTHRENE	GCMS	1625
99092	3-NITROANILINE	GCMS	1625
91941	3,3'-DICHLOROBENZIDINE	GCMS	1625
119904	3,3'-DIMETHOXYBENZIDINE	GCMS	1625
1576676	3,6-DIMETHYLPHENANTHRENE	GCMS	1625
92671	4-AMINOBIPHENYL	GCMS	1625
101553	4-BROMOPHENYL PHENYL ETHER	GCMS	1625
89634	4-CHLORO-2-NITROANILINE	GCMS	1625
59507	4-CHLORO-3-METHYLPHENOL	GCMS	1625
7005723	4-CHLOROPHENYLPHENYL ETHER	GCMS	1625
100027	4-NITROPHENOL	GCMS	1625
101144	4,4'-METHYLENEBIS(2-CHLOROANILINE)	GCMS	1625
203546	4,5-METHYLENE PHENANTHRENE	GCMS	1625
99558	5-NITRO-O-TOLUIDINE	GCMS	1625
57976	7,12-DIMETHYLBENZ(A)ANTHRACENE	GCMS	1625

176 STANDARD SEMIVOLATILE ANALYTES

Table A-3

List of Constituents for Analysis - Metal Analytes

CAS Number	Common Name	Technique	Method
7429905	ALUMINUM	ICP	1620
7440360	ANTIMONY	FURNAA	1620
7440382	ARSENIC	FURNAA	1620
7440393	BARIUM	ICP	1620
7440417	BERYLLIUM	ICP	1620
7440428	BORON	ICP	1620
7440439	CADMIUM	ICP	1620
7440702	CALCIUM	ICP	1620
7440473	CHROMIUM	ICP	1620
7440484	COBALT	ICP	1620
7440508	COPPER	ICP	1620
7439896	IRON	ICP	1620
7439921	LEAD	ICP	1620
7439954	MAGNESIUM	ICP	1620
7439965	MANGANESE	ICP	1620
7439976	MERCURY	CVAA	1620
7439987	MOLYBDENUM	ICP	1620
7440020	NICKEL	ICP	1620
7782492	SELENIUM	FURNAA	1620
7440224	SILVER	ICP	1620
7440235	SODIUM	ICP	1620
7440280	THALLIUM	FURNAA	1620
7440315	TIN	ICP	1620
7440326	TITANIUM	ICP	1620
7440622	VANADIUM	ICP	1620
7440655	YTTRIUM	ICP	1620
7440666	ZINC	ICP	1620

27 METALS ANALYTES

Table A-4

List of Constituents for Analysis - Organo-Phosphorous Pesticide Analytes

CAS Number	Common Name	Technique	Method
2642719	AZINPHOS ETHYL	GC-FPD	1657
86500	AZINPHOS METHYL	GC-FPD	1657
470906	CHLORFEVINPHOS	GC-FPD	1657
2921882	CHLOROPYRIFOS	GC-FPD	1657
56724	COUMAPHOS	GC-FPD	1657
7700176	CROTOXYPHOS	GC-FPD	1657
78488	DEF	GC-FPD	1657
8065483	DEMETON	GC-FPD	1657
8065483A	DEMETON A	GC-FPD	1657
8065483B	DEMETON B	GC-FPD	1657
333415	DIAZINON	GC-FPD	1657
97176	DICHLOFENTHION	GC-FPD	1657
62737	DICHLORVOS	GC-FPD	1657
141662	DICROTOPHOS	GC-FPD	1657
60515	DIMETHOATE	GC-FPD	1657
78342	DIOXATHION	GC-FPD	1657
298044	DISULFOTON	GC-FPD	1657
2104645	EPN	GC-FPD	1657
563122	ETHION	GC-FPD	1657
13194484	ETHOPROP	GC-FPD	1657
52857	FAMPHUR	GC-FPD	1657
115902	FENSULFOTHION	GC-FPD	1657
55389	FENTHION	GC-FPD	1657
680319	HEXAMETHYLPHOSPHORAMIDE	GC-FPD	1657
21609905	LEPTOPHOS	GC-FPD	1657
121755	MALATHION	GC-FPD	1657
150505	MERPHOS	GC-FPD	1657
10265926	METHAMIDOPHOS	GC-FPD	1657
5598130	METHYL CHLORPYRIFOS	GC-FPD	1657
298000	METHYL PARATHION	GC-FPD	1657
953173	METHYL TRITHION	GC-FPD	1657
7786347	MEVINPHOS	GC-FPD	1657
6923224	MONOCROTOPHOS	GC-FPD	1657
300765	NALED	GC-FPD	1657
56382	PARATHION (ETHYL)	GC-FPD	1657
298022	PHORATE	GC-FPD	1657
732116	PHOSMET	GC-FPD	1657
13171216	PHOSPHAMIDON	GC-FPD	1657
297994	PHOSPHAMIDON E	GC-FPD	1657
23783984	PHOSPHAMIDON Z	GC-FPD	1657

Table A-4 (continued)

CAS Number	Common Name	Technique	Method
299843	RONNEL	GC-FPD	1657
3689245	SULFOTEPP	GC-FPD	1657
35400432	SULPROFOS (BOLSTAR)	GC-FPD	1657
107493	TEPP	GC-FPD	1657
13071799	TERBUFOS	GC-FPD	1657
22248799	TETRACHLORVINPHOS	GC-FPD	1657
34643464	TOKUTHION	GC-FPD	1657
52686	TRICHLORFON	GC-FPD	1657
327980	TRICHLORONATE	GC-FPD	1657
78308	TRICRESYLPHOSPHATE	GC-FPD	1657
512561	TRIMETHYLPHOSPHATE	GC-FPD	1657

51 ORGANO-PHOSPHORUS PESTICIDE ANALYTES

Table A-5

List of Constituents for Analysis - Organo-Halide Pesticide Analytes

CAS Number	Common Name	Technique	Method
30560191	ACEPHATE	GC-HSD	1656
50594666	ACIFIUORFEN	GC-HSD	1656
15972608	ALACHLOR	GC-HSD	1656
309002	ALDRIN	GC-HSD	1656
1912249	ATRAZINE	GC-HSD	1656
1861401	BENFLURALIN (BENEFIN)	GC-HSD	1656
319846	"-BHC	GC-HSD	1656
319857	$-BHC	GC-HSD	1656
58899	(-BHC (LINDANE)	GC-HSD	1656
319868	*-BHC	GC-HSD	1656
314409	BROMACIL	GC-HSD	1656
1689992	BROMOXYNIL OCTANOATE	GC-HSD	1656
23184669	BUTACHLOR	GC-HSD	1656
2425061	CAPTAFOL	GC-HSD	1656
133062	CAPTAN	GC-HSD	1656
786196	CARBOPHENOTHION (TRITHION)	GC-HSD	1656
57749	CHLORDANE	GC-HSD	1656
5103719	" -CHLORDANE (CIS-CHLORDANE)	GC-HSD	1656
5103742	(-CHLORDANE (TRANS-CHLORDANE)	GC-HSD	1656
510156	CHLORBENZILATE	GC-HSD	1656
2675776	CHLORONEB (TERRANEB)	GC-HSD	1656
5836102	CHLOROPROPYLATE (ACARALATE)	GC-HSD	1656
1897456	CHLOROTHALONIL	GC-HSD	1656
96128	DBCP (DIBROMOCHLOROPROPANE)	GC-HSD	1656
1861321	DCPA (DACTHAL)	GC-HSD	1656
72548	4,4'-DDD (TDE)	GC-HSD	1656
72559	4,4'-DDE	GC-HSD	1656
50293	4,4'-DDT	GC-HSD	1656
2303164	DIALLATE (AVADEX)	GC-HSD	1656
2303164A	DIALLATE A	GC-HSD	1656
2303164B	DIALLATE B	GC-HSD	1656
117806	DICHLONE	GC-HSD	1656
115322	DICOFOL	GC-HSD	1656
60571	DIELDRIN	GC-HSD	1656
959988	ENDOSULFAN I	GC-HSD	1656
33213659	ENDOSULFAN II	GC-HSD	1656
1031078	ENDOSULFAN SULFATE	GC-HSD	1656
72208	ENDRIN	GC-HSD	1656
7421934	ENDRIN ALDEHYDE	GC-HSD	1656
53494705	ENDRIN KETONE	GC-HSD	1656
55283686	ETHALFLURALIN (SONALAN)	GC-HSD	1656
2593159	ETRIDIAZOLE	GC-HSD	1656

Table A-5 (Continued)

CAS Number	Common Name	Technique	Method
60168889	FENARIMOL (RUBIGAN)	GC-HSD	1656
76448	HEPTACHLOR	GC-HSD	1656
1024573	HEPTACHLOR EPOXIDE	GC-HSD	1656
465736	ISODRIN	GC-HSD	1656
33820530	ISOPROPALIN (PAARLAN)	GC-HSD	1656
143500	KEPONE	GC-HSD	1656
72435	METHOXYCHLOR	GC-HSD	1656
21087649	METRIBUZIN	GC-HSD	1656
2385855	MIREX	GC-HSD	1656
1836755	NITROFEN (TOK)	GC-HSD	1656
27314132	NORFLUORAZON	GC-HSD	1656
12674112	PCB-1016	GC-HSD	1656
11104282	PCB-1221	GC-HSD	1656
11141165	PCB-1232	GC-HSD	1656
53469219	PCB-1242	GC-HSD	1656
12672296	PCB-1248	GC-HSD	1656
11097691	PCB-1254	GC-HSD	1656
11096825	PCB-1260	GC-HSD	1656
82688	PCNB (PENTACHLORONITROBENZENE)	GC-HSD	1656
40487421	PENDAMETHALIN (PROWL)	GC-HSD	1656
61949766	CIS-PERMETHRIN	GC-HSD	1656
61949777	TRANS-PERMETHRIN	GC-HSD	1656
72560	PERTHANE (ETHYLAN)	GC-HSD	1656
1918167	PROPACHLOR	GC-HSD	1656
709988	PROPANIL	GC-HSD	1656
139402	PROPAZINE	GC-HSD	1656
122349	SIMAZINE	GC-HSD	1656
8001501	STROBANE	GC-HSD	1656
5902512	TERBACIL	GC-HSD	1656
5915413	TERBUTHYLAZINE	GC-HSD	1656
8001352	TOXAPHENE	GC-HSD	1656
43121433	TRIADIMEFON (BAYLETON)	GC_HSD	1656
1582098	TRIFLURALIN	GC-HSD	1656

75 ORGANO-HALIDE PESTICIDE ANALYTES

Table A-6

List of Constituents for Analysis - Chlorinated Biphenyls Congeners

There are 209 possible congeners, 12 of which have toxicological significance (i.e., the "toxic" PCBs identified by the World Health Organization). Method 1668A can unambiguously determine 126 of the 209 congeners as separate chromatographic peaks. The remaining 83 congeners do not appear as separate peaks, but elute from the gas chromatograph in groups of 2 to 6 congeners that cannot be completely resolved by the instrumentation. Ten of the 12 "toxic" congeners are resolved, and the remaining two congeners (PCB 156 and PCB 157) elute as a congener pair. (Because PCB 156 and 157 have identical toxicity equivalency factors (TEFs), it is possible to accurately calculate PCB toxic equivalence (TEQ) based on the 12 toxic congeners.)

For reporting purposes, each sample will be associated with 126 results that represent the 126 single PCB congeners, and another 33 results that represent co-eluting congener groups for the remaining 83 congeners, for a total of 159 PCB congener "results." In addition, each sample will be associated with 10 values corresponding to the 10 possible levels of chlorination for the parent biphenyl. Each of these 10 values represents the sum of the concentrations of all of the congeners in a given level of chlorination (i.e., a total of the mon-chlorinated PCBs, a total of the di-chloro PCBs, etc.). Finally, each sample is associated with a grand total PCB value, which represents the sum of the 126 congener results plus the 33 values for the co-eluting congeners. In summary, each analysis will include 170 unique PCB results (126+33+10+1), and 11 of these results represent totals drawn from the first 159 records (126+33).

159 congeners, including the following 12 "toxic" congeners:

Common Name	Technique	Method
3,3'4,4'-TeCB	HRGCMS	1668
3,4,4',5-TeCB	HRGCMS	1668
2,3,3'4,4'-PeCB	HRGCMS	1668
2,3,4,4',5-PeCB	HRGCMS	1668
2,3'4,4',5-PeCB	HRGCMS	1668
2',3,4,4',5-PeCB	HRGCMS	1668
3,3'4,4',5-PeCB	HRGCMS	1668
2,3,3',4,4',5-HxCB	HRGCMS	1668
2,3,3'4,4',5'-HxCB	HRGCMS	1668
2,3',4,4',5,5'-HxCB	HRGCMS	1668
3,3'4,4',5,5'-HxCB	HRGCMS	1668
2,3,3',4,4',5,5'-HpCB	HRGCMS	1668

209 PCB CONGENERS

Table A-7

List of Constituents for Analysis - Dioxin and Furan Analytes

CAS Number	Common Name	Technique	Method
3268879	OCTACHLORODIBENZO-P-DIOXIN	HRGCMS	1613
39001020	OCTACHLORODIBENZOFURAN	HRGCMS	1613
35822469	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXINS	HRGCMS	1613
67562394	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	HRGCMS	1613
39227286	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	HRGCMS	1613
70648269	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	HRGCMS	1613
55673897	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	HRGCMS	1613
57653857	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	HRGCMS	1613
57117449	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	HRGCMS	1613
40321764	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	HRGCMS	1613
57117416	1,2,3,7,8-PENTACHLORODIBENZOFURAN	HRGCMS	1613
19408743	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	HRGCMS	1613
72918219	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	HRGCMS	1613
60851345	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	HRGCMS	1613
57117314	2,3,4,7,8-PENTACHLORODIBENZOFURAN	HRGCMS	1613
1746016	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	HRGCMS	1613
51207319	2,3,7,8-TETRACHLORODIBENZOFURAN	HRGCMS	1613

17 DIOXIN ANALYTES

Appendix B

Field Measurement Test Kit Instructions and Calibration Requirements

Appendix B of the Sampling and Analysis Plan for Holland America Veendam can be found in the Cruise Ship Rulemaking Record in Section 6.4, Document Control Number 00335.

Appendix C

Sampling Schedule

Pre-Sampling and Sampling Schedules
HAL Veendam

June 12 (Saturday)

- Pre-Sampling Team arrives in Vancouver.

June 13 (Sunday)
Vancouver, 8:00am to 5:00pm

- Board Veendam.
- Establish ship contacts, emergency procedures, sampling procedures.
- Health and safety briefing and lifeboat drill.
- Locate and load ISCOs, flow meters, bottles, trip blank, and pre-sampling equipment/PPE.
- Verify all sampling ports have been installed.
- Locate storage and staging areas; prep and organize these areas.
- Locate/confirm availability of berthing areas for sampling staff.
- Identify and test Internet connection.
- Check bottles for breakage or incomplete shipment.

June 14 (Monday)
Cruising Inside Passage

- SP-6: Influent to wastewater treatment. Install Controlotron flow meter on combined influent pipe (likely to require a ladder). Alternate location is after the screen. Begin logging data; compare to other flow data sources for confirmation of setup. Practice downloading data from flow meter. Connect to ISCO, and practice programming.
- Complete data sheets.

June 15 (Tuesday)
Ketchikan, 7:00am to 3:00pm

- SP-6: Influent to wastewater treatment. Download and review flow data. Attempt a 24-hour test composite.

- SP-9: Effluent from wastewater treatment. Connect ISCO to Endress+Hauser meter on effluent pipe (location could be dirty/oily and is located beneath decking and equipment). Alternative is to install Controlotron meter on the same pipe. Determine how to retrieve logged Endress+Hauser flow data from the Veendam control system; practice retrieving/downloading flow data. Practice programming ISCO.

- Complete data sheets.

June 16 (Wednesday)
Juneau, 7:00am to 11:00pm

- Locate and load sampling equipment.

- Assist laboratory analysis crew member, who will board for the day and set up laboratory space.

- Collect equipment blank and send off with laboratory analysis crew member.

- SP-1: Laundry wastewater characterization. Attempt to install Controlotron flow meter on one of two potential locations identified (pipe under decking probably has the best potential). Alternate location is gravity feed into tank; identify any other potential locations. Begin logging data; collect data on laundry tank levels for confirmation of setup. Practice downloading data from flow meter. Connect to ISCO, and practice programming.

- SP-6: Influent to wastewater treatment. Download and review flow data. Attempt another 24-hour test composite (if needed).

- SP-9: Effluent from wastewater treatment. Download and review flow data. Attempt a 24-hour test composite.

- Unpack and organize sampling equipment in storage and staging areas. Identify missing or broken equipment.

- Complete data sheets.

June 17 (Thursday)
Skagway, 7:00am to 9:00pm

- SP-1: Laundry wastewater characterization. If flow meter installation was successful, download and review flow data and attempt a 24-hour test composite. If setup was not successful, develop a plan/schedule for collecting tank level data and samples.

- SP-3: Accommodations wastewater characterization. Attempt to install Controlotron flow meter on one of two potential locations identified; trace pipes and identify any other potential locations. Begin logging data; collect data on accommodations tank levels for confirmation of setup. Practice downloading data from flow meter. Connect to ISCO, and practice programming.

- SP-6: Influent to wastewater treatment. Download and review flow data. Attempt another 24-hour test composite (if needed).

- SP-9: Effluent from wastewater treatment. Download and review flow data. Attempt another 24-hour test composite (if needed).

- Complete data sheets.

June 18 (Friday)
Cruising Glacier Bay National Park

- SP-1: Laundry wastewater characterization. If flow meter installation was successful, download and review flow data. Attempt a 24-hour test composite to represent a day at sea. If it was not successful, gather tank level data.

- SP-3: Accommodations wastewater characterization. If flow meter installation was successful, download and review flow data and attempt a 24-hour test composite. If setup was not successful, develop a plan/schedule for collecting tank level data and samples.

- SP-5: Galley wastewater characterization. Attempt to install Controlotron flow meter on the potential location identified; trace pipes and identify any other potential locations. Begin logging data; collect data on galley tank levels for confirmation of setup. Practice downloading data from flow meter. Connect to ISCO, and practice programming.

- SP-6: Influent to wastewater treatment. Download and review flow data. Attempt a 24-hour test composite to represent a day at sea.

- SP-9: Effluent from wastewater treatment. Download and review flow data. Attempt a 24-hour test composite to represent a day at sea.

- Complete data sheets.

June 19 (Saturday)
Cruising College Fjord

- SP-1: Laundry wastewater characterization. If flow meter installation was successful, download and review flow data. Attempt another 24-hour test composite (if needed). If it was not successful, gather tank level data.

- SP-3: Accommodations wastewater characterization. If flow meter installation was successful, download and review flow data. Attempt another 24-hour test composite (if needed). If it was not successful, gather tank level data.

- SP-5: Galley wastewater characterization. If flow meter installation was successful, download and review flow data and attempt a 24-hour test composite. If setup was not successful, develop a plan/schedule for collecting tank level data and samples.

- SP-6: Influent to wastewater treatment. Download and review flow data. Attempt another 24-hour test composite (if needed).

- SP-9: Effluent from wastewater treatment. Download and review flow data. Attempt another 24-hour test composite (if needed).

- Based on flow data collected, determine appropriate peak/off-peak times for grab samples.

- Sampling Team arrives in Anchorage and travels to Seward.

- Complete data sheets.

June 20 (Sunday)
Seward, 8:00am to 8:00pm
Sampling Day 1

- Sampling Team and laboratory analysis crew member board ship at 8:00am.

- Collect samples according to Sampling Schedule table for HAL Veendam.

- Laboratory analysis crew member analyzes all microbiological grabs.

- Monitor flow meters and download/retrieve flow data and tank level data. Run test composites at graywater points if necessary.

- Conduct field tests after each grab.

- Complete data sheets.

June 21 (Monday)
Cruising College Fjord
Sampling Day 2

- Collect samples according to Sampling Schedule table for HAL Veendam.
- Laboratory analysis crew member analyzes all microbiological grabs and Day 1 BOD5 and Settleable Solids samples.
- Keep Day 1 SVOC, VOC, and Group I samples separate for shipment from Sitka. Prepare all other Day 1 samples for shipment from Juneau.
- Conduct field tests after each grab.
- Monitor flow meters and download/retrieve flow data and tank level data. Run test composites at graywater points if necessary.
- Complete data sheets

June 22 (Tuesday)
Cruising Glacier Bay National Park
Sampling Day 3

- Collect samples according to Sampling Schedule table for HAL Veendam.
- Laboratory analysis crew member analyzes all microbiological grabs and Day 2 Settleable Solids samples.
- Keep Day 2 SVOC, VOC, Group I, BOD5, and Pesticides samples separate for shipment from Sitka. Prepare all other Day 2 samples for shipment from Juneau.
- Conduct field tests after each grab.
- Monitor flow meters and download/retrieve flow data and tank level data. Run test composites at graywater points if necessary.
- Complete data sheets.

June 23 (Wednesday)
Sitka, 8:00am to 6:00pm
Sampling Day 4

- Collect samples according to Sampling Schedule table for HAL Veendam.

- Keep Day 3 SVOC, VOC, Group I, BOD5, and Pesticides samples separate for shipment from Sitka. Prepare all other Day 3 samples for shipment from Juneau.

- Meet Goldstreak courier in port, and transmit all time-critical samples for shipment.

- Laboratory analysis crew member analyzes all microbiological grabs and Day 3 Settleable Solids samples.

- Conduct field tests after each grab.

- Monitor flow meters and download/retrieve flow data and tank level data. Run test composites at graywater points if necessary.

- Complete data sheets.

June 24 (Thursday)
Juneau, 8:00am to 6:00pm
Sampling Day 5

- Collect samples according to Sampling Schedule table for HAL Veendam.

- Prepare remaining Day 1 through Day 3 samples and all Day 4 samples for shipment from Juneau.

- Pack any excess equipment for shipment from Juneau back to the office.

- Meet analytical laboratory courier in port, and transmit all remaining Day 1 through Day 3 samples and all Day 4 samples and excess equipment to FedEx.

- Laboratory analysis crew member analyzes all microbiological grabs and Day 4 Settleable Solids samples.

- Monitor flow meters and download/retrieve flow data and tank level data.

- Complete data sheets.

June 25 (Friday)
Ketchikan, 2:00pm to 8:00pm
Sampling Ends

- Prepare Day 5 samples for shipment from Ketchikan.

- Pack remaining equipment (not including flow meters) for shipment from Ketchikan.

- Meet Goldstreak courier in port, and transmit Day 5 samples and equipment for shipment.

- Laboratory analysis crew member analyzes all microbiological grabs and Day 5 Settleable Solids samples.

- Monitor flow meters and download/retrieve flow data and tank level data.

- Complete data sheets.

June 26 (Saturday)
Cruising Inside Passage

- Laboratory analysis crew member analyzes all microbiological grabs.

- Complete data sheets.

- Monitor flow meters and download/retrieve flow data and tank level data.

June 27 (Sunday)
Vancouver, 8:00am to 5:00pm

- Download/retrieve flow data and tank level data.

- Remove flow meters, and pack remaining equipment from shipment.

- Sampling crew disembarks.

Sampling Schedule for HAL VEENDAM (6/20 to 6/24)

Sample Point	Day 1	Day 2	Day 3	Day 4	Day 5
	Sunday, 6/20/04	**Monday, 6/21/04**	**Tuesday, 6/22/04**	**Wednesday, 6/23/04**	**Thursday, 6/24/04**
SP-1 Laundry Wastewater	NA	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide Composite: SVOCs Metals BOD Solids Group I Group II D/F (dup) Total Volume: 11.5 L	NA	NA	NA
SP-2 Duplicate of SP-1	NA	D/F	NA	NA	NA
SP-3 Accommodations Graywater	NA	NA	NA	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide **Composite**: SVOCs Metals BOD Solids Group I Group II Total Volume: 7.5 L	NA

Sampling Schedule for HAL VEENDAM (6/20 to 6/24) (Continued)

Sample Point	Day 1	Day 2	Day 3	Day 4	Day 5
	Sunday, 6/20/04	**Monday, 6/21/04**	**Tuesday, 6/22/04**	**Wednesday, 6/23/04**	**Thursday, 6/24/04**
SP-4 Food Pulper Wastewater	NA	NA	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide **Composite**: SVOCs Metals BOD Solids Group I Group II Total Volume: 7.5 L		
SP-5 Galley wastewater	NA	NA	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide **Composite**: SVOCs Metals BOD Solids Group I Group II Pesticides Total Volume: 11.5 L	NA	NA

Sampling Schedule for HAL VEENDAM (6/20 to 6/24) (Continued)

Sample Point	Day 1 Sunday, 6/20/04	Day 2 Monday, 6/21/04	Day 3 Tuesday, 6/22/04	Day 4 Wednesday, 6/23/04	Day 5 Thursday, 6/24/04
SP-6 Influent to Wastewater Treatment System	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide **Composite**: SVOCs Metals BOD Solids Group I Group II Total Volume: 8.5 L	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide **Composite**: SVOCs Metals BOD Solids Group I Group II Organo-P Pesticides (dup and MS/MSD) Total Volume: 16.5 L	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide **Composite**: SVOCs Metals BOD Solids Group I Group II Organo-H Pesticides (dup and MS/MSD) Total Volume: 16.5 L	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide **Composite**: SVOCs Metals BOD Solids Group I Group II PCBs Total Volume: 10.5 L	**Grabs** (4x): Micros, VOCs, HEM/SGT-HEM, Cyanide **Composite**: SVOCs Metals BOD Solids Group I Group II Total Volume: 8.5
SP-7 Duplicate of SP-6		Organo-P Pesticides (dup)	Organo-H Pesticides (dup)		
SP-8 Influent to UV	**Grabs**: Micros	**Grabs**: Micros	**Grabs**: Micros	**Grabs**: Micros	**Grabs**: Micros
SP-9 Effluent from Wastewater Treatment	**Grabs** (4x): Micros (dups, MS/MSD), VOCs (dups) HEM/SGT-HEM Cyanide (dups) **Composite**: SVOCs Metals (dups) BOD Solids Group I (dups, MS/MSD) Group II (dups, MS/MSD) Total Volume: 18 L	**Grabs** (4x): Micros VOCs (dups, MS/MSD) HEM/SGT-HEM Cyanide (dups) **Composite**: SVOCs (dups, MS/MSD) Metals (MS/MSD) BOD Solids Group I (dups) Group II Total Volume: 18.5	**Grabs** (4x): Micros VOCs (MS/MSD) HEM/SGT-HEM Cyanide (MS/MSD) **Composite**: SVOCs (MS/MSD) Metals (dups, MS/MSD) BOD (dups) Solids Group I Group II Total Volume: 18.5 L	**Grabs** (4x): Micros VOCs HEM/SGT-HEM (MS/MSD, 4x) Cyanide (MS/MSD) **Composite**: SVOCs Metals BOD (MS/MSD) Solids (dups) Group I (MS/MSD) Group II (MS/MSD) Total Volume: 19.5	**Grabs** (4x): Micros (Dups, MS/MSD) VOCs HEM/SGT-HEM (MS/MSD, 2x) Cyanide **Composite**: SVOCs (dups) Metals BOD (dups, MS/MSD) Solids (dups) Group I Group II (dups) Total Volume: 19 L

Sampling Schedule for HAL VEENDAM (6/20 to 6/24) (Continued)

Sample Point	Day 1	Day 2	Day 3	Day 4	Day 5
	Sunday, 6/20/04	**Monday, 6/21/04**	**Tuesday, 6/22/04**	**Wednesday, 6/23/04**	**Thursday, 6/24/04**
SP-10 Duplicate of SP-9	**Grabs**: Micros+QC, VOCs, Cyanide **Composite**: Metals Group I Group II	**Grabs**: Micros+QC, VOCs, Cyanide **Composite**: SVOCs Group I	**Grabs**: Micros+QC **Composite**: Metals BOD	**Grabs**: Micros+QC **Composite**: Solids	**Grabs**: Micros+QC **Composite**: SVOCs BOD Solids Group II
SP-11 Screening Solids	NA	**Grab** (1x): VOCs SVOCs Metals (total only) Cyanide HEM/SGT-HEM BOD Solids Group I Group II Total Volume: 9.5 L	NA	NA	NA
SP-12 Waste Biosludge	NA	NA	**Grab** (up to 4x): VOCs SVOCs Metals (total only) Cyanide BOD Solids Group I Group II Total Volume: 9.5 L	NA	NA
SP-13 Incinerator Ash	**Grab** (1x): SVOCs Metals (total only) D/F (dups)	NA	NA	NA	NA
SP-14 Duplicate of SP-13	**Grab** (1x): D/F	NA	NA	NA	NA

Sampling Schedule for HAL VEENDAM (6/20 to 6/24) (Continued)

Sample Point	Day 1	Day 2	Day 3	Day 4	Day 5
	Sunday, 6/20/04	**Monday, 6/21/04**	**Tuesday, 6/22/04**	**Wednesday, 6/23/04**	**Thursday, 6/24/04**
SP-15 Source Water	**Grab** (1x): Micros VOCs SVOCs Metals Cyanide BOD Solids Group I Group II	**Grab** (1x): Micros	**Grab** (1x): Micros	**Grab** (1x): Micros	**Grab** (1x): Micros
SP-16 Trip Blank	NA	NA	NA	NA	Ship on Day 5
SP-17 Equipment Blank	Perform June 16 **Grab** SVOCs Metals Total Volume: 4 L				

Sampling Schedule for HAL VEENDAM (6/20 to 6/24) (Continued)

Sample Point	Day 1	Day 2	Day 3	Day 4	Day 5
	Sunday, 6/20/04	**Monday, 6/21/04**	**Tuesday, 6/22/04**	**Wednesday, 6/23/04**	**Thursday, 6/24/04**
Shipping Schedule	Ship SP-17 on June 16th 1 cooler (SVOCs) 1 cooler (metals) Total: 2 coolers (small)	No shipping Separate SVOC, VOC Group 1	No shipping Separate SVOC, VOC Group 1 BOD Pesticides	Ship to one lab contractor to resend to Laboratories D1-3 SVOC, VOCs (5) D2-3 Pesticides (3) D2-3 BOD (1) to Analytica D1-3 Group I (2) Total: 11 coolers	Shipping via FedEx D4-5SVOC, VOCs (2) D1-5 HEMs (10) D1-5 Wet (4) D4-5 BOD (1) D1-5 A-CN (2) D1-5 D/F, PCBs (1) D1-5 metals (3) Total: 23 coolers
					Friday, 6/25/04 Ship to one lab contractor to resend to laboratories D4-5SVOC, VOCs (1) D1-5 HEMs (2) D1-5 Wet (1) D4-5 BOD (1) D1-5 A-CN (2) D1-5 metals (1) Total: 8 coolers