

2006 Large Ships Sampling Results (2 samples per season)

Federal and State Laws

U.S. Congress enacted Title XIV – Certain Alaskan Cruise Ship Operations on December 21, 2000. Under this federal legislation, large¹ cruise ships may discharge blackwater² in Alaska marine waters while underway³ or continuously⁴ while meeting effluent standards. Federal law states that during an underway discharge, blackwater effluent must contain no more than 200 fecal coliform bacteria per 100 milliliters and no more than 150 milligrams per liter of total suspended solids. Large ships must meet more stringent standards to discharge continuously.

Alaska Statute AS 46.03.460-46.03.490 establishes the same standards for blackwater as the federal law and includes graywater⁵ discharges. Large ships that discharge blackwater, graywater or other wastewater in Alaska are subject to two unannounced sampling events each season to demonstrate compliance with state and federal standards. Large ships certified by the United States Coast Guard (USCG) to discharge continuously must sample twice per month to maintain their certification. Please refer to the “2006 Large Ship Wastewater Continued Compliance Samples for continuous discharge certification by the USCG” report for more information on continuous compliance samples.

Of the twenty-nine large ships that visited Alaska in 2006, 23 discharged into Alaska waters and were subject to the unannounced sampling requirements. The other six discharge outside Alaska waters. All ships discharging in Alaska water had continuous discharge approval from the USCG, except for Seven Seas Mariner who discharged outside 1 nautical mile from shore traveling greater than six knots.

Tables 1 and 2 contain a summary of the two unannounced sampling results for conventional pollutants for all large cruise ships that discharged during the 2006 season. Table 3 contains the conventional sample results for individual ships. Table 4 contains the priority sample results for individual ships. Table 5 contains Table 5 provides a list of all of the conventional and priority pollutants that were analyzed.

Advanced wastewater treatment systems continue to be effective at removing bacteria and suspended solids. Chlorine concentrations of large ships effluent has declined from past seasons to below detection levels. Some large ships wastewater discharges have ammonia, dissolved copper, dissolved nickel and dissolved zinc results that exceed Alaska water quality standards. Most of these standards will be met quickly in the receiving water because the effluent is dispersed and should not pose a risk to the environment. The Department of Environmental Conservation contacted representatives of ships that had results that may pose a risk to the environment.

Table 1. Summary 2006 Large Ship Unannounced Sampling Results, Conventional Pollutants (23 ships, 48 samples)

	Ammonia as N	pH	Biochemical O ₂ Demand	Chemical O ₂ Demand	Total Suspended Solids	Chlorine, Free	Chlorine, Residual	Fecal Coliform Bacteria by MPN
Alaska Water Quality Standards	20.0 ⁶	6.5-8.5	N/A	N/A	N/A	0.0075	N/A	14 ⁷
Units	mg/l	s.u.	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100ml
Minimum	0	5.34	0	0	0	0	0	0
Maximum	150	8.77	35.4	405	33	0.15	0.24	5000
Median	26.5	7.54	2.19	67.5	0	0	0	0

¹ 500+ overnight passengers

² Wastewater from toilets

³ Traveling at a minimum speed of six knots and at least one nautical mile from shore.

⁴ Traveling at less than six knots and within one nautical mile from shore.

⁵ Wastewater from galley, sinks and showers and laundry.

⁶ Ammonia standards are based on temperature, pH and salinity. This standard is from Table IX in the *Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances* using a pH 7.8, salinity of 20 g/kg and temperature between 10-15 degrees Celsius. Large ships while stationary have a minimum dilution factor of 10. Ammonia results greater than 20 mg/L exceed water quality standards in the receiving water.

⁷ Standard used for consumption of raw shellfish.

Table 2. Summary 2006 Large Ship Unannounced Sampling Results, Conventional Pollutants (23 ships, 48 samples)

	Conductivity	Oil & Grease	Total Organic Carbon	Alkalinity	Total Nitrate	Phosphorus, Total	Total Kjeldahl Nitrogen	Total Settleable Solids
Alaska Water Quality Standards	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SS ⁸
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Minimum	40.7	0	0	19.4	0	0	.62	0
Maximum	22,800	11	53	634	37	20	131	0
Median	978	0	15	155.5	0	3.05	29	0

Table 3 includes the 2006 unannounced twice-per-season sampling results for Conventional Pollutants. Sample results highlighted in yellow indicate that the parameter exceeded the continuous discharge or underway limits. Sample results highlighted in blue indicate that the parameter exceeded Alaska’s water quality standards.

One unannounced sample per season included testing for 167 priority pollutants: 13 total metals, 12 dissolved metals, 72 volatile organic compounds (VOC’s), and 70 bases, neutral, acids (BNA’s). Table 4 includes only pollutants with sample medians that exceeded the reportable limit (PQL) or a pollutant with a sample maximum that was 10 times the PQL. A list of all the priority pollutants that were analyzed and the associated PQL can be found in Table 5. The pollutants not listed in Table 4 are considered not detected and the statistical analysis of those pollutants is unnecessary. Sample results highlighted in blue indicate that the parameter exceeded Alaska’s water quality standards.

It should be noted that some of the dissolved metal totals are higher than the total recoverable metals, which is not what is expected. This issue has also been observed in past season’s sample results, and ADEC is looking into reasons for these discrepancies. One reason for the discrepancies could be explained through comparison of the range of acceptability for each test method, which is +/- 10% of the actual result. A situation where dissolved metal totals are higher than total metals could be attributed to a dissolved metal result at the top of the variance and total metal result at the end of the variance. Since the allowable variance can be as much as 20% there can be a significant difference in the results for dissolved and total metals.

⁸ Alaska Water Quality Standards definition- No measurable increase in the concentration of settleable solids above natural conditions, as measured by the volumetric Imhoff cone method.

Table 3. 2006 Large Ships Unannounced Sampling Results for Conventional Pollutants

Vessel	Sample Date	Ammonia as N	pH	Biochemical O ² Demand	Chemical O ² Demand	Total Suspended Solids	Free Chlorine	Residual Chlorine	Fecal Coliform Bacteria by MPN	Conductivity	Hexane Extractable Material	Total Organic Carbon	Alkalinity	Total Nitrate	Total Phosphorus	Total Kjeldahl Nitrogen	Total Settable Solids
	Detection Limit	0.10	0.10	2.00	10.00	4.00	0.10	0.10	2.00	2.00	5.00	1.00	2.00	1.00	0.05	1.00	
	Units	mg/l	s.u.	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100 ml	umhos/cm	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Alaska Water Quality Standards		20	6.5-8.5	None	None	None	0.0075	None	14	None	None	None	None	None	None	None	None
Carnival Spirit	6/3/06	0.24	7.58	8.86	26	ND	ND	ND	ND	40.7	ND	7	19.4	ND	ND	1.41	ND
Carnival Spirit	7/1/06	0.23	7.41	12	ND	ND	ND	ND	ND	57.2	ND	5.2	25.2	ND	0.068	1.82	ND
Coral Princess	6/8/06	110	7.67	ND	92	ND	ND	ND	ND	1380	ND	18	360	ND	6.4	92.1	ND
Coral Princess	8/21/06	150	7.4	34.1	100	ND	0.1	ND	ND	1650	ND	40	459	ND	10	131	ND
Dawn Princess	5/29/06	59	7.19	ND	94	ND	ND	ND	ND	2060	ND	14	87.9	21	16	46.2	ND
Dawn Princess	6/26/06	26	6.72	ND	104	ND	ND	ND	ND	4900	ND	22	42.6	35	11	27	ND
Diamond Princess	5/24/06	36	7.73	ND	85	ND	ND	ND	8	1040	ND	14	178	14	6.1	48.1	ND
Diamond Princess	6/21/06	44	7.84	ND	58	ND	ND	ND	ND	878	ND	18	211	2.9	13	51.4	ND
Diamond Princess	8/2/06	61	7.94	ND	71	ND	ND	ND	ND	886	ND	14	237	ND	13	59.5	ND
Infinity	6/22/06	36	7.86	3.04	87	ND	ND	ND	ND	2730	ND	15	263	11	4.1	40.1	ND
Infinity	7/27/06	130	7.95	3.71	90	ND	ND	ND	ND	2630	ND	24	496	ND	0.76	114	ND
Island Princess	5/26/06	22	7.65	ND	156	5	ND	ND	ND	7010	ND	17	135	7	12	25.3	ND

ND means not detected

* Ammonia standards are based on temperature, pH and salinity. This standard is from Table IX in the *Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances* using a pH 7.8, salinity of 20 g/kg and temperature between 10-15 degrees Celsius

** Standard used for the consumption of raw shellfish

*** Alaska Water Quality Standards definition- No measurable increase in the concentration of settleable solids above natural conditions, as measured by the volumetric Imhoff cone method.

Table 3 continued

Vessel	Sample Date	Ammonia as N	pH	Biochemical O ² Demand	Chemical O ² Demand	Total Suspended Solids	Free Chlorine	Residual Chlorine	Fecal Coliform Bacteria by MPN	Conductivity	Hexane Extractable Material	Total Organic Carbon	Alkalinity	Total Nitrate	Total Phosphorus	Total Kjedahl Nitrogen	Total Settable Solids
	Detection Limit	0.10	0.10	2.00	10.00	4.00	0.10	0.10	2.00	2.00	5.00	1.00	2.00	1.00	0.05	1.00	
	Units	mg/l	s.u.	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100 ml	umhos/cm	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Alaska Water Quality Standards		20*	6.5-8.5	None	None	None	0.0075	None	14**	None	None	None	None	None	None	None	None
Island Princess	6/23/06	22	7.22	ND	67	ND	ND	ND	ND	1290	ND	23	134	9.9	9.4	24.3	ND
Oosterdam	7/10/06	20	8.77	12.5	25	ND	ND	ND	ND	657	ND	15	224	ND	2.2	20.4	ND
Oosterdam	8/14/06	47	7.75	19.2	59	6	ND	ND	ND	349	ND	17	112	2	6.4	45.6	ND
Mercury	7/9/06	1.7	7.71	ND	12	ND	ND	ND	ND	51.7	ND	3.4	19.9	ND	ND	1.9	ND
Mercury	8/13/06	0.94	7.73	ND	ND	ND	ND	ND	ND	41.2	ND	ND	33.6	ND	ND	1.05	ND
Norwegian Wind	6/22/06	36	6.69	3.59	57	5	ND	ND	ND	1140	ND	15	73.5	1.3	0.071	37.1	ND
Norwegian Wind	8/23/06	30	6.82	11	71	ND	ND	ND	ND	1200	ND	17	72	ND	0.15	29.1	ND
Norwegian Star	5/23/06	44	7.58	3.24	52	5	ND	ND	5000	1000	ND	11	188	ND	0.14	49.1	ND
Norwegian Star	8/8/06	51	6.9	ND	73	4	ND	ND	ND	1050	ND	9.3	142	ND	3.2	46.7	ND
Norwegian Sun	5/23/06	25	6.93	26.3	106	8	ND	ND	2	813	ND	44	73.5	ND	1	38.4	ND
Norwegian Sun	7/11/06	36	6.96	18.2	52	7	ND	ND	ND	943	ND	13	82.1	ND	8.8	36	ND

ND means not detected

* Ammonia standards are based on temperature, pH and salinity. This standard is from Table IX in the *Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances* using a pH 7.8, salinity of 20 g/kg and temperature between 10-15 degrees Celsius

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Table 3 continued

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	Detection Limit	0.10	0.10	2.00	10.00	4.00	0.10	0.10	2.00	2.00	5.00	1.00	2.00	1.00	0.05	1.00	
	Units	mg/l	s.u.	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100 ml	umhos/cm	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Alaska Water Quality Standards		20*	6.5-8.5	None	None	None	0.0075	None	14**	None	None	None	None	None	None	None	None
Regal Princess	6/9/06	59	7.54	4.21	189	ND	ND	ND	ND	1480	ND	53	184	13	12	53.2	ND
Regal Princess	7/20/06	60	7.11	4.24	163	ND	ND	ND	ND	1080	ND	44	110	37	20	50.3	ND
Ryndam	6/1/06	2.9	7.04	ND	38	ND	ND	ND	ND	550	ND	9.4	53.4	15	19	3.34	ND
Ryndam	7/27/06	3.4	8.26	12.9	120	ND	ND	ND	ND	1260	ND	37	634	ND	2.1	7.6	ND
Sapphire Princess	5/31/06	54	7.5	ND	87	ND	ND	ND	ND	1470	ND	23	254	ND	ND	59.1	ND
Sapphire Princess	8/29/06	66	7.76	2	58	ND	ND	ND	ND	932	ND	11	249	ND	9.5	54.9	ND
Serenade	6/15/06	14	6.7	2.76	39	6	ND	ND	420	920	ND	15	71.6	ND	0.14	13.9	ND
Serenade	8/3/06	27	6.9	3.64	65	8	ND	ND	ND	956	ND	13	97.7	ND	7	28.1	ND
Seven Seas	6/12/06	22	7.39	2.25	69	ND	ND	ND	ND	587	ND	14	154	0.95	12	20.6	ND
Seven Seas	8/7/06	ND	7.29	ND	57	ND	ND	ND	1	285	ND	9.2	73.8	ND	0.63	0.978	ND

ND means not detected

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	Detection Limit	0.10	0.10	2.00	10.00	4.00	0.10	0.10	2.00	2.00	5.00	1.00	2.00	1.00	0.05	1.00	
	Units	mg/l	s.u.	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100 ml	umhos/cm	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Alaska Water Quality Standards		20*	6.5-8.5	None	None	None	0.0075	None	14**	None	None	None	None	None	None	None	None
Silver Shadow	6/16/06	0.077	5.34	11.8	405	33	ND	ND	ND	22800	ND	4.4	27.1	ND	ND	0.974	ND
Silver Shadow	7/21/06	0.054	6.89	16.3	254	21	ND	ND	ND	19400	11	8.3	42.6	ND	ND	0.615	ND
Statendam	5/30/06	24	7.37	ND	39	ND	ND	ND	ND	153	ND	19	36.2	ND	1.3	19.8	ND
Statendam	8/9/06	35	7.88	ND	45	ND	ND	ND	ND	717	ND	11	245	ND	0.9	33.4	ND
Sun Princess	5/24/06	42	7.75	ND	172	ND	ND	ND	ND	7010	ND	19	185	ND	7.9	43.3	ND
Sun Princess	6/21/06	23	7.83	2.07	60	ND	ND	ND	ND	589	ND	15	157	ND	6.4	29.2	ND
Sun Princess	8/2/06	51	7.89	ND	128	ND	ND	ND	ND	693	ND	11	221	ND	9.9	48.2	ND
Veendam	5/25/06	16	7.34	ND	66	ND	ND	ND	ND	1050	ND	14	205	ND	0.12	22.4	ND
Veendam	8/3/06	14	7.85	2.14	52	ND	ND	ND	ND	1010	ND	14	405	ND	2.1	13.7	ND
Volendam	5/19/06	8.7	7.55	ND	65	ND	ND	ND	ND	1070	ND	17	275	ND	0.19	9.46	ND
Volendam	7/26/08	10	7.86	ND	48	ND	ND	ND	ND	730	ND	15	257	ND	0.11	12.9	ND
Westerdam	6/14/06	40	6.67	35.4	68	ND	ND	ND	ND	570	ND	14	186	ND	3.2	41	ND
Westerdam	7/19/06	27	7.81	27.2	87	ND	ND	ND	2	470	ND	16	145	ND	2.9	29	ND
Zaandam	5/14/06	22	7.39	4.24	74	ND	0.15	0.24	ND	2600	ND	29	246	ND	0.76	21.2	ND
Zaandam	8/9/06	14	7.97	6.5	66	ND	ND	ND	ND	772	ND	14	290	ND	4.7	13.5	ND
	MIN	0	5.34	0	0	0	0	0	0	40.7	0	0	19.4	0	0	0.615	0
	MAX	150	8.77	35.4	405	33	0.15	0.24	5000	22800	11	53	634	37	20	131	0
	MEDIAN	26.5	7.545	2.195	67.5	0	0	0	0	978	0	15	155.5	0	3.05	29.05	0

ND means not detected

*Ammonia standards are based on temperature, pH and salinity. This standard is from Table IX in the *Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances* using a pH 7.8, salinity of 20 g/kg and temperature between 10-15 degrees Celsius

** Standard used for the consumption of raw shellfish

*** Alaska Water Quality Standards definition- No measurable increase in the concentration of settleable solids above natural conditions, as measured by the volumetric Imhoff cone method.

Table 4. 2006 Large Ships Unannounced Sampling Results for Priority Pollutant

Vessel	Date	Acetone	chromium (TR)	Chromium dissolved	copper (TR)	Copper dissolved	nickel (TR)	Nickel dissolved	selenium (TR)	Selenium dissolved	zinc (TR)	Zinc dissolved
	PQL	50.0	2.5	2.5	1.0	1.0	1.0	1.0	2.5	2.5	2.5	2.5
	Units	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Alaska Water Quality Standards		N/A	N/A	N/A	N/A	3.10	N/A	8.20	N/A	71.00	N/A	81.00
Carnival Spirit	7/1/06	ND	1.53	1.1	0.665	0.796	0.236	ND	4.49	2.84	5.89	6.85
Coral Princess	8/21/06	180	ND	ND	7.5	7.64	9.85	9.4	ND	ND	41.7	46.7
Dawn Princess	6/26/06	ND	3.53	3.17	25	22.7	5.26	4.3	41.1	35	255	252
Diamond Princess	6/27/06	ND	ND	2	11.5	10.7	14.9	15.5	ND	ND	114	89.8
Infinity	7/27/06	ND	3.93	3.13	2.95	3.07	21.5	21.8	6.68	6.14	197	199
Island Princess	6/23/06	ND	12.1	8.57	19.5	19.2	7.46	7.93	8.14	6.88	97.7	98.3
Mercury	8/13/06	83	ND	ND	1.03	1.14	0.956	0.714	ND	ND	10.8	10.6
Norwegian Wind	8/23/06	160	ND	ND	8.27	8.06	15.7	16.1	ND	ND	38.2	22.2
Norwegian Star	8/8/06	ND	ND	ND	2.79	2.84	7.43	7.27	ND	ND	67.6	67.1
Norwegian Sun	7/11/06	ND	ND	2.24	4.21	2.37	5.02	5.39	ND	2.31	55.4	39
Oosterdam	8/14/06	ND	3.03	3.2	1.2	2.94	8.1	6.66	ND	ND	129	107
Regal Princess	7/20/06	ND	ND	ND	66.7	66.7	13.3	15.4	ND	ND	122	137
Ryndam	7/27/06	ND	3.14	2.27	6.91	7.73	37.9	40.5	ND	ND	13.1	14.7

* Samples were run at a lower reporting limit (PQL).

** Samples were run at a lower reporting limit, but the samples were diluted prior to analysis thus increasing the PQL higher than what was listed in the Quality Assurance Quality Control Plan.

Table 4. continued.

Vessel	Date	Acetone	chromium (TR)	Chromium dissolved	copper (TR)	Copper dissolved	nickel (TR)	Nickel dissolved	selenium (TR)	Selenium dissolved	zinc (TR)	Zinc dissolved
	PQL	50.0	2.5	2.5	1.0	1.0	1.0	1.0	2.5	2.5	2.5	2.5
	Units	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Alaska Water Quality Standards		N/A	N/A	N/A	N/A	3.10	N/A	8.20	N/A	71.00	N/A	81.00
Sappire Princess	8/29/06	ND	ND	0.788	172	160	14.8	15.7	ND	ND	68.1	67.2
Serenade	8/3/06	ND	ND	ND	4.34	3.97	13.7	14.6	ND	ND	245	233
Seven Seas Mariner	8/7/06	ND	ND	ND	4.19	4.61	3.33	3.87	ND	ND	79.5	86.7
Silver Shadow	7/21/06	ND	22.1	21.9	11.3	9.03	50.3	14.8	135	160	36.2	34.9
Statendam	8/9/06	ND	ND	ND	3.21	2.6	23	21	ND	ND	16.6	14.5
Sun Princess	6/21/06	ND	ND	ND	12	11.2	7.99	7.77	ND	ND	169	176
Veendam	8/3/06	ND	ND	ND	3.87	3.72	11.1	11.4	ND	ND	29.6	24.9
Volendam	7/28/06	ND	0.769	0.991	8.84	9.04	11.6	11.4	ND	ND	64.2	54.3
Westerdam	7/19/06	ND	ND	ND	8.04	1.97	7.27	8.72	ND	ND	28.2	26.2
Zaandam	8/13/06	52	2.11	2.49	6.61	7.22	15.8	15.9	ND	ND	27.7	28.1
	Minimum	0	0	0	0.665	0.796	0.236	0	0	0	5.89	6.85
	Maximum	180	22.1	21.9	172	160	50.3	40.5	135	160	255	252
	Median	0	0	0.788	6.91	7.22	11.1	11.4	0	0	64.2	54.3

* Samples were run at a lower reporting limit (PQL).

** Samples were run at a lower reporting limit, but the samples were diluted prior to analysis thus increasing the PQL higher than what was listed in the Quality Assurance Quality Control Plan.

Table 5. Conventional and Priority Pollutants Analyzed

Conventional Pollutants	Method	Reportable Limit (PQL) mg/L
Ammonia- Total	350.3	0.10
Biochemical Oxygen Demand	405.1	2.0
Chemical Oxygen Demand	410.4	10
Chlorine, residual	SM 4500	0.1
Chlorine, free	SM 4500	0.1
Alkalinity	SM 2320 B	2.0
Settable Solids	160.5	0.10 (ml/L)
Total Suspended Solids	160.2	4.0
Fecal Coliform	SM 9221E or SM 9222 D	2 (FC/100 ml)
Specific Conductance-Conductivity	120.1	2 (µmHos/cm)
Total Organic Carbon	SM 5310 B	1.0
Oil and Grease	1664	5.0
Total Kjeldahl Nitrogen	EPA various	1.0
Total Phosphorus	EPA 365.2	0.050
Priority Pollutants	Method	Reportable Limit (PQL)
Total Recoverable Metals		Ug/l
Antimony	200.8	2.5
Arsenic	200.8	2.5
Beryllium	200.8	1.0
Cadmium	200.8	1.0
Chromium	200.8	2.5
Copper	200.8	1.0
Lead	200.8	1.0
Mercury (Total)	245.1	1.0
Nickel	200.8	1.0
Selenium	200.8	2.5
Silver	200.8	1.0
Thallium	200.8	1.0
Zinc	200.8	2.5
Dissolved Metals		
Antimony	200.8	2.5
Arsenic	200.8	2.5
Beryllium	200.8	1.0
Cadmium	200.8	0.5

Chromium	200.8	2.5
Copper	200.8	1.0
Lead	200.8	1.0
Nickel	200.8	1.0
Selenium	200.8	2.5
Silver	200.8	1.0
Thallium	200.8	1.0
Zinc	200.8	2.5
VOCs		
1,1,1,2-Tetrachloroethane	624	2
1,1,1-Trichloroethane	624	2
1,1,2,2-Tetrachloroethane	624	2
1,1,2-Trichloroethane	624	2
1,1-Dichloroethane	624	2
1,1-Dichloroethene	624	2
1,1-Dichloropropene	624	2.5
1,2,3-Trichlorobenzene	624	2.8
1,2,3-Trichloropropane	624	2.5
1,2,4-Trichlorobenzene	624	2.8
1,2,4-Trimethylbenzene	624	2.7
1,2-Dibromo-3-Chloropropane	624	10
1,2-Dichlorobenzene	624	2
1,2-Dichloroethane	624	2
1,2-Dichloroethane	624	2
1,2-Dichloropropane	624	2
1,3,5-Trimethylbenzene	624	2
1,3-Dichlorobenzene	624	2
1,3-Dichloropropane	624	2
1,4-Dichlorobenzene	624	2
2,2-Dichloropropane	624	2
2-Butanone	624	50
2-Chloroethyl Vinyl Ether	624	10
2-Chlorotoluene	624	2.1
2-Hexanone	624	20
4-Chlorotoluene	624	2
4-Isopropyltoluene	624	2.8
4-Methyl-2-Pentanone	624	20
Acetone	624	50
Acrolein	624	100
Acrylonitrile	624	10

VOCs continued		
Benzene	624	2
Bromobenzene	624	2
Bromochloromethane	624	2
Bromodichloromethane	624	2
Bromoform	624	2
Bromomethane	624	5
Carbon Disulfide	624	2
Carbon Tetrachloride	624	2
Chlorobenzene	624	2
Chloroethane	624	5
Chloroform	624	2
Chloromethane	624	5
Cis-1,2-Dichloroethene	624	2
Cis-1,3-Dichloropropene	624	2.3
Dibromochloromethane	624	2
Dibromomethane	624	2
Dichlorodifluoromethane	624	5
Ethylbenzene	624	2
Hexachlorobutadiene	624	2
Iodomethane	624	5
Isopropylbenzene	624	2.6
m&p Xylenes	624	2
Methylene Chloride	624	5
Naphthalene	624	2.8
n-Butylbenzene	624	2.8
n-Propylbenzene	624	2
O-Xylene	624	2.3
sec-Butylbenzene	624	2.3
Styrene	624	2.6
tert-Butyl Methyl Ether	624	2
tert-Butylbenzene	624	3.0
Tetrachloroethene	624	2
Toluene	624	2
Trans 1,2-Dichloroethene	624	2
trans-1,3-Dichloropropene	624	2.1
trans-1,4-Dichloro-2 Buten	624	10
Trichloroethene	624	2
Trichlorofluoromethane	624	2
Trichlorotrifluoroethane	624	2

Vinyl Acetate	624	5
Vinyl Chloride	624	2
BNAs		
1,2,4-Trichlorobenzene	625	5
1,2-Dichlorobenzene	625	5
1,2-Diphenylhydrazine	625	5
1,3-Dichlorobenzene	625	5
1,4-Dichlorobenzene	625	5
2,4,5-Trichlorophenol	625	5
2,4,6-Trichlorophenol	625	5
2,4-Dichlorophenol	625	5
2,4-Dimethylphenol	625	25
2,4-Dinitrophenol	625	100
2,4-Dinitrotoluene	625	5
2,6-Dinitrotoluene	625	5
2-Chloronaphthalene	625	10
2-Chloronaphthalene	625	10
2-Chlorophenol	625	5
2-Methylnaphthalene	625	5
2-Methylphenol	625	5
2-Nitroaniline	625	100
2-Nitrophenol	625	5
3&4-Methylphenol	625	5
3,3'-Dichlorobenzidine	625	20
3-Nitroaniline	625	50
4,6-Dinitro-2-methylphenol	625	25
4-Bromophenyl Phenyl ether	625	5
4-chloro-3-methylphenol	625	5
4-Chloroaniline	625	5
4-Chlorophenyl methylsulfone	625	20
4-Chlorophenyl Phenyl ether	625	5
4-Nitroaniline	625	50
4-Nitrophenol	625	100
Acenaphthene	625	5
Acenaphthylene	625	5
Anthracene	625	5
Benzidine	625	200
Benzo (A) Anthracene	625	5
Benzo (A) Pyrene	625	5
Benzo (B) Fluoranthene	625	5

BNAs continued		
Benzo (g,h,i) Perylene	625	5
Benzo (K) Fluoranthene	625	5
Benzoic Acid	625	130
Benzyl Alcohol	625	10
Bis (2-Chloroethoxy) methane	625	5
Bis (2-chloroethyl) ether	625	5
Bis (2-Chloroisopropyl) ether	625	5
Bis (2-Ethylhexyl) Phthalate	625	2.5
Butyl Benzyl Phthalate	625	5
Chrysene	625	5
Dibenzo (a,h) Anthracene	625	5
Dibenzofuran	625	5
Diethyl Phthalate	625	5
Dimethyl Phthalate	625	5
Di-N-Butyl Phthalate	625	5
Di-N-Octyl Phthalate	625	5
Fluoranthene	625	5
Fluorene	625	5
Hexachlorobenzene	625	5
Hexachlorobutadiene	625	5
Hexachlorocyclopentadiene	625	10
Hexachloroethane	625	5
Indeno (1,2,3-CD) Pyrene	625	5
Isophorone	625	5
Napthalene	625	10
Nitrobenzene	625	5
N-Nitrosodimethylamine	625	5
N-Nitrosodi-N-Propylamine	625	5
N-Nitrosodiphenylamine	625	10
Pentachlorophenol	625	5
Phenanthrene	625	5
Phenol	625	5
Pyrene	625	5